Aus der Klinik und Poliklinik für Psychiatrie und Psychotherapie

Klinikum rechts der Isar

Technische Universität München

Antipsychotika und ihre Effekte auf die kognitive Funktion:

Eine systematische Übersichtsarbeit, paarweise Metaanalyse und Netzwerk-Metaanalyse

Dissertation

zum Erwerb des Doktorgrades der Humanbiologie

an der Medizinischen Fakultät der

Ludwig-Maximilians-Universität München

vorgelegt von

Lena Feber

aus

München

2024

Mit Genehmigung der Medizinischen Fakultät der

Ludwig-Maximilians-Universität zu München

Erster Gutachter:	Prof. Dr. Stefan Leucht
Zweiter Gutachter:	Prof. Dr. Robert Perneczky
Dritter Gutachter:	Prof. Dr. Ulrich Mansmann
Dekan:	Prof. Dr. med. Thomas Gudermann

Tag der mündlichen Prüfung: 18.10.2024

Diese Dissertation entstand im Rahmen eines vom Bundesministerium für Bildung und Forschung finanzierten Forschungsprojekts, mit dem Förderkennzeichen: 01KG2108

Inhalte dieser Arbeit wurden teilweise bereits veröffentlicht:

Feber, L., Peter, N., Schneider-Thoma, J. *et al.* Antipsychotic drugs and their effects on cognitive function: protocol for a systematic review, pairwise, and network meta-analysis. *Syst Rev* **12**, 54 (2023). https://doi.org/10.1186/s13643-023-02213-5

Feber L, Peter N. Antipsychotic drugs and their effects on cognitive function: a systematic review, pairwise and network meta-analysis. 2022. Available from: crd.york.ac.uk/PROSPERO/display_record.php?RecordID=312483 (2023, December 10)

Feber L, Peter NL, Chiocchia V, Schneider-Thoma J, Siafis S, Bighelli I, Hansen WP, Lin X, Prates-Baldez D, Salanti G, Keefe RSE, Engel RR, Leucht S. Antipsychotic Drugs and Cognitive Function: A Systematic Review and Pairwise Network Meta-Analysis. JAMA Psychiatry. 2024 Oct 16. doi: 10.1001/jamapsychiatry.2024.2890. Epub ahead of print. PMID: 39412783.

.

Inhaltsverzeichnis

Zusammenfassung

Inhalte dieses Abschnitts wurden bereits publiziert (Feber et al. 2023, Feber et al. 2024).

Einleitung Kognitive Defizite bilden eine unabhängige Symptomgruppe der Schizophrenie. Sie beeinflussen sowohl die Lebensqualität als auch die Funktionsfähigkeit der Betroffenen in einem erheblichen Ausmaß. Antipsychotika gehören hierbei zu den Hauptbehandlungsmethoden, wobei es Hinweise darauf gibt, dass sich Antipsychotika in ihrer Wirkung auf die kognitive Symptomatik unterscheiden. Ziel dieser Arbeit ist es, eine evidenzbasierte Entscheidungsgrundlage zu schaffen, die die Auswahl der besten Behandlungsmöglichkeit für die kognitive Symptomatik für den individuellen Patienten unterstützt.

Methoden Zur Untersuchung der Effekte von Antipsychotika auf die kognitive Funktion wurde eine systematische Übersichtsarbeit mit paarweisen Metaanalysen und Netzwerk-Metaanalysen erstellt. Hierbei wurden randomisiert-kontrollierte Studien eingeschlossen, die Patienten mit einer Schizophrenie untersuchten. Es wurden sowohl verblindete als auch offene Studien eingeschlossen. In den eingeschlossenen Studien wurden entweder verschiedene Antipsychotika miteinander oder mit Placebo verglichen und die Effekte auf die Kognition erhoben. Bei den Erhebungsinstrumenten zur Erfassung der kognitiven Symptomatik wurde sich vorzugsweise an den Empfehlungen der Initiative „*Measurement and Treatment Research to Improve Cognition in Schizophrenia“* (MATRICS) orientiert oder Tests mit einer hohen Ähnlichkeit verwendet. Die Interventionsphase betrug mindestens 3 Wochen. Die Suche nach passenden Studien erfolgte über das Cochrane Schizophrenia Trials Register. Als primäres Outcome gilt ein Gesamtscore, der aus den angegeben kognitiven Domänen gebildet wurde. Sekundäre Outcomes stellen die spezifischen kognitiven Domänen nach MATRICS, Lebensqualität und Funktionsfähigkeit dar.

Ergebnisse Es wurden 68 Studien mit insgesamt 9525 Patienten eingeschlossen. Ergebnisse der durchgeführten Netzwerk-Metaanalysen zeigen keine wesentlichen Effekte der untersuchten Antipsychotika im Vergleich zu Placebo auf den primären und die sekundären Outcomes. Ergebnisse der Metaregressionen und Sensitivitätsanalysen zeigen Konsistenz zur primären Analyse auf. Eine post-hoc Analyse, in der die Antipsychotika nach ihren Rezeptorprofilen vier Gruppen zugeordnet wurden, zeigt jedoch bessere Effekte aller Gruppen im Vergleich zu Placebo auf.

Diskussion Nach aktuellem Kenntnisstand handelt es sich bei der vorliegenden Arbeit um die derzeit umfangreichste Netzwerk-Metaanalyse, die bisher zu den Effekten von Antipsychotika auf die kognitive Funktion im Rahmen einer Schizophrenie durchgeführt wurde. Es wurden alle bekannteren Antipsychotika miteinbezogen und sich am MATRICS-Goldstandard orientiert. Die Ergebnisse zeigen keine wesentlichen Überlegenheiten der einzelnen Antipsychotika im Vergleich zu Placebo, sowohl in Bezug auf den primären Outcome, als auch auf die sekundären Outcomes. Demnach kann auf Grundlade der aktuellen Evidenz keine eindeutige Empfehlung eines bestimmten Antipsychotikums für die Behandlung der kognitiven Symptomatik im Rahmen einer Schizophrenie ausgesprochen werden. Eine weitere Erkenntnis, die aus dieser Arbeit hervorgeht, ist, dass sich bisher kein Goldstandard zur Erhebung von Kognition durchsetzen konnte und demnach eine standardisierte Messung von Kognition im Rahmen einer Schizophrenie dringend benötigt wird.

Abstract

Content of this section has already been published (Feber et al. 2023, Feber et al. 2024).

Background Cognitive deficits form an independent symptom group of schizophrenia. They are a strong predictor of quality of life and functioning of affected people. Antipsychotics represent a crucial treatment option but there is evidence that they differ in their effects on cognitive function. The objective of this work is to furnish an evidence-based foundation to enable the selection of the best treatment option for cognitive symptoms for each individual patient.

Methods A systematic review with paired meta-analysis and network meta-analysis was conducted to explore the effects of antipsychotics on cognitive function. Randomized controlled trials examining patients with schizophrenia were included. Both, (double-)blinded and open-label studies were included. Studies comparing antipsychotics with each other or placebo and which measured their effects on cognitive function were included. The measurement instruments for cognitive function were preferably based on the recommendations of the initiative „Measurement and Treatment Research to Improve Cognition in Schizophrenia“ (MATRICS) or showed a high similarity to the tests. The intervention phase was at least 3 weeks. The Cochrane Schizophrenia Trials Register has been screened for eligible studies. The primary outcome is an overall-score build by the given cognitive domains. Secondary outcomes are the specific cognitive domains by MATRICS, quality of life and functioning.

Results 68 studies were included with a total of 9525 patients. The results of the network meta-analyses showed no substantially better effects of the investigated antipsychotics compared to placebo for primary and secondary outcomes. Results of the meta-regressions and sensitivity analyses showed consistency with the primary analysis. However, a post-hoc analysis categorizing antipsychotics into four groups based on their receptor-binding profiles demonstrated better effects of all groups compared to placebo.

Discussion According to current knowledge, this is the largest network meta-analysis focusing on the effects of antipsychotics on cognitive function in schizophrenia. All known antipsychotics were included and the measurement of cognitive function followed the MATRICS-goldstandard. The results show no meaningfully better effects of a specific antipsychotic drug compared to placebo concerning the primary and secondary outcomes. Thus, based on the current evidence, no clear recommendation for a specific antipsychotic drug for the treatment of cognitive symptoms in schizophrenia can be made. A further finding emerging from this work is, that there is no established gold standard for assessing cognition in schizophrenia, so far. Therefore a standardized measurement of cognitive function in schizophrenia is of important need.

Abbildungsverzeichnis

Tabellenverzeichnis

Abkürzungsverzeichnis

CANTAB	Cambridge Neuropsychological Test Automated Battery
CI	Confidence interval
CINeMA	Confidence in Network Meta-Analysis
COSMIN	COnsensus-based Standards for the selection of health Measurement INstruments
DSM	Diagnostic and Statistical Manual of Mental Disorders
FGA	First generation antipsychotics
GRADE	Grading of Recommendations Assessment, Development and Evaluation
ICD	International Classification of Diseases
MATRICS	Measurement and Treatment Research to Improve Cognition
NbN	Neuroscience-based Nomenclature
MCCB	MATRICS Consensus Cognitive Battery
N	Teilnehmerzahl
NMA	Netzwerk-Metaanalyse
RBANS	Repeatable Battery for the Assessment of Neuropsychological Status
RCT	Randomized controlled trial
RoB	Risk of Bias
RoB-MEN	Risk of Bias due to missing evidence in network meta-analysis
SD	Standard deviation
SE	Standard error
SGA	Second generation antipsychotics
SMD	Standardized mean difference

1. Einleitung

Inhalte des folgenden Abschnitts, die bereits von der Verfasserin dieser Arbeit in der Funktion als Erstautorin veröffentlicht wurden, wurden entsprechend zitiert.

1.1 Einordnung der Schizophrenie

Weltweit gehört Schizophrenie zu den am häufigsten auftretenden psychiatrischen Erkrankungen, mit einer Lebenszeitprävalenz von 1% (McGrath et al. 2008). Es handelt sich um eine oft lebenslange Erkrankung und sie liegt nach dem Global-Burden-of-Disease-Report auf Rang 15 hinsichtlich der Jahre, die mit einer krankheitsbedingten Behinderung gelebt werden (Vos et al. 2012). (Feber et al. 2023)

Eine Schizophrenie äußert sich meist in einem sehr heterogenen Erscheinungsbild mit unterschiedlichen Symptomen (Remschmidt und Theisen 2011). Nach ICD-10 (International Statistical Classification of Diseases and Related Health Problems), dem internationalen Klassifikationssystem der Weltgesundheitsorganisation, existieren folgende Unterformen einer Schizophrenie (F20.-) (Dilling et al. 2015):

- Paranoide Schizophrenie (F20.0)
- Hebephrene Schizophrenie (F20.1)
- Katatone Schizophrenie (F20.2)
- Undifferenzierte Schizophrenie (F20.3)
- Postschizophrenie Depression (F20.4)
- Schizophrenes Residuum (F20.5)
- Schizophrenia simplex (F20.6)
- sonstige Schizophrenie (F20.8)
- Schizophrenie, nicht näher bezeichnet (F20.9)

Die unterschiedlichen Subtypen nach ICD-10, sind durch verschiedene vorherrschende Symptome zum Zeitpunkt der Diagnosestellung gekennzeichnet. Während bei einer paranoiden Schizophrenie Wahnsymptome und Halluzinationen im Vordergrund sind, stehen bei einer hebephrenen Schizophrenie vielmehr die affektiven Veränderungen im Fokus. Die katatone Schizophrenie ist wiederum gekennzeichnet durch psychomotorische Veränderungen. Die Diagnose einer unspezifischen Schizophrenie wird vergeben, wenn die generellen Symptome einer Schizophrenie erfüllt sind, jedoch keine spezifische Zuordnung in F20.0-F20.2 stattfinden konnte. Bei der postschizophrenen Depression steht eine depressive Episode im Vordergrund, die nach einer schizophrenen Erkrankung folgt. Hierbei bestehen weiterhin einige Positiv- und Negativsymptome, welche allerdings nicht mehr vorherrschend sind. Das Schizophrene Residuum und Schizophrenia simplex zeigen vordergründig Negativsymptome, während bei der Diagnose Schizophrenia simplex jedoch keine produktiv psychotischen Symptome vorangegangen sind. (Dilling et al. 2015; Falkai 2015; Lincoln 2019)

Die Klassifikation nach ICD-10 wird in Deutschland aktuell noch verwendet. Eine vollständige Implementierung des ICD-11 ist derzeit in Deutschland noch nicht erfolgt, die Einführung findet schrittweise statt. ICD-11 sieht bezüglich der Beurteilung einer Schizophrenie keine Einteilung mehr nach Subtypen vor (Zielasek und Gaebel 2018). Stattdessen stehen Symptomindikatoren im Vordergrund, welche eine Abstufung des Schweregrads der Symptomausprägung ermöglichen (Lau 2021).

Auch das diagnostisch-statistische Handbuch mentaler Störungen (DSM-5) der Amerikanischen Psychiatrischen Vereinigung, gehört zu den gängigen Klassifikationssystemen zur Einordnung einer Schizophrenie (Falkai 2015; Remschmidt und Theisen 2011). Im DSM-5 wird ebenso wie im ICD-11 auf die Einteilung in die traditionellen Subtypen verzichtet (Jäger 2015). Die beiden Klassifikationssysteme unterscheiden sich in ihrem Zeitkriterium, welches nach ICD-10 und ICD-11 mindestens einen Monat beträgt und nach DSM-5 deutlich restriktiver behandelt wird (Remschmidt und Theisen 2011).

Bei der Symptomatik einer Schizophrenie findet jedoch nach beiden diagnostischen Klassifikationssystemen eine Einteilung in sogenannte Positivsymptome und Negativsymptome statt. Zu Positivsymptomen zählen Symptome wie Halluzinationen, Wahnvorstellungen, desorganisiertes Verhalten oder formale Denkstörungen und entsprechende Schwierigkeiten sich auszudrücken, während als Negativsymptome beispielsweise eine Verminderung des Antriebs, sozialer Rückzug und eine Affektverflachung gelten (Lincoln 2019; Falkai et al. 2017). Ebenso spielen kognitive Defizite eine wesentliche Rolle, die im nächsten Abschnitt näher thematisiert werden. Generell besteht jedoch kein einzelnes Merkmal welches ausschlaggebend für die Diagnosestellung einer Schizophrenie ist (Lincoln 2019). Nach ICD-10 bzw. ICD-11 und DSM-5 wird daher eine gewisse Mindestanzahl an Symptomen verschiedener Bereiche beschrieben, welche für die Diagnosestellung erfüllt sein muss (Falkai 2015; Dilling et al. 2015).

Demnach besteht eine Vielzahl an Symptomen welche stark variieren können. Eine genaue Diagnostik ist daher dringend erforderlich um die entsprechenden Behandlungsmöglichkeiten abwägen zu können, die für die spezifische Symptomatik und Symptomausprägung am geeignetsten scheint.

1.2 Kognitive Defizite im Rahmen einer Schizophrenie

Kognitive Einschränkungen stellen neben der Positiv- und Negativsymptomatik mittlerweile eine weitere wesentliche, unabhängige Kernsymptomatik der Schizophrenie dar. Typische kognitive Symptome sind beispielsweise Beeinträchtigungen der Aufmerksamkeit, Konzentration und des Gedächtnisses. Zwar wurden bereits von Kraepelin kognitive Leistungseinschränkungen als Kernsymptom der früher noch als „Dementia praecox“ bezeichneten Erkrankung beschrieben, jedoch stand über lange Zeit die Positivsymptomatik der Schizophrenie im Vordergrund (Zec 1995).

Bei nahezu allen an einer Schizophrenie erkrankten Personen zeigen sich kognitive Beeinträchtigungen (Keefe 2008). Im Vergleich zu affektiven Störungen sind kognitive Beeinträchtigungen innerhalb einer Schizophrenie meist schwerer ausgeprägt (Krabbendam et al. 2005; Buchanan et al. 2005). Trotz der hohen Relevanz der kognitiven Symptomatik im Rahmen einer Schizophrenie, finden sie bisher zwar ihren Platz in der Beschreibung der Erkrankung, sie befindet sich jedoch nicht unter den spezifischen Diagnosekriterien für eine Schizophrenie oder deren Subtypen (Keefe 2008). In der Vergangenheit wurde jedoch bereits daran gearbeitet, wie die kognitiven Defizite im Rahmen einer Schizophrenie in die Diagnosekriterien einfließen könnten (Keefe 2008; Keefe und Fenton 2007). Im ICD-11 wird kognitiven Beeinträchtigungen im Kontext der Beurteilung verschiedener Schweregrade mehr Bedeutung zugemessen (Lau 2021).

In der Vergangenheit schien es zudem häufig unklar, ob die kognitive Symptomatik möglicherweise auch mit der Medikation zusammenhängen könnte. Ein Großteil der klinischen Studien in der sich eine kognitive Symptomatik zeigte, untersuchte meist Patienten, die bereits Antipsychotika einnahmen (Fatouros-Bergman et al. 2014). Eine Metaanalyse konnte jedoch zeigen, dass

kognitive Einschränkungen auch unabhängig und vor der ersten antipsychotischen Behandlung bestehen können und es sich somit um eine Symptomatik der Erkrankung und nicht zwangsläufig um eine Nebenwirkung handelt (Fatouros-Bergman et al. 2014).

Die Bedeutung der kognitiven Symptomatik sowie die nähere Fokussierung der spezifischen Behandlungsoptionen scheint essentiell vor dem Hintergrund, dass sich die kognitiven Beeinträchtigungen entscheidend auf den Langzeitverlauf der Erkrankung und die Lebensqualität sowie Funktionsfähigkeit der Betroffenen auswirkt (Kane und Lencz 2008; Keefe und Fenton 2007). (Feber et al. 2023; Feber et al. 2024)

1.2.1 Erhebungsmöglichkeiten der kognitiven Symptomatik

Die Auseinandersetzung mit den Erhebungsmöglichkeiten der kognitiven Symptomatik zeigt verschiedenste Testverfahren auf. Neben leistungsbasierten Testverfahren existieren beispielsweise auch Selbstbeurteilungsfragebögen oder –interviews, sowie Fremdbeurteilungsmöglichkeiten (z.B. durch Angehörige oder geschultes Fachpersonal) der kognitiven Einschränkungen.

Eine systematische Übersichtsarbeit konnte zeigen, dass folgende Testbatterien häufig eingesetzt werden, um Kognition im Rahmen einer Schizophrenie zu erfassen (Bakkour et al. 2014): Cambridge Neuropsychological Test Automated Battery (CANTAB) (Sahakian und Owen 1992), CogState (Maruff et al. 2009) und Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) (Randolph et al. 1998). In vielen Studien werden auch nur einzelne Tests dieser Batterien verwendet. Es lässt sich allerdings zusammenfassen, dass diese Testverfahren nicht spezifisch für die Erfassung von kognitiven Defiziten im Rahmen einer Schizophrenie entworfen wurden und eher für ältere Patienten mit kognitiven Einschränkungen gedacht sind (Vita et al. 2022b). Ein Nachteil ist zudem, dass diese Testverfahren oft sehr komplex und sehr zeitintensiv sind (Bakkour et al. 2014; Vita et al. 2022b). Da sich kognitive Defizite stark auf die (Alltags-)Funktionsfähigkeit der Betroffenen auswirkt, wird eine zusätzliche Selbstbeurteilung durch Betroffene oder durch Beobachter empfohlen (Vita et al. 2022b). Hierdurch können wesentliche ergänzende Informationen über die Auswirkungen der kognitiven Einschränkungen, auf beispielsweise soziale Interaktionen, Alltagsaktivitäten oder die Arbeitsfunktion, gewonnen werden (Vita et al. 2022b).

Bei näherer Betrachtung der unterschiedlichen Testverfahren wird deutlich, dass viele verschiedene Möglichkeiten zur Erhebung der kognitiven Symptomatik existieren, welchen wiederum ein unterschiedliches Verständnis von Kognition zugrunde liegt. Eine standardisierte und somit vergleichbare Erfassung von Kognition ist jedoch essentiell, weshalb die Initiative „Measurement and Treatment Research to Improve Cognition in Schizophrenia“ (MATRICS) vom National Institute of Mental Health gegründet wurde (Nuechterlein et al. 2008). MATRICS setzte sich zum Ziel einen Goldstandard zum einheitlichen Verständnis und zur standardisierten Erfassung von Kognition zu schaffen. In diesen Prozess wurden Experten aus verschiedensten Bereichen einbezogen, die einerseits die Domänen zur Erfassung basierend auf Faktorenanalysen auswählten und die Kriterien bei der Auswahl geeigneter Testverfahren festlegten. Hieraus gingen die folgenden sieben kognitiven Domänen hervor: Verarbeitungsgeschwindigkeit, Aufmerksamkeit/Vigilanz, Arbeitsgedächtnis, Verbales Lernen, Visuelles Lernen, Argumentation und Problemlösung und Soziale Kognition (Green et al. 2004). Da es keinen Konsens darüber gibt, welche Domäne am wichtigsten ist, wird ein Gesamtscore aus den sieben Domänen gebildet (Nuechterlein et al. 2008). Dieser wird meist als Composite Score bezeichnet. (Feber et al. 2023; Feber et al. 2024)

Kriterien wie die Reliabilität, Validität und Durchführbarkeit in klinischen Studien, spielten bei der Auswahl von geeigneten Testverfahren eine wesentliche Rolle. Es konnte eine Beta-Batterie mit 20 geeigneten Testverfahren, welche die einzelnen kognitiven Domänen erheben, entworfen werden. Anhand der Erprobung dieser Tests im Rahmen einer klinischen Studie, sowie der erneuten Einbeziehung von Experten, wurde die Beta-Batterie zu der finalen MATRICS Consensus Cognitive Battery (MCCB), bestehend aus 10 Tests zur Erfassung der sieben Domänen, reduziert. Zum Einsatz soll die MCCB vor allem in klinischen Studien zur Untersuchung von Effekten von Medikamenten auf die kognitive Funktion bei Schizophrenie oder verwandten Krankheitsbildern kommen, um eine Vergleichbarkeit von Ergebnissen zwischen Studien zu schaffen (Nuechterlein et al. 2008).

Diese Arbeit soll sich ebenfalls an den Vorschlägen der MATRICS-Initiative orientieren. Allerdings wird erwartet, dass viele der eingeschlossenen Studien die Empfehlungen noch nicht berücksichtigten, da die Hauptpublikationen von MATRICS 2008 veröffentlicht wurden. (Feber et al. 2023; Feber et al. 2024)

1.2.2 Psychopharmakologische Behandlungsmöglichkeiten der kognitiven Symptomatik

Antipsychotika gehören zu den wesentlichen Behandlungsmöglichkeiten einer akuten Schizophrenie (Leucht et al. 2012; Leucht et al. 2013; Huhn et al. 2019). Antipsychotika dienten anfangs vorwiegend zur Behandlung psychotischer Symptome, zeigen aber auch bei der Behandlung anderer Beschwerden wie Grübelneigung, innerer Unruhe und Insomnie positive Effekte (Gaebel 2006). Diese wurden bisher vorwiegend in Antipsychotika der ersten Generation, auch bekannt als typische Antipsychotika und der zweiten Generation, auch als atypische Antipsychotika bezeichnet, unterteilt. Antipsychotika der ersten Generation zeigten im klinischen Einsatz häufig extrapyramidalmotorische Nebenwirkungen, zu denen Parkinson-Syndrome, dystone Reaktionen, Akathisien und weitere Beschwerden, die die unwillkürliche Motorik betreffen zählen (Gaebel 2006). Antipsychotika der zweiten Generation zeigen vergleichsweise jedoch kaum extrapyramidalmotorische Nebenwirkungen und sollen sich in folgenden weiteren Charakteristika von Antipsychotika der ersten Generation unterscheiden: Reduktion der Negativsymptome, Reduktion kognitiver Einschränkungen, Wirksamkeit bei Therapieresistenz, geringes Auftreten oder Ausbleiben von Spätdyskinesien und wenig oder keine Erhöhung des Prolaktinspiegels (Gaebel 2006; Gründer und Benkert 2012). Allerdings konnte nach heutigem Kenntnisstand keine gemeinsame pharmakologische Basis der atypischen Antipsychotika gefunden werden und bis auf Clozapin erfüllt kein atypisches Antipsychotikum alle aufgezählten Charakteristika (Gaebel 2006). Zudem resultiert aus klinischen Studien, dass auch Antipsychotika der ersten Generation manche dieser Kriterien erfüllen. Beispielsweise konnte gezeigt werden, dass Haloperidol vergleichbare positive Effekte in Bezug auf die Negativsymptomatik und depressive Symptome erzielte, wie auch Antipsychotika der zweiten Generation (Leucht et al. 2009).

Die Einteilung in Antipsychotika der ersten- und zweiten Generation ist mittlerweile veraltet. Heutzutage wird eher eine Einteilung herangezogen, bei der die Rezeptorprofile der unterschiedlichen Antipsychotika eine wesentliche Rolle spielt (Gaebel 2006). Die Beurteilung nach der von Experten entwickelten Neuroscience-based Nomenclature (NbN) scheint daher immer geläufiger. Hierbei soll ein Medikament nicht mehr strikt mit einer Diagnose verbunden werden, sondern vor allem die pharmakologischen Mechanismen von Medikamenten in den Vordergrund rücken (Zohar et al. 2015). McCutcheon et al. teilte Antipsychotika ebenfalls nach ihren Rezeptorbindungsprofilen in vier verschiedene Gruppe auf: 1. Muskarinantagonist (muscarinic), 2. partieller

Dopaminagonist und adrenerger Antagonist (adrenergic/lowDA), 3. serotonerger und dopaminerger Antagonist (serotonergic/dopaminergic) und 4. Dopaminantagonist (dopaminergic) (McCutcheon et al. 2023a). Da in den meisten eingeschlossenen Studien der vorliegenden Arbeit bisher jedoch noch die Einteilung nach Antipsychotika der ersten- und zweiten Generation erfolgte, werden die Begriffe im Folgenden weiterhin verwendet. (Feber et al. 2023; Feber et al. 2024)

Somit existiert eine große Auswahl an Antipsychotika, die sich in ihrem Wirkmechanismus, Effekten und Nebenwirkungen unterscheiden. Es wird ebenfalls darüber diskutiert, ob sich Antipsychotika auch in Hinblick auf ihre Effekte auf die kognitive Symptomatik unterscheiden. Beispielsweise gibt es Hinweise darauf, dass Antipsychotika der zweiten Generation im Vergleich zu Antipsychotika der ersten Generation bessere Effekte auf die kognitive Funktion zeigen (Woodward et al. 2005; Riedel et al. 2018). Ebenso geht aus den Leitlinien der Europäischen Psychiatrischen Vereinigung hervor, dass atypische Antipsychotika aufgrund ihrer vorteilhaften Auswirkungen insbesondere auf die kognitive Funktion im Rahmen einer Schizophrenie priorisiert werden (Vita et al. 2022a; Gründer und Benkert 2012). Allerdings konnte bisher kein spezifisches Antipsychotikum benannt werden, welches zwischen den anderen herausstach (Vita et al. 2022a). Anticholinergika und Benzodiazepine zeigten unterdessen negative Auswirkungen auf die kognitive Funktion, weshalb die Gabe bei ausgeprägten kognitiven Defiziten so gering wie möglich gehalten werden sollte (Vita et al. 2022a). Auch die S3-Leitlinien für Schizophrenie fassen die Überlegenheit von Antipsychotika der zweiten Generation zusammen (Gaebel 2006). Weiterhin zeigen die Ergebnisse der zwei großen Phase IV Studien CATIE und EUFEST, dass eine antipsychotische Behandlung generell zu einer moderaten Verbesserung kognitiver Funktionen führen konnte (Davidson et al. 2009; Keefe et al. 2007). In beiden Studien konnte jedoch ebenfalls keine Überlegenheit eines der untersuchten Antipsychotika dargestellt werden. In der CATIE-Studie stach sogar Perphenazin, ein Antipsychotikum der ersten Generation, mit den vergleichsweise besten Effekten in Bezug auf die kognitive Symptomatik heraus (Keefe et al. 2007). (Feber et al. 2023; Feber et al. 2024)

1.3 Ziel dieser Arbeit

Ziel dieser Arbeit ist die Erstellung einer systematischen Übersichtsarbeit mit paarweisen Metaanalysen und Netzwerk-Metaanalysen zu den Effekten von Antipsychotika auf die kognitive Symptomatik einer Schizophrenie (Feber et al. 2023; Feber et al. 2024). Im Folgenden wird dargestellt welche bisherigen Forschungsergebnisse es bereits zu dieser Thematik gibt und weshalb diese nicht ausreichend sind. Daraus resultiert die Motivation für die vorliegende Arbeit.

1.3.1 Bisherige Forschungsergebnisse

Es liegen bereits ein paar wenige (Netzwerk-)Metaanalysen vor, die sich mit der Wirkung von Antipsychotika auf die kognitive Funktion beschäftigen. Allerdings sind diese entweder nicht aktuell, fokussieren sich nur auf bestimmte Medikamente bzw. schließen neuere Antipsychotika nicht mit ein oder weisen eine niedrige Qualität auf. Zudem handelt es sich vorwiegend um Metaanalysen, bisher sind nur drei Netzwerk-Metaanalysen (Nielsen et al. 2015; Baldez et al. 2021; Désaméricq et al. 2014) veröffentlicht. In früheren (Netzwerk-)Metaanalysen wurde außerdem meist der Fokus auf Vergleiche zwischen den Antipsychotika gelegt und nicht auf Vergleiche mit Placebo. (Feber et al. 2023; Feber et al. 2024)

In der Netzwerk-Metaanalyse von Nielsen et al. (Nielsen et al. 2015) wird sich auf Antipsychotika der zweiten Generation fokussiert und ältere Medikamente als „FGA“ (first generation antipsychotika) zusammengefasst und nicht einzeln untersucht. Einschränkungen sind weiterhin, dass unter anderem nur Langzeit-Studien eingeschlossen wurden, die Domänen sich nicht an den MATRICS-Empfehlungen orientierten, Depot-Antipsychotika ausgeschlossen wurden und keine Einschätzung des Risk of Bias stattfand. Die neusten Antipsychotika sind zudem nicht enthalten. Ergebnisse dieser Arbeit zeigen positive Effekte von Sertindol auf die exekutive Funktion und positive Effekte von Clozapin sowie Olanzapin auf die Wortflüssigkeit (Nielsen et al. 2015).

Die Netzwerk-Metaanalyse von Baldez et al. (Baldez et al. 2021) zeigt ebenfalls Limitationen auf. Beispielsweise war die Suche begrenzt auf drei Datenbanken (kein Studienregister) und doppelblind Studien. Depot-Antipsychotika wurden ausgeschlossen und auch hier wurden bei der Domänen-Bildung die MATRICS-Empfehlungen nicht ausreichend miteinbezogen. Die Netzwerk-Metaanalyse zeigte positive Effekte von Amisulprid auf das verbale Lernen; von Quetiapin auf den Gesamtscore, Aufmerksamkeit und verbales Lernen; von Lurasidon auf den Gesamtscore; von Olanzapin auf den Gesamtscore und die meisten kognitiven Domänen, von Perphenazin auf den Gesamtscore, exekutive Funktion, Arbeitsgedächtnis und verbales Lernen; von Risperidon auf die exekutive Funktion und verbales Lernen; von Sertindol auf die Verarbeitungsgeschwindigkeit und von Ziprasidon auf den Gesamtscore, Arbeitsgedächtnis und verbales Lernen (Baldez et al. 2021).

Désamériqc et al. (Désaméricq et al. 2014) konzentrierten sich in ihrer Netzwerk-Metaanalyse vorwiegend auf die Langzeiteffekte von Antipsychotika auf die Neurokognition (Désaméricq et al. 2014). Es wurde sich auf den Vergleich von Zweit-Generations Antipsychotika mit Placebo oder Haloperidol fokussiert. Die MATRICS-Empfehlungen wurden nicht miteinbezogen. Es wurden lediglich neun Studien eingeschlossen. Die Ergebnisse zeigen positive Effekte von Quetiapin, Olanzapin und Risperidon auf einen „globalen“ Kognitionsscore; von Ziprasidon auf das Gedächtnis; von Quetiapin auf Aufmerksamkeit und Verarbeitungsgeschwindigkeit und positive Effekte von Quetiapin, Risperidon und Olanzapin auf die exekutive Funktion (Désaméricq et al. 2014).

Die S3 Leitlinien (https://register.awmf.org/assets/guidelines/038-009l_S3_Schizophrenie_2019-03.pdf) beschreiben vier weitere Metaanalysen zu den Effekten von Antipsychotika auf die kognitive Symptomatik im Rahmen einer Schizophrenie (Woodward et al. 2007, 2005; Mishara und Goldberg 2004; Keefe et al. 1999). Diese Metaanalysen sind allerdings mittlerweile veraltet, konnten demnach nicht die später erschienenen Empfehlungen von MATRICS berücksichtigen und konzentrierten sich nur auf ausgewählte Antipsychotika.

(Feber et al. 2023; Feber et al. 2024)

1.3.2 Motivation für die Erstellung einer (Netzwerk-)Metaanalyse

Die bisherigen Forschungsergebnisse zeigen den Bedarf an qualitativ hochwertigen (Netzwerk-) Metaanalysen zu den Effekten von Antipsychotika auf die kognitive Funktion, denn bisherige Arbeiten hierzu sind entweder nicht aktuell, beziehen die neueren Medikamente nicht mit ein oder weisen eine niedrige methodische Qualität auf. In der vorliegenden Arbeit soll sich nun am aktuellen Goldstandard der MATRICS-Initiative orientiert werden und alle wesentlichen Antipsychotika miteingeschlossen werden. Um die Effekte von Antipsychotika auf die kognitive Symptomatik zu untersuchen wird eine Netzwerk-Metaanalyse durchgeführt, die es ermöglicht direkte und indirekte Evidenz zu dieser Thematik zu kombinieren. Es handelt sich dabei um hoch komplexe und aufwändige statistische Verfahren, durch die die Präzision der Ergebnisse erhöht werden

kann und Hierarchien gebildet werden können welches Antipsychotikum das beste, zweitbeste, etc. Medikament für kognitive Defizite im Rahmen einer Schizophrenie darstellt. Zudem sollen Vergleiche der Antipsychotika mit Placebo fokussiert werden.

Des Weiteren wurden bei der Erstellung dieser Arbeit Patientenvertreter der Patientenorganisation „BASTA-Bündnis für psychisch erkrankte Menschen“ (http://www.bastagegenstigma.de/) miteinbezogen, wie bereits bei vielen anderen Projekten der Arbeitsgruppe in der Vergangenheit. Hierbei wurde sich an den Empfehlungen von INVOLVE, einer vom National Institute of Health (UK) unterstützten Organisation, orientiert (Briefing notes for researchers | INVOLVE). Sie fördern die Einbeziehung von Patienten in wissenschaftliche Projekte und sehen eine Beteiligung von Patientenvertretern in alle wesentlichen Schritte bei der Erstellung eines systematischen Reviews als essentiell. Somit wurde mit Patientenvertretern von BASTA das Vorhaben besprochen. Es stellte sich heraus, dass insbesondere kognitive Defizite für Betroffene einen hohen Leidensdruck und starke Einschränkungen im Alltag darstellen und daher eine Arbeit mit dem Ziel einer Auswertung, welches Antipsychotikum die beste Wirkung auf die kognitive Funktion hat, eine hohe Relevanz darstellt.

Durch die Ergebnisse dieser Arbeit soll eine evidenzbasierte Entscheidungsgrundlage geschaffen werden, die die Auswahl des besten Antipsychotikums bei der Behandlung der individuellen kognitiven Symptomatik im Rahmen einer Schizophrenie für Behandler und Betroffene erleichtern soll.

(Feber et al. 2023; Feber et al. 2024)

2. Methoden

Die Dissertation entstand im Rahmen eines vom Bundesministerium für Bildung und Forschung finanzierten Forschungsprojekts, mit dem Förderkennzeichen: 01KG2108. Die Methodik wurde bereits in einem Protokoll in PROSPERO (CRD42022312483) und einem ausführlichen Protokoll in BMC Systematic Reviews veröffentlicht (Feber et al. 2023). Die Endpublikation wurde über JAMA Psychiatry veröffentlicht (Feber et al. 2024). Alle beschriebenen Arbeitsschritte wurden von der Verfasserin dieser Arbeit parallel mit einem zweiten Reviewer durchgeführt. Eine unabhängige Überprüfung der Daten ist zur Gewährleistung der Qualitätssicherung qualitativ hochwertiger Metaanalysen zwingend erforderlich.

2.1 Ein- und Ausschlusskriterien

Studien

Bei den in die Analysen einbezogenen Studien handelt es sich um randomisiert-kontrollierte Studien (RCTs). Es wurden sowohl verblindete als auch offene Studien eingeschlossen. Wenn die Randomisierungsmethode ein zu hohes Biasrisiko darstellte, wurde die Studie ausgeschlossen. Ein wesentliches Einschlusskriterium war, dass die Studien die Effekte von Antipsychotika auf die kognitive Funktion bei Schizophrenie-Patienten untersuchten. Es wurden Studien eingeschlossen in denen ein Antipsychotikum entweder mit anderen Antipsychotika oder mit Placebo verglichen wurde. Die Interventionsphase der Studien betrug hierbei mindestens einer Dauer von drei Wochen. (Feber et al. 2023; Feber et al. 2024)

Interventionen

Es wurden alle bedeutsamen älteren (auch als typisch oder erste Generation bezeichnet) und neueren (auch als atypisch oder zweite Generation bezeichnet) Antipsychotika miteinbezogen.

Folgende Antipsychotika der ersten Generation wurden eingeschlossen:

Haloperidol, Chlorpromazin, Perphenazin, Clopenthixol, Fluphenazin, Flupentixol, Levomepromazin, Loxapin, Molindon, Penfluridol, Perazin, Pimozid, Sulpirid, Thioridazin, Thiotixen, Trifluoperazin und Zuclopenthixol.

Folgende Antipsychotika der zweiten Generation wurden eingeschlossen:

Amilsulprid, Aripiprazol, Asenapin, Brexpiprazol, Cariprazin, Clozapin, Iloperidon, Lumateperon, Lurasidon, Olanzapin, Olanzapin/Samidorphan, Paliperidon, Quetiapin, Risperidon, Sertindol und Ziprasidon.

Die Auswahl der Erst-Generations-Antipsychotika beruhte auf einer systematischen Befragung von internationalen Schizophrenie-Experten (Leucht et al. 2016a). Die Antipsychotika der zweiten Generation wurden eingeschlossen, da sie heutzutage die verbreiteste Medikamentenwahl zur Behandlung der Schizophrenie darstellen. Die Differenzierung in Antipsychotika der ersten und zweiten Generation ist veraltet, dennoch wird die Benennung zum besseren Verständnis im Verlauf dieser Arbeit beibehalten (Leucht et al. 2013; Buchanan et al. 2010). Die Gabe der Antipsychotika konnte in oraler Form oder als intramuskuläre Depot-Injektion erfolgen. Nur kurz-wirksame intramuskuläre Injektionspräparate wurden ausgeschlossen. Die zulässige Dosierung von Studienarmen mit festem Dosierungsschema entsprach den Ergebnissen der Konsensstudie zur

antipsychotischen Dosierung (Gardner et al. 2010). Studienarme mit flexiblen Dosierungsschemata wurden ohne Einschränkung miteinbezogen, da hier eine flexible Anpassung der Dosierung entsprechend der individuellen Bedürfnisse des Patienten möglich war. (Feber et al. 2023)(Feber et al. 2023; Feber et al. 2024)

Bezüglich der post-hoc Analyse nach Rezeptorbindungsprofil der Antipsychotika, fand folgende Einteilung statt (McCutcheon et al. 2023a):
1. Muskarinantagonist (muscarinic): Clozapin, Olanzapin, Quetiapin, Thioridazin
2. partieller Dopaminagonist und adrenerger Antagonist (adrenergic/lowDA): Aripiprazol, Brexpiprazol, Lurasidon, Ziprasidon
3. serotonerger und dopaminerger Antagonist (serotonergic/dopaminergic): Fluphenazin, Haloperidol, Paliperidon, Risperidon, Sertindol, Zotepin
4. Dopaminantagonist (dopaminergic): Amisulprid, Molindon
In dieser Auflistung befinden sich nur die Antipsychotika, die in der Analyse vorkamen.

(Feber et al. 2023; Feber et al. 2024)

Studienteilnehmer

Es wurden Studienteilnehmer eingeschlossen, bei denen eine Schizophrenie, eine schizophrenieforme oder eine schizoaffektive Störung vorlag. Hierbei war nicht entscheidend, dass die Diagnose nach ICD-10, ICD-11 oder DSM-5 operationalisiert wurde, da diese auch im klinischen Alltag nicht immer herangezogen werden können. Es gab keine Einschränkungen bezüglich Alter, Geschlecht, Herkunft, Schwere oder Dauer der Erkrankung oder dem Behandlungssetting (ambulant oder stationär) der Studienteilnehmer. Eine Studie wurde ausgeschlossen, wenn alle Studienteilnehmer per Einschlusskriterium Komorbiditäten aufweisen. (Feber et al. 2023)

2.2 Suchstrategie und Studienauswahl

Zur Suche nach passenden Studien wurde das Cochrane Schizophrenia Trial Register verwendet (Register of trials 2023). Hier wurde zu Beginn nach publizierten und nicht-publizierten randomisiert kontrollierten Studien gesucht, die für unsere Fragestellung relevant waren. Im Anhang befindet sich die genaue Suchstrategie. Die Suchstrategie wurde von einem Bibliothekar mit spezifischer Erfahrung, Dr. Farhad Shokraneh, entwickelt und durchgeführt. Die Suche erfolgte bis zum 25. Juni 2023. Bei der Suche gab es keine Einschränkungen bzgl. der Sprache oder dem Publikationsjahr. Im Falle unvollständiger oder fehlender Outcomes potentiell passender Studien wurden die Studienautoren oder Pharmaunternehmen kontaktiert und um zusätzliche Information gebeten. Zusätzlich zur elektronischen Suche wurden auch verwandte Übersichtsarbeiten durchsucht.

Die identifizierten Referenzen wurden dann von zwei Reviewern unabhängig voneinander überprüft. Im ersten Schritt wurden die Suchergebnisse auf ihre generellen Ein- und Ausschlusskriterien kontrolliert. Im zweiten Schritt wurde die Verfügbarkeit eines Messinstruments für Kognition beurteilt sowie anschließend die Passung des Messinstruments entschieden.

Die Ergebnisse dieser Beurteilung wurde von beiden Reviewern untereinander abgeglichen und bei Unstimmigkeiten diskutiert bzw. eine dritte Person hinzugezogen.

(Feber et al. 2023; Feber et al. 2024)

2.3 Outcomes

Bei der Auswahl der kognitiven Outcomes wurde sich auf die Empfehlungen von MATRICS fokussiert. Allerdings stellte sich heraus, dass die wenigsten Studien dem aktuellen Goldstandard folgten und die vollständige MCCB kaum eingesetzt wurde. Demnach wurden auch Tests außerhalb der MCCB akzeptiert, sofern sie eine der sieben MATRICS-Domänen zuzuordnen waren und eine hohe Ähnlichkeit zu dem entsprechenden MCCB-Test aufwiesen. Diese Entscheidung wurde von zwei Personen unabhängig voneinander getroffen, abgeglichen und von neuropsychologischen Experten begleitet. Wie bereits beschrieben war die unabhängige Beurteilung zwingend erforderlich zur Qualitätssicherung qualitativ hochwertiger Metaanalysen. (Feber et al. 2023; Feber et al. 2024)

2.3.1 Primäre Outcomes

Die Auswahl der kognitiven Outcomes orientiert sich an den MATRICS-Empfehlungen (Green et al. 2008; Kern et al. 2008; Nuechterlein et al. 2008). Es werden ausschließlich die sieben kognitiven Domänen verwendet, die auch von MATRICS zur Erfassung von Kognition vorgeschlagen werden (Green et al. 2004): Verarbeitungsgeschwindigkeit, Aufmerksamkeit/Vigilanz, Arbeitsgedächtnis, Verbales Lernen, Visuelles Lernen, Argumentation und Problemlösung, Soziale Kognition.

Als primärer Outcome wird ein Gesamtscore für alle erhobenen kognitiven Domänen verwendet. Soweit angegeben wurde hierzu der Composite Score der MCCB extrahiert. Jedoch kam dies sehr selten vor, weshalb wir selbst einen Gesamtscore aus den angegebenen Tests pro Studie berechneten, da diese sehr sorgfältig ausgewählt wurden. Der selbst berechnete Gesamtwert wird im Folgenden meist als Overall-Score bezeichnet. Die nähere Beschreibung der Testauswahl für die einzelnen Domänen folgt im nächsten Abschnitt.

(Feber et al. 2023; Feber et al. 2024)

2.3.2 Sekundäre Outcomes

Die einzelnen Testverfahren für die spezifischen kognitiven Domänen wurden als sekundäre Outcomes extrahiert. In Tabelle 1 sind die Testverfahren aufgelistet, die von MATRICS für die Erhebung der entsprechenden Domänen eingesetzt werden. Zusätzlich wurden Lebensqualität und Funktionsfähigkeit als sekundäre Outcomes festgelegt.

Tabelle 1: Tests der final- und beta-MCCB für die Erhebung der spezifischen Domänen (basierend auf Feber et al. 2023)

Kognitive Domäne	Finale MCCB	Beta Batterie der MCCB
Verarbeitungs-geschwindigkeit	Brief Assessment of Cognition in Schizophrenia (BACS): Symbol Coding Subtest Category Fluency: Animal Naming Trail Making Test: Part A	Wechsler Adult Intelligence Scale 3rd Ed. (WAIS-III): Digit Symbol-Coding Subtest
Aufmerksamkeit/Vigilanz	Continuous Performance Test - Identical Pairs Version (CPT-IP)	3-7 Continuous Performance Test – Shortened Version
Arbeitsgedächtnis	Wechsler Memory Scale 3rd Ed. (WMS-III): Spatial Span Subtest Letter-Number-Span test	Brief Assessment of Cognition in Schizophrenia (BACS): Digit Sequencing Subtest Wechsler Adult Intelligence Scale 3rd Ed. (WAIS-III): Letter Number Sequencing Subtest Spatial Delayed Response Task
Verbales Lernen	Hopkins Verbal Learning Test – revised (HVL-R): Immediate Recall	Neuropsychological Assessment Battery: Daily Living Memory Subtest
Visuelles Lernen	Brief Visuospatial Memory Test – Revised (BVMT-R)	Neuropsychological Assessment Battery: Shape Learning Subtest
Argumentation und Problemlösung	Neuropsychological Assessment Battery (NAB): Mazes Subtest	Wechsler Adult Intelligence Scale 3rd Ed. (WAIS-III): Block Design Subtest Brief Assessment of Cognition in Schizophrenia (BACS): Tower of London Subtest
Soziale Kognition	Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT): Managing Emotions Branch	Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT): Perceiving Emotions Branch

MCCB= MATRICS Consensus Cognitive Battery; Tabelle enthält kognitive Domänen und vorgeschlagene Tests zur Erhebung nach MATRICS (Nuechterlein et al. 2008)

Die Tabelle stammt aus dem Open Access publizierten Protokoll zu dieser Arbeit (Feber et al. 2023) unter folgender Lizenz: CC BY 4.0 DEED, https://creativecommons.org/licenses/by/4.0/; es fand eine Anpassung hinsichtlich der Sprache und der aufgeführten Outcomes statt, es wird sich auf die sieben kognitiven Domänen fokussiert

Für die Erhebung von Funktionsfähigkeit wurden von MATRICS ebenfalls konkrete Tests vorgeschlagen (Green et al. 2008). Beispielsweise werden „Maryland Assessment of Social Competence“, „UCSD Performance-Based Skills Assessment“, Schizophrenia Cognition Rating Scale“, und „Clinical Global Impression of Cognition in Schizophrenia“ empfohlen (Feber et al. 2023).

Direktere Messinstrumente werden von MATRICS nicht vorgeschlagen, diese wurden jedoch in dieser Arbeit ebenfalls verwendet, sofern kein empfohlenes Erhebungsinstrument vorlag. Für die Erfassung von Lebensqualität existieren bisher keine MATRICS-Empfehlungen. Hier wurden die gängigen, publizierten Skalen extrahiert.

Pro kognitiver Domäne wurde ein Test extrahiert. Im Falle mehrerer Tests für eine Domäne wurde nur ein Test ausgewählt, um psychometrische Probleme zu vermeiden, die bspw. die Validität der kombinierten Ergebnisse und die Vergleichbarkeit von Ergebnissen gefährden könnte (dokumentation [TDB2Online] 2023). Ausnahmen wurden bei Domänenscores der MCCB gemacht, denn für Verarbeitungsgeschwindigkeit und Arbeitsgedächtnis werden hier mehrere Tests eingesetzt.

Bei der Auswahl aus mehreren Tests pro Domäne, wurden Tests der final- und beta-MCCB priorisiert. Im Falle mehrerer MATRICS-Tests für eine Domäne, wurde der Test mit der höchsten Intraklassenkorrelation gewählt und der höchsten Übereinstimmung mit den Gütekriterien, die auch bei der Entwicklung der MCCB herangezogen wurden (Nuechterlein et al. 2008). Im Falle von mehreren Tests, die nicht der MCCB zuzuordnen sind, wurde der Test mit der höchsten Ähnlichkeit zum MATRICS-Test gewählt. Die Entscheidungen zur Auswahl der Tests wurde von zwei neuropsychologischen Experten begleitet.

Bezüglich mehrerer in Frage kommender Tests für Lebensqualität und Funktionsfähigkeit, wurde ebenfalls nur ein Test ausgewählt. Hierbei wurden die Gütekriterien und die Bekanntheit der Tests berücksichtigt. Es wurde bei der Auswahl insbesondere den Empfehlungen der COSMIN(COnsensus-based Standards for the selection of health Measurement Instruments)-Initiative gefolgt, die folgende Kriterien bei der Bewertung von unterschiedlichen Tests vorschlagen: Reliabilität, Validität, Responsivität und Interpretierbarkeit (COSMIN 2022).

(Feber et al. 2023; Feber et al. 2024)

2.4 Datenextraktion

Die Extraktion der Daten erfolgte durch zwei Personen unabhängig voneinander. Zur Datenextraktion wurde eine Microsoft Access Datenbank verwendet, die innerhalb der Arbeitsgruppe speziell für die Extraktion von Studien zu Schizophrenie entwickelt wurde. Es wurden generelle Informationen zur Studie (z.B. Name des Autors, Publikationsjahr, Angaben zum Studiendesign), Informationen zur Methodik (z.B. Dauer der Studie, Verblindung, Verwendung von diagnostischen Kriterien), Charakteristika der Studienteilnehmer (z.B. Alter, Anzahl an Männern und Frauen, Bildungsniveau), Angaben zu den verwendeten Antipsychotika und Angaben zu den spezifischen Outcomes erfasst. Hierdurch konnte ein standardisierter Prozess der Datenextraktion ermöglicht werden. Des Weiteren konnte durch automatische Vergleiche innerhalb der Datenbank Unterschiede in der Datenextraktion zwischen den beiden extrahierenden Personen festgestellt werden. Unterschiede in der Datenerfassung wurden vorerst versucht durch Diskussion zu klären und falls dies nicht möglich war, wurde eine dritte erfahrene Person hinzugezogen. (Feber et al. 2023; Feber et al. 2024)

2.5 Bewertung des Biasrisikos

Im Rahmen der Datenextraktion wurde auch das Biasrisiko von zwei Personen unabhängig voneinander eingeschätzt und im Anschluss verglichen. Hierzu wurde jede Studie anhand des

Cochrane Risk of Bias 2 Tool (RoB 2.0) bewertet (Sterne et al. 2019). Folgende Domänen waren hierbei zu beurteilen (Sterne et al. 2019):

- Randomisierung
- Verdeckte Zuteilung
- Verblindung von Patienten und Personal
- Verblindung der Outcome-Erhebung
- Unvollständigkeit der Outcome-Daten
- Selektives Berichten der Outcome-Daten
- Sonstige Gründe für Bias

Für die aufgelisteten Kategorien erfolgte eine Einstufung des Biasrisikos in ein entweder „hohes Risiko“, „unklares Risiko“ oder „geringes Risiko“ (Buchberger et al. 2014).

(Feber et al. 2023; Feber et al. 2024)

2.6 Statistische Auswertung

Alle statistischen Analysen wurden anhand der R-Software durchgeführt (R: a language and environment for statistical computing 2023). Hierbei wurden die R-Pakete „meta“ und „netmeta“ verwendet (meta: An R package for meta-analysis 2007; Rücker G, König J, Efthimiou O et al.). Für die Netzwerk-Metaregressionen wurden im Rahmen eines bayesianischen Vorgehens selbstprogrammierte Routinen in rjags eingesetzt (JAGS - Just Another Gibbs Sampler 2022). (Feber et al. 2023; Feber et al. 2024)

Effektstärkenmaße

Als Ergebnisparameter wurde für jede Skala der Mittelwert von Baseline und Endpoint extrahiert. Es wurden zudem Standardabweichungen (SDs) extrahiert und falls nur Standardfehler (SE) angegeben waren, wurden diese in SDs umgewandelt. Falls beides fehlte, wurde die SD aus t-Werten, p-Werten oder Konfidenzintervallen berechnet, wie im Cochrane Handbuch beschrieben (Higgins et al. 2019a). Sofern auch diese Werte nicht gegeben waren, wurde die SD aus Studien übernommen, die den gleichen Test verwendeten. Ergebnisse, die aus Imputationsmethoden resultieren, wurden per Protokoll Ergebnissen vorgezogen. (Feber et al. 2023; Feber et al. 2024)

Für die Berechnungen im Rahmen der (Netzwerk-)Metaanalysen fand eine Standardisierung der Mittelwerte statt (SMD), da die Studien meist unterschiedliche Skalen zur Erfassung der verschiedenen Domänen verwendeten. (Feber et al. 2023; Feber et al. 2024)

Der Gesamtwert für Kognition wurde gebildet, indem zuerst für die einzelnen Domänen SMDs pro Vergleich berechnet wurden. Die Stichprobengrößen wurde anschließend durch die Anzahl an Domänen dividiert, um zu vermeiden, dass diese künstlich zu hoch eingehen bei der Durchführung der Metaanalysen. Die SMDs wurden anschließend über die Domänen hinweg zusammengefasst, indem ein metaanalytisches „multivariate fixed-effects model“ zum Einsatz kam. (Feber et al. 2023; Feber et al. 2024)

Metaanalyse

Herkömmliche paarweise Metaanalysen gehen Netzwerk-Metaanalysen voraus. Für die paarweisen Metaanalysen wurde das „random effects frequentist“-Modell verwendet (Feber et al. 2023). Die Ergebnisse werden anhand von Forest-Plots visualisiert. Effekte werden anhand von SMDs und ihrem 95%-igen Konfidenzintervall angegeben.

(Feber et al. 2023; Feber et al. 2024)

Netzwerk-Metaanalyse

Die Methode der Netzwerk-Metaanalyse wurden herangezogen, da hierdurch direkte und indirekte Evidenz kombiniert werden kann und Schätzungen mit maximaler Power und Präzision ermöglicht wird (Salanti et al. 2008). Netzwerk-Metaanalysen wurden sowohl nach dem frequentistischen als auch nach dem bayesschen Ansatz durchgeführt. In dieser Arbeit werden Ergebnisse des frequentistischen Ansatzes präsentiert, im Anhang befinden sich zudem die Ergebnisse für spezielle Untersuchungen, die nur mit bayesschen Berechnungen möglich sind. Effekte wurden auch hier anhand von Forest-Plots und zusätzlichen League-Tables dargestellt. Hierbei wurden Effekte wie auch bei den paarweisen Metaanalysen anhand der Angabe von SMDs und ihrem 95%-igen Konfidenzintervall präsentiert. Sofern die Bedingungen für eine Netzwerk-Metaanalyse nicht erfüllt waren, wurden nur die Ergebnisse der paarweisen Metaanalysen verwendet. (Feber et al. 2023; Feber et al. 2024)

Heterogenität

Um die Heterogenität bzw. die Varianz zwischen den Studien zu überprüfen, wurde sich für eine τ^2 –Statistik entschieden (Feber et al. 2023). Das Ausmaß der Heterogenität wurde unter Verwendung empirischer Verteilungen als niedrig, mittel oder hoch klassifiziert (Rhodes et al. 2016; Turner et al. 2012). Mögliche Ursachen für Heterogenität wurden im Anschluss durch Subgruppenanalysen und Metaregressionen untersucht.

(Feber et al. 2023; Feber et al. 2024)

Beurteilung der Transitivitäts-Annahme

Es besteht die Annahme, dass Patienten, die die Einschlusskriterien erfüllten, mit gleicher Wahrscheinlichkeit den untersuchten Antipsychotika zugeteilt wurden. Die Transitivitätsannahme soll durch den „design-by-treatment interaction test“ und durch „seperating indirect evidence from direct evidence test“ untersucht werden (Feber et al. 2023; Higgins et al. 2012; Dias et al. 2010). Der „design-by-treatment interaction test“ untersucht die Inkonsistenz aus allen möglichen Quellen des Netzwerks (Feber et al. 2023; Higgins et al. 2012). Der „seperating indirect evidence from direct evidence test“ untersucht zudem die Übereinstimmung direkter und indirekter Evidenz für jeden möglichen Vergleich im Netzwerk (Feber et al. 2023; Dias et al. 2010). Im Falle von Inkonsistenz oder Intransitivität wurden Effektmodifikatoren getestet, die Einfluss auf das Studienergebnis haben könnten. Diese sind unter „Subgruppenanalysen und Metaregression“ näher aufgeführt.

(Feber et al. 2023; Feber et al. 2024)

Subgruppenanalysen und Metaregression

Anhand von Subgruppenanalysen und Metaregressionen wurde die Bedeutung potentieller Effektmoderatoren untersucht (Feber et al. 2023; Feber et al. 2024).

Folgende Charakteristika wurden hierzu untersucht (Feber et al. 2023; Feber et al. 2024):

- Ausprägung der Gesamtsymptomatik
- Symptomausprägung (stabil oder akut erkrankt)
- Alter
- Zusätzliche Einnahme von Benzodiazepinen
- Zusätzliche Einnahme von Anticholinergika
- Antipsychotika nach Rezeptor-Affinität

Sensitivitätsanalysen

Um die Robustheit der Ergebnisse zu untersuchen, wurden Sensitivitätsanalysen durchgeführt.

In Sensitivitätsanalysen wurden folgende Studien ausgeschlossen (Feber et al. 2023; Feber et al. 2024):

- Offene Studien
- Studien mit einem hohen Risk of Bias
- Studien ohne operationalisierbare Kriterien für die Diagnose
- Studien mit einer Interventionsphase, die kürzer als 12 Wochen war
- Studien mit besonderen Patientencharakteristika (z.B. vorwiegend Negativsymptomatik oder behandlungsresistente Patienten)
- Studien mit einem extrahierten Composite Score
- Studien mit Armen mit stark unterschiedlichen Dosen

Zur Untersuchung der unterschiedlichen Dosen wurden die verschiedenen Antipsychotika in Olanzapin-Äquivalente umgewandelt. Dies war durch Vorarbeiten der Arbeitsgruppe möglich (Leucht et al. 2020; Leucht et al. 2016b; Leucht et al. 2015; Leucht et al. 2014). Eine Dosis wurde dann als unterschiedlich bewertet, wenn die Dosis eines Arms doppelt so hoch war oder weniger als die Hälfte betrug, als die eines anderen Arms innerhalb einer Studie. (Feber et al. 2023; Feber et al. 2024)

Small-Study-Effects und Reporting-Bias

Um den Zusammenhang zwischen Studiengröße und Effektgröße zu untersuchen wurde die „comparison-adjusted-funnel-plot“-Methode angewendet. (Chaimani und Salanti 2012; Leucht et al. 2017; Mavridis et al. 2013). Für Vergleiche, die aus mehr als 10 Studien bestehen wurden sogenannte „contour-enhanced-funnel-plots“ erstellt. (Feber et al. 2023)

Der Reporting Bias wurde spezifisch über Confidence in Network Meta-analysis (CINeMA) (https://cinema.ispm.unibe.ch/) erfasst und bei der Bewertung nach dem Vorgehen und den Empfehlungen von RoB-MEN (Risk of Bias due to missing evidence in network meta-analysis) entschieden (Nikolakopoulou et al. 2020; Chiocchia et al. 2021).

(Feber et al. 2023; Feber et al. 2024)

Bewertung der Qualität der Evidenz

Zur Bewertung der Qualität der Evidenz wurde das CINeMA-Programm angewendet (Nikolakopoulou et al. 2020). Dabei handelt es sich um eine Erweiterung der GRADE (Grading of Recommendations Assessment, Development and Evaluation)-Methode für Netzwerk-Metaanalysen. Hierbei wurde sich auf den primären Outcome konzentriert. (Feber et al. 2023; Feber et al. 2024)

3. Ergebnisse

In diesem Abschnitt werden die wesentlichen Ergebnisse bezüglich der Studiencharakteristika, sowie primären und sekundären Outcomes näher beschrieben. Zusätzliche Ergebnisse befinden sich im Anhang. Die Hauptergebnisse wurden zudem bei einer wissenschaftlichen, internationalen Fachzeitschrift publiziert (Feber et al. 2024).

3.1 Deskriptive Ergebnisse

Im Folgenden werden die eingeschlossenen Studien näher dargestellt und die Auswahl erläutert. Hierzu wird zunächst ein Diagramm dargestellt, welches des Studienselektionsprozess nachvollziehbar macht. Anschließend werden die Charakteristika der eingeschlossenen Studien beschrieben und die einzelnen Studien mit und ohne verwendbare Daten aufgelistet. Die dazugehörigen Referenzen befinden sich Anhang.

3.1.1 Studienselektionsprozess

Anhand des folgenden Diagramms wird der Prozess der Studienselektion näher dargestellt. Insgesamt wurden 13802 Referenzen durch die Suche im Cochrane Schizophrenia Group Trials Register identifiziert und auf die allgemeinen Einschlusskriterien geprüft. Hieraus resultierten 5177 passenden Referenzen, von denen nach zusätzlicher Prüfung noch einmal 3870 Referenzen ausgeschlossen wurden. Ein Hauptgrund war bei diesem Schritt vor allem, dass die Erhebung der kognitiven Symptomatik nicht den festgelegten Einschlusskriterien entsprach. Schließlich wurden 1307 Referenzen eingeschlossen, die zu 167 Studien gehörten, hiervon 68 Studien mit verwendbaren Daten. Bei fehlenden Daten oder Angaben wurde immer versucht die Studienautoren zu kontaktieren. (Feber et al. 2024)

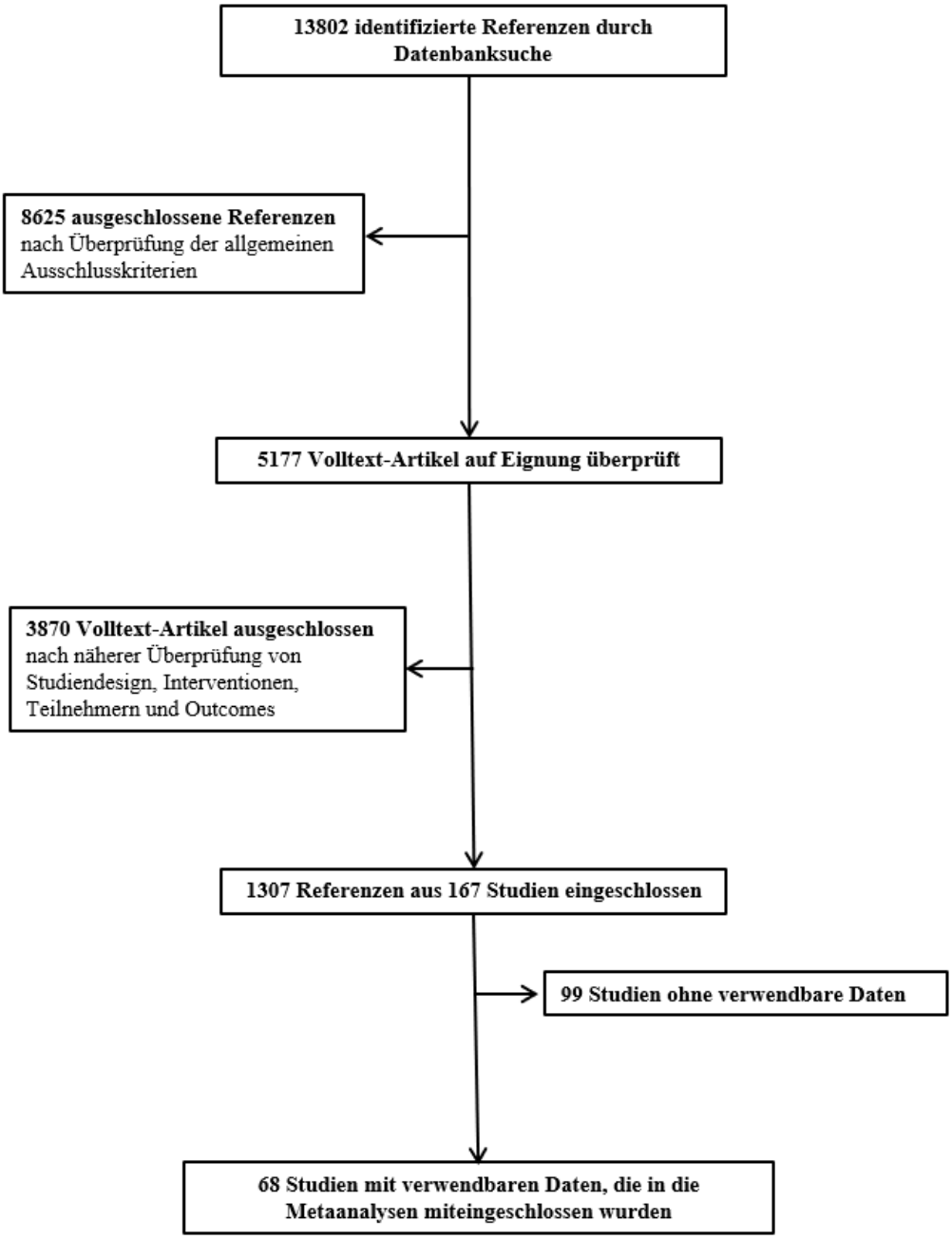


Abbildung 1: Diagramm zur Studienselektion (Feber et al. 2024)

3.1.2 Charakteristika der eingeschlossenen Studien

Zunächst werden die Studiencharakteristika der Studien dargestellt, die verwendbare Daten berichteten und somit in die (Netzwerk-)Metaanalysen eingeschlossen werden konnten. Hierbei handelt es sich insgesamt um 68 Studien mit einer Gesamtzahl von n=9526 Teilnehmern. Zwei Studien davon konnten jedoch nicht in die Netzwerk-Metaanalysen miteingeschlossen werden. Eine Studie (Koshikawa et al. 2016) konnte nicht eingeschlossen werden, weil sie nicht mit dem Netzwerk verbunden war und für eine weitere Studie (Ernst Nielsen et al. 2014) konnte kein Overall-Score berechnet werden, da die Stichprobengröße (n=9) zu klein war.

Die eingeschlossenen Studien wurden zwischen 1958 und 2022 publiziert. Der Median der Studiendauer betrug 12 Wochen (der Bereich lag hier zwischen 3-104 Wochen). Die Hälfte der Studien bestanden aus Akut-Patienten und ein Viertel aus stabilen Patienten, für die verbleibenden Studien fehlte eine konkrete Angabe zum Zustand. 28 Studien untersuchten Subgruppen: 4 Studien untersuchten Patienten mit vorwiegend Negativ-Symptomatik, 10 Studien untersuchten Teilnehmer in ihrer ersten Episode, 10 Studien untersuchten behandlungsresistente Patienten, eine Studie ältere Patienten und 3 Studien Kinder und Jugendliche. (Feber et al. 2024)

Der Mittelwert (SD) des Alters aller Teilnehmer lag bei 35.06 (8.93) Jahren. 30% der Teilnehmer waren Frauen und der Durchschnitt der absolvierten Schuljahre der Gesamtstichprobe lag bei 12 Jahren. Die mittlere Erkrankungsdauer beträgt 10.5 (7.4) Jahre. Bei 15% der Studien (n=10) handelte es sich um offene Studien. Über 50% der Studien zeigten einen hohen Risk of Bias auf. (Feber et al. 2024)

Tabelle 2: Studiencharakteristika von Studien mit verwendbaren Daten (Feber et al. 2024)

Study Name, Year	Blinding	Duration (wks)	Diagnostic System and Term	State of Symptoms, Participant Subgroup	Cognition domains (Scales)	Intervention	Mean dose (range) (mg/d)	N randomized	Mean Age (yrs)
Abdolahian 2008	double-blind	8	DSM-IV chronic schizophrenia	Acute	RPS (WCST - Preservation Error)	Haloperidol	12.5 (10-15)	30	n.i.
						Risperidone	6 (4-8)	35	n.i.
Abrams 1958	double-blind	17	Clinical diagnosis schizophrenia	Acute	SP (Wechsler-Bellevue-Intelligence-Scale: digit symbol); WM (Wechsler-Bellevue-Intelligence-Scale: digit span backward); RPS (Wechsler-Bellevue-Intelligence-Scale: Block Design); AV (Wechsler-Bellevue-Intelligence-Scale: digit span forward)	Chlorpromazine	478 (200-600)	20	n.i.
						Placebo	n.i.	20	n.i.
Adrianzen 2008	open-label	39	DSM-IV schizophrenia or schizophreniform disorder	Acute	SP (Trail Making Test, Part A, mean time in seconds)	Haloperidol	n.i. (5-20)	40	31.84
						Olanzapine	n.i. (5-20)	31	28.9
Alvarez 2006	open-label	52	DSM-IV schizophrenia with prominent negative symptoms	Stable Negative symptoms Treatment resistant	RPS (Wisconsin Card Sorting Test - perseverative errors (number))	Olanzapine	12.2 (10-n.i.)	124	37
						Risperidone	4.9 (3-n.i.)	123	35.5
Arvanitis 1993	double-blind	52	DSM-III-R Schizophrenia	Stable	SP (Trail Making Test, Part A, mean time in seconds); VerL (Hopkins VL-free-no. Correct); RPS (Stroop color-word no. Correct); VisL (Pattern Memo - immediate)	Haloperidol	12 (12-12)	41	37
						Quetiapine	300 (300-300)	88	37
						Quetiapine	600 (600-600)	87	38
Bai 2005	single-blind	24	NA chronic schizophrenia with tardive dyskinesia	Stable	RPS (WCST-%persev-errors); AV (CPT-d-prime)	Amisulpride	503.8 (n.i.)	27	50.1
						Olanzapine	n.i. (n.i.)	27	49.2
Boulay 2007	double-blind	8	DSM-IV schizophrenia or schizoaffective disorder	Acute	SP (Finger Tapping mean both hands); WM (WAIS III, Letter-number sequencing (trials)); RPS (Stroop C-W_interference T); AV (D2-concentration perf)	Haloperidol	9.32 (2.5-20)	13	34.73
						Olanzapine	12 (2.5-20)	14	32.86
Buchanan 1998_cognition	double-blind	10	DSM-III-R or RDC schizophrenia or schizoaffective disorder	Stable Treatment resistant	SP (CF-animals no. Correct); VerL (WMS-R Logical, number correct); RPS (WAIS-R Blocks, points, age-corr); VisL (WMS-R Vis Repro, number accuracy crit)	Haloperidol	24.5 (10-30)	19	34
						Clozapine	410.5 (200-600)	19	33.7
Buller 2011	double-blind	12	DSM-IV-TR Schizophrenia	Stable	CS (MCCB Comp T); SP (MCCB SP T); VerL (MCCB VerLM T); WM (MCCB WM T); RPS (MCCB RPS T); VisL (MCCB VisLM T); SC (MCCB SC T); AV (MCCB AV T)	Sertindole	n.i. (12-20)	131	42
						Quetiapine	n.i. (400-600)	133	42
ChiCTR-IPR-15007635	single-blind	16	DSM-IV schizophrenia	n.i.	SC (Reading the Mind in the Eyes, 36, number correct)	Haloperidol	10.9 (4-20)	31	24.7
						Paliperidone	7.2 (3-12)	29	25.1
Citrome 2012_cognition	double-blind	26	DSM-IV schizophrenia or	Stable	CS (MCCB Overall Composite Score); SP (MCCB Speed of Processing Score); VerL (MCCB Verbal Learning Score); WM (MCCB Working Memory Score); RPS (MCCB Reasoning and Problem Solving Score); VisL (MCCB Visual Learning	Lurasidone	84.7 (40-120)	427	41.7
						Risperidone	4.3 (2-6)	202	41.6

			schizoaffective disorder		Score); SC (MCCB Social Cognition Score); AV (MCCB Attention/Vigilance Score)				
Citrome 2015	open-label	6	DSM-IV-TR schizophrenia	Acute	VisL (CogState One Card z-score)	Aripiprazole	18.2 (10-20)	33	42.1
						Brexpiprazole	3.58 (1-4)	64	42.2
Clark 1961	double-blind	16	diagnostic manual of the American Psychiatric Association (1952) chronic schizophrenia	Acute	SP (WAIS Digit Symbol 90sec)	Chlorpromazine	663 (200-800)	20	41.2
						Placebo	n.i.	20	43.6
Clark 1968a	double-blind	16	Clinical Diagnosis chronic schizophrenia	Acute	SP (Wechsler Adult Intelligence Scale, digit symbols test)	Chlorpromazine	842.3 (n.i.-1000)	23	45.6
						Placebo	n.i.	23	45.2
Clark 1970a	double-blind	12	Clinical Diagnosis chronic schizophrenia	Acute	SP (Wechsler Adult Intelligence Scale, digit symbols test)	Chlorpromazine	684 (200-1000)	15	38.9
						Molindone	68.2 (20-100)	15	42.5
						Placebo	n.i.	14	37.4
Clark 1971a	double-blind	4	Clinical Diagnosis acutely exacerbated chronic schizophrenia	Acute	SP (Wechsler Adult Intelligence Scale, digit symbols test)	Chlorpromazine	718 (0-1000)	23	33.5
						Fluphenazine	7.28 (0-10)	20	32.8
						Placebo	n.i.	21	32.3
						Thioridazine	760 (0-1000)	22	33.4
Conley 2001	double-blind	8	DSM-IV schizophrenia or schizoaffective disorder	Acute	SP (Category fluency 60sec animals+fruits+veggies); VerL (California Verbal Learning Test - total learning); RPS (Wisconsin Card Sorting Test - perseverative errors (number)); VisL (Spatial working memory test, total correct 5s); AV (CPT-d-prime)	Olanzapine	13.1 (5-20)	189	38.9
						Risperidone	4.7 (2-6)	188	41
Dossenbach 2004_cognition	double-blind	22	DSM-IV schizophrenia	Acute	SP (WAIS-R DigSymb); VerL (Auditory Verbal Learning Test, number of learned words trial 6); RPS (WAIS, block design subtest measuring two-dimensional construction ability)	Fluphenazine	n.i. (6-21)	8	37
						Olanzapine	n.i. (5-20)	10	37
EQUATOR	double-blind	52	DSM-IV-TR schizophrenia	Stable	VisL (One Card Learning Task (Cogstate))	Brexpiprazole	3.6 (1-4)	97	38.8
						Placebo	n.i.	105	41.6
Findling 2013	double-blind	6	DSM-IV schizophrenia	Acute Children/ adolescents	VerL (CNS_verbMemo); VisL (CNS_visMemo); AV (CNS_sustAttention)	Ziprasidone	n.i. (40-160)	193	15.3
						Placebo	n.i.	90	15.4
Gallhofer 2007_all patients	double-blind	12	DSM-IV schizophreniform disorder, schizophrenia, acute schizophrenia	n.i.	RPS (Wisconsin Card Sorting Test - perseverative errors (number))	Haloperidol	5.8 (5-15)	20	30.4
						Sertindole	11.8 (10-24)	20	28.1
Geffen 2012	double-blind	6	DSM-IV-TR acute	Acute	SP (BACS-symbol coding); VerL (BACS, verbal memory); WM (BACS-digit sequencing); RPS (BACS-Tower of London)	Placebo	n.i.	93	35.2
						Risperidone	6.8 (2-8)	91	34.2

			exacerbation of chronic schizophrenia						
Gilbertson 1997	double-blind	3	DSM-III-R schizophrenia or schizoaffective disorder	Stable	SP (Trail Making Test, Part A, mean time in seconds); VerL (WMS-R, Verbal Memory Index); VisL (WMS-R, Visual Memory Index); AV (Visual Continuous Performance Test, Perceptual Sensitivity)	Haloperidol	n.i. (n.i.)	12	38.41
						Placebo	n.i.	9	40.56
Grootens 2009	double-blind	8	DSM-IV schizophrenia, schizoaffective disorder, or schizophreniform disorder	Acute	SP (CF-animals no. Correct); VerL (CVLT-immediate-no. Correct); RPS (WCST - perseverative errors); VisL (WMS-R - visual reproduction immediate score); AV (CPT - IP (d-prime))	Olanzapine	14 (10-20)	35	23.1
						Ziprasidone	104 (80-160)	39	24.3
Jerrell 2002	open-label	52	DSM-IV schizophrenia or schizoaffective disorder	Acute	SP (Animals-best score in 60sec); VerL (WMS-R Logical Mem I); WM (WAIS-III Digit Span BW); RPS (Stroop Color Word); AV (WAIS-III Digit Span Forward)	Olanzapine	14.61 (12-15)	30	34.1
						Risperidone	5.67 (4-6)	36	37.56
Jeste 2003	double-blind	8	DSM-IV schizophrenia or schizoaffective disorder	n.i. Elderly	SP (Trail Making Test, Part A, mean time in seconds); VerL (Serial Verbal Learning Test, total learning); RPS (Wisconsin Card Sorting Test, number of categories completed); AV (CPT-d-prime)	Olanzapine	11.1 (5-20)	88	71.4
						Risperidone	1.9 (1-3)	87	70.9
Kahn 2008	open-label	52	DSM-IV schizophrenia, schizophreniform disorder, or schizoaffective disorder	n.i. First episode	SP (TMT-A, time z-Score); VerL (Rey VerL-total learning-z-score)	Amisulpride	450.8 (200-800)	104	25.2
						Haloperidol	3 (1-4)	103	25.4
						Olanzapine	12.6 (5-20)	105	26.3
						Quetiapine	498.6 (200-750)	104	26.4
						Ziprasidone	107.2 (40-160)	82	26.7
Kinon 2006a	double-blind	24	DSM-IV schizophrenia or schizoaffective disorder	n.i. Negative symptoms	SC (Social Cue Recognition Task, high emotion abstract)	Olanzapine	15.6 (10-20)	171	41.67
						Quetiapine	455.8 (300-700)	175	40.45
Kinon 2006b	double-blind	24	DSM-IV schizophrenia or schizoaffective disorder and prominent depressive symptoms	n.i.	SP (BACS-symbol coding); VerL (BACS, verbal memory); WM (BACS-digit sequencing); RPS (BACS-Tower of London)	Olanzapine	14.2 (10-20)	202	41.07
						Ziprasidone	110.2 (80-160)	192	42.13
	open-label	24		Stable		Risperidone	n.i. (n.i.)	16	46.43

Koshikawa 2016			DSM-IV-TR schizophrenia or schizoaffective disorder		SP (BACS Symbol Coding z); VerL (BACS VerL z); WM (BACS WM z); RPS (BACS ToL z); SC (Cogstate, Social Emotional Cognition Task (Accuracy))	Paliperidone	n.i. (n.i.)	14	43.5
Krakowski 2006	double-blind	12	DSM-IV schizophrenia, schizoaffective disorder	n.i.	SP (TMT-A, time z-Score); VerL (WMS-R Logical immediate+delayed, z score); RPS (WAIS-R Block Des z); VisL (WMS-R Figural immediate+delayed z-score)	Clozapine	565.5 (200-800)	37	35.1
						Haloperidol	23.3 (10-30)	36	32.7
						Olanzapine	24.7 (10-30)	37	35.6
Kryzhanovskaya 2009	double-blind	6	DSM-IV-TR schizophrenia	Acute Children/ adolescents	SP (BACS symbol cod stnd z); VerL (BACS VerL z); WM (BACS WM z); RPS (BACS ToL z)	Olanzapine	11.1 (10-20)	72	16.1
						Placebo	n.i.	35	16.3
Lee 2007d	double-blind	8	DSM-IV schizophrenia	Acute First episode	RPS (Gallhofer complex maze velocity)	Haloperidol	7.6 (n.i.)	10	27.2
						Risperidone	4.1 (n.i.)	10	25.9
Lieberman 2003a	double-blind	12	DSM-IV schizophrenia, schizophreniform disorder, schizoaffective disorder	Acute First episode	SP (WAIS-R Digit Symbol), VerL (CVLT, total words recalled), WM (letter-number sequencing test score (correct responses), RPS (Wisconsin Card Sorting Test - perseverative errors), VisL (Wechsler Memory Scale Revised - visual reproduction immediate recall score), AV (CPT, Identical Pairs Version, response sensitivity measure)	Haloperidol	4.4 (n.i.)	132	24.0
						Olanzapine	9.1 (n.i.)	131	23.5
Lindenmayer 2007	double-blind	12	DSM-IV-TR schizophrenia and predominant negative symptoms	Stable Negative symptoms	SP (Trail Making Test, Part A, mean time in seconds); VerL (Rey Auditory Verbal Learning Test, sum of trials 1-5 (words); WM (WAIS III, Letter-number sequencing (trials)); RPS (WCST 128 number pers. Errors)	Olanzapine	18.44 (15-20)	16	39.02
						Haloperidol	17.11 (15-20)	19	39.77
Liu 2000	double-blind	12	DSM-III-R schizophrenic disorders	Acute	AV (Continuous Performance Test, d prime (degraded))	Haloperidol	n.i. (n.i.)	28	35.1
						Risperidone	n.i. (n.i.)	28	32.7
Maat 2014	open-label	8	DSM-IV-TR schizophrenia	Acute	SP (WAIS-III-digit symbol coding); WM (WM Task); VisL (Identity Learning, no. Correct); SC (Facial Affect Recognition)	Aripiprazole	17 (7.5-30)	38	26.4
						Risperidone	3.55 (1-6)	42	24.82
Marder 2003	double-blind	104	DSM-IV Schizophrenia	Stable	SP (verbal fluency, total number of words generated across the three letters); VerL (California Verbal Learning Test, words correctly recalled in the 5 trials); WM (Digit Span Distractability, error score); RPS (WAIS-III-block design); VisL (Spatial working memory, error score); AV (CPT, error score)	Haloperidol	4.5 (2-16)	30	43.3
						Risperidone	5.7 (2-16)	33	43.7
McEvoy 2007a	double-blind	52	DSM-IV schizophrenia, schizophreniform disorder, schizoaffective disorder	n.i. First episode	SP (BACS, Symbol Coding (total score)); VerL (Hopkins Verbal Learning Test, total words); WM (letter-no sequenc); RPS (BACS, Tower of London (total correct)); AV (Continuous Performance Test, identical pairs (z score of d-prime for 3 trials))	Olanzapine	11.7 (2.5-20)	133	24.7
						Quetiapine	506 (100-800)	134	25
						Risperidone	2.4 (0.5-4)	133	23.9

McGurk 2005	double-blind	29	DSM-IV schizophrenia, schizoaffective disorder; treatment resistant	n.i. Treatment resistant	WM (Spatial working memory performance, 15-second delay); RPS (WCST-%persev-errors)	Clozapine	456.7 (12.5-800)	53	41.9
						Risperidone	6.8 (1-16)	54	41.9
Meltzer 2008	double-blind	26	DSM-IV schizophrenia, schizoaffective disorder	n.i. Treatment resistant	SP (WAIS-R DigSymb); VerL (List Learning immediate 12 words); RPS (WCST-%persev-errors)	Clozapine	564 (300-900)	21	37.2
						Olanzapine	33.6 (25-45)	19	36.4
Meyer-Lindenberg 1997	double-blind	6	DSM-III-R schizophrenia	Acute Treatment resistant	WM (Digit-Span Backward Reproduction (hits)); RPS (Frontal Maze I -passage time (seconds)); AV (Choice Reaction Rask with 6 Selection Segments-selection errors (n))	Clozapine	215 (150-450)	25	33.2
						Zotepine	180 (150-450)	25	33.7
Mortimer 2004_cognition	double-blind	26	DSM-IV schizophrenia or schizophreniform disorder	Acute	SP (Trail Making Test, Part A, mean time in seconds); VerL (Rey Auditory Verbal Learning Test, sum of trials 1-5 (words)	Amisulpride	504 (200-800)	18	44
						Olanzapine	13 (5-20)	18	38.07
Naber 2005_cognition	double-blind	26	DSM-IV schizophrenia	n.i. Treatment resistant	RPS (ToL % correct)	Clozapine	209.4 (100-400)	24	35.2
						Olanzapine	16.2 (5-25)	30	32.9
Nct00827840	open-label	12	DSM-IV schizophrenia	Stable	SP (Trail Making Test, Part A, mean time in seconds); VerL (Rey Auditory Verbal Learning Test, short-term delayed recall (trial A6)); WM (Digit Span Backward (n)); AV (CPT, correct response (n))	Paliperidone	9 (3-12)	32	35.4
						Risperidone	4.9 (n.i.)	26	32.5
NCT01057849_cognition	open-label	52	DSM-IV schizophrenia	n.i. First episode	CS (MCCB Overall Composite Score); SP (Animal Naming); VerL (HVLT-R); WM (Wechsler Memory Scale, spatial span subtest); RPS (Stroop Color Word); VisL (BVMT-R)	Aripiprazole	n.i. (15-30)	179	25.37
						Olanzapine	n.i. (10-25)	178	23.51
						Risperidone	n.i. (3-6)	189	24.6
Nielsen 2014	double-blind	12	ICD-10 schizophrenia	n.i.	SP (Rapid Visual Information Processing, mean latency); VerL (Verbal Recognition Memory (immediate), total correct); WM (Spatial working memory, between errors); RPS (One Touch Stockings of Cambridge, mean choices to correct); VisL (Pattern Recognition Memory (immediate), number correct)	Olanzapine	n.i. (10-20)	4	49.3
						Sertindole	n.i. (16-24)	5	34.1
Pagsberg 2017	double-blind	12	ICD-10 schizophrenia, persistent delusional disorder, acute and transient psychotic disorder, induced delusional disorder, schizoaffective disorder, other/inspecified	Acute Children/ adolescents First episode	RPS (BACS ToL z)	Quetiapine	426.39 (50-800)	55	15.8
						Aripiprazole	12.97 (2.5-30)	58	15.7

			nonorganic psychosis, mania with psychotic symptoms, bipolar affective or depressive d. with psychotic symptoms						
Pfizer 2005h	double-blind	4	DSM-IV schizophrenia or schizophrenic disorder	Acute	SP (Simple Reaction Task (msec)); RPS (Maze Solving Behavior, Route (pixel)); AV (Choice Reaction Task (msec))	Ziprasidone	n.i. (80-160)	32	n.i.
						Olanzapine	n.i. (10-20)	27	n.i.
Potkin 2011	double-blind	3	DSM-IV schizophrenia or schizoaffective disorder	Stable	CS (MCCB Composite Z-Score); SP (BACS-symbol coding); VerL (HVLT-R); WM (UoM letter-number span); RPS (NAB-mazes); VisL (BVMT-R); SC (MSCEIT subtest, ns)	Lurasidone	120 (120-120)	154	42.3
						Ziprasidone	160 (160-160)	153	43.5
Purdon 2000	double-blind	54	DSM-IV Schizophrenia	Stable First episode	SP (WAIS-R DigSymb); VerL (Rey Auditory Learning Test, serial list learning); RPS (WCST - perseverative errors); VisL (WMS Vis Reprod Figures, age-adjusted); AV (WMS-R Digit Span)	Haloperidol	9.7 (5-20)	23	28.83
						Olanzapine	11 (5-20)	21	26.01
						Risperidone	6 (4-10)	21	31.77
Purdon 2001	double-blind	26	DSM-IV schizophrenia	Stable	SP (WAIS-R Digit Symbol z-score); VerL (ReyCrawford AVLT, z-score); RPS (WCST, pers errors, z-score); VisL (WMS Vis Reprod z-score); AV (WMS Digit Span z-score)	Haloperidol	15.5 (10-20)	12	35.3
						Quetiapine	468.2 (300-600)	13	32.7
Ranjan 2003	double-blind	4	ICD-10 schizophrenia	Acute	SP (COWA, word fluency); VerL (PGI verbal memory, similar); WM (WAIS-R, digit span backward); RPS (Stroop Test, error difference between cards C and W); VisL (PGI Memory Scale, visual recognition); AV (WAIS-R, digit span forward)	Risperidone	n.i. (2-10)	29	30.77
						Olanzapine	n.i. (10-25)	24	32.61
Rémillard 2005y1	double-blind	52	DSM-III-R schizophrenia	Stable	VerL (California Verbal Learning Test, words correctly recalled in the 5 trials); RPS (WCST - perseverative errors); AV (d2, reaction time)	Haloperidol	11.7 (2-40)	16	46
						Risperidone	4.1 (2-6)	15	41.9
Riedel 2005	double-blind	12	DSM-IV/ICD-10 schizophrenia	n.i. Negative symptoms	SP (Trail Making Test, Part A, mean time in seconds); VerL (Rey Auditory Verbal Learning Test, trials 1-5 (learning trials)); WM (letter number span); VisL (Wechsler Visual Memory Scale, Immediate Reproduction)	Quetiapine	589.7 (50-800)	22	30.6
						Risperidone	4.9 (2-8)	22	39.3
Riedel 2007	double-blind	8	DSM-IV schizophrenia, acute episode	Acute	SP (Category fluency, acceptable words); VerL (Rey Auditory Verbal Learning Test, sum of trials 1-5 (words); WM (letter-number span Gold); VisL (WMS-R, visual reproduction, immediate recall total	Olanzapine	15.82 (10-20)	26	34.47
						Quetiapine	586.86 (400-800)	26	36.69
Robinson 2006	single-blind	16	DSM-IV schizophrenia, schizophreniform disorder, schi-	Acute First episode	VerL (WMS-R logical memory, story elements recalled)	Olanzapine	11.8 (2.5-20)	60	23.3
						Risperidone	3.9 (1-6)	60	23.3

			zoaffective disorder						
Sacchetti 2009	double-blind	18	DSM-IV schizophrenia, treatment resistant	n.i. Treatment resistant	SP (Trail Making Test, Part A, mean time in seconds); VerL (RSVLT, total learning); RPS (Stroop-difference interference-word naming)	Clozapine	345.7 (250-600)	74	38.3
						Ziprasidone	130.4 (80-160)	73	41.6
Schooler 2005	double-blind	104	DSM-IV schizophrenia, schizophreniform disorder, schizoaffective disorder	n.i. First episode	SP (Category fluency 60sec animals+fruits+veggies); VerL (Rey Auditory Verbal Learning Test, sum of trials 1-5 (words); RPS (WCST - perseverative errors); VisL (WMS-R - visual reproduction immediate score); AV (CPT-IP 4 digits_d-prime_450 trials)	Haloperidol	2.9 (1-8)	278	25.7
						Risperidone	3.3 (1-8)	281	25.2
Sergi 2007	double-blind	8	DSM-IV schizophrenia, schizoaffective disorder	Acute	SP (WAIS III, digit symbol coding subtest (total correct responses in 120 sec)); VerL (California Verbal Learning Test, words correctly recalled in the 5 trials); WM (letter-number span Gold); RPS (Wisconsin Card Sorting Test, number of categories completed); SC (Facial Emotion Identification Test); AV (Degraded-Stimulus Continuous Performance Test, sensitivity score)	Haloperidol	8 (8-8)	20	50
						Olanzapine	15 (15-15)	40	49.2
						Risperidone	4 (4-4)	40	48.2
Simpson 2004	double-blind	6	DSM-IV schizophrenia or schizoaffective disorder	Acute	SP (Category fluency 60sec animals+fruits+veggies); VerL (Rey Auditory Verbal Learning Test, sum of trials 1-5 (words); WM (Digit Span Distractability with Distraction-proportion correct); RPS (WCST - perseverative errors); AV (CPT-d-prime)	Olanzapine	11.3 (5-15)	133	37.6
						Ziprasidone	129.9 (80-160)	136	37.7
Volavka 2002	double-blind	14	DSM-IV chronic schizophrenia, schizoaffective disorder, and suboptimal response to previous treatment	Acute Treatment resistant	SP (CF-animals no. Correct); VerL (HVLT total); WM (Letter-Number Span (total correct)); RPS (WAIS-R Blocks, points, age-corr); VisL (Visual Reproductions Immediate)	Clozapine	526.6 (200-800)	40	42.6
						Haloperidol	25.7 (10-30)	37	37.3
						Olanzapine	30.4 (10-40)	39	41
						Risperidone	11.6 (4-16)	41	42.9
Voruganti 2007	single-blind	52	DSM-IV schizophrenia	Acute	RPS (WCST, total score of correct sorts accomplished); AV (Asarnow total number correct)	Olanzapine	17.2 (n.i.)	42	41.33
						Quetiapine	612.8 (n.i.)	43	38.72
Wagner 2005	double-blind	8	DSM-IV/ICD-10 schizophrenia	Acute	SP (Trail Making Test, Part A, mean time in seconds); VerL (RAVLT trials 2-5); WM (WAIS III, Letter-number sequencing (trials)); RPS (Chapuis labyrinth 1-3 time total in sec); AV (CPT - IP (d-prime))	Amisulpride	511.1 (400-800)	26	38.3
						Olanzapine	15 (10-20)	26	34.3
Wang 2013b	open-label	24	DSM-IV schizophrenia oder schizophreniform disorder	n.i. First episode	VerL (Hopkins Verbal Learning Test, immediate, z-score); WM (WMS-III Spatial Span z); RPS (Stroop Color-Word Test, z-score); VisL (BVMT-R, total free 3 trials, z)	Olanzapine	n.i. (2.5-20)	32	22.3
						Risperidone	n.i. (1-4)	34	25
						Aripiprazole	n.i. (5-20)	34	23.3
Wang 2022	double-blind	12	DSM-IV schizophrenia	Acute Treatment resistant	SP (Brief Assessment of Cognition in Schizophrenia (BACS), symbol coding subtest), WM (Wechsler Memory Scale, 3rd ed. (WMS-III), spatial span subtest), RPS (Neuropsychological Assessment Battery, mazes subtest),	Olanzapine	20.49 (10-30)	41	33.10
						Paliperidone	10.73 (6-15)	45	33.42

Wirshing 1999	double-blind	8	DSM-III-R schizophrenia, treatment-refractory	Acute Treatment resistant	VerL (California Verbal Learning Test, words correctly recalled in the 5 trials); WM (Digit Span Distractability with Distraction-proportion correct); SC (Facial+Voice+Videotape Composite measure total correct)	Haloperidol	19.4 (5-30)	33	40
						Risperidone	7.5 (3-15)	34	41
Zhong 2006_cognition	double-blind	8	DSM-IV schizophrenia	Acute	SP (Category fluency 60sec animals+fruits+veggies); VerL (Rey Auditory Verbal Learning Test, sum of trials 1-5 (words); SC (Penn Emotional Acuity Test, total correct); AV (CPT-IP, proportion correct)	Quetiapine	529.62 (200-800)	135	40.24
						Risperidone	5.33 (2-8)	154	39.85

n=number of participants, SP=speed of processing, VerL=verbal learning, AV=attention and vigilance, SC=social cognition, WM=working memory, RPS=reasoning and problem solving, VisL=visual learning

Es folgt zudem eine Auflistung von Studien, die zwar den allgemeinen Einschlusskriterien entsprachen aber keine verwendbaren Daten hatten. Gründe hierfür waren entweder, dass es sich lediglich um Protokolle oder Zusammenfassungen handelte oder die angegebenen Daten nicht verwendbar für eine Metaanalyse waren und auch Studienautoren keine weiteren Daten zur Verfügung stellen konnten. Hierbei handelt es sich insgesamt um 98 Studien.

Tabelle 3: Studiencharakteristika von Studien ohne verwendbare Daten (Feber et al. 2024)

Reason why data could not be used	**Study**	**Intervention**	**Application**	**N (randomized)**
results not usable for meta-analysis	Clark 1967	Chlorpromazine	oral	51
		Placebo	oral	21
only protocol	Shen 2014	Olanzapine	oral	77
		Placebo	oral	78
only abstact	Sikich 2004	Haloperidol	oral	15
		Olanzapine	oral	16
		Risperidone	oral	20
results not usable for meta-analysis	Sikich 2008	Molindone	oral	41
		Olanzapine	oral	36
		Risperidone	oral	42
only abstract	Conley 2005	Fluphenazine	oral	13
		Quetiapine	oral	12
		Risperidone	oral	13
only abstract	Csernansky 2002	Haloperidol	oral	188
		Risperidone	oral	179
results not usable for meta-analysis	Daniel 1996	Clozapine	oral	10
		Risperidone	oral	10
results not usable for meta-analysis	Fagerlund 2004	Risperidone	oral	15
		Zuclopenthixol	oral	10

outcome seems to have been analysed but no further information	Gallant 1967	Chlorpromazine	oral	19
		Haloperidol	oral	19
only protocol	Hera 041-021	Asenapine	oral	208
		Olanzapine	oral	103
		Placebo	oral	106
		Asenapine	oral	102
		Asenapine	oral	106
only protocol	Hera 041-022	Asenapine	oral	91
		Olanzapine	oral	93
		Placebo	oral	93
outcome seems to have been analysed but no further information	Johnstone 1978	Flupentixol	oral	15
		Placebo	oral	15
only protocol and synopsis	Kane 2010a	Asenapine	oral	220
		Haloperidol	oral	115
		Placebo	oral	123
		Asenapine	oral	106
		Asenapine	oral	114
results not usable for meta-analysis	Keefe 2006	Haloperidol	oral	97
		Olanzapine	oral	159
		Risperidone	oral	158
only abstract	Lacro 2001	Haloperidol	oral	15
		Risperidone	oral	12
only abstract	Lieberman 2003b	Chlorpromazine	oral	83
		Clozapine	oral	81

results not usable for meta-analysis	Lieberman 2005_18months	Olanzapine	oral	336
		Perphenazine	oral	261
		Quetiapine	oral	337
		Risperidone	oral	341
		Ziprasidone	oral	185
results not usable for meta-analysis	Litmann 2014	Olanzapine	oral	22
		Placebo	oral	41
neurocognitive measures mentioned but no further information	Möller 2008	Haloperidol	oral	148
		Risperidone	oral	148
results not usable for meta-analysis	Paredes 1966	Chlorpromazine	oral	48
		Placebo	oral	24
only abstract	Potkin 2007c	Asenapine	oral	60
		Placebo	oral	62
		Risperidone	oral	60
only information about significance	Reardon 1966	Chlorpromazine	oral	11
		Placebo	oral	12
		Trifluoperazine	oral	11
results not usable for meta-analysis	Saletu 1994	Amisulpride	oral	19
		Fluphenazine	oral	21
		Asenapine	oral	913

neurocognition and cognitive functioning as secondary outcomes, no further information	Schoemaker 2010	Olanzapine	oral	312
only information that there are no significant results	Spohn 1977	Chlorpromazine	both	20
		Placebo	both	20
specific cogstate results per domain missing	Loebel 2013	Lurasidone	oral	246
		Placebo	oral	122
		Quetiapine	oral	120
		Lurasidone	oral	125
		Lurasidone	oral	121
only protocol	Swanson 2005	Olanzapine	oral	Not indicated
		Placebo	oral	Not indicated
only abstract	Tapp 2005	Haloperidol	oral	9
		Quetiapine	oral	11
only protocol	Zimbroff 2007	Aripiprazole	oral	129
		Ziprasidone	oral	127
color trails test mentioned but no further information	Kane 2015b	Cariprazine	oral	151
		Cariprazine	oral	148
		Placebo	oral	147
results not usable for meta-analysis	Rosenheck 2003_1 year	Haloperidol	oral	150
		Olanzapine	oral	159
only information that there are no significant differences	Cantillon 2014	Aripiprazole	oral	20
		Placebo	oral	38
results not usable for meta-analysis	Spiegel 1967	Carphenazine	oral	Not indicated

		Chlorpromazine	oral	Not indicated
		Trifluoperazine	oral	Not indicated
results not usable for meta-analysis	Daston 1959	Chlorpromazine	oral	7
		Placebo	oral	6
		Promazine	oral	7
only abstract	Berman 1995	Haloperidol	oral	Not indicated
		Risperidone	oral	Not indicated
results not usable for meta-analysis	Kern 2006	Aripiprazole	oral	128
		Olanzapine	oral	127
only information that there are significant results	Ragland 1968	Chlorpromazine	oral	Not indicated
		Placebo	oral	Not indicated
only information that there were no effects	Litman 2016	Placebo	oral	55
		Risperidone	oral	31
only protocol	Kane 2011	Asenapine	oral	194
		Placebo	oral	192
only protocol	NCT00049946	Risperidone	oral	Not indicated
		Placebo	oral	Not indicated
only protocol	NCT00103727	Risperidone	oral	Not indicated
		Placebo	oral	Not indicated
only ineligible composite score reported	Goldman 2017	Lurasidone	oral	108
		Lurasidone	oral	106
		Placebo	oral	113
		Lurasidone	oral	214
study on hold	NCT02088060	Olanzapine	oral	Not indicated
		Placebo	oral	Not indicated
only protocol	REPRIEVE	Iloperidone	oral	153
		Placebo	oral	150
results not usable for meta-analysis	Wang 2013	Olanzapine	oral	129

		Placebo	oral	132
only abstract	Thomas 2010	Risperidone	oral	4928
		Sertindole	oral	4930
only abstract	Loza 2006	Olanzapine	oral	39
		Risperidone	oral	40
only abstract	Ibrahim 2011	Haloperidol	oral	9
		Quetiapine	oral	11
only protocol	NCT00712270	Aripiprazole	oral	Not indicated
		Risperidone	oral	Not indicated
results not usable for meta-analysis	Canive 2006	Risperidone	oral	4
		Olanzapine	oral	5
no further information on wechsler intelligence scale	Grinspoon 1967	Thioridazine	oral	Not indicated
		Placebo	oral	Not indicated
only reported that there is no significant difference	Gallant 1966	Thioridazine	oral	18
		Tiotixene	oral	18
only abstract	Boehle 1995	Clozapine	99999	Not indicated
		Fluphenazine	99999	Not indicated
results not usable for meta-analysis	Jin 1998	Clozapine	oral	Not indicated
		Placebo	oral	Not indicated
		Haloperidol	oral	Not indicated
Mentioned separate paper but it is not available	May 1968	Psychoanalytic therapy + no medication	99999	46
		Psychoanalytic therapy + medication	both	44
		No antipsychotic medication	99999	43
		Antipsychotic medication	both	48

		Electroshock therapy	99999	47
results not usable for meta-analysis	Gallhofer 2007_chronic	Haloperidol	oral	5
		Sertindole	oral	5
only abstract	Hagger 1997	Risperidone	oral	Not indicated
		Ziprasidone	oral	Not indicated
only abstract	Gaebel 2007	Risperidone	oral	77
		Haloperidol	oral	75
results not usable for meta-analysis	McEvoy 2014	Haloperidol	depot	154
		Paliperidone	depot	157
only protocol	Vontour 2005	Aripiprazole	oral	Not indicated
		Olanzapine	oral	Not indicated
results not usable for meta-analysis	McCreadie 1989	Flupentixol oder Pimozide	oral	8
		Placebo	oral	7
results not usable for meta-analysis	Freedman 1967	Chlorpromazine	oral	Not indicated
		Placebo	oral	Not indicated
		Promazine	oral	Not indicated
only abstract	Ibrahim 2007	Haloperidol	oral	Not indicated
		Quetiapine	oral	Not indicated
		Quetiapine	oral	Not indicated
author has been contacted, no data available	Green 2004a	Clozapine	oral	Not indicated
		Olanzapine	oral	Not indicated
only protocol	NCT00169091	Clozapine	oral	Not indicated

		Haloperidol	oral	Not indicated
only protocol	NCT00480844_24w	Risperidone	oral	Not indicated
		Sertindole	oral	Not indicated
only protocol	NCT00645515	Risperidone	oral	Not indicated
		Ziprasidone	oral	Not indicated
only clinical trials registration	NCT01451736	Paliperidone	depot	Not indicated
		Risperidone	oral	Not indicated
measurement of cognition mentioned but no data available	NCT02146547	Aripiprazole	oral	124
		Aripiprazole	depot	131
		Paliperidone	oral	127
		Paliperidone	depot	141
outcome seems to have been analysed but no specific data	Rosen 1972	Chlorpromazine	oral	152
		Placebo	oral	142
		Promazine	oral	150
only abstract	Study 3001+3002+3003_52w	Haloperidol	oral	Not indicated
		Iloperidone	oral	Not indicated
only protocol	NCT01234454	Risperidone	oral	Not indicated
		Olanzapine	oral	Not indicated
		Tiotixene	oral	Not indicated
only abstract	Addington 1996	Risperidone	oral	Not indicated
		Haloperidol	oral	Not indicated
only abstract	Oliemeulen 2000	Olanzapine	oral	21
		Clozapine	oral	15
study ongoing	EARLY_KUM_PSY	Clozapine	oral	Not indicated

		Olanzapine	oral	Not indicated
cognition mentioned as secondary outcome, no further information	Kinon 2009	Risperidone	oral	192
		Olanzapine	oral	186
only clinical trials registration	JPRN-jRCTs031200338	Lurasidone	oral	Not indicated
		Paliperidone	oral	Not indicated
only clinical trials registration	Sharma 2020	Aripiprazole	oral	Not indicated
		Olanzapine	oral	Not indicated
only abstract	Antonova 2005	Olanzapine	oral	Not indicated
		Risperidone	oral	Not indicated
		Quetiapine	oral	Not indicated
only abstract of planned study - unclear if it was ever started	Armenteros 2001	Risperidone	oral	Not indicated
		Placebo	oral	Not indicated
results not usable for mata-analysis	Emsley 2015	Risperidone	depot	Not indicated
		Flupentixol	depot	Not indicated
only abstract	Fleming 1999	Olanzapine	oral	Not indicated
		Clozapine	oral	Not indicated
		Placebo	oral	Not indicated
results not usable for meta-analysis	Gardner 1955	Chlorpromazine	oral	10
		Reserpine	oral	10
		Placebo	oral	10
results not usable for meta-analysis	Gilgash 1957	Thorazine	oral	22
		Placebo	oral	22
only abstract	Jia 2009	Quetiapine	oral	Not indicated
		Haloperidol	oral	Not indicated

only abstract	Kolff 2000	Risperidone	oral	Not indicated
		Olanzapine	oral	Not indicated
only abstract	Lee 2014a	Haloperidol	oral	Not indicated
		Placebo	oral	Not indicated
only description of trial design	Li 2020	Olanzapine	oral	Not indicated
		Risperidone	oral	Not indicated
		Amisulpride	oral	Not indicated
		Aripiprazole	oral	Not indicated
		Perphenazine	oral	Not indicated
only protocol	Nct00761670	Amisulpride	oral	Not indicated
		Risperidone	oral	Not indicated
only protocol	Nct02199743	Lurasidone	oral	Not indicated
		Haloperidol	oral	Not indicated
		Perphenazine	oral	Not indicated
only abstract only abstract	Preussler 1995	Clozapine	oral	Not indicated
		Fluphenazine	oral	Not indicated
only protocol	Ris-int-45	Risperidone	oral	Not indicated
		Olanzapine	oral	Not indicated
only protocol	Xiao 2021	Olanzapine	oral	Not indicated
		Risperidone	oral	Not indicated
		Aripiprazole	oral	Not indicated
		Ziprasidone	oral	Not indicated
		Amisulpride	oral	Not indicated
		Haloperidol	oral	Not indicated
results not usable for meta-analysis	Schneider 2013	Quetiapine	oral	18
		Flupentixol	oral	13

results not usable for meta-analysis	Robinson 2015_1y	Aripiprazole	oral	Not indicated
		Risperidone	oral	Not indicated
Only clinical trial registration available	ChiCTR2200060542	Ziprasidone	oral	Not indicated
		Haloperidol	oral	Not indicated
Only clinical trial registration available	ChiCTR2200061843	Quetiapine	oral	Not indicated
		Haloperidol	oral	Not indicated
results not usable for meta-analysis	Serafetinides 1972	Clopenthixol	oral	15
		Chlorpromazin	oral	14
		Haloperidol	oral	14
		Placebo	oral	14

3.1.3 Einsatz der MCCB

Die MCCB wurde in lediglich 4 der 68 eingeschlossenen Studien vollständig eingesetzt (Buller 2011, Citrome 2012, NCT01057849, Potkin 2011). In einer Studie hiervon war allerdings kein Gesamtwert berechnet worden, demnach resultierte nur aus 3 dieser Studien ein extrahierbarer Composite Score. Für alle anderen Studien wurde ein Overall-Score berechnet aus den jeweils extrahierten Domänen. Bis auf Speed of Processing, waren meist weniger als die Hälfte der eingeschlossenen Tests Teil der MCCB (blau), bei den anderen Tests handelte es sich jedoch um eine sehr strikte Auswahl an Messinstrumenten, die sehr ähnlich zum entsprechenden MCCB-Test waren (orange). Bei Social Cognition handelt es sich um die Domäne, mit den wenigsten Tests, die den Einschlusskriterien entsprachen. Für Speed of Processing lagen hingegen die meisten Testergebnisse vor.

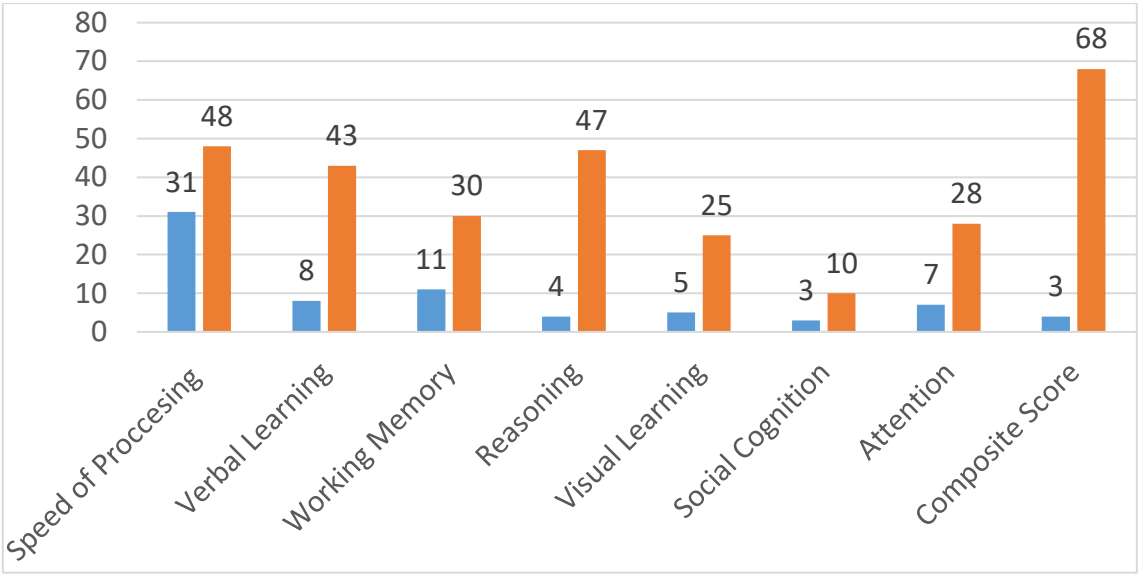


Abbildung 2: Diagramm zum Einsatz der MCCB

In blau sind die Studien (n) abgebildet, die Tests aus der MCCB für die entsprechende Domäne verwendeten, bzw. die vollständige MCCB für den Composite Score

In orange sind die Studien (n) abgebildet, die insgesamt für die Domäne eingeschlossen wurden

3.2 Ergebnisse bezüglich des primären Outcomes

Zur Beschreibung und Visualisierung des primären Outcomes werden im Folgenden der Netzwerkplot, der Forest-Plot und der League-Table dargestellt. Ergebnisse des Forest-Plots und des League-Tables beruhen auf einer Frequentist-Analyse. Im Anhang befindet sich zusätzlich Ergebnisse, die aus einer Bayesianischen-Analyse erfolgten. Alle aufgeführten Darstellungen resultieren aus der Netzwerk-Metaanalyse. Ergebnisse aus paarweisen Metaanalysen werden abschließend berichtet. Die Referenzen der angegebenen Studien befinden sich im Anhang. SMDs und Konfidenzintervalle < 0 zeigen positive Effekte in den Vergleichen.

In der Netzwerk-Metaanalyse zum primären Outcome wurden 18 Antipsychotika und 66 Studien eingeschlossen.

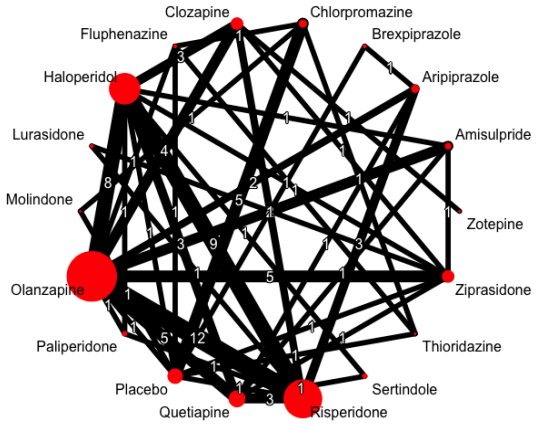


Abbildung 3: Netzwerkplot des Primären Outcomes (Overall-Score) (Feber et al. 2024)

Die Größe der Kreise entspricht der Größe der Stichprobe und die Liniendicke ist proportional zur Anzahl an Studien, die die spezifische Intervention anhand direkter Vergleiche untersuchten

Anhand des Netzwerkplots (Abbildung 3) lässt sich eine gute Vernetzung der Interventionen erkennen, die Voraussetzung für die Durchführung einer Netzwerk-Metaanalyse war demnach gegeben. Olanzapin, Haloperidol und Risperidon stechen hierbei als häufig eingesetzte Interventionen mit einer vergleichsweisen großen Stichprobe besonders hervor.

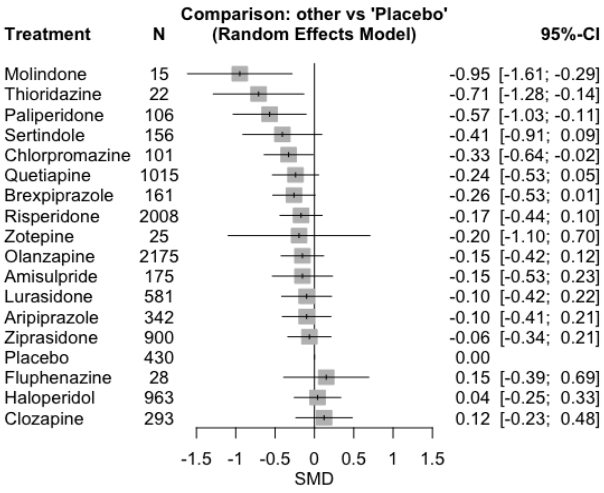


Abbildung 4: Forest-Plot des Primären Outcomes (Overall-Score) (Feber et al. 2024)

Vergleich der Antipsychotika mit Placebo. Es ist die untersuchte Teilnehmerzahl (N), sowie der Effekt anhand der Angabe der standardisierten Mittelwertsdifferenz (SMD) und des 95%-Konfidenzintervalls (CI) für jeden Vergleich zu sehen.

Anhand des Forest-Plots (Abbildung 4) werden die Vergleiche der Antipsychotika mit Placebo dargestellt.

Es sind signifikante Effekte von Molindon, Thioridazin, Paliperidon und Chlorpromazin im Vergleich zu Placebo zu erkennen. Auch Sertindol zeigt einen kleinen positiven Effekt auf. Diese Ergebnisse beruhen allerdings alle entweder auf einer geringen Stichprobenanzahl, einer limitierten Anzahl an Domänen aus denen sich der Overall-Score zusammensetzt oder einer begrenzten Anzahl oder Aktualität an Studien.

Molindon wurde im Rahmen von nur einer Studie untersucht (Clark 1970a) mit einer Stichprobengröße von n=15, der Overall-Score beruht auf einer Domäne (Speed of Processing). Der Effekt von Thioridazin resultiert ebenfalls aus nur einer Studie (Clark 1971a), mit einer Stichprobengröße von n=22. Auch hier wurde nur eine Domäne (Speed of Processing) erfasst, auf der der Overall-Score beruht. Der Effekt von Chlorpromazin basiert auf Ergebnissen von fünf Studien (Abrams 1958, Clark 1968a, Clark 1970a, Clark 1971a, Clark 1961) und einer Gesamtstichprobe von n=101, alle Studien wurden vor 1971 publiziert. In vier der Studien beruht der Overall-Score auf einer Domäne (Speed of Processing) und in einer Studie setzt sich der Overall-Score aus drei Domänen zusammen (Speed of Processing, Working Memory, Reasoning and Problem Solving). Effekte von Sertindol und Paliperidon beruhen zwar ebenfalls auf einer relativ kleinen Stichprobe (n=156;106) allerdings sind die Studien aus denen die Ergebnisse resultieren aktueller und der Overall-Score beruht auf mehreren Domänen.

Die anderen Antipsychotika zeigen im Vergleich zu Placebo nur sehr kleine und meist nicht signifikante Effekte auf. Clozapin, Fluphenazin und Haloperidol befinden sich im Forest-Plot unterhalb von Placebo, was davon ausgehen lässt, dass diese Antipsychotika im Vergleich zu Placebo eher schlechtere Effekte erzielen.

Tabelle 4: League-Table für den primären Outcome (Overall-Score für Kognition) (Feber et al. 2024)

MOL				**-0.86 (-1.6 to -0.12)**										-0.7 (-1.44 to 0.04)			
-0.24 (-1.09 to 0.61)	THIOR			-0.52 (-1.15 to 0.11)										-0.5 (-1.15 to 0.15)	**-0.93 (-1.59 to -0.27)**		
-0.38 (-1.19 to 0.43)	-0.14 (-0.87 to 0.59)	PAL					-0.16 (-1.06 to 0.74)		-0.42 (-1.02 to 0.19)							**-0.71 (-1.28 to -0.13)**	
-0.54 (-1.37 to 0.29)	-0.3 (-1.06 to 0.45)	-0.16 (-0.73 to 0.41)	SER		0.07 (-0.43 to 0.58)											**-0.95 (-1.68 to -0.22)**	
-0.62 (-1.28 to 0.04)	-0.38 (-0.96 to 0.19)	-0.24 (-0.8 to 0.31)	-0.08 (-0.67 to 0.51)	CPZ										-0.31 (-0.62 to 0)	-0.41 (-1.05 to 0.23)		
-0.71 (-1.43 to 0.02)	-0.47 (-1.11 to 0.17)	-0.33 (-0.74 to 0.08)	-0.17 (-0.59 to 0.25)	-0.09 (-0.51 to 0.33)	QUE		0.09 (-0.24 to 0.43)		-0.12 (-0.32 to 0.07)	0.04 (-0.39 to 0.46)		-0.25 (-0.62 to 0.12)	0.14 (-0.33 to 0.6)			-0.09 (-0.43 to 0.25)	
-0.69 (-1.4 to 0.03)	-0.45 (-1.08 to 0.18)	-0.31 (-0.81 to 0.19)	-0.15 (-0.68 to 0.38)	-0.07 (-0.48 to 0.34)	0.02 (-0.32 to 0.36)	BRE						-0.02 (-0.44 to 0.4)		**-0.33 (-0.64 to -0.03)**			
-0.78 (-1.49 to -0.07)	-0.54 (-1.17 to 0.09)	**-0.4 (-0.79 to -0.01)**	-0.24 (-0.68 to 0.2)	-0.16 (-0.56 to 0.25)	-0.07 (-0.24 to 0.1)	-0.09 (-0.41 to 0.23)	RIS		0.07 (-0.08 to 0.23)		-0.15 (-0.42 to 0.12)	-0.04 (-0.4 to 0.31)		-0.06 (-0.53 to 0.41)		**-0.23 (-0.45 to -0.01)**	**-0.52 (-1.02 to -0.02)**
-0.75 (-1.87 to 0.36)	-0.51 (-1.58 to 0.55)	-0.37 (-1.32 to 0.57)	-0.21 (-1.18 to 0.75)	-0.13 (-1.08 to 0.82)	-0.04 (-0.92 to 0.83)	-0.06 (-0.98 to 0.86)	0.03 (-0.84 to 0.89)	ZOT									-0.32 (-1.14 to 0.51)
-0.8 (-1.51 to -0.08)	-0.56 (-1.18 to 0.07)	**-0.42 (-0.8 to -0.03)**	-0.25 (-0.69 to 0.18)	-0.18 (-0.58 to 0.23)	-0.09 (-0.24 to 0.07)	-0.11 (-0.43 to 0.22)	-0.02 (-0.14 to 0.11)	-0.04 (-0.91 to 0.83)	OLA	0.02 (-0.3 to 0.33)		-0.1 (-0.5 to 0.3)	-0.04 (-0.27 to 0.19)	-0.07 (-1.02 to 0.88)	0.25 (-1.08 to 1.58)	-0.13 (-0.38 to 0.11)	-0.28 (-0.7 to 0.13)
-0.8 (-1.56 to -0.03)	-0.56 (-1.24 to 0.13)	-0.42 (-0.89 to 0.06)	-0.26 (-0.76 to 0.25)	-0.18 (-0.66 to 0.31)	-0.09 (-0.39 to 0.22)	-0.11 (-0.53 to 0.32)	-0.02 (-0.32 to 0.28)	-0.04 (-0.95 to 0.87)	0 (-0.28 to 0.28)	AMI			0.1 (-0.36 to 0.57)			-0.07 (-0.5 to 0.37)	
-0.85 (-1.58 to -0.12)	-0.61 (-1.26 to 0.04)	**-0.47 (-0.91 to -0.03)**	-0.31 (-0.79 to 0.17)	-0.23 (-0.67 to 0.21)	-0.14 (-0.4 to 0.12)	-0.16 (-0.53 to 0.21)	-0.07 (-0.28 to 0.14)	-0.1 (-0.98 to 0.79)	-0.05 (-0.28 to 0.17)	-0.05 (-0.4 to 0.3)	LUR		-0.11 (-0.38 to 0.15)				
-0.85 (-1.58 to -0.12)	-0.61 (-1.26 to 0.04)	**-0.47 (-0.92 to -0.02)**	-0.31 (-0.79 to 0.17)	-0.23 (-0.66 to 0.2)	-0.14 (-0.38 to 0.1)	-0.16 (-0.48 to 0.16)	-0.07 (-0.31 to 0.17)	-0.1 (-0.99 to 0.8)	-0.05 (-0.29 to 0.18)	-0.05 (-0.41 to 0.31)	0 (-0.31 to 0.31)	ARI					
-0.88 (-1.6 to -0.17)	**-0.65 (-1.28 to -0.02)**	**-0.51 (-0.92 to -0.09)**	-0.34 (-0.81 to 0.12)	-0.26 (-0.67 to 0.15)	-0.18 (-0.4 to 0.04)	-0.2 (-0.53 to 0.14)	-0.11 (-0.29 to 0.08)	-0.13 (-1 to 0.74)	-0.09 (-0.27 to 0.09)	-0.09 (-0.41 to 0.23)	-0.04 (-0.25 to 0.18)	-0.04 (-0.31 to 0.24)	ZIP	-0.06 (-0.46 to 0.34)		-0.17 (-0.64 to 0.31)	-0.13 (-0.59 to 0.33)
-0.95 (-1.61 to -0.29)	**-0.71 (-1.28 to -0.14)**	**-0.57 (-1.03 to -0.11)**	-0.41 (-0.91 to 0.09)	**-0.33 (-0.64 to -0.02)**	-0.24 (-0.53 to 0.05)	-0.26 (-0.53 to 0.01)	-0.17 (-0.44 to 0.1)	-0.2 (-1.1 to 0.7)	-0.15 (-0.42 to 0.12)	-0.15 (-0.53 to 0.23)	-0.1 (-0.42 to 0.22)	-0.1 (-0.41 to 0.21)	-0.06 (-0.34 to 0.21)	PLB	-0.43 (-1.09 to 0.22)	0.19 (-1.19 to 1.57)	
-1.1 (-1.93 to -0.27)	**-0.86 (-1.5 to -0.22)**	**-0.72 (-1.42 to -0.02)**	-0.56 (-1.28 to 0.16)	-0.48 (-1.03 to 0.07)	-0.39 (-0.99 to 0.21)	-0.41 (-1.01 to 0.19)	-0.32 (-0.9 to 0.26)	-0.35 (-1.38 to 0.69)	-0.3 (-0.89 to 0.28)	-0.3 (-0.95 to 0.34)	-0.25 (-0.86 to 0.36)	-0.25 (-0.86 to 0.36)	-0.21 (-0.8 to 0.38)	-0.15 (-0.69 to 0.39)	FLU		
-0.99 (-1.71 to -0.26)	**-0.75 (-1.39 to -0.11)**	**-0.61 (-1 to -0.22)**	**-0.45 (-0.88 to -0.01)**	-0.37 (-0.79 to 0.06)	**-0.28 (-0.47 to -0.08)**	-0.3 (-0.65 to 0.05)	**-0.21 (-0.37 to -0.05)**	-0.23 (-1.11 to 0.64)	**-0.19 (-0.35 to -0.03)**	-0.19 (-0.5 to 0.12)	-0.14 (-0.39 to 0.11)	-0.14 (-0.41 to 0.13)	-0.1 (-0.32 to 0.12)	-0.04 (-0.33 to 0.25)	0.11 (-0.49 to 0.71)	HAL	0.1 (-0.42 to 0.62)
-1.07 (-1.82 to -0.32)	**-0.83 (-1.5 to -0.16)**	**-0.69 (-1.15 to -0.23)**	**-0.53 (-1.03 to -0.03)**	-0.45 (-0.92 to 0.02)	**-0.36 (-0.66 to -0.07)**	-0.38 (-0.79 to 0.02)	**-0.29 (-0.56 to -0.02)**	-0.32 (-1.14 to 0.51)	**-0.28 (-0.54 to -0.01)**	-0.28 (-0.65 to 0.1)	-0.22 (-0.54 to 0.1)	-0.22 (-0.57 to 0.12)	-0.19 (-0.47 to 0.09)	-0.12 (-0.48 to 0.23)	0.03 (-0.6 to 0.66)	-0.08 (-0.37 to 0.2)	CLZ

Die Antipsychotika sind nach ihren Effekten geordnet. Es werden SMDs präsentiert sowie 95%-KIs. Ergebnisse der Netzwerk-Metaanalyse befinden sich in der linken unteren Hälfte, die Ergebnisse der paarweisen Metaanalysen in der rechten oberen Hälfte. Die farbliche Hinterlegung spiegelt die Ergebnisse der CINeMA-Bewertung wieder: grün = hohe Zuverlässigkeit der Schätzungen, blau = moderate Zuverlässigkeit der Schätzungen, orange = niedrige Zuverlässigkeit der Schätzungen, rot = sehr niedrige Zuverlässigkeit der Schätzungen. Folgende Abkürzungen werden für die Antipsychotika verwendet: MOL=Molindon, THIOR=Thioridazin, PAL=Paliperidon, SER=Sertindol, CPZ=Chlorpromazin, QUE=Quetiapin, BRE=Brexpiprazol, RIS=Risperidon, ZOT=Zotepin, OLA=Olanzapin, AMI=Amisulprid, LUR=Lurasidon, ARI=Aripiprazol, ZIP=Ziprasidon, PLB=Placebo, FLU=Fluphenazin, HAL=Haloperidol, CLZ=Clozapin

Der League-Table (Tabelle 4) dient der zusätzlichen Visualisierung der Ergebnisse.

Es existiert keine farbliche Hinterlegung in grün, stattdessen lässt sich feststellen, dass ein Drittel der Vergleiche rot hinterlegt sind, was für eine sehr niedrige Zuverlässigkeit der Schätzungen spricht. Gründe hierfür sind meist auf ein hohes Risiko für Verzerrungen innerhalb der Studien und Ungenauigkeit/Unschärfe zurückzuführen. Dies kann z.B. aus Stichprobenverzerrungen, Verlusten von Teilnehmern während des Studienverlaufs oder aus einem Publikationsbias resultieren. Nähere Angaben zur CINeMA-Bewertung befinden sich im Anhang.

Bezüglich der paarweisen Metaanalysen zum primären Outcome zeigten sich ebenfalls vereinzelt signifikante Effekte. Die im Folgenden beschriebenen Ergebnisse beruhen auf dem Random Effects Modell, da eine gewisse Heterogenität anzunehmen war. Hier zeigten sich folgende positive Effekte: von Risperidon vs. Haloperidol (SMD = -0.23, KI -0.45 bis -0.01), von Paliperidon vs. Haloperidol (SMD = -0.71, KI -1.28 bis -0.13), von Molindon vs. Chlorpromazin (SMD = -0.86, KI -1.60 bis -0.12), von Thioridazin vs. Fluphenazin (SMD = -0.93, KI -1.59 bis -0.27), von Brexpiprazol vs. Placebo (SMD = -0.33, KI -0,64 bis -0.03), von Sertindol vs. Haloperidol (SMD = -0.95, KI -1.68 bis -0.22) und von Risperidon vs. Clozapin (SMD = -0.52, KI -1.02 bis -0.02). Sowohl aus paarweisen Metaanalysen als auch aus der Netzwerk-Metaanalyse zum primären Outcome zeigen sich für Haloperidol und Clozapin im Vergleich zu anderen Antipsychotika oder Placebo schlechtere Effekte.

Die Ergebnisse der Metaregressionen und Sensitivitätsanalysen zum primären Outcome stimmen insgesamt mit der primären Analyse überein und sprechen für die Robustheit der Ergebnisse.

(Feber et al. 2024)

3.3 Ergebnisse bezüglich der sekundären Outcomes

Die dargestellten Forest-Plots beruhen weiterhin auf einer Frequentist-Analyse. Zur Beschreibung der Ergebnisse aus paarweisen Metaanalysen wurden die Daten des Random Effects Modells gewählt, da von einer gewissen Heterogenität auszugehen ist. In allen dargestellten Forest-Plots entspricht die Dicke der Linien der Anzahl an Studien mit direkten Vergleichen der entsprechenden Interventionen und die Kreisgröße der Größe der Stichprobe. Die angegebenen Studien können in der Referenzenliste im Anhang gefunden werden. SMDs und Konfidenzintervalle < 0 zeigen positive Effekte in den Vergleichen.

3.3.1 Speed of Processing

Im folgenden Netzwerkplot lässt sich auch für Speed of Processing eine gute Vernetzung der Interventionen erkennen. Es wurden 16 Antipsychotika und insgesamt 46 Studien in die Netzwerk-Metaanalyse eingeschlossen.

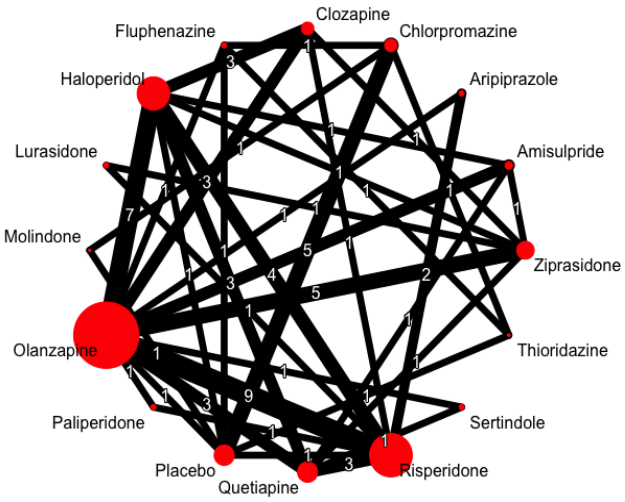


Abbildung 5: Netzwerkplot zu Speed of Processing (Feber et al. 2024)

Die Größe der Kreise entspricht der Größe der Stichprobe und die Liniendicke ist proportional zur Anzahl an Studien, die die spezifische Intervention anhand direkter Vergleiche untersuchten

Der Forest-Plot (Abbildung 6) für die Netzwerk-Metaanalyse zu Speed of Processing, in dem Vergleiche der Antipsychotika gegen Placebo dargestellt wurden, zeigt die signifikanten Effekte von Molindon, Thioridazin, Paliperidon und Chlorpromazin auf, die bereits aus der Netzwerk-Metaanalyse zum primären Outcome bekannt sind. Wie bereits erwähnt, beruhen die Ergebnisse hierzu auf einer sehr geringen Domänenanzahl oder allgemein limitierter Evidenz, weshalb die Effekte nicht für eine eindeutige Überlegenheit im Vergleich zu Placebo sprechen. Lurasidon sticht bezüglich Speed of Processing ebenfalls heraus, allerdings mit einem relativ kleinen positiven Effekt. Die Teilnehmeranzahl ist jedoch vergleichsweise größer. Die Ergebnisse resultieren

jedoch auch hier aus lediglich zwei Studien (Citrome 2012, Potkin 2011). Dennoch ist anzumerken, dass bei den beiden Studien die MCCB zum Einsatz kam. Zusammenfassend können auf Grundlage der eingeschränkten Evidenz oder den kleinen Effekten keine wesentlichen Überlegenheiten spezifischer Antipsychotika hervorgehoben werden, die für eine klare Empfehlung sprechen.

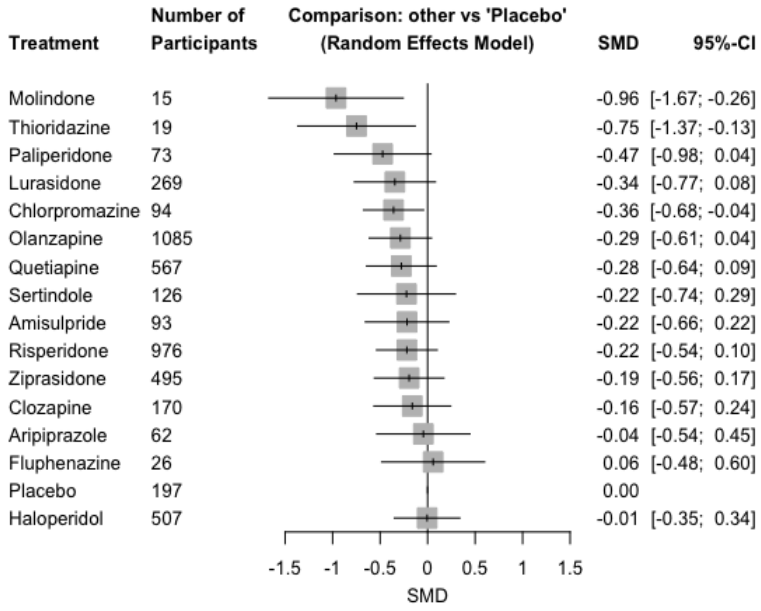


Abbildung 6: Forest-Plot zu Speed of Processing (Feber et al. 2024)

Vergleich der Antipsychotika mit Placebo. Es ist die untersuchte Teilnehmerzahl (N), sowie der Effekt anhand der Angabe der standardisierten Mittelwertsdifferenz (SMD) und des 95%-Konfidenzintervalls (CI) für jeden Vergleich zu sehen.

Paarweise Metaanalysen zeigten signifikante positive Effekte von: Olanzapin vs. Haloperidol (SMD = -0.37; KI -0.59 bis -0.14), Molindon vs. Chlorpromazin (SMD = -0.86, KI -1.60 bis -0.12), Thioridazin vs. Fluphenazin (SMD = -0.93, KI -1.59 bis -0,27), Olanzapin vs. Aripiprazol (SMD = -0.48, KI -0.93 bis -0.03) und von Clozapin vs. Haloperidol (SMD = -0.39, KI -0.77 bis -0.01). Haloperidol schneidet in den paarweisen Metaanalysen, wie auch in der Netzwerk-Metaanalyse somit im Vergleich zu Placebo und anderen Antipsychotika am schlechtesten ab.

(Feber et al. 2024)

3.3.2 Working Memory

In der Netzwerk-Metaanalyse von Working Memory wurden 14 Antipsychotika einbezogen und insgesamt 28 Studien untersucht. Olanzapin und Risperidon zeigen vergleichsweise eine besonders große Stichprobe.

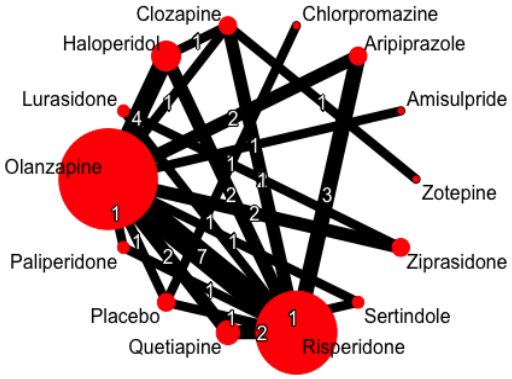


Abbildung 7: Netzwerkplot zu Working Memory (Feber et al. 2024)

Die Größe der Kreise entspricht der Größe der Stichprobe und die Liniendicke ist proportional zur Anzahl an Studien, die die spezifische Intervention anhand direkter Vergleiche untersuchten

Im folgenden Forest-Plot (Abbildung 8) sind keine signifikanten Effekte zu erkennen. Die positiven aber moderaten Effekte von Paliperidon und Zotepin beruhen auf einer geringen Teilnehmerzahl, die keine ausreichende Überlegenheit im Vergleich zu Placebo ableiten lassen. Der Effekt von Zotepin bezüglich Working Memory auf lediglich einer Studie (Meyer-Lindenberg 1997), der Effekt von Paliperidon resultiert aus drei Studien (Koshikawa 2016, NCT00827840, Wang 2022).

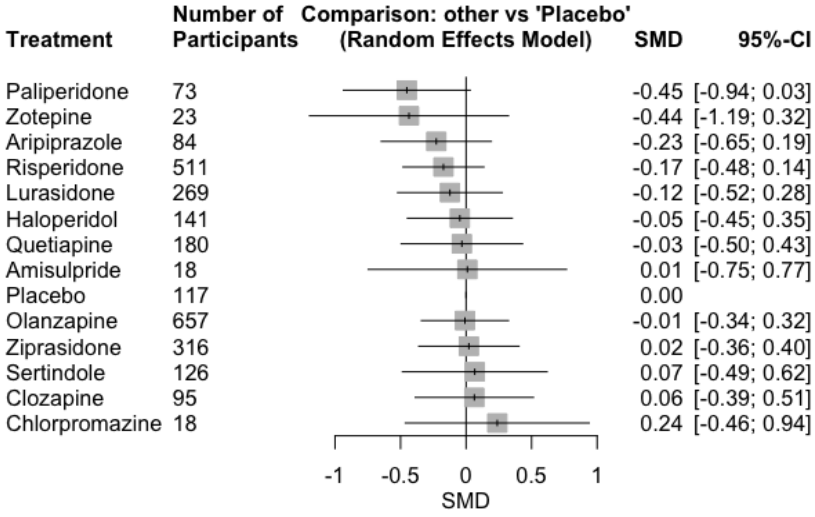


Abbildung 8: Forest-Plot zu Working Memory (Feber et al. 2024)

Vergleich der Antipsychotika mit Placebo. Es ist die untersuchte Teilnehmerzahl (N), sowie der Effekt anhand der Angabe der standardisierten Mittelwertsdifferenz (SMD) und des 95%-Konfidenzintervalls (CI) für jeden Vergleich zu sehen.

Aus paarweisen Metaanalysen resultieren positive Effekte von Risperidon vs. Clozapin (SMD = -0.34, KI -0.66 bis -0.01) und von Olanzapin vs. Sertindol (SMD = -1.96, KI -3,77 bis -0,14).

(Feber et al. 2024)

3.3.3 Visual Learning

In der Netzwerk-Metaanalyse zu Visual Learning konnten 25 Studien eingeschlossen und 11 Antipsychotika untersucht werden. Haloperidol, Olanzapin und Risperidon fallen im Netzwerkplot aufgrund der Stichprobengröße und Anzahl an untersuchten Studien auf.

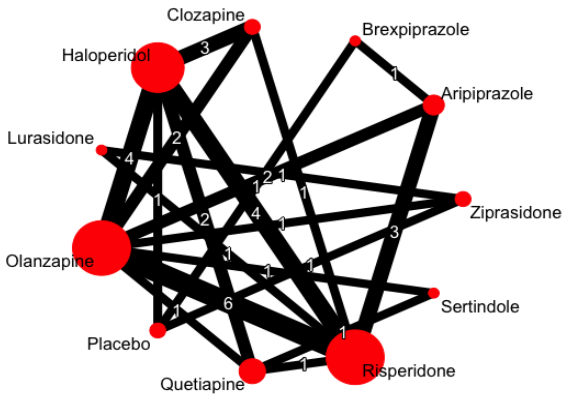


Abbildung 9: Netzwerkplot zu Visual Learning (Feber et al. 2024)

Die Größe der Kreise entspricht der Größe der Stichprobe und die Liniendicke ist proportional zur Anzahl an Studien, die die spezifische Intervention anhand direkter Vergleiche untersuchten

Im Forest-Plot (Abbildung 10) zeigt sich ein kleiner signifikant besserer Effekt von Bexpiprazol im Vergleich zu Placebo. Die Ergebnisse beruhen auf zwei Studien (EQUATOR, Citrome 2015) und das Antipsychotikum wurde anhand einer Stichprobenanzahl von n=148 untersucht. Bei beiden Studien wurde nur eine Domäne erhoben, allerdings handelt es sich hierbei um aktuellere Studien. Die Ergebnisse sprechen anhand der aktuellen Datenlage nicht für eine klare Überlegenheit im Vergleich zu Placebo. Daher resultieren auch aus dieser Netzwerk-Metaanalyse keine wesentlich besseren Effekte der Antipsychotika im Vergleich zu Placebo.

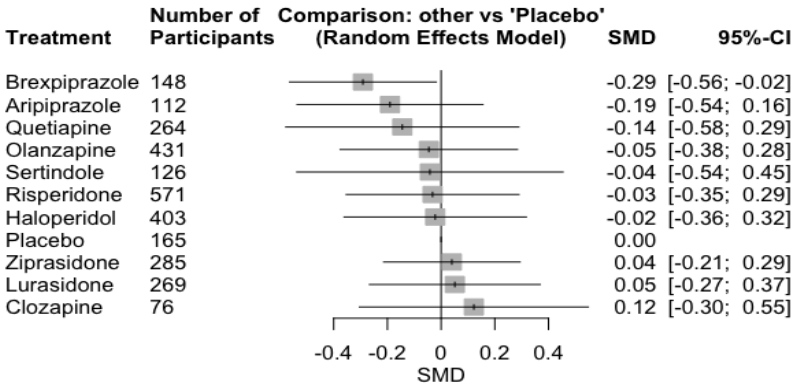


Abbildung 10: Forest-Plot zu Visual Learning (Feber et al. 2024)

Vergleich der Antipsychotika mit Placebo. Es ist die untersuchte Teilnehmerzahl (N), sowie der Effekt anhand der Angabe der standardisierten Mittelwertsdifferenz (SMD) und des 95%-Konfidenzintervalls (CI) für jeden Vergleich zu sehen.

Aus paarweisen Metaanalysen resultiert ebenfalls ein signifikant positiver Effekt von Brexpiprazol vs. Placebo (SMD = -0.33, KI -0.64 bis -0.03).

(Feber et al. 2024)

3.3.4 Verbal Learning

In der Netzwerk-Metaanalyse zu Verbal Learning wurden 42 Studien und 13 Antipsychotika eingeschlossen. Auch hier stehen Olanzapin, Risperidon und Haloperidol im Netzwerkplot im Vordergrund aufgrund ihrer Stichprobengröße.

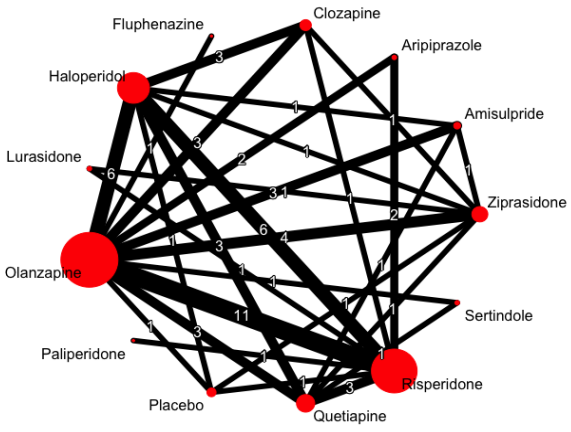


Abbildung 11: Netzwerkplot zu Verbal Learning (Feber et al. 2024)

Die Größe der Kreise entspricht der Größe der Stichprobe und die Liniendicke ist proportional zur Anzahl an Studien, die die spezifische Intervention anhand direkter Vergleiche untersuchten

Aus dem Forest-Plot (Abbildung 12) resultieren keine signifikant besseren Effekte der Antipsychotika im Vergleich zu Placebo. Die positiven Effekt von Paliperidon und Fluphenazin beruhen auf einer sehr kleinen Teilnehmeranzahl und jeweils auf lediglich einer Studie (NCT00827840, Dossenbach 2004). Demnach ist eine limitierte Evidenz für diese Effekte verfügbar.

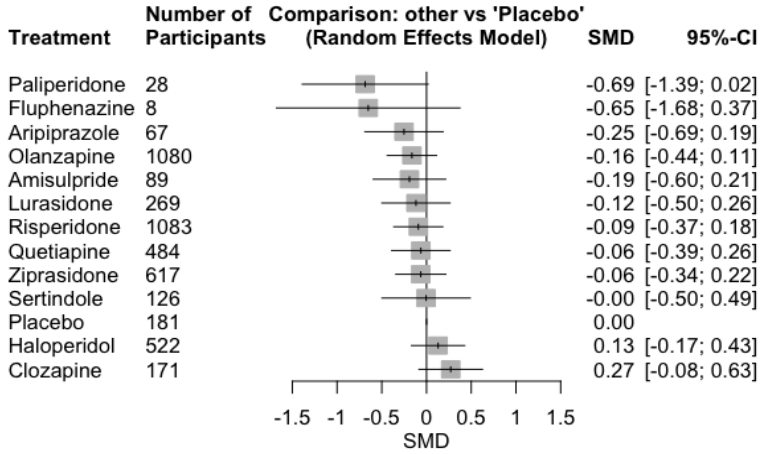


Abbildung 12: Forest-Plot zu Verbal Learning (Feber et al. 2024)

Vergleich der Antipsychotika mit Placebo. Es ist die untersuchte Teilnehmerzahl (N), sowie der Effekt anhand der Angabe der standardisierten Mittelwertsdifferenz (SMD) und des 95%-Konfidenzintervalls (CI) für jeden Vergleich zu sehen.

In paarweisen Metaanalysen zeigten sich signifikant positive Effekte von: Olanzapin vs. Clozapin (SMD = -0.59, KI -0.96 bis -0.22) und Olanzapin vs. Haloperidol (SMD = -0.48, KI -0.72 bis -0.24). Im Vergleich zu Risperidon zeigt Paliperidon einen signifikant besseren Effekt (SMD = -0.59, KI -1.17 bis -0.02).

(Feber et al. 2024)

3.3.5 Social Cognition

Im Vergleich zu den vorangegangenen Outcomes konnten in der Netzwerk-Metaanalyse zu Social Cognition nur wenige Studien und Antipsychotika eingeschlossen werden. Es werden 9 Antipsychotika und 9 Studien einbezogen. Ebenfalls konnte kein Vergleich zu Placebo hergestellt werden, da diese Intervention nicht im Netzwerk enthalten ist. Stattdessen wurde gegen Risperidon vergleichen, hierbei handelte es sich um die Intervention mit den meisten direkten Vergleichen und der vergleichsweise größten Stichprobe.

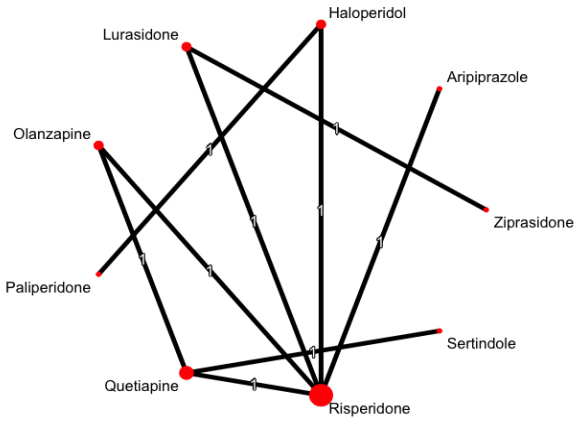


Abbildung 13: Netzwerkplot zu Social Cognition (Feber et al. 2024)

Die Größe der Kreise entspricht der Größe der Stichprobe und die Liniendicke ist proportional zur Anzahl an Studien, die die spezifische Intervention anhand direkter Vergleiche untersuchten

Der Forest-Plot (Abbildung 14) zeigt keine signifikant besseren Ergebnisse der Antipsychotika im Vergleich zu Risperidon. Im Vergleich zu Risperidon zeigte kein Antipsychotikum wesentlich bessere Effekte, die meisten Antipsychotika zeigten allerdings schlechtere Effekte, besonders Haloperidol sticht hierbei heraus.

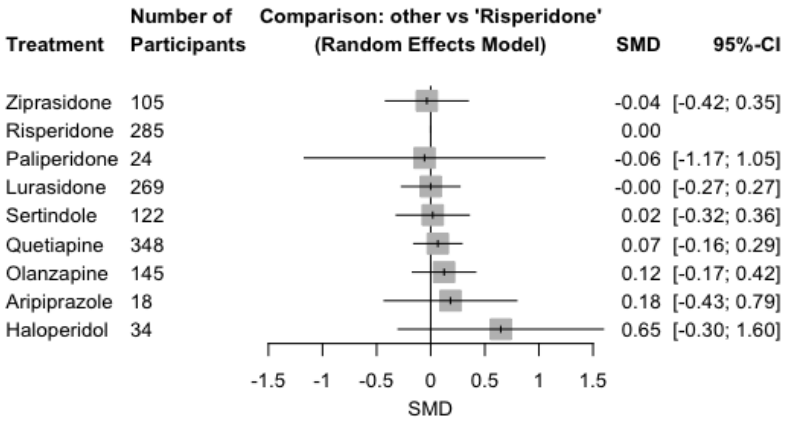


Abbildung 14: Forest-Plot zu Social Cognition (Feber et al. 2024)

Vergleich der Antipsychotika mit Placebo. Es ist die untersuchte Teilnehmerzahl (N), sowie der Effekt anhand der Angabe der standardisierten Mittelwertsdifferenz (SMD) und des 95%-Konfidenzintervalls (CI) für jeden Vergleich zu sehen.

Aus paarweisen Metaanalysen resultieren signifikant positive Effekte von Risperidon LAI vs. Paliperidon LAI (SMD = -1.41, KI -2.36 bis -0.45), allerdings zeigte Paliperidon bessere Effekte im Vergleich zu Haloperidol (SMD = -0.71, KI -1.28 bis -0.13)

(Feber et al. 2024)

3.3.6 Attention/Vigilance

In der Netzwerk-Metaanalyse zu Attention/Vigilance wurden 5 Antipsychotika eingeschlossen aus insgesamt 4 Studien. Hier wurden die verschiedenen Antipsychotika wie bei Verbal Learning auch gegen Risperidon untersucht, weil keine direkten Placebo-Vergleiche bestanden. Risperidon war das Antipsychotikum mit den meisten direkten Vergleichen für Attention/Vigilance.

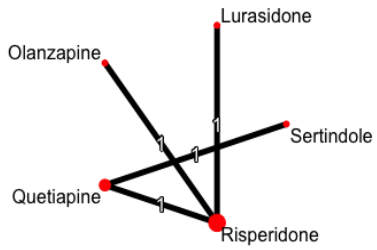


Abbildung 15: Netzwerkplot zu Attention/Vigilance (Feber et al. 2024)

Die Größe der Kreise entspricht der Größe der Stichprobe und die Liniendicke ist proportional zur Anzahl an Studien, die die spezifische Intervention anhand direkter Vergleiche untersuchten

Der Forest-Plot zu Attention/Vigilance (Abbildung 16) zeigt keine wesentlich besseren oder schlechteren Effekte im Vergleich zu Risperidon.

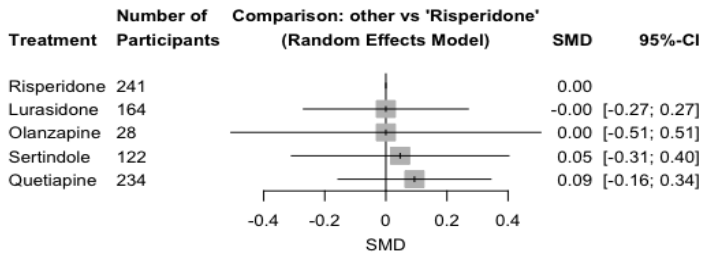


Abbildung 16: Forest-Plot zu Attention/Vigilance (Feber et al. 2024)

Vergleich der Antipsychotika mit Placebo. Es ist die untersuchte Teilnehmerzahl (N), sowie der Effekt anhand der Angabe der standardisierten Mittelwertsdifferenz (SMD) und des 95%-Konfidenzintervalls (CI) für jeden Vergleich zu sehen.

In paarweisen Metaanalysen zeigte sich ein signifikant positiver Effekt von Clozapin vs. Zotepin (SMD = -0.62, KI -1.22 bis -0.02) und ein signifikant positiver Effekt von Quetiapin vs. Olanzapin (SMD = -0.70, KI -1.04 bis -0.36).

(Feber et al. 2024)

3.3.7 Reasoning and Problem Solving

In die Netzwerk-Metaanalyse zu Reasoning and Problem Solving wurden 45 Studien und 15 Antipsychotika eingeschlossen. Haloperidol, Olanzapin und Risperidon stechen als die Medikamente mit der größten Stichprobe und den meisten Studien heraus.

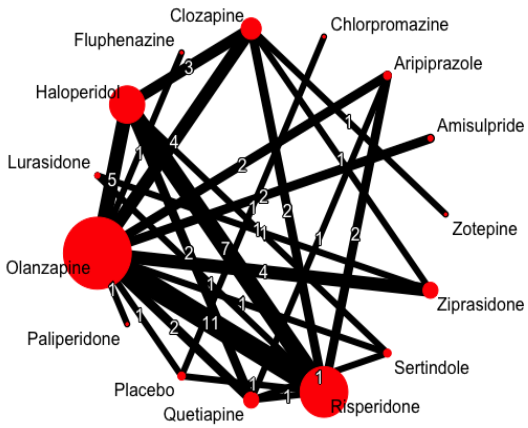


Abbildung 17: Netzwerkplot zu Reasoning and Problem Solving (Feber et al. 2024)

Die Größe der Kreise entspricht der Größe der Stichprobe und die Liniendicke ist proportional zur Anzahl an Studien, die die spezifische Intervention anhand direkter Vergleiche untersuchten

Aus der Netzwerk-Metaanalyse resultieren nur kleine, nicht signifikante Ergebnisse. Der positive aber kleine Effekt von Paliperidon beruht erneut auf einer sehr geringen Teilnehmerzahl und auf lediglich einer Studie (Wang 2022). Haloperidol, Clozapin und Zotepin zeigen im Vergleich zu Placebo schlechtere Effekte auf.

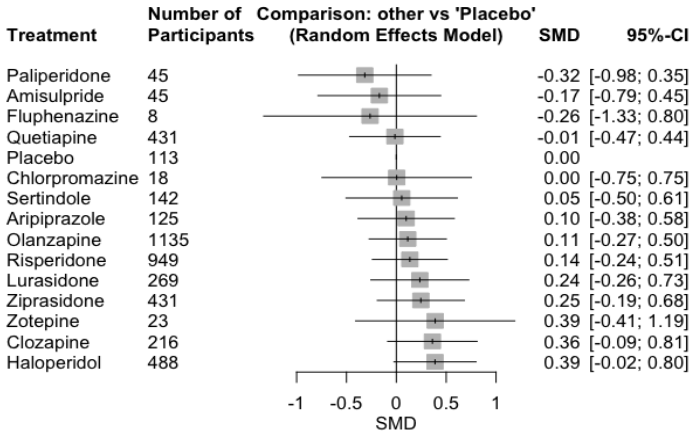


Abbildung 18: Forest-Plot zu Reasoning and Problem Solving (Feber et al. 2024)

Vergleich der Antipsychotika mit Placebo. Es ist die untersuchte Teilnehmerzahl (N), sowie der Effekt anhand der Angabe der standardisierten Mittelwertsdifferenz (SMD) und des 95%-Konfidenzintervalls (CI) für jeden Vergleich zu sehen.

In paarweisen Metaanalysen zeigten sich positive Effekte von Risperidon vs. Haloperidol (SMD = -0.26, KI -0.47 bis -0.04), von Sertindol vs. Haloperidol (SMD = -0.95, KI -1.68 bis -0.22) von Olanzapin vs. Clozapin (SMD = -0.40, KI -0.71 bis -0.08) und von Risperidon vs. Clozapin (SMD = -0.62, KI -1.12 bis -0.11). Auch hier zeigen Haloperidol und Clozapin sowohl in paarweisen Metaanalysen als auch in der Netzwerk-Metaanalyse vergleichsweise schlechte Effekte.

(Feber et al. 2024)

3.3.8 Lebensqualität

In die Netzwerk-Metaanalyse zur Lebensqualität wurden 13 Studien und 10 Antipsychotika eingeschlossen. Da Placebo hierbei nicht als Intervention existierte wurden die Antipsychotika gegen Olanzapin verglichen.

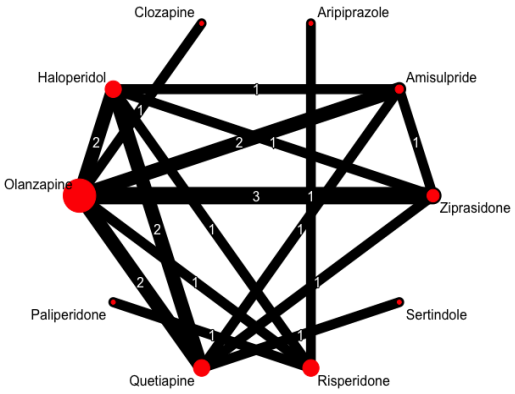


Abbildung 19: Netzwerkplot zu Lebensqualität (Feber et al. 2024)

Die Größe der Kreise entspricht der Größe der Stichprobe und die Liniendicke ist proportional zur Anzahl an Studien, die die spezifische Intervention anhand direkter Vergleiche untersuchten

Im Vergleich zu Olanzapin zeigen sich im Forest-Plot (Abbildung 20) keine wesentlich besseren Effekte. Paliperidon, Risperidon und Aripiprazol stechen im Vergleich zu Olanzapin mit schlechteren Effekten heraus.

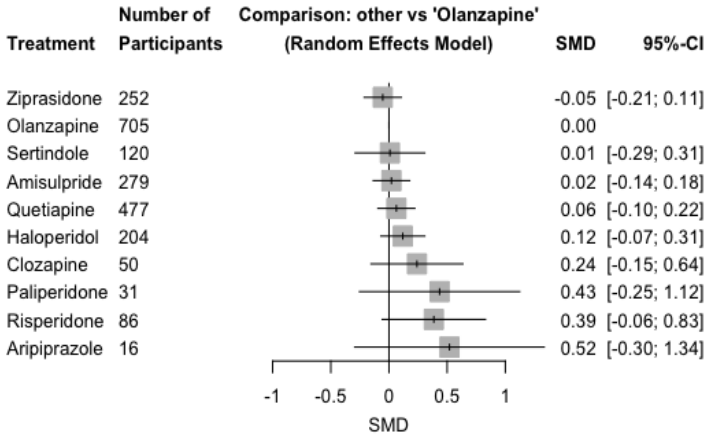


Abbildung 20: Forest-Plot zu Lebensqualität (Feber et al. 2024)

Vergleich der Antipsychotika mit Placebo. Es ist die untersuchte Teilnehmerzahl (N), sowie der Effekt anhand der Angabe der standardisierten Mittelwertsdifferenz (SMD) und des 95%-Konfidenzintervalls (CI) für jeden Vergleich zu sehen.

Aus paarweisen Metaanalysen resultieren keine signifikanten Effekte aus den Vergleichen der einzelnen Antipsychotika.

(Feber et al. 2024)

3.3.9 Funktionsfähigkeit

In die Netzwerk-Metaanalyse zur Untersuchung der Funktionsfähigkeit wurden 16 Studien und 12 Antipsychotika eingeschlossen.

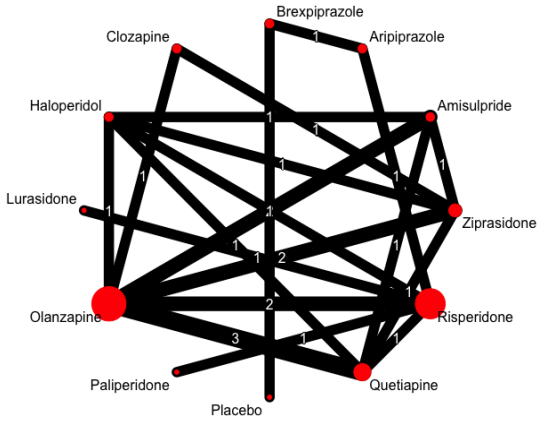


Abbildung 21: Netzwerkplot zu Funktionsfähigkeit (Feber et al. 2024)

Die Größe der Kreise entspricht der Größe der Stichprobe und die Liniendicke ist proportional zur Anzahl an Studien, die die spezifische Intervention anhand direkter Vergleiche untersuchten

Im Vergleich zu Placebo zeigen sich keine wesentlichen Effekte, die für eine Überlegenheit der untersuchten Antipsychotika im Vergleich zu Placebo sprechen. Brexpiprazol zeigt einen kleinen positiven Effekt im Vergleich zu Placebo in der Netzwerk-Metaanalyse, der ebenfalls aus paarweisen Metaanalysen resultiert.

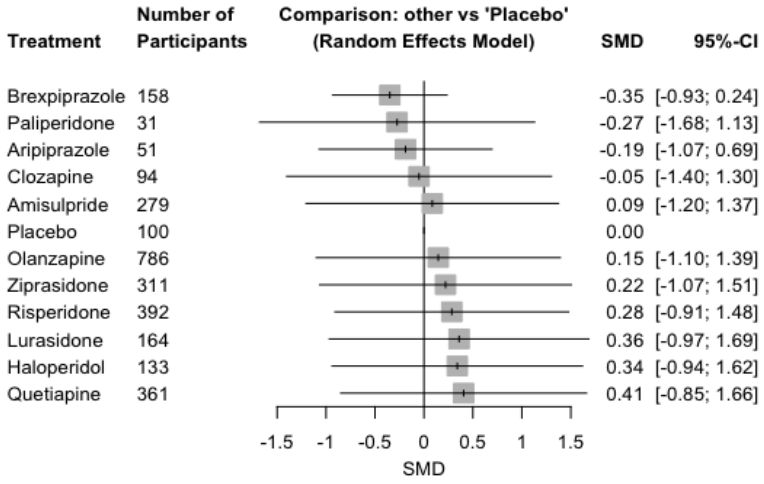


Abbildung 22: Forest-Plot zu Funktionsfähigkeit (Feber et al. 2024)

Vergleich der Antipsychotika mit Placebo. Es ist die untersuchte Teilnehmerzahl (N), sowie der Effekt anhand der Angabe der standardisierten Mittelwertsdifferenz (SMD) und des 95%-Konfidenzintervalls (CI) für jeden Vergleich zu sehen.

Aus paarweisen Metaanalysen resultierten signifikant positive Effekte von: Amisulprid vs. Quetiapin (SMD = -0.29, KI -0.01 bis -0.56), Amisulprid vs. Haloperidol (SMD = -0.28, KI -0.56 bis -0.01), Clozapin vs. Olanzapin (SMD = -0,86, KI -1.51 bis -0.21), Olanzapin vs. Risperidon (SMD

= -0.42, KI -0.71 bis -0.13), Brexpiprazol vs. Placebo (SMD = -0.35, KI -0.63 bis -0.06) und Risperidon vs. Quetiapin (SMD = -0.58, KI -0.88 bis -0.27).

(Feber et al. 2024)

3.4 Post-hoc Analyse nach Rezeptorprofilen

In dieser Analyse wurden die Antipsychotika nach ihrer Rezeptor-Affinität in die vier verschiedenen Gruppen eingeteilt: 1. Muskarinantagonist (muscarinic), 2. partieller Dopaminagonist und adrenerger Antagonist (adrenergic/lowDA), 3. serotonerger und dopaminerger Antagonist (serotonergic/dopaminergic) und 4. Dopaminantagonist (dopaminergic) (McCutcheon et al. 2023). Alle Gruppen zeigen im Vergleich zu Placebo zwar sehr kleine aber bessere und signifikante Effekte auf.

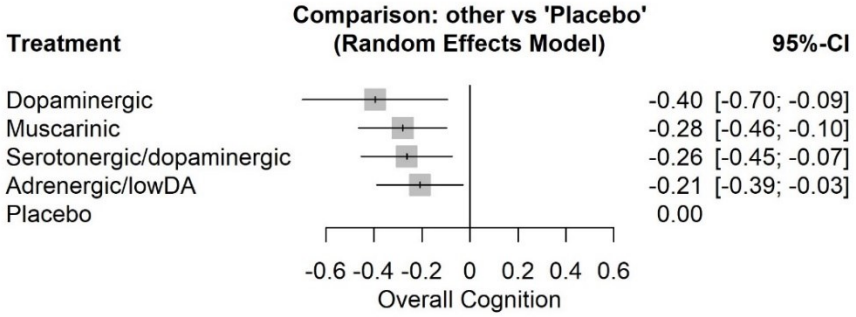


Abbildung 23: Forest-Plot der post-hoc Analyse nach Rezeptorprofilen (Feber et al. 2024)

Zuordnung der Antipsychotika nach Rezeptor-Affinität in vier Gruppen, welche mit Placebo verglichen werden. CI = Konfidenzintervall, der Effekt wird anhand der standardisierten Mittelwertsdifferenz (SMD) angegeben

(Feber et al. 2024)

3.5 Risk of Bias Bewertung

Die Bewertung des Risk of Bias bezog sich auf den primären Outcome. Mehr als 50% der eingeschlossenen Studien zeigten in ihrer Gesamtbewertung einen hohen Risk of Bias. Diese resultierte vorwiegend aus fehlenden Daten zu den Outcomes oder aus Abweichungen von den geplanten Interventionen. In der Appendix befinden sich nähere Informationen zur Bewertung.

Da die Studien sehr strikt bezüglich ihrer Erhebungsinstrumente ausgewählt wurden, zeigten sich hingegen in der Messung der Outcomes ein niedriges Bias Risiko. Auch bezüglich der Auswahl der berichteten Ergebnisse zeigte sich ein vorwiegend niedriges Bias Risiko.

(Feber et al. 2024)

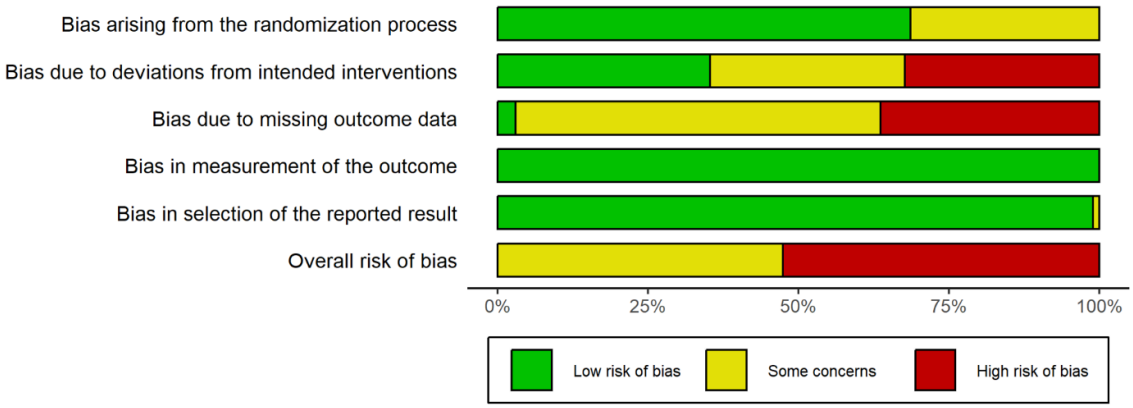


Abbildung 24: Zusammenfassung der Risk of Bias Bewertung (Overall-Score) (Feber et al. 2024)

In der Abbildung befindet sich eine Zusammenfassung des Bias Risikos aller eingeschlossenen Studien. Bedeutung der Farben: grün=niedriges Bias Risiko, gelb=unklares Bias Risiko, rot=hohes Bias Risiko

Tabelle 4: Risk of Bias Tabelle (Overall-Score) (Feber et al. 2024)

Study_name	Comparison	ROB2_Randomisation	ROB2_IntendedInterventions	ROB2_MissingData	ROB2_MeasurementOutcome	ROB2_SelectionResults	RoB2Category_OverallCognitionScore
Abdolahian 2008	Haloperidol vs Risperidone	!	✗	✗	✓	✓	✗
Abrams 1958	Chlorpromazine vs Placebo	!	!	!	✓	✓	!
Adrianzen 2008	Haloperidol vs Olanzapine	✓	✗	!	✓	✓	✗
Alvarez 2006	Olanzapine vs Risperidone	✓	!	✗	✓	✓	✗
Arvanitis 1993	Haloperidol vs Quetiapine	✓	✗	✗	✓	✓	✗
Bai 2005	Amisulpride vs Olanzapine	!	!	!	✓	✓	!
Boulay 2007	Haloperidol vs Olanzapine	✓	✓	✗	✓	✓	✗
Buchanan 1998_cognition	Clozapine vs Haloperidol	!	✗	✗	✓	✓	✗
Buller 2011	Quetiapine vs Sertindole	✓	✗	!	✓	✓	✗
ChiCTR-IPR-15007635	Haloperidol vs Paliperidone	✓	!	!	✓	✓	!
Citrome 2012_cognition	Lurasidone vs Risperidone	✓	✓	!	✓	✓	!
Citrome 2015	Aripiprazole vs Brexpiprazole	✓	!	✗	✓	!	✗
Clark 1961	Chlorpromazine vs Placebo	!	!	✓	✓	✓	!
Clark 1968a	Chlorpromazine vs Placebo	!	!	✓	✓	✓	!
Clark 1970a	Chlorpromazine vs Molindone	!	✓	!	✓	✓	!
Clark 1970a	Chlorpromazine vs Placebo	!	!	!	✓	✓	!
Clark 1970a	Molindone vs Placebo	!	!	!	✓	✓	!
Clark 1971a	Chlorpromazine vs Fluphenazine	!	✓	!	✓	✓	!
Clark 1971a	Chlorpromazine vs Placebo	!	!	!	✓	✓	!
Clark 1971a	Chlorpromazine vs Thioridazine	!	✓	!	✓	✓	!
Clark 1971a	Fluphenazine vs Placebo	!	!	!	✓	✓	!
Clark 1971a	Fluphenazine vs Thioridazine	!	✓	!	✓	✓	!
Clark 1971a	Placebo vs Thioridazine	!	!	!	✓	✓	!
Conley 2001	Olanzapine vs Risperidone	✓	✗	!	✓	✓	✗
Dossenbach 2004_cognition	Fluphenazine vs Olanzapine	✓	✗	✗	✓	✓	✗
EQUATOR	Brexpiprazole vs Placebo	✓	!	✗	✓	✓	✗
Findling 2013	Placebo vs Ziprasidone	✓	!	!	✓	✓	!
Gallhofer 2007_all patients	Haloperidol vs Sertindole	✓	✓	!	✓	✓	!
Geffen 2012	Placebo vs Risperidone	✓	!	!	✓	✓	!
Gilbertson 1997	Haloperidol vs Placebo	!	✗	✗	✓	✓	✗
Grootens 2009	Olanzapine vs Ziprasidone	✓	✗	!	✓	✓	✗
Jerrell 2002	Olanzapine vs Risperidone	!	!	✗	✓	✓	✗
Jeste 2003	Olanzapine vs Risperidone	✓	✓	!	✓	✓	!
Kahn 2008	Amisulpride vs Haloperidol	✓	!	✗	✓	✓	✗
Kahn 2008	Amisulpride vs Olanzapine	✓	!	!	✓	✓	!
Kahn 2008	Amisulpride vs Quetiapine	✓	!	✗	✓	✓	✗
Kahn 2008	Amisulpride vs Ziprasidone	✓	!	!	✓	✓	!
Kahn 2008	Haloperidol vs Olanzapine	✓	!	✗	✓	✓	✗

Kahn 2008	Haloperidol vs Quetiapine	✓	!	!	✓	✓	!
Kahn 2008	Haloperidol vs Ziprasidone	✓	!	!	✓	✓	!
Kahn 2008	Olanzapine vs Quetiapine	✓	!	✗	✓	✓	✗
Kahn 2008	Olanzapine vs Ziprasidone	✓	!	!	✓	✓	!
Kahn 2008	Quetiapine vs Ziprasidone	✓	!	!	✓	✓	!
Kinon 2006a	Olanzapine vs Quetiapine	✓	✓	✗	✓	✓	✗
Kinon 2006b	Olanzapine vs Ziprasidone	✓	✓	!	✓	✓	!
Koshikawa 2016	Paliperidone LAI vs Risperidone LAI	!	✗	✗	✓	✓	✗
Krakowski 2006	Clozapine vs Haloperidol	✓	✗	!	✓	✓	✗
Krakowski 2006	Clozapine vs Olanzapine	✓	✗	!	✓	✓	✗
Krakowski 2006	Haloperidol vs Olanzapine	✓	✗	!	✓	✓	✗
Kryzhanovskaya 2009	Olanzapine vs Placebo	✓	!	✗	✓	✓	✗
Lee 2007d	Haloperidol vs Risperidone	!	!	✓	✓	✓	!
Lieberman 2003a	Haloperidol vs Olanzapine	✓	✗	!	✓	✓	✗
Lindenmayer 2007	Haloperidol vs Olanzapine	✓	!	!	✓	✓	!
Liu 2000	Haloperidol vs Risperidone	!	✗	✗	✓	✓	✗
Maat 2014	Aripiprazole vs Risperidone	✓	✗	!	✓	✓	✗
Marder 2003	Haloperidol vs Risperidone	!	✗	!	✓	✓	✗
McEvoy 2007a	Olanzapine vs Quetiapine	✓	✗	!	✓	✓	✗
McEvoy 2007a	Olanzapine vs Risperidone	✓	✗	!	✓	✓	✗
McEvoy 2007a	Quetiapine vs Risperidone	✓	✗	!	✓	✓	✗
McGurk 2005	Clozapine vs Risperidone	!	✓	✗	✓	✓	✗
Meltzer 2008	Clozapine vs Olanzapine	✓	✓	!	✓	✓	!
Meyer-Lindenberg 1997	Clozapine vs Zotepine	✓	✓	✗	✓	✓	✗
Mortimer 2004_cognition	Amisulpride vs Olanzapine	✓	✓	✗	✓	✓	✗
NCT01057849_cognition	Aripiprazole vs Olanzapine	!	✗	✗	✓	✓	✗
NCT01057849_cognition	Aripiprazole vs Risperidone	!	✗	✗	✓	✓	✗
NCT01057849_cognition	Olanzapine vs Risperidone	!	✗	!	✓	✓	✗
Naber 2005_cognition	Clozapine vs Olanzapine	✓	✗	✗	✓	✓	✗
Nct00827840	Paliperidone vs Risperidone	✓	!	!	✓	✓	!
Nielsen 2014	Olanzapine vs Sertindole	✓	✓	✗	✓	✓	✗
Pagsberg 2017	Aripiprazole vs Quetiapine	✓	✓	!	✓	✓	!
Pfizer 2005h	Olanzapine vs Ziprasidone	✓	✓	!	✓	✓	!
Potkin 2011	Lurasidone vs Ziprasidone	✓	✓	✗	✓	✓	✗
Purdon 2000	Haloperidol vs Olanzapine	✓	✓	✗	✓	✓	✗
Purdon 2000	Haloperidol vs Risperidone	✓	✓	✗	✓	✓	✗
Purdon 2000	Olanzapine vs Risperidone	✓	✓	!	✓	✓	!
Purdon 2001	Haloperidol vs Quetiapine	✓	✓	✗	✓	✓	✗
Ranjan 2003	Olanzapine vs Risperidone	✓	!	!	✓	✓	!
Riedel 2005	Quetiapine vs Risperidone	!	✓	✗	✓	✓	✗
Riedel 2007	Olanzapine vs Quetiapine	✓	✗	✗	✓	✓	✗
Robinson 2006	Olanzapine vs Risperidone	!	!	!	✓	✓	!
Rémillard 2005y1	Haloperidol vs Risperidone	✓	✗	✗	✓	✓	✗
Sacchetti 2009	Clozapine vs Ziprasidone	✓	✓	!	✓	✓	!
Schooler 2005	Haloperidol vs Risperidone	✓	✓	!	✓	✓	!
Sergi 2007	Olanzapine vs Risperidone	✓	✗	✗	✓	✓	✗
Simpson 2004	Olanzapine vs Ziprasidone	✓	✓	!	✓	✓	!
Volavka 2002	Clozapine vs Haloperidol	✓	✓	!	✓	✓	!
Volavka 2002	Clozapine vs Olanzapine	✓	✓	!	✓	✓	!
Volavka 2002	Clozapine vs Risperidone	✓	✓	!	✓	✓	!

Volavka 2002	Haloperidol vs Olanzapine	+	+	!	+	+	!
Volavka 2002	Haloperidol vs Risperidone	+	+	!	+	+	!
Volavka 2002	Olanzapine vs Risperidone	+	+	!	+	+	!
Voruganti 2007	Olanzapine vs Quetiapine	+	-	-	+	+	-
Wagner 2005	Amisulpride vs Olanzapine	+	+	!	+	+	!
Wang 2013b	Aripiprazole vs Olanzapine	!	-	!	+	+	-
Wang 2013b	Aripiprazole vs Risperidone	!	-	!	+	+	-
Wang 2013b	Olanzapine vs Risperidone	!	-	-	+	+	-
Wang 2022	Olanzapine vs Paliperidone	!	+	!	+	+	!
Wirshing 1999	Haloperidol vs Risperidone	+	+	!	+	+	!
Zhong 2006_cognition	Quetiapine vs Risperidone	+	-	-	+	+	-


Some Concerns


Low Risk of Bias


High Risk of Bias

In dieser Tabelle befinden sich die einzelnen Bewertungen des Bias Risikos pro Studie und pro Vergleich. Bedeutung der Farben: grün=niedriges Bias Risiko, gelb=unklares Bias Risiko, rot=hohes Bias Risiko

4. Diskussion

Die Inhalte des folgenden Abschnitts sind teilweise von der Verfasserin dieser Doktorarbeit in der Funktion als Erstautorin bereits in einem ausführlichen Protokoll bei BMC Systematic Reviews veröffentlicht (Feber et al. 2023) und die Hauptergebnisse bei JAMA Psychiatry publiziert (Feber et al. 2024).

Es werden zunächst die wesentlichen Ergebnisse dargestellt, welche anschließend diskutiert werden. Ebenfalls findet eine Diskussion der Methode statt und es werden Stärken und Schwächen dieser Arbeit zusammengefasst. Hieraus wird abschließend ein Fazit und Ausblick abgeleitet.

4.1 Zusammenfassung der wesentlichen Ergebnisse

Nach aktuellem Kenntnisstand handelt es sich bei der vorliegenden Arbeit um die bisher größte Netzwerk-Metaanalyse zu den Effekten von Antipsychotika auf die kognitive Funktion im Rahmen einer Schizophrenie. Es wurde eine große Anzahl an RCTs eingeschlossen und alle in den USA oder Europa zugelassenen Antipsychotika berücksichtigt. Es wurde sich in dieser Arbeit erstmals auf Vergleiche der Antipsychotika mit Placebo konzentriert, während frühere Netzwerk-Metaanalysen vor allem Vergleiche zwischen den Antipsychotika fokussierten. Zudem wurde sich am aktuellen Goldstandard zur Erhebung orientiert und nur Tests eingeschlossen, die entweder von MATRICS empfohlen wurden oder eine sehr hohe Ähnlichkeit aufweisen.

Im Rahmen dieser Arbeit ließen sich keine eindeutig besseren Effekte der untersuchten Antipsychotika im Vergleich zu Placebo finden. Diese Aussage bezieht sich sowohl auf den primären Outcome als auch auf die sekundären Outcomes.

Vereinzelt konnten positive Effekte gefunden werden. Für den Overall-Score zeigten sich in der Netzwerk-Metaanalyse positive Effekte von Molindon, Thioridazin, Sertindol, Chlorpromazin und Paliperidon im Vergleich zu Placebo. Die positiven Effekte von Molindon und Thioridazin waren erneut für Speed of Processing sichtbar, denn der Overall-Score beruhte auf ausschließlich dieser Domäne. Für Visual Learning und Funktionsfähigkeit zeigte sich ein kleiner aber signifikanter Effekt von Brexpiprazol. Paliperidon zeigte positive Effekte für Verbal Learning, Working Memory und Reasoning and Problem Solving. In einer post-hoc Analyse, in der die Antipsychotika in vier Gruppen nach ihren Rezeptorprofilen eingeordnet wurden, zeigten sich allerdings zwar kleine aber signifikant bessere Effekte aller Gruppen im Vergleich zu Placebo. Die Ergebnisse aus Sensitivitätsanalysen und Metaregressionen zeigten sich konsistent mit der primären Analyse.

Die beschriebenen Effekte der einzelnen Antipsychotika basierten jedoch auf einer limitierten Evidenz. Grund hierfür war vorwiegend eine begrenzte Studienlage, kleine Stichprobengrößen und/ oder eine geringe Anzahl an Domänen.

Aus paarweisen Metaanalysen resultierten ebenfalls vereinzelt signifikante Überlegenheiten zwischen den Antipsychotika. Jedoch ließ sich auch hier kein spezifisches Antipsychotikum erkennen, welches eindeutige Überlegenheiten über die Vergleiche hinweg zeigte. Es lässt sich allerdings zusammenfassen, dass meist die Antipsychotika der zweiten Generation bessere Effekte zeigten im Vergleich zu Antipsychotika der ersten Generation. Haloperidol und Clozapin schnitten in paarweisen Metaanalysen und Netzwerk-Metaanalysen meist am schlechtesten ab.

(Feber et al. 2024)

4.2 Diskussion der Ergebnisse

Bei einem näheren Blick auf frühere Netzwerk-Metaanalysen zu diesem Thema, konnten bezüglich des Gesamtwerts für Kognition (in früheren Netzwerk-Metaanalysen meist als Composite Score bezeichnet) ebenfalls keine wesentlichen Effekte der Antipsychotika im Vergleich zu Placebo gefunden werden (Baldez et al. 2021; Nielsen et al. 2015; Désaméricq et al. 2014). Frühere Netzwerk-Metaanalysen konzentrierten sich mehr auf Vergleiche zwischen den Antipsychotika. Aus bisherigen Arbeiten resultierten viele unterschiedliche Ergebnisse, bisher gelang es anhand der bestehenden Datenlage nicht eine klare Empfehlung für spezifische Antipsychotika auszusprechen.

Aus der vorliegenden Netzwerk-Metaanalyse gingen positive Effekte für Molindon, Thioridazin, Chlorpromazin, Sertindol und Paliperidon in Bezug auf den Overall-Score hervor. Allerdings gibt es hinsichtlich der Evidenz dieser Effekte gewisse Limitationen. Die Ergebnisse von Molindon und Thioridazin beruhen auf einer sehr begrenzten Anzahl an Studien mit kleinen Stichproben und lediglich einer Domäne, die den Overall-Score bildet. Für Chlorpromazin lagen vergleichsweise mehr Studien vor und es wurden mehrere Domänen erhoben. Allerdings handelt es sich bei den Studien, die für Molindon, Thioridazin und Chlorpromazin vorliegen um ältere Studien, die alle vor 1971 publiziert wurden. Effektstärken haben sich jedoch über die letzten Jahrzehnte reduziert, was die Vergleichbarkeit älterer und neuerer Studien erschweren kann (Leucht et al. 2017). (Feber et al. 2024)

Studien, die die Effekte von Sertindol und Paliperidon stützen, sind hingegen aktueller und erheben mehrere Domänen. Positive Effekte von Sertindol wurden bereits in einer früheren Netzwerk-Metaanalyse hervorgehoben, allerdings unter der Erwähnung, dass auch hier die Evidenz der Ergebnisse sehr begrenzt war (Nielsen et al. 2015). In vorherigen Netzwerk-Metaanalysen wurden keine Paliperidon-Studien eingeschlossen. Dies könnte darauf zurückzuführen sein, dass von den in dieser Arbeit eingeschlossenen Paliperidon-Studien nur eine Studie doppelt-verblindet war und die Effekte im Vergleich zu Placebo auf indirekter Evidenz beruhen. Sertindol und Paliperidon zeigten in früheren Arbeiten vergleichsweise geringe Sedierung, was sich bezüglich ihres Einflusses auf die kognitive Symptomatik vorteilhaft auswirken könnte (Huhn 2017; Leucht et al. 2013). (Feber et al. 2024)

Nachdem die Einteilung in Antipsychotika der Erst- und Zweitgeneration mittlerweile veraltet ist und eine Einteilung nach den Wirkmechanismen empfohlen wird, wurde eine zusätzliche Post-hoc-Analyse der Ergebnisse vorgenommen. Hierbei fand eine Einteilung nach Rezeptorprofilen statt (McCutcheon et al. 2023a). Es ließen sich zwar kleine aber signifikant positive Effekte aller Gruppen im Vergleich zu Placebo erkennen. Eine eindeutige Empfehlung für eine der Gruppen kann auf dieser Grundlage weiterhin nicht ausgesprochen werden. Allerdings deuten die Ergebnisse und insbesondere die kleineren Konfidenzintervalle darauf hin, dass die geringe statistische Power für das Fehlen eindeutiger Effekte in der Primäranalyse verantwortlich sein könnte.

In einer Übersichtsarbeit zur pharmakologischen Behandlung kognitiver Defizite im Rahmen einer Schizophrenie, fand ebenfalls eine Einteilung nach pharmakologischen Klassen statt (Arsenault-Mehta et al. 2023). Auch hier lag keine ausreichende Evidenz für eine klare Empfehlung einer bestimmten Klasse vor. Als mögliche Erklärung wird die Heterogenität der Krankheit/Diagnose, die Heterogenität der kognitiven Defizite, Herausforderungen in der Erhebung und Nebenwirkungen bestimmter Medikamente, die zur Verwirrtheit führen können, in Betracht gezogen (Arsenault-Mehta et al. 2023).

Es lässt sich bezüglich der Wirkmechanismen der eingeschlossenen Antipsychotika jedoch zusammenfassen, dass Medikamente wie Haloperidol und Fluphenazin, die vorwiegend zur Blockade des D2-Rezeptors führen, meist schlechtere Effekte aufweisen. Beide Antipsychotika werden als hochpotente Neuroleptika der ersten Generation eingestuft. Clozapin zeigt wiederum ähnlich schlechte Effekte über die Analysen hinweg, zählt jedoch zu den atypischen Antipsychotika und führt zu einer Blockade des D4-Rezeptors. Allerdings wird das anticholinerge sowie antihistaminerge Profil ursächlich für seine sedierende Wirkung gesehen, welche sich nachteilig auf die kognitive Funktion auswirken kann.

In vorangegangenen, aktuelleren klinischen Studien wird allerdings der attraktive Wirkmechanismus von Brexpiprazol und Cariprazin, auch bezüglich der kognitiven Symptomatik, hervorgehoben (McCutcheon et al. 2023b; Laszlovszky et al. 2021; McIntyre et al. 2023; Sachs und Erfurth 2022). Brexpiprazol ist ein partieller D2-D3 Agonist, während sich Cariprazin als partieller Agonist vor allem auf den D3-Rezeptor fokussiert. Brexpiprazol konnte in dieser Arbeit bereits zwar kleine aber signifikant bessere Effekte im Vergleich zu Placebo aufzeigen. Die gefundenen Effekte beruhen auf lediglich zwei Studien. Weitere klinische Studien werden dringend benötigt um diese Effekte zu stützen. Cariprazin wurde zwar in die Suchstrategie eingeschlossen, allerdings lag keine Studie vor, die den Einschlusskriterien dieser Arbeit entsprach. Hauptgrund war hierbei meist, dass die Erhebung von Kognition nicht den Einschlusskriterien dieser Arbeit entsprach.

Die aus dieser Arbeit resultierenden positiven Effekte beruhen demnach auf einer eingeschränkten Evidenz, welche keine klare Empfehlung eines spezifischen Antipsychotikums ableiten lässt (Feber et al. 2024).

(Feber et al. 2024)

4.3 Diskussion der Methode

Es stellte sich schnell heraus, dass der aktuelle MATRICS-Goldstandard zur standardisierten Erfassung von Kognition im Rahmen einer Schizophrenie, nur sehr selten eingesetzt wurde. Einerseits gab es bezüglich des Publikationsjahrs keine Einschränkungen, weshalb auch einige Studien eingeschlossen wurden, die vor den ersten Publikationen der MATRICS-Empfehlungen durchgeführt wurden. Allerdings orientierten sich auch später veröffentlichte klinische Studien kaum an den Empfehlungen. Es wird angenommen, dass die Umsetzbarkeit im klinischen Alltag auch in Abhängigkeit vom Zustand der Patienten einen wesentlichen Faktor darstellt. Die Durchführung der MCCB benötigt 60-90 Minuten, was bei stärker ausgeprägter Symptomatik eine Herausforderung darstellt. Über die Studien hinweg war allerdings auch kein anderes Messinstrument zu erkennen, welches sich bei der Erhebung der kognitiven Symptomatik im Rahmen einer Schizophrenie klar durchsetzen konnte.

Aufgrund des seltenen Einsatzes der MCCB konnte demnach auch nur in drei Fällen ein Composite Score extrahiert werden. Infolge der sehr strikten Testauswahl, mit der Ähnlichkeit zur MCCB als Hauptentscheidungskriterium, wurde sich dazu entschieden selbst einen Overall-Score zu berechnen. Jedoch basierte dieser auf den pro Studien angegebenen Domänen, welche in den seltensten Fällen alle sieben Domänen berücksichtigten. Es existieren jedoch Hinweise darauf, dass die meiste Variabilität für globale Kognition bereits aus wenigen Tests resultieren kann (Keefe et al. 2006).

Zudem existiert auch Kritik an den MATRICS-Empfehlungen, beispielsweise durch die European Psychiatric Association (Vita et al. 2022b). Auch sie stellen dar, dass das Verständnis von sieben

kognitiven Domänen, die einen globalen Kognitionswert repräsentieren, grundsätzlich anhand vieler Studien belegt wird (Vita et al. 2022b). Allerdings existieren auch mehrere Studien die auch Modelle aus 5, 3 oder 6 Domänen als bestes Modell herausstellten (Vita et al. 2022b). Dies stützte ebenfalls das Vorgehen einen Overall-Score zu bilden, auch wenn nicht alle Domänen erfasst wurden. Außerdem wird hervorgehoben, dass der MCCB-Test zur Erfassung von sozialer Kognition möglicherweise nicht ausreicht und die Domäne genauer erfasst werden sollte anhand der spezifischen Bereiche: Theory of Mind, soziale Wahrnehmung, Emotionsverarbeitung (Vita et al. 2022b). Bei sozialer Kognition handelte es sich unter den eingeschlossenen Studien dieser Arbeit um die Domäne, die am seltensten erhoben wurde.

Von der European Psychiatric Association werden generell zusätzliche Fragebögen und Berichte zur Selbsteinschätzung empfohlen, die eine Ergänzung der Testergebnisse darstellen sollen (Vita et al. 2022b). Dies wurde durch die Einbeziehung von auf Interviews basierenden Erhebungen bei der Datenextraktion dieser Arbeit berücksichtigt, denn auch MATRICS empfahl den zusätzlichen Einsatz von weiteren Erhebungsinstrumenten der Funktionsfähigkeit (Green et al. 2008). Da allerdings kaum Daten hierzu vorlagen, konnte es nicht weiter im Rahmen der Analysen untersucht werden. Eine zusätzliche Erfassung der Selbstbeurteilung ist jedoch in jedem Fall empfehlenswert für zukünftige Forschung.

(Feber et al. 2024)

4.4 Stärken und Schwächen der Arbeit

Diese Arbeit wurde in einer Arbeitsgruppe angefertigt, welche seit vielen Jahren international bekannt ist für ihre komplexen und methodisch hochrangigen (Netzwerk-) Metaanalysen. Demnach lag eine wesentliche grundsätzliche Stärke dieser Arbeit darin, dass diese Netzwerk-Metaanalyse in einem Umfeld mit hoher Expertise in diesem Bereich und mit Schwerpunkt auf die Behandlung der Schizophrenie angefertigt wurde. Kennzeichnend für das Vorgehen der Erstellung einer Netzwerk-Metaanalyse in dieser Arbeitsgruppe ist beispielsweise, dass jeder Schritt immer von zwei Personen unabhängig voneinander durchgeführt wird. Dies führt zu einer wesentlichen Reduktion von Fehlern und somit zur Qualitätssicherung. Eine weitere Stärke dieser Arbeit liegt darin, dass die Einschlusskriterien der Netzwerk-Metaanalyse sehr breit definiert waren. Es wurden beispielsweise alle wesentlichen Antipsychotika einbezogen und vorerst keine strikten Vorgaben bzgl. Alter, Geschlecht, Herkunft, Schwere oder Dauer der Erkrankung oder dem Behandlungssetting festgelegt um ein möglichst umfassendes Bild der aktuellen Datenlage zum vorliegenden Thema zu gewinnen. Eventuelle Einflüsse wurden dennoch anhand von Metaregressionen und Sensitivitätsanalysen näher analysiert. Nach aktuellem Kenntnisstand handelt es sich hierbei um die bisher umfangreichste Netzwerk-Metaanalyse zu den Effekten von Antipsychotika auf die kognitive Funktion im Rahmen einer Schizophrenie.

Es bestehen jedoch auch Limitationen dieser Arbeit. Es stellte sich früh heraus, dass die wenigsten Studien die MCCB verwendeten oder generell den aktuellen Goldstandard zur Erfassung der kognitiven Symptomatik im Rahmen einer Schizophrenie berücksichtigen. Diese Netzwerk-Metaanalyse sollte sich aber dadurch auszeichnen, eine möglichst einheitliche Erfassung von Kognition einzubeziehen und sich dabei stark an den MATRICS-Empfehlungen zu orientieren. Demnach wurde eng mit zwei neuropsychologischen Experten zusammengearbeitet (Prof. Rolf Engel und Prof. Richard Keefe) um die einzelnen Tests auf ihre Ähnlichkeit zu den empfohlenen MATRICS-Messinstrumenten zu prüfen. Ein möglicher Grund für den seltenen Einsatz der MCCB un-

ter den eingeschlossenen Studien könnte sein, dass die Batterie für weniger akut erkrankte Patienten entwickelt wurde, die bereits medikamentös eingestellt sind. In dieser Arbeit untersuchten allerdings ca. die Hälfte der Studien Patienten in einer Akutphase der Erkrankung.

Der Primäre Outcome ist ein Overall-Score, der aus den in den Studien angegebenen Domänen resultiert, welche jedoch meist nicht aus all den sieben kognitiven Domänen nach MATRICS bestanden. Ein extrahierbarer Composite Score war nur in drei Fällen gegeben, weshalb sich dazu entschieden wurde, aufgrund der strikten Auswahl der anderen Tests, den Overall-Score selbst zu berechnen. Für die Berechnung konnte kein evidenzbasiertes standardisiertes Vorgehen verwendet werden, es wurde sich aber an der Bildung des MATRICS-Composite-Scores orientiert. Des Weiteren wurde dieser Aspekt in Sensitivitätsanalysen berücksichtigt und Studien mit einem Overall-Score, der aus weniger als drei Domänen besteht, ausgeschlossen. Zudem wurde eine Sensitivitätsanalyse durchgeführt, die Studien mit einem extrahiertem Composite Score ausschloss. Die Sensitivitätsanalysen zeigten, dass die Ergebnisse der Primäranalyse als robust zu sehen sind.

Als weitere Einschränkungen könnten die breiten Einschlusskriterien dieser Arbeit gesehen werden, welche jedoch dazu dienten eine möglichst umfassende Einschätzung der vorliegenden Datenlage zu gewinnen. Beispielsweise gab es keine Limitationen bezüglich Alter, Geschlecht, Publikationsjahr oder auch Zustand der Patienten. Um mögliche Einflüsse dieser Variablen zu kontrollieren wurden Metaregressionen zur Ausprägung der Gesamtsymptomatik, Symptomausprägung (stabil oder akut), Alter und zur zusätzlichen Einnahme von Benzodiazepinen und Anticholinergika durchgeführt. Ebenso wurden Sensitivitätsanalysen durchgeführt unter Ausschluss von open-label Studien, von Studien mit einem hohen Risk of Bias, von Studien ohne operationalisierbare Kriterien für die Diagnose, von Studien mit einer Interventionsphase kürzer als 12 Wochen, von Studien mit besonderen Patientencharakteristika (z.B. vorwiegend Negativsymptomatik oder behandlungsresistente Patienten), von Studien mit einem extrahierten Composite Score und von Studien mit Armen mit stark unterschiedlichen Dosen.

(Feber et al. 2024)

4.5 Fazit und Ausblick

Es lässt sich zusammenfassen, dass die Hauptergebnisse dieser Netzwerk-Metaanalyse zeigen, dass keines der eingeschlossenen Antipsychotika Placebo eindeutig überlegen ist. Zwar konnten (kleine) Effekte bestimmter Antipsychotika gefunden werden, jedoch konnten diese aufgrund der limitierten Evidenz nicht als ausreichend für eine klare Empfehlung interpretiert werden. Hier würde es sich demnach lohnen in zukünftigen Studien diese Medikamente noch einmal näher zu untersuchen. Neben den bereits untersuchten Antipsychotika scheint aber auch die generelle Notwendigkeit eines Medikaments, welches gleichermaßen für die Behandlung der Positiv-, Negativ- und kognitiven Symptomatik im Rahmen einer Schizophrenie geeignet ist, wesentlich. Hierbei ist anzumerken, dass mehrere Studienergebnisse derzeit die positive Wirkung von Cariprazin auf die kognitive Symptomatik betonen (Sachs und Erfurth 2022; McIntyre et al. 2023; Laszlovszky et al. 2021). Zwar wurde das Antipsychotikum als Suchbegriff verwendet, jedoch entsprach von den derzeit publizierten klinischen Studien keine den Einschlusskriterien dieser Arbeit. Demnach könnte es sehr interessant sein, auch dieses Medikament in zukünftiger Forschung näher zu fokussieren, auch aufgrund des besonderen Wirkmechanismus. Neben der weiteren Forschung an einem Medikament zur Behandlung der kognitiven Defizite im Rahmen einer Schizo-

phrenie, ist jedoch auch die zusätzliche nicht-medikamentöse Behandlung essentiell. Psychotherapeutische Interventionen, wie kognitive Remediation, zeigten bisher vielversprechende Evidenz (Wykes et al. 2011; McGurk et al. 2007).

Bezüglich der Erhebung der kognitiven Symptomatik im Rahmen einer Schizophrenie lässt sich anhand dieser Arbeit noch einmal klar erkennen, dass sich eine standardisierte Erfassung und ein einheitliches Verständnis von Kognition bisher nicht durchsetzen konnte. Demnach lässt sich ableiten, dass ein Goldstandard weiterhin dringend benötigt wird, an dem sich klinische Studien orientieren können und eine Vergleichbarkeit der Studien gewährleistet wird. Ein näherer Einblick der aktuellen Schwierigkeiten bei der Erfassung von Kognition scheint hierfür notwendig. Auch die zusätzliche Erfassung der Selbstbeurteilung des Betroffenen sollte in zukünftigen Studien zusätzlich berücksichtigt werden.

(Feber et al. 2024)

Literaturverzeichnis

Adams, Clive; Bhagat, Nishant; Bhagat, Vinaya; Bhoopathi, Paranthaman; El-Sayeh, Hany; Pinfold, Vanessa et al. (2009): Losing participants before the trial ends erodes credibility of findings. In: *Psychiatric Bulletin* 33 (7), S. 254–257. DOI: 10.1192/pb.bp.108.021949.

Arsenault-Mehta, Kyle; Hochman-Bérard, Mario; Johnson, Alexander; Semenova, Dar'ya; Nguyen, Bea; Willis, Jessie et al. (2023): Pharmacological management of neurocognitive impairment in schizophrenia: A narrative review. In: *Neuropsychopharmacology reports*. DOI: 10.1002/npr2.12382.

Bakkour, Nadia; Samp, Jennifer; Akhras, Kasem; El Hammi, Emna; Soussi, Imen; Zahra, Fatma et al. (2014): Systematic review of appropriate cognitive assessment instruments used in clinical trials of schizophrenia, major depressive disorder and bipolar disorder. In: *Psychiatry research* 216 (3), S. 291–302. DOI: 10.1016/j.psychres.2014.02.014.

Baldez, Daniel Prates; Biazus, Tais Boeira; Rabelo-da-Ponte, Francisco Diego; Nogaro, Guilherme Pedro; Martins, Dayane Santos; Kunz, Maurício; Czepielewski, Letícia Sanguinetti (2021): The effect of antipsychotics on the cognitive performance of individuals with psychotic disorders: Network meta-analyses of randomized controlled trials. In: *Neuroscience and biobehavioral reviews* 126, S. 265–275. DOI: 10.1016/j.neubiorev.2021.03.028.

Briefing notes for researchers | INVOLVE. Online verfügbar unter http://www.invo.org.uk/resource-centre/resource-for-researchers/, zuletzt geprüft am 23.04.2018.

Buchanan, Robert W.; Davis, Miriam; Goff, Donald; Green, Michael F.; Keefe, Richard S. E.; Leon, Andrew C. et al. (2005): A summary of the FDA-NIMH-MATRICS workshop on clinical trial design for neurocognitive drugs for schizophrenia. In: *Schizophrenia bulletin* 31 (1), S. 5–19. DOI: 10.1093/schbul/sbi020.

Buchanan, Robert W.; Kreyenbuhl, Julie; Kelly, Deanna L.; Noel, Jason M.; Boggs, Douglas L.; Fischer, Bernard A. et al. (2010): The 2009 schizophrenia PORT psychopharmacological treatment recommendations and summary statements. In: *Schizophrenia bulletin* 36 (1), S. 71–93. DOI: 10.1093/schbul/sbp116.

Buchberger, B.; Elm, E. von; Gartlehner, G.; Huppertz, H.; Antes, G.; Wasem, J.; Meerpohl, J. J. (2014): Bewertung des Risikos für Bias in kontrollierten Studien. In: *Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz* 57 (12), S. 1432–1438. DOI: 10.1007/s00103-014-2065-6.

Chaimani, Anna; Salanti, Georgia (2012): Using network meta-analysis to evaluate the existence of small-study effects in a network of interventions. In: *Research synthesis methods* 3 (2), S. 161–176. DOI: 10.1002/jrsm.57.

Chiocchia, Virginia; Nikolakopoulou, Adriani; Higgins, Julian P. T.; Page, Matthew J.; Papakonstantinou, Theodoros; Cipriani, Andrea et al. (2021): Tool to assess risk of bias due to missing evidence in network meta-analysis (ROB-MEN): elaboration and examples.

COSMIN (2022): COSMIN - Improving the selection of outcome measurement instruments. Online verfügbar unter https://www.cosmin.nl/, zuletzt aktualisiert am 28.06.2022, zuletzt geprüft am 11.01.2023.

Davidson, Michael; Galderisi, Silvana; Weiser, Mark; Werbeloff, Nomi; Fleischhacker, Wolfgang W.; Keefe, Richard S. et al. (2009): Cognitive effects of antipsychotic drugs in first-episode

schizophrenia and schizophreniform disorder: a randomized, open-label clinical trial (EUFEST). In: *The American journal of psychiatry* 166 (6), S. 675–682. DOI: 10.1176/appi.ajp.2008.08060806.

Désaméricq, G.; Schurhoff, F.; Meary, A.; Szöke, A.; Macquin-Mavier, I.; Bachoud-Lévi, A. C.; Maison, P. (2014): Long-term neurocognitive effects of antipsychotics in schizophrenia: a network meta-analysis. In: *European journal of clinical pharmacology* 70 (2), S. 127–134. DOI: 10.1007/s00228-013-1600-y.

Dias, S.; Welton, N. J.; Caldwell, D. M.; Ades, A. E. (2010): Checking consistency in mixed treatment comparison meta-analysis. In: *Statistics in medicine* 29 (7-8), S. 932–944. DOI: 10.1002/sim.3767.

Dilling, Horst; Mombour, Werner; Schmidt, Martin H. (Hg.) (2015): Internationale Klassifikation psychischer Störungen. ICD-10 Kapitel V (F) klinisch-diagnostische Leitlinien. Weltgesundheitsorganisation. 10. Auflage, unter Berücksichtigung der Änderungen entsprechend ICD-10-GM 2015. Bern: Hogrefe Verlag.

dokumentation [TDB2Online] (2023). Online verfügbar unter https://psytest.psy.med.uni-muenchen.de/tdb2online/doku.php?id=dokumentation#mehrfachstandardisierung_auf_unterschiedlichen_ebenen, zuletzt aktualisiert am 27.08.2023, zuletzt geprüft am 27.08.2023.

Ernst Nielsen, René; Odur, Florence; Ostergaard, Torben; Munk-Jørgensen, Povl; Nielsen, Jimmi (2014): Comparison of the effects of Sertindole and Olanzapine on Cognition (SEROLA): a double-blind randomized 12-week study of patients diagnosed with schizophrenia. In: *Therapeutic advances in psychopharmacology* 4 (1), S. 4–14. DOI: 10.1177/2045125313499065.

Falkai, Peter (Hg.) (2015): Diagnostisches und statistisches Manual psychischer Störungen DSM-5®. American Psychiatric Association. Göttingen, Bern, Wien: Hogrefe.

Falkai, Peter; Schennach, Rebecca; Lincoln, Tania; Schaub, Annette; Hasan, Alkomiet (2017): Schizophrene Psychosen. In: Hans-Jürgen Möller, Gerd Laux und Hans-Peter Kapfhammer (Hg.): Psychiatrie, Psychosomatik, Psychotherapie. Berlin, Heidelberg: Springer Berlin Heidelberg, S. 1583–1674.

Fatouros-Bergman, Helena; Cervenka, Simon; Flyckt, Lena; Edman, Gunnar; Farde, Lars (2014): Meta-analysis of cognitive performance in drug-naïve patients with schizophrenia. In: *Schizophrenia research* 158 (1-3), S. 156–162. DOI: 10.1016/j.schres.2014.06.034.

Feber, Lena; Peter, Natalie; Chiocchia, Virginia; Schneider-Thoma, Johannes; Siafis, Spyridon; Bighelli, Irene, Hansen, Wulf-Peter; Lin, Xiao; Prates-Baldez, Daniel; Salanti, Georgia; Keefe, Richard S.E.; Engel, Rolf R.; Leucht, Stefan (2024): Antipsychotic Drugs and Cognitive Function: A Systematic Review and Pairwise Network Meta-Analysis. In: *JAMA Psychiatry.* doi: 10.1001/jamapsychiatry.2024.2890. Epub ahead of print. PMID: 39412783.

Feber, Lena; Peter, Natalie; Schneider-Thoma, Johannes; Siafis, Spyridon; Bighelli, Irene; Hansen, Wulf-Peter et al. (2023): Antipsychotic drugs and their effects on cognitive function: protocol for a systematic review, pairwise, and network meta-analysis. In: *Systematic reviews* 12 (1), S. 54. DOI: 10.1186/s13643-023-02213-5.

Gaebel, Wolfgang (2006): Behandlungsleitlinie Schizophrenie. Darmstadt: Steinkopff (Praxisleitlinien in Psychiatrie und Psychotherapie, / Deutsche Gesellschaft für Psychiatrie, Psychotherapie und Nervenheilkunde (Hrsg.). Red.: W. Gaebel … ; Bd. 1).

Gardner, David M.; Murphy, Andrea L.; O'Donnell, Heather; Centorrino, Franca; Baldessarini, Ross J. (2010): International consensus study of antipsychotic dosing. In: *The American journal of psychiatry* 167 (6), S. 686–693. DOI: 10.1176/appi.ajp.2009.09060802.

Green, Michael F.; Nuechterlein, Keith H.; Gold, James M.; Barch, Deanna M.; Cohen, Jonathan; Essock, Susan et al. (2004): Approaching a consensus cognitive battery for clinical trials in schizophrenia: the NIMH-MATRICS conference to select cognitive domains and test criteria. In: *Biological psychiatry* 56 (5), S. 301–307. DOI: 10.1016/j.biopsych.2004.06.023.

Green, Michael F.; Nuechterlein, Keith H.; Kern, Robert S.; Baade, Lyle E.; Fenton, Wayne S.; Gold, James M. et al. (2008): Functional co-primary measures for clinical trials in schizophrenia: results from the MATRICS Psychometric and Standardization Study. In: *The American journal of psychiatry* 165 (2), S. 221–228. DOI: 10.1176/appi.ajp.2007.07010089.

Gründer, Gerhard; Benkert, Otto (Hg.) (2012): Handbuch der Psychopharmakotherapie. 2. Aufl. 2012. Berlin, Heidelberg: Springer Berlin Heidelberg. Online verfügbar unter http://nbn-resolving.org/urn:nbn:de:bsz:31-epflicht-1567149.

Higgins, J. P. T.; Jackson, D.; Barrett, J. K.; Lu, G.; Ades, A. E.; White, I. R. (2012): Consistency and inconsistency in network meta-analysis. Concepts and models for multi-arm studies. In: *Research synthesis methods* 3 (2), S. 98–110. DOI: 10.1002/jrsm.1044.

Higgins, Julian P.T.; Thomas, James; Chandler, Jacqueline; Cumpston, Miranda; Li, Tianjing; Page, Matthew J.; Welch, Vivian A. (2019a): Cochrane Handbook for Systematic Reviews of Interventions. 2. ed.: Wiley-Blackwell|.

Higgins, Julian P.T.; Thomas, James; Chandler, Jacqueline; Cumpston, Miranda; Li, Tianjing; Page, Matthew J.; Welch, Vivian A. (Hg.) (2019b): Cochrane Handbook for Systematic Reviews of Interventions: Wiley.

Huhn, Maximilian (2017): Efficacy and side effects of antipsychotics – results from a network meta-analysis examining 24 antipsychotics. Worl Congress of Psychiatry. Berlin, 2017.

Huhn, Maximilian; Nikolakopoulou, Adriani; Schneider-Thoma, Johannes; Krause, Marc; Samara, Myrto; Peter, Natalie et al. (2019): Comparative efficacy and tolerability of 32 oral antipsychotics for the acute treatment of adults with multi-episode schizophrenia: a systematic review and network meta-analysis. In: *The Lancet* 394 (10202), S. 939–951. DOI: 10.1016/S0140-6736(19)31135-3.

Jäger, Markus (2015): Aktuelle psychiatrische Diagnostik. Stuttgart: Georg Thieme Verlag.

JAGS - Just Another Gibbs Sampler (2022). Online verfügbar unter https://mcmc-jags.sourceforge.io/, zuletzt aktualisiert am 12.04.2022, zuletzt geprüft am 11.01.2023.

Kane, John M.; Lencz, Todd (2008): Cognitive deficits in schizophrenia: short-term and long-term. In: *World psychiatry : official journal of the World Psychiatric Association (WPA)* 7 (1), S. 29–30. DOI: 10.1002/j.2051-5545.2008.tb00143.x.

Keefe, R. S.; Silva, S. G.; Perkins, D. O.; Lieberman, J. A. (1999): The effects of atypical antipsychotic drugs on neurocognitive impairment in schizophrenia: a review and meta-analysis. In: *Schizophrenia bulletin* 25 (2), S. 201–222. DOI: 10.1093/oxfordjournals.schbul.a033374.

Keefe, Richard S. E. (2008): Should cognitive impairment be included in the diagnostic criteria for schizophrenia? In: *World psychiatry : official journal of the World Psychiatric Association (WPA)* 7 (1), S. 22–28. DOI: 10.1002/j.2051-5545.2008.tb00142.x.

Keefe, Richard S. E.; Bilder, Robert M.; Davis, Sonia M.; Harvey, Philip D.; Palmer, Barton W.; Gold, James M. et al. (2007): Neurocognitive effects of antipsychotic medications in patients with chronic schizophrenia in the CATIE Trial. In: *Archives of general psychiatry* 64 (6), S. 633–647. DOI: 10.1001/archpsyc.64.6.633.

Keefe, Richard S. E.; Bilder, Robert M.; Harvey, Philip D.; Davis, Sonia M.; Palmer, Barton W.; Gold, James M. et al. (2006): Baseline neurocognitive deficits in the CATIE schizophrenia trial. In: *Neuropsychopharmacology : official publication of the American College of Neuropsychopharmacology* 31 (9), S. 2033–2046. DOI: 10.1038/sj.npp.1301072.

Keefe, Richard S. E.; Fenton, Wayne S. (2007): How should DSM-V criteria for schizophrenia include cognitive impairment? In: *Schizophrenia bulletin* 33 (4), S. 912–920. DOI: 10.1093/schbul/sbm046.

Kern, Robert S.; Nuechterlein, Keith H.; Green, Michael F.; Baade, Lyle E.; Fenton, Wayne S.; Gold, James M. et al. (2008): The MATRICS Consensus Cognitive Battery, part 2: co-norming and standardization. In: *The American journal of psychiatry* 165 (2), S. 214–220. DOI: 10.1176/appi.ajp.2007.07010043.

Kirkham, Jamie J.; Altman, Douglas G.; Chan, An-Wen; Gamble, Carrol; Dwan, Kerry M.; Williamson, Paula R. (2018): Outcome reporting bias in trials: a methodological approach for assessment and adjustment in systematic reviews. In: *BMJ (Clinical research ed.)* 362, k3802. DOI: 10.1136/bmj.k3802.

Koshikawa, Yosuke; Takekita, Yoshiteru; Kato, Masaki; Sakai, Shiho; Onohara, Ai; Sunada, Naotaka et al. (2016): The Comparative Effects of Risperidone Long-Acting Injection and Paliperidone Palmitate on Social Functioning in Schizophrenia: A 6-Month, Open-Label, Randomized Controlled Pilot Trial. In: *Neuropsychobiology* 73 (1), S. 35–42. DOI: 10.1159/000442209.

Krabbendam, Lydia; Arts, Baer; van Os, Jim; Aleman, André (2005): Cognitive functioning in patients with schizophrenia and bipolar disorder: a quantitative review. In: *Schizophrenia research* 80 (2-3), S. 137–149. DOI: 10.1016/j.schres.2005.08.004.

Laszlovszky, István; Barabássy, Ágota; Németh, György (2021): Cariprazine, A Broad-Spectrum Antipsychotic for the Treatment of Schizophrenia: Pharmacology, Efficacy, and Safety. In: *Advances in therapy* 38 (7), S. 3652–3673. DOI: 10.1007/s12325-021-01797-5.

Lau, Steffen (2021): Die Schizophrenie im Entwurf der ICD-11 und Implikationen für die Beurteilung der Schuldfähigkeit. In: *Forens Psychiatr Psychol Kriminol* 15 (1), S. 13–19. DOI: 10.1007/s11757-020-00650-9.

Lefebvre, Carol; Glanville, Julie; Briscoe, Simon; Littlewood, Anne; Marshall, Chris; Metzendorf, Maria-Inti et al. (2019): Searching for and selecting studies. In: Julian P.T. Higgins, James Thomas, Jacqueline Chandler, Miranda Cumpston, Tianjing Li, Matthew J. Page und Vivian A. Welch (Hg.): Cochrane Handbook for Systematic Reviews of Interventions: Wiley, S. 67–107.

Leucht, S.; Arbter, D.; Engel, R. R.; Kissling, W.; Davis, J. M. (2009): How effective are second-generation antipsychotic drugs? A meta-analysis of placebo-controlled trials. In: *Molecular psychiatry* 14 (4), S. 429–447. DOI: 10.1038/sj.mp.4002136.

Leucht, Stefan; Cipriani, Andrea; Spineli, Loukia; Mavridis, Dimitris; Örey, Deniz; Richter, Franziska et al. (2013): Comparative efficacy and tolerability of 15 antipsychotic drugs in schizophrenia. A multiple-treatments meta-analysis. In: *The Lancet* 382 (9896), S. 951–962. DOI: 10.1016/S0140-6736(13)60733-3.

Leucht, Stefan; Crippa, Alessio; Siafis, Spyridon; Patel, Maxine X.; Orsini, Nicola; Davis, John M. (2020): Dose-Response Meta-Analysis of Antipsychotic Drugs for Acute Schizophrenia. In: *The American journal of psychiatry* 177 (4), S. 342–353. DOI: 10.1176/appi.ajp.2019.19010034.

Leucht, Stefan; Davis, John M. (2022): Which first-generation antipsychotics should be "repurposed" for the treatment of schizophrenia. In: *European archives of psychiatry and clinical neuroscience* 272 (1), S. 1–3. DOI: 10.1007/s00406-021-01378-1.

Leucht, Stefan; Huhn, Maximilian; Rothe, Philipp; Schneider, Johannes; Zhu, Yikang (2016a): Which are the most important first-generation antipsychotic drugs? Survey of international schizophrenia experts. In: *npj Schizophrenia: Abstracts of the 5th Biennial Schizophrenia International Research Conference*.

Leucht, Stefan; Leucht, Claudia; Huhn, Maximilian; Chaimani, Anna; Mavridis, Dimitris; Helfer, Bartosz et al. (2017): Sixty Years of Placebo-Controlled Antipsychotic Drug Trials in Acute Schizophrenia. Systematic Review, Bayesian Meta-Analysis, and Meta-Regression of Efficacy Predictors. In: *The American journal of psychiatry* 174 (10), S. 927–942. DOI: 10.1176/appi.ajp.2017.16121358.

Leucht, Stefan; Samara, Myrto; Heres, Stephan; Davis, John M. (2016b): Dose Equivalents for Antipsychotic Drugs: The DDD Method. In: *Schizophrenia bulletin* 42 Suppl 1, S90-4. DOI: 10.1093/schbul/sbv167.

Leucht, Stefan; Samara, Myrto; Heres, Stephan; Patel, Maxine X.; Furukawa, Toshi; Cipriani, Andrea et al. (2015): Dose Equivalents for Second-Generation Antipsychotic Drugs: The Classical Mean Dose Method. In: *Schizophrenia bulletin* 41 (6), S. 1397–1402. DOI: 10.1093/schbul/sbv037.

Leucht, Stefan; Samara, Myrto; Heres, Stephan; Patel, Maxine X.; Woods, Scott W.; Davis, John M. (2014): Dose equivalents for second-generation antipsychotics: the minimum effective dose method. In: *Schizophrenia bulletin* 40 (2), S. 314–326. DOI: 10.1093/schbul/sbu001.

Leucht, Stefan; Tardy, Magdolna; Komossa, Katja; Heres, Stephan; Kissling, Werner; Salanti, Georgia; Davis, John M. (2012): Antipsychotic drugs versus placebo for relapse prevention in schizophrenia. A systematic review and meta-analysis. In: *Lancet (London, England)* 379 (9831), S. 2063–2071. DOI: 10.1016/S0140-6736(12)60239-6.

Lincoln, Tania (2019): Kognitive Verhaltenstherapie der Schizophrenie. Ein individuenzentrierter Ansatz. 3., überarbeitete Auflage. Göttingen: Hogrefe. Online verfügbar unter https://elibrary.hogrefe.com/book/10.1026/02956-000.

Maruff, Paul; Thomas, Elizabeth; Cysique, Lucette; Brew, Bruce; Collie, Alex; Snyder, Peter; Pietrzak, Robert H. (2009): Validity of the CogState brief battery: relationship to standardized tests and sensitivity to cognitive impairment in mild traumatic brain injury, schizophrenia, and AIDS dementia complex. In: *Archives of clinical neuropsychology : the official journal of the National Academy of Neuropsychologists* 24 (2), S. 165–178. DOI: 10.1093/arclin/acp010.

Mavridis, Dimitris; Sutton, Alex; Cipriani, Andrea; Salanti, Georgia (2013): A fully Bayesian application of the Copas selection model for publication bias extended to network meta-analysis. In: *Statistics in medicine* 32 (1), S. 51–66. DOI: 10.1002/sim.5494.

McCutcheon, Robert A.; Harrison, Paul J.; Howes, Oliver D.; McGuire, Philip K.; Taylor, David M.; Pillinger, Toby (2023a): Data-Driven Taxonomy for Antipsychotic Medication: A New Classification System. In: *Biological psychiatry* 94 (7), S. 561–568. DOI: 10.1016/j.biopsych.2023.04.004.

McCutcheon, Robert A.; Keefe, Richard S. E.; McGuire, Philip K. (2023b): Cognitive impairment in schizophrenia: aetiology, pathophysiology, and treatment. In: *Molecular psychiatry* 28 (5), S. 1902–1918. DOI: 10.1038/s41380-023-01949-9.

McGrath, John; Saha, Sukanta; Chant, David; Welham, Joy (2008): Schizophrenia. A concise overview of incidence, prevalence, and mortality. In: *Epidemiologic reviews* 30, S. 67–76. DOI: 10.1093/epirev/mxn001.

McGurk, Susan R.; Twamley, Elizabeth W.; Sitzer, David I.; McHugo, Gregory J.; Mueser, Kim T. (2007): A meta-analysis of cognitive remediation in schizophrenia. In: *The American journal of psychiatry* 164 (12), S. 1791–1802. DOI: 10.1176/appi.ajp.2007.07060906.

McIntyre, Roger S.; Daniel, David G.; Vieta, Eduard; Laszlovszky, István; Goetghebeur, Pascal J.; Earley, Willie R.; Patel, Mehul D. (2023): The efficacy of cariprazine on cognition: a post hoc analysis from phase II/III clinical trials in bipolar mania, bipolar depression, and schizophrenia. In: *CNS spectrums* 28 (3), S. 319–330. DOI: 10.1017/S109285292200013X.

meta: An R package for meta-analysis (2007). Online verfügbar unter https://cran.rstudio.org/doc/rnews/rnews_2007-3.pdf#page=40.

Mishara, Aaron L.; Goldberg, Terry E. (2004): A meta-analysis and critical review of the effects of conventional neuroleptic treatment on cognition in schizophrenia: opening a closed book. In: *Biological psychiatry* 55 (10), S. 1013–1022. DOI: 10.1016/j.biopsych.2004.01.027.

Nielsen, R. E.; Levander, S.; Kjaersdam Telléus, G.; Jensen, S. O. W.; Østergaard Christensen, T.; Leucht, S. (2015): Second-generation antipsychotic effect on cognition in patients with schizophrenia--a meta-analysis of randomized clinical trials. In: *Acta psychiatrica Scandinavica* 131 (3), S. 185–196. DOI: 10.1111/acps.12374.

Nikolakopoulou, Adriani; Higgins, Julian P. T.; Papakonstantinou, Theodoros; Chaimani, Anna; Del Giovane, Cinzia; Egger, Matthias; Salanti, Georgia (2020): CINeMA: An approach for assessing confidence in the results of a network meta-analysis. In: *PLoS medicine* 17 (4), e1003082. DOI: 10.1371/journal.pmed.1003082.

Nuechterlein, Keith H.; Green, Michael F.; Kern, Robert S.; Baade, Lyle E.; Barch, Deanna M.; Cohen, Jonathan D. et al. (2008): The MATRICS Consensus Cognitive Battery, part 1: test selection, reliability, and validity. In: *The American journal of psychiatry* 165 (2), S. 203–213. DOI: 10.1176/appi.ajp.2007.07010042.

R: a language and environment for statistical computing (2023). Online verfügbar unter https://www.gbif.org/tool/81287/r-a-language-and-environment-for-statistical-computing, zuletzt aktualisiert am 07.02.2023, zuletzt geprüft am 07.02.2023.

Randolph, C.; Tierney, M. C.; Mohr, E.; Chase, T. N. (1998): The Repeatable Battery for the Assessment of Neuropsychological Status (RBANS): preliminary clinical validity. In: *Journal of clinical and experimental neuropsychology* 20 (3), S. 310–319. DOI: 10.1076/jcen.20.3.310.823.

Register of trials (2023). Online verfügbar unter https://schizophrenia.cochrane.org/register-trials, zuletzt aktualisiert am 30.08.2023, zuletzt geprüft am 30.08.2023.

Remschmidt, Helmut; Theisen, Frank M. (2011): Schizophrenie. Berlin, Heidelberg: Springer (Manuale psychischer Störungen bei Kindern und Jugendlichen). Online verfügbar unter https://swbplus.bsz-bw.de/bsz345710622cov.htm.

Rhodes, Kirsty M.; Turner, Rebecca M.; Higgins, Julian P. T. (2016): Empirical evidence about inconsistency among studies in a pair-wise meta-analysis. In: *Research synthesis methods* 7 (4), S. 346–370. DOI: 10.1002/jrsm.1193.

Riedel, P.; Smolka, M. N.; Bauer, M. (2018): Schizophrenie und bipolare Störung : Behandlung kognitiver Beeinträchtigungen. In: *Der Nervenarzt* 89 (7), S. 784–795. DOI: 10.1007/s00115-018-0500-x.

Rücker G, König J, Efthimiou O et al.: Package 'netmeta': network meta-analysis using frequentist methods. Online verfügbar unter https://cran.r-project.org/web/packages/netmeta/netmeta.pdf., zuletzt geprüft am 07.02.2023.

Sachs, Gabriele; Erfurth, Andreas (2022): Wirkungen von Cariprazin auf Negativsymptome und kognitive Störungen bei Schizophrenie. In: *psychopraxis. neuropraxis* 25 (3), S. 166–171. DOI: 10.1007/s00739-022-00802-y.

Sahakian, B. J.; Owen, A. M. (1992): Computerized assessment in neuropsychiatry using CANTAB: discussion paper. In: *Journal of the Royal Society of Medicine* 85 (7), S. 399–402.

Salanti, Georgia; Higgins, Julian P. T.; Ades, A. E.; Ioannidis, John P. A. (2008): Evaluation of networks of randomized trials. In: *Statistical methods in medical research* 17 (3), S. 279–301. DOI: 10.1177/0962280207080643.

Shokraneh, Farhad; Adams, Clive E. (2019): Study-based registers reduce waste in systematic reviewing: discussion and case report. In: *Systematic reviews* 8 (1), S. 129. DOI: 10.1186/s13643-019-1035-3.

Shokraneh, Farhad; Adams, Clive E. (2020): Cochrane Schizophrenia Group's Study-Based Register of Randomized Controlled Trials: Development and Content Analysis. In: *Schizophrenia Bulletin Open* 1 (1), Artikel sgaa061. DOI: 10.1093/schizbullopen/sgaa061.

Shokraneh, Farhad; Adams, Clive E. (2023): Classification of all pharmacological interventions tested in trials relevant to people with schizophrenia: A study-based analysis. In: *Health information and libraries journal* 40 (2), S. 201–216. DOI: 10.1111/hir.12366.

Shokraneh, Farhad; Adams, Clive Elliott (2017): Study-based registers of randomized controlled trials. Starting a systematic review with data extraction or meta-analysis. In: *BioImpacts : BI* 7 (4), S. 209–217. DOI: 10.15171/bi.2017.25.

Sterne, Jonathan A. C.; Savović, Jelena; Page, Matthew J.; Elbers, Roy G.; Blencowe, Natalie S.; Boutron, Isabelle et al. (2019): RoB 2: a revised tool for assessing risk of bias in randomised trials. In: *BMJ (Clinical research ed.)* 366, l4898. DOI: 10.1136/bmj.l4898.

Turner, Rebecca M.; Davey, Jonathan; Clarke, Mike J.; Thompson, Simon G.; Higgins, Julian Pt (2012): Predicting the extent of heterogeneity in meta-analysis, using empirical data from the Cochrane Database of Systematic Reviews. In: *International journal of epidemiology* 41 (3), S. 818–827. DOI: 10.1093/ije/dys041.

Vita, Antonio; Gaebel, Wolfgang; Mucci, Armida; Sachs, Gabriele; Barlati, Stefano; Giordano, Giulia Maria et al. (2022a): European Psychiatric Association guidance on treatment of cognitive impairment in schizophrenia. In: *European psychiatry : the journal of the Association of European Psychiatrists* 65 (1), e57. DOI: 10.1192/j.eurpsy.2022.2315.

Vita, Antonio; Gaebel, Wolfgang; Mucci, Armida; Sachs, Gabriele; Erfurth, Andreas; Barlati, Stefano et al. (2022b): European Psychiatric Association guidance on assessment of cognitive impairment in schizophrenia. In: *European psychiatry : the journal of the Association of European Psychiatrists* 65 (1), e58. DOI: 10.1192/j.eurpsy.2022.2316.

Vos, Theo; Flaxman, Abraham D.; Naghavi, Mohsen; Lozano, Rafael; Michaud, Catherine; Ezzati, Majid et al. (2012): Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010. A systematic analysis for the Global Burden of Disease Study 2010. In: *The Lancet* 380 (9859), S. 2163–2196. DOI: 10.1016/S0140-6736(12)61729-2.

WHO Collaborating Centre for Drug Statistics Methodology (2018): ATC/DDD Index 2018. Online verfügbar unter https://www.whocc.no/atc_ddd_index/.

Woodward, Neil D.; Purdon, Scot E.; Meltzer, Herbert Y.; Zald, David H. (2005): A meta-analysis of neuropsychological change to clozapine, olanzapine, quetiapine, and risperidone in schizophrenia. In: *The international journal of neuropsychopharmacology* 8 (3), S. 457–472. DOI: 10.1017/S146114570500516X.

Woodward, Neil D.; Purdon, Scot E.; Meltzer, Herbert Y.; Zald, David H. (2007): A meta-analysis of cognitive change with haloperidol in clinical trials of atypical antipsychotics: dose effects and comparison to practice effects. In: *Schizophrenia research* 89 (1-3), S. 211–224. DOI: 10.1016/j.schres.2006.08.021.

Wykes, Til; Huddy, Vyv; Cellard, Caroline; McGurk, Susan R.; Czobor, Pál (2011): A meta-analysis of cognitive remediation for schizophrenia: methodology and effect sizes. In: *The American journal of psychiatry* 168 (5), S. 472–485. DOI: 10.1176/appi.ajp.2010.10060855.

Zec, R. F. (1995): Neuropsychology of schizophrenia according to Kraepelin: disorders of volition and executive functioning. In: *European archives of psychiatry and clinical neuroscience* 245 (4-5), S. 216–223. DOI: 10.1007/BF02191800.

Zielasek, Jürgen; Gaebel, Wolfgang (2018): Schizophrenie und andere primäre psychotische Störungen in ICD-11. In: *Fortschritte der Neurologie-Psychiatrie* 86 (3), S. 178–183. DOI: 10.1055/s-0044-101832.

Zohar, Joseph; Stahl, Stephen; Moller, Hans-Jurgen; Blier, Pierre; Kupfer, David; Yamawaki, Shigeto et al. (2015): A review of the current nomenclature for psychotropic agents and an

introduction to the Neuroscience-based Nomenclature. In: *European neuropsychopharmacology : the journal of the European College of Neuropsychopharmacology* 25 (12), S. 2318–2325. DOI: 10.1016/j.euroneuro.2015.08.019.

Inhalte des Anhangs sind ebenfalls Teil der Appendix der folgenden Publikation:

Feber L, Peter NL, Chiocchia V, Schneider-Thoma J, Siafis S, Bighelli I, Hansen WP, Lin X, Prates-Baldez D, Salanti G, Keefe RSE, Engel RR, Leucht S. Antipsychotic Drugs and Cognitive Function: A Systematic Review and Pairwise Network Meta-Analysis. JAMA Psychiatry. 2024 Oct 16. doi: 10.1001/jamapsychiatry.2024.2890. Epub ahead of print. PMID: 39412783.

Anhang A: Suchstrategie

We searched the register of the Cochrane Schizophrenia Group.

Following the methods from Cochrane (Lefebvre et al. 2019), the Information Specialist compiles this register from systematic searches of major resources and their monthly updates (unless otherwise specified):

1. MEDLINE;
2. Embase;
3. Allied and Complementary Medicine (AMED);
4. Cumulative Index to Nursing and Allied Health Literature (CINAHL);
5. PsycINFO;
6. PubMed;
7. US National Institute of Health Ongoing Trials Register ClinicalTrials.gov;
8. World Health Organization International Clinical Trials Registry Platform (www.who.int/ictrp);
9. ProQuest Dissertations and Theses A&I and its quarterly update;
10. Chinese databases (Chinese Biomedical Literature Database, China Knowledge Resource Integrated Database, and Wanfang) and their annual updates until the end of 2016.

The register also includes handsearches and conference proceedings (see Group's website: http://schizophrenia.cochrane.org/register-trials). It does not place any limitations on language, date, document type or publication status.

Further information about the register has been published by Shokraneh et al. (Shokraneh und Adams 2020, 2023, 2019; Shokraneh und Adams 2017).

The search string for the first search (04/27/2020) was:

(*Amisulpride* OR *Aripiprazole* OR *Asenapine* OR *Benperidol* OR *Brexpiprazole* OR *Cariprazine* OR *Chlorpromazine* OR *Clopenthixol* OR *Clozapine* OR *Flupentixol* OR *Fluphenazine* OR *Fluspirilene* OR *Haloperidol* OR *Iloperidone* OR *Levomepromazine* OR *Loxapine* OR *Lumateperone* OR *Lurasidone* OR *Molindone* OR *Olanzapine* OR *Paliperidone* OR *Penfluridol* OR *Perazine* OR *Perphenazine* OR *Pimozide* OR *Quetiapine* OR *Risperidone* OR *Sertindole* OR *Sulpiride* OR *Thioridazine* OR *Tiotixene* OR *Trifluoperazine* OR *Ziprasidone* OR *Zotepine* OR *Zuclopenthixol*) in Intervention Field of STUDY

Information for the second update search (03/06/2022):

Another two update searches of the Cochrane Schizophrenia Group Register were made on September 19, 2021 and March 06, 2022, respectively. Both searches were not restricted to the antipsychotic drugs above but all controlled trials of schizophrenia in the register were inspected. Apart from this, all descriptions above applied.

The search string for the third update search (06/25/2023) was:

We searched the register of the Cochrane schizophrenia group for references added to the register between March 07, 2022 and June 25, 2023 for reports of studies indexed as investigating one of the following interventions:

Amisulpride, Aripiprazole, Asenapine, Benperidol, Blonanserin, Brexpiprazole, Cariprazine, Chlorpromazine, Clopenthixol, Clozapine, Flupentixol, Fluphenazine, Fluspirilene, Haloperidol, Iloperidone, Levomepromazine, Loxapine, Lumateperone, Lurasidone, Molindone, Olanzapine, Olanzapine+Samidorphan,

Paliperidone, Penfluridol, Perazine, Perospirone, Perphenazine, Pimozide, Quetiapine, Risperidone, Samidorphan, Sertindole, Sulpiride, Thioridazine, Tiotixene, Trifluoperazine, Ziprasidone, Zotepine, Zuclopenthixol

We selected references that were entered in the database in 2022 and 2023 and removed duplicates.

Survey to inform the choice of the searched first-generation antipsychotic drugs

As the aim of our network meta-analysis is to provide a comprehensive overview of the effects of antipsychotic drugs on cognitive function, we did not apply any restrictions in form of administration and included all newer antipsychotics developed in the last decades (formerly called second-generation antipsychotics (SGAs)) as well as a selection of the most important older antipsychotics.

The selection of older antipsychotics, formerly called first-generation antipsychotics, was informed by a survey of international schizophrenia experts (Leucht und Davis 2022). In a simple survey, 56 international experts were asked to select 10 formerly called first-generation antipsychotics that they found most important (for whatever reason) out of an alphabetically ordered list of at that time 52 antipsychotics listed by the "WHO Collaborating Centre for Drug Statistics" (http://www.whocc.no/atc_ddd_methodology/who_collaborating_centre/). Although the survey has methodological limitations in the selection of experts and statistical evaluation, it provides some guidance on which older antipsychotics are still clinically relevant. The 15 drugs with the most votes were chosen (chlorpromazine, clopenthixol, flupenthixol, fluphenazine, haloperidol, levomepromazine, loxapine, molindone, perazine, perphenazine, pimozide, sulpiride, thioridazine, trifluoperazine and zuclopenthixol). Benperidol and fluspirilene are frequently used in Germany and were therefore added to the selection because the project was sponsored by the German Ministry of Education and Research. Penfluridol and tiotixene were also supplemented because we knew from Cochrane reviews that many studies have been conducted, unlike for other older antipsychotics.

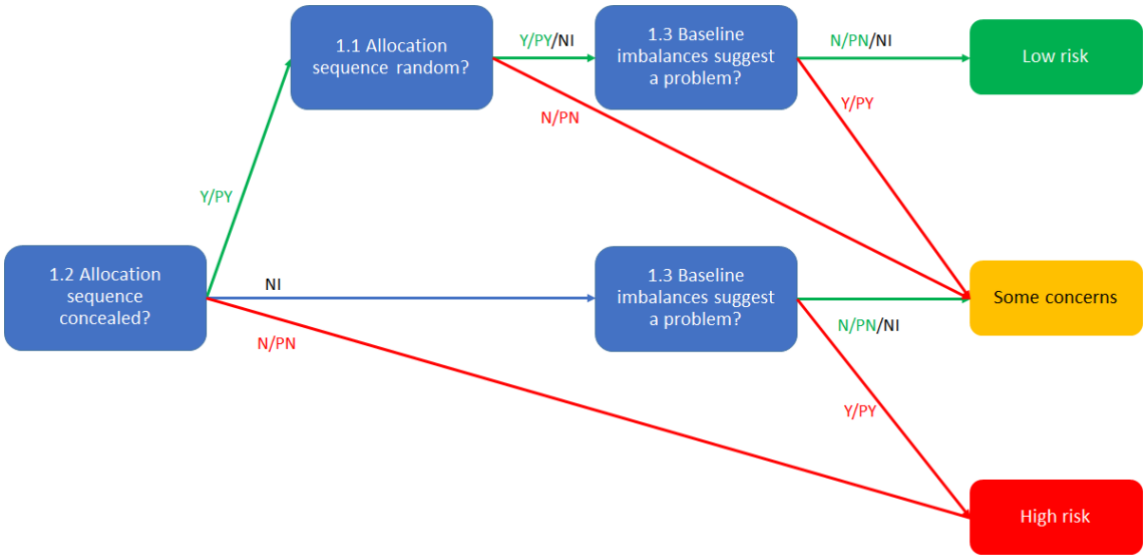
Of note, our list of included antipsychotics contains all antipsychotics listed in the WHO list of essential medicines (WHO Collaborating Centre for Drug Statistics Methodology 2018).

Anhang B: Bewertung des Risk of Bias

Domain 1: Randomisation Process

1.1 Was the allocation sequence random?

If there was no information about the exact methods (e.g. only stated “randomized”), we stated “not indicated”. For trials investigating second-generation-antipsychotic drugs that were sponsored by pharmaceutical companies, we assumed that the sequence generation for randomisation was appropriate, even when it is only stated “randomized”, and we stated “probably yes”. The reason is that we contacted many pharmaceutical companies in the past and all reported use of appropriate methods in these modern studies, even when it was not clearly stated in the primary publications.



Algorithm for suggested judgement of risk of bias arising from the randomization process

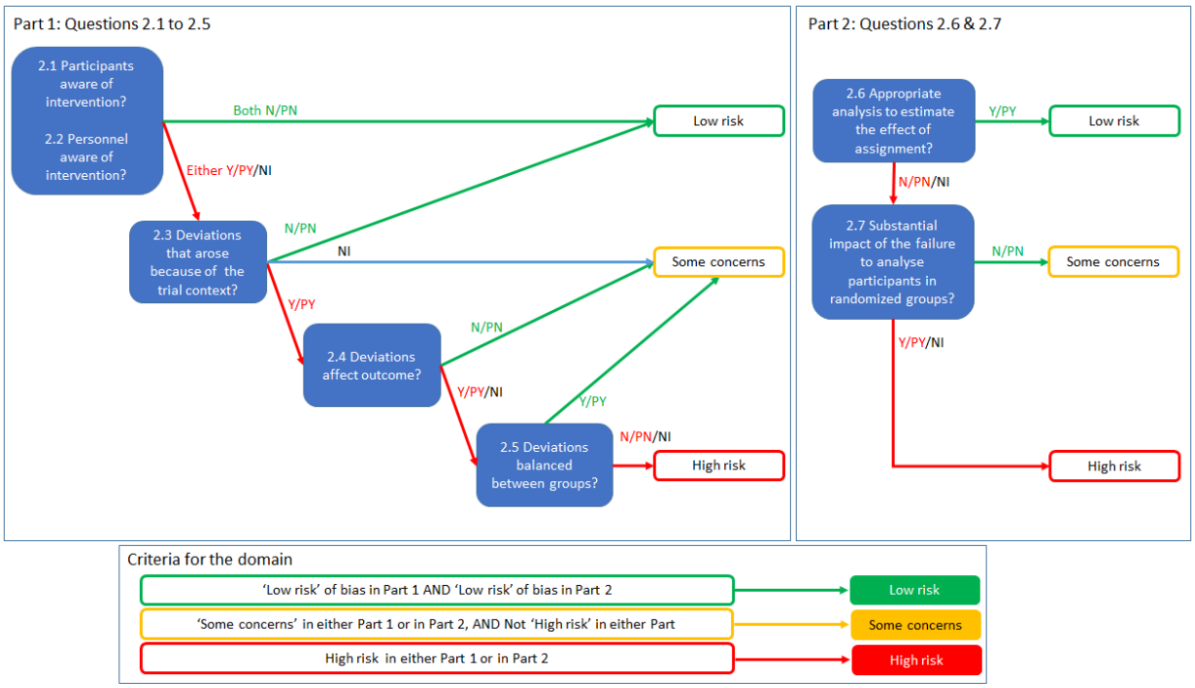
1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?

Similar to 1.1.

1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?

No specific comments.

Domain 2: Deviations from intended interventions



Algorithm for suggested judgement of risk of bias due to deviations from the intended interventions (effect of assignment to intervention)

Part 1:

2.1 Were participants aware of their assigned intervention during the trial?

If only stated "double-blind" without further information about the methods, we decided to assume that the method of blinding was appropriate and to state "probably no", as in studies of antipsychotic drugs blinding can be rather easily achieved by encapsulating drugs with identical capsules. In placebo-controlled trials, following the suggestion of the RoB2-guidance document (Sterne et al. 2019), we assumed unblinding due to side effects. In head-to-head trials of antipsychotics, we did not make this assumption, because the different antipsychotics still have some similarities (overlapping receptor-binding-profiles). Consequently, differences in side-effects are more difficult to evaluate for patients and personnel which makes it more difficult to guess the assigned intervention.

2.2 Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?

Similar to 2.1.

2.3 If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?

This question is only relevant for unblinded studies (open, single-blind or placebo-controlled (unblinded due to side effects) trials). Typically, protocol deviations are not reported in detail, which leads to a judgement of "some concerns". Although protocol deviations due to the experimental context cannot be excluded, we do not deem substantial protocol deviations (that potentially affect the outcome, see questions below) to happen frequently. Thus, we do not expect important bias from such deviations and a judgement of "some concerns" seems fair or even too punitive.

2.4. Were these deviations likely to have affected the outcome?

No specific comments.

2.5. Were these deviations from intended intervention balanced between groups?

No specific comments.

Part 2:

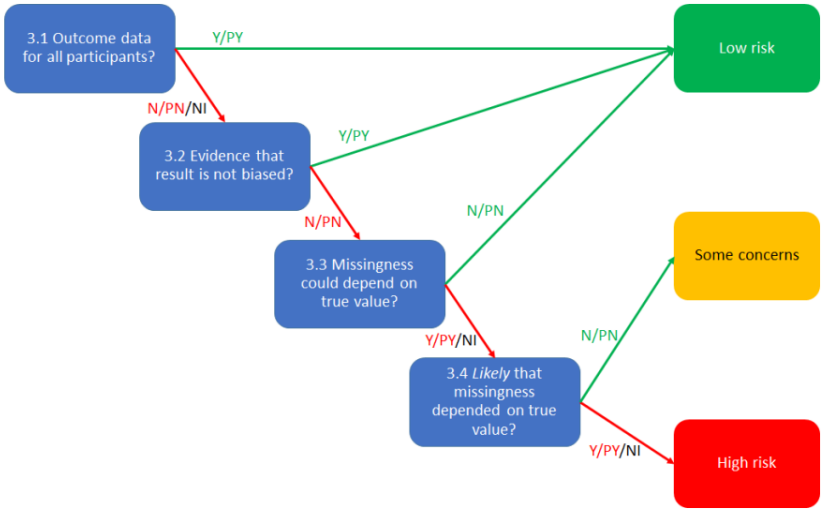
2.6. Was an appropriate analysis used to estimate the effect of assignment to intervention?

We considered completer analyses as inappropriate because from such analyses patients are excluded post-randomisation due to toxicity or lack of efficacy. In case of differences in the type of available data between the different domains in one study, we extend the worst single rating to the whole study.

2.7. Was there potential for a substantial impact (on the results) of the failure to analyse participants in the group to which they were randomized?

According to the guidance, authors need to make a decision about when exclusion of patients post-randomisation could have a substantial impact on the results. We considered studies to be of "low risk" if the percentage of patients with premature study discontinuation was below 5%, of "some concerns" between 5-20%, and at "high risk" when more than 20% of the patients randomized discontinued prematurely. The decision for this threshold was informed by the work of Xia et al. (Adams et al. 2009).

Domain 3: Missing outcome data



Algorithm for suggested judgement of risk of bias due to missing outcome data

3.1 Were data for this outcome available for all, or nearly all, participants randomized?

We used the threshold of 5% (study discontinuation rate at maximum 5% of number of patients randomized) mentioned in the RoB2-guidance-document.

3.2 If N/PN/NI to 3.1: Is there evidence that the result was not biased by missing outcome data?

For all outcomes, the available aggregate data is not sufficient to conduct sensitivity analyses: For continuous outcomes, time-point of study discontinuation and characteristics of patients that discontinued are typically not reported. Moreover, the aggregate data typically already include some data of the patients who discontinued prematurely (by LOCF or MMRM) and cannot be used as a basis for a sensitivity analysis (which would mean adding assumed outcomes of patients with premature study discontinuation to the reported result). Rarely, results were presented by the original investigators using sophisticated methods such as "multiple imputation (MI)" or "mixed-model-of-repeated-measurement (MMRM)" to account for missing outcome data. However, the RoB2-guidance-document recommends to critically consider the underlying assumptions in these analyses. Based on the reported data, this critical assessment of methods is however not possible. Thus, we did not consider them appropriate and continued in the decision tree.

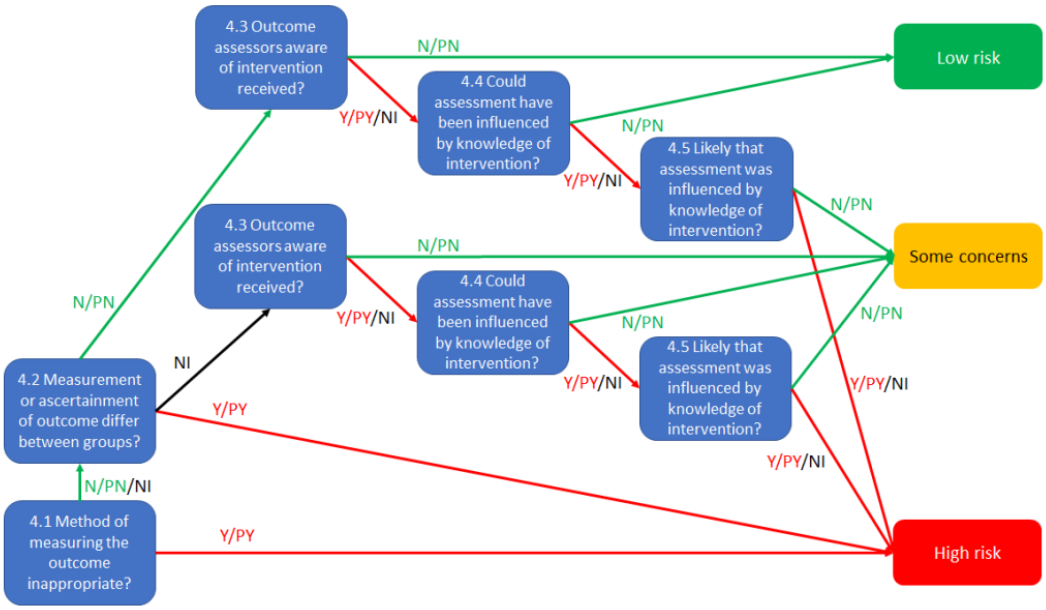
3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?

If no reasons for study discontinuation are reported, then "probably yes", because in studies of antipsychotics in schizophrenia, discontinuation due to inefficacy are likely. Also, for many reported reasons, doubts remain whether the reason is related to inefficacy. Moreover, it needs to be noted that in our aggregate data (where continuous data is usually reported using LOCF/MMRM) also patients that discontinued due to reasons unrelated to the outcome can affect the result: This is because patients who discontinued prematurely contribute results of early time points to the results. Thus, all studies with rates of premature study discontinuation above the threshold mentioned in 3.1 need further evaluation.

3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?

As recommended in the RoB2-guidance-document, we investigated whether there were differences in the total number of participants with premature study discontinuation (dropouts) and in the number of participants with premature study discontinuation for reasons related to the outcome. Thereby, we judged whether it is likely that missingness depended on the outcome and that missingness influenced the outcome substantially (high risk) or to some extent (some concerns). For the outcomes, we judged the mechanism of missingness and its potential impact on the result according to the following algorithm: When the rate of study discontinuation for any reason was ≤ 20%, we judged at some concerns. This threshold was informed by the work of Xia et al. (Adams et al. 2009). Otherwise proceed. When the ratio of study discontinuation for any reason (between two groups compared in a trial) is <0.5/ >2 (half/double), we judged at high risk. Otherwise proceed. When the rate of study discontinuation due to related reasons (i.e. due to inefficacy) was ≤ 20%, we judged at some concerns. Otherwise proceed. When the rate of study discontinuation due to related reasons (between two groups compared in a trial) is <0.5/ >2 (half/double), we judged at high risk of bias, when ≥0.5/ ≤2, we judge at some concerns.

Domain 4: Measurement of the outcome



Algorithm for suggested judgement of risk of bias in measurement of the outcome

4.1. Was the method of measuring the outcome inappropriate?

No specific comments.

4.2. Could measurement or ascertainment of the outcome have differed between intervention groups?

No specific comments.

4.3. Were outcome assessors aware of the intervention received by study participants?

In head-to-head studies of antipsychotic drugs, when only reported that the study was double-blind, we assumed that blinding was appropriate and stated “probably no” (similar to 2.1.). In open trials or double-blind placebo-controlled trials (with potential unblinding of study personal, see 2.1.) we checked if there were particular methods to blind the outcome assessors. If such particular methods were not explicitly described, we assumed that the outcomes were assessed by study personal and answered “probably yes”. For all outcomes, we considered the personal/external raters (and not the patient him- or herself) to be most important for the outcome assessment (observer-reported outcome; modern single-blind studies in the field of schizophrenia have particularly blinded raters, e.g. with remote-ratings, which emphasizes the role of the rater as outcome assessor).

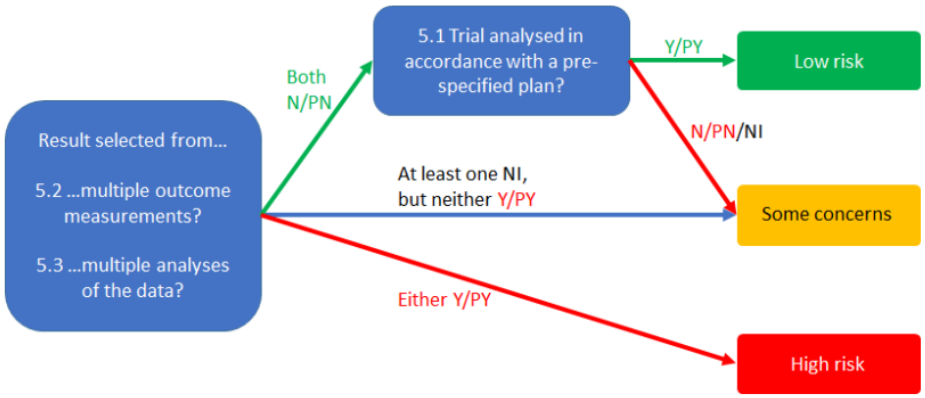
4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?

No specific comments.

4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?

In general, we considered the influence of knowledge of intervention received as minor, resulting in a judgement of some concerns.

Domain 5: Selection of reported results



Algorithm for suggested judgement of risk of bias in selection of the reported result

5.1. Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?

Typically, the analysis plan was not available. In this case, we followed the recommendations of the Cochrane handbook (Higgins et al. 2019b) and compared the reported results with the reported methods section and with the outcomes that are expected for such trials as informed by other trials.

Is the numerical result being assessed likely to have been selected, on the basis of the results, from...

5.2. ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?

No specific comments.

5.3 ... multiple eligible analyses of the data?

No specific comments.

Overall risk of bias

Risk-of-bias judgement		Low / High / Some concerns
Optional: What is the overall predicted direction of bias for this outcome?		Favours experimental / Favours comparator / Towards null /Away from null / Unpredictable / NA

Overall risk-of-bias judgement	**Criteria**
Low risk of bias	The study is judged to be at **low risk of bias for all domains** for this result.
Some concerns	The study is judged to raise **some concerns** in at least one domain for this result, but not to be at high risk of bias for any domain.
High risk of bias	The study is judged to be at **high risk of bias** in at least one domain for this result. Or The study is judged to have **some concerns** for **multiple domains** in a way that substantially lowers confidence in the result.

In specification of the guidelines in the table, we judged a study at overall high risk of bias when 4 or more domains were rated as “some concerns”.

Anhang C: Bewertung der Zuverlässigkeit der Schätzungen

General notes

We assessed the confidence in estimates for our primary outcome, again under the assumption the judgement would not meaningfully differ for the single cognition domains.

We used the official webtool at https://cinema.ispm.unibe.ch/ and followed the CINeMA guidance document (Nikolakopoulou et al. 2020). As it was not possible to use the RoB-MEN web system as such as it cannot compute comparison-based data, we assessed the reporting bias via CINeMA in line with the RoB-MEN recommendations (Kirkham et al. 2018).

We assumed random effects and chose "Average" for the calculation of the summary of risk of bias contributions to each network estimate as well as for the summary of indirectness across contributions for each network estimate.

We set the clinically important effect size (SMD) at 0.1.

Indirect comparisons were always judged at "some concerns".

Reporting Bias

Reporting Bias per study

The reporting bias for each study was judged according to the following table. We created the table based on the ROBMEN principles.

Classification	Description	Risk of Bias *
Clear that outcome was measured and analysed		
A	Composite Score was not reported, but we can calculate it from the results of 7 domains	Low
B	Outcome seems to have been analysed, only information reported: not significant (p >0.05)	High
C	Outcome seems to have been analysed, only information reported: significant (p <0.05)	Low
D	Outcome seems to have been analysed, but results not usable for meta-analysis (eg missing SDs, correlations, not per group …)	Unclear
E	Outcome (or single tests that could potentially contribute to the outcome) seems to have been analysed, but no information at all. Also if report states "cognition results will follow in a separate publication" and this other publication is not available.	High
F	Protocol, poster, poster abstract	Unclear
Outcome was potentially measured, unclear if analysed		
G	Full report	Unclear
H	Protocol, poster, poster abstract	Unclear
Clear that the outcome was not measured (does not apply)		

Guidelines for rating the risk of reporting bias in line with the ROBMEN principles.

Reporting Bias per comparison

To arrive at an overall judgement of reporting bias for each (mixed or direct effects) comparison, we needed to define rules how to proceed in case the studies in that comparison differed in their reporting bias risk.

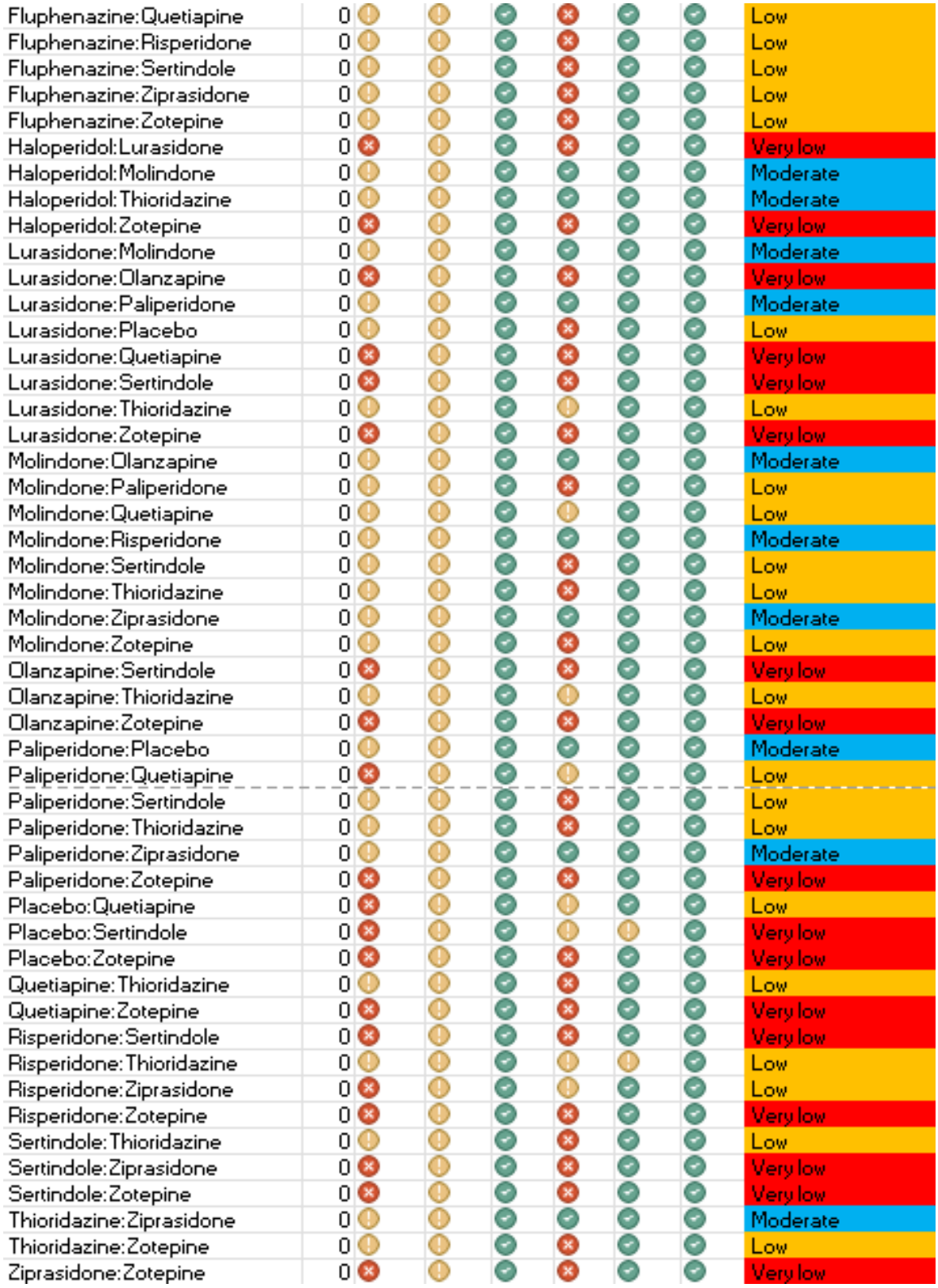
Starting with the rating "some concerns" for all comparisons, we rated "low risk" only if at least 80% of participants were in studies with a "low risk" rating. We rated "high risk" if at least 20% of participants were in studies with a "high risk" rating.

As some abstracts or protocols did not report sample sizes, we chose “some concerns” as a default – except one or more studies in this comparison was rated at “high risk”, in which case the whole comparison was rated as “high risk”.

Overall confidence in estimates for the primary outcome, by comparison

Comparison	Number of studies	Within-study bias	Reporting bias	Indirectness	Imprecision	Heterogeneity	Incoherence	Confidence rating
Amisulpride:Haloperidol	1	✓	!	✓	✗	✓	✓	Very low
Amisulpride:Olanzapine	4	✗	!	✓	✗	✓	✓	Very low
Amisulpride:Quetiapine	1	✗	✓	✓	✗	✓	✓	Low
Amisulpride:Ziprasidone	1	✗	!	✓	✗	✓	✓	Very low
Aripiprazole:Brexpiprazole	1	✗	✓	✓	✗	✓	✓	Low
Aripiprazole:Olanzapine	2	✗	!	✓	✗	✓	✓	Very low
Aripiprazole:Quetiapine	1	✗	!	✓	✗	✓	✓	Very low
Aripiprazole:Risperidone	3	✗	!	✓	✗	✓	✓	Very low
Brexpiprazole:Placebo	1	✗	✓	✓	!	✓	✓	Low
Chlorpromazine:Fluphenazine	1	!	✓	✓	!	✓	✓	Moderate
Chlorpromazine:Molindone	1	!	✓	✓	!	✓	✓	Moderate
Chlorpromazine:Placebo	5	!	✓	✓	✓	✓	✓	Moderate
Chlorpromazine:Thioridazine	1	!	✓	✓	✗	✓	✓	Low
Clozapine:Haloperidol	3	✗	✓	✓	✗	✓	✓	Low
Clozapine:Olanzapine	4	✗	✗	✓	✓	✓	✓	Low
Clozapine:Risperidone	2	✗	✓	✓	✓	✓	✓	Low
Clozapine:Ziprasidone	1	!	✓	✓	!	✓	✓	Moderate
Clozapine:Zotepine	1	✗	✓	✓	✗	✓	✓	Low
Fluphenazine:Olanzapine	1	!	✓	✓	✗	✓	✓	Low
Fluphenazine:Placebo	1	!	✓	✓	✗	✓	✓	Low
Fluphenazine:Thioridazine	1	!	✓	✓	✓	✓	✓	Moderate
Haloperidol:Olanzapine	8	✗	!	✓	✓	✓	✓	Low
Haloperidol:Paliperidone	1	!	✓	✓	✓	✓	✓	Moderate
Haloperidol:Placebo	1	✗	!	✓	✗	✓	✓	Very low
Haloperidol:Quetiapine	3	✗	✓	✓	✓	✓	✓	Low
Haloperidol:Risperidone	9	✗	!	✓	✓	✓	✓	Low
Haloperidol:Sertindole	1	✗	✓	✓	✓	✓	✗	Low
Haloperidol:Ziprasidone	1	✗	!	✓	✗	✓	✓	Very low
Lurasidone:Risperidone	1	!	✓	✓	✗	✓	✓	Low
Lurasidone:Ziprasidone	1	✗	✓	✓	✗	✓	✓	Low
Molindone:Placebo	1	!	✓	✓	✓	✓	✓	Moderate
Olanzapine:Paliperidone	1	!	✓	✓	✓	✓	✓	Moderate
Olanzapine:Placebo	1	✗	!	✓	✗	✓	✓	Very low
Olanzapine:Quetiapine	5	✗	!	✓	!	✓	✓	Low
Olanzapine:Risperidone	12	✗	!	✓	✗	✓	✗	Very low
Olanzapine:Ziprasidone	5	!	!	✓	!	✓	✓	Low
Paliperidone:Risperidone	1	!	✓	✓	✓	!	✓	Moderate
Placebo:Risperidone	1	!	!	✓	!	!	✓	Low
Placebo:Thioridazine	1	!	✓	✓	✓	✓	✓	Moderate
Placebo:Ziprasidone	1	!	✓	✓	✗	✓	✓	Low
Quetiapine:Risperidone	3	✗	!	✓	✗	✓	✓	Very low
Quetiapine:Sertindole	1	✗	✓	✓	✗	✓	!	Very low
Quetiapine:Ziprasidone	1	✗	✓	✓	!	✓	✓	Low
Amisulpride:Aripiprazole	0	✗	!	✓	✗	✓	✓	Very low
Amisulpride:Brexpiprazole	0	✗	!	✓	✗	✓	✓	Very low
Amisulpride:Chlorpromazine	0	!	!	✓	✗	✓	✓	Low
Amisulpride:Clozapine	0	✗	!	✓	✗	✓	✓	Very low
Amisulpride:Fluphenazine	0	!	!	✓	✗	✓	✓	Low
Amisulpride:Lurasidone	0	✗	!	✓	✗	✓	✓	Very low
Amisulpride:Molindone	0	!	!	✓	✓	✓	✓	Moderate

Amisulpride:Paliperidone	0	!	!	✓	!	✓	✓	Low
Amisulpride:Placebo	0	✗	!	✓	✗	✓	✓	Very low
Amisulpride:Risperidone	0	✗	!	✓	✗	✓	✓	Very low
Amisulpride:Sertindole	0	✗	!	✓	✗	✓	✓	Very low
Amisulpride:Thioridazine	0	!	!	✓	✗	✓	✓	Low
Amisulpride:Zotepine	0	✗	!	✓	✗	✓	✓	Very low
Aripiprazole:Chlorpromazine	0	!	!	✓	✗	✓	✓	Low
Aripiprazole:Clozapine	0	✗	!	✓	✗	✓	✓	Very low
Aripiprazole:Fluphenazine	0	!	!	✓	✗	✓	✓	Low
Aripiprazole:Haloperidol	0	✗	!	✓	✗	✓	✓	Very low
Aripiprazole:Lurasidone	0	✗	!	✓	✗	✓	✓	Very low
Aripiprazole:Molindone	0	!	!	✓	✓	✓	✓	Moderate
Aripiprazole:Paliperidone	0	!	!	✓	✓	✓	✓	Moderate
Aripiprazole:Placebo	0	✗	!	✓	✗	✓	✓	Very low
Aripiprazole:Sertindole	0	✗	!	✓	✗	✓	✓	Very low
Aripiprazole:Thioridazine	0	!	!	✓	!	✓	✓	Low
Aripiprazole:Ziprasidone	0	✗	!	✓	✗	✓	✓	Very low
Aripiprazole:Zotepine	0	✗	!	✓	✗	✓	✓	Very low
Brexpiprazole:Chlorpromazine	0	!	!	✓	✗	✓	✓	Low
Brexpiprazole:Clozapine	0	✗	!	✓	!	✓	✓	Low
Brexpiprazole:Fluphenazine	0	!	!	✓	✗	✓	✓	Low
Brexpiprazole:Haloperidol	0	✗	!	✓	!	✓	✓	Low
Brexpiprazole:Lurasidone	0	✗	!	✓	✗	✓	✓	Very low
Brexpiprazole:Molindone	0	!	!	✓	!	✓	✓	Low
Brexpiprazole:Olanzapine	0	✗	!	✓	✗	✓	✓	Very low
Brexpiprazole:Paliperidone	0	✗	!	✓	✗	✓	✓	Very low
Brexpiprazole:Quetiapine	0	✗	!	✓	✗	✓	✓	Very low
Brexpiprazole:Risperidone	0	✗	!	✓	✗	✓	✓	Very low
Brexpiprazole:Sertindole	0	✗	!	✓	✗	✓	✓	Very low
Brexpiprazole:Thioridazine	0	!	!	✓	✗	✓	✓	Low
Brexpiprazole:Ziprasidone	0	✗	!	✓	✗	✓	✓	Very low
Brexpiprazole:Zotepine	0	✗	!	✓	✗	✓	✓	Very low
Chlorpromazine:Clozapine	0	!	!	✓	!	✓	✓	Low
Chlorpromazine:Haloperidol	0	!	!	✓	!	✓	✓	Low
Chlorpromazine:Lurasidone	0	!	!	✓	✗	✓	✓	Low
Chlorpromazine:Olanzapine	0	!	!	✓	✗	✓	✓	Low
Chlorpromazine:Paliperidone	0	!	!	✓	✗	✓	✓	Low
Chlorpromazine:Quetiapine	0	!	!	✓	✗	✓	✓	Low
Chlorpromazine:Risperidone	0	!	!	✓	✗	✓	✓	Low
Chlorpromazine:Sertindole	0	!	!	✓	✗	✓	✓	Low
Chlorpromazine:Ziprasidone	0	!	!	✓	✗	✓	✓	Low
Chlorpromazine:Zotepine	0	!	!	✓	✗	✓	✓	Low
Clozapine:Fluphenazine	0	!	!	✓	✗	✓	✓	Low
Clozapine:Lurasidone	0	✗	!	✓	!	!	✓	Very low
Clozapine:Molindone	0	!	!	✓	✓	✓	✓	Moderate
Clozapine:Paliperidone	0	!	!	✓	✓	✓	✓	Moderate
Clozapine:Placebo	0	!	!	✓	✗	✓	✓	Low
Clozapine:Quetiapine	0	✗	!	✓	✓	✓	✓	Low
Clozapine:Sertindole	0	✗	!	✓	✓	✓	✓	Low
Clozapine:Thioridazine	0	!	!	✓	✓	✓	✓	Moderate
Fluphenazine:Haloperidol	0	!	!	✓	✗	✓	✓	Low
Fluphenazine:Lurasidone	0	!	!	✓	✗	✓	✓	Low
Fluphenazine:Molindone	0	!	!	✓	✓	✓	✓	Moderate
Fluphenazine:Paliperidone	0	!	!	✓	✓	✓	✓	Moderate



Confidence in estimates per comparison, = low risk of bias, =some concerns, =high risk of bias

Anhang D: Referenzliste der eingeschlossenen Studien

Study_name	Author	Title	Subtitle	Periodical	Year	Volume	Number	Page_range
Abdolahian 2008	Abdolahian, E.; Mohareri, F.; Bordbar, M. R. F.	Haloperidol versus risperidone	A comparison of beneficial effect on cognitive function of patients with chronic schizophrenia	Iranian Journal of Psychiatry and Behavioral Sciences	2008	2	1	14–20
Abdolahian 2008	Abdollahian, E.; Mohareri, F.; Zandi, B.	Comparing the effects of risperidone and haloperidol in chronic schizophrenic patients		Proceedings of the Thematic Conference of the World Psychiatric Association on "Treatments in Psychiatry: An Update"; 2004 Nov 10-13; Florence, Italy	2004			
Abrams 1958	Abrams, J.	Chlorpromazine in the treatment of chronic schizophrenia		Diseases of the Nervous System	1958	19		20–28
Addington 1996	Addington, J.; Addington, D.	Cognitive functioning in schizophrenia	a trial of risperidone versus haloperidol	Proceedings of the 20th Collegium Internationale Neuro-Psychopharmacologicum Congress; 1996 Jun 23-27; Melbourne, Australia	1996			
Addington 1996	Addington, J.; Addington, D.	Neurocognitive functioning in schizophrenia	a trial of risperidone versus haloperidol	Canadian Journal of Psychiatry [Revue Canadienne de Psychiatrie]	1997	42	9	983
Addington 1996	Liberman, R. P.; Gutkind, D.; Mintz, J.; Green, M.; Marshall, B. D. [JR]; Robertson, M. J.; Hayden, J.	Impact of risperidone versus haloperidol on activities of daily living in the treatment of refractory schizophrenia		Comprehensive Psychiatry	2002	43	6	469–473
Adrianzen 2008	Adrianzen, C.; Sanchez, M.; Cordova, J.; Castillo, I.	Olanzapine versus haloperidol	effectiveness in functionality and health state in a sample of Venezuelan patients with schizophrenia	Revista Argentina de Psiquiatria	2008	19	81	254–260
Adrianzen 2008	Eli, Lilly; Company	Olanzapine for schizophrenia	a cost benefit study	http://www.Clinicalstudyresults.org/	2006			
Alvarez 2006	Olivares, J. M.; Ciudad, A.; Alvarez, E.; Bousono-Garcia, M.; Cuesta, M.; Gomez, J. C.	Olanzapine versus risperidone	one-year results in social functioning in schizophrenia	Proceedings of the 157th Annual Meeting of the American Psychiatric Association; 2004 May 1-6; New York, USA	2004			
Alvarez 2006	Olivares, J. M.; Ciudad, A.; Gomez, J. C.; Cuesta, M.; Bousono, M.; Alvarez, E.	Olanzapine versus risperidone	efficacy results in negative symptoms of a one year randomized trial in outpatients with schizophrenia with prominent negative symptoms	International Journal of Neuropsychopharmacology	2004	7	Suppl 2	S407
Alvarez 2006	Alvarez, E.; Ciudad, A.; Olivares, J. M.; Bousono, M.;	A randomized, 1-year follow-up study of olanzapine and risperi-		Journal of Clinical Psychopharmacology	2006	26	3	238–249

	Gomez, J. C.	done in the treatment of negative symptoms in outpatients with schizophrenia						
Alvarez 2006	Ciudad, A.; Alvarez, E.; Bousono, J.; Cuesta, M.; Olivares, J. M.; Gomez, J. C.	Efficacy of olanzapine versus risperidone	one-year results in schizophrenia	Proceedings of the 157th Annual Meeting of the American Psychiatric Association; 2004 May 1-6; New York, USA	2004			
Alvarez 2006	Ciudad, A.; Alvarez, E.; Bousono, M.; Cuesta, M.; Gomez, J. C.; Olivares, J. M.	Olanzapine versus risperidone	results of a one-year randomized trial in outpatients with schizophrenia with prominent negative symptoms	Proceedings of the 12th Biennial Winter Workshop on Schizophrenia; 2004 Feb 7-13; Davos, Switzerland	2004			
Alvarez 2006	Ciudad, A.; Alvarez, E.; Bousono, M.; Cuesta, M.; Gomez, J. C.; Olivares, J. M.	Olanzapine versus risperidone	results of a one year randomized trial in outpatients with schizophrenia with prominent negative symptoms	Schizophrenia Research	2004	67	1	161–162
Alvarez 2006	Ciudad, A.; Alvarez, E.; Bousono, M.; Olivares, J.; Gomez, J.	Olanzapine versus risperidone	one-year results in positive symptoms in schizophrenia	Proceedings of the 158th Annual Meeting of the American Psychiatric Association; 2005 May 21-26; Atlanta, Georgia, USA	2005			
Alvarez 2006	Ciudad, A.; Alvarez, E.; Bousono, M.; Olivares, J. M.; Gomez, J. C.	Safety and tolerability of olanzapine versus risperidone	a one-year randomized study in outpatients with schizophrenia with prominent negative symptoms	Actas Espanolas de Psiquiatria	2007	35	2	105–114
Alvarez 2006	Ciudad, A.; Olivares, J. M.; Bousono, M.; Gomez, J. C.; Alvarez, E.	Improvement in social functioning in outpatients with schizophrenia with prominent negative symptoms treated with olanzapine or risperidone in a 1 year randomized, open-label trial		Progress in Neuro-Psychopharmacology and Biological Psychiatry	2006	30	8	1515–1522
Alvarez 2006	Cuidad, A.; Alvarez, E.; Bousono, M.; Cuesta, M.; Gomez, J. C.; Olivares, J. M.	Olanzapine versus risperidone	safety results of a one year randomized trial in outpatients with schizophrenia with prominent negative symptoms	International Journal of Neuropsychopharmacology	2004	7	Suppl 2	S233
Alvarez 2006	Gilaberte, I.; Bousono, M.; Ciudad, A.; Olivares, J. M.; de, Polavieja J. G.; Alvarez, E.	Comparison between two functional recovery criteria approaches in outpatients with schizophrenia after one year of randomized treatment to second-generation antipsychotics		Proceedings of the 13th Biennial Winter Workshop on Schizophrenia Research; 2006 Feb 4-10; Davos, Switzerland	2006			
Alvarez 2006	Gurpegui, M.; Alvarez, E.; Bousono, M.; Ciudad, A.; Gomez,	Effect of olanzapine or risperidone treatment on some cognitive functions in a one-year follow-up of		European Neuropsychopharmacology	2007	17	11	725–734

	J. C.; Olivares, J. M.	schizophrenia outpatients with prominent negative symptoms						
Alvarez 2006	Gurpegui, N.; Alvarez, E.; Bousono, M.; Ciudad, A.; Gomez, J.; Olivares, J.	The effect of treatment with olanzapine or risperidone on some cognitive functions	results of a one year randomized trial in outpatients with schizophrenia with prominent negative symptoms	Schizophrenia Bulletin	2005	31	2	485
Antonova 2005	Antonova, E.; Kumari, V.; Halari, R.; Zachariah, E.; Mehrotra, R.; Kumar, A.; Sharma, T.	Superior cognitive efficacy of atypical antipsychotics olanzapine, risperidone, and quetiapine, as a group, relative to low doses of conventional antipsychotics		Schizophrenia Bulletin	2005	31		474
Armenteros 2001	Armenteros, J. L.	Risperidone treatment of adolescents with schizophrenia		CRISP Database (https://www-commons.cit.nih.gov/crisp/index.html Accessed 19th February 2001)	2001			
Arvanitis 1993	Nct	Comparative effectiveness of antipsychotic medications in patients with schizophrenia (CATIE schizophrenia trial)		https://ClinicalTrials.gov/	2001			
Arvanitis 1993	Velligan, D. I.; Newcomer, J.; Pultz, J.; Csernansky, J.; Hoff, A. L.; Mahurin, R.; Miller, A.	Improvement in cognitive functioning with long term quetiapine is superior to haloperidol		Schizophrenia Research	2000	41	1	205
Arvanitis 1993	Velligan, D. I.; Newcomer, J.; Pultz, J.; Csernansky, J.; Hoff, A. L.; Mahurin, R.; Miller, A. L.	Does cognitive function improve with quetiapine in comparison to haloperidol?		Schizophrenia Research	2002	53		239–248
Arvanitis 1993	Velligan, D. I.; Pultz, J.; Csernansky, J. G.; Hoff, A. L.; Mahurin, R.; Miller, A. L.; Newcomer, J. W.	Changes in cognitive function with quetiapine fumarate versus haloperidol		Proceedings of the 152nd Annual Meeting of the American Psychiatric Association; 1999 May 15-20; Washington DC, USA	1999			
Arvanitis 1993	Velligan, D. I.; Pultz, J.; Newcomer, J. W.	Changes in cognitive function with quetiapine versus haloperidol		Proceedings of the 51st Institute on Psychiatric Services; 1999 Oct 25-Nov 2; New Orleans, Louisiana, USA	1999			
Arvanitis 1993	Arvanitis, L.; Scott, M.; Miller, A.	A multicenter, double-blind, randomized, controlled, multiple fixed-dose and dose regimen comparison of seroquelTM (ICI 204,436) and		Data on File	1993			1–2314

		haloperidol in the prevention of psychotic relapse in patients with chronic or subchronic schizophrenia						
Arvanitis 1993	Arvanitis, L. A.; Sweitzer, D. E.; Goldstein, J. M.; Yeung, P. P.	Seroquel reduces aggression in patients with acute exacerbation of schizophrenia		Proceedings of the 11th European College of Neuropsychopharmacology Congress; 1998 Oct 31 - Nov 4; Paris, France	1998			
AstraZeneca 5077IL/0031	Astra-Zeneca	A multicenter, double-blind, randomized, comparison of quetiapine (seroquel) and chlorpromazine in the treatment of subjects with treatment-resistant schizophrenia		http://www.Clinicalstudyresults.org/	2005			
Bai 2005	Nct	Tardive dyskinesia and cognitive function		https://ClinicalTrials.gov/	2008			
Bai 2005	Bai, Y. M.; Ping, L. Y.; Lin, C. C.; Wang, Y. C.; Liou, Y. J.; Wu, B. J.; Chen, T. T.; Chen, J. Y.; Lin, C. Y.; Chou, P.	Comparative effects of atypical antipsychotic on tardive dyskinesia and neurocognition	a 24-week randomized, single-blind, controlled study	Proceedings of the 8th World Congress of Psychiatry; 2005 Sep 10-15; Cairo, Egypt	2005			
Bai 2005	Bai, Y. M.; Ping, L. Y.; Lin, C. C.; Wang, Y. C.; Liou, Y. J.; Wu, B. J.; Chen, T. T.; Chen, J. Y.; Lin, C. Y.; Chou, P.	Comparative effects of atypical antipsychotic on tardive dyskinesia and neurocognition	a 24-week randomized, single-blind, controlled study	European Neuropsychopharmacology	2005	15	Suppl 3	S473
Berman 1995	Berman, I.; Allan, E. R.; Pappas, D.; Sison, C. E.; Merson, A.	The cognitive effect of risperidone in elderly schizophrenic patients a pilot double-blind comparison study with haloperidol		Proceedings of the 150th Annual Meeting of the American Psychiatric Association; 1997 May 17-22; San Diego, California, USA	1997			
Berman 1995	Berman, I.; Merson, A.; Allan, E.; Alexis, C.; Losonczy, M.	Effect of risperidone on cognitive performance in elderly schizophrenic patients	a double-blind comparison study with haloperidol	Psychopharmacology Bulletin	1995	31	3	552
Berman 1995	Berman, I.; Pappas, D.; Patel, C.; Chang, H.; Goff, D.	Effect of risperidone on cognitive function in schizophrenia		Proceedings of the 151st Annual Meeting of the American Psychiatric Association; 1998 May 30 - Jun 4; Toronto, Ontario, Canada	1998			
Boehle 1995	Preussler, B.; Bohle, C.; Jeschke, G.; Volz, H. P.; Sauer, H.	Psychometric performance of clozapine and fluphenazine treated schizophrenics		PharmacoPsychiatry	1995	28		204
Boehle 1995	Preussler, B.; Hubner,	Psychometric performance of		PharmacoPsychiatry	1997	30		207

	G.; Rossger, G.; Jeschke, G.; Lorenz, S.; Volz, H. P.; Sauer, H.	chronic schizophrenics treated with a typical neuroleptic (fluphenazine) or an atypical neuroleptic drug (clozapine) - a double-blind controlled clinical trial						
Boehle 1995	Rossger, G.; Preussler, B.; Rauch, J.; Kunze, M.; Lorenz, S.; Harting, J.; Volz, H. P.; Sauer, H.	Neuropsychological test performance of chronic schizophrenics treated with clozapine or fluphenazine - a double-blind, controlled clinical trial		PharmacoPsychiatry	1997	30		212
Boehle 1995	Boehle, C.; Volz, H. P.; Hornstein, C.; Preussler, B.; Kunze, M.; Rauch, J.; Sauer, H.	Neuropsychological performance of clozapine treated schizophrenics		PharmacoPsychiatry	1995	28		166
Boulay 2007	Boulay, L. J.	Contrasting the effects of haloperidol and olanzapine on attention and working memory in schizophrenia	a double-blind flexible dose study	Dissertation	2004			
Boulay 2007	Boulay, L. J.; Labelle, A.; Bourget, D.; Robertson, S.; Habib, R.; Tessier, P.; Tombaugh, T.; Milin, R.	Dissociating medication effects from learning and practice effects in a neurocognitive study of schizophrenia	olanzapine versus haloperidol	Cognitive NeuroPsychiatry	2007	12	4	322–338
Boulay 2007	Boulay, L. J.; Labelle, A.; Bourget, D.; Robertson, S.; Tessier, P.; Habib, R.; Tombaugh, T.; Milin, R.; Ward, H.	Dissociating medication effects from learning and practice effects in a neurocognitive study of schizophrenia	olanzapine versus haloperidol	Schizophrenia Research	2004	67	1	204
Buchanan 1998_cognition	Arango, C.; Breier, A.; McMahon, R.; Carpenter, W. T., Jr.; Buchanan, R. W.	The relationship of clozapine and haloperidol treatment response to prefrontal, hippocampal, and caudate brain volumes		American Journal of Psychiatry	2003	160	8	1421–1427
Buchanan 1998_cognition	Arango, C.; Buchanan, R. W.; Breier, A.; MacMahon, R.; Carpenter, J. W. T.	The relationship of clozapine and haloperidol treatment response to prefrontal, hippocampal, and caudate brain volumes		Schizophrenia Research	2003	60		189
Buchanan 1998_cognition	Breier, A.; Buchanan, R. W.; Kirkpatrick, B.;	Clozapine treatment in schizophrenic outpatients	preliminary results from a double-blind efficiacy study	Schizophrenia Research	1991	4	3	315

	Carpenter, W. T.; Davies, O.; Moricle, L. A.; Irish, D.							
Buchanan 1998_cognition	Breier, A.; Buchanan, R. W.; Kirkpatrick, B.; Davis, O. R.; Irish, D.; Summerfelt, A.; Carpenter, W. T., Jr.	Effects of clozapine on positive and negative symptoms in outpatients with schizophrenia		American Journal of Psychiatry	1994	151	1	20–26
Buchanan 1998_cognition	Breier, A.; Buchanan, R. W.; Waltrip, R. W.; Listwak, S.; Holmes, C.; Goldstein, D. S.	The effect of clozapine on plasma norepinephrine	relationship to clinical efficacy	Neuropyschopharmacology	1994	10	1	1–7
Buchanan 1998_cognition	Buchanan, R. W.; Breier, A.; Kirkpatrick, B.; Ball, P.; Carpenter, W. T., Jr.	Positive and negative symptom response to clozapine in schizophrenic patients with and without the deficit syndrome		American Journal of Psychiatry	1998	155	6	751–760
Buchanan 1998_cognition	Buchanan, R. W.; Holstein, C.; Breier, A.	The comparative efficacy and long-term effect of clozapine treatment on neuropsychological test performance		Biological Psychiatry	1994	36	11	717–725
Buchanan 1998_cognition	Buchanan, R. W.; Koeppl, P.; Breier, A.	Stability of neurological signs with clozapine treatment		Biological Psychiatry	1994	36	3	198–200
Buchanan 1998_cognition	Bustillo, J.; Lauriello, J.; Rowland, L. M.; Keith, S. J.; Harrington, D. L.; Bish, J.; Brooks, W.	Differential brain effects of chronic exposure to haloperidol and quetiapine in antipsychotic-naive schizophrenia	a longitudinal protonmagnetic resonance spectroscopy study	Schizophrenia Research	2001	49	1-2	192
Buchanan 1998_cognition	Bustillo, J. R.; Buchanan, R. W.; Irish, D.; Breier, A.	Differential effect of clozapine on weight	a controlled study	American Journal of Psychiatry	1996	153	6	817–819
Buller 2011	Buller, R.; Mittoux, A.; Green, M. F.; Keefe, R.; Forray, C.; Schooler, N.; Marder, S.	A randomized, double-blind, parallelgroup, flexible-dose study exploringthe neurocognitive effect of sertindole vs. Quetiapine in patients with schizophrenia using the matrics consensus cognitive battery (mccb)		Schizophrenia Bulletin	2011	37		298
Canive 2006	Edgar, J. C.; LaNoue, M.; Heller, W.; Weisend,	Regional changes in alpha power reflect changes in symptoms in patients with schizo-		Schizophrenia Research	2002	53	3 Suppl 1	219

	M. P.; Miller, G. A.; Morey, R. A.; Canive, J. M.	phrenia, olanzapine and risperidone treated						
Canive 2006	Canive, J.; LaNoue, M.; Heller, W.; Edgar, J. C.; Sherwood, A. F.; Thoma, R.; Miller, G. A.	Regional brain activity and functional connectivity in schizophrenia		International Journal of Neuropsychopharmacology	2002	5	Suppl 1	S82
Canive 2006	Canive, J. M.; Edgar, J. C.; LaNoue, M.; Miller, G. A.; Tuason, V. B.	The effects of olanzapine and risperidone on meg recorded spontaneous brain activity		International Journal of Neuropsychopharmacology	2000	3	Suppl 1	S167
Canive 2006	Canive, J. M.; Edgar, J. C.; LaNoue, M. D.; Miller, G. A.; Weisend, M. P.; Tuason, V. B.	A magnetoencephalographic examination on the effects of olanzapine and risperidone in patients with schizophrenia		Proceedings of the 40th Annual Meeting of the New Clinical Drug Evaluation Unit; 2000 May 30 - Jun 2; Boca Raton, Florida, USA	2000			131
Canive 2006	Canive, J. M.; LaNoue, M.; Heller, W.; Edgar, J. C.; Miller, G. A.	Fronto-temporal disconnection and negative symptoms in schizophrenia		European Neuropsychopharmacology	2001	11	3	295
Canive 2006	Canive, J. M.; LaNoue, M.; Heller, W.; Edgar, J. C.; Miller, G. A.	Functional connectivity and regional brain activity in schizophrenia		European Neuropsychopharmacology	2002	12	Suppl 3	S272
Canive 2006	Canive, J. M.; Miller, G. A.; Irwin, J. G.; Moses, S. N.; Thoma, R. J.; Edgar, J. C.; Sherwood, A.; Torres, F.; LaNoue, M.; Lewis, S.; Hanlon, F. M.; Weisend, M. P.; Mead, V.; Tuason, V. B.	Efficacy of olanzapine and risperidone in schizophrenia	a randomized double-blind crossover design	Psychopharmacology Bulletin	2006	39	1	105–116
Canive 2006	Irwin, J.; Moses, S. N.; Edgar, J. C.; Torres, F.; Thoma, R. J.; Hanlon, F. M.; Anderson, L.; Weisend, M. P.; Miller, G. A.; Tuason, V. B.; Canive, J. M.	Olanzapine and risperidone in schizophrenia	a randomized double-blind crossover study	Schizophrenia Research	2003	60		286

Cantillon 2014	Nct	Rp5063 in subjects with schizophrenia or schizoaffective disorder		https://ClinicalTrials.gov/	2011			
Cantillon 2014	Cantillon, M.	Efficacy and safety of novel dopamine serotonin stabilizer rp 5063 in acute schizophrenia and schizoaffective disorder		Schizophrenia Research	2014	153	Suppl.1	S22
Cantillon 2014	Cantillon, M.; Prakash, A.; Alexander, A.; Ings, R.; Sweitzer, D.; Bhat, L.	Dopamine serotonin stabilizer RP5063	A randomized, double-blind, placebo-controlled multicenter trial of safety and efficacy in exacerbation of schizophrenia or schizoaffective disorder	Schizophrenia Research	2017	189		126–133
ChiCTR2200060542	ChiCTR2200060542	A 16-Week, Randomized, Open label, Haloperidol-Controlled Study to Evaluate the Efficacy of Ziprasidone in Improving Social Cognitive Function of Patients with Schizophrenia		https://trialsearch.who.int/Trial2.aspx?TrialID=ChiCTR2200060542	2022			
ChiCTR2200061843	ChiCTR2200061843	An 24-Week, Randomized, Open-Label, Haloperidol-Controlled Study to Evaluate the Efficacy of Quetiapine in Improving Social Cognitive Function of Patients with Schizophrenia		https://trialsearch.who.int/Trial2.aspx?TrialID=ChiCTR2200061843	2022			
ChiCTR-IPR-15007635	ChiCtr-Ipr	An 16-Week, Randomized, Open label, Haloperidol-Controlled Study to Evaluate the Efficacy of Paliperidone In Improving Social Cognitive Function of Patients with Schizophrenia		http://apps.who.int/trialsearch/	2015			
ChiCTR-IPR-15007635	Zhong, J.; Zhu, H.; Yin, D.; Ning, Y.; Zheng, S.; Zhang, Y.; Jia, H.	Paliperidone Compared with Haloperidol on the Theory of Mind Tasks in Schizophrenia: A Pilot Trial		Neuropsychiatr Dis Treat	2021	17	10.2147/ndt.S335597	3683–3691
Citrome 2012_cognition	Nct	Lurasidone HCl - a long term safety phase 3 study of		https://ClinicalTrials.gov/	2008			

		patients with clinically stable schizophrenia						
Citrome 2012_cognition	Newcomer, J.; Pikalov, A.; Watabe, K.; Cucchiaro, J.; Rajagopalan, K.; Loebel, A.	Effect of long-term treatment with lurasidone or risperidone on metabolic syndrome status in patients with schizophrenia		International Journal of Neuropsychopharmacology	2014	17		149
Citrome 2012_cognition	Newcomer, J.; Pikalov, A.; Watabe, K.; Cucchiaro, J.; Rajagopalan, K.; Loebel, A.	Effect of lurasidone or risperidone on metabolic syndrome status in patients with schizophrenia	A post hoc analysis of a long-term study	European Neuropsychopharmacology	2014	24		S558-S559
Citrome 2012_cognition	Newcomer, J.; Tocco, M.; Pikalov, A.; Zheng, H.; Cucchiaro, J.; Loebel, A.	Metabolic syndrome in patients with schizophrenia receiving long-term treatment with lurasidone, extended release quetiapine, or risperidone		European Neuropsychopharmacology	2016	26		S564
Citrome 2012_cognition	Newcomer, J. W.; Pikalov, A.; Watabe, K.; Cucchiaro, J.; Rajagopalan, K.; Loebel, A.	Effect of long-term treatment with lurasidone or risperidone on metabolic syndrome status in patients with schizophrenia		Schizophrenia Research	2014	153		S349
Citrome 2012_cognition	Alcock, S.	Phase 3 long-term safety, tolerability and effectiveness of lurasidone in subjects with schizophrenia or schizoaffective disorder	a randomised, active comparator-controlled trial	http://www.isrctn.com/	2008			
Citrome 2012_cognition	Citrome, L.; Cucchiaro, J.; Sarma, K.; Phillips, D.; Silva, R.; Tsuchiya, S.; Loebel, A.	Long-term safety and tolerability of lurasidone in schizophrenia	A 12-month, double-blind, active-controlled study	International Clinical Psychopharmacology	2012	27	3	165–176
Citrome 2012_cognition	Patel, P. J.; Weidenfeller, C.; Jones, A. P.; Nilsson, J.; Hsu, J.	Long-Term Assessment of Lurasidone in Schizophrenia: Post Hoc Analysis of a 12-Month, Double Blind, Active-Controlled Trial and 6-Month Open-Label Extension Study		Neurology and therapy (Neurol Ther)	2021	10	1	121–147
Citrome 2012_cognition	Tocco, M.; Newcomer, Jw; Mao, Y.; Pikalov, A.; Loebel, A.	Lurasidone and Risk for Metabolic Syndrome: Results from Short and Long-term Clinical Studies in Patients with Schizophrenia		CNS Spectrums	2020			InPress

Citrome 2012_cognition	Mattingly, Gw; Haddad, Pm; Tocco, M.; Xu, J.; Phillips, D.; Pikalov, A.; Loebel, A.	Switching to Lurasidone following 12-months of treatment with Risperidone: results of a 6-month, open-label study		BMC psychiatry	2020		1	199
Citrome 2012_cognition	Patel, Pj; Weidenfeller, C.; Jones, Ap; Nilsson, J.; Hsu, J.	Long-Term Assessment of Lurasidone in Schizophrenia: Post Hoc Analysis of a 12-Month, Double Blind, Active-Controlled Trial and 6-Month Open-Label Extension Study		Neurology & Therapy	2020			24
Citrome 2015	Nct	Brexpiprazole (OPC-34712) Trial in the Treatment of Adults With Acute Schizophrenia		https://ClinicalTrials.gov/	2014			
Citrome 2015	Citrome, L.; Ota, A.; Nagamizu, K.; Perry, P.; Weiller, E.; Baker, R.	Brexpiprazole (OPC-34712) vs aripiprazole in adults with acute schizophrenia	A multicenter, randomized, open-label, flexible-dose, exploratory study	European Neuropsychopharmacology	2015	25		S516-S517
Citrome 2015	Citrome, L.; Ota, A.; Nagamizu, K.; Perry, P.; Weiller, E.; Baker, R.	The effect of brexpiprazole (OPC-34712) versus aripiprazole in adult patients with acute schizophrenia	An exploratory study	Biological Psychiatry	2015	77	9	203S
Citrome 2015	Citrome, L.; Ota, A.; Nagamizu, K.; Perry, P.; Weiller, E.; Baker, R. A.	The effect of brexpiprazole (OPC-34712) and aripiprazole in adult patients with acute schizophrenia	results from a randomized, exploratory study	International Clinical Psychopharmacology	2016	31		192–201
Clark 1961	Ray, T. S.; Ragland, R. E.; Clark, M. L.	Chlorpromazine in chronic schizophrenic women	comparison of differential effects on various psychological modalities during and after treatment	Journal of Nervous and Mental Disease	1964	138		348–353
Clark 1961	Clark, M. L.; Ray, T. S.; Paredes, A.; Costiloe, J. P.; Chappell, J. S.; Hagans, J. A.; Wolf, S.	Chlorpromazine in chronic schizophrenic women	I. experimental design and effects at maximum point of treatment	Psychopharmacology	1961	2		107–136
Clark 1961	Clark, M. L.; Ray, T. S.; Ragland, R. E.	Chlorpromazine in chronic schizophrenic women	rate of onset and rate of dissipation of drug effects	Psychosomatic Medicine	1963	25		212–217
Clark 1967	Clark, M.; Dubowski, K.; Colmore, J.	The effect of chlorpromazine on serum cholesterol in chronic schizophrenic patients		Clinical Pharmacology and Therapeutics	1970	11		883–889
Clark 1967	Clark, M. L.; Ray, T. S.; Paredes, A.; Ragland, R.	Chlorpromazine in women with chronic schizophrenia	the effect on cholesterol levels and cholesterol-behavior relationships	Psychosomatic Medicine	1967	29		634–642

	E.; Costiloe, J. P.; Smith, C. W.; Wolf, S.							
Clark 1968a	Clark, M. L.; Ray, T. S.; Huber, W. K.; Willis, D.; Ramsey, H. R.	Evaluation of butaperazine in chronic schizophrenia		Clinical Pharmacology and Therapeutics	1968	9	6	757–764
Clark 1970a	Clark, M.; Dubowski, K.; Colmore, J.	The effect of chlorpromazine on serum cholesterol in chronic schizophrenic patients		Clinical Pharmacology and Therapeutics	1970	11		883–889
Clark 1970a	Clark, M. L.; Huber, W. K.; Sakata, K.; Fowles, D. C.; Serafetinides, E. A.	Molindone in chronic schizophrenia		Clinical Pharmacology and Therapeutics	1970	11	5	680–688
Clark 1971a	Serafetinides, E. A.; Willis, D.; Clark, M. L.	The EEG effects of dibenzoxazepines (loxapine succinate) as compared to CPZ	EEG changes as drug side effects	International PharmacoPsychiatry	1971	6	1	38–44
Clark 1971a	Clark, M.; Huber, W. K.; Sullivan, J.; Wood, F.; Costiloe, J. P.	Evaluation of loxapine succinate in chronic schizophrenia		Diseases of the Nervous System	1972	33	12	783–791
Clark 1971a	Clark, M. L.; Huber, W. K.; Charalampous, K. D.; Serafetinides, E. A.; Trousdale, W.; Colmore, J. P.	Drug treatment in newly admitted schizophrenic patients		Archives of General Psychiatry	1971	25	5	404–409
Conley 2001	Myers, J.; Mahmoud, R.; Berry, S.; Conley, R.	Risperidone versus olanzapine for the treatment of mood symptoms in patients with schizophrenia and schizoaffective disorder		Bipolar Disorders	2001	3	Suppl 1	49
Conley 2001	Myers, J. E.; Mahmoud, R.; Berry, S.; Conley, R. R.	Risperidone versus olanzapine for the treatment of mood symptoms in patients with schizophrenia and schizoaffective disorder		European Neuropsychopharmacology	2001	11	3	254
Conley 2001	Myers, J. E.; Mahmoud, R. A.; Berry, S. A.; Conley, R. R.	Risperidone versus olanzapine for the treatment of mood symptoms in patients with schizophrenia and schizoaffective disorder		Proceedings of the 154th Annual Meeting of the American Psychiatric Association; 2001 May 5-10; New Orleans, Louisiana, USA	2001			

Conley 2001	Myers, J. E.; Mahmoud, R. A.; Berry, S. A.; Conley, R. R.	Risperidone versus olanzapine for the treatment of mood symptoms in patients with schizophrenia and schizoaffective disorder		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Conley 2001	Myers, J. E.; Mahmoud, R. A.; Keith, S. J.; Csernansky, J. G.	Long-term benefit of risperidone versus haloperidol for affective symptoms in patients with schizophrenia and schizoaffective disorder		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Conley 2001	Robinson, G.; Wheeler, A.; Byrd, J.; Visser, S.	Longer-term effects of switching from typical to atypical antipsychotics in patients with stable schizophrenia		European Neuropsychopharmacology	2000	10	Suppl 3	S291
Conley 2001	Anonymous	Comparison of atypical neuroleptic drugs. Efficacy of risperidone in acute exacerbation and in recurrent prophylaxis		Nervenheilkunde	2000	19	3	96–97
Conley 2001	Anonymous	Risperidone, an antipsychotic with proven long-term efficacy		Le Concours Medical	2000			885
Conley 2001	Berry, S.; Martinez, R.; Myers, J. E.; Mahmoud, R.	Serum prolactin in schizophrenia		Proceedings of the 7th World Congress of Biological Psychiatry; 2001 Jul 1-6; Berlin, Germany	2001	2	Suppl 1	
Conley 2001	Berry, S.; Martinez, R. A.; Myers, J. E.; Mahmoud, R.	Serum prolactin in schizophrenia		European Neuropsychopharmacology	2001	11	3	257
Conley 2001	Berry, S. A.; Gudelsky, G. A.; Mahmoud, R. A.	Serum prolactin levels in schizophrenia		Biological Psychiatry	2001	49	8	22S
Conley 2001	Berry, S. A.; Martinez, R. A.; Gudelsky, G. A.; Mahmoud, R.; Myers, J.	Serum prolactin levels in schizophrenia		Schizophrenia Research	2001	49	1-2	280–281
Conley 2001	Berry, S. A.; Martinez, R. A.; Gudelsky, G. A.; Myers, J. E.; Mahmoud, R. A.	Serum prolactin in schizophrenia		Proceedings of the 39th Annual Meeting of the American College of Neuropsychopharmacology; 2000 Dec 10-14; San Juan, Puerto Rico	2000			
Conley 2001	Berry, S. A.; Martinez, R. A.; Gudelsky, G. A.; Myers, J. E.; Mahmoud, R. A.	Serum prolactin levels in schizophrenia		Proceedings of the 154th Annual Meeting of the American Psychiatric Association; 2001 May 5-10; New Orleans, Louisiana, USA	2001			

Conley 2001	Brecher, M.	Risperidone versus olanzapine in the treatment of patients with schizophrenia or schizoaffective disorder		Proceedings of the 11th European College of Neuropsychopharmacology Congress; 1998 Oct 31 - Nov 4; Paris, France	1998			
Conley 2001	Brecher, M.; The, Risperidone Olanzapine Study Group	Risperidone versus olanzapine in the treatment of patients with schizophrenia or schizoaffective disorder		Proceedings of the 21st Collegium Internationale Neuro-Psychopharmacologicum Congress; 1998 Jul 12-16; Glasgow, UK	1998			
Conley 2001	Brecher, M.; The, Risperidone-Olanzapine Study Group	Risperidone versus olanzapine in the treatment of patients with schizophrenia or schizoaffective disorder conference abstract		Schizophrenia Research	1999	36	1-3	271
Conley 2001	Conley, R. R.; Mahmoud, R.	Efficacy of risperidone vs. olanzapine in the treatment of patients with schizophrenia or schizoaffective disorder		International Journal of Neuropsychopharmacology	2000	3	Suppl 1	S151
Conley 2001	Conley, R. R.; Mahmoud, R.	Efficacy of risperidone vs. olanzapine in the treatment of patients with schizophrenia or schizoaffective disorder		European Neuropsychopharmacology	2000	10	Suppl 3	S343
Conley 2001	Conley, R. R.; Brecher, M.; The, Risperidone Olanzapine Study Group	Risperidone versus olanzapine in patients with schizophrenia or schizoaffective disorders		Proceedings of the 11th European College of Neuropsychopharmacology Congress; 1998 Oct 31 - Nov 4; Paris, France	1998			
Conley 2001	Conley, R. R.; Brecher, M. B.; Olanzapine-Risperidone, Study Group	Risperidone versus olanzapine in the treatment of patients with schizophrenia or schizoaffective disorder		Proceedings of the 152nd Annual Meeting of the American Psychiatric Association; 1999 May 15-20; Washington DC, USA	1999			
Conley 2001	Conley, R. R.; Mahmoud, R.	Risperidone vs olanzapine in patients with schizophrenia & schizoaffective disorder		Proceedings of the 40th Annual Meeting of the New Clinical Drug Evaluation Unit; 2000 May 30 - Jun 2; Boca Raton, Florida, USA	2000			
Conley 2001	Conley, R. R.; Mahmoud, R.	Risperidone vs olanzapine in patients with schizophrenia and schizo-affective disorder		International Drug Therapy Newsletter	2000	35	10	77–78
Conley 2001	Conley, R. R.; Mahmoud, R.	Risperidone vs. olanzapine in the treatment of patients with schizophrenia or schizoaffective disorder	safety comparisons	International Journal of Neuropsychopharmacology	2000	3	Suppl 1	S151
Conley 2001	Conley, R. R.; Mahmoud, R.	Risperidone vs. olanzapine in the treatment of patients with schizophrenia or	safety comparisons	European Neuropsychopharmacology	2000	10	Suppl 3	S342

		schizoaffective disorder						
Conley 2001	Conley, R. R.; Mahmoud, R.	A randomized double-blind study of risperidone and olanzapine in the treatment of schizophrenia or schizoaffective disorder		American Journal of Psychiatry	2001	158	5	765–774
Conley 2001	Conley, R. R.; Mahmoud, R.	A randomized double-blind study of risperidone and olanzapine in the treatment of schizophrenia or schizoaffective disorder (vol 158, pg 765, 2001)		American Journal of Psychiatry	2001	158	10	1759
Conley 2001	Conley, R. R.; Mahmoud, R.	Risperidone and olanzapine in people with schizophrenia or schizoaffective disorder	a randomised double-blind study	Data on File	2001			
Conley 2001	Conley, R. R.; Mahmoud, R.; Risperidone, Study Group	Risperidone versus olanzapine in patients with schizophrenia and schizoaffective disorder		Proceedings of the 10th Biennial Winter Workshop on Schizophrenia; 2000 Feb 5-11; Davos, Switzerland	2000			
Conley 2001	Conley, R. R.; Mahmoud, R.; Risperidone, Study Group	Risperidone versus olanzapine in patients with schizophrenia and schizoaffective psychosis		Nervenheilkunde	2000	19	5	110–112
Conley 2001	Conley, R. R.; Mahmoud, R. A.	Risperidone versus olanzapine in patients with schizophrenia and schizoaffective disorder		Proceedings of the 153rd Annual Meeting of the American Psychiatric Association; 2000 May 13-18; Chicago, Illinois, USA	2000			
Conley 2001	Conley, R. R.; Mahmoud, R. A.	Risperidone versus olanzapine in patients with schizophrenia and schizoaffective disorder		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Conley 2001	Conley, R. R.; Mahmoud, R. Risperidone Study Group	Risperidone vs. olanzapine in patients with schizophrenia and schizoaffective disorder		Biological Psychiatry	2000	47		32S
Conley 2001	Harvey, P.; Meltzer, H.; Green, M.	Risperidone cognitive effects in schizophrenia and schizoaffective patients		International Drug Therapy Newsletter	2001	36	8	59
Conley 2001	Harvey, P.; Meltzer, H. Y.; Green, M. P.	Cognitive effects of risperidone versus olanzapine in patients with schizophrenia or schizoaffective disorder		Proceedings of the 7th World Congress of Biological Psychiatry; 2001 Jul 1-6; Berlin, Germany	2001	2	Suppl 1	
Conley 2001	Harvey, P.; Melzer, H.; Green, M.	Cognitive effects of risperidone and olanzapine in patients with schizophrenia or		Biological Psychiatry	2001	49	8	123S

		schizoaffective disorder						
Conley 2001	Harvey, P. D.	Cognitive effects of risperidone and olanzapine in patients with schizophrenia		Proceedings of the 52nd Institute on Psychiatric Services; 2000 Oct 25-29; Philadelphia, Pennsylvania, USA	2000			
Conley 2001	Harvey, P. D.	Cognitive effects of risperidone and olanzapine in patients with schizophrenia or schizoaffective disorder		Proceedings of the 153rd Annual Meeting of the American Psychiatric Association; 2000 May 13-18; Chicago, Illinois, USA	2000			
Conley 2001	Harvey, P. D.	Cognitive effects of risperidone and olanzapine in patients with schizophrenia or schizoaffective disorder		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Conley 2001	Harvey, P. D.; Gharabawi, G.	Risperidone and cognition in schizophrenic elderly		Proceedings of the 12th World Congress of Psychiatry; 2002 Aug 24-29; Yokohama, Japan	2002			
Conley 2001	Harvey, P. D.; Green, M. F.; McGurk, S. R.; Meltzer, H. Y.	Changes in cognitive functioning with risperidone and olanzapine treatment	a large-scale, double-blind, randomized study	Psychopharmacology	2003	169	3-4	404–411
Conley 2001	Harvey, P. D.; Mahmoud, R.; Meltzer, H. Y.; Green, M. P.	Cognitive effects of risperidone and olanzapine in patients with schizophrenia or schizoaffective disorder		European Neuropsychopharmacology	2001	11	3	257
Conley 2001	Harvey, P. D.; Meltzer, H. Y.; Green, M.	Cognitive effects of risperidone and olanzapine in patients with schizophrenia or schizoaffective disorder		Proceedings of the 39th Annual Meeting of the American College of Neuropsychopharmacology; 2000 Dec 10-14; San Juan, Puerto Rico	2000			
Conley 2001	Harvey, P. D.; Meltzer, H. Y.; Green, M. F.	Cognitive effects of risperidone and olanzapine in patients with schizophrenia or schizoaffective disorder		Proceedings of the 40th Annual Meeting of the New Clinical Drug Evaluation Unit; 2000 May 30 - Jun 2; Boca Raton, Florida, USA	2000			
Conley 2001	Kelly, D. L.; Conley, R. R.; Love, R. C.; Morrison, J. A.; McMahon, R. P.	Metabolic risk with second-generation antipsychotic treatment	a double-blind randomized 8-week trial of risperidone and olanzapine	Annals of Clinical Psychiatry	2008	20	2	71–78
Conley 2001	Lasser, R. A.; Mao, L.; Gharabawi, G.	Smokers and nonsmokers equally affected by olanzapine-induced weight gain	metabolic implications	Schizophrenia Research	2004	66	2-3	163–167
Conley 2001	Mahmoud, R.; Harvey, P. D.; Meltzer, H. Y.; Green, M. F.	Cognitive effects of risperidone and olanzapine in patients with schizophrenia or schizoaffective disorder		Schizophrenia Research	2001	49	1-2	236–237

Conley 2001	Mahmoud, R. A.; Engelhart, L. M.; Janagap, C.; Awad, G.	Assessment of symptoms affecting quality of life and patient satisfaction with antipsychotic drugs	new insights for a trial of risperidone/olanzapine	Proceedings of the 152nd Annual Meeting of the American Psychiatric Association; 1999 May 15-20; Washington DC, USA	1999			
Conley 2001	Mahmoud, R. A.; Engelhart, L. M.; Janagap, C.; Dogherty, J.	Symptoms commonly attributed to prolactin	a new assessment tool and findings from a trial of risperidone versus olanzapine	Proceedings of the 152nd Annual Meeting of the American Psychiatric Association; 1999 May 15-20; Washington DC, USA	1999			
Conley 2001	Martinez, R. A.; Berry, S. A.; Gudelsky, G. A.; Myers, J. E.; Mahmoud, R. A.	Serum prolactin levels in schizophrenia		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Conley 2005	Nct	New antipsychotic strategies	quetiapine and risperidone vs. fluphenazine in treatment resistant schizophrenia	https://ClinicalTrials.gov/	2005			
Conley 2005	Richardson, C. M.; Kelly, D. L.; Gold, J. M.; McMahon, R.; Yu, Y.; Conley, R. R.	Risperidone vs quetiapine vs fluphenazine in treatment - resistant schizophrenia	neuropsychological outcome	Schizophrenia Bulletin	2005	31		501–502
Conley 2005	Conley, R. R.; Kelly, D. L.; Nelson, M. W.; Richardson, C. M.; Feldman, S.; Benham, R.; Steiner, P.; Yu, Y.; Khan, I.; McMullen, R.; Gale, E.; Mackowick, M.; Love, R. C.	Risperidone, quetiapine, and fluphenazine in the treatment of patients with therapy-refractory schizophrenia		Clinical Neuropharmacology	2005	28	4	163–168
Conley 2005	Greenspan, A.; Gharabawi, G.; Kwentus, J.	Thyroid dysfunction during treatment with atypical antipsychotics		Journal of Clinical Psychiatry	2005	66	10	1334–1335
Conley 2005	Kelly, D.; Conley, R. R.	Sexual side effects of quetiapine and risperidone compared with fluphenazine		Stanley Foundation Research Programs	1999			
Conley 2005	Kelly, D. L.; Conley, R. R.	Thyroid function in treatment-resistant schizophrenia patients treated with quetiapine, risperidone, or fluphenazine		Journal of Clinical Psychiatry	2005	66	1	80–84
Kahn 2008	Boter, H.	The European First Episode Schizophrenia Trial (EUFEST)	comparison of outcome in first episode schizophrenia with different low dose antipsychotic drug regimens	http://www.isrctn.com/	2005			
Kahn 2008	Boter, H.; Derks, E.	Generalizability of the results of	comparisons between subgroups of participants	Journal of Clinical Psychiatry	2010	71	1	58–65

	M.; Fleischhacker, W. W.; Davidson, M.; Kahn, R. S.; Grp, E. S.	efficacy trials in first-episode schizophrenia	of the European First Episode Schizophrenia Trial (EUFEST)					
Kahn 2008	Boter, H.; Peuskens, J.; Libiger, J.; Fleischhacker, W. W.; Davidson, M.; Galderisi, S.; Kahn, R. S.	Effectiveness of antipsychotics in first-episode schizophrenia and schizophreniform disorder on response and remission	an open randomized clinical trial (EUFEST)	Schizophrenia Research	2009	115	2-3	97–103
Kahn 2008	Ceskova, E.; Prikryl, R.; Libiger, J.	Gender differences in the pharmacotherapy of schizophrenia		International Journal of Neuropsychopharmacology	2014	17		66
Kahn 2008	Ceskova, E.; Prikryl, R.; Libiger, J.; Svancara, J.; Jarkovsky, J.	Gender differences in the treatment of first-episode schizophrenia	Results from the European First Episode Schizophrenia Trial	Schizophrenia Research	2015	169	1-3	303–307
Kahn 2008	Czobor, P.; Van, Dorn R. A.; Citrome, L.; Kahn, R. S.; Fleischhacker, W. W.; Volavka, J.	Treatment adherence in schizophrenia	A patient-level meta-analysis of combined CATIE and EUFEST studies	European Neuropsychopharmacology	2015	25	8	1158–1166
Kahn 2008	Davidson, M.; Galderisi, S.; Weiser, M.; Werbeloff, N.; Fleischhacker, W. W.; Keefe, R. S.; Boter, H.; Keet, I. P.; Prelipceanu, D.; Rybakowski, J. K.; Libiger, J.; Hummer, M.; Dollfus, S.; Lopez-Ibor, J. J.; Hranov, L. G.; Gaebel, W.; Peuskens, J.; Linde	Cognitive effects of antipsychotic drugs in first-episode schizophrenia and schizophreniform disorder	a randomized, open-label clinical trial (EUFEST)	American Journal of Psychiatry	2009	166	6	675–682
Kahn 2008	Davidson, M.; Galderisi, S.; Weiser, M.; Werbeloff, N.; Fleischhacker, W. W.; Keefe, R. S.; Boter, H.; Keet, I. P. M.; Prelipceanu,	"Cognitive effects of antipsychotic drugs in first-episode schizophrenia and schizophreniform disorder	a randomized, open-label clinical trial (EUFEST)": correction	American Journal of Psychiatry	2009	166	6	731

	D.; Rybakowski, J. K.; Libiger, J.; Hummer, M.; Dollfus, S.; Lopez-Ibor, J. J.; Hranov, L. G.; Gaebel, W.; Peuskens, J.; Li							
Kahn 2008	Fleischhacker, W.	Clinical predictors of response/remission in antipsychotic-naive first episode patients		Neuropsychopharmacology	2010	35		S27
Lieberman 2003b	Nebhinani, N.; Grover, S.	Clozapine v. Chlorpromazine in treatment-naive first-episode schizophrenia		British Journal of Psychiatry	2012	200	2	165; autho
Lieberman 2003b	Wang, P. S.; Ganz, D. A.; Benner, J. S.; Glynn, R. J.; Avorn, J.	Should clozapine continue to be restricted to third-line status for schizophrenia?	: A decision-analytic model	Journal of Mental Health Policy and Economics	2004	7	2	77–85
Lieberman 2003b	Girgis, R. R.; Phillips, M. R.; Li, X.; Li, K.; Jiang, H.; Wu, C.; Duan, N.; Niu, Y.; Lieberman, J. A.	Clozapine v chlorpromazine in treatment-naïve, first-episode schizophrenia	9 year outcomes of a randomised clinical trial	British Journal of Psychiatry	2011	199	4	281–288
Lieberman 2003b	Girgis, R. R.; Phillips, M. R.; Li, X.; Li, K.; Jiang, H.; Wu, C.; Duan, N.; Niu, Y.; Lieberman, J. A.	Clozapine v. Chlorpromazine in treatment-naive, first-episode schizophrenia	9-year outcomes of a randomised clinical trial	British Journal of Psychiatry	2011	199	4	281–288
Lieberman 2003b	Lieberman, J. A.; Phillips, M.; Gu, H.; Bilder, R.; Zhang, P.; Ji, Z.; Koch, G.	Effects of atypical and conventional antipsychotic drugs on cognitive performance in treatment naive first - episode schizophrenia	a 3 year randomized trial of clozapine versus chlorpromazine	Schizophrenia Bulletin	2005	31		493
Lieberman 2003b	Lieberman, J. A.; Phillips, M.; Gu, H.; Stroup, S.; Zhang, P.; Kong, L.; Ji, Z.; Koch, G.; Hamer, R. M.	Atypical and conventional antipsychotic drugs in treatment-naïve first-episode schizophrenia	a 52-week randomized trial of clozapine vs chlorpromazine	Neuropyschopharmacology	2003	28		995–1003
Lieberman 2003b	Lieberman, J. A.; Phillips, M.; Kong, L.; Gu, H.; Koch, G.	Efficacy and safety of clozapine versus chlorpromazaine in first-episode psychosis	results of a 52 week randomized double blind trial	Proceedings of the 39th Annual Meeting of the American College of Neuropsychopharmacology; 2000 Dec 10-14; San Juan, Puerto Rico	2000			

Lieberman 2003b	Lieberman, J. A.; Phillips, M.; Kong, L.; Gu, H.; Koch, G.	Efficacy and safety of clozapine versus chlorpromazine in first episode psychosis	results of a 52-week randomized double-blind trial	Schizophrenia Research	2001	49	1-2	236
Loebel 2013	Harvey, P. D.; Siu, C.; Cucchiaro, J.; Pikalov, A.; Loebel, A.	Neurocognitive functioning and impairment in awareness of illness in schizophrenia	Baseline correlations and treatment effects	Neuropsychopharmacology	2012	38	S1	S270
Loebel 2013	Harvey, P. D.; Siu, C.; Loebel, A.; Cucchiaro, J.; Pikalov, A.	Awareness of illness as a predictor of cooperation with cognitive assessments and cognitive benefits of atypical antipsychotic medication		Schizophrenia Bulletin	2013	39		S333
Loebel 2013	Harvey, P. D.; Siu, C. O.; Hsu, J.; Cucchiaro, J.; Maruff, P.; Loebel, A.	Effect of lurasidone on neurocognitive performance in patients with schizophrenia	A short-term placebo- and active-controlled study followed by a 6-month double-blind extension	European Neuropsychopharmacology	2013	23	11	1373–1382
Loebel 2013	Harvey, P. D.; Siu, C. O.; Loebel, A. D.	Change in daytime sleepiness and cognitive function in a 6-month, double-blind study of lurasidone and quetiapine XR in patients with schizophrenia		Schizophrenia Research: Cognition	2016	5		7–12
Loebel 2013	Harvey, P. D.; Siu, C. O.; Loebel, A. D.	Insight and Treatment Outcomes in Schizophrenia	Post-hoc Analysis of a Long-term, Double-blind Study Comparing Lurasidone and Quetiapine XR	Innovations in Clinical Neuroscience	2017	14	11-12	23–29
Loebel 2013	Harvey, P. D.; Siu, C. O.; Ogasa, M.; Loebel, A.	Effect of lurasidone dose on cognition in patients with schizophrenia	Post-hoc analysis of a long-term, double-blind continuation study	Schizophrenia Research	2015	166	1-3	334–338
Loebel 2013	Isrctn	A phase III randomised, double-blind, active comparator-controlled clinical trial to study the safety and efficacy of lurasidone in subjects with schizophrenia (PEARL 3 extension study)		http://www.isrctn.com/	2009			
Loebel 2013	Isrctn	Safety and efficacy trial of two doses of lurasidone in acutely psychotic subjects with schizophrenia (PEARL 3)		http://www.isrctn.com/	2009			
Conley 2005	Kelly, D. L.; Conley, R. R.	A randomized double-blind 12-week study of quetiapine, risperidone or fluphenazine on sexual functioning in people with schizophrenia		Psychoneuroendocrinology	2006	31	3	340–346

Csernansky 2002	Myers, J.; Mahmoud, R.; Keith, S. J.; Csernansky, J. G.	The long-term benefit of risperidone vs. haloperidol for affective symptoms in patients with schizophrenia and schizoaffective disorder		Proceedings of the 39th Annual Meeting of the American College of Neuropsychopharmacology; 2000 Dec 10-14; San Juan, Puerto Rico	2000			
Csernansky 2002	Myers, J.; Mahmoud, R.; Keith, S. J.; Csernansky, J. G.	The long-term benefit of risperidone versus haloperidol for affective symptoms in schizophrenia and schizoaffective disorder		Schizophrenia Research	2001	49	1-2	240
Csernansky 2002	Myers, J. E.; Mahmoud, R. A.; Keith, S. J.; Csernansky, J. G.	Long-term benefit of risperidone versus haloperidol for affective symptoms in patients with schizophrenia and schizoaffective disorder		Proceedings of the 154th Annual Meeting of the American Psychiatric Association; 2001 May 5-10; New Orleans, Louisiana, USA	2001			
Csernansky 2002	Nct	A comparison of risperidone and haloperidol for prevention of relapse in subjects with schizophrenia and schizoaffective disorders		https://ClinicalTrials.gov/	2005			
Csernansky 2002	O'Connor, R.; Power, A.; Csernansky, J. G.; Brecher, M. B.; Hirsch, S.; Okamoto, A.	A 28-week comparison of flexible-dose ziprasidone with haloperidol in outpatients with stable schizophrenia	risperidone versus haloperidol for prevention of relapse in schizophrenia and schizoaffective disorders: a long-term, double-blind comparison	Proceedings of the 51st Institute on Psychiatric Services; 1999 Oct 25-Nov 2; New Orleans, Louisiana, USA	1999			
Csernansky 2002	Vangeneugden, T.; Augustyns, I.; Curinckx, H.; Inghama, M.; Mahmoud, R.	Long-term relapse prevention	a stratified dose comparison of risperidone and haloperidol	Schizophrenia Research	2002	53	3 Suppl 1	175–176
Csernansky 2002	Anonymous	Comparison of atypical neuroleptic drugs. Efficacy of risperidone in acute exacerbation and in recurrent prophylaxis		Nervenheilkunde	2000	19	3	96–97
Csernansky 2002	Anonymous	Risperidone, an antipsychotic with proven long-term efficacy		Le Concours Medical	2000			885
Csernansky 2002	Arnould, B.; Ingham, M.; Lehman, A. F.; Grogg, A.; Duchesne, I.	Antipsychotics and quality of life among stable schizophrenia patients		European Neuropsychopharmacology	2002	12	S up pl 3	S310
Csernansky 2002	Arnould, B.; Lehman, A. F.; Ingham, M.; Bréand, S.; Duchesne, I.	The impact of neuroleptic treatment on the quality of life of stable schizophrenic patients		European Neuropsychopharmacology	2001	11	3	261

Csernansky 2002	Csernansky, J.	Do novel antipsychotics optimize long term outcomes in schizophrenia		International Journal of Neuropsychopharmacology	2000	3	Suppl 1	S1
Csernansky 2002	Csernansky, J.; Brecher, M.; Okamoto, A.	Risperidone vs haloperidol	relapse prevention in schizophrenia and schizoaffective disorders: a long-term double-blind comparison	Proceedings of the 11th World Congress of Psychiatry; 1999 Aug 6-11; Hamburg, Germany	1999	2		
Csernansky 2002	Csernansky, J.; Okamoto, A.	A long term double blind comparison of risperidone and haloperidol in stable outpatients with schizophrenia or schizoaffective disorder		International Journal of Neuropsychopharmacology	2000	3	Suppl 1	S155
Csernansky 2002	Csernansky, J.; Okamoto, A.	Risperidone versus haloperidol for prevention of relapse in schizophrenia and schizoaffective disorders	long term double blind comparison	Proceedings of the 22nd Collegium Internationale Neuro-Psychopharmacologicum Congress; 2000 Jul 9-13; Brussels, Belgium	2000			
Csernansky 2002	Csernansky, J.; Okamoto, A.	Risperidone versus haloperidol for prevention of relapse in schizophrenia and schizoaffective disorders	long term double blind comparison	Schizophrenia Research	2000	41	1	198
Csernansky 2002	Csernansky, J. G.; Mahmoud, R.; Brenner, R.; The, Risperidone- U. S. A. Study Group	A comparison of risperidone and haloperidol for the prevention of relapse in patients with schizophrenia		New England Journal of Medicine	2002	346	1	16–22
Csernansky 2002	Csernansky, J. G.; Okamoto, A.	Risperidone versus haloperidol for prevention of relapse in patients with schizophrenia and schizoaffective disorder	a long-term double blind comparison	Proceedings of the 38th Annual Meeting of the American College of Neuropsychopharmacology; 1999 Dec 12-16; Acapulco, Mexico	1999			
Csernansky 2002	Csernansky, J. G.; Okamoto, A.	Risperidone versus haloperidol for relapse prevention in schizophrenia and schizoaffective disorder	a long-term double-blind placebo controlled comparison	Proceedings of the 40th Annual Meeting of the New Clinical Drug Evaluation Unit; 2000 May 30 - Jun 2; Boca Raton, Florida, USA	2000			
Csernansky 2002	Csernansky, J. G.; Okamoto, A.	Risperidone vs haloperidol for relapse prevention in schizophrenia and schizoaffective disorder	a long-term double-blind comparison	Biological Psychiatry	2000	47		31-2S
Csernansky 2002	Csernansky, J. G.; Okamoto, A.; Brecher, M.	Risperidone vs haloperidol	prevention of relapse in schizophrenia	European Neuropsychopharmacology	1999	9		S268
Csernansky 2002	Csernansky, J. G.; Okamoto, A.; Brecher, M. B.	Risperidone versus haloperidol for prevention of relapse in schizophrenia and schizoaffective disorder	a long-term, double-blind comparison	Proceedings of the 51st Institute on Psychiatric Services; 1999 Oct 25-Nov 2; New Orleans, Louisiana, USA	1999			110
Csernansky 2002	Harvey, P.; Meltzer, H.; Green, M.	Long term cognitive effects of		International Journal of Neuropsychopharmacology	2000	3	Sup	S154

		risperidone treatment in schizophrenia					pl 1	
Csernansky 2002	Harvey, P. D.	Long-term cognitive effects of risperidone treatment in schizophrenia		Proceedings of the 52nd Institute on Psychiatric Services; 2000 Oct 25-29; Philadelphia, Pennsylvania, USA	2000			
Csernansky 2002	Harvey, P. D.	Long-term cognitive effects of risperidone treatment in schizophrenia		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Csernansky 2002	Harvey, P. D.; Lyons, B. E.; Mahmoud, R.	Long term cognitive effects of risperidone		Schizophrenia Research	2000	41	1	200–201
Csernansky 2002	Harvey, P. D.; Meltzer, H. Y.; Green, M. F.	Long-term cognitive effects of risperidone treatment in schizophrenia		Proceedings of the 39th Annual Meeting of the American College of Neuropsychopharmacology; 2000 Dec 10-14; San Juan, Puerto Rico	2000			
Csernansky 2002	Martinez, R.; Brecher, M.; Risperidone, Study Group	Risperidone versus haloperidol for prevention of relapse in schizophrenia and schizoaffective disorders		Schizophrenia Research	1999	36	1-3	289
Csernansky 2002	Martinez, R. A.; Harvey, P. D.; Green, M. F.; Meltzer, H. Y.	Long-term cognitive effects of risperidone in patients with schizophrenia and schizoaffective disorder		Schizophrenia Research	2001	49	1-2	237–238
Daniel 1996	Daniel, D.	Crossover comparison of risperidone and clozapine on clinical, cognitive, and side effect measures in treatment-resistant psychosis		Psychopharmacology Bulletin	1994	30	4	629
Daniel 1996	Daniel, D. G.	Comparison of risperidone and clozapine on clinical and cognitive functions in psychotic disorders		Biological Psychiatry	1994	35		667
Daniel 1996	Daniel, D. G.; Goldberg, T. E.; Lubick, L. J.; Weinberger, D. R.; Kleinman, J. E.; Pickar, D.; Williams, T. S.	Self-reported cognitive impairment predicts patient preference between risperidone and clozapine		Schizophrenia Research	1995	15	1-2	147–148
Daniel 1996	Daniel, D. G.; Goldberg, T. E.; Weinberger, D. R.; Kleinman, J. E.; Pickar, D.;	Different side effect profiles of risperidone and clozapine in 20 outpatients with schizophrenia or schizoaffective disorder	a pilot study	American Journal of Psychiatry	1996	153	3	417–419

	Lubick, L. J.; Williams, T. S.							
Daston 1959	Daston, P. G.	Effects of two phenothiazine drugs on concentrative attention span of chronic schizophrenics		Journal of Clinical Psychology	1959	15		106–109
Dossenbach 2004_cognition	Milas, D. Z.; Ljubin, T.; Mimica, N.; Folnegovic-Smalc, V.; Makaric, G.	Some memory span functions and motor speed in schizophrenics treated with olanzapine versus fluphenazine		Psychiatria Danubina	1999	11	1-2	55–59
Dossenbach 2004_cognition	Ljubin, T.; Milas, D. Z.; Mimica, N.; Folnegovic, Smalc V.; Makaric, G.	A preliminary study of the comparative effects of olanzapine and fluphenazine on cognition in schizophrenic patients		Human Psychopharmacology	2000	15	7	513–519
EARLY_KUM_PSY	Drks	Effects of early clozapine treatment on remission rates in acute schizophrenia (EARLY)		http://apps.who.int/trialsearch/	2018			
EARLY_KUM_PSY	Euctr, de	Effects of early clozapine treatment on remission rates in acute schizophrenia (EARLY)		http://www.who.int/trial-search/Trial2.aspx?TrialID=EUCTR2018-001514-15-DE	2018			
Emsley 2015	Emsley, R.; Asmal, L.; Chiliza, B.; du, Plessis S.; Carr, J.; Kidd, M.; Malhotra, A. K.; Vink, M.; Kahn, R. S.	Changes in brain regions associated with food-intake regulation, body mass and metabolic profiles during acute antipsychotic treatment in first-episode schizophrenia		Psychiatry Research	2015	233		186–193
Emsley 2015	Emsley, R.; Asmal, L.; du, Plessis S.; Chiliza, B.; Kidd, M.; Carr, J.; Vink, M.	Dorsal striatal volumes in never-treated patients with first-episode schizophrenia before and during acute treatment		Schizophrenia Research	2015	169	1-3	89–94
EQUATOR	Nct	Efficacy, Safety, and Tolerability of Brexpiprazole (OPC-34712) as Maintenance Treatment in Adults With Schizophrenia		https://ClinicalTrials.gov/	2012			
EQUATOR	Therrien, F.; Weiss, C.; Jin, N.; Baker, R. A.; MacKenzie, E.; Meehan, S. R.	Effect of brexpiprazole on patient functioning in patients with schizophrenia	results from a long-term, randomized, double-blind, placebo-controlled, maintenance study	Neuropsychopharmacology	2017	43	Suppl.1	S244-S245
EQUATOR	Weiller, E.; Hobart, M.; Pfster, S.; Forbes, A.; Ouyang, J.; Weiss, C.	Effect of brexpiprazole on long-term remission in adults with schizophrenia	Results from a randomized, double-blind, placebo-controlled, maintenance study	Schizophrenia Bulletin	2017	43		S202-S203
EQUATOR	Weiss, C.; Forbes, A.;	Short-term and long-term efficacy	Effect across marder factors	Schizophrenia Bulletin	2017	43		S155

	Hobart, M.; Pfster, S.; Ouyang, J.; Weiller, E.	of brexpiprazole in adults with schizophrenia						
EQUATOR	Weiss, C.; Ouyang, J.; Eramo, A.; Duffy, R. A.; Weiller, E.; Baker, R. A.	Switching patients with acute schizophrenia to brexpiprazole	Post-hoc analysis of a double-blind randomized maintenance treatment study	Neuropsychopharmacology	2015	40		S227-S228
EQUATOR	Weiss, C.; Weiller, E.; Hobart, M.; Ouyang, J.	Effect of brexpiprazole on weight and metabolic parameters	Analysis of a maintenance trial in schizophrenia	European Neuropsychopharmacology	2016	26		S556
EQUATOR	Baker, R.; Hobart, M.; Forbes, A.; Ouyang, J.; Weiller, E.	Effect of brexpiprazole on long-term functioning in adults with schizophrenia	Results from a randomized, double-blind, placebo-controlled, maintenance study	Australian and New Zealand Journal of Psychiatry	2017	51	Suppl 1	148
EQUATOR	Correll, C. U.; Shi, L.; Weiss, C.; Hobart, M.; Eramo, A.; Duffy, R. A.; Weiller, E.; Baker, R. A.	Successful switching of patients with acute schizophrenia from another antipsychotic to brexpiprazole	comparison of clinicians' choice of cross-titration schedules in a post hoc analysis of a randomized, double-blind, maintenance treatment study	CNS Spectrums	2019	24	5	507–517
EQUATOR	Fleischhacker, W. W.; Hobart, M.; Ouyang, J.; Forbes, A.; Pfister, S.; McQuade, R.; Carson, W. H.; Sanchez, R.; Nyilas, M.; Weiller, E.	Brexpiprazole (OPC-34712) efficacy and safety as maintenance therapy in adults with schizophrenia	Randomised, double-blind, placebo-controlled study	European Neuropsychopharmacology	2015	25		S527
EQUATOR	Fleischhacker, W. W.; Hobart, M.; Ouyang, J.; Forbes, A.; Pfister, S.; McQuade, R. D.; Carson, W. H.; Sanchez, R.; Nyilas, M.; Weiller, E.	Efficacy and Safety of Brexpiprazole (OPC-34712) as Maintenance Treatment in Adults with Schizophrenia	a Randomized, Double-Blind, Placebo-Controlled Study	International Journal of Neuropsychopharmacology	2017	20	1	11–21
EQUATOR	Correll, Cu; He, Y.; Therrien, F.; MacKenzie, E.; Meehan, [SR]; Weiss, C.; Hefting, N.; Hobart, M.	Effects of Brexpiprazole on Functioning in Patients With Schizophrenia: Post Hoc Analysis of Short- and Long-Term Studies		J Clin Psychiatry	2022	83	2	20m13793
EQUATOR	Marder, [SR]; Meehan, [SR]; Weiss, C.; Chen, D.; Hobart, M.; Hefting, N.	Effects of Brexpiprazole Across Symptom Domains in Patients With Schizophrenia: Post Hoc Analysis of Short- and Long-Term Studies		Schizophr Bull Open	2021	2	1	sgab014
Fagerlund 2004	Nct	Effects of classical and atypical		https://ClinicalTrials.gov/	2005			

		antipsychotics on dopamine receptor binding of 123i-epidepride, cognition, startle response and extrapyramidal side-effects in drug-naive first-episode schizophrenic patients						
Fagerlund 2004	Norbak-Emig, H.; Ebdrup, B. H.; Fagerlund, B.; Svarer, C.; Rasmussen, H.; Friberg, L.; Allerup, P. N.; Rostrup, E.; Pinborg, L. H.; Glenthoj, B. Y.	Frontal D2/3 Receptor Availability in Schizophrenia Patients Before and After Their First Antipsychotic Treatment	Relation to Cognitive Functions and Psychopathology	International Journal of Neuropsychopharmacology	2016	19	5	1–10
Fagerlund 2004	sMackeprang, T.; Fagerlund, B.; Videbaek, C.; Hemmingsen, R. P.; Glenthoj, B. Y.	Extrastriatal dopamine(d2/d3)-receptor occupancy and cognition in first episode schizophrenic patients		Schizophrenia Research	2001	49	Suppl 1, 2	194
Fagerlund 2004	Fagerlund, B.; Mackeprang, T.; Gade, A.; Glenthoj, B. Y.	Effects of risperidone and zuclopenthixol on cognitive deficits in drug-naive first episode schizophrenic patients		Schizophrenia Research	2003	60		133–134
Fagerlund 2004	Fagerlund, B.; Mackeprang, T.; Gade, A.; Hemmingsen, R.; Glenthoj, B. Y.	Effects of low-dose risperidone and low-dose zuclopenthixol on cognitive functions in fisrt-episode drug-naive schizophrenic patients		CNS Spectrums	2004	9	5	364–374
Fagerlund 2004	Glenthǿj, B. Y.; Mackeprang, T.; Fagerlund, B.; Hemmingsen, R. P.	Effects of antipsychotic treatment on prepulse inhibition of the startle response (ppi) and cognition in first episode drug-naive schizophrenic patients		Schizophrenia Research	2001	49	1-2	133
Fagerlund 2004	Glenthoj, B.; Fagerlund, B.; Rasmussen, H.; Pinborg, L.; Svarer, C.; Friberg, L.; Mackeprang, T.; Baare, W.; Videbaek, C.	Extrastriatal dopamine D2/D3-receptors in drug-naïve first-episode schizophrenic patients	relation to psychopathology, cognition and treatment outcome	International Journal of Neuropsychopharmacology	2008	11	Suppl 1	6–7
Fagerlund 2004	Glenthoj, B. Y.; Mackeprang,	Effects of antipsychotics on information-processing		Proceedings of the 39th Annual Meeting	2000			

	T.; Fagerlund, B.; Hemmingsen, R.	and extrastriatal dopamine d2/d3 receptors in first-episode drug-naive schizophrenic patients		of the American College of Neuropsychopharmacology; 2000 Dec 10-14; San Juan, Puerto Rico				
Findling 2013	Nct	Six week, double-blind, placebo controlled phase III trial evaluating the efficacy, safety and pharmacokinetics of flexible doses of oral ziprasidone in adolescent subjects with schizophrenia		https://ClinicalTrials.gov/	2005			
Findling 2013	Findling, R. L.; Cavus, I.; Pappadolulos, E.; Backinsky, M.; Schwartz, J. H.; Vanderburg, D. G.	A placebo-controlled trial to evaluate the efficacy and safety of flexibly dosed oral ziprasidone in adolescent subjects with schizophrenia		Schizophrenia Research	2010	117	2-3	437
Findling 2013	Findling, R. L.; Cavus, I.; Pappadopulos, E.; Vanderburg, D. G.; Schwartz, J. H.; Gundapaneni, B. K.; DelBello, M. P.	Ziprasidone in adolescents with schizophrenia	results from a placebo-controlled efficacy and long-term open-extension study	Journal of Child and Adolescent Psychopharmacology	2013	23	8	531–544
Fleming 1999	Fleming, K.; Potkin, S. G.; Alva, G.; Carreon, D.	Dissociation of improvement in neurocognition and negative symptomatology with olanzapine and clozapine conference abstract		Schizophrenia Research	1999	36	1-3	279
Freedman 1967	Freedman, N.; Rosen, B.; Engelhardt, D. M.	Prediction of psychiatric hospitalization	I. The measurement of hospitalization proneness	Journal of Abnormal Psychology	1967	72	6	468–477
Gaebel 2007	Mossner, R.; Schuhmacher, A.; Kuhn, K. U.; Cvetanovska, G.; Rujescu, D.; Zill, P.; Quednow, B. B.; Rietschel, M.; Wolwer, W.; Gaebel, W.; Wagner, M.; Maier, W.	Functional serotonin 1A receptor variant influences treatment response to atypical antipsychotics in schizophrenia		Pharmacogenetics and Genomics	2009	19	1	91–94
Gaebel 2007	Nct	One year maintenance treatment with low dose haloperidol vs risperidone in		https://ClinicalTrials.gov/	2005			

		first-episode schizophrenia						
Gaebel 2007	Schennach-Wolff, R.; Jager, M.; Mayr, A.; Meyer, S.; Kuhn, K. U.; Klingberg, S.; Heuser, I.; Klosterkotter, J.; Gastpar, M.; Schmitt, A.; Schlosser, R.; Schneider, F.; Gaebel, W.; Seemuller, F.; Moller, H. J.; Riedel, M.	Predictors of response and remission in the acute treatment of first-episode schizophrenia patients - is it all about early response		European Neuropsychopharmacology	2011	21	5	370–378
Gaebel 2007	Thienel, R.; Kircher, T.; Habel, U.; Kellermann, T.; Reske, M.; Woelwer, W.; Frommann, I.; Meisenzahl, E.; Wagner, M.; Schneider, F.; Gaebel, W.	Differential effect of risperidone versus haloperidol on brain activation in firstepisode schizophrenia patients	A multicentre fMRI study	International Journal of Neuropsychopharmacology	2012	15		218–219
Gaebel 2007	Wolwer, W.; Riesbeck, M.; Brinkmeyer, J.; Gaebel, W.	Effects of risperidone vs. haloperidol on neurocognition in first-episode schizophrenia	results from a rct	International Journal of Neuropsychopharmacology	2008	11	Suppl 1	159
Gaebel 2007	Zaske, H.; Linden, M.; Degner, D.; Jockers-Scherubl, M.; Klingberg, S.; Klosterkotter, J.; Maier, W.; Moller, H. J.; Sauer, H.; Schmitt, A.; Gaebel, W.	Stigma experiences and perceived stigma in patients with first-episode schizophrenia in the course of 1 year after their first inpatient treatment		European Archives of Psychiatry and Clinical Neuroscience	2019	269	4	459–468
Gaebel 2007	Gaebel, W.; Riesbeck, M.; Wolwer, W.; Klimke, A.; Eickhoff, M.; von, Wilmsdorff M.; Jockers-Scherubl, M. C.; Kuhn, K. U.; Lemke, M.; Bechdolf, A.; Bender, S.; Degner, D.; Schlosser,	Maintenance treatment with risperidone or low-dose haloperidol in first-episode schizophrenia	1-year results of a randomized controlled trial within the German Research Network on Schizophrenia	Journal of Clinical Psychiatry	2007	68	11	1763–1774

	R.; Schmidt, L. G.; Schmitt, A.; Jager, M.; Buchkremer, G.; Falkai, P.; K							
Gallant 1966	Gallant, D. M.; Bishop, M. P.; Timmons, E.; Gould, A. R.	Thiothixene (P-4657B)	a controlled evaluation in chronic schizophrenic patients	Current Therapeutic Research, Clinical and Experimental	1966	8	4	153–158
Gallant 1967	Pratt, J. P.; Bishop, M. P.; Gallant, D. M.	Trifluperidol and haloperidol in the treatment of acute schizophrenia		American Journal of Psychiatry	1964	121		592–594
Gallant 1967	Gallant, D. M.; Bishop, M.; Figueroa, R. G.	Effects of two butyrophenone compounds on acute schizophrenic patients	speculation on the neurophysiologic sites of action	International Journal of NeuroPsychiatry	1967	3	Suppl 1	S53-7
Gallhofer 2007_all patients	Arnt, J.; Rodefer, J.; Didriksen, M.; Gallhofer, B.	Sertindole reverses cognitive impairment induced by PCP in two rat models and improve cognitive processing in patients with schizophrenia		Schizophrenia Bulletin	2007	33	2	469
Gallhofer 2007_all patients	Gallhofer, B.	The effect of antipsychotics on cognitive performance in schizophrenia	Implication on clinical outcome	European Neuropsychopharmacology	2009	19		S714
Gallhofer 2007_all patients	Gallhofer, B.; Jaanson, P.; Mittoux, A.; Tanghoj, P.; Lis, S.; Krieger, S.	Course of recovery of cognitive impairment in patients with schizophrenia	a randomised double-blind study comparing sertindole and haloperidol	PharmacoPsychiatry	2007	40	6	275–286
Gallhofer 2007_all patients	Lis, S.; Krieger, S.; Gallhofer, B.; Jaanson, P.; Torre, P.; Mittoux, A.; Menard, F.	Sertindole is superior to haloperidol in cognitive performance in patients with schizophrenia	a comparative study	Proceedings of the Cognition and Schizophrenia: Improving Real Life Function Conference; 2004 Sep 16-17; London, United Kingdom	2004			
Gallhofer 2007_all patients	Lis, S.; Krieger, S.; Gallhofer, B.; Torre, P.; Mittoux, A.; Menard, F.	Sertindole is superior to haloperidol in cognitive performance in patients with schizophrenia	a comparative study	Proceedings of the 16th European College of Neuropsychopharmacology Congress; 2003 Sep 20-24; Prague, Czech Republic	2003			
Gallhofer 2007_all patients	Lis, S.; Krieger, S.; Gallhofer, B.; Torre, P.; Mittoux, A.; Menard, F.	Sertindole is superior to haloperidol in cognitive performance in patients with schizophrenia	a comparative study	European Neuropsychopharmacology	2003	13	4	S323
Gallhofer 2007_chronic	Arnt, J.; Rodefer, J.; Didriksen, M.; Gallhofer, B.	Sertindole reverses cognitive impairment induced by PCP in two rat models and improve cognitive processing		Schizophrenia Bulletin	2007	33	2	469

		in patients with schizophrenia						
Gallhofer 2007_chronic	Gallhofer, B.	The effect of antipsychotics on cognitive performance in schizophrenia	Implication on clinical outcome	European Neuropsychopharmacology	2009	19		S714
Gallhofer 2007_chronic	Gallhofer, B.; Jaanson, P.; Mittoux, A.; Tanghoj, P.; Lis, S.; Krieger, S.	Course of recovery of cognitive impairment in patients with schizophrenia	a randomised double-blind study comparing sertindole and haloperidol	PharmacoPsychiatry	2007	40	6	275–286
Gallhofer 2007_chronic	Lis, S.; Krieger, S.; Gallhofer, B.; Jaanson, P.; Torre, P.; Mittoux, A.; Menard, F.	Sertindole is superior to haloperidol in cognitive performance in patients with schizophrenia	a comparative study	Proceedings of the Cognition and Schizophrenia: Improving Real Life Function Conference; 2004 Sep 16-17; London, United Kingdom	2004			
Gallhofer 2007_chronic	Lis, S.; Krieger, S.; Gallhofer, B.; Torre, P.; Mittoux, A.; Menard, F.	Sertindole is superior to haloperidol in cognitive performance in patients with schizophrenia	a comparative study	Proceedings of the 16th European College of Neuropsychopharmacology Congress; 2003 Sep 20-24; Prague, Czech Republic	2003			
Gallhofer 2007_chronic	Lis, S.; Krieger, S.; Gallhofer, B.; Torre, P.; Mittoux, A.; Menard, F.	Sertindole is superior to haloperidol in cognitive performance in patients with schizophrenia	a comparative study	European Neuropsychopharmacology	2003	13	4	S323
Gardner 1955	Gardner, M. J.; Hawkins, H. M.; Judah, L. N.; Murphree, O. D.	Objective measurement of psychiatric changes produced by chlorpromazine and reserpine in chronic schizophrenia		Psychiatric Research Reports	1955	1		77–83
Geffen 2012	Nct	BL-1020 dose finding study		https://ClinicalTrials.gov/	2007			
Geffen 2012	Geffen, Y.; Anand, R.; Keefe, R.; Davidson, M.	Results of phase 2b eagle trial; a double blind placebo control study evaluating the efficacy and safety of bl-1020, a gaba enhanced antipsychotic for the treatment of schizophrenia		Schizophrenia Research	2010	117	2-3	212
Geffen 2012	Geffen, Y.; Keefe, R.; Rabinowitz, J.; Anand, R.; Davidson, M.	Bl-1020, a new -aminobutyric acid-enhanced antipsychotic	Results of 6-week, randomized, double-blind, controlled, efficacy and safety study	Journal of Clinical Psychiatry	2012	73	9	e1168-e74
Geffen 2012	Kalali, A. H.; Geffen, Y.; Davidson, M.; Hufford, M. R.; Gendreau, R. M.; Rao, S. G.; Zablocki, R.;	Methodological challenges of demonstrating cognitive improvements with broad spectrum agents	A novel approach	European Archives of Psychiatry and Clinical Neuroscience	2011	261		S17

	Kranzler, J. D.							
Geffen 2012	Keefe, R.; Harvey, P.; Geffen, Y.; Hufford, M.; Gendreau, M.; Rao, S.; Zablocki, R.; Kranzler, J.	Clinical trial design issues affecting the assessment of the pro-cognitive effects of broad spectrum antipsychotics	Examples from 12-week extension data from the phase 2b eagle trial of cyp-1020	Proceedings of the 49th Annual Meeting of the American College of Neuropsychopharmacology; 2010 Dec 5-9; Miami, Florida	2010			
Geffen 2012	Keefe, R.; Harvey, P.; Geffen, Y.; Hufford, M.; Gendreau, R. M.; Rao, S.; Zablocki, R.; Kranzler, J.	Clinical trial design issues affecting the assessment of the pro-cognitive effects of broad spectrum antipsychotics	Examples from 12-week extension data from the phase 2b eagle trial of cyp-1020	Neuropsychopharmacology	2010	35		S207-S8
Gilbertson 1997	Gilbertson, M. W.; Van, Kammen D. P.	Recent and remote memory dissociation	medication effects and hippocampal function in schizophrenia	Biological Psychiatry	1997	42	7	585–595
Gilgash 1957	Gilgash, C. A.	Effects of thorazine on wechsler scores of adult catatonic schizophrenics		Psychological Reports	1957	3		561–564
Gilgash 1957	Gilgash, C. A.	Thorazine therapy with catatonic schizophrenics in relation to Wechsler verbal and performance subtest comparison		Journal of Clinical Psychology	1961	17	1	95
Goldman 2017	Nct	A 6-Week Randomized, Parallel, Double-Blind, Placebo-Controlled, Fixed-Dose, Multicenter Study To Evaluate The Efficacy and Safety of Lurasidone in Adolescent Subjects With Schizophrenia		https://ClinicalTrials.gov/	2013			
Goldman 2017	Pikalov, A.; Tocco, M.; Siu, C.; Loebel, A.	C-reactive protein and response to lurasidone treatment in adolescents with schizophrenia		Schizophrenia Bulletin	2019	45		S264
Goldman 2017	Tocco, M.; Pikalov, A. A.; Deng, L.; Goldman, R. S.	Lurasidone in Adolescents with Schizophrenia	Remission and Recovery during 2 Years of Open-Label Treatment	Journal of the American Academy of Child and Adolescent Psychiatry	2019	58		S254
Goldman 2017	Correll, C.; Goldman, R.; Cucchiaro, J.; Deng, L.; Loebel, A.	Lurasidone for the treatment of adolescent patients with schizophrenia	Effect on panss subscales	Schizophrenia Bulletin	2017	43		S154-S155
Goldman 2017	Correll, C.; Goldman, R.; Tocco, M.; Pikalov, A.; Hsu, J.; Loebel, A.	Efficacy of lurasidone in antipsychotic-naive adolescents with schizophrenia	Post-hoc analysis of a 6-week, randomized, placebocontrolled study	Schizophrenia Bulletin	2019	45		S293-S294

Goldman 2017	Correll, C. U.; Goldman, R. S.; Tocco, M.; Pikalov, A. A.; Hsu, J.; Loebel, A.	Long-Term Efficacy of Lurasidone in Antipsychotic-Naive Versus Antipsychotic-Exposed Adolescents with Schizophrenia	Post-Hoc Analysis of a 2-Year, Open-Label Study	Journal of the American Academy of Child and Adolescent Psychiatry	2019	58		S236
Goldman 2017	Findling, R.; Goldman, R.; Cucchiaro, J.; Deng, L.; Loebel, A.	Effect of lurasidone on quality of life, function, and metabolic parameters in adolescent patients with schizophrenia	Results from a 6-week, double-blind, placebo-controlled study	Schizophrenia Bulletin	2017	43		S78
Goldman 2017	Goldman, R.; Loebel, A.; Cucchiaro, J.; Deng, L.; Findling, R. L.	Efficacy and Safety of Lurasidone in Adolescents with Schizophrenia	A 6-Week, Randomized Placebo-Controlled Study	Journal of Child and Adolescent Psychopharmacology	2017	27	6	516–525
Goldman 2017	Goldman, R. S.; Findling, R. L.; Silva, R.; Cucchiaro, J.; Deng, L.; Loebel, A.	The efficacy and safety of lurasidone in adolescent patients with schizophrenia	A 6-week, double-blind, placebo-controlled, multicenter study	CNS Spectrums	2017	22	1	94–95
Goldman 2017	Goldman, R. S.; Findling, R. L.; Silva, R. M.; Cucchiaro, J. B.; Deng, L.; Loebel, A.	The efficacy and safety of lurasidone in adolescent patients with schizophrenia	A 6-week, double-blind, placebo-controlled, multicenter study	Journal of the American Academy of Child and Adolescent Psychiatry	2016	55	10 Suppl 1	S163-S164
Goldman 2017	Goldman, R. S.; Robb, A. S.; Silva, R. M.; Cucchiaro, J. B.; Deng, L.; Loebel, A.	Effect of lurasidone on body weight and laboratory parameters in adolescent patients with schizophrenia	Results from a 6-week, double-blind, placebo-controlled study	Journal of the American Academy of Child and Adolescent Psychiatry	2016	55	10 Suppl 1	S163
Goldman 2017	Costamagna, I.; Calisti, F.; Cattaneo, A.; Hsu, J.; Pikalov, A.; Tocco, M.; Goldman, R.	Efficacy and safety of lurasidone in adolescents and young adults with schizophrenia: A pooled post hoc analysis of double-blind, placebo-controlled 6-week studies		European psychiatry : the journal of the Association of European Psychiatrists	2021		1	e35
Goldman 2017	Correll, C.; Goldman, R.; Tocco, M.; Pikalov, A.; Hsu, J.; Loebel, A.	Efficacy of lurasidone in antipsychotic-naÏve adolescents with schizophrenia: Post-hoc analysis of a 6-week, randomized, placebo-controlled study		Schizophrenia Bulletin	2019			S293
Goldman 2017	Correll, C.; Goldman, R.; Tocco, M.; Pikalov, A.; Loebel, A.	Long-term efficacy of lurasidone in antipsychotic-naïve vs. antipsychotic-exposed adolescents with schizophrenia: Post-hoc analysis of a two year, open-label study		European neuropsychopharmacology	2019			S88

Goldman 2017	Correll, Cu; Findling, Rl; Tocco, M.; Pikalov, A.; Deng, L.; Goldman, R.	Safety and effectiveness of lurasidone in adolescents with schizophrenia: results of a 2-year, open-label extension study		CNS Spectrums	2020			InPress
Goldman 2017	Correll, Cu; Goldman, R.; Tocco, M.; Hsu, J.; Pikalov, A.	Long-term Efficacy of Lurasidone in Antipsychotic-naïve vs. Antipsychotic-exposed Adolescents with Schizophrenia: Analysis of a Two-Year Study		CNS Spectrums	2020		2	267–268
Goldman 2017	Correll, Cu; Tocco, M.; Pikalov, A.; Goldman, R.	Efficacy of lurasidone in antipsychotic-naive vs. previously treated adolescents with schizophrenia: Posthoc analysis of a 6-week, randomized, placebocontrolled study		Australian and New Zealand Journal of Psychiatry	2021		Suppl 1	103
Goldman 2017	Tocco, M.; Pikalov, A.; Ling, D.; Goldman, R.	Lurasidone in adolescents with schizophrenia: remission and recovery during 2 years of open-label treatment		European neuropsychopharmacology	2020		Suppl. 1	S318
Goldman 2017	Correll, C.; Tocco, M.; Pikalov, A.; Hsu, J.; Goldman, R.	Efficacy of Lurasidone in Antipsychotic-Naive vs. Antipsychotic-Exposed Adolescents with Schizophrenia: Post-Hoc Analysis of a Two-Year, Open-Label Study		CNS spectrums	2021	26	2	147
Goldman 2017	Correll CU // Tocco M // Goldman R // Pikalov A	Efficacy of lurasidone in antipsychotic-naive versus previously treated adolescents with schizophrenia: Post-hoc analysis of a 2-year, open-label study		Australian and New Zealand journal of psychiatry	2022	56		206
Goldman 2017	Correll CU // Tocco M // Hsu J // Goldman R // Pikalov A	Short-term Efficacy and Safety of Lurasidone Versus Placebo in Antipsychotic-Naïve vs. Previously Treated Adolescents with an Acute Exacerbation of Schizophrenia		European psychiatry	2022	In-Press		InPress
Goldman 2017	Correll CU // Tocco M // Pikalov A // Hsu J // Goldman R	Long-term safety and effectiveness of open-label lurasidone in antipsychotic-Naive versus previously treated adolescents with Schizophrenia: A post-hoc analysis		Schizophrenia Research	2022	240		205-213

Goldman 2017	Tocco M // Pikalov A // Deng L // Goldman R	Lurasidone in adolescents with schizophrenia: sustained remission and recovery during 2 years of open-label treatment		European psychiatry	2021	64		S165-S16
Green 2004a	Nct	Clozapine vs olanzapine	an effectiveness study	https://ClinicalTrials.gov/	2005			
Grinspoon 1967	Messier, M.; Finnerty, R.; Botvin, C. S.; Grinspoon, L.	A follow-up study of intensively treated chronic schizophrenic patients		American Journal of Psychiatry	1969	125		1123–1127
Grinspoon 1967	Grinspoon, L.; Ewalt, J. R.; Shader, R.	Long-term treatment of chronic schizophrenia. A preliminary report		International Journal of Psychiatry	1967	4	2	116–128
Grinspoon 1967	Grinspoon, L.; Ewalt, J. R.; Shader, R. I.	The clinical research center	problems in conducting a long-term	Schizophrenia: Pharmacotherapy and Psychotherapy	1972			25–29
Grootens 2009	Nct	A multicenter, double-blind, randomized trial of ziprasidone (80 - 160 mg) versus olanzapine (10 - 20 mg) in patients with recent-onset schizophrenia, schizoaffective and schizophreniform disorder		https://ClinicalTrials.gov/	2005			
Grootens 2009	Van, Veelen N. M. J.; Grootens, K. P.; Peuskens, J.; Sabbe, B. G. C.; Salden, M. E.; Verkes, R. J.; Kahn, R. S.; Sitskoorn, M. M.	Short term neurocognitive effects of treatment with ziprasidone and olanzapine in recent onset schizophrenia		Schizophrenia Research	2010	120	1-3	191–198
Grootens 2009	Grootens, K.; Van, Veelen N. M. J.; Sitskoorn, M. M.; Verkes, R. J.; Kahn, R. S.	Effects of olanzapine and ziprasidone on cognitve outcome in recent-onset schizophrenia		European Neuropsychopharmacology	2009	19		S547
Grootens 2009	Grootens, K.; Veelen, Nv; Sitskoom, M.; Verkes, R. J.; Kahn, R.	Effects of olanzapine and ziprasidone on cognitve outcome in recent-onset schizophrenia		Proceedings of the 15th Biennial Winter Workshop in Psychoses; 2009 Nov 15-18; Barcelona, Spain	2009			
Grootens 2009	Grootens, K. P.; Van, Veelen N. M. J.; Peuskens, J.; Sabbe, B. G. C.; Thys, E.; Buitelaar, J. K.; Verkes, R. J.; Kahn, R. S.	Ziprasidone vs olanzapine in recent-onset schizophrenia and schizoaffective disorder	Results of an 8-week double-blind randomized controlled trial	Schizophrenia Bulletin	2011	37	2	352–361

Grootens 2009	Grootens, K. P.; Van, Veelen N. M. J.; Sitskoorn, M. M.; Sabbe, B. G. C.; Peuskens, J.; Buitelaar, J. K.; Verkes, R. J.; Kahn, R. S.	Effects on cognitive functioning after olanzapine-ziprasidone crossover in recent-onset schizophrenia		European Neuropsychopharmacology	2010	20	1 2	907–912
Hagger 1997	Mitchell, D.; Hagger, C.; Wise, A.; Charles, S. S.	Effects of oral ziprasidone and risperidone on cognitive functioning in patients with schizophrenia or schizoaffective disorder	Preliminary	Schizophrenia Research	1997	24	1 - 2	116
Hagger 1997	Hagger, C.; Mitchell, D.; Wise, A.; Schulz, S. C.	Effects of oral ziprasidone and riperidone on cognitive function in patients with schizophrenia or schizoaffective disorder	preliminary data	Proceedings of the 36th Annual Meeting of the American College of Neuropsychopharmacology; 1997 Dec 8-12; Waikoloa, Hawaii, USA	1997			304
Hagger 1997	Hagger, C.; Mitchell, D.; Wise, A. L.; Schulz, S. C.	Effects of oral ziprasidone and risperidone on cognitive functioning in patients with schizophrenia or schizoaffective disorder	Preliminary data	Proceedings of the 10th European College of Neuropsychopharmacology Congress; 1997 Sep 13-17; Vienna, Austria	1997			
Hera 041-021	Nct	A multicenter, double-blind, flexible-dose, long-term extension trial of the safety and maintenance of effect of asenapine using olanzapine positive control in subjects who complete protocols 041021/041022		https://ClinicalTrials.gov/	2005			
Hera 041-021	Nct	A multicenter, randomized, double-blind, fixed-dose, 6-week trial of the efficacy and safety of asenapine compared with placebo using olanzapine positive control in subjects with an acute exacerbation of schizophrenia		https://ClinicalTrials.gov/	2005			
Hera 041-021	Potkin, S. G.; Kane, J. M.; Emsley, R. A.; Naber, D.; Panagides, J.	Asenapine in schizophrenia	an overview of clinical trials in the Olympia program	Proceedings of the 63rd Annual Scientific Convention and Meeting of the Society of Biological Psychiatry; 2008 May 1-3; Washington, DC	2008			
Hera 041-021	The, National Horizon Scanning Centre	Asenapine (Saphris) for schizophrenia		Report	2010			

Hera 041-021	Castle, D. J.; Jensen, J. K. S.	Management of depressive symptoms in schizophrenia	A pooled, post hoc analysis from the asenapine development program	Clinical Schizophrenia and Related Psychoses	2015	9	1	13–20
Hera 041-021	Leucht, S.; Zhao, J.	Early improvement as a predictor of treatment response and remission in patients with schizophrenia	a pooled, post-hoc analysis from the asenapine development program	Journal of psychopharmacology (Oxford, England)	2014	28	4	387–394
Hera 041-022	Nct	A multicenter, randomized, double-blind, flexible-dose, 6-week trial of the efficacy and safety of asenapine compared with placebo using olanzapine positive control in subjects with an acute exacerbation of schizophrenia		https://ClinicalTrials.gov/	2005			
Hera 041-022	Potkin, S. G.; Kane, J. M.; Emsley, R. A.; Naber, D.; Panagides, J.	Asenapine in schizophrenia	an overview of clinical trials in the Olympia program	Proceedings of the 63rd Annual Scientific Convention and Meeting of the Society of Biological Psychiatry; 2008 May 1-3; Washington, DC	2008			
Hera 041-022	The, National Horizon Scanning Centre	Asenapine (Saphris) for schizophrenia		Report	2010			
Ibrahim 2007	Ibrahim, H.; Preda, A.; Jain, S.; Burns, W.; Cheng, P.; Greene, R. W.; Tamminga, C.	A functional MRI study of the neurocognitive effects of quetiapine compared to haloperidol in schizophrenia		Schizophrenia Bulletin	2007	33	2	371
Ibrahim 2007	Ibrahim, H.; Preda, A.; Jain, S.; Burns, W.; Cheng, P.; Greene, R. W.; Tamminga, C.	Comparison of the neurocognitive effects of quetiapine and haloperidol in patients with schizophrenia	a functional mri study	Proceedings of the 160th Annual Meeting of the American Psychiatric Association; 2007 May 19-24; San Diego, CA	2007			
Ibrahim 2011	Ibrahim, H. M.; Cullum, C. M.; Greene, R. W.; Tamminga, C. A.	A functional mri study of the nerocognitive effect of quetiapine compared to haloperidol in schizophrenia		Proceedings of the 50th Annual Meeting of the American College of Neuropsychopharmacology; 2011 Dec 4-8; Waikoloa, Hawaii	2011			S273-4
Jerrell 2002	Jerrell, J. M.	Cost-effectiveness of risperidone, olanzapine, and conventional antipsychotic medications		Schizophrenia Bulletin	2002	28	4	589–605
Jerrell 2002	Jerrell, J. M.; Hrisko, S.	Changes in cognitive function associated with syndrome changes on two five-factor models of the positive and negative syndrome scale		Human Psychopharmacology	2012	27	6	566–576
Jerrell 2002	Jerrell, J. M.; Hrisko, S.	A comparison of the panss pentagonal and van der gaag 5-factor		Psychiatry Research	2013			

		models for assessing change over time						
Jerrell 2002	Jerrell, J. M.; Hrisko, S.	Utility of Two PANSS 5-Factor Models for Assessing Psychosocial Outcomes in Clinical Programs for Persons with Schizophrenia		Schizophrenia Research and Treatment	2013	2013	2013	ArticleID
Jerrell 2002	Jerrell, J. M.; Ramirez, P. M.	Changes in neuropsychological functioning following treatment with risperidone, olanzapine, and conventional antipsychotic medications		Human Psychopharmacology	2008	23	7	595–604
Jeste 2003	Tune, L.; Mulsant, B.; Gharabawi, G.	Anticholinergic effect of atypical antipsychotics in elderly patients		European Neuropsychopharmacology	2002	12	Suppl 3	S314
Jeste 2003	Docherty, J. P.; Napolitano, J.; Mahmoud, R. A.; Martinez, R. A.; Lasser, R. A.; Pandina, G. J.; Gharabawi, G.	Anticholinergic effect of atypical antipsychotics in elderly patients		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Jeste 2003	Harvey, P. D.; Gharabawi, G.	Cognition in elderly patients with schizophrenia	risperidone versus olanzapine	International Journal of Neuropsychopharmacology	2002	5	Suppl 1	S77
Jeste 2003	Harvey, P. D.; Mao, L.; Napolitano, J.; Gharabawi, G.	Cognition in elderly schizophrenic patients	risperidone vs olanzapine	European Psychiatry	2002	17	Suppl 1	192s
Jeste 2003	Harvey, P. D.; Mao, L.; Napolitano, J.; Gharabawi, G.	Improved cognition in elderly schizophrenic patients	risperidone versus olanzapine	Schizophrenia Research	2002	53	3 Supp l 1	28
Jeste 2003	Harvey, P. D.; Napolitano, J. A.; Mao, L.; Gharabawi, G.	Comparative effects of risperidone and olanzapine on cognition in elderly patients with schizophrenia or schizoaffective disorder		International Journal of Geriatric Psychiatry	2003	18	9	820–828
Jeste 2003	Jeste, D.; Madhusoodanan, S.; Barak, Y.; Martinez, R. A.; Mahmoud, R.; Kershaw, P.	Risperidone and olanzapine in elderly patients with schizophrenia and schizoaffective disorder		International Psychogeriatrics	2001	13	2	295S
Jeste 2003	Jeste, D. V.; Barak, Y.; Madhusoodanan, S.; Grossman,	International multisite double-blind trial of the atypical antipsychotics risperidone and olanzapine in 175		American Journal of Geriatric Psychiatry	2003	11	6	638–647

	F.; Gharabawi, G.	elderly patients with chronic schizophrenia						
Jeste 2003	Jeste, D. V.; Madhusoodanan, S.; Barak, F.; Martinez, R. A.	Risperidone versus olanzapine in elderly patients with schizophrenia		Proceedings of the 154th Annual Meeting of the American Psychiatric Association; 2001 May 5-10; New Orleans, Louisiana, USA	2001			
Jeste 2003	Jeste, D. V.; Madhusoodanan, S.; Barak, F.; Martinez, R. A.	Risperidone versus olanzapine in elderly patients with schizophrenia		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Jeste 2003	Lasser, R. A.; Mao, L.; Gharabawi, G.	Smokers and nonsmokers equally affected by olanzapine-induced weight gain	metabolic implications	Schizophrenia Research	2004	66	2-3	163–167
Jia 2009	Jia, H.; Gao, R.; Zhu, H.; Bu, L.; Zhang, Y.	Schizophrenic patients treated with quetiapine perform better than haloperidol on theory of mind tasks		European Neuropsychopharmacology	2009	19		S526-S7
Jin 1998	Potkin, S. G.; Fleming, K.; Jin, Y.; Gulasekaram, B.	Clozapine enhances neurocognition and clinical symptomatology more than standard neuroleptics		Journal of Clinical Psychopharmacology	2001	21	5	479–483
Jin 1998	Potkin, S. G.; Fleming, K.; Telford, J.; Costa, J.; Gulasekaram, B.; Jin, Y.	Clozapine enhances neurocognition and clinical symptoms more than standard neuroleptics		Schizophrenia Research	1997	24	1-2	188
Johnstone 1978	Cotes, P. M.; Crow, T. J.; Johnstone, E. C.; Bartlett, W.; Bourne, R. C.	Neuroendocrine changes in acute schizophrenia as a function of clinical state and neuroleptic medication		Psychological Medicine	1978	8	4	657–665
Johnstone 1978	Johnstone, E. C.	Personal Communication		Personal Communication	2011			
Johnstone 1978	Johnstone, E. C.; Crow, T. J.; Frith, C. D.; Carney, M. W.; Price, J. S.	Mechanism of the antipsychotic effect in the treatment of acute schizophrenia		Lancet	1978	1	8069	848–851
Johnstone 1978	Johnstone, E. C.; Frith, C. D.; Gold, A.; Stevens, M.	The outcome of severe acute schizophrenic illnesses after one year		British Journal of Psychiatry	1979	134		28–33
Johnstone 1978	Joseph, M. H.; Baker, H. F.; Johnstone, E. C.; Crow, T. J.	3-methoxy-4-hydroxyphenylglycol excretion in acutely schizophrenic patients during a controlled clinical trial of the isomers of flupenthixol		Psychopharmacology	1979	64	1	35–40

JPRN-jRCTs031200338	Jprn, jRCTs	Valuable interaction with cognitive remediation and optimal antipsychotics for recovery in schizophrenia		https://jrct.niph.go.jp/latest-detail/jRCTs031200338	2021			
Kahn 2008	Mortimer, A.	The European First Episode Schizophrenia Trial	comparison of outcome in first episode schizophrenia with different low dose antipsychotic regimens (EUFEST)	National Research Register	2003	1		
Kahn 2008	Ntr	The european first episode schizophrenia trial (eufest)	Comparison of outcome in first episode schizophrenia with different low dose antipsychotic drug regimens	http://www.isrctn.com/	2005			
Kahn 2008	Pijnenborg, G.; Timmerman, M.; Derks, E.; Fleischhacker, W.; Kahn, R.; Aleman, A.	Do antipsychotics affect insight in psychosis differentially?	Data from the eufest trial	Schizophrenia Bulletin	2015	41		S36
Kahn 2008	Pijnenborg, G.; Timmerman, M. E.; Derks, E. M.; Fleischhacker, W.; Kahn, R. S.; Aleman, A.	Do antipsychotics affect insight in psychosis differentially?	Data from the eufest trial	European Psychiatry	2015	30		239
Kahn 2008	Pijnenborg, G. H.; Timmerman, M. E.; Derks, E. M.; Fleischhacker, W. W.; Kahn, R. S.; Aleman, A.	Differential effects of antipsychotic drugs on insight in first episode schizophrenia	Data from the European First-Episode Schizophrenia Trial (EUFEST)	European Neuropsychopharmacology	2015	25	6	808–816
Kahn 2008	Rabe-Jablonska, J.; Pawelczyk, T.; Jarema, M.; Olajossy, M.; Rybakowski, J.	Polish patients of the eufest study after 1 year antipsychotic treatment	Drug discontinuation and metabolic syndrome parameters	European Neuropsychopharmacology	2010			467
Kahn 2008	Riecher-Rossler, A.; Rybakowski, J. K.; Pflueger, M. O.; Beyrau, R.; Kahn, R. S.; Malik, P.; Fleischhacker, W. W.; Group, Eufest Study	Hyperprolactinemia in antipsychotic-naive patients with first-episode psychosis		Psychological Medicine	2013	43	12	2571–2582
Kahn 2008	Rybakowski, J. K.; Vansteelandt, K.; Remlin-	Extrapyramidal symptoms during treatment of first schizophrenia episode	Results from EUFEST	European Neuropsychopharmacology	2014	24	9	1500–1505

	ger-Molenda, A.; Fleischhacker, W. W.; Kahn, R. S.; Peuskens, J.							
Kahn 2008	Rybakowski, J. K.; Vansteelandt, K.; Szafranski, T.; Thys, E.; Jarema, M.; Wolfgang, Fleischhacker W.; Kahn, R. S.; Peuskens, J.	Treatment of depression in first episode of schizophrenia	Results from eufest	European Neuropsychopharmacology	2012	22	12	875–882
Kahn 2008	Szafranski, T.; Jarema, M.; Olajossy, M.; Rabe-Jablons, J.; Rybakowski, J. K.	Depressive symptoms in the first episode of schizophrenia - analysis of polish results of the eufest study		Schizophrenia Research	2010	117	2-3	503
Kahn 2008	Volavka, J.; Czobor, P.; Derks, E. M.; Bitter, I.; Libiger, J.; Kahn, R. S.; Fleischhacker, W. W.; Group, E. S.	Efficacy of antipsychotic drugs against hostility in the european first-episode schizophrenia trial (eufest)		Journal of Clinical Psychiatry	2011	72	7	955–961
Kahn 2008	Volavka, J.; Van, Dorn R. A.; Citrome, L.; Kahn, R. S.; Fleischhacker, W. W.; Czobor, P.	Hostility in schizophrenia	An integrated analysis of the combined Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) and the European First Episode Schizophrenia Trial (EUFEST) studies	European Psychiatry	2016	31		13–19
Kahn 2008	Wobrock, T.; Falkai, P.; Schneider-Axmann, T.; Hasan, A.; Galderisi, S.; Davidson, M.; Kahn, R. S.; Derks, E. M.; Boter, H.; Rybakowski, J. K.; Libiger, J.; Dollfus, S.; LÃ³pez-Ibor, J. J.; Peuskens, J.; Hranov, L. G.; Gaebel, W.; Fleischhacker, W. W. E.	Comorbid substance abuse in first-episode schizophrenia	effects on cognition and psychopathology in the EUFEST study	Schizophrenia Research	2013	147	1	132–139

Kahn 2008	Anonymous	Effectiveness of antipsychotic drugs in first-episode schizophrenia and schizophreniform disorder		African Journal of Psychiatry	2009	12	1	82
Kahn 2008	Fleischhacker, W.; Kahn, R.; Karayal, O.; Siu, C.; Pappadopulos, E.	Eufest	The moderating impact of metabolic co-morbidities on treatment outcomes in first-episode schizophrenia	European Neuropsychopharmacology	2009	19		S529-S30
Kahn 2008	Fleischhacker, W. W.	Safety and tolerability of first and second generation antipsychotics		Proceedings of the World Psychiatric Association International congress; 2009 April 1-4th; Florence Italy	2009	8	Suppl 1	
Kahn 2008	Fleischhacker, W. W.; For, the E. U. F. E. S. T. Study Group	The European First Episode Schizophrenia Trial (EUFEST)		Proceedings of the Thematic Conference of the World Psychiatric Association on "Treatments in Psychiatry: An Update"; 2004 Nov 10-13; Florence, Italy	2004			
Kahn 2008	Fleischhacker, W. W.; Keet, I. P. M.; Kahn, R. S.	The European First Episode Schizophrenia Trial (EUFEST)	rationale and design of the trial	Schizophrenia Research	2005	78	2-3	147–156
Kahn 2008	Gaebel, W.; Riesbeck, M.; von, Wilmsdorff M.; Burns, T.; Derks, E. M.; Kahn, R. S.; Rossler, W.; Fleischhacker, W. W.	Drug attitude as predictor for effectiveness in first-episode schizophrenia	Results of an open randomized trial (EUFEST)	European Neuropsychopharmacology	2010	20	5	310–316
Kahn 2008	Galderisi, S.; Davidson, M.; Kahn, R. S.; Mucci, A.; Boter, H.; Gheorghe, M. D.; Rybakowski, J. K.; Libiger, J.; Dollfus, S.; Lopez-Ibor, J. J.; Peuskens, J.; Hranov, L. G.; Fleischhacker, W. W.	Correlates of cognitive impairment in first episode schizophrenia	The eufest study	Schizophrenia Research	2009	115	2-3	104–114
Kahn 2008	Galderisi, S.; Mucci, A.; Bitter, I.; Libiger, J.; Bucci, P.; Fleischhacker, W. W.; Kahn, R. S.	Persistent negative symptoms in first episode patients with schizophrenia	results from the European First Episode Schizophrenia Trial	European Neuropsychopharmacology	2013	23	3	196–204
Kahn 2008	Kahn, R.	Effectiveness of antipsychotic	an open randomised clinical trial	Early Intervention in Psychiatry	2008	2	Sup	A24

		drugs in first-episode schizophrenia and schizophreniform disorder					pl 1	
Kahn 2008	Kahn, R.; Boter, H.	EUFEST	A randomized pragmatic long-term trial in first episode schizophrenia	European Psychiatry	2005	20		S56
Kahn 2008	Kahn, R.; Fleischhacker, W. W.; Karayal, O.; Siu, C.; Pappadopulos, E.	EUFEST	the effects of first and second generation antipsychotics on metabolic and cardiovascular risk factors	Proceedings of the 162nd Annual Meeting of the American Psychiatric Association; 2009 May 16-21; San Francisco, CA	2009			
Kahn 2008	Kahn, R. S.	Effectiveness of antipsychotic drugs in first-episode schizophrenia and schizophreniform disorder	an open randomized clinical trial	Proceedings of the World Psychiatric Association International congress; 2009 April 1-4th; Florence Italy	2009	8	Supp l 1	
Kahn 2008	Kahn, R. S.	Effectiveness of second-generation antipsychotics in first episode schizophrenia	the EUFEST study	Proceedings of the World Psychiatric Association International congress; 2009 April 1-4th; Florence Italy	2009	8	Supp l 1	
Kahn 2008	Kahn, R. S.; Fleischhacker, W. W.	The EUFEST study		Schizophrenia Research	2006	86	Supp l 1	S3
Kahn 2008	Kahn, R. S.; Fleischhacker, W. W.; Boter, H.; Davidson, M.; Vergouwe, Y.; Keet, I. P.; Gheorghe, M. D.; Rybakowski, J. K.; Galderisi, S.; Libiger, J.; Hummer, M.; Dollfus, S.; Lopez-Ibor, J. J.; Hranov, L. G.; Gaebel, W.; Peuskens, J.; Lindefors, N.; Riec	Effectiveness of antipsychotic drugs in first-episode schizophrenia and schizophreniform disorder	an open randomised clinical trial	Lancet	2008	371	9618	1085–1097
Kahn 2008	Koutsouleris, N.; Kahn, R. S.; Chekroud, A. M.; Leucht, S.; Falkai, P.; Wobrock, T.; Derks, E. M.; Fleischhacker, W. W.; Hasan, A.	Multisite prediction of 4-week and 52-week treatment outcomes in patients with first-episode psychosis	a machine learning approach	Lancet Psychiatry	2016	3	10	935–946

Kahn 2008	Landolt, K.; Rossler, W.; Ajdacic-Gross, V.; Derks, E. M.; Libiger, J.; Kahn, R. S.; Fleischhacker, W. W.	Predictors of discontinuation of antipsychotic medication and subsequent outcomes in the European First Episode Schizophrenia Trial (EUFEST)		Schizophrenia Research	2016	172	1-3	145–151
Kahn 2008	Malik, P.; Kemmler, G.; Hummer, M.; Riecher-Roessler, A.; Kahn, R. S.; Fleischhacker, W. W.; Grp, E. S.	Sexual dysfunction in first-episode schizophrenia patients results from european first episode schizophrenia trial		Journal of Clinical Psychopharmacology	2011	31	3	274–280
Kahn 2008	Matei, V. P.; Mihailescu, A.; Paraschiv, G.; Al-Bataineh, R.; Purnichi, T.	Weight gain and antipsychotics. Data from EUFEST study		Acta Endocrinologica	2016	12	2	177–184
Kahn 2008	Matei, V. P.; Purnichi, T.; Mihailescu, A.; Grigoras, R.	Prolactin level in patients with first episode schizophrenia treated for one year with atypical antipsychotics		Acta Endocrinologica	2018	14	4	483–490
Kahn 2008	Matei, V.; Al-Bataineh, R.; Mihailescu, A.; Purnichi, T.; Crasan, A.	Roots to clinical prognosis in first episode psychosis of schizophrenia data from EUFEST study		European Neuropsychopharmacology	2015	25		S538
Kahn 2008	Matei, V.; Mihailescu, A.; Purnichi, T.; Al-Bateineh, R.	Weight gain and antipsychotics, data from EUFEST study		European Neuropsychopharmacology	2015	25		S487-S488
Kahn 2008	Petre, Matei V.; Ioana, Mihailescu A.; Raluca, Gheorghe I.; Grigoras, R.; Crasan, A.; Rosca, A.; Popa-Velea, O.	Clinical validity of subjective clinical prognosis in first episode psychosis schizophrenia patients: An analysis of data from the european first episode schizophrenia trial (EUFEST) study		Neuropsychiatric Disease and Treatment	2020			1279–1284
Kahn 2008	Szmulewicz A // Martinez-Ales G // Ferrara M // Fredrikson D // Gago J // Conderino S // Srihari VH // Yatham L	Benchmarking observational analyses against randomized trial results: An application to first episode psychosis		Early Intervention in Psychiatry	2023	17 (Supplement 1)		144
Kahn 2008	Szmulewicz A // Martinez-Ales	Benchmarking Observational Analyses Against		Biological Psychiatry	2023	93 (9 Su		S328-S329

	G // Ferrara M // Fredrikson D // Gago J // Srihari V // Yatham L // Conderino S // Shinn A // Ongur D // Hernan M	Randomized Trial Results: An Application to First Episode Psychosis				pple-ment)		
Kane 2010a	Meltzer, H.; Cohen, M.; Snow-Adami, L.; Mackle, M.; Zhao, J.; Szegedi, A.; Panagides, J.	Long-term safety and maintenance of effect of asenapine in patients with acute exacerbation of schizophrenia		European Neuropsychopharmacology	2009	19		S536-S7
Kane 2010a	Nct	A multicenter, double-blind, flexible dose, long-term extension trial of the safety and maintenance of effect of asenapine using a haloperidol positive control in subjects who complete protocol 041023		https://ClinicalTrials.gov/	2005			
Kane 2010a	Nct	A multicenter, randomized, double-blind, fixed-dose, 6-week trial of the efficacy and safety of asenapine compared with placebo using haloperidol positive control in subjects with an acute exacerbation of schizophrenia		https://ClinicalTrials.gov/	2005			
Kane 2010a	Potkin, S. G.; Kane, J. M.; Emsley, R. A.; Naber, D.; Panagides, J.	Asenapine in schizophrenia	an overview of clinical trials in the Olympia program	Proceedings of the 63rd Annual Scientific Convention and Meeting of the Society of Biological Psychiatry; 2008 May 1-3; Washington, DC	2008			
Kane 2010a	The, National Horizon Scanning Centre	Asenapine (Saphris) for schizophrenia		Report	2010			
Kane 2010a	Castle, D. J.; Jensen, J. K. S.	Management of depressive symptoms in schizophrenia	A pooled, post hoc analysis from the asenapine development program	Clinical Schizophrenia and Related Psychoses	2015	9	1	13–20
Kane 2010a	Kane, J.; Jensen, J. K.	The effect of asenapine on depressive symptoms in patients with acute schizophrenia, results from post HOC analyses		Schizophrenia Research	2012	136		S280
Kane 2010a	Kane, J.; Zhao, J.; Cohen, M.; Panagides, J.	Efficacy and safety of asenapine in patients with acute exacerbation of schizophrenia		Schizophrenia Research	2008	98		14

Kane 2010a	Kane, J. M.; Cohen, M.; Zhao, J.; Alphs, L.; Panagides, J.	Efficacy and safety of asenapine in a placebo- and haloperidol-controlled trial in patients with acute exacerbation of schizophrenia		Journal of Clinical Psychopharmacology	2010	30	2	106–115
Kane 2010a	Kane, J. M.; Zhao, J.; Cohen, M.; Panagides, J.	Efficacy and safety of asenapine in patients with acute schizophrenia		Proceedings of the 161st Annual Meeting of the American Psychiatric Association; 2008 May 3-8; Washington DC, USA	2008			
Kane 2010a	Leucht, S.; Zhao, J.	Early improvement as a predictor of treatment response and remission in patients with schizophrenia	a pooled, post-hoc analysis from the asenapine development program	Journal of psychopharmacology (Oxford, England)	2014	28	4	387–394
Kane 2011	Nct	A randomized, placebo-controlled, double-blind trial of asenapine in the prevention of relapse after long-term treatment of schizophrenia		https://ClinicalTrials.gov/	2005			
Kane 2011	The, National Horizon Scanning Centre	Asenapine (Saphris) for schizophrenia		Report	2010			
Kane 2011	Kane, J. M.; Mackle, M.; Snow-Adami, L.; Zhao, J.; Szegedi, A.; Panagides, J.	Double-blind, placebo-controlled trial of asenapine in prevention of relapse after long-term treatment of schizophrenia		International Journal of Neuropsychopharmacology	2010	13		223
Kane 2011	Kane, J. M.; Mackle, M.; Snow-Adami, L.; Zhao, J.; Szegedi, A.; Panagides, J.	A randomized placebo-controlled trial of asenapine for the prevention of relapse of schizophrenia after long-term treatment		Journal of Clinical Psychiatry	2011	72	3	349–355
Kane 2011	Mackle, M.; Snow-Adami, L.; Zhao, J.; Szegedi, A.; Panagides, J.	Double-blind, placebo-controlled trial of asenapine in prevention of relapse after long-term treatment of schizophrenia		European Neuropsychopharmacology	2009	19	Suppl 3	S543
Kane 2015b	Nct	Safety and efficacy of cariprazine in schizophrenia		https://ClinicalTrials.gov/	2010			
Kane 2015b	Zukin, S. R.; Kane, J.; A, J. C.; Wang, Y.; Mokliatchouk, O.; Nagy, K.; laszlovszky, I.; Durgam, S.	Efficacy and safety of cariprazine in acute exacerbation of schizophrenia	A phase iii, international, randomized double-blind, placebo-controlled trial	Neuropsychopharmacology	2012	38	S1	S319

Kane 2015b	Durgam, S.; laszlovszky, I.; Nagy, K.; Lu, K.; Volk, S.; Litman, R.	Categorical improvements in severity of mania and schizophrenia symptoms	Pooled analyses of cariprazine phase II/III trials	International Journal of Neuropsychopharmacology	2014	17		54
Kane 2015b	Citrome, L.; Litman, R. E.; Wang, Y.; Mokliatchouk, O.; Nemeth, G.; laszlovszky, I.; Durgam, S.	Cariprazine efficacy in acute exacerbation of schizophrenia	Analysis of PAN SS data from a phase III, international, randomized, double-blind, placebo-controlled trial	Schizophrenia Bulletin	2013	39		S325
Kane 2015b	Citrome, L.; Lu, K.; Ferguson, P.; laszlovszky, I.; Earley, W.; Durgam, S.	Cariprazine and the reduction of hostility associated with schizophrenia		European Neuropsychopharmacology	2015	25		S523
Kane 2015b	Earley, W.; Durgam, S.; Lu, K.; laszlovszky, I.; Debelle, M.; Kane, J. M.	Safety and tolerability of cariprazine in patients with acute exacerbation of schizophrenia	a pooled analysis of four phase II/III randomized, double-blind, placebo-controlled studies	International Clinical Psychopharmacology	2017	32	6	319–328
Kane 2015b	Forest, Laboratories Inc; Gedeon, Richter Plc	Announce results from two positive phase iii trials with the investigational antipsychotic cariprazine for the treatment of schizophrenia		http://investor.frx.com/press-release/rd-news/forest-laboratories-inc-and-gedeon-richter-plc-announce-results-two-positive-p	2012			
Kane 2015b	Gopal, S.; Xu, H.; Bossie, C.; Buron, J. A.; Fu, D. J.; Savitz, A.; Nuamah, I.; Hough, D.	Incidence of tardive dyskinesia	a comparison of long-acting injectable and oral paliperidone clinical trial databases	International Journal of Clinical Practice	2014	68	12	1514–1522
Kane 2015b	Kane, J.; Citrome, L.; Litman, R.; Zukin, S.; Lu, K.; Ruth, A.; Nagy, K.; laszlovszky, I.; Durgam, S.	Efficacy of cariprazine on PANSS items and Marder factors	Post hoc analysis of a double-blind, placebo-controlled trial in schizophrenia	European Neuropsychopharmacology	2013	23		S461-S462
Kane 2015b	Kane, J. M.; Zukin, S.; Wang, Y.; Lu, K.; Ruth, A.; Nagy, K.; laszlovszky, I.; Durgam, S.	Efficacy and Safety of Cariprazine in Acute Exacerbation of Schizophrenia	Results From an International, Phase III Clinical Trial	Journal of Clinical Psychopharmacology	2015	35	4	367–373
Kane 2015b	Marder, S.; Fleischhacker, W. W.; Earley, W.; Lu, K.; Zhong, Y.; Nemeth, G.; laszlovszky, I.;	Efficacy of cariprazine across symptom domains in patients with acute exacerbation of schizophrenia	Pooled analyses from 3 phase II/III studies	European Neuropsychopharmacology	2019	29	1	127–136

	Szalai, E.; Durgam, S.							
Kane 2015b	Sebe, B.; Barabassy, A.; Acsai, K.; Laszlovszky, I.; Dombi, Zb; Vass, G.; Szatmari, B.; Patel, M.; Earley, W.; Nemeth, G.	The effect of cariprazine on agitation and hostility in patients with schizophrenia: post-hoc analysis		European neuropsychopharmacology	2020		Suppl. 1	S327-s328
Kane 2015b	Dombi, Zb; Acsai, K.; Barabassy, A.; Sebe, B.; Laszlovszky, I.; Vass, G.; Szatmari, B.; Patel, M.; Earley, W.; Nemeth, G.	Efficacy of cariprazine in the early stage of schizophrenia: a pooled, post-hoc analysis of 3 phase II/III double-blind placebo-controlled trials		European neuropsychopharmacology	2020		Suppl. 1	S325-s326
Kane 2015b	Falkai, P.; Dombi, Zb; Acsai, K.; Barabassy, A.; Schmitt, A.; Nemeth, G.	The efficacy and safety of cariprazine in the early and late stage of schizophrenia: a post hoc analysis of three randomized, placebo-controlled trials		CNS Spectr	2021	In-Press		InPress
Kane 2015b	Correll C // Sebe B // Csehi R // Acsai K // Barabassy A	Benzodiazepine use during cariprazine treatment in acute schizophrenia		European psychiatry	2022	65		S98
Kane 2015b	Culpepper L // Vieta E // Kelly DL // Patel MD // Szatmari B // Hankinson A // Earley WR	Minimal Effects of Cariprazine on Prolactin Levels in Bipolar Disorder and Schizophrenia		Neuropsychiatric disease and treatment	2022	18		995-1011
Kane 2015b	Dombi ZB // Acsai K // Barabassy A // Sebe B // Laszlovszky I // Vass G // Szatmari B // Patel M // Earley W // Nemeth G	Tolerability of cariprazine in the early stage of schizophrenia: a pooled, post-hoc analysis of 4 phase ii/iii double-blind placebo-controlled trials		European psychiatry	2021	64		S524-S52
Kane 2015b	Falkai P // Dombi Z // Acsai K // Barabassy A // Nemeth G	The efficacy of cariprazine in chronic schizophrenia - post hoc analyses of phase II/III clinical trials		European psychiatry	2022	65		S323
Keefe 2006	Namjoshi, M.; Young, C.; Huang, L.; Edgell, E. T.; Breier, A.	Conical and quality-of-life outcomes associated with olanzapine, risperidone, and haloperidol treatment in patients	results from a US random study	International Journal of Neuropsychopharmacology	2002	5	Suppl 1	S127

		with schizophrenia						
Keefe 2006	Namjoshi, M.; Young, C.; Huang, L.; Edgell, E. T.; Breier, A.	Hospitalization rates associated with olanzapine, risperidone, and haloperidol treatment in patients with schizophrenia	results from a U.S. randomized controlled trial	European Neuropsychopharmacology	2002	12	Suppl 3	S315
Keefe 2006	Namjoshi, M.; Young, C. A.; Huang, L.; Edgell, E.; Breier, A.	Cost-effectiveness of olanzapine compared to risperidone and haloperidol in the treatment of patients with schizophrenia	results from a U.S. randomized controlled trial	Schizophrenia Research	2003			
Keefe 2006	Namjoshi, M.; Young, C. A.; Huang, L.; Edgell, E.; Breier, A.	Cost-effectiveness of olanzapine compared to risperidone and haloperidol in the treatment of patients with schizophrenia	results from a U.S. randomized controlled trial	Schizophrenia Research	2003	60		296
Keefe 2006	Sethuraman, G.; Ahmed, S.; Rock, S. L.; Young, C. A.; Marquez, E. M.; Purdon, S. E.; Keefe, R. S. E.	Can the PANSS cognitive factor be a valid surrogate for neurocognition in schizophrenia?		European Neuropsychopharmacology	2004	14	Suppl 3	S292
Keefe 2006	Breier, A.; Keefe, R. S.; Young, C. A.; Purdon, S. E.; Gold, J. M.; Davis, K. L.	A one-year double-blind comparison of the neurocognitive efficacy of olanzapine, risperidone, and haloperidol in patients with schizophrenia		Proceedings of the 9th International Congress on Schizophrenia Research; 2003 Mar 29-Apr 2; Colorado Spings, Colorado, USA	2003			
Keefe 2006	Breier, A.; Keefe, R. S.; Young, C. A.; Purdon, S. E.; Gold, J. M.; Davis, K. L.	A one-year double-blind comparison of the neurocognitive efficacy of olanzapine, risperidone, and haloperidol in patients with schizophrenia		Schizophrenia Research	2003	60		274–275
Keefe 2006	Keefe, R.; McEvoy, J.; Vaughn, A.	Source monitoring improvement in patients with schizophrenia		Schizophrenia Research	2002	53	3 Suppl 1	196
Keefe 2006	Keefe, R. S.; Poe, M. P.; McEvoy, J. P.; Vaughan, A.	Source monitoring improvement in patients with schizophrenia receiving antipsychotic medications		Psychopharmacology	2003	169	3-4	383–389
Keefe 2006	Keefe, R. S. E.; Alaka, K.; Purdon, S. E.; Rock, S.; Wei, H.; Marquez, E.; Ahmed, S.	Outcomes and characteristics of olanzapine cognitive super-responders		Proceedings of the 157th Annual Meeting of the American Psychiatric Association; 2004 May 1-6; New York, USA	2004			

Keefe 2006	Keefe, R. S. E.; Young, C. A.; Rock, S. L.; Purdon, S. E.; Gold, J. M.; Breier, A.	One-year double-blind study of the neurocognitive efficacy of olanzapine, risperidone, and haloperidol in schizophrenia		Schizophrenia Research	2006	81	1	1–15
Keefe 2006	Lipkovich, I. A.; Deberdt, W.; Csernansky, J. G.; Sabbe, B.; Keefe, R. S.; Kollack-Walker, S.	Relationships among neurocognition, symptoms and functioning in patients with schizophrenia	a path-analytic approach for associations at baseline and following 24 weeks of antipsychotic drug therapy	BMC psychiatry	2009	9	4 4	
Keefe 2006	Liu-Seifert, H.; Osuntokun, O. O.; Godfrey, J. L.; Feldman, P. D.	Patient perspectives on antipsychotic treatments and their association with clinical outcomes		Patient preference and adherence	2010	4		369–377
Keefe 2006	Lysaker, P. H.	Olanzapine and risperidone may improve neurocognition more than haloperidol in people with schizophrenia who continue treatment for 52 weeks		Evidence-Based Mental Health	2006	9	3	71
Kern 2006	Carson, W.; Cornblatt, B.; Saha, A.; Ali, M.; Kern, R.; Green, M.	Neurocognitive benefits of aripiprazole versus olanzapine in stable psychosis		European Neuropsychopharmacology	2002	12	Suppl 3	S291
Kern 2006	Cornblatt, B.; Kern, R. S.; Carson, W. H.; Ali, M. W.; Luo, X.; Green, M.	Neurocognitive effects of aripiprazole versus olanzapine in stable psychosis		International Journal of Neuropsychopharmacology	2002	5	Suppl 1	S185
Kern 2006	Cornblatt, B.; Kern, R. S.; Carson, W. H.; Stock, E.; Ali, M.; Ingenito, G.; Green, M. F.	Neurocognitive effects of aripiprazole versus olanzapine in patients with stabile psychosis		Journal of Psychopharmacology	2002	16	Suppl 3	A15
Kern 2006	Cornblatt, B.; Kern, R. S.; Carson, W. H.; Stock, E.; Ali, M.; Ingenito, G.; Green, M. F.	Neurocognitive effects of aripiprazole versus olanzapine in patients with stable psychosis		Schizophrenia Research	2002	53	3 Suppl 1	27
Kern 2006	Dubitsky, G. M.; Harris, R.; Laughren, T.; Hardeman, S.	Abilify (aripiprazole) tablets; medical review part 1		http://www.fda.gov/cder/foi/nda/2002/21-436_Abilify.htm	2002			1–50
Kern 2006	Dubitsky, G. M.; Harris, R.; Laughren, T.; Hardeman, S.	Abilify (aripiprazole) tablets; medical review part 2		http://www.fda.gov/cder/foi/nda/2002/21-436_Abilify.htm	2002			50–110

Kern 2006	Dubitsky, G. M.; Harris, R.; Laughren, T.; Hardeman, S.	Abilify (aripiprazole) tablets; medical review part 3		http://www.fda.gov/cder/foi/nda/2002/21-436_Abilify.htm	2002			111–175
Kern 2006	Dubitsky, G. M.; Harris, R.; Laughren, T.; Hardeman, S.	Abilify (aripiprazole) tablets; medical review part 4		http://www.fda.gov/cder/foi/nda/2002/21-436_Abilify.htm	2002			176–232
Kern 2006	Kern, R. S.; Cornblatt, B.; Carson, W. H.; Dunbar, G.; Ali, M.; Ingenito, G.; Green, M. F.	An open-label comparison of the neurocognitive effects of aripiprazole versus olanzapine in patients with stable psychosis		Schizophrenia Research	2001	49	1-2	234
Kern 2006	Kern, R. S.; Cornblatt, B.; Carson, W. H.; Stock, E.; Saha, A. R.; Ali, M. W.; Ingenito, G.; Green, M. F.	Neurocognitive effects	aripiprazole vs olanzapine in stable psychosis	European Psychiatry	2002	17	Suppl 1	104s
Kern 2006	Kern, R. S.; Green, M. F.; Cornblatt, B. A.; Owen, J. R.; McQuade, R. D.; Carson, W. H.; Ali, M.; Marcus, R.	The neurocognitive effects of aripiprazole	an open-label comparison with olanzapine	Psychopharmacology	2006	187	3	312–320
Kern 2006	Kindermann, S. S.	Attention, working memory and antipsychotics using fmri		CRISP Database (https://www-commons.cit.nih.gov/crisp/index.html Accessed 19th February 2001)	2001			
Kinon 2006a	Roberts, D. L.; Penn, D. L.; Corrigan, P.; Lipkovich, I.; Kinon, B.; Black, R. A.	Antipsychotic medication and social cue recognition in chronic schizophrenia		Psychiatry Research	2010	178	1	46–50
Kinon 2006a	Roychowdhury, S. M.; Sethuraman, G.; Phillips, G. A.; Enerson, M.; Berg, P. H.; Breier, A.	Comparison of olanzapine to other atypical antipsychotics in preventing relapse in patients with schizophrenia		Proceedings of the Thematic Conference of the World Psychiatric Association on "Treatments in Psychiatry: An Update"; 2004 Nov 10-13; Florence, Italy	2004			
Kinon 2006a	Stauffer, V. L.; Song, G.; Kinon, B. J.; Ascher-Svanum, H.; Chen, L.; Feldman, P. D.; Conley, R. R.	Responses to antipsychotic therapy among patients with schizophrenia or schizoaffective disorder and either predominant or prominent negative symptoms		Schizophrenia Research	2012	134		195–201

Kinon 2006a	Anonymous	Erratum	Randomized, double-blind 6-month comparison of olanzapine and quetiapine in patients with schizophrenia or schizoaffective disorder with prominent negative symptoms and poor functioning (Journal of Clinical Psychopharmacology (2006) 26 (453-461))	Journal of Clinical Psychopharmacology	2009	29	2	169
Kinon 2006a	Bushe, C.; Poole-Hoffmann, V.; Lipkovich, I.	Metabolic comparisons from a 6-month randomized trial of olanzapine and quetiapine in schizophrenia		Proceedings of the 62nd Annual Scientific Meeting of the Society of Biological Psychiatry	2007			255
Kinon 2006a	Bushe, C.; Sniadecki, J.; Bradley, A. J.; Poole, Hoffmann V.	Comparison of metabolic and prolactin variables from a six-month randomised trial of olanzapine and quetiapine in schizophrenia		Journal of Psychopharmacology	2010	24	7	1001–1009
Kinon 2006a	Kinon, B. J.; Liu-Seifert, H.; Hill, A. L.; Roychowdhury, S.; Edwards, S. B.	Superiority of olanzapine versus quetiapine in improving overall functioning in patients with schizophrenia		Proceedings of the 16th European College of Neuropsychopharmacology Congress; 2003 Sep 20-24; Prague, Czech Republic	2003			
Kinon 2006a	Kinon, B. J.; Noordsy, D. L.; Liu-Seifert, H.; Gulliver, A. H.; Ascher-Svanum, H.; Kollack-Walker, S.	Randomized, double-blind 6-month comparison of olanzapine and quetiapine in patients with schizophrenia or schizoaffective disorder with prominent negative symptoms and poor functioning		Journal of Clinical Psychopharmacology	2006	26	5	453–461
Kinon 2006a	Kinon, B. J.; Volavka, J.; Stauffer, V.; Edwards, B.; Liu-Seifert, H.; Chen, L.; Lindenmayer, J. P.; Adams, D. H.; McEvoy, J.; Buckley, P. F.; Lieberman, J. A.; Meltzer, H. Y.; Wilson, D.; Citrome, L.	Standard and higher doses of olanzapine in acutely ill patients with schizophrenia or schizoaffective disorder with suboptimal prior response	a randomized double-blind fixed dose study	International Journal of Neuropsychopharmacology	2006	9	Suppl 1	S281
Kinon 2006a	Kollack-Walker, S.; Hill, A.; Liu-Seifert, H.; Kinon, B. J.	Superiority of olanzapine versus quetiapine in improving overall functioning		Proceedings of the 157th Annual Meeting of the American Psychiatric Association; 2004 May 1-6; New York, USA	2004			
Kinon 2006b	Kinon, B.; Lipkovich,	Improvement of comorbid depres-		Schizophrenia Research	2004	67	1	163

	I.; Edwards, S.; Hill, A.; Ahl, J.	sion with olanzapine versus ziprasidone treatment in patients with schizophrenia or schizoaffective disorder						
Kinon 2006b	Kinon, B. J.; Lipkovich, I.; Carlson, C.; Dunayevich, E.; Edwards, S. B.	Improvement of comorbid depression with olanzapine versus ziprasidone treatment in patients with schizophrenia or schizoaffective disorder		Proceedings of the 12th Biennial Winter Workshop on Schizophrenia; 2004 Feb 7-13; Davos, Switzerland	2004			
Kinon 2006b	Kinon, B. J.; Lipkovich, I.; Edwards, S. B.; Adams, D. H.; Ascher-Svanum, H.; Siris, S. G.	A 24-week randomized study of olanzapine versus ziprasidone in the treatment of schizophrenia or schizoaffective disorder in patients with prominent depressive symptoms		Journal of Clinical Psychopharmacology	2006	26	2	157–162
Kinon 2006b	Kinon, B. J.; Lipkovich, I.; Edwards, S. E.	Improvement of comorbid depression with olanzapine versus ziprasidone treatment in patients with schizophrenia or schizoaffective disorder		Schizophrenia Bulletin	2005	31		491
Kinon 2009	Naber, D.; Kollack-Walker, S.; Chen, J.; Stauffer, V. L.; Kinon, B. J.; Case, M.; Ascher-Svanum, H.; Kapur, S.; Kane, J. M.	Predicting a 'combined treatment outcome' in chronic schizophrenia	the role of demographics, symptomatology, functioning and subjective well-being	PharmacoPsychiatry	2013	46	3	114–119
Kinon 2009	Nct	Predicting response to risperidone treatment through identification of early-onset of antipsychotic drug action in schizophrenia		https://ClinicalTrials.gov/	2006			
Kinon 2009	Nct	Predicting response to risperidone treatment through identification of early-onset of antipsychotic drug action in schizophrenia		https://ClinicalTrials.gov/	2006			
Kinon 2009	Peng, X.; Ascher-Svanum, H.; Faries, D. E.; Stauffer, V. L.; Kollack-Walker, S.; Kinon, B. J.; Kane, J. M.	Cost-effectiveness of early responders versus early nonresponders to atypical antipsychotic therapy		Clinicoeconomics and Outcomes Research	2011	3	1	79–87

Kinon 2009	Stauffer, V.; Chen, L.; Ascher-Svanum, H.; Kollack-Walker, S.; Zhou, W.; Kapur, S.; Kane, J.; Kinon, B. J.	Switching antipsychotic drugs enhances improvement in patients who show lack of an early response to their initial antipsychotic therapy		Proceedings of the 162nd Annual Meeting of the American Psychiatric Association; 2009 May 16-21; San Francisco, CA	2009			
Kinon 2009	Stauffer, V. L.; Case, M.; Ascher-Svanum, H.; Conley, R.; Kapur, S.; Kane, J. M.; Kollack-Walker, S.; Jacob, J.; Kinon, B. J.	The heterogeneity of antipsychotic response in the treatment of schizophrenia		Schizophrenia Research	2010	117	2-3	502–503
Kinon 2009	Ascher-Svanum, H.; Nyhuis, A. W.; Stauffer, V.; Kinon, B. J.; Faries, D. E.; Phillips, G. A.; Schuh, K.; Awad, A. G.; Keefe, R.; Naber, D.	Reasons for discontinuation and continuation of antipsychotics in the treatment of schizophrenia from patient and clinician perspectives		Current Medical Research and Opinion	2010	26	10	2403–2410
Kinon 2009	Case, M.; Stauffer, V. L.; Ascher-Svanum, H.; Conley, R.; Kapur, S.; Kane, J. M.; Kollack-Walker, S.; Jacob, J.; Brackins, T.; Kinon, B. J.	The heterogeneity of antipsychotic response in the treatment of schizophrenia		Journal of Pharmacy Practice	2010	23	2	159
Kinon 2009	Case, M.; Stauffer, V. L.; Ascher-Svanum, H.; Conley, R.; Kapur, S.; Kane, J. M.; Kollack-Walker, S.; Jacob, J.; Kinon, B. J.	The heterogeneity of antipsychotic response in the treatment of schizophrenia		Psychological Medicine	2011	41	6	1291–1300
Kinon 2009	Chen, L.; Phillips, G.; Johnston, J.; Kinon, B. J.; Ascher-Svanum, H.; Kollack-Walker, S.; Succop, P.; Naber, D.	The relationship, structure and profiles of schizophrenia measurements	A post-hoc analysis of the baseline measures from a randomized clinical trial	BMC psychiatry	2011	11		203

Kinon 2009	Chen, L.; Phillips, G. A.; Johnston, J.; Stauffer, V.; Kinon, B. J.; Ascher-Svanum, H.; Kollack-Walker, S.; Succop, P.; Naber, D.	Relationships among multiple outcome measures in the study of schizophrenia		Schizophrenia Research	2010	117	2-3	400
Kinon 2009	Eli, Lilly; Company	Efficacy study of early onset of antipsychotic drug action in schizophrenia		https://ClinicalTrials.gov/	2006			
Kinon 2009	Fijal, B. A.; Stauffer, V. L.; Kinon, B. J.; Conley, R. R.; Hoffmann, V. P.; Witte, M. M.; Zhao, F.; Houston, J. P.	Analysis of gene variants previously associated with iloperidone response in patients with schizophrenia who are treated with risperidone		Journal of Clinical Psychiatry	2012	73	3	367–371
Kinon 2009	Kinon, B.; Chen, L.; Stauffer, V.; Ascher-Svanum, H.; Zhou, W.; Kollack-Walker, S.; Kane, J.; Kapur, S.	Differences between early responders and early non-responders to atypical antipsychotics on symptom and functional outcomes in the treatment of schizophrenia		Schizophrenia Research	2010	117	2-3	132
Kinon 2009	Kinon, B. J.; Chen, L.; Ascher-Svanum, H.; Stauffer, V.; Kollack-Walker, S.; Zhou, W.; Kapur, S.; Kane, J.	Early response as a response predictor	Use of individual variability in clinical trials	European Neuropsychopharmacology	2009	19		S183
Kinon 2009	Kinon, B. J.; Chen, L.; Ascher-Svanum, H.; Stauffer, V. L.; Kollack-Walker, S.; Zhou, W.; Kapur, S.; Kane, J. M.	Early response to antipsychotic drug therapy as a clinical marker of subsequent response in the treatment of schizophrenia		Neuropsychopharmacology	2010	35	2	581–590
Kinon 2009	Kinon, B. J.; Chen, L.; Ascher-Svanum, H.; Stauffer, V. L.; Kollack-Walker, S.; Zhou, W.; Kapur, S.; Kane, J. M.; Naber, D.	Challenging the assumption that improvement in functional outcomes is delayed relative to improvement in symptoms in the treatment of schizophrenia		Schizophrenia Research	2010	118	1-3	176–182

Kinon 2009	Kinon, B. J.; Stauffer, V.; Ascher-Svanum, H.; Tomori, O.; Kollack-Walker, S.	Predicting response to risperidone treatment through identification of early-onset of antipsychotic drug action in schizophrenia		Proceedings of the 161st Annual Meeting of the American Psychiatric Association; 2008 May 3-8; Washington DC, USA	2008			
Kinon 2009	Kollack-Walker, S.; Stauffer, V.; Case, M.; Conley, R.; Ascher-Svanum, H.; Kinon, B. J.	Early response to antipsychotic drug therapy as a predictor of subsequent response in the treatment of patients with first episode psychosis		Proceedings of the 162nd Annual Meeting of the American Psychiatric Association; 2009 May 16-21; San Francisco, CA	2009			
Kolff 2000	Kolff, M.; Coenen, A.; Van, Dis H.; Duigemans, P.	Differential effects of antipsychotic drugs on clinical symptoms and cognitive functions in the treatment of schizophrenia		European Neuropsychopharmacology	2000	10	Suppl 2	S59
Koshikawa 2016	Takekita, Y.; Koshikawa, Y.; Fabbri, C.; Sakai, S.; Sunada, N.; Onohara, A.; Nishida, K.; Yoshimura, M.; Kato, M.; Serretti, A.; Kinoshita, T.	Cognitive function and risperidone long-acting injection vs. paliperidone palmitate in schizophrenia	a 6-month, open-label, randomized, pilot trial	BMC psychiatry	2016	16		172
Koshikawa 2016	Umin	A Randomized Controlled Trial of Paliperidone and Risperidone for Cognitive and Social Function; Long-Acting Injection in Japanese Schizophrenia Patients (PARASOL-J)		http://apps.who.int/trialsearch/	2014			
Koshikawa 2016	Koshikawa, Y.; Takekita, Y.; Kato, M.; Sakai, S.; Onohara, A.; Sunada, N.; Nishida, K.; Yoshimura, M.; Fabbri, C.; Serretti, A.; Kinoshita, T.	The effects of risperidone long-acting injection versus paliperidone palmitate on cognitive and social function in schizophrenia - An open pilot randomised controlled trial		European Neuropsychopharmacology	2015	25		S500-S501
Koshikawa 2016	Koshikawa, Y.; Takekita, Y.; Kato, M.; Sakai, S.; Onohara, A.; Sunada, N.; Nishida, K.; Yoshimura, M.;	The Comparative Effects of Risperidone Long-Acting Injection and Paliperidone Palmitate on Social Functioning in Schizophrenia	A 6-Month, Open-Label, Randomized Controlled Pilot Trial	Neuropsychobiology	2016	73	1	35–42

	Fabbri, C.; Serretti, A.; Kinoshita, T.							
Krakowski 2006	Krakowski, M.; Czobor, P.	A prospective longitudinal study of cholesterol and aggression in patients randomized to clozaplne, olanzapine and haloperidol		Proceedings of the 15th Biennial Winter Workshop in Psychoses; 2009 Nov 15-18; Barcelona, Spain	2009			
Krakowski 2006	Krakowski, M.; Czobor, P.	Cholesterol and cognition in schizophrenia	A double-blind study of patients randomized to clozapine, olanzapine and haloperidol	Schizophrenia Research	2011	130	1-3	27–33
Krakowski 2006	Krakowski, M.; Czobor, P.; Citrome, L.	Weight gain, metabolic parameters, and the impact of race in aggressive inpatients randomized to double-blind clozapine, olanzapine or haloperidol		Schizophrenia Research	2009	110	1-3	95–102
Krakowski 2006	Krakowski, M. I.	Clozapine and olanzapine in violent schizophrenics		CRISP Database (https://www-commons.cit.nih.gov/crisp/index.html Accessed 19th February 2001)	2001			
Krakowski 2006	Krakowski, M. I.; Czobor, P.	A prospective longitudinal study of cholesterol and aggression in patients randomized to clozapine, olanzapine, and haloperidol		Journal of Clinical Psychopharmacology	2010	30	2	198–200
Krakowski 2006	Krakowski, M. I.; Czobor, P.	Neurocognitive impairment limits the response to treatment of aggression with antipsychotic agents		Schizophrenia Bulletin	2011	37		311–312
Krakowski 2006	Krakowski, M. I.; Czobor, P.	Executive function predicts response to antiaggression treatment in schizophrenia	A randomized controlled trial	Journal of Clinical Psychiatry	2012	73	1	74–80
Krakowski 2006	Krakowski, M. I.; Czobor, P.	Depression and impulsivity as pathways to violence	implications for antiaggressive treatment	Schizophrenia Bulletin	2014	40	4	886–894
Krakowski 2006	Krakowski, M. I.; Czobor, P.; Citrome, L.; Bark, N.; Cooper, T. B.	Atypical antipsychotic agents in the treatment of violent patients with schizophrenia and schizoaffective disorder		Archives of General Psychiatry	2006	63	6	622–629
Krakowski 2006	Krakowski, M. I.; Czobor, P.; Nolan, K. A.	Atypical antipsychotics, neurocognitive deficits, and aggression in schizophrenic patients		Journal of Clinical Psychopharmacology	2008	28	5	485–493
Krakowski 2006	Krakowski, M.; Tural, U.; Czobor, P.	The Importance of Conduct Disorder in the Treatment of Violence in Schizophrenia: Efficacy of Clozapine Compared With		The American journal of psychiatry (Am J Psychiatry)	2021	178	3	266–274

		Olanzapine and Haloperidol						
Krakowski 2006	Krakowski, M.; Tural, U.; Czobor, P.	The Importance of Conduct Disorder in the Treatment of Violence in Schizophrenia: Efficacy of Clozapine Compared With Olanzapine and Haloperidol		American Journal of Psychiatry	2021			InPress
Kryzhanovskaya 2009	Nct	Olanzapine versus placebo in the treatment of adolescents with schizophrenia		https://ClinicalTrials.gov/	2002			
Kryzhanovskaya 2009	Nct	Olanzapine versus placebo in the treatment of adolescents with schizophrenia		https://ClinicalTrials.gov/	2003			
Kryzhanovskaya 2009	Robertson-Plouch, C.; Schuh, L. M.; Xu, W.; Kryzhanovskaya, L.; Tohen, M.	A comparison of three randomized, double-blind, placebo-controlled studies of olanzapine treatment in adolescent and adult patients with schizophrenia		Proceedings of the 14th Biennial Winter Workshop on Schizophrenia and Bipolar Disorders; 2008 Feb 3-7; Montreux, Switzerland	2008			
Kryzhanovskaya 2009	Robertson-Plouch, C.; Schuh, L. M.; Xu, W.; Kryzhanovskaya, L.; Tohen, M.	A comparison of three randomized, double-blind, placebo-controlled studies of olanzapine treatment in adolescent and adult patients with schizophrenia		Schizophrenia Research	2008	98		45–46
Kryzhanovskaya 2009	Stentebjerg-Olesen, M.; Ganocy, S. J.; Findling, R. L.; Chang, K.; DelBello, M. P.; Kane, J. M.; Tohen, M.; Jeppesen, P.; Correll, C. U.	Early response or nonresponse at week 2 and week 3 predict ultimate response or nonresponse in adolescents with schizophrenia treated with olanzapine	results from a 6-week randomized, placebo-controlled trial	European Child and Adolescent Psychiatry	2015	24	12	1485–1496
Kryzhanovskaya 2009	Dittmann, R. W.; Krzyhanovskaya, L.; Schulz, C.; McDougle, C. J.; Frazier, J. A.; Robertson-Plouch, C.; Bauer, T.; Xu, W.; Wang, W. V.; Carlson, J.	Results from a double-blind, placebo-controlled study of olanzapine in adolescents with schizophrenia		Schizophrenia Research	2006	86	Suppl 1	S133
Kryzhanovskaya 2009	Kemp, D. E.; Correll, C. U.; Tohen, M.; DelBello,	Associations among obesity, acute weight gain, and response to treatment with		Journal of Child and Adolescent Psychopharmacology	2013	23	8	522–530

	M. P.; Ganocy, S. J.; Findling, R. L.; Chang, K.	Olanzapine in adolescent schizophrenia						
Kryzhanovskaya 2009	Kryzhanovskaya, L.; Schulz, C.; McDougle, C. J.; Frazier, J. A.; Dittmann, R.; Robertson-Plouch, C.; Bauer, T.; Xu, W.; Wang, W. V.; Carlson, J.; Tohen, M.	A double-blind, placebo-controlled study of olanzapine in adolescents with schizophrenia		Proceedings of the 13th Biennial Winter Workshop on Schizophrenia Research; 2006 Feb 4-10; Davos, Switzerland	2006			44–45
Kryzhanovskaya 2009	Kryzhanovskaya, L.; Schulz, C.; McDougle, C. J.; Frazier, J. A.; Dittmann, R.; Robertson-Plouch, C.; Bauer, T.; Xu, W.; Wang, W. V.; Carlson, J.; Tohen, M.	A double-blind, placebo-controlled study of olanzapine in adolescents with schizophrenia		Proceedings of the 61st Annual Convention of the Society of Biological Psychiatry; 2006 May 18-20; Toronto, Canada	2006			733
Kryzhanovskaya 2009	Kryzhanovskaya, L.; Schulz, C.; McDougle, C. J.; Frazier, J. A.; Dittmann, R. W.; Robertson-Plouch, C.; Bauer, T.; Xu, W.; Wang, W. V.; Carlson, J.; Tohen, M.	A double-blind, placebo-controlled study of olanzapine in adolescents with schizophrenia		Proceedings of the 13th Biennial Winter Workshop on Schizophrenia Research; 2006 Feb 4-10; Davos, Switzerland	2006			
Kryzhanovskaya 2009	Kryzhanovskaya, L.; Schulz, C.; McDougle, C. J.; Frazier, J. A.; Dittmann, R. W.; Robertson-Plouch, C.; Bauer, T.; Xu, W.; Wang, W. V.; Carlson, J.; Tohen, M.	A double-blind, placebo-controlled study of olanzapine in adolescents with schizophrenia		Pharmacoepidemiology and Drug Safety	2006	15		646
Kryzhanovskaya 2009	Kryzhanovskaya, L.; Schulz, C.; McDougle, C. J.; Frazier, J. A.; Dittmann,	A double-blind, placebo-controlled study of olanzapine in adolescents with schizophrenia		Proceedings of the 159th Annual Meeting of the American Psychiatric Association; 2006 May 20-25; Toronto, Canada	2006			

	R. W.; Tohen, M. F.							
Kryzhanovskaya 2009	Kryzhanovskaya, L.; Schulz, C.; McDougle, C. J.; Frazier, J. A.; Dittmann, R. W.; Robertson-Plouch, C.; Bauer, T.; Xu, W.; Wang, W. V.; Carlson, J.; Tohen, M.	Results from a double-blind, placebo-controlled study of olanzapine in adolescents with schizophrenia		Proceedings of the 5th International Conference on Early Psychosis; 2006 Oct 4-6, Birmingham, United Kingdom	2006			
Kryzhanovskaya 2009	Kryzhanovskaya, L.; Schulz, C.; McDougle, C. J.; Frazier, J. A.; Shen, J.; Dittman, R.; Robertson-Plouch, C.; Bauer, T.; Xu, W.; Wang, W. V.; Carlson, J.; Corya, S.; Tohen, M.	A double-blind, placebo-controlled study of olanzapine in adolescents with schizophrenia		Neuropsychopharmacology	2005	30	Suppl 1	S258-S259
Kryzhanovskaya 2009	Kryzhanovskaya, L.; Schulz, S. C.; McDougle, C.; Frazier, J.; Dittmann, R.; Robertson-Plouch, C.; Bauer, T.; Xu, W.; Wang, W.; Carlson, J.; Tohen, M.	Olanzapine versus placebo in adolescents with schizophrenia	a 6-week, randomized, double-blind, placebo-controlled trial	Journal of the American Academy of Child and Adolescent Psychiatry	2009	48	1	60–70
Kryzhanovskaya 2009	McCormack, P. L.	Olanzapine in adolescents with schizophrenia or bipolar I disorder		CNS drugs	2010	24	5	443–452
Lacro 2001	Lacro, J.	Antipsychotic treatment in late life schizophrenia		CRISP Database (https://www-commons.cit.nih.gov/crisp/index.html Accessed 19th February 2001)	2001			
Lee 2007d	Lee, S. M.; Chou, Y. H.; Li, M. H.; Wan, F. J.; Yen, M. H.	Effects of antipsychotics on cognitive performance in drug-naive schizophrenic patients		Progress in Neuro-Psychopharmacology and Biological Psychiatry	2007	31	5	1101–1107
Lee 2007d	Lee, S. M.; Chou, Y. H.; Li, M. H.; Wan, F. J.; Yen, M. H.	Effects of haloperidol and risperidone on cerebrohemodynamics in drug-naive schizophrenic patients		Journal of Psychiatric Research	2008		4	328–335
Lee 2014a	Lee, B.; Vogel, S.; Sisk, S.;	The Effects of Dopamine Antagonism on Reward		Archives of Clinical Neuropsychology	2014	29	6	580

	Daniel, A.; Yao, J.	Learning in Schizophrenia						
Li 2020	Li, X.; Guo, X.; Fan, X.; Feng, T.; Wang, C.; Yao, Z.; Xu, X.; Chen, Z.; Wang, H.; Xie, S.; He, J.; Zhuo, K.; Xiang, Q.; Cen, H.; Wang, J.; Smith, Rc; Jin, H.; Keshavan, Ms; Marder, [SR]; Davis, Jm; Jiang, K.; Xu, Y.; Liu, D.	Sequential Multiple-Assignment Randomized Trials to Compare Antipsychotic Treatments (SMART-CAT) in first-episode schizophrenia patients: Rationale and trial design		Schizophrenia research	2020			InPress
Lieberman 2003a	Perkins, D. O.; Johnson, J. L.; Hamer, R. M.; Zipursky, R. B.; Keefe, R. S.; Centorrhino, F.; Green, A. I.; Glick, I. B.; Kahn, R. S.; Sharma, T.; Tohen, M.; McEvoy, J. P.; Weiden, P. J.; Lieberman, J. A.; Hgdh, Research Group	Predictors of antipsychotic medication adherence in patients recovering from a first psychotic episode		Schizophrenia Research	2006	83	1	53–63
Lieberman 2003a	Perkins, D. O.; Lieberman, J.; Gu, H.; Tohen, M.; McEvoy, J.; Green, A.; Zipursky, R.; Strakowski, S.; Sharma, T.; Kahn, R.; Gur, R.; Tollefson, G.; Hgdh, Research Group	Predictors of antipsychotic treatment response in patients with first-episode schizophrenia, schizoaffective and schizophreniform disorders		British Journal of Psychiatry	2004	185		18–24
Lieberman 2003a	Renshaw, P. F.; Todd, D. Y.; Wei, H.; Charles, C.; Tollefson, G. D.; Lieberman, J. A.	Olanzapine-induced reduction in frontal lobe lactate in first episode psychosis		Proceedings of the 156th Annual Meeting of the American Psychiatric Association; 2003 May 17-22; San Francisco, California, USA	2003			
Lieberman 2003a	Renshaw, P. F.; Yurgelun-Todd, D. A.; Wei, H.; Charles,	Olanzapine induced reductions in frontal lobe lactate levels correlate with treatment		Schizophrenia Research	2003	60		301

	H. C.; Tohen, M.; Lieberman, J. A.	response in first episode psychosis						
Lieberman 2003a	Sanger, T. M.; Lieberman, J. A.; Tohen, M.; Grundy, S.; Beasley, C., Jr.; Tollefson, G. D.	Olanzapine versus haloperidol treatment in first-episode psychosis		American Journal of Psychiatry	1999	156	1	79–87
Lieberman 2003a	Sharma, T.	The acute and long-term efficacy of olanzapine in first-episode psychotic disorders	a randomised double-blind comparison with haloperidol	National Research Register	2000			
Lieberman 2003a	Sharma, T.	The acute and long-term efficacy of olanzapine in first-episode psychotic disorders	a randomised double-blind comparison with haloperidol	National Research Register	2001	1		
Lieberman 2003a	Sharma, T.; Lieberman, J. A.; McEvoy, J. P.; Perkins, D. O.; Hamer, R. M.; Zipursky, R. B.; Kahn, R. S.; Gur, R. E.; Centorrino, F.; Glick, I.; Green, A. I.; Nemeroff, C. B.; Rothschild, A. J.; Strakowski, S. M.; Tohen, M.; Tollefson, G. D.	Long-term efficacy and safety of atypical and conventional antipsychotic drugs in first episode schizophrenia		European Neuropsychopharmacology	2003	13	4	S134
Lieberman 2003a	Stauffer, V. L.; Case, M.; Kinon, B. J.; Conley, R.; Ascher-Svanum, H.; Kollack-Walker, S.; Kane, J.; McEvoy, J.; Lieberman, J.	Early response to antipsychotic therapy as a clinical marker of subsequent response in the treatment of patients with first-episode psychosis		Psychiatry Research	2011	187	1-2	42–48
Lieberman 2003a	Strakowski, S. M.; Johnson, J. L.; Del-Bello, M. P.; Hamer, R. M.; Green, A. I.; Tohen, M.; Lieberman, J. A.; Glick, I.; Patel, J. K.	Quality of life during treatment with haloperidol or olanzapine in the year following a first psychotic episode		Schizophrenia Research	2005	78	2-3	161–169
Lieberman 2003a	Thompson, P.	Significant slowing of grey matter loss rates with olanzapine versus haloperidol		Data on File	2005			

Lieberman 2003a	Thompson, P. M.; Bartzokis, G.; Hayashi, K. M.; Klunder, A. D.; Lu, P. H.; Edwards, N.; Hong, M. S.; Yu, M.; Geaga, J. A.; Toga, A. W.; Charles, C.; Perkins, D. O.; McEvoy, J.; Hamer, R. M.; Tohen, M.; Tollefson, G. D.; Lieberman, J. A.	Time-lapse mapping of cortical changes in schizophrenia with different treatments		Cerebral Cortex	2009	19	5	1107–1123
Lieberman 2003a	Zipursky, R.; Gu, H.; Green, A. I.; Centorrina, F.; Glick, I.; Perkins, D. O.; McEvoy, J.; Sharma, T.; Gur, R.; Strakowski, S. M.	Clinical correlates of weight gain in first episode psychosis patients treated with olanzapine		Schizophrenia Research	2003	60		372
Lieberman 2003a	Zipursky, R. B.; Christensen, B. K.; Daskalakis, Z.; Epstein, I.; Roy, P.; Furimsky, I.; Sanger, T.; Kapur, S.	Treatment response to olanzapine and haloperidol and its association with dopamine d-sub-2 receptor occupancy in first-episode psychosis		Canadian Journal of Psychiatry [Revue Canadienne de Psychiatrie]	2005	50	8	462–469
Lieberman 2003a	Zipursky, R. B.; Gu, H.; Charles, C.; Sharma, T.; Green, A. I.; Gur, R. E.; Kahn, R. S.; Perkins, D.; Keefe, R.; Hamer, R. M.; Tollefson, G. D.; Tohen, M.; Lieberman, J. A.	Clinical correlates of mri brain volumes in first episode psychosis		Schizophrenia Bulletin	2005	31		408
Lieberman 2003a	Zipursky, R. B.; Gu, H.; Green, A. I.; Perkins, D. O.; Tohen, M. F.; McEvoy, J. P.; Strakowski, S. M.; Sharma, T.; Kahn, R.	Course and predictors of weight gain in people with first-episode psychosis treated with olanzapine or haloperidol		British Journal of Psychiatry	2005	187		537–543

	S.; Gur, R. E.; Tollefson, G. D.; Lieberman, J. A.							
Lieberman 2003a	Zipursky, R. B.; Hongbin, G.; Green, A. I.; Centorrina, F.; Glick, I. D.; Lieberman, J. A.	Clinical correlates of weight gain in first-episode patients on olanzapine		Proceedings of the 156th Annual Meeting of the American Psychiatric Association; 2003 May 17-22; San Francisco, California, USA	2003			
Lieberman 2003a	Awad, G.	First episode psychosis	olanzapine and haloperidol provide similar improvements in quality of life and social functioning	Evidence-Based Mental Health	2006	9	2	47
Lieberman 2003a	Centorrino, F.; Hamer, R. M.; Tohen, M.; Lieberman, J. A.	Drug attitudes and treatment adherence in a clinical trial comparing haloperidol and olanzapine in first episode schizophrenia		Schizophrenia Research	2003	60		277
Lieberman 2003a	Green, A.; Tohen, M.; Strakowski, S. M.; Lieberman, J. A.; Glick, D.; Clarke, S. W.; Hgdh, Study Group	Comorbid substance use disorder and first episode schizophrenia	acute effects of olanzapine versus haloperidol	Schizophrenia Research	2001	49	1-2	230
Lieberman 2003a	Green, A. I.; Hamer, R. M.; Woolson, S. L.; Tohen, M.; Lieberman, J. A.	First episode psychosis and substance abuse	olanzapine vs. haloperidol	Schizophrenia Bulletin	2007	33	2	431
Lieberman 2003a	Green, A. I.; Lieberman, J. A.; Hamer, R. M.; Glick, I. D.; Gur, R. E.; Kahn, R. S.; McEvoy, J. P.; Perkins, D. O.; Rothschild, A. J.; Sharma, T.; Tohen, M. F.; Woolson, S.; Zipursky, R. B.	Olanzapine and haloperidol in first episode psychosis	two-year data	Schizophrenia Research	2006	86	1-3	234–243
Lieberman 2003a	Green, A. I.; Tohen, M. F.; Hamer, R. M.; Strakowski, S. M.; Lieberman, J. A.; Glick, I. C. W. S.; Hgdh, Research Group	First episode schizophrenia-related psychosis and substance use disorders	acute response to olanzapine and haloperidol	Schizophrenia Research	2004	66	2-3	125–135

Lieberman 2003a	Jarboe, K. S.; Lewine, R. R.	Haloperidol versus olanzapine induced weight gain and clinical relevance, a double-blind and open label comparison		Schizophrenia Research	2001	49	1 - 2	232
Lieberman 2003a	Kahn, R. S.; Lieberman, J. A.; Charles, C.; Sharma, T.; Zipursky, R. B.; Gur, R.; Tohen, M.; Green, A. I.; McEvoy, J. P.; Perkins, D. O.; Hamer, R. M.; Nemeroff, C. B.; Rothschild, A. J.; Kuldau, J.; Strakowski, S. M.; Tollefson, G. D.	Antipsychotic treatment effects on progression of brain pathomorphology in first episode schizophrenia		Proceedings of the 16th European College of Neuropsychopharmacology Congress; 2003 Sep 20-24; Prague, Czech Republic	2003			
Lieberman 2003a	Kahn, R. S.; Lieberman, J. A.; Charles, C.; Sharma, T.; Zipursky, R. B.; Gur, R.; Tohen, M.; Green, A. I.; McEvoy, J. P.; Perkins, D. O.; Hamer, R. M.; Nemeroff, C. B.; Rothschild, A. J.; Kuldau, J.; Strakowski, S. M.; Tollefson, G. D.	Antipsychotic treatment effects on progression of brain pathomorphology in first episode schizophrenia		European Neuropsychopharmacology	2003	13	4	S336
Lieberman 2003a	Keefe, R.; Seidman, L. J.; Christensen, B.; Hamer, R. M.; Yurgelun-Todd, D.; Lewine, R.; Sitskoorn, M.; Sharma, T.; Tohen, M.; Lieberman, J. A.	Neurocognitive effects of olanzapine and low-dose haloperidol	a two-year treatment study in first episode psychosis	Schizophrenia Research	2003	60		289–290
Lieberman 2003a	Keefe, R. S.; Seiden, L. J.; Christensen, B.; Yurgelun-Todd, D. A.; Lewine, R. R.; Sitskoorn, M.; Sharma, T.; Clark, W. S.; Sanger,	Treatment of neurocognitive deficits with olanzapine or low-dose haloperidol in first episode psychosis		Proceedings of the 39th Annual Meeting of the American College of Neuropsychopharmacology; 2000 Dec 10-14; San Juan, Puerto Rico	2000			

	T. M.; Tohen, M.; Lieberman, J. A.							
Lieberman 2003a	Keefe, R. S.; Seidman, L. J.; Christensen, B. K.; Yurgelun-Todd, D. A.; Lewine, R. R.; Lieberman, MMSitskoorn J.	Treatment of neurocognitive deficits with olanzapine or low-dose haloperidol in first episode psychosis		Schizophrenia Research	2001	49	1 - 2	234
Lieberman 2003a	Keefe, R. S.; Seidman, L. J.; Hamer, R. M.; Todd, D. Y.; Christensen, B.; Sitskoorn, M. M.; Lieberman, J. A.	Neurocognition after two years olanzapine or low-dose haldol in fe psychosis		Proceedings of the 156th Annual Meeting of the American Psychiatric Association; 2003 May 17-22; San Francisco, California, USA	2003			
Lieberman 2003a	Keefe, R. S. E.	Treatment of neurocognitive deficits with olanzapine or haloperidol in first episode psychosis		Proceedings of the 2nd International Conference on Early Psychosis; 2000 Mar 31 - Apr 2; New York, New York, USA	2000			
Lieberman 2003a	Keefe, R. S. E.; Seidman, L. J.; Christensen, B. K.; Hamer, R. M.; Sharma, T.; Sitskoorn, M. M.; Lewine, R. R. J.; Yurgelun-Todd, D. A.; Gur, R. C.; Tohen, M.; Tollefson, G. D.; Sanger, T. M.; Lieberman, J. A.	Comparative effect of atypical and conventional antipsychotic drugs on neurocognition in first-episode psychosis	a randomized, double-blind trial of olanzapine versus low doses of haloperidol	American Journal of Psychiatry	2004	161	6	985–995
Lieberman 2003a	Keefe, R. S. E.; Seidman, L. J.; Christensen, B. K.; Hamer, R. M.; Sharma, T.; Sitskoorn, M. M.; Rock, S. L.; Woolson, S.; Tohen, M.; Tollefson, G. D.; Sanger, T. M.; Lieberman, J. A.	Long-term neurocognitive effects of olanzapine or low-dose haloperidol in first-episode psychosis		Biological Psychiatry	2006	59	2	97–105

Lieberman 2003a	Keefe, Rse; Seidman, Lj; Christensen, B.; Hamer, Rm; Yurgelun-Todd, D.	Neurocognitive effects of olanzapine and low-dose haloperidol	a two- year treatment study in first episode psychosis	Schizophrenia Research	2004	67	1	206
Lieberman 2003a	Lambert, M. T.	Olanzapine is associated with more rapid weight gain than haloperidol in people with first episode psychosis		Evidence-Based Mental Health	2006	9	3	72
Lieberman 2003a	Levine, S. Z.; Leucht, S.	Early symptom response to antipsychotic medication as a marker of subsequent symptom change	An eighteen-month follow-up study of recent episode schizophrenia	Schizophrenia Research	2012	141	2-3	168–172
Lieberman 2003a	Levine, S. Z.; Rabinowitz, J.; Case, M.; Ascher-Svanum, H.	Treatment response trajectories and their antecedents in recent-onset psychosis. a 2-year prospective study		Journal of Clinical Psychopharmacology	2010	30	4	446–449
Lieberman 2003a	Lieberman, J.; Charles, C.; Sharma, T.; Zipursky, R.; Kahn, R.; Gur, R.; Hamer, R.; Gu, H.; Tollefson, G.	Antipsychotic treatment effects on progression of brain pathomorphology in first episode schizophrenia		Society for Neuroscience Abstract Viewer and Itinerary Planner	2003			
Lieberman 2003a	Lieberman, J.; Charles, H. C.; Sharma, T.; Zipursky, R.; Kahn, R.; Gur, R.; Tohen, M.; Green, A. I.; McEvoy, J.; Perkins, D.	Antipsychotic treatment effects on progression of brain pathomorphology in first episode schizophrenia		Schizophrenia Research	2003	60		293
Lieberman 2003a	Lieberman, J.; Sanger, T.; Tohen, M.; First, Episode Collaborative Study Group	Olanzapine and haloperidol treatment of first episode schizophrenia and schizoaffective disorder	12 week outcome of a two year randomized double blind trial	Proceedings of the 2nd International Conference on Early Psychosis; 2000 Mar 31 - Apr 2; New York, New York, USA	2000			
Lieberman 2003a	Lieberman, J.; Tohen, M.; McEvoy, J.; Sanger, T.; Keefe, R.; Charles, C.; Clark, S.; Brier, A.; Tollefson, G.; The, H. G. D. H. Study Group	Olanzapine versus haldoperidol in the treatment of first episode phychosis		Proceedings of the 39th Annual Meeting of the American College of Neuropsychopharmacology; 2000 Dec 10-14; San Juan, Puerto Rico	2000			
Lieberman 2003a	Lieberman, J. A.; Charles, C.; Sharma, T.; Zipursky,	Effect of olanzapine versus haloperidol on		Proceedings of the 156th Annual Meeting of the American Psychiatric Association; 2003 May 17-	2003			

	R. B.; Hamer, R. M.; Tollefson, G. D.	brain pathomorphology in first-episode psychosis		22; San Francisco, California, USA				
Lieberman 2003a	Lieberman, J. A.; Keefe, R. E.; Baker, R. W.; Eli, Lilly; Company	Authors' Note		American Journal of Psychiatry	2009	166	8	942
Lieberman 2003a	Lieberman, J. A.; Tollefson, G.; Tohen, M.; Green, A. I.; Gur, R. E.; Kahn, R.; McEvoy, J.; Perkins, D.; Sharma, T.; Zipursky, R.; Wei, H.; Hamer, R. M.; Hgdh, Study Group	Comparative efficacy and safety of atypical and conventional antipsychotic drugs in first-episode psychosis	a randomized, double-blind trial of olanzapine versus haloperidol	American Journal of Psychiatry	2003	160	8	1396–1404
Lieberman 2003a	Lieberman, J. A.; Tollefson, G. D.; Charles, C.; Zipursky, R.; Sharma, T.; Kahn, R. S.; Keefe, R. S. E.; Green, A. I.; Gur, R. E.; McEvoy, J.; Perkins, D.; Hamer, R. M.; Gu, H.; Tohen, M.	Antipsychotic drug effects on brain morphology in first-episode psychosis		Archives of General Psychiatry	2005	62	4	361–370
Lieberman 2003a	Mamah, D.; Harms, M. P.; Barch, D.; Styner, M.; Lieberman, J. A.; Wang, L.	Hippocampal shape and volume changes with antipsychotics in early stage psychotic illness		Frontiers in Psychiatry	2012	3		96
Lieberman 2003a	McClure, R. K.; Styner, M.; Maltbie, E.; Lieberman, J. A.; Gouttard, S.; Gerig, G.; Shi, X.; Zhu, H.	Localized differences in caudate and hippocampal shape are associated with schizophrenia but not antipsychotic type		Psychiatry Research	2013	211	1	1–10
Lieberman 2003a	McEvoy, J.; Lieberman, J. A.; Perkins, D.; Hamer, R. M.; Sharma, T.; Zipursky, R.; Kahn, R.; Gur, R.; Centorrino, F.; Glick, I.	Long-term efficacy and safety of atypical and conventional antipsychotic drugs in first episode schizophrenia		Schizophrenia Research	2003	60		313

Lieberman 2003a	McEvoy, J. P.; Johnson, J.; Perkins, D.; Lieberman, J. A.; Hamer, R. M.; Keefe, R. S. E.; Tohen, M.; Glick, I. D.; Sharma, T.	Insight in first-episode psychosis		Psychological Medicine	2006	36	10	1385–1393
Lieberman 2003a	McEvoy, J. P.; Lieberman, J. A.; Perkins, D. O.; Hamer, R. M.; Sharma, T.; Zipursky, R. B.	Long-term olanzapine treatment versus haloperidol in first-episode psychosis		Proceedings of the 156th Annual Meeting of the American Psychiatric Association; 2003 May 17-22; San Francisco, California, USA	2003			
Lieberman 2005_18months	Melkote, R.; Singh, A.; Vermeulen, A.; Remmerie, B.; Savitz, A.	Relationship between antipsychotic blood levels and treatment failure during the CATIE study		Biological Psychiatry	2017	81	10 Suppl 1	S350
Lieberman 2005_18months	Melkote, R.; Singh, A.; Vermeulen, A.; Remmerie, B.; Savitz, A.	Relationship between antipsychotic blood levels and treatment failure during the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) study		Schizophrenia Research	2018	201		324–328
Lieberman 2005_18months	Meltzer, H. Y.; Bobo, W. V.	Interpreting the efficacy findings in the CATIE Study	what clinicians should know	CNS Spectrums	2006	11	Suppl 7	14–24
Lieberman 2005_18months	Meyer, J. M.	Antipsychotics and metabolics in the post-catie era		Behavioral Neurobiology of Schizophrenia and Its Treatment	2010	2010		23–42
Lieberman 2005_18months	Meyer, J. M.; Davis, V. G.; Goff, D. C.; McEvoy, J. P.; Nasrallah, H. A.; Davis, S. M.; Rosenheck, R. A.; Daumit, G. L.; Hsiao, J.; Swartz, M. S.; Stroup, T. S.; Lieberman, J. A.	Change in metabolic syndrome parameters with antipsychotic treatment in the CATIE Schizophrenia Trial	prospective data from phase 1	Schizophrenia Research	2008	101	1-3	273–286
Lieberman 2005_18months	Meyer, J. M.; Davis, V. G.; McEvoy, J. P.; Goff, D. C.; Nasrallah, H. A.; Davis, S. M.; Daumit, G. L.; Hsiao, J.; Swartz, M. S.; Stroup,	Impact of antipsychotic treatment on nonfasting triglycerides in the CATIE schizophrenia trial phase 1		Schizophrenia Research	2008	103	1-3	104–109

	T. S.; Lieberman, J. A.							
Lieberman 2005_18months	Meyer, J. M.; Nasrallah, H. A.; McEvoy, J. P.; Goff, D. C.; Davis, S. M.; Chakos, M.; Patel, J. K.; Keefe, R. S.; Stroup, T. S.; Lieberman, J. A.	The Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) Schizophrenia Trial	clinical comparison of subgroups with and without the metabolic syndrome	Schizophrenia Research	2005	80	1	9–18
Lieberman 2005_18months	Miller, B. J.; Buckley, P. F.; McEvoy, J. P.	Inflammation, substance use, psychopathology, and cognition in phase 1 of the clinical antipsychotic trials of intervention effectiveness study		Schizophrenia Research	2018	195		275–282
Lieberman 2005_18months	Miller, D. D.; Caroff, S. N.; Davis, S. M.; Rosenheck, R. A.; McEvoy, J. P.; Saltz, B. L.; Riggio, S.; Chakos, M. H.; Swartz, M. S.; Keefe, R. S. E.; Stroup, T. S.; Lieberman, J. A.	Extrapyramidal side-effects of antipsychotics in a randomised trial		British Journal of Psychiatry	2008	193	4	279–288
Lieberman 2005_18months	Miller, D. D.; McEvoy, J. P.; Davis, S. M.; Caroff, S. N.; Saltz, B. L.; Chakos, M. H.; Swartz, M. S.; Keefe, R. S. E.; Rosenheck, R. A.; Stroup, T. S.; Lieberman, J. A.	Clinical correlates of tardive dyskinesia in schizophrenia	baseline data from the CATIE schizophrenia trial	Schizophrenia Research	2005	80	1	33–43
Lieberman 2005_18months	Mohamed, S.; Rosenheck, R.; McEvoy, J.; Swartz, M.; Stroup, S.; Lieberman, J. A.	Cross-sectional and longitudinal relationships between insight and attitudes toward medication and clinical outcomes in chronic schizophrenia		Schizophrenia Bulletin	2009	35	2	336–346
Lieberman 2005_18months	Mohamed, S.; Rosenheck, R.; Swartz, M.; Stroup, S.; Lieberman, J. A.;	Relationship of cognition and psychopathology to functional impairment in schizophrenia		American Journal of Psychiatry	2008	165	8	978–987

	Keefe, R. S.							
Lieberman 2005_18months	Mohamed, S.; Rosenheck, R. A.; Lin, H.; Swartz, M.; McEvoy, J.; Stroup, S.	Randomized Trial of the Effect of Four Second-Generation Antipsychotics and One First-Generation Antipsychotic on Cigarette Smoking, Alcohol, and Drug Use in Chronic Schizophrenia		Journal of Nervous and Mental Disease	2015	203	7	486–492
Lieberman 2005_18months	Mori, N.; McEvoy, J. P.; Miller, B. J.	Total and differential white blood cell counts, inflammatory markers, adipokines, and the metabolic syndrome in phase 1 of the clinical antipsychotic trials of intervention effectiveness study		Schizophrenia Research	2015	169	1-3	30–35
Lieberman 2005_18months	Moriguchi, S.; Bies, R. R.; Remington, G.; Suzuki, T.; Mamo, D. C.; Watanabe, K.; Mimura, M.; Pollock, B. G.; Uchida, H.	Estimated dopamine D(2) receptor occupancy and remission in schizophrenia	analysis of the CATIE data	Journal of Clinical Psychopharmacology	2013	33	5	682–685
Lieberman 2005_18months	Naber, D.; Lambert, M.	The CATIE and CUtLASS studies in schizophrenia	results and implications for clinicians	CNS drugs	2009	23	8	649–659
Lieberman 2005_18months	Nakajima, S.; Takeuchi, H.; Fervaha, G.; Plitman, E.; Chung, J. K.; Caravaggio, F.; Iwata, Y.; Mihashi, Y.; Gerretsen, P.; Remington, G.; Mulsant, B.; Graff-Guerrero, A.	Comparative efficacy between clozapine and other atypical antipsychotics on depressive symptoms in patients with schizophrenia	Analysis of the CATIE phase 2E data	Schizophrenia Research	2015	161	2-3	429–433
Lieberman 2005_18months	Narasimhan, M.; Masand, P.	Metabolic syndrome in patients with schizophrenia	CATIE results	Current psychiatry reports	2006	8	3	213–214
Lieberman 2005_18months	Olfson, M.; Ascher-Svanum, H.; Faries, D. E.; Marcus, S. C.	Predicting psychiatric hospital admission among adults with schizophrenia		Psychiatric Services	2011	62	10	1138–1145
Lieberman 2005_18months	Ostergaard, S. D.; Foldager, L.; Mors, O.; Bech, P.; Correll, C.	The validity and sensitivity of PANSS-6 in the clinical antipsychotic trials of in-		Neuropsychopharmacology	2016	41		S419

		tervention effectiveness (CATIE) study						
Lieberman 2005_18months	Ostergaard, S. D.; Foldager, L.; Mors, O.; Bech, P.; Correll, C. U.	The Validity and Sensitivity of PANSS-6 in the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) Study		Schizophrenia Bulletin	2018	44	2	453–462
Lieberman 2005_18months	Ozzoude, M.; Nakajima, S.; Plitman, E.; Chung, J. K.; Kim, J.; Iwata, Y.; Caravaggio, F.; Takeuchi, H.; Uchida, H.; Graff-Guerrero, A.; Gerretsen, P.	The effects of illness severity, cognition, and estimated antipsychotic dopamine receptor occupancy on insight into the illness in schizophrenia	An analysis of clinical antipsychotic trials of intervention effectiveness (CATIE) data	Progress in Neuro-Psychopharmacology and Biological Psychiatry	2019	89		207–213
Lieberman 2005_18months	Park, T.; Kuntz, K. M.	Cost-effectiveness of second-generation antipsychotics for the treatment of schizophrenia		Value in Health	2014	17	4	310–319
Lieberman 2005_18months	Pathak, S.; Jiang, Y.; DiPetrillo, L.; Todtenkopf, M.; Liu, Y.; Silverman, B.; Correll, C.	Schizophrenia with history of alcohol use disorder suffers a worse course of psychosis	Results from NIMH catie study analyses	Neuropsychopharmacology	2016	41		S247-S248
Lieberman 2005_18months	Perlick, D. A.; Rosenheck, R. A.; Kaczynski, R.; Swartz, M. S.; Canive, J. M.; Lieberman, J. A.	Impact of antipsychotic medication on family burden in schizophrenia	longitudinal results of CATIE trial	Schizophrenia Research	2010	116	2-3	118–125
Lieberman 2005_18months	Rabinowitz, J.; Levine, S. Z.; Garibaldi, G.; Bugarski-Kirola, D.; Berardo, C. G.; Kapur, S.	Negative symptoms have greater impact on functioning than positive symptoms in schizophrenia	Analysis of catie data	Schizophrenia Research	2012	137	1-3	147–150
Lieberman 2005_18months	Ramsey, T. L.; Brennan, M. D.	Glucagon-like peptide 1 receptor (GLP1R) haplotypes correlate with altered response to multiple antipsychotics in the CATIE trial		Schizophrenia Research	2014	160	1-3	73–79
Lieberman 2005_18months	Ramsey, T. L.; Liu, Q.; Massey, B. W.; Brennan, M. D.	Genotypic variation in the SV2C gene impacts response to atypical antipsychotics the CATIE study		Schizophrenia Research	2013	149	1-3	21–25
Lieberman 2005_18months	Resnick, S. G.; Rosenheck, R. A.; Canive, J. M.; De,	Employment outcomes in a randomized trial of second-generation antipsychotics and		Journal of Behavioral Health Services and Research	2008	35	2	215–225

	Souza C.; Stroup, T. S.; McEvoy, J.; Davis, S.; Keefe, R. S. E.; Swartz, M.; Lieberman, J.	perphenazine in the treatment of individuals with schizophrenia						
Lieberman 2005_18months	Rhee, T. G.; Rosenheck, R. A.	Does improvement in symptoms and quality of life in chronic schizophrenia reduce family caregiver burden?		Psychiatry Research	2019	271		402–404
Lieberman 2005_18months	Rosenheck, R.; Lin, H.	Noninferiority of perphenazine vs. three second-generation antipsychotics in chronic schizophrenia		The Journal of nervous and mental disease	2014	202	1	18–24
Lieberman 2005_18months	Rosenheck, R.; Swartz, M.; McEvoy, J.; Stroup, T. S.; Davis, S.; Keefe, R. S.; Hsiao, J.; Lieberman, J.	Second-generation antipsychotics	Reviewing the cost-effectiveness component of the catie trial	Expert Review of Pharmacoeconomics and Outcomes Research	2007	7	2	103–111
Lieberman 2005_18months	Rosenheck, R. A.	Cost-effectiveness of atypical antipsychotics in the CATIE schizophrenia trial		Neuropsychopharmacology	2005	30	Suppl 1	S32
Lieberman 2005_18months	Rosenheck, R. A.; Davis, S.; Covell, N.; Essock, S.; Swartz, M.; Stroup, S.; McEvoy, J.; Lieberman, J.	Does switching to a new antipsychotic improve outcomes?	Data from the CATIE Trial	Schizophrenia Research	2009	107	1	22–29
Lieberman 2005_18months	Sakurai, H.; Bies, R. R.; Stroup, S. T.; Keefe, R. S. E.; Rajji, T. K.; Suzuki, T.; Mamo, D. C.; Pollock, B. G.; Watanabe, K.; Mimura, M.; Uchida, H.	Dopamine D2 receptor occupancy and cognition in schizophrenia	Analysis of the CATIE data	Schizophrenia Bulletin	2013	39	3	564–574
Lieberman 2005_18months	Schulte, P. F. J.; de, Haan L.	Effectiveness of antipsychotic drugs in patients with chronic schizophrenia		Tijdschrift Voor Psychiatrie	2006	48	3	243–244
Lieberman 2005_18months	Shortreed, S. M.; Moodie, E. E.	Estimating the optimal dynamic antipsychotic treatment regime	Evidence from the sequential multiple assignment randomized CATIE Schizophrenia Study	Journal of the Royal Statistical Society. Series C, Applied statistics	2012	61	4	577–599
Lieberman 2005_18months	Stefanovics, E. A.; Krystal, J.	Symptom structure and severity	a comparison of responses to the positive and negative syndrome scale (PANSS) between	Comprehensive Psychiatry	2014	55	4	887–895

	H.; Rosenheck, R. A.		patients with PTSD or schizophrenia					
Lieberman 2005_18months	Stroup, S.	CATIE's Data Repository		Personal Communicatation	2018			
Lieberman 2005_18months	Stroup, S.; Appelbaum, P.; Swartz, M.; Patel, M.; Davis, S.; Jeste, D.; Kim, S.; Keefe, R.; Manschreck, T.; McEvoy, J.; Lieberman, J.	Decision-making capacity for research participation among individuals in the CATIE schizophrenia trial		Schizophrenia Research	2005	80	1	1–8
Lieberman 2005_18months	Stroup, T. S.	Baseline decision making capacity in the CATIE schizophrenia trial		Schizophrenia Research	2004	67	1	209
Lieberman 2005_18months	Stroup, T. S.	Comparison of ziprasidone versus other atypical drugs in prospectively defined, unresponsive patients		Proceedings of the 159th Annual Meeting of the American Psychiatric Association; 2006 May 20-25; Toronto, Canada	2006			
Lieberman 2005_18months	Stroup, T. S.; Appelbaum, P. S.; Gu, H.; Hays, S.; Swartz, M. S.; Keefe, R. S.; Kim, S. Y.; Manschreck, T. C.; Boshes, R. A.; McEvoy, J. P.; Lieberman, J. A.	Longitudinal consent-related abilities among research participants with schizophrenia	Results from the catie study	Schizophrenia Research	2011	130	1-3	47–52
Lieberman 2005_18months	Stroup, T. S.; Catie, Study Group	Statistical methods and analytic plan		CATIE Protocol	2005			
Lieberman 2005_18months	Stroup, T. S.; Lieberman, J. A.; McEvoy, J. P.; Davis, S. M.; Swartz, M. S.; Keefe, R. S. E.; Miller, A. L.; Rosenheck, R. A.; Hsiao, J. K.	Results of phase 3 of the CATIE schizophrenia trial		Schizophrenia Research	2009	107	1	1–12
Lieberman 2005_18months	Stroup, T. S.; McEvoy, J. P.; Swartz, M. S.; Byerly, M. J.; Glick, I. D.; Canive, J. M.; McGee, M. F.; Simpson, G. M.; Stevens, M.	The National Institute of Mental Health Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) project	schizophrenia trial design and protocol development	Schizophrenia Bulletin	2003	29	1	15–31

	C.; Lieberman, J. A.							
Lieberman 2005_18months	Sullivan, P.; David, G.	Pharmacogenetic studies in CATIE, a large randomized clinical trial for schizophrenia		American Journal of Medical Genetics	2006	141B	7	707
Lieberman 2005_18months	Sullivan, P. F.; Lin, D.; Tzeng, J. Y.; van, den Oord E.; Perkins, D.; Stroup, T. S.; Wagner, M.; Lee, S.; Wright, F. A.; Zou, F.; Liu, W.; Downing, A. M.; Lieberman, J.; Close, S. L.	Genomewide association for schizophrenia in the CATIE study	results of stage 1.[Erratum appears in Mol Psychiatry. 2009 Dec;14(12):1144]	Molecular Psychiatry	2008	13	6	570–584
Lieberman 2005_18months	Swanson, J. W.; Swartz, M. S.; Van, Dorn R. A.; Volavka, J.; Monahan, J.; Stroup, T. S.; McEvoy, J. P.; Wagner, H. R.; Elbogen, E. B.; Lieberman, J. A.	Comparison of antipsychotic medication effects on reducing violence in people with schizophrenia		British Journal of Psychiatry	2008	193	1	37–43
Lieberman 2005_18months	Swartz, M. S.; Perkins, D. O.; Stroup, T. S.; McEvoy, J. P.; Nieri, J. M.; Haak, D. C.	Assessing clinical and functional outcomes in the clinical antipsychotic trials of intervention effectiveness (CATIE) schizophrenia trial		Schizophrenia Bulletin	2003	29	1	33–43
Lieberman 2005_18months	Swartz, M. S.; Stroup, T. S.; McEvoy, J. P.; Davis, S. M.; Rosenheck, R. A.; Keefe, R. S. E.; Hsiao, J. K.; Lieberman, J. A.	What CATIE found	results from the schizophrenia trial	Psychiatric Services	2008	59	5	500–506
Lieberman 2005_18months	Swartz, M. S.; Perkins, D. O.; Stroup, T. S.; Davis, S. M.; Capuano, G.; Rosenheck, R. A.; Reimherr, F.; McGee, M. F.; Keefe, R. S. E.; McEvoy, J. P.; Hsiao, J.	Effects of antipsychotic medications on psychosocial functioning in patients with chronic schizophrenia	findings from the NIMH CATIE study	American Journal of Psychiatry	2007	164	3	428–436

	K.; Lieberman, J. A.							
Lieberman 2005_18months	Swartz, M. S.; Wagner, H. R.; Swanson, J. W.; Stroup, T. S.; McEvoy, J. P.; Reimherr, F.; Miller, D. D.; McGee, M.; Khan, A.; Canive, J. M.; Davis, S. M.; Hsiao, J. K.; Lieberman, J. A.	The effectiveness of antipsychotic medications in patients who use or avoid illicit substances	results from the CATIE study	Schizophrenia Research	2008	100	1-3	39–52
Lieberman 2005_18months	Takeuchi, H.	Optimal Antipsychotic Dose and Dosing Interval in the Treatment of Schizophrenia		Seishin Shinkeigaku Zasshi [Psychiatria et neurologia Japonica]	2015	117	7	562–567
Lieberman 2005_18months	Takeuchi, H.; Fervaha, G.; Lee, J.; Agid, O.; Remington, G.	Impact of once- versus twice-daily risperidone and olanzapine dosing on clinical outcomes	Findings from the catie schizophrenia study	International Journal of Neuropsychopharmacology	2014	17		110–111
Lieberman 2005_18months	Takeuchi, H.; Fervaha, G.; Lee, J.; Agid, O.; Remington, G.	Effectiveness of different dosing regimens of risperidone and olanzapine in schizophrenia		European Neuropsychopharmacology	2015	25	3	295–302
Lieberman 2005_18months	Takeuchi, H.; Fervaha, G.; Remington, G.	Effect of Antipsychotic Dosing Regimen on Neurocognition in Schizophrenia		Journal of Clinical Psychopharmacology	2015	35	6	728–730
Lieberman 2005_18months	Takeuchi, H.; Fervaha, G.; Uchida, H.; Suzuki, T.; Bies, R. R.; Gronte, D.; Remington, G.	Impact of once- versus twice-daily perphenazine dosing on clinical outcomes	an analysis of the CATIE data	Journal of Clinical Psychiatry	2014	75	5	506–511
Lieberman 2005_18months	Takeuchi, H.; Suzuki, T.; Bies, R. R.; Remington, G.; Mamo, D. C.; Pollock, B. G.; Mimura, M.; Uchida, H.	Estimated dopamine D2 receptor occupancy from plasma concentrations of atypical antipsychotics and subjective experience/drug attitude in schizophrenia	An analysis of the CATIE data	Schizophrenia Research	2013	150	2-3	373–379
Lieberman 2005_18months	Thomas, J.; McEvoy, J. P.; Miller, B. J.	Urinary tract infection, inflammation, and cognition in phase 1 of the Clinical Antipsychotic Trials of Intervention Effectiveness Study		Annals of Clinical Psychiatry	2019	31	4	242–248
Lieberman 2005_18months	Tiwari, Arun K.; Brandl, Eva J.; Zai, Clement C.;	Association of Orexin Receptor Polymorphisms		Biological Psychiatry	2015	77	9, Suppl	400S

	Goncalves, Vanessa F.; Chowdhury, Nabilah I.; Freeman, Natalie Lieberman Jeffrey A.; Meltzer, Herbert Y.; Kennedy, James L.; Mueller, Daniel J.	with Antipsychotic-induced Weight Gain					.S	
Lieberman 2005_18months	Tsai, H. T.; Caroff, S. N.; Miller, D. D.; McEvoy, J.; Lieberman, J. A.; North, K. E.; Stroup, T. S.; Sullivan, P. F.	A candidate gene study of tardive dyskinesia in the CATIE schizophrenia trial		American Journal of Medical Genetics	2010	153B	1	336–340
Lieberman 2005_18months	Tsuboi, T.; Bies, R. R.; Suzuki, T.; Mamo, D. C.; Pollock, B. G.; Graff-Guerrero, A.; Mimura, M.; Uchida, H.	Hyperprolactinemia and estimated dopamine D2 receptor occupancy in patients with schizophrenia	analysis of the CATIE data	Progress in Neuro-Psychopharmacology and Biological Psychiatry	2013	45		178–182
Lieberman 2005_18months	Valeri, L.; Bellavia, A.; Centorrino, F.; Jackson, J.; Fitzmaurice, G.	Explaining comparative efficacy of antipsychotic medications	A causal mediation approach	Biological Psychiatry	2017	81	10Suppl1	S34
Lieberman 2005_18months	Van, Dorn R. A.; Desmarais, S. L.; Tueller, S. J.; Jolley, J. M.; Johnson, K. L.; Swartz, M. S.	Drug and alcohol trajectories among adults with schizophrenia	data from the CATIE study	Schizophrenia Research	2013	148	1-3	126–129
Lieberman 2005_18months	Van, Dorn R. A.; Desmarais, S. L.; Young, M. S.; Lee, B.; Swartz, M. S.	Longitudinal substance use trajectories for persons with schizophrenia		Schizophrenia Research	2012	136		S372
Lieberman 2005_18months	Van, Dorn Richard A.; Desmarais, Sarah L.; Young, M. Scott; Sellers, Brian G.; Swartz, Marvin S.	Assessing illicit drug use among adults with schizophrenia		Psychiatry Research	2012	200		228–236
Lieberman 2005_18months	Volavka, J.; Czobor, P.; Citrome, L.; Van, Dorn R. A.	Effectiveness of antipsychotic drugs against hostility in patients with schizophrenia in the Clinical Antipsychotic Trials of Intervention		CNS Spectrums	2014	19	5	374–381

		Effectiveness (CATIE) study						
Lieberman 2005_18months	Volavka, J.; Van, Dorn R. A.; Citrome, L.; Kahn, R. S.; Fleischhacker, W. W.; Czobor, P.	Hostility in schizophrenia	An integrated analysis of the combined Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) and the European First Episode Schizophrenia Trial (EUFEST) studies	European Psychiatry	2016	31		13–19
Lieberman 2005_18months	Wessels, A. M.; Bies, R. R.; Pollock, B. G.; Schneider, L. S.; Lieberman, J. A.; Stroup, S.; Li, C. H.; Coley, K.; Kirshner, M. M.; Marder, S. R.	Population pharmacokinetic modeling of ziprasidone in patients with schizophrenia from the catie study		Journal of Clinical Pharmacology	2011	51	11	1587–1591
Lieberman 2005_18months	Wiste, A.; McGrath, L. M.; Lee, P. H.; Smoller, J. W.	Genome-wide association study of smoking behavior among schizophrenics	Preliminary results	Biological Psychiatry	2011	69	9 Suppl S	250–251
Lieberman 2005_18months	Witt, K.; Hawton, K.; Fazel, S.	The relationship between suicide and violence in schizophrenia	analysis of the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) dataset	Schizophrenia Research	2014	154	1-3	61–67
Lieberman 2005_18months	Yavorsky, C.; Opler, M. G.; Khan, A.; Lucic, L.; Rothman, B.; Jovic, S.	Rescaling the positive and negative syndrome scale (PAN SS)	Effects on percent change from baseline	Schizophrenia Bulletin	2013	39		S358
Lieberman 2005_18months	Yolken, R. H.; Torrey, E. F.; Lieberman, J. A.; Yang, S.; Dickerson, F. B.	Serological evidence of exposure to herpes simplex virus type 1 is associated with cognitive deficits in the catie schizophrenia sample		Schizophrenia Research	2011	128	1-3	61–65
Lieberman 2005_18months	Yoshida, K.; Bies, R. R.; Suzuki, T.; Remington, G.; Pollock, B. G.; Mizuno, Y.; Mimura, M.; Uchida, H.	Tardive dyskinesia in relation to estimated dopamine D2 receptor occupancy in patients with schizophrenia	analysis of the CATIE data	Schizophrenia Research	2014	153	1-3	184–188
Lieberman 2005_18months	Yuen, E.; Tek, C.	Effectiveness of clozapine versus other atypical antipsychotics	Clinical antipsychotic trials for interventions effectiveness (CATIE)	50 Studies Every Psychiatrist Should Know	2018	50		266–273
Lieberman 2005_18months	Zhang, F.; Apud, J.; Bigos, K.; Decot, H.; Vakkalanka, R.; Weinberger, D.	Effect of genetic variation in kcnh2 on antipsychotic treatment in schizophrenia		Neuropsychopharmacology	2010	35		S323

Lieberman 2005_18months	Zhang, F.; Bigos, K.; Weinberger, D.	Genome-wide analysis of antipsychotic drug response in schizophrenia		Proceedings of the 50th Annual Meeting of the American College of Neuropsychopharmacology; 2011 Dec 4-8; Waikoloa, Hawaii	2011	50		135
Lieberman 2005_18months	Zhang, F.; Birnbaum, R.; Apud, J.; Radulescu, E.; Bigos, K.; Chen, Q.; Hyde, T.; Kleinman, J.; Weinberger, D.	Schizophrenia risk associated DRD2 single nucleotide polymorphisms impact antipsychotic drug response and its gene expression in postmortem human brains		Neuropsychopharmacology	2014	39		S429-S430
Lieberman 2005_18months	Addington, D.	Impact of second generation antipsychotics and perphenazine on depressive symptoms in a randomized trial of treatment for chronic schizophrenia		Proceedings of the 164th Annual General Meeting of the American Psychiatric Association; 2011 May 14-18; Honolulu, Hawaii	2011			
Lieberman 2005_18months	Addington, D. E.; Mohamed, S.; Rosenheck, R. A.; Davis, S. M.; Stroup, T. S.; McEvoy, J. P.; Swartz, M. S.; Lieberman, J. A.	Impact of second-generation antipsychotics and perphenazine on depressive symptoms in a randomized trial of treatment for chronic schizophrenia		Journal of Clinical Psychiatry	2011	72	1	75–80
Lieberman 2005_18months	Adkins, D. E.; Khachane, A. N.; McClay, J. L.; Aberg, K.; Buksszar, J.; Sullivan, P. F.; Van, den Oord E. J.	Snp-based analysis of neuroactive ligand-receptor interaction pathways implicates pge2 as a novel mediator of antipsychotic treatment response	Data from the catie study	Schizophrenia Research	2012	135	1-3	200–201
Lieberman 2005_18months	Adkins, D. E.; Souza, R. P.; Aberg, K.; Clark, S. L.; McClay, J. L.; Sullivan, P. F.; Van, den Oord E. J.	Genotype-Based Ancestral Background Consistently Predicts Efficacy and Side Effects across Treatments in CATIE and STAR*D		PLoS One	2013	8	2	e55239
Lieberman 2005_18months	Ahmed, A.; Dodell-Feder, D.; Illnicki, A.; Marino, B.	Investigating heterogeneity in response to antipsychotic treatment in schizophrenia		Neuropsychopharmacology	2016	41		S575
Lieberman 2005_18months	Anonymous	Newer antipsychotics similar to older agents		Journal of Family Practice	2005	54	12	1026
Lieberman 2005_18months	Anonymous	A new comparison of antipsychotic drugs		Harvard Mental Health Letter	2006	22	7	7
Lieberman 2005_18months	Anonymous	Comparison of drugs in patients with schizophrenia		Tagliche Praxis	2006	47	1	137–139

Lieberman 2005_18months	Arnold, J. G.; Miller, A. L.; Canive, J. M.; Rosenheck, R. A.; Swartz, M. S.; Mintz, J.	Comparison of outcomes for African Americans, Hispanics, and non-Hispanic whites in the CATIE study		Psychiatric Services	2013	64	6	570–578
Lieberman 2005_18months	Bahorik, A. L.	The longitudinal impact of intrinsic motivation on substance use severity in schizophrenia and its patterns in men and women		Dissertation	2016	77	2-BE	
Lieberman 2005_18months	Bellavia, A.; Centorrino, F.; Jackson, J. W.; Fitzmaurice, G.; Valeri, L.	The role of weight gain in explaining the effects of antipsychotic drugs on positive and negative symptoms	An analysis of the CATIE schizophrenia trial	Schizophrenia Research	2019	206		96–102
Lieberman 2005_18months	Berkowitz, R. L.; Patel, U.; Ni, Q.; Parks, J. J.; Docherty, J. P.	The impact of the clinical antipsychotic trials of intervention effectiveness (catie) on prescribing practices	An analysis of data from a large midwestern state	Journal of Clinical Psychiatry	2012	73	4	498–503
Lieberman 2005_18months	Bhalla, I. P.; Stefanovics, E. A.; Rosenheck, R. A.	Mental health multimorbidity and poor quality of life in patients with schizophrenia		Schizophrenia Research	2018	201		39–45
Lieberman 2005_18months	Bick, P.; Knoesen, N.; Castle, D.	Clinical implications of the CATIE schizophrenia trials	day-to-day management lessons for Australasian psychiatrists	Australasian Psychiatry	2007	15	6	465–469
Lieberman 2005_18months	Bornheimer, L. A.	Factors involved in suicidal behavior among adults diagnosed with schizophrenia	A secondary analysis of data from the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE)	Dissertation	2016			147
Lieberman 2005_18months	Brandl, E. J.; Tiwari, A. K.; Zai, C. C.; Nurmi, E. L.; Chowdhury, N. I.; Arenovich, T.; Sanches, M.; Goncalves, V. F.; Shen, J. J.; Lieberman, J. A.; Meltzer, H. Y.; Kennedy, J. L.; Muller, D. J.	Genome-wide association study on antipsychotic-induced weight gain in the CATIE sample		Pharmacogenomics journal	2016	16	4	352–356
Lieberman 2005_18months	Butler, E. L.; Laber, E. B.; Davis, S. M.; Kosorok, M. R.	Incorporating Patient Preferences into Estimation of Optimal Individualized Treatment Rules		Biometrics	2018	74	1	18–26
Lieberman 2005_18months	Caroff, S. N.; Davis, V. G.; Miller, del D.; Davis, S.	Treatment outcomes of patients with tardive dyskinesia and		Journal of Clinical Psychiatry	2011	72	3	295–303

	M.; Rosenheck, R. A.; McEvoy, J. P.; Campbell, E. C.; Saltz, B. L.; Riggio, S.; Chakos, M. H.; Swartz, M. S.; Keefe, R. S.; Stroup, T. S.; Lieberman, J. A.; Investigators, C.	chronic schizophrenia						
Lieberman 2005_18months	Carpenter, W. T.	Schizophrenia	risperidone and olanzapine increase time to discontinuation compared with quetiapine and ziprasidone	Evidence-Based Mental Health	2006	9	4	106
Lieberman 2005_18months	Casey, D. E.	Implications of the CATIE trial on treatment	extrapyramidal symptoms	CNS Spectrums	2006	11	7 Suppl 7	25–31
Lieberman 2005_18months	Chakos, M.; Patel, J. K.; Rosenheck, R.; Glick, I. D.; Hammer, M. B.; Tapp, A.; Miller, A.	Concomitant psychotropic medication use during treatment of schizophrenia patients	Longitudinal results from the catie study	Clinical Schizophrenia and Related Psychoses	2011	5	3	124–134
Lieberman 2005_18months	Chwastiak, L. A.; Rosenheck, R. A.; McEvoy, J. P.; Stroup, T. S.; Swartz, M. S.; Davis, S. M.; Lieberman, J. A.	The impact of obesity on health care costs among persons with schizophrenia		General Hospital Psychiatry	2009	31	1	1–7
Lieberman 2005_18months	Clark, S. L.; Adkins, D. E.; Van, den Oord E. J. C. G.	Analysis of efficacy and side effects in catie demonstrates drug response subgroups and potential for personalized medicine		Schizophrenia Research	2011	132	2-3	114–120
Lieberman 2005_18months	Czobor, P.; Van, Dorn R. A.; Citrome, L.; Kahn, R. S.; Fleischhacker, W. W.; Volavka, J.	Treatment adherence in schizophrenia	A patient-level meta-analysis of combined CATIE and EUFEST studies	European Neuropsychopharmacology	2015	25	8	1158–1166
Lieberman 2005_18months	Daumit, G. L.; Goff, D. C.; Meyer, J. M.; Davis, V. G.; Nasrallah, H. A.; McEvoy, J. P.; Rosenheck, R.; Davis, S. M.; Hsiao,	Antipsychotic effects on estimated 10-year coronary heart disease risk in the CATIE schizophrenia study		Schizophrenia Research	2008	105	1-3	175–187

	J. K.; Stroup, T. S.; Lieberman, J. A.							
Lieberman 2005_18months	Davies, A.; Vardeva, K.; Loze, J. Y.; L'Italien, G. J.; Sennfalt, K.; Pugner, K.; Van, Baardewijk M.	Cost-effectiveness of aripiprazole for the management of schizophrenia in the United Kingdom		Value in Health	2008	11		A119
Lieberman 2005_18months	Davies, A.; Vardeva, K.; Loze, J. Y.; L'Italien, G. J.; Sennfalt, K.; Baardewijk, M.	Cost-effectiveness of atypical antipsychotics for the management of schizophrenia in the uk		Current Medical Research and Opinion	2008	24	11	3275–3285
Lieberman 2005_18months	Davis, S. M.; Koch, G. G.; Davis, C. E.; LaVange, L. M.	Statistical approaches to effectiveness measurement and outcome-driven rerandomizations in the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) studies		Schizophrenia Bulletin	2003	29	1	73–80
Lieberman 2005_18months	Davis, S. M.; Stroup, T. S.; Koch, G. G.; Davis, C. E.; Rosenheck, R. A.; Lieberman, J. A.	Time to all-cause treatment discontinuation as the primary outcome in the clinical antipsychotic trials of intervention effectiveness (catie) schizophrenia study		Statistics in Biopharmaceutical Research	2011	3	2	253–265
Lieberman 2005_18months	Dunayevich, E.; Chen, C. Y.; Marder, S. R.; Rabinowitz, J.	Restrictive symptomatic inclusion criteria create barriers to clinical research in schizophrenia negative symptoms	an analysis of the CATIE dataset	European Neuropsychopharmacology	2014	24	10	1615–1621
Lieberman 2005_18months	Essock, S. M.; Covell, N. H.; Davis, S. M.; Stroup, T. S.; Rosenheck, R. A.; Lieberman, J. A.	Effectiveness of switching antipsychotic medications		American Journal of Psychiatry	2006	163	12	2090–2095
Lieberman 2005_18months	Fagiolini, A.; Goracci, A.	The long term--maximising potential for rehabilitation in patients with schizophrenia		European Neuropsychopharmacology	2007	17	Suppl 2	S123-S9
Lieberman 2005_18months	Fervaha, G.; Agid, O.; Takeuchi, H.; Foussias, G.; Lee, J.; Remington, G.	Clinical and functional outcomes in people with schizophrenia with a high sense of well-being		Journal of Nervous and Mental Disease	2015	203	3	187–193
Lieberman 2005_18months	Fervaha, G.; Agid, O.; Takeuchi,	Clinical determinants of life satisfaction in chronic schizophrenia	data from the CATIE study	Schizophrenia Research	2013	151	1-3	203–208

	H.; Foussias, G.; Remington, G.							
Lieberman 2005_18months	Fervaha, G.; Agid, O.; Takeuchi, H.; Foussias, G.; Remington, G.	Life satisfaction among individuals with schizophrenia in the clinical antipsychotic trial of intervention effectiveness (CATIE) study		American Journal of Psychiatry	2013	170	9	1061–1062
Lieberman 2005_18months	Fervaha, G.; Agid, O.; Takeuchi, H.; Foussias, G.; Remington, G.	Effect of antipsychotic medication on overall life satisfaction among individuals with chronic schizophrenia	Findings from the NIMH CATIE study	European Neuropsychopharmacology	2014	24	7	1078–1085
Lieberman 2005_18months	Fervaha, G.; Foussias, G.; Agid, O.; Remington, G.	Impact of primary negative symptoms on functional outcomes in schizophrenia		European Psychiatry	2014	29	7	449–455
Lieberman 2005_18months	Fervaha, G.; Foussias, G.; Agid, O.; Remington, G.	Motivational and neurocognitive deficits are central to the prediction of longitudinal functional outcome in schizophrenia		Acta Psychiatrica Scandinavica	2014	130	4	290–299
Lieberman 2005_18months	Fervaha, G.; Remington, G.	Validation of an abbreviated quality of life scale for schizophrenia		European Neuropsychopharmacology	2013	23	9	1072–1077
Lieberman 2005_18months	Fervaha, G.; Takeuchi, H.; Agid, O.; Lee, J.; Foussias, G.; Remington, G.	Determinants of patient-rated and clinician-rated illness severity in schizophrenia		Journal of Clinical Psychiatry	2015	76	7	924–930
Lieberman 2005_18months	Gao, L.; Khan, A.; Lucic, L.; Rothman, B.	Use of reliable change index to evaluate clinical significance in the positive and negative syndrome scale (panss)	A catie analysis	Schizophrenia Research	2014	153	Suppl.1	S265
Lieberman 2005_18months	Glazer, W. M.; Conley, R. R.; Citrome, L.	Are we treating schizophrenia effectively?	Understanding the primary outcomes of the catie study	CNS Spectrums	2006	11	Suppl10	1–11
Lieberman 2005_18months	Glick, H. A.; Li, P.; Harvey, P. D.	The relationship between Positive and Negative Syndrome Scale (PANSS) schizophrenia severity scores and risk for hospitalization	an analysis of the CATIE Schizophrenia Trial	Schizophrenia Research	2015	166	1-3	110–114
Lieberman 2005_18months	Glick, I. D.; Stekoll, A. H.; Hays, S.	The role of the family and improvement in treatment maintenance, adherence, and outcome for schizophrenia		Journal of Clinical Psychopharmacology	2011	31	1	82–85

Lieberman 2005_18months	Goldstein, D.	The genetics and pharmacogenetics of neurocognition in patients with schizophrenia		Schizophrenia Bulletin	2007	33	2	299
Lieberman 2005_18months	Greenberg, G.; Rosenheck, R. A.; Erickson, S. K.; Desai, R. A.; Stefanovics, E. A.; Swartz, M.; Keefe, R. S.; McEvoy, J.; Stroup, T. S.	Criminal justice system involvement among people with schizophrenia		Community mental health journal	2011	47	6	727–736
Lieberman 2005_18months	Heinrichs, R. W.	Cognitive improvement in response to antipsychotic drugs	neurocognitive effects of antipsychotic medications in patients with chronic schizophrenia in the CATIE trial	Archives of General Psychiatry	2007	64	6	631–632
Lieberman 2005_18months	Heres, S.; Kissling, W.; Leucht, S.	Different antipsychotics produce similar, small improvements in psychosocial functioning at one year in people with schizophrenia		Evidence-Based Mental Health	2007	10	4	112
Lieberman 2005_18months	Hermes, E.; Nasrallah, H.; Davis, V.; Meyer, J.; McEvoy, J.; Goff, D.; Davis, S.; Stroup, T. S.; Swartz, M.; Lieberman, J.; Rosenheck, R.	The association between weight change and symptom reduction in the catie schizophrenia trial		Schizophrenia Research	2011	128	1-3	166–170
Lieberman 2005_18months	Hermes, E.; Rosenheck, R.	Choice of randomization to clozapine versus other second generation antipsychotics in the catie schizophrenia trial		Journal of Psychopharmacology	2012	26	9	1194–1200
Lieberman 2005_18months	Hermes, E.; Rosenheck, R.	Predictors of antipsychotic dose changes in the catie schizophrenia trial		Psychiatry Research	2012	199	1	1–7
Lieberman 2005_18months	Hermes, E. D.; Sokoloff, D.; Stroup, T. S.; Rosenheck, R. A.	Minimum clinically important difference in the positive and negative syndrome scale with data from the clinical antipsychotic trials of intervention effectiveness (CATIE)		Journal of Clinical Psychiatry	2012	73	4	526–532
Lieberman 2005_18months	Hill, S. K.; Sweeney, J. A.; Hamer, R. M.; Keefe, R. S.; Perkins, D. O.; Gu, H.;	Efficiency of the CATIE and BACS neuropsychological batteries in assessing cognitive effects of antipsychotic treatments in schizophrenia		Journal of the International Neuropsychological Society	2008	14	2	209–221

	McEvoy, J. P.; Lieberman, J. A.							
Lieberman 2005_18months	Jackson, J.	Diagnostics for informative censoring	Application to antipsychotic trials with high dropout rates	Pharmacoepidemiology and Drug Safety	2018	27	Supplement 2	7–8
Lieberman 2005_18months	Jakubovski, E.; Carlson, J. P.; Bloch, M. H.	Prognostic subgroups for remission, response, and treatment continuation in the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) trial		Journal of Clinical Psychiatry	2015	76	11	1535–1545
Lieberman 2005_18months	Jin, Y.; Pollock, B. G.; Coley, K.; Miller, D.; Marder, S. R.; Florian, J.; Schneider, L.; Lieberman, J.; Kirshner, M.; Bies, R. R.	Population pharmacokinetics of perphenazine in schizophrenia patients from CATIE	impact of race and smoking	Journal of Clinical Pharmacology	2010	50	1	73–80
Lieberman 2005_18months	Johnson, K. L.; Desmarais, S. L.; Swartz, M. S.; Van, Dorn R. A.	Latent class analysis of discordance between results of drug use assessments in the CATIE data		Schizophrenia Research	2015	161	2-3	434–438
Lieberman 2005_18months	Kane, J. M.	Commentary on the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE)		Journal of Clinical Psychiatry	2006	67	5	831–832
Lieberman 2005_18months	Keefe, R.	Neurocognitive efficacy in patients with chronic schizophrenia		European Neuropsychopharmacology	2006	16	Suppl 4	S577
Lieberman 2005_18months	Keefe, R.; Bilder, R. M.; Harvey, P. D.; Davis, S.; Palmer, B.; McEvoy, J. P.; Goldberg, T. E.; Gold, J. M.; Green, M. F.; Swartz, M.; Stroup, S.; Rosenheck, R.; Perkins, D. O.; Meltzer, H. Y.; Miller, D.; Canive, J.; Walker, T. M.; Lieberman, J. A.	Baseline neurocognitive assessment of 1364 patients with schizophrenia in the clinical antipsychotic trials for intervention effectiveness (CATIE) project		Schizophrenia Bulletin	2005	31		361–362

Lieberman 2005_18months	Keefe, R. S.; Bilder, R. M.; Harvey, P. D.; Davis, S. M.; Palmer, B. W.; Gold, J. M.; Meltzer, H. Y.; Green, M. F.; Miller, D. D.; Canive, J. M.; Adler, L. W.; Manschreck, T. C.; Swartz, M.; Rosenheck, R.; Perkins, D. O.; Walker, T. M.; Stroup, T. S.; McE	Baseline neurocognitive deficits in the CATIE schizophrenia trial		Neuropsychopharmacology	2006	31	9	2033–2046
Lieberman 2005_18months	Keefe, R. S. E.; Bilder, R. M.; Davis, S. M.; Harvey, P. D.; Palmer, B. W.; Gold, J. M.; Meltzer, H. Y.; Green, M. F.; Capuano, G.; Stroup, T. S.; McEvoy, J. P.; Swartz, M. S.; Rosenheck, R. A.; Perkins, D. O.; Davis, C. E.; Hsiao, J. K.; Lieberman, J. A.	Neurocognitive effects of antipsychotic medications in patients with chronic schizophrenia in the CATIE trial		Archives of General Psychiatry	2007	64	6	633–647
Lieberman 2005_18months	Keefe, R. S. E.; Mohs, R. C.; Bilder, R. M.; Harvey, P. D.; Green, M. F.; Meltzer, H. Y.; Gold, J. M.; Sano, M.	Neurocognitive assessment in the clinical antipsychotic trials of intervention effectiveness (CATIE) project schizophrenia trial	development, methodology, and rationale	Schizophrenia Bulletin	2003	29	1	45–55
Lieberman 2005_18months	Kelly, C. W.; McEvoy, J. P.; Miller, B. J.	Total and differential white blood cell counts, inflammatory markers, adipokines, and incident metabolic syndrome in phase 1 of the clinical antipsychotic trials of intervention effectiveness study		Schizophrenia Research	2019	209		193–197
Lieberman 2005_18months	Kerfoot, K. E.; Rosenheck, R. A.; Petrakis, I.	Substance use and schizophrenia	Adverse correlates in the catie study sample	Schizophrenia Research	2011	132	2-3	177–182

	L.; Swartz, M. S.; Keefe, R. S.; McEvoy, J. P.; Stroup, T. S.							
Lieberman 2005_18months	Kryszak, D.; Choudhary, S.; Eaton, W. W.; Gregory, P. E.; Cascella, N. G.; Fasano, A.	Elevated levels of neuronal tissue transglutaminase (ttg)6 in aga-iga positive schizophrenic subjects		Gastroenterology	2012	142	5, Suppl. 1	S-17
Lieberman 2005_18months	Lane, C.; Ranganathan, M.	Effectiveness of antipsychotics in the treatment of schizophrenia	CATIE phase 1	50 Studies Every Psychiatrist Should Know	2018	50		253–259
Lieberman 2005_18months	Lee, B. S.; McIntyre, R. S.; Gentle, J. E.; Park, N. S.; Chiriboga, D. A.; Lee, Y.; Singh, S.; McPherson, M. A.	A computational algorithm for personalized medicine in schizophrenia		Schizophrenia Research	2018	192		131–136
Lieberman 2005_18months	Leiderman, E. A.	Effectiveness trials in chronic schizophrenic patients	CATIE. What can we learn?	Vertex	2009	20	84	129–135
Lieberman 2005_18months	Levine, S. Z.; Ascher-Svanum, H.; Faries, D. E.; Lawson, A. H.; Rabinowitz, J.	Comparing symptom response among antipsychotic medications in CATIE		Schizophrenia Research	2012	136		S253-S254
Lieberman 2005_18months	Levine, S. Z.; Rabinowitz, J.; Ascher-Svanum, H.; Faries, D.; Lawson, T.	Extent of attaining and maintaining symptom remission by antipsychotic medication in the treatment of chronic schizophrenia	Evidence from the catie study	Value in Health	2011	14	7	A287
Lieberman 2005_18months	Levine, S. Z.; Rabinowitz, J.; Ascher-Svanum, H.; Faries, D. E.; Lawson, A. H.	Extent of attaining and maintaining symptom remission by antipsychotic medication in the treatment of chronic schizophrenia	Evidence from the catie study	Schizophrenia Research	2011	133	1-3	42–46
Lieberman 2005_18months	Levine, S. Z.; Rabinowitz, J.; Ascher-Svanum, H.; Faries, D. E.; Lawson, A. H.	Comparing symptom response among antipsychotic medications in CATIE		Journal of Clinical Psychopharmacology	2013	33		123–126
Lieberman 2005_18months	Levine, S. Z.; Rabinowitz, J.; Faries, D.; Lawson, A. H.; Ascher-Svanum, H.	Treatment response trajectories and antipsychotic medications	Examination of up to18months of treatment in the catie chronic schizophrenia trial	Schizophrenia Research	2012	137	1-3	141–146

Lieberman 2005_18months	Lieberman, J.; McEnvoy, J.; Stroup, S.	Protocol	comparative effectiveness of antipsychotic medications in patients with schizophrenia: revised in response to DSMB comments	National Institute of Mental Health	2000			
Lieberman 2005_18months	Lieberman, J.; McEvoy, J.; Stroup, S.	Trial design summary	comparative effectiveness of antipsychotic medications in patients with schizophrenia: draft	Protocol	2002			
Lieberman 2005_18months	Lieberman, J. A.	Research gaps and current research initiatives to improve the treatment of schizophrenia		Proceedings of the 156th Annual Meeting of the American Psychiatric Association; 2003 May 17-22; San Francisco, California, USA	2003			
Lieberman 2005_18months	Lieberman, J. A.; Schneider, L. S.; McEroy, J.; Pariot, P.; Stroup, S.; Adiao, J.; Lebowitz, B. D.	Effectiveness trials of antipsychotic drugs		Proceedings of the 154th Annual Meeting of the American Psychiatric Association; 2001 May 5-10; New Orleans, Louisiana, USA	2001			
Lieberman 2005_18months	Lieberman, J. A.; Schneider, L. S.; McEroy, J.; Pariot, P.; Stroup, S.; Adiao, J.; Lebowitz, B. D.	Effectiveness trials of antipsychotic drugs		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Lieberman 2005_18months	Lieberman, J. A.; Stroup, T. S.	Schizophrenia, VI	Treatments	American Journal of Psychiatry	2003	160	10	1748
Lieberman 2005_18months	Lieberman, J. A.; Stroup, T. S.; McEvoy, J. P.; Swartz, M. S.; Keefe, R.; Perkins, D. O.; Davis, S.; Davis, C. E.; Lebowitz, B.; Hsiao, J.	CATIE trial results		European Neuropsychopharmacology	2006	16	Suppl 4	S184
Lieberman 2005_18months	Lieberman, J. A.; Stroup, T. S.; McEvoy, J. P.; Swartz, M. S.; Rosenheck, R. A.; Perkins, D. O.; Keefe, R. S.; Davis, S. M.; Davis, C. E.; Lebowitz, B.; Hsiao, J.; Severe, J.	Effectiveness of antipsychotic drugs in patients with chronic schizophrenia	primary efficacy and safety outcomes of the clinical antipsychotic trials of intervention effectiveness (CATIE) schizophrenia trial	Neuropsychopharmacology	2005	30	Suppl 1	S32
Lieberman 2005_18months	Lieberman, J. A.; Stroup, T.	Effectiveness of antipsychotic drugs in patients		New England Journal of Medicine	2005	353	12	1209–1223

	S.; McEvoy, J. P.; Swartz, M. S.; Rosenheck, R. A.; Perkins, D. O.; Keefe, R. S. E.; Davis, S. M.; Davis, C. E.; Lebowitz, B. D.; Severe, J.; Hsiao, J. K.	with chronic schizophrenia						
Lieberman 2005_18months	Lin, L. A.	Comparing antipsychotic treatments for schizophrenia	A health state approach	Dissertation	2012	73	2-B	863
Lieberman 2005_18months	Lin, L. A.; Rosenheck, R.; Sugar, C.; Zbrozek, A.	Comparing Antipsychotic Treatments for Schizophrenia	A Health State Approach	Psychiatric Quarterly	2015	86	1	107–121
Lieberman 2005_18months	Liu, Q.; Jamba, M.; Patrick, C.; Iii; Padmanabhan, S.; Brennan, M. D.	Targeted pharmacogenetic analysis of antipsychotic response in the catie study		Pharmacogenomics	2012	13	11	1227–1237
Lieberman 2005_18months	McEvoy, J. P.; Stroup, T. S.; Lieberman, J. A.	Effectiveness and efficacy	staying on treatment and symptom reduction	Antipsychotic Trials in Schizophrenia: The CATIE Project	2010			39–56
Lieberman 2005_18months	McIntyre, R. S.; Cragin, L.; Sorensen, S.; Naci, H.; Baker, T.; Roussy, J. P.	Comparison of the metabolic and economic consequences of long-term treatment of schizophrenia using ziprasidone, olanzapine, quetiapine and risperidone in canada	A cost-effectiveness analysis	Journal of Evaluation in Clinical Practice	2010	16	4	744–755
Lieberman 2005_18months	Bellavia, A.; Centorrino, F.; Jackson, Jw; Fitzmaurice, G.; Valeri, L.	The role of weight gain in explaining the effects of antipsychotic drugs on positive and negative symptoms: an analysis of the CATIE schizophrenia trial		Schizophrenia research	2019			96-102
Lieberman 2005_18months	Feng, T.; McEvoy, Jp; Miller, Bj	Longitudinal study of inflammatory markers and psychopathology in schizophrenia		Schizophrenia research	2020			58–66
Lieberman 2005_18months	Anonymous	CATIE trial confirms different metabolic effects of antipsychotics...Clinical Antipsychotic Trials of Intervention Effectiveness		Brown university psychopharmacology update	2008	19	7	1- 4
Lieberman 2005_18months	Beaudoin M Hudon A Giguere C-E Potvin S Dumais A	Prediction of quality of life in schizophrenia using machine learning models on data from Clinical Antipsychotic Trials		NPJ schizophrenia	2022	8		29

		of Intervention Effectiveness (CATIE) schizophrenia trial						
Lieberman 2005_18months	Beaudoin M // Potvin S // Hudon A // Giguere CE // Dumais A	Prediction of quality of life in schizophrenia using machine learning models on data from clinical antipsychotic trials of intervention effectiveness (CATIE) schizophrenia trial		European psychiatry	2021	64		S157
Lieberman 2005_18months	Buchanan A // Stefanovics E // Rosenheck R	Victimization in schizophrenia and its relation to violence		Schizophrenia Research	2023	255		52-58
Lieberman 2005_18months	Fabbri C // Leggio GM // Drago F // Serretti A	Imputed expression of schizophrenia-associated genes and cognitive measures in patients with schizophrenia		Molecular Genetics & Genomic Medicine	2022	10	6	e1942
Lieberman 2005_18months	Lysaker PH // Weiden PJ // Sun X // O'Sullivan AK // McEvoy JP	Impaired insight in schizophrenia: impact on patient-reported and physician-reported outcome measures in a randomized controlled trial		BMC Psychiatry	2022	22	1	574
Lieberman 2005_18months	Xavier RM // Shanavas Y // Britt BM // George WT	Influences of race and clinical variables on psychiatric genetic research participation: Results from a schizophrenia sample		PLoS ONE	2023	18	4	e0284356
Lindenmayer 2007	Smith, R. C.; Infante, M.; Singh, A.; Khandat, A.	The effects of olanzapine on neurocognitive functioning in medication-refractory schizophrenia		International Journal of Neuropsychopharmacology	2001	4	3	239–250
Lindenmayer 2007	Smith, R. C.; Infante, M.; Singh, A. K.; Garlapati, V. K.; Ali, A.	Response of chronic nonresponding schizophrenic patients to olanzapine	clinical and neurocognitive effects	Proceedings of the 39th Annual Meeting of the New Clinical Drug Evaluation Unit; 1999 Jun 1-4; Boca Raton, Florida, USA	1999			81
Lindenmayer 2007	Smith, R. C.; Lindenmayer, J. P.; Khandat, A.; Infante, M.; Singh, A.	Olanzapine affects neurocognitive function in medication-refractory schizophrenia		Proceedings of the 154th Annual Meeting of the American Psychiatric Association; 2001 May 5-10; New Orleans, Louisiana, USA	2001			
Lindenmayer 2007	Smith, R. C.; Lindenmayer, J. P.; Khandat, A.; Infante, M.; Singh, A.	Olanzapine affects neurocognitive function in medication-refractory schizophrenia		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Lindenmayer 2007	Smith, R. C.; Nigam, S.; Stern, A.; Infante, M.; Mehta, R.	Olanzapine in chronic nonresponding schizophrenia	effects on psychopathology and neurocognitive function	Proceedings of the 21st Collegium Internationale Neuro-Psychopharmacologicum Congress; 1998 Jul 12-16; Glasgow, UK	1998			

Lindenmayer 2007	Lindenmayer, J.; Iskander, A.; Abad, T.; Parker, B.; Lerman, M.; Khan, A.	A randomized, double - blind study of olanzapine vs haloperidol in the treatment of primary negative symptoms in schizophrenia		Schizophrenia Bulletin	2005	31		493–494
Lindenmayer 2007	Lindenmayer, J. P.; Khan, A.; Iskander, A.; Abad, M. T.; Parker, B.	A randomized controlled trial of olanzapine versus haloperidol in the treatment of primary negative symptoms and neurocognitive deficits in schizophrenia		Journal of Clinical Psychiatry	2007	68	3	368–379
Litman 2016	Nct	Study to assess the efficacy, safety, and tolerability of AZD8529 in adult schizophrenia patients		https://ClinicalTrials.gov/	2009			
Litman 2016	Litman, R.; Smith, M.; Doherty, J.; Cross, A.; Raines, S.; Zukin, S.	AZD8529, a positive allosteric modulator at the MGGLUR2 receptor, does not improve symptoms in schizophrenia	A proof of principle study	European Neuropsychopharmacology	2014	24		S508-S509
Litman 2016	Litman, R. E.; Smith, M. A.; Doherty, J.; Cross, A.; Raines, S.; Zukin, S.	AZD8529, a positive allosteric modulator at the mGLuR2 receptor, does not improve symptoms in schizophrenia	A proof of principle study	Schizophrenia Research	2014	153		S176
Litman 2016	Litman, R. E.; Smith, M. A.; Doherty, J. J.; Cross, A.; Raines, S.; Gertsik, L.; Zukin, S. R.	AZD8529, a positive allosteric modulator at the mGluR2 receptor, does not improve symptoms in schizophrenia	A proof of principle study	Schizophrenia Research	2016	172	1-3	152–157
Litmann 2014	Nct	Phase IIA study in patients with schizophrenia		https://ClinicalTrials.gov/	2008			
Litmann 2014	Litman, R. E.; Smith, M.; Desai, D.; Simpson, T.; Kanes, S.	The selective nk3 antagonist azd2624 does not improve symptoms or cognition in schizophrenia		Proceedings of the 163rd Annual Meeting of the American Psychiatric Association; 2010 May 22-26; New Orleans, LA	2010			
Litmann 2014	Litman, R. E.; Smith, M. A.; Desai, D. G.; Simpson, T.; Sweitzer, D.; Kanes, S. J.	The selective neurokinin 3 antagonist AZD2624 does not improve symptoms or cognition in schizophrenia	a proof-of-principle study	Journal of Clinical Psychopharmacology	2014	34	2	199–204
Liu 2000	Liu, S. K.; Chen, W. J.; Chang, C. J.; Lin, H. N.	Effects of atypical neuroleptics on sustained attention deficits in schizophrenia	a trial of risperidone versus haloperidol	Neuropyschopharmacology	2000	22	3	311–319
Loebel 2013	Meyer, J. M.; Werner, P.; Cucchiaro, J.; Silva, R.;	Short-and long-term treatment with lurasidone and quetiapine XR	Effect on metabolic syndrome	Schizophrenia Bulletin	2013	39		S344

	Pikalov, A.; Hsu, J.; Grossman, F.; Loebel, A.	in patients with schizophrenia						
Loebel 2013	Miller, B.; Pikalov, A.; Siu, C.; Tocco, M.; Tsai, J.; Harvey, P.; Loebel, A.	Inflammatory markers and cognitive performance in patients with schizophrenia treated with lurasidone		Neuropsychopharmacology	2017	43	Suppl. 1	S585
Loebel 2013	Miller, B. J.; Pikalov, A.; Siu, C.; Tocco, M.; Tsai, J.; Harvey, P. D.; Loebel, A.	Inflammatory markers and cognitive performance in patients with schizophrenia treated with lurasidone		Australian and New Zealand Journal of Psychiatry	2019	53		144–145
Loebel 2013	Mosolov, S. N.; Malyutin, A. V.; Pikalov, A. A.	Effect of Lurasidone on symptoms of schizophrenia in five-factor dimensional model	pooled analysis of two short-term, randomized, double-blind, placebo-controlled studies in patients from Russia and Ukraine	Zhurnal Nevrologii I Psikhiatrii Imeni S.S. Korsakova	2019	119	12	29–37
Loebel 2013	Nasrallah, H. A.; Cucchiaro, J. B.; Mao, Y.; Pikalov, A. A.; Loebel, A. D.	Lurasidone for the treatment of depressive symptoms in schizophrenia	analysis of 4 pooled, 6-week, placebo-controlled studies	CNS Spectrums	2015	20	2	140–147
Loebel 2013	Nct	Lurasidone HCL - a 6-week phase 3 study of patients with acute schizophrenia		https://ClinicalTrials.gov/	2008			
Loebel 2013	Nct	Lurasidone HCl - a long term phase 3 study of patients with chronic schizophrenia		https://ClinicalTrials.gov/	2008			
Loebel 2013	Pikalov, A.; Citrome, L.; Hsu, J.; Werner, P.; Cucchiaro, J.; Loebel, A.	Comparative effectiveness of long-term treatment with atypical antipsychotics in patients with schizophrenia		Schizophrenia Bulletin	2013	39		S349-S350
Loebel 2013	Pikalov, A.; Loebel, A.; Cucchiaro, J.; Xu, J.; Sarma, K.; Kane, J.	Relapse prevention in schizophrenia	12 month treatment with lurasidone versus quetiapine extended release among responders to acute treatment	European Neuropsychopharmacology	2012	22	Suppl. 2	S340-S1
Loebel 2013	Potkin, S.; Tocco, M.; Pikalov, A.; Hsu, J.; Cucchiaro, J.; Loebel, A.	Safety of lurasidone in older adults with schizophrenia	A pooled analysis of short-term placebo-controlled studies	Neuropsychopharmacology	2015	40		S552-S553
Loebel 2013	Rajagopalan, K.; Niecko, T.; Pikalov, A.; Loebel, A.	Risk reduction and numbers needed to treat to avoid metabolic syndrome	12-month cardiometabolic parameters changes among schizophrenia subjects treated with lurasidone or quetiapine xr	Schizophrenia Research	2014	153	Suppl. 1	S241
Loebel 2013	Rajagopalan, K.; O'Day, K.; Meyer, K.; Pikalov, A.; Loebel, A.	Annual cost of relapses and relapse-related hospitalizations in adults with schizophrenia	results from a 12-month, double-blind, comparative study of lurasidone vs quetiapine extended-release	Journal of Medical Economics	2013	16	8	987–996

Loebel 2013	Silva, R.; Cucchiaro, J.; Hsu, J.; Sarkin, A.; Loebel, A.; Marder, S. R.	Effect of short-term treatment with lurasidone on quality of life in schizophrenia	Results from the pearl 3 trial	Schizophrenia Bulletin	2011	37		321
Loebel 2013	Silva, R.; Cucchiaro, J.; Pikalov, A.; Xu, J.; Siu, C.; Loebel, A.; Kalali, A.	Daytime sleepiness as a mediator of treatment outcome in a placebo- and quetiapine xr-controlled trial of lurasidone in patients with schizophrenia		Proceedings of the 50th Annual Meeting of the American College of Neuropsychopharmacology; 2011 Dec 4-8; Waikoloa, Hawaii	2011			S98-S9
Loebel 2013	Citrome, L.; Pikalov, A.; Tocco, M.; Hsu, J.; Loebel, A.	Effects of lurasidone on hostility in patients with an acute exacerbation of schizophrenia	A pooled post hoc analysis of five short-term studies	Neuropsychopharmacology	2014	39		S379-S380
Loebel 2013	Harvey, P.; Cucchiaro, J.; Pikalov, A.; Loebel, A.; Siu, C.	Cognitive performance in patients with schizophrenia treated with lurasidone	Results from a placebo- and active-controlled acute phase study followed by a 6 month double-blind extension	Proceedings of the 50th Annual Meeting of the American College of Neuropsychopharmacology; 2011 Dec 4-8; Waikoloa, Hawaii	2011			S169-70
Loebel 2013	Harvey, P.; Ogasa, M.; Siu, C.; Loebel, A.	Improvement in depressive symptoms mediates changes in functional capacity in schizophrenia	A treatment study	Neuropsychopharmacology	2015	40		S213
Loebel 2013	Harvey, P.; Siu, C.	Effect of lurasidone dose on cognitive impairment in patients with schizophrenia	post-hoc analysis of a long-term continuation study	168th Annual Meeting of American Psychiatric Association; Toronto, Canada; May 16-20, 2015	2015			
Loebel 2013	Harvey, P.; Siu, C. O.; Cucchiaro, J.; Pikalov, A.; Loebel, A.	Impact of improved insight in schizophrenia	A double-blind lurasidone and quetiapine XR study	European Neuropsychopharmacology	2013	23		S285
Loebel 2013	Harvey, P. D.; Loebel, A.; Cucchiaro, J.; Phillips, D.; Siu, C.	Is quality of life related to cognitive performance or negative symptoms in patients with schizophrenia?	Results from a double-blind, active-controlled, lurasidone continuation study	Schizophrenia Research	2014	153	Suppl. 1	S149
Loebel 2013	Loebel, A.; Cucchiaro, J.; Pikalov, A.; Sarma, K.; Hsu, J.; Kalali, A.; Potkin, S.; Meltzer, H.	Lurasidone in the treatment of acute schizophrenia	Results of the double-blind, placebo-controlled, 6-week, pearl 3 trial	Proceedings of the 49th Annual Meeting of the American College of Neuropsychopharmacology; 2010 Dec 5-9; Miami, Florida	2010			
Loebel 2013	Loebel, A.; Cucchiaro, J.; Pikalov, A.; Sarma, K.; Hsu, J.; Kalali, A.; Potkin, S.; Meltzer, H.	Lurasidone in the treatment of acute schizophrenia	Results of the double-blind, placebo-controlled, 6-week, pearl 3 trial	Neuropsychopharmacology	2010	35		S313-S4
Loebel 2013	Loebel, A.; Cucchiaro, J.; Sarma, K.; Hsu, J.; Kalali, A.	Lurasidone in the treatment of acute schizophrenia	Results of the double-blind, placebo-controlled, 6-week, pearl 3 trial	Schizophrenia Bulletin	2011	37		313

	H.; Potkin, S. G.							
Loebel 2013	Loebel, A.; Cucchiaro, J.; Sarma, K.; Xu, L.; Hsu, C.; Kalali, A. H.; Pikalov, A.; Potkin, S. G.	Efficacy and safety of lurasidone 80 mg/day and 160 mg/day in the treatment of schizophrenia	a randomized, double-blind, placebo- and active-controlled trial	Schizophrenia Research	2013	145	1-3	101–109
Loebel 2013	Loebel, A.; Cucchiaro, J.; Silva, R.; Mao, Y.; Xu, J.; Pikalov, A.; Marder, S. R.	Efficacy of lurasidone across five symptom dimensions of schizophrenia	Pooled analysis of short-term, placebo-controlled studies	European Psychiatry	2015	30	1	26–31
Loebel 2013	Loebel, A.; Cucchiaro, J.; Xu, J.; Hsu, J.; Sarma, K.; Pikalov, A.; Kane, J. M.	Relapse prevention and remission during 12 months of double-blind treatment with lurasidone vs. quetiapine XR in patients with schizophrenia		Schizophrenia Bulletin	2013	39		S342
Loebel 2013	Loebel, A.; Cucchiaro, J.; Xu, J.; Hsu, J.; Sarma, K.; Warner, P.; Pikalov, A.; Kane, J. M.	Remission during 12 months of double-blind treatment with lurasidone vs quetiapine xr in patients with schizophrenia		Neuropsychopharmacology	2012	38	S1	S436
Loebel 2013	Loebel, A.; Cucchiaro, J.; Xu, J.; Sarma, K.; Pikalov, A.; Kalali, A.	Relapse prevention with lurasidone vs. Quetiapine xr in chronic schizophrenia	Results of a 12-month, double-blind study	Proceedings of the 50th Annual Meeting of the American College of Neuropsychopharmacology; 2011 Dec 4-8; Waikoloa, Hawaii	2011			
Purdon 2001	Purdon, S.; Lit, W.; Malla, A.; Labelle, A.	Quetiapine improves cognition in schizophrenia		Proceedings of the 52nd Institute on Psychiatric Services; 2000 Oct 25-29; Philadelphia, Pennsylvania, USA	2000			
Purdon 2001	Purdon, S.; Malla, A.; Labelle, A.; Litt, W.	Long-term treatment of quetiapine improves cognitive function in schizophrenia	a double-blind study	Proceedings of the 10th Biennial Winter Workshop on Schizophrenia; 2000 Feb 5-11; Davos, Switzerland	2000			
Purdon 2001	Purdon, S. E.; Hellewell, J. S.	The effect of quetiapine in improving cognitive impairment in schizophrenia		Schizophrenia Research	2001	49	1-2	118
Purdon 2001	Purdon, S. E.; Malla, A.; Labelle, A.; Lit, W.	Neuropsychological change in patients with schizophrenia after treatment with quetiapine or haloperidol		Journal of Psychiatry and Neuroscience	2001	26	2	137–149
Purdon 2001	Purdon, S. E.; Malla, A.; Labelle, A.; Litt, W.	Neuropsychological change in schizophrenia after 6 months of double blind treatment with quetiapine or haloperidol		Schizophrenia Research	2000	41	1	205–206

Ragland 1968	Ragland, R.; Clark, M. L.; Ray, T. S.; Paredes, A.; Costiloe, J. P.; Segal, B.; Wolf, S.	The evaluation of chlorpromazine therapy in chronic schizophrenic women. A replicated experiment		Journal of Chronic Diseases	1968	21	6	445–460
Ranjan 2003	Ranjan, S.	Cognitive improvement in schizophrenia with atypical antipsychotics	A randomized double-blind comparison between risperidone and olanzapine	Dissertation	2003			214
Reardon 1966	Reardon, J. D.; Abrams, S.	Acute paranoid schizophrenia (treatment with chlorpromazine, trifluoperazine and placebo)		Diseases of the Nervous System	1966	27		265–270
Rémillard 2005y1	Remillard, S.; Pourcher, E.; Cohen, H.	The effect of neuroleptic treatments on executive function and symptomatology in schizophrenia	a 1-year follow up study	Schizophrenia Research	2005	80	1	99–106
Rémillard 2005y1	Remillard, S.; Pourcher, E.; Cohen, H.	Long-term effects of risperidone versus haloperidol on verbal memory, attention, and symptomatology in schizophrenia		Journal of the International Neuropsychological Society	2008	14	1	110–118
REPRIEVE	Nct	Efficacy in prevention of relapse of schizophrenia in subjects taking either placebo or iloperidone		https://ClinicalTrials.gov/	2011			
REPRIEVE	Weiden, P. J.; Manning, R.; Wolfgang, C. D.; Ryan, J. M.; Mancione, L.; Han, G.; Ahmed, S.; Mayo, M. G.	A Randomized Trial of Iloperidone for Prevention of Relapse in Schizophrenia	The REPRIEVE Study	CNS drugs	2016	30	8	735–747
REPRIEVE	Ctri	A clinical trial to study prevention of relapse in patients with schizophrenia receiving either flexible dose iloperidone or placebo in long-term use		http://apps.who.int/trialsearch/	2010			
Riedel 2005	Nct	Efficacy of quetiapine compared to risperidone on negative symptoms and cognition with regard to underlying neurobiological mechanisms and brain activation		https://ClinicalTrials.gov/	2006			
Riedel 2005	Riedel, M.; Moller, H. J.; Strassnig, M.; Spellmann, I.; Muller-Arends, A.; Dehning,	Comparison of quetiapine versus risperidone in treating negative symptoms		Proceedings of the 157th Annual Meeting of the American Psychiatric Association; 2004 May 1-6; New York, USA	2004			

	S.; Sandowsky, N.; Muller, N.							
Riedel 2005	Riedel, M.; Möller, H. J.; Strassnig, M.; Spellmann, I.; Müller-Arends, A.; Dehning, S.; Sadowsky, N.; Müller, N.	Efficacy of quetiapine against negative symptoms in schizophrenia		Proceedings of the 8th World Congress of Psychiatry; 2005 Sep 10-15; Cairo, Egypt	2005			
Riedel 2005	Riedel, M.; Muller, N.; Strassnig, M.; Spellmann, I.; Engel, R. R.; Musil, R.; Dehning, S.; Douhet, A.; Schwarz, M. J.; Moller, H. J.	Quetiapine has equivalent efficacy and superior tolerability to risperidone in the treatment of schizophrenia with predominantly negative symptoms		European Archives of Psychiatry and Clinical Neuroscience	2005	255	6	432–437
Riedel 2005	Riedel, M.; Spellmann, I.; Muller, N.; Strassnig, M.; Muller-Arends, A.; Dehning, S.; Moller, H. J.	Cognitive benefits of quetiapine versus risperidone in schizophrenia		Proceedings of the 158th Annual Meeting of the American Psychiatric Association; 2005 May 21-26; Atlanta, Georgia, USA	2005			
Swanson 2005	Nct	A multi centre, double-blind, double-dummy, placebo-controlled, randomised, adaptive, dose-range study to evaluate the safety and efficacy of SB-773812 administered once daily for 12 weeks in adults with schizophrenia		https://ClinicalTrials.gov/	2005			
Tapp 2005	Tapp, A.; Wood, A. E.; Kilzieh, N.; Kennedy, A.	Double - blind comparison of quetiapine and haloperidol on cognitive functioning in patients with schizophrenia		Schizophrenia Bulletin	2005	31		379
Thomas 2010	Mittoux, A.; Crocq, M. A.; Tanghoej, P.; Naber, D.	Suicide attempts in a prospective cohort of patients with schizophrenia treated with sertindole or risperidone		Proceedings of the 15th Biennial Winter Workshop in Psychoses; 2009 Nov 15-18; Barcelona, Spain	2009			
Thomas 2010	Mittoux, A.; Hert, M. D.; Yuan, H.; Peuskens, J.	Metabolic parameters in the short- and long-term treatment of schizophrenia with sertindole or risperidone		Proceedings of the 15th Biennial Winter Workshop in Psychoses; 2009 Nov 15-18; Barcelona, Spain	2009			

Thomas 2010	Mittoux, A.; Peuskens, J.; Tanghoej, P.	Outcome of the Sertindole Cohort Prospective (SCOP) study	all-cause mortality	Proceedings of the 15th Biennial Winter Workshop in Psychoses; 2009 Nov 15-18; Barcelona, Spain	2009			
Thomas 2010	Nct	Sertindole versus risperidone safety outcome study	a randomised, partially-blinded, parallel-group, active-controlled, post-marketing study	https://ClinicalTrials.gov/	2007			
Thomas 2010	Nct	Safety study of sertindole versus risperidone under normal conditions of use		https://ClinicalTrials.gov/	2009			
Thomas 2010	Peuskens, J.	Outcome of the sertindole cohort prospective (SCoP) study	all-cause mortality	European Neuropsychopharmacology	2008	18		S404-S405
Thomas 2010	Peuskens, J.; Tanghoj, P.; Mittoux, A.	The Sertindole Cohort Prospective (SCoP) study	rationale, design and methodology	Proceedings of the Die Deutsche Gesellschaft Für Psychiatrie, Psychotherapie Und Nervenheilkunde Congress; 2007 Nov 21-24; Berlin, Germany	2007			
Thomas 2010	Peuskens, J.; Tanghoj, P.; Mittoux, A.	The Sertindole Cohort Prospective (SCoP) study	rationale, design and methodology	Pharmacoepidemiology and Drug Safety	2008	17	5	425–433
Thomas 2010	Peuskens, J.; Tanghoj, T.; Mittoux, A.	Principal outcomes of the sertindole cohort prospective (SCOP) study		Schizophrenia Research	2010	117	2-3	268–269
Thomas 2010	Thomas, S. H. L.; Drici, M. D.; Hall, G. C.; Crocq, M. A.; Everitt, B.; Lader, M. H.; Le, Jeunne C.; Naber, D.; Priori, S.; Sturkenboom, M.; Thibaut, F.; Peuskens, J.; Mittoux, A.; Tanghoj, P.; Toumi, M.; Moore, N. D.; Mann, R. D.	Safety of sertindole versus risperidone in schizophrenia	Principal results of the sertindole cohort prospective study (scop)	Acta Psychiatrica Scandinavica	2010	122	5	345–355
Thomas 2010	Cheung, H. K.	Sertindole versus risperidone safety outcome study	a randomised, partially-blinded, parallel-group, active-controlled, post-marketing study	http://www.ekg.org.hk/HAREC-CTR/index.jsp	2005			
Thomas 2010	Crocq, M. A.; Lader, M. H.; Mittoux, A.; TanghÃ¸j, P.; Thibaut, F.; Peuskens, J.; Everitt, B.; Mann, R.; Moore, N. D.; Naber, D.	Suicide in a prospective cohort of patients with schizophrenia treated with sertindole or risperidone		Proceedings of the 162nd Annual Meeting of the American Psychiatric Association; 2009 May 16-21; San Francisco, CA	2009			

Thomas 2010	Crocq, M. A.; Mittoux, A.; Tanghoj, P.; Naber, D.	Suicide attempts in the SCOP study		Schizophrenia Research	2010	117	2-3	385
Thomas 2010	Crocq, M. A.; Naber, D.; Lader, M. H.; Thibaut, F.; Drici, M.; Everitt, B.; Hall, G. C.; Le, Jeunne C.; Mittoux, A.; Peuskens, J.; Priori, S.; Sturkenboom, M.; Thomas, S. H. L.; Tanghoj, P.; Toumi, M.; Mann, R.; Moore, N. D.	Suicide attempts in a prospective cohort of patients with schizophrenia treated with sertindole or risperidone		European Neuropsychopharmacology	2010	20	12	829–838
Thomas 2010	De, Hert M.; Mittoux, A.; He, Y.; Peuskens, J.	A head-to-head comparison of sertindole and risperidone on metabolic parameters		Schizophrenia Research	2010	123	2-3	276–277
Thomas 2010	De, Hert M.; Mittoux, A.; He, Y.; Peuskens, J.	Metabolic parameters in a subset of patients in the scop study		Schizophrenia Research	2010	117	2-3	500–501
Thomas 2010	De, Hert M.; Mittoux, A.; He, Y.; Peuskens, J.	Metabolic parameters in the short- and long-term treatment of schizophrenia with sertindole or risperidone		European Archives of Psychiatry and Clinical Neuroscience	2011	261	4	231–239
Thomas 2010	Lundbeck, H.	A prospective randomised partially-blinded parallel-group active-controlled study of sertindole in schizophrenia		http://www.lundbeck-trials.com	2002			
Volavka 2002	Mohr, P.; Volavka, J.; Lieberman, J. A.; Czobor, P.; McEnvoy, J.; Lindenmayer, J. P.; Citrome, L.; Sheitman, B.	Clozapine, olanzapine, risperidone, and haloperidol in refractory schizophrenia		European Psychiatry	2000	15	Suppl 2	284S
Volavka 2002	Nolan, K. A.; Volavka, J.; Czobor, P.; Sheitman, B.; Lindenmayer, J. P.; Citrome, L. L.; McEvoy, J.; Lieberman, J. A.	Aggression and psychopathology in treatment-resistant inpatients with schizophrenia and schizoaffective disorder		Journal of Psychiatric Research	2005	39	1	109–115

Volavka 2002	Pal, C.	Basic underlying structure of psychopathological symptoms in schizophrenia and its change over time during pharmacological treatment		Dissertation	2006			98
Volavka 2002	Tiwari, A. K.; Zai, C. C.; Meltzer, H. Y.; Lieberman, J. A.; Muller, D. J.; Kennedy, J. L.	Association study of polymorphisms in insulin induced gene 2 (insig2) with antipsychotic-induced weight gain in european and african-american schizophrenia patients		Human Psychopharmacology	2010	25	3	253–259
Volavka 2002	Volavka, J.; Czobor, P.; Cooper, T. B.; Sheitman, B.; Lindenmayer, J. P.; Citrome, L.; McEvoy, J. P.; Lieberman, J. A.	Prolactin levels in schizophrenia and schizoaffective disorder patients treated with clozapine, olanzapine, risperidone, or haloperidol		Journal of Clinical Psychiatry	2004	65	1	57–61
Volavka 2002	Volavka, J.; Czobor, P.; Nolan, K.; Sheitman, B.; Lindenmayer, J. P.; Citrome, L. M. J. P.; Cooper, T. B.; Lieberman, J. A.	Overt aggression and psychotic symptoms in patients with schizophrenia treated with clozapine, olanzapine, risperidone, or haloperidol		Journal of Clinical Psychopharmacology	2004	24	2	225–228
Volavka 2002	Volavka, J.; Czobor, P.; Sheitman, B.; Lindenmayer, J. P.; Citrome, L.; McEvoy, J.; Cooper, T. B.; Chakos, M.; Kline, J. A. L. N.	Clozapine, olanzapine, risperidone, and haloperidol in refractory schizophrenia		Proceedings of the 39th Annual Meeting of the American College of Neuropsychopharmacology; 2000 Dec 10-14; San Juan, Puerto Rico	2000			
Loebel 2013	Loebel, A.; Cucchiaro, J.; Xu, J.; Sarma, K.; Pikalov, A.; Kane, J.	Effectiveness of lurasidone vs. quetiapine XR for relapse prevention in schizophrenia	A 12-month, double-blind study	International Journal of Neuropsychopharmacology	2012	15		125
Loebel 2013	Loebel, A.; Cucchiaro, J.; Xu, J.; Sarma, K.; Pikalov, A.; Kane, J. M.	Effectiveness of lurasidone vs. quetiapine XR for relapse prevention in schizophrenia	A 12-month, double-blind study	Schizophrenia Research	2012	136		S260
Loebel 2013	Loebel, A.; Cucchiaro, J.; Xu, J.; Sarma, K.; Pikalov, A.; Kane, J. M.	Effectiveness of lurasidone vs. quetiapine XR for relapse prevention in schizophrenia	A 12-month, double-blind, noninferiority study	Schizophrenia Research	2013	147		95–102
Loebel 2013	Loebel, A.; Harvey, P.; Ogassa, M.; Cucchiaro,	A double-blind comparison of the effects of lurasidone and	differential sensitivity of performance-based and interview measures	Proceedings of the American College of Neuropsychopharma-	2008			

	J.; Keefe, R.	ziprasidone on cognitive function		cology Annual Meeting; 2008 Oct 1-11; Scottsdale, Arizona				
Loebel 2013	Loebel, A.; Silva, R.; Goldman, R.; Watabbe, K.; Pikalov, A.; Cucchiaro, J.; Kane, J. M.	Optimizing treatment with lurasidone in patients with schizophrenia	Results of a randomized, double-blind, placebo-controlled trial	Schizophrenia Bulletin	2015	41		S321
Loebel 2013	Loebel, A.; Silva, R.; Goldman, R.; Watabe, K.; Cucchiaro, J.; Kane, J.	Optimizing treatment with lurasidone in patients with schizophrenia	Results: Of a randomized, doubleblind, placebo-controlled trial (optimize trial)	Neuropsychopharmacology	2014	39		S476-S477
Loebel 2013	Loebel, A.; Siu, C.; Cucchiaro, J.; Pikalov, A.; Goldman, R.; Grossman, F.; Schooler, N.	Lurasidone treatment response in patients with schizophrenia assessed using the dsm-5 dimensions of psychosis severity scale		168th Annual Meeting of American Psychiatric Association; Toronto, Canada; May 16-20, 2015	2015			
Loebel 2013	Loebel, A.; Siu, C.; Cucchiaro, J.; Pikalov, A.; Harvey, P.	Evaluation of daytime sleepiness in patients with schizophrenia treated with atypical antipsychotics	Results from a randomized, double-blind, placebo-controlled trial	International Journal of Neuropsychopharmacology	2014	17		146
Loebel 2013	Loebel, A.; Siu, C.; Cucchiaro, J.; Pikalov, A.; Harvey, P.	Evaluation of daytime sleepiness in patients with schizophrenia treated with atypical antipsychotics		European Neuropsychopharmacology	2014	24		S561
Loebel 2013	Loebel, A. D.; Siu, C. O.; Cucchiaro, J. B.; Pikalov, A. A.; Harvey, P. D.	Daytime sleepiness associated with lurasidone and quetiapine XR	results from a randomized double-blind, placebo-controlled trial in patients with schizophrenia	CNS Spectrums	2014	19	2	197–205
Loebel 2013	Miller, B. J.; Pikalov, A.; Siu, C. O.; Tocco, M.; Tsai, J.; Harvey, P. D.; Newcomer, J. W.; Loebel, A.	Association of C-reactive protein and metabolic risk with cognitive effects of lurasidone in patients with schizophrenia		Comprehensive psychiatry (Compr Psychiatry)	2020	102		152195
Loebel 2013	Hagi, K.; Nosaka, T.; Pikalov, A.	Is metabolic syndrome related to cognitive performance in patients with schizophrenia? Results from a double blind, active-controlled, lurasidone study		Schizophrenia Bulletin	2020		Suppl. 1	S152
Loebel 2013	Hagi, K.; Nosaka, T.; Pikalov, A.	Is Metabolic Syndrome Related to Cognitive Performance in Patients With Schizophrenia? Results From a Double-Blind, Active-Controlled, Lurasidone Study		Biological Psychiatry	2020		9 Suppl.	S300-s301

Loebel 2013	Miller, Bj; Pikalov, A.; Siu, C.; Tocco, M.; Tsai, J.; Harvey, Pd; Loebel, A.	Inflammatory markers and cognitive performance in patients with schizophrenia treated with lurasidone		Australian and New Zealand Journal of Psychiatry	2019		Suppl. 1	144-5
Loebel 2013	Miller, Bj; Pikalov, A.; Siu, Co; Tocco, M.; Tsai, J.; Harvey, Pd; Newcomer, Jw; Loebel, A.	Association of C-reactive protein and metabolic risk with cognitive effects of lurasidone in patients with schizophrenia		Comprehensive Psychiatry	2020			152195
Loebel 2013	Tocco, M.; Newcomer, Jw; Mao, Y.; Pikalov, A.; Loebel, A.	Lurasidone and Risk for Metabolic Syndrome: Results from Short and Long-term Clinical Studies in Patients with Schizophrenia		CNS Spectrums	2020			InPress
Loebel 2013	Costamagna, I.; Calisti, F.; Cattaneo, A.; Hsu, J.; Pikalov, A.; Tocco, M.; Goldman, R.	Efficacy and safety of lurasidone in adolescents and young adults with schizophrenia: A pooled post hoc analysis of double-blind, placebo-controlled 6-week studies		European psychiatry : the journal of the Association of European Psychiatrists	2021		1	e35
Loebel 2013	Calisti F // Cattaneo A // Calabrese M // Mao Y // Tocco M // Pikalov A // Goldman R	Efficacy and safety of lurasidone in schizophrenia: pooled analysis of European results from double-blind, placebo-controlled 6-week studies		International Clinical Psychopharmacology	2022	37	5	215-222
Loebel 2013	Calisti F // Costamagna I // Hsu J // Tocco M // Pikalov A // Goldman R	Efficacy and safety of lurasidone in adolescents and young adults with schizophrenia: pooled analysis of double-blind, placebo-controlled 6-week studies		European psychiatry	2021	64		S166
Loebel 2013	Calisti F // Tocco M // Mao Y // Pikalov A // Goldman R	Long-Term Safety and Effectiveness of Lurasidone in Adolescents and Young Adults With Schizophrenia: Pooled Posthoc Analyses of Two 12-month Extension Studies		CNS Spectrums	2023	28		248-249
Loza 2006	Loza, B.; Czernikiewicz, A.; Roszkowska, A.; Szulc, A.	Atypical antipsychotics	the prosocial capacity. double-blind, randomized, prospective study of olanzapine and risperidone treatment of schizophrenia: cognitive, awareness and quality of life report	International Journal of Neuropsychopharmacology	2006	9	Suppl 1	S271
Maat 2014	Maat, A.; Cahn, W.; Gijsman,	Open, randomized trial of the effects of aripiprazole		European Neuropsychopharmacology	2013	23		S202-S203

	H. J.; Hovens, J. E.; Kahn, R. S.; Aleman, A.	versus risperidone on social cognition in schizophrenia						
Maat 2014	Maat, A.; Cahn, W.; Gijsman, H. J.; Hovens, J. E.; Kahn, R. S.; Aleman, A.	Open, randomized trial of the effects of aripiprazole versus risperidone on social cognition in schizophrenia		European Neuropsychopharmacology	2014	24	4	575–584
Marder 2003	Green, M. F.; Marder, S. R.; Glynn, S. M.; McGurk, S. R.; Wirshing, W. C.; Wirshing, D. A.; Liberman, R. P.; Mintz, J.	The neurocognitive effects of low-dose haloperidol	a two-year comparison with risperidone	Biological Psychiatry	2002	51	12	972–978
Marder 2003	Marder, S. R.; Glynn, S. M.; Wirshing, W. C.; Wirshing, D. A.; Ross, D.; Widmark, C. M. J.; Liberman, R. P.; Blair, K. E.	Maintenance treatment of schizophrenia with risperidone or haloperidol	2-year outcomes	American Journal of Psychiatry	2003	160	8	1405–1412
Marder 2003	Marder, S. R.; Meibach, R. C.	Risperidone in the treatment of schizophrenia		American Journal of Psychiatry	1994	151	6	825–835
Marder 2003	Marder, S. R.; Wirshing, W. C.; Glynn, S.; Wirshing, D. A.; Mintz, J.; Liberman, R. P.	Risperidone and haloperidol in maintenance treatment	interactions with psychosocial treatments	Schizophrenia Research	1999	36	1-3	288
Marder 2003	Marder, S. R.; Wirshing, W. C.; Glynn, S. M.; Wirshing, D. A.; Mintz, J.; Liberman, R. P.	Subjective responses to risperidone and haloperidol during long-term maintenance therapy		Schizophrenia Research	2001	49	1-2	237
Marder 2003	Marder, S. R.; Wirshing, W. C.; Glynn, S. M.; Wirshing, D. A.; Mintz, J.; Libermann, R. P.	Risperidone and haloperidol in patients receiving two forms of behavioral skills training		Proceedings of the 38th Annual Meeting of the American College of Neuropsychopharmacology; 1999 Dec 12-16; Acapulco, Mexico	1999			
May 1968	Tuma, A. H.; May, P.	Therapist characteristics and the		Archives of General Psychiatry	1978	35	1	81–85

	R.; Yale, C.; Forsythe, A. B.	outcome of treatment in schizophrenia						
May 1968	Tuma, A. H.; May, P. R.; Yale, C.; Forsythe, A. B.	Therapist experience, general clinical ability, and treatment outcome in schizophrenia		Journal of Consulting and Clinical Psychology	1978	46	5	1120–1126
May 1968	Tuma, A. H.; May, P. R. A.	Psychotherapy, drugs and therapist experience in the treatment of schizophrenia	a critique of the Michigan State Project	Psychotherapy: Theory, Research and Practice	1975	12	2	138–142
May 1968	Wyatt, R. J.	Early intervention in schizophrenia improves the long-term course of the illness		Schizophrenia Research	1995	15	1-2	170
May 1968	Wyatt, R. J.; Green, M. F.; Tuma, A. H.	Long-term morbidity associated with delayed treatment of first admission schizophrenic patients	a re-analysis of the Camarillo State Hospital data	Psychological Medicine	1997	27		261–268
May 1968	May, P. R.; Tuma, A. H.	The Paul H. Hoch Award Lecture	a followup study of the results of treatment of schizophrenia	Proceedings of the Annual Meeting of the American Psychopathological Association; 1976	1976			256–284
May 1968	May, P. R.; Tuma, A. H.; Dixon, W. J.	Schizophrenia - a follow-up study of results of treatment. I. Design and other problems		Archives of General Psychiatry	1976	33	4	474–478
May 1968	May, P. R.; Tuma, A. H.; Dixon, W. J.; Yale, C.; Thiele, D. A.; Kraude, W. H.	Schizophrenia. A follow-up study of the results of five forms of treatment		Archives of General Psychiatry	1981	38	7	776–784
May 1968	May, P. R.; Tuma, A. H.; Yale, C.; Potepan, P.; Dixon, W. J.	Schizophrenia - a follow-up study of results of treatment. II. Hospital stay over two to five years		Archives of General Psychiatry	1976	33	4	481–486
May 1968	May, P. R. A.	Design and procedures of the schizophrenia research project		Treatment of Schizophrenia: a Comparative Study of Five Treatment Methods	1968			56–105
May 1968	May, P. R. A.	Schizophrenia follow up	a controlled treatment study	Unknown Source	1974	10		55
May 1968	May, P. R. A.	Psychotherapy and ataraxic drugs in schizophrenia		Proceedings of the 131st Annual Meeting of the American Psychiatric Association; 1978 May 8-12; Atlanta, Georgia, USA	1978			
May 1968	May, P. R. A.; Tuma, A. H.	Treatment of schizophrenia	an experimental study of five treatment methods	British Journal of Psychiatry	1965	111		503–510
May 1968	McKeever, W. F.; May, P. R.; Tuma, A. H.	Prognosis in schizophrenia	prediction of length of hospitalization from psychological test variables	Journal of Clinical Psychology	1965	21		214–221
McCreadie 1989	Scottish, Schizophrenia Research Group	The Scottish First Episode Schizophrenia Study. II. Treatment	pimozide versus flupenthixol	British Journal of Psychiatry	1987	150		334–338

McCreadie 1989	Scottish, Schizophrenia Research Group	The Scottish First Episode Schizophrenia Study V. One-year follow-up. The Scottish Schizophrenia Research Group		British Journal of Psychiatry	1988	152		470–476
McCreadie 1989	Scottish, Schizophrenia Research Group	The Scottish first episode schizophrenia study. VIII. Five-year follow-up	clinical and psychosocial findings. The Scottish Schizophrenia Research Group	British Journal of Psychiatry	1992	161		496–500
McCreadie 1989	The, Scottish Schizophrenia Research Group	The Scottish First Episode Schizophrenia Study. III. Cognitive performance		British Journal of Psychiatry	1987	150		338–340
McCreadie 1989	McCreadie, R. G.; Wiles, D.; Grant, S.; Crockett, G. T.; Mahmood, Z.; Livingston, M. G.; Watt, J. A. G.; Greene, J. G.; Kershaw, P. W.; Todd, N. A.; Scott, A. M.; Loudon, J.; Dyer, J. A. T.; Philip, A. E.; Batchelor, D.	The Scottish first episode schizophrenia study. VII. Two-year follow-up. Scottish Schizophrenia Research Group		Acta Psychiatrica Scandinavica	1989	80	6	597–602
McEvoy 2007a	Nct	Efficacy and tolerability of olanzapine, quetiapine and risperidone in the treatment of first episode psychosis	a randomized double blind 52-week comparison	https://ClinicalTrials.gov/	2002			
McEvoy 2007a	Patel, J. K.; Buckley, P. F.; Hamer, R. M.; Woolson, S.; McEvoy, J. P.; Perkins, D.; Lieberman, J. A.	Changes in metabolic parameters in first episode schizophrenia following treatment with atypical antipsychotics for 52 weeks	subset analysis from the CAFE study	Schizophrenia Bulletin	2007	33	2	504–505
McEvoy 2007a	Patel, J. K.; Buckley, P. F.; Woolson, S.; Hamer, R. M.; McEvoy, J. P.; Perkins, D. O.; Lieberman, J. A.; Investigators, C.	Metabolic profiles of second-generation antipsychotics in early psychosis	findings from the CAFE study	Schizophrenia Research	2009	111	1-3	9–16
McEvoy 2007a	Perkins, D. O.; Gu, H.; Weiden, P. J.; McEvoy, J. P.; Hamer, R. M.; Lieberman, J. A.	Predictors of treatment discontinuation and medication nonadherence in patients recovering from a first episode of schizophrenia, schizo-	a randomized, double-blind, flexible-dose, multicenter study	Journal of Clinical Psychiatry	2008	69	1	106–113

		phreniform disorder, or schizoaffective disorder						
McEvoy 2007a	Carpenter, W. T.; Conley, R. R.	Challenge to atypical antipsychotic drug effect on cognition		American Journal of Psychiatry	2007	164	12	1910–1911
McEvoy 2007a	Keefe, R.; Gu, H.; Sweeney, J.; Perkins, D.; McEvoy, J.; Hamer, R.; Lieberman, J.	A comparison of the effects of olanzapine, quetiapine and risperidone on neurocognitive function in first-episode psychosis		Proceedings of the 44th Annual Meeting of the American College of Neuro-Psychopharmacology; 2005 Dec 11-15; Waikoloa, Hawaii	2005			
McEvoy 2007a	Keefe, R.; Gu, H. B.; Sweeney, J.; Perkins, D.; McEvoy, J.; Hamer, R.; Lieberman, J.	A comparison of the effects of olanzapine, quetiapine, and risperidone on neurocognitive function in first-episode psychosis		Neuropsychopharmacology	2005	30	Suppl 1	S192
McEvoy 2007a	Keefe, R. S.; Sweeney, J. A.; Gu, H.; Hamer, R. M.; Perkins, D. O.; McEvoy, J. P. Lieberman J. A.	Effects of olanzapine, quetiapine, and risperidone on neurocognitive function in early psychosis	a randomized, double-blind 52-week comparison	American Journal of Psychiatry	2007	164	7	1061–1071
McEvoy 2007a	Keefe, R. S. E.; Gu, H.; Perkins, D.; Hamer, R. M.; Lieberman, J. A.	The effects of olanzapine, quetiapine, and risperidone on neurocognitive function in first-episode psychosis	a double-blind, 52-week comparison	Proceedings of the 13th Biennial Winter Workshop on Schizophrenia Research; 2006 Feb 4-10; Davos, Switzerland	2006			54-
McEvoy 2007a	Keefe, R. S. E.; Gu, H.; Sweeney, J. A.; Perkins, D. O.; McEvoy, J. P.; Hamer, R. M.; Lieberman, J. A.	The effects of olanzapine, quetiapine and risperidone on neurocognitive function in first-episode psychosis	a double-blind 52-week comparison	Proceedings of the 159th Annual Meeting of the American Psychiatric Association; 2006 May 20-25; Toronto, Canada	2006			
McEvoy 2007a	Keefe, R. S. E.; Gu, H.; Sweeney, J. A.; Perkins, D. O.; McEvoy, J. P.; Hamer, R. M.; Lieberman, J. A.	The effects of olanzapine, quetiapine, and risperidone on neurocognitive function in first-episode psychosis	a double-blind, 52-week comparison	Proceedings of the 11th International Congress on Schizophrenia Research; 2007 Mar 28-Apr 1; Colorado Springs, Colorado, USA	2007			
McEvoy 2007a	Keefe, R. S. E.; McEvoy, J. P.; Sweeney, J.; Gu, H.; Perkins, D. O.; Hamer, R. M.; Lieberman, J. A.	The effects of olanzapine, quetiapine, and risperidone on neurocognitive function in first-episode psychosis	a double-blind, 52-week comparison	Proceedings of the 13th Biennial Winter Workshop on Schizophrenia Research; 2006 Feb 4-10; Davos, Switzerland	2006			

McEvoy 2007a	Lazarus, A.; Sweitzer, D.; McEvoy, J. P.	Olanzapine, quetiapine, and risperidone in first-episode schizophrenia	subset analysis from the CAFÉ study	Proceedings of the 11th International Congress on Schizophrenia Research; 2007 Mar 28-Apr 1; Colorado Springs, Colorado, USA	2007			
McEvoy 2007a	Lieberman, J.; McEvoy, J. P.; Perkins, D.; Hamer, R. H.	Comparison of atypicals in first-episode psychosis	a randomized, 52-week comparison of olanzapine, quetiapine, and risperidone	European Neuropsychopharmacology	2005	15	Suppl 3	S525
McEvoy 2007a	Lieberman, J. A.; Tollefson, G.; Tohen, M.; Green, A. I.; Gur, R. E.; Kahn, R.; McEvoy, J.; Perkins, D.; Sharma, T.; Zipursky, R.; Wei, H.; Hamer, R. M.	American Journal of Psychiatry	correction	American Journal of Psychiatry	2003	160	10	1901
McEvoy 2007a	McEvoy, J.; Lieberman, J.; Perkins, D.; Gu, H.; Hamer, R.	Comparison of olanzapine, quetiapine, and risperidone in first-episode psychosis	a randomized, 52-week trial	Proceedings of the 44th Annual Meeting of the American College of Neuro-Psychopharmacology; 2005 Dec 11-15; Waikoloa, Hawaii	2005			
McEvoy 2007a	McEvoy, J. P.	Efficacy and tolerability of olanzapine, quetiapine and risperidone in the treatment of first-episode psychosis a randomized double-blind 52-week comparison		Proceedings of the 159th Annual Meeting of the American Psychiatric Association; 2006 May 20-25; Toronto, Canada	2006			
McEvoy 2007a	McEvoy, J. P.; Lieberman, J. A.; Perkins, D.; Hamer, R. M.	Comparison of atypicals in first-episode psychosis (CAFE)	a randomized, 52-week comparison of olanzapine, quetiapine, and risperidone	Neuropsychopharmacology	2005	30	Suppl 1	S201
McEvoy 2007a	McEvoy, J. P.; Lieberman, J. A.; Perkins, D.; Hamer, R. M.	Comparison of olanzapine, quetiapine, and risperidone in first-episode psychosis	A randomized 52-week trial	Proceedings of the 13th Biennial Winter Workshop on Schizophrenia Research; 2006 Feb 4-10; Davos, Switzerland	2006			22
McEvoy 2007a	McEvoy, J. P.; Lieberman, J. A.; Perkins, D. O.; Hamer, R. M.; Gu, H.; Lazarus, A.; Sweitzer, D.; Olexy, C.; Weiden, P.; Strakowski, S. D.	Efficacy and tolerability of olanzapine, quetiapine, and risperidone in the treatment of early psychosis	a randomized, double-blind 52-week comparison	American Journal of Psychiatry	2007	164	7	1050–1060
McEvoy 2007a	McEvoy, J. P.; Perkins, D. O.; Gu, H.; Hamer,	Clinical effectiveness and predictors of treatment non-adherence	comparison of olanzapine, quetiapine, and risperidone in first-episode psychosis	Schizophrenia Research	2006	86	Suppl 1	S130

	R. M.; Lieberman, J. A.							
McEvoy 2007a	McEvoy, J. P.; Perkins, D. O.; Gu, H.; Hamer, R. M.; Lieberman, J. A.	Olanzapine, quetiapine, and risperidone in the treatment of first-episode psychosis	effectiveness and factors influencing adherence to treatment	European Neuropsychopharmacology	2006	16	Suppl 4	S425
McEvoy 2014	Nct	A comparison of long-acting injectable medications for schizophrenia (ACLAIMS)		https://ClinicalTrials.gov/	2010			
McEvoy 2014	Ostuzzi, G.; Barbui, C.	Comparative effectiveness of long-acting antipsychotics	issues and challenges from a pragmatic randomised study	Epidemiology and Psychiatric Sciences	2016	25	1	21–23
McEvoy 2014	Rosenheck, R. A.; Leslie, D. L.; Sint, K. J.; Lin, H.; Li, Y.; McEvoy, J. P.; Byerly, M. J.; Hamer, R. M.; Swartz, M. S.; Stroup, T. S.	Cost-Effectiveness of Long-Acting Injectable Paliperidone Palmitate Versus Haloperidol Decanoate in Maintenance Treatment of Schizophrenia		Psychiatric Services	2016	67	10	1124–1130
McEvoy 2014	Stroup, T. S.; Bareis, N. A.; Rosenheck, R. A.; Swartz, M. S.; McEvoy, J. P.	Heterogeneity of Treatment Effects of Long-Acting Injectable Antipsychotic Medications		Journal of Clinical Psychiatry	2018	80	1	18m12109
McEvoy 2014	Byerly, M.; Nakonezny, P.; Stroup, T. S.; McEvoy, J.; Hamer, R.; Swartz, M.; Rosenheck, R.	A single assessment with the brief adherence rating scale (BARS) discriminates responders to long-acting injectable antipsychotic treatment in patients with schizophrenia		Neuropsychopharmacology	2014	39		S381-S382
McEvoy 2014	McEvoy, J. P.; Byerly, M.; Hamer, R. M.; Dominik, R.; Swartz, M. S.; Rosenheck, R. A.; Ray, N.; Lamberti, J. S.; Buckley, P. F.; Wilkins, T. M.; Stroup, T. S.	Effectiveness of paliperidone palmitate vs haloperidol decanoate for maintenance treatment of schizophrenia	a randomized clinical trial	Jama	2014	311	19	1978–1987
McEvoy 2014	McEvoy, J. P.; Byerly, M.; Hamer, R. M.; Stroup, S.; Dominik, R.	A comparison of long-acting injected medications for schizophrenia		Schizophrenia Research	2014	153	Suppl. 1	S346

McGurk 2005	Schooler, N. R.; Marder, S. R.; Chengappa, K. N.; Petrides, G.; Ames, D.; Wirshing, W. C.; McMeniman, M.; Baker, R. W.; Parepally, H.; Umbricht, D.; Kane, J. M.	Clozapine and risperidone in moderately refractory schizophrenia	a 6-month randomized double-blind comparison	Journal of Clinical Psychiatry	2016	77		628–634
McGurk 2005	Bellack, A. S.; Schooler, N. R.; Kane, J. M.; Marder, S. R.	The impact of clozapine psychosocial competence		Schizophrenia Research	1995	15	1-2	143
McGurk 2005	McGurk, S. R.; Carter, C.; Goldman, R.; Green, M. F.; Marder, S. R.; Xie, H.; Schooler, N. R.; Kane, J. M.	The effects of clozapine and risperidone on spatial working memory in schizophrenia		American Journal of Psychiatry	2005	162	5	1013–1016
Meltzer 2008	Meltzer, H. Y.; Bobo, W. V.; Roy, A.; Jayathilake, K.; Chen, Y.; Ertugrul, A.; Yagcioglu, A. E. A.; Small, J. G.	A randomized, double-blind comparison of clozapine and high-dose olanzapine in treatment-resistant patients with schizophrenia		Journal of Clinical Psychiatry	2008	69	2	274–285
Meltzer 2008	Nct	Olanzapine versus clozapine in treatment refractory schizophrenia		https://ClinicalTrials.gov/	2005			
Meltzer 2008	Jayathilake, K.; Meltzer, D. O.; Small, J.; Meltzer, H. Y.	Comparison of clozapine and high dose olanzapine in treatment resistant schizophrenia in a double blind, randomized, 6 month clinical trial		Neuropsychopharmacology	2005	30	Suppl 1	S202
Meyer-Lindenberg 1997	Meyer-Lindenberg, A.; Gruppe, H.; Bauer, U.; Lis, S.; Krieger, S.; Gallhofer, B.	Improvement of cognitive function in schizophrenic patients receiving clozapine or zotepine	results from a double-blind study	PharmacoPsychiatry	1997	30	2	35–42
Meyer-Lindenberg 1997	Gallhofer, B.; Gruppe, H.; Bauer, U.	Zotepine versus clozapine	a comparison of the impact on the cognitive dysfunction syndrome in schizophrenia (a double blind trial)	PharmacoPsychiatry	1995	28		179
Möller 2008	Moller, H. J.; Riedel, M.; Jager, M.; Wickelmaier, F.;	Short-term treatment with risperidone or haloperi-	8-week results of a randomized controlled trial within the German Research Network on Schizophrenia	International Journal of Neuropsychopharmacology	2008	11	7	985–997

	Maier, W.; Kuhn, K. U.; Buchkremer, G.; Heuser, I.; Klosterkotter, J.; Gastpar, M.; Braus, D. F.; Schlosser, R.; Schneider, F.; Ohmann, C.; Riesbeck, M.; Gaebel, W.	dol in first-episode schizophrenia						
Möller 2008	Nct	Optimization of acute treatment in first episode schizophrenic patients by new pharmacological treatments		https://ClinicalTrials.gov/	2005			
Möller 2008	Riedel, M.; Mayr, A.; Seemller, F.; Maier, W.; Klingberg, S.; Heuser, I.; Klosterkotter, J.; Gastpar, M.; Schmitt, A.; Sauer, H.; Schneider, F.; Gaebel, W.; Jger, M.; Moller, H. J.; Schennach-Wolff, R.	Depressive symptoms and their association with acute treatment outcome in first-episode schizophrenia patients	Comparing treatment with risperidone and haloperidol	World Journal of Biological Psychiatry	2012	13	1	30–38
Möller 2008	Schuhmacher, A.; Mossner, R.; Quednow, B. B.; Kuhn, K. U.; Wagner, M.; Cvetanovska, G.; Rujescu, D.; Zill, P.; Moller, H. J.; Rietschel, M.; Franke, P.; Wolwer, W.; Gaebel, W.; Maier, W.	Influence of 5-HT3 receptor subunit genes HTR3A, HTR3B, HTR3C, HTR3D and HTR3E on treatment response to antipsychotics in schizophrenia		Pharmacogenetics and Genomics	2009	19	11	843–851
Möller 2008	Seemuller, F.; Schennach, R.; Mayr, A.; Musil, R.; Jager, M.; Maier, W.; Klingenberg, S.; Heuser, I.; Klosterkotter, J.; Gastpar, M.; Schmitt, A.; Schlosser,	Akathisia and suicidal ideation in first-episode schizophrenia		Journal of Clinical Psychopharmacology	2012	32	5	694–698

	R.; Schneider, F.; Ohmann, C.; Lewitzka, U.; Gaebel, W.; Moller, H. J.; Riedel, M.							
Möller 2008	Wölwer, W.; Brinkmeyer, J.; Riesbeck, M.; Freimüller, L.; Klimke, A.; Wagner, M.; Möller, H. J.; Klingberg, S.; Gaebel, W.	Neuropsychological impairments predict the clinical course in schizophrenia		European Archives of Psychiatry and Clinical Neuroscience	2008	258	Suppl 5	28–34
Möller 2008	Gaebel, W.; Hans-juergen, M.	Treatment strategies in first episode schizophrenia		Proceedings of the 12th World Congress of Psychiatry; 2002 Aug 24-29; Yokohama, Japan	2002			
Möller 2008	Gaebel, W.; Moeller, H. J.	Measures to prevent relapse in long-term treatment	results from the German Research Network on Schizophrenia	Proceedings of the 159th Annual Meeting of the American Psychiatric Association; 2006 May 20-25; Toronto, Canada	2006			
Möller 2008	Gaebel, W.; Moller, H. J.; Buchkremer, G.; Ohmann, C.; Riesbeck, M.; Wolwer, W. V. W. M.; Bottlender, R.; Klingberg, S.	Pharmacological long-term treatment strategies in first episode schizophrenia--study design and preliminary results of an ongoing RCT within the German Research Network on Schizophrenia		European Archives of Psychiatry and Clinical Neuroscience	2004	254	2	129–140
Möller 2008	Gaebel, W.; Riesbeck, M.; von, Wilmsdorff M.; Zielasek, J.	Pharmacological long - term treatment strategies in first episode schizophrenia	preliminary results of an ongoing randomised clinical trial within the German research network on schizophrenia	Schizophrenia Bulletin	2005	31		483
Möller 2008	Gaebel, W.; Riesbeck, M.; Wolwer, W.; Klimke, A.; Eickhoff, M.; von, Wilmsdorff M.; Heuser, I.; Maier, W.; Klosterkotter, J.; Falkai, P.; Schlosser, R.; Schmitt, A.; Riedel, M.; Klingberg, S.; Kopcke, W.; Ohmann, C.; Moller, H. J.	Rates and predictors of remission in first-episode schizophrenia within 1 year of antipsychotic maintenance treatment. Results of a randomized controlled trial within the German Research Network on Schizophrenia		Schizophrenia Research	2014	152	2-3	478–486
Möller 2008	Jager, M.; Riedel, M.; Bottlender, R.; von,	Pharmacological acute treatment in first episode		Nervenheilkunde	2006	25	1-2	32–36

	Wilmsdorff M.; Wolwer, W.; Gaebel, W.; Moller, H. J.; Maier, W.	schizophrenic disorders						
Mortimer 2004_cognition	Mortimer, A.	A six month international controlled trial of the therapeutic activity of amisulpride 200 to 800mg/day versus olanzapine 5 to 20 mg/day in patients with schizophrenic disorders' (The solianol study)		National Research Register	2002	1		
Mortimer 2004_cognition	Mortimer, A.; Martin, S.; Loo, H.; Peuskens, J.; Solianol, Sudy Group	A double-blind, randomized comparative trial of amisulpride versus olanzapine for 6 months in the treatment of schizophrenia		International Clinical Psychopharmacology	2004	19	2	63–69
Mortimer 2004_cognition	Mortimer, A.; Rein, W.; Fleurot, O.	A six-month, double-blind, controlled trial in schizophrenic patients comparing amisulpride and olanzapine		European Neuropsychopharmacology	2003	13	4	S334
Mortimer 2004_cognition	Mortimer, A. M.; Joyce, E.; Balasubramaniam, K.; Choudhary, P. C.; Saleem, P. T.	Treatment with amisulpride and olanzapine improve neuropsychological function in schizophrenia		Human Psychopharmacology	2007	22	7	445–454
Mortimer 2004_cognition	Peuskens, J.	Less weight gain with amisulpride	results from double-blind studies vs. risperidone and olanzapine	Proceedings of the 16th European College of Neuropsychopharmacology Congress; 2003 Sep 20-24; Prague, Czech Republic	2003			
Mortimer 2004_cognition	Peuskens, J.; De, Hert M.; Mortimer, A.; Solianol, Study Group	Metabolic control in patients with schizophrenia treated with amisulpride or olanzapine		International Clinical Psychopharmacology	2007	22	3	145–152
Mortimer 2004_cognition	Singh, V.	A six month international controlled trial of the therapeutic activity of amisulpride 200 to 800 mg/day verses olanzapine 5 to 20 mg/day in patients with schizophrenic disorders		National Research Register	2001	1		
Mortimer 2004_cognition	Fleurot, O.; Martins, S.; Loo, H.; Peuskens, J.; Rein, W.	Amisulpride vs olanzapine in schizophrenia. Preliminary results on short-term analysis		European Psychiatry	2002	17	Suppl 1	107s

Mortimer 2004_cognition	Fleurot, O.; Martins, S.; Loo, H.; Peuskens, J.; Rein, W.	Amisulpride vs. olanzapine in schizophrenia		Proceedings of the 12th World Congress of Psychiatry; 2002 Aug 24-29; Yokohama, Japan	2002			
Mortimer 2004_cognition	Joyce, E.; Rein, W.; Fleurot, O.	Effect of amisulpride and olanzapine on neuropsychological performance in schizophrenic patients	a sub-analysis of a double-blind, randomized clinical trial	International Journal of Neuropsychopharmacology	2004	7	Suppl 2	S244
Mortimer 2004_cognition	Lecrubier, Y.; Rein, W.; Ponsard, C.	A double-blind, randomized clinical trial of amisulpride and olanzapine in acute schizophrenia	patient responder profile	International Journal of Neuropsychopharmacology	2004	7	Suppl 2	S409-S10
Mortimer 2004_cognition	Martin, S.; Loo, H.; Peuskens, J.; Thirumalai, S.; Giudicelli, A.; Fleurot, O.; Rein, W.; Solianol, Study Group	A double-blind, randomised, comparative trial of amisulpride versus olanzapine in the treatment of schizophrenia	short-term results at two months	Current Medical Research and Opinion	2002	18	6	355–362
Mortimer 2004_cognition	Martin, S. D.; Loo, H.; Peuskens, J.; Rein, W.; Fleurot, O.	A six-month, double-blind, controlled trial in schizophrenic patients comparing amisulpride and olanzapine. Preliminary results on short-term analysis		International Journal of Neuropsychopharmacology	2002	5	Suppl 1	S119
Mortimer 2004_cognition	Martins, S.; Loo, H.; Peuskens, J.; Rein, W.; Fleurot, O.	A six-month, double-blind, controlled trial in schizophrenic patients comparing amisulpride and olanzapine. Preliminary results on short-term analysis		European Neuropsychopharmacology	2002	12	Suppl 3	S329
Naber 2005_cognition	Naber, D.	Subjective effects of antipsychotic treatment [editorial]		Acta Psychiatrica Scandinavica	2005	111	2	81–83
Naber 2005_cognition	Naber, D.; Bandelow, B.; Bender, S.; Klimke, A.; Kuhn, K.; Lambert, M.; Lemmer, W.; Dittmann, M.; Riedel, E. R.	Subjective well-being under neuroleptic treatment with olanzapine versus clozapine	first results from a double-blind clinical trial using the swn self-rating scale	Schizophrenia Research	2001	49	1-2	240
Naber 2005_cognition	Naber, D.; Degner, D.; Bender, S.; Klimke, A.; Kuhn, K. U.; Lambert, M.; Lemmer, W.; Riedel, M.; Vorbach, E. U.;	Olanzapine vs. clozapine	findings on subjective well-being from a double-blind clinical trial	Schizophrenia Research	2002	53	3 Suppl 1	176

	Dittmann, R. W.							
Naber 2005_cognition	Naber, D.; Riedel, M.; Klimke, A.; Vorbach, E. U.; Lambert, M.; Kühn, K. U.; Bender, S.; Bandelow, B.; Lemmer, W.; Moritz, S.; Dittmann, R. W.	Randomized double blind comparison of olanzapine vs clozapine on subjective well-being and clinical outcome in patients with schizophrenia		Acta Psychiatrica Scandinavica	2005	111	2	106–115
Naber 2005_cognition	Bender, S.; Balcar, A. Dittmann; Schall, U.; Klimke, A.; Riedel, M.; Vorbach, U.; Kuehn, K. U.; Lambert, M.; Dittmann, R. W.; Naber, D.	Effects of olanzapine versus clozapine on executive functions in schizophrenia		Schizophrenia Research	2002	53	3 Suppl 1	194
Naber 2005_cognition	Bender, S.; Dittmann-Balcar, A.; Schall, U.; Wolstein, J.; Klimke, A.; Riedel, M.; Vorbach, E. U.; Kuhn, K. U.; Lambert, M.; Dittmann, R. W.; Naber, D.	Influence of atypical neuroleptics on executive functioning in patients with schizophrenia	a randomized, double-blind comparison of olanzapine vs clozapine	International Journal of Neuropsychopharmacology	2006	9	2	135–145
Naber 2005_cognition	Collie, A.; Maruff, P.; Snyder, P. J.	Does atypical antipsychotic medication improve executive function in schizophrenia?		International Journal of Neuropsychopharmacology	2006	9	5	629–630
Naber 2005_cognition	Dittmann-Balcar, A.; Bender, S.; Schall, U.; Klimke, A.; Mueller, N.; Vorbach, U.; Kuehn, K. U.; Dittmann, R. W.; Naber, D.	Effects of olanzapine versus clozapine on executive functions in schizophrenia		Schizophrenia Research	2003	60		131
NCT00049946	Nct	A multicenter, double-blind, double-dummy, placebo-controlled, randomized, parallel group evaluation of the efficacy and safety of a fixed-dose of talnetant versus placebo versus		https://ClinicalTrials.gov/	2002			

		risperidone in subjects with schizophrenia						
NCT00103727	Nct	A multicenter, double-blind, double-dummy, placebo-controlled, randomized, parallel group evaluation of the efficacy and safety of a fixed-dose of talnetant versus placebo versus risperidone in subjects with schizophrenia		https://ClinicalTrials.gov/	2005			
NCT00103727	Nct	A multicenter, double-blind, double-dummy, placebo-controlled, randomized, parallel group evaluation of the efficacy and safety of a fixed-dose of talnetant versus placebo versus risperidone in subjects with schizophrenia		https://ClinicalTrials.gov/	2006			
NCT00169091	Nct	Clozapine or haloperidol in first episode schizophrenia		https://ClinicalTrials.gov/	2005			
NCT00480844_24w	Nct	Comparison of cognitive functions of schizophrenic patients treated with sertindole versus risperidone		https://ClinicalTrials.gov/	2007			
NCT00645515	Nct	A study comparing the safety and efficacy of ziprasidone and risperidone for the treatment of chronic schizophrenia		https://ClinicalTrials.gov/	2008			
NCT00712270	Nct	Best event schizophrenia trial--a randomized double-blind trial of aripiprazole and risperidone in schizophrenia		https://ClinicalTrials.gov/	2008			
NCT00712270	Lehrer, D.; Christian, B.; Entis, J.; Shi, B.; Kirbas, C.; Chiang, M.; Sidhu, S.; Short, H.; Buchsbaum, M.; Chu, K. W.	Relation of 18F-fallypride binding potential and antipsychotic treatment response in patients with schizophrenia		Biological Psychiatry	2009			294
Nct00761670	Nct	Efficacy study on cognitive functions in schizophrenic patients		https://ClinicalTrials.gov/	2008			
Nct00827840	Nct	Paliperidone extended-release (ER) versus risperidone for neurocognitive		https://ClinicalTrials.gov/	2009			

		function in patients with schizophrenia						
Nct00827840	Kim, S. W.; Chung, Y. C.; Lee, Y. H.; Lee, J. H.; Kim, S. Y.; Bae, K. Y.; Kim, J. M.; Shin, I. S.; Yoon, J. S.	Paliperidone er versus risperidone for neurocognitive function in patients with schizophrenia	A randomized, open-label, controlled trial	International Clinical Psychopharmacology	2012	27	5	267–274
NCT01057849_cognition	Nct	Standard comprehensive intervention to treat first-episode schizophrenia		https://ClinicalTrials.gov/	2010			
NCT01057849_cognition	Yuan, Y.; Yang, F.; Lu, Z.; Wang, C. Y.; Deng, H.; Zhao, J.; Yu, X.	Effectiveness of three atypical antipsychotic-initiated treatments in chinese first-episode schizophrenia	An open randomized clinical trial	Schizophrenia Research	2014	153	Suppl.1	S218
NCT01057849_cognition	Cheng, Z.; Yuan, Y.; Han, X.; Yang, L.; Cai, S.; Yang, F.; Lu, Z.; Wang, C.; Deng, H.; Zhao, J.; Xiang, Y.; Correll, C. U.; Yu, X.	An open-label randomised comparison of aripiprazole, olanzapine and risperidone for the acute treatment of first-episode schizophrenia	Eight-week outcomes	Journal of psychopharmacology (Oxford, England)	2019	33	10	1227–1236
NCT01057849_cognition	Cheng, Z.; Yuan, Y.; Han, X.; Yang, L.; Zeng, X.; Yang, F.; Lu, Z.; Wang, C.; Deng, H.; Zhao, J.; Xiang, Y. T.; Correll, C. U.; Yu, X.	Rates and predictors of one-year antipsychotic treatment discontinuation in first-episode schizophrenia	Results from an open-label, randomized, "real world" clinical trial	Psychiatry Research	2019	273		631–640
NCT01057849_cognition	Han, X.; Yuan, Y. B.; Yu, X.; Zhao, J. P.; Wang, C. Y.; Lu, Z.; Yang, F. D.; Dong, H.; Wu, Y. F.; Ungvari, G. S.; Xiang, Y. T.; Chiu, H. F.	The chinese first-episode schizophrenia trial	background and study design	East Asian Archives of Psychiatry : Official Journal of the Hong Kong College of Psychiatrists = Dong Ya Jing Shen Ke Xue Zhi : Xianggang Jing Shen Ke Yi Xue Yuan Qi Kan	2014	24	4	169–173
NCT01057849_cognition	Hou, Y.; Xie, J.; Yuan, Y.; Cheng, Z.; Han, X.; Yang, L.; Yu, X.; Shi, C.	Neurocognitive effects of atypical antipsychotics in patients with first-episode schizophrenia		Nordic Journal of Psychiatry	2020		8	594–601
NCT01057849_cognition	Cheng, Z.; Yuan, Y.; Han, X.; Yang, L.;	Which Subgroup of First-Episode Schizophrenia Patients Can Remit		Frontiers in psychiatry Frontiers Research Foundation	2020			566

	Zeng, X.; Yang, F.; Lu, Z.; Wang, C.; Deng, H.; Zhao, J.; Yu, X.	During the First Year of Antipsychotic Treatment?						
NCT01057849_cognition	Pu, C.; Huang, B.; Zhou, T.; Cheng, Z.; Wang, Y.; Shi, C.; Yu, X.	Gender Differences in the First-Year Antipsychotic Treatment for Chinese First-Episode Schizophrenia		Neuropsychiatric Disease & Treatment	2020			3145–3152
NCT01057849_cognition	Chen Y // Cao H // Liu S // Zhang B // Zhao G // Zhang Z // Li S // Li H // Yu X // Deng H	Brain Structure Measurements Predict Individualized Treatment Outcome of 12-Week Antipsychotic Monotherapies in First-episode Schizophrenia		Schizophrenia Bulletin	2023	49	3	697-705
NCT01234454	Nct	Atypical antipsychotic treatment effect on brain function in schizophrenia measured by fmri		https://ClinicalTrials.gov/	2010			
NCT01451736	Nct	Brain myelination effects of paliperidone palmitate versus oral risperidone in first episode schizophrenia		https://ClinicalTrials.gov/	2011			
NCT01451736	Nct	Oral risperidone versus injectable paliperidone palmitate for treating first-episode schizophrenia		https://ClinicalTrials.gov/	2011			
NCT02088060	Nct	A Four-week, Multicentre, Double-blinded, Randomised, Active- and Placebo- Controlled, Parallel-group Trial Investigating Efficacy and Safety of Cannabidiol in Acute, Early-stage Schizophrenic Patients		https://ClinicalTrials.gov/	2014			
NCT02146547	Nct	European Long-acting Antipsychotics in Schizophrenia Trial		https://ClinicalTrials.gov/	2014			
NCT02146547	Teitelbaum, A.; Kodesh, A.	Long-acting injectable antipsychotics in schizophrenia		Harefuah	2019	158	7	453–457
NCT02146547	Euctr	A European study with long-acting antipsychotics for schizophrenic patients		https://ClinicalTrials.gov/	2015			
NCT02146547	Anonymous	Correction to Lancet Psychiatry 2023; 10: 197-208 (The Lancet Psychiatry (2023) 10(3) (197-208), (S2215036623000		Lancet Psychiatry	2023	10		e10

		056), (10.1016/S2215-0366(23)00005-6))						
NCT02146547	Winter I // Davidson M // Fleischhacker W // Kahn R	Effectiveness of oral versus long-acting antipsychotic treatment early-phase schizophrenia patients: an openlabel randomized trial		European psychiatry	2022	65		S130
NCT02146547	Winter-van Rossum I // Weiser M // Galderisi S // Leucht S // Bitter I // Glenthoj B // Hasan A // Luykx J // Kupchik M // Psota G // Rocca P // Stefanis N // Teitelbaum A // Haim MB // Leucht C // Kemmler G // Schurr T // The EU-LAST Study Group Davidson	Efficacy of oral versus long-acting antipsychotic treatment in patients with early-phase schizophrenia in Europe and Israel: a large-scale, open-label, randomised trial (EULAST)		Lancet Psychiatry	2023	10		197-208
Nct02199743	Nct	Lurasidone Effects on Tissue Glutamate in Schizophrenia		https://ClinicalTrials.gov/	2013			
Nielsen 2014	Nct	Exploratory cognition study of sertindole in patients with schizophrenia		https://ClinicalTrials.gov/	2008			
Nielsen 2014	Nct	Comparing the effects of sertindole and olanzapine on cognition (SEROLA)		https://ClinicalTrials.gov/	2009			
Nielsen 2014	Ernst, Nielsen R.; Odur, F.; Ostergaard, T.; Munk-Jorgensen, P.; Nielsen, J.	Comparison of the effects of Sertindole and Olanzapine on Cognition (SEROLA)	a double-blind randomized 12-week study of patients diagnosed with schizophrenia	Therapeutic Advances in Psychopharmacology	2014	4	1	4–14
Oliemeulen 2000	Oliemeulen, E. A. P.; Jogems-Kosterman, B. J. M.; Van, Hoof J. J. M.	Is olanzapine a substitute for clozapine?		Schizophrenia Research	1999	36	1-3	146–147
Oliemeulen 2000	Oliemeulen, E. A. P.; Van, Hoof J. J. M.; Jogem-Kosterman, B. J. M.; Hulsttijn, W.; Tuynman-Qua, H. G.	Is olanzapine a substitute for clozapine?	The effects on psychomotor performance	Schizophrenia Research	2000	41	1	187

Pagsberg 2017	Nct	Tolerance and effect of antipsychotics in children and adolescents with psychosis		https://ClinicalTrials.gov/	2010			
Pagsberg 2017	Pagsberg, A. K.	Quetiapine extended release versus aripiprazole in children and adolescents with psychosis in the randomized, blinded clinical tolerability and efficacy of antipsychotics (TEA) trial		Journal of the American Academy of Child and Adolescent Psychiatry	2016	55	10 Suppl 1	S168
Pagsberg 2017	Pagsberg, A. K.; Fink-Jensen, A.; Rudaa, D.; Jensen, K. G.; Klauber, D. G.; Stentebjerg-Olesen, M.; Gluud, C.; Correl, C. U.; Fagerlund, B.; Jepsen, J. R.; Bilenberg, N.; Jantzen, P.; Saldeen, A. S.; Carlsen, T. S.; Werge, T.; Jeppesen, P.	Recruitment status of the tea trial	Tolerance and effect of antipsychotics in children and adolescents with psychosis. an investigator-initiated, phase iv, randomised double-blind multi-centre trial of the benefits and harms of aripiprazole versus quetiapine in children and adolescentswith	Schizophrenia Research	2012	136		S208
Pagsberg 2017	Pagsberg, A. K.; Jeppesen, P.; Klauber, D. G.; Jensen, K. G.; Ruda, D.; Jepsen, J. R. M.; Fagerlund, B.; Krogmann, A.; Von, Hardenberg L.; Fink-Jensen, A.; Correll, C. U.; Galling, B.	Early non-response to antipsychotic medication in adolescents with first-episode psychosis is a reliable predictor of ultimate non-response and non-remission	Results from the 12-week TEA trial	Early Intervention in Psychiatry	2018	12	Supplement 1	88
Pagsberg 2017	Pagsberg, A. K.; Jeppesen, P.; Klauber, D. G.; Jensen, K. G.; Ruda, D.; Stentebjerg-Olesen, M.; Jantzen, P.; Rasmussen, S.; Saldeen, E. A.; Lauritsen, M. G.; Bilenberg, N.; Stenstrom,	Quetiapine extended release versus aripiprazole in children and adolescents with first-episode psychosis	the multicentre, double-blind, randomised tolerability and efficacy of antipsychotics (TEA) trial	Lancet Psychiatry	2017	4	8	605–618

	A. D.; Nyvang, L.; Madsen, S.; Werge, T. M.; Lange, T.; Gluud, C.; Skoo							
Pagsberg 2017	Pagsberg, A. K.; Jeppesen, P.; Klauber, D. G.; Jensen, K. G.; RudÃ¥, D.; Stentebjerg-Olesen, M.; Jantzen, P.; Rasmussen, S.; Saldeen, E. A.; Lauritsen, M. B.; Bilenberg, N.; StenstrÃ¸m, A. D.; Pedersen, J.; Nyvang, L.; Madsen, S.; Lauritsen, M. B.; Vernal	Quetiapine versus aripiprazole in children and adolescents with psychosis - protocol for the randomised, blinded clinical Tolerability and Efficacy of Antipsychotics (TEA) trial		BMC psychiatry	2014	14	1	199
Pagsberg 2017	Stentebjerg-Olesen, M.; Pagsberg, A. K.; Fink-Jensen, A.; Rudaa, D.; Gjessing-Jensen, K.; Jepsen, J. R.; Fagerlund, B.; Jeppesen, P.	Can early-onset antipsychotic effect predict later clinical effect of antipsychotic medication in children and adolescents		Schizophrenia Bulletin	2011	37		322–323
Pagsberg 2017	Von, Hardenberg L.; Correll, C. U.; Galling, B.; Pagsberg, K.	Early response to antipsychotic medication in adolescents with first-episode psychosis predictor of ultimate response and remission		European Neuropsychopharmacology	2019	29	Suppl. 1	S421-2
Pagsberg 2017	Jensen, K. G.; Correll, C. U.; Ruda, D.; Klauber, D. G.; Decara, M. S.; Fagerlund, B.; Jepsen, J. R. M.; Eriksson, F.; Fink-Jensen, A.; Pagsberg, A. K.	Cardiometabolic Adverse Effects and Its Predictors in Children and Adolescents With First-Episode Psychosis During Treatment With Quetiapine-Extended Release Versus Aripiprazole	12-Week Results From the Tolerance and Effect of Antipsychotics in Children and Adolescents With Psychosis (TEA) Trial	Journal of the American Academy of Child and Adolescent Psychiatry	2019	58	11	1062–1078
Pagsberg 2017	Jensen, K. G.; Correll, C. U.; Ruda, D.; Klauber, D. G.; Stentebjerg-Ole-	Pretreatment Cardiometabolic Status in Youth With Early-Onset Psychosis	Baseline Results From the TEA Trial	Journal of Clinical Psychiatry	2017	78	8	e1035-e104

	sen, M.; Fagerlund, B.; Jepsen, J. R. M.; Fink-Jensen, A.; Pagsberg, A. K.							
Pagsberg 2017	Jensen, K. G.; Correll, C. U.; Rudaa, D.; Klauber, D. G.; Decara, M. S.; Fagerlund, B.; Jepsen, J. R. M.; Eriksson, F.; Fink-Jensen, A.; Pagsberg, A. K.	Cardiometabolic adverse effects and its predictors in children and adolescents with first-episode psychosis during treatment with quetiapine-er versus aripiprazole	12-week results: from the tea trial	Schizophrenia Bulletin	2019	45		S197
Pagsberg 2017	Jensen, K. G.; Gartner, S.; Correll, C. U.; Ruda, D.; Klauber, D. G.; Stentebjerg-Olesen, M.; Fagerlund, B.; Jepsen, J. R.; Fink-Jensen, A.; Juul, K.; Pagsberg, A. K.	Change and dispersion of QT interval during treatment with quetiapine extended release versus aripiprazole in children and adolescents with first-episode psychosis	results from the TEA trial	Psychopharmacology	2018	235	3	681–693
Pagsberg 2017	Karsten, Gj; Correll, Cu; Rudaa, D.; Klauber, Dg; Decara, Ms; Fagerlund, B.; Mollegaard, Jepsen [JR]; Eriksson, F.; Fink-Jensen, A.; Pagsberg, Ak	Cardiometabolic Adverse Effects and Its Predictors in Children and Adolescents with First-Episode Psychosis during Treatment with Quetiapine-Er Versus Aripiprazole: 12-Week Results: From the Tea Trial		Schizophrenia Bulletin	2019		Suppl. 2	S197
Pagsberg 2017	Pagsberg, Ak; Krogmann, A.; Jeppesen, P.; von, Hardenberg L.; Klauber, Dg; Jensen, Kg; Ruda, D.; Decara, Ms; Jepsen, Jrm; Fagerlund, B.; Fink-Jensen, A.; Correll, Cu; Galling, B.	Early Antipsychotic Nonresponse as a Predictor of Nonresponse and Nonremission in Adolescents With Psychosis Treated With Aripiprazole or Quetiapine: Results From the TEA Trial		J Am Acad Child Adolesc Psychiatry	2022	In-Press	10.1016/j.jaac.2021.11.032	InPress
Paredes 1966	Paredes, A.; Baumgold, J.; Pugh, L.	Clinical judgment in the assessment		Journal of Nervous and Mental Disease	1966	142	2	153–160

	A.; Ragland, R.	of psychopharmacological effects						
Pfizer 2005h	Pfizer	Effects of ziprasidone (80 - 160 mg/d) versus olanzapine (10-20 mg/d) on cognitive function in patients with schizophrenia or schizophrenic disorder previously treated with a typical neuroleptic drug (fluphenazine) - multicenter, randomized, double-blind		http://www.Clinicalstudyresults.org/	2005			
Potkin 2007c	Potkin, S.; Fleming, K.; Binneman, B.; Keller, D. S.; Alphs, L.; Panagides, J.	Asenapine improves cognitive function in acute schizophrenia	a placebo- and risperidone- controlled trial	Proceedings of the 160th Annual Meeting of the American Psychiatric Association; 2007 May 19-24; San Diego, CA	2007			
Potkin 2007c	Potkin, S.; Fleming, K.; Binneman, B.; Keller, S.	Asenapine cognitive function effects in acute schizophrenia	a placebo-and risperidone-controlled trial	Schizophrenia Bulletin	2007	33	2	454
Potkin 2007c	Potkin, S. G.; Cohen, M.; Panagides, J.; Jina, A. S.	Asenapine efficacy, safety, and tolerability in the treatment of acute schizophrenia	a randomized, placebo- and risperidone-controlled trial	Biological Psychiatry	2006	59	8 Suppl	154S
Potkin 2007c	Potkin, S. G.; Cohen, M.; Panagides, J.; Jina, A. S.	Asenapine safety and tolerability during acute schizophrenia	a placebo- and risperidone controlled trial	Proceedings of the 159th Annual Meeting of the American Psychiatric Association; 2006 May 20-25; Toronto, Canada	2006			
Potkin 2007c	Potkin, S. G.; Cohen, M.; Jina, A. S.; Nettler, S.; Alphs, L.; Panagides, J.	Asenapine efficacy during acute episodes of schizophrenia	a randomized placebo and risperidone controlled trial	Proceedings of the 44th Annual Meeting of the American College of Neuro-Psychopharmacology; 2005 Dec 11-15; Waikoloa, Hawaii	2005			
Potkin 2007c	Potkin, S. G.; Cohen, M.; Baker, R. A.; Jina, A. S.; Nettler, S.; Alphs, L.; Panagides, J.	Asenapine, a novel psychotherapeutic agent with efficacy in positive and negative symptoms during acute episodes of schizophrenia	a randomized, placebo- and risperidone-controlled trial	Neuropsychopharmacology	2005	30	Suppl 1	S112-3
Potkin 2007c	Potkin, S. G.; Cohen, M.; Jina, A. S.; Nettler, S.; Alphs, L.; Panagides, J.	Asenapine efficacy during acute episodes of schizophrenia	a randomized placebo- and risperidone-controlled trial	Proceedings of the 13th Biennial Winter Workshop on Schizophrenia Research; 2006 Feb 4-10; Davos, Switzerland	2006			
Potkin 2007c	Potkin, S. G.; Cohen, M.; Panagides, J.	Efficacy and tolerability of asenapine in acute schizophrenia	a placebo- and risperidone-controlled trial	Journal of Clinical Psychiatry	2007	68	10	1492–1500
Potkin 2007c	Potkin, S. G.; Cohen, M.; Panagides, J.; Jina, A.	Asenapine safety and tolerability in acute schizophrenia	a placebo- and risperidone-controlled trial	European Neuropsychopharmacology	2006	16	Suppl 4	S401

Potkin 2007c	Potkin, S. G.; Cohen, M.; Panagides, J.; Jina, A. S.	Asenapine efficacy in acute schizophrenia	a randomized, placebo- and risperidone-controlled trial	International Journal of Neuropsychopharmacology	2006	9	Suppl 1	S275
Potkin 2007c	Potkin, S. G.; Kane, J. M.; Emsley, R. A.; Naber, D.; Panagides, J.	Asenapine in schizophrenia	an overview of clinical trials in the Olympia program	Proceedings of the 63rd Annual Scientific Convention and Meeting of the Society of Biological Psychiatry; 2008 May 1-3; Washington, DC	2008			
Potkin 2007c	Castle, D. J.; Jensen, J. K. S.	Management of depressive symptoms in schizophrenia	A pooled, post hoc analysis from the asenapine development program	Clinical Schizophrenia and Related Psychoses	2015	9	1	13–20
Potkin 2007c	Fleming, K.; Potkin, S. G.; Binneman, B.; Keller, D.; Alphs, L.; Panagides, J.	Effects of asenapine on cognitive function in acute schizophrenia	a placebo- and risperidone-controlled trial	European Neuropsychopharmacology	2007	17	Suppl 4	S466
Potkin 2011	Harvey, P. D.; Ogasa, M.; Cucchiaro, J.; Loebel, A.; Keefe, R. S. E.	A double-blind comparison of lurasidone and ziprasidone on cognitive function in outpatients with schizophrenia or schizoaffective disorder		Proceedings of the 162nd Annual Meeting of the American Psychiatric Association; 2009 May 16-21; San Francisco, CA	2009			
Potkin 2011	Harvey, P. D.; Ogasa, M.; Cucchiaro, J.; Loebel, A.; Keefe, R. S. E.	Performance and interview-based assessments of cognitive change in a randomized, double-blind comparison of lurasidone vs. Ziprasidone		Schizophrenia Research	2011	127	1-3	188–194
Potkin 2011	Loebel, A.; Harvey, P.; Ogassa, M.; Cucchiaro, J.; Keefe, R.	A double-blind comparison of the effects of lurasidone and ziprasidone on cognitive function	differential sensitivity of performance-based and interview measures	Proceedings of the American College of Neuropsychopharmacology Annual Meeting; 2008 Oct 1-11; Scottsdale, Arizona	2008			
Preussler 1995	Preussler, B.; Bohle, C.; Jeschke, G.; Volz, H. P.; Sauer, H.	Psychometric performance of clozapine and fluphenazine treated schizophrenics		PharmacoPsychiatry	1995	28		204
Preussler 1995	Preussler, B.; Hubner, G.; Rossger, G.; Jeschke, G.; Lorenz, S.; Volz, H. P.; Sauer, H.	Psychometric performance of chronic schizophrenics treated with a typical neuroleptic (fluphenazine) or an atypical neuroleptic drug (clozapine) - a double-blind controlled clinical trial		PharmacoPsychiatry	1997	30		207
Purdon 2000	Purdon, S. E.; Canadian, Cognition; Outcome, Study Group	Neuropsychological change in early phase schizophrenia over twelve months of treatment with olanzapine, risperidone, or haloperidol		Schizophrenia Research	1998	29	1-2	152–153

Purdon 2000	Purdon, S. E.; Jones, B.; Labelle, A.; Addington, D.; Tollefson, G.; Study, Group	A multicentre comparison of olanzapine, risperidone, and haloperidol on working memory, new learning, and delayed recall of verbal and non-verbal materials in early-phase schizophrenia over a 12-month prospective double-blind clinical trial		Schizophrenia Research	1999	36	1-3	150
Purdon 2000	Purdon, S. E.; Jones, B. D.; Stip, E.; Labelle, A.; Addington, D.; David, S. R.; Breier, A.; Tollefson, G. D.	Neuropsychological change in early phase schizophrenia during 12 months of treatment with olanzapine, risperidone, or haloperidol		Archives of General Psychiatry	2000	57	3	249–258
Purdon 2000	Purdon, S. E.; Jones, B. D. W.; Stip, E.; Labelle, A.; Addington, D.; Breier, A.; Tollefson, G. D.; The, Canadian Collaborative Group for Research on Cognition in Schizophrenia	Olanzapine versus haloperidol versus risperidone in early illness schizophrenia		Data on File	2001			39–45
Purdon 2000	Purdon, S. E.; Woodward, N.; Lindborg, S. R.; Stip, E.	Procedural learning in schizophrenia after 6 months of double-blind treatment with olanzapine, risperidone, and haloperidol		Psychopharmacology	2003	169	3-4	390–397
Purdon 2000	Woodward, N. D.; Purdon, S. E.; David, S. R.; Stip, E.	Procedural learning over six months double blind treatment with haloperidol, risperidone or olanzapine		Schizophrenia Research	2001	49	1-2	125
Purdon 2000	David, S. R.; Purdon, S.; Jones, B. D.; Stip, E.; Labelle, A.; Breier, A. F.; Tollefson, G. D.; Kutcher, S. P.; Maclaren, C.; Hadrava, V.; Thompson, P. M.; Leblanc	Olanzapine versus risperidone versus haloperidol in early illness schizophrenia		Proceedings of the 152nd Annual Meeting of the American Psychiatric Association; 1999 May 15-20; Washington DC, USA	1999			
Purdon 2000	David, S. R.; Rubin,	Modeling schizophrenic behaviour and testing drug		Schizophrenia Research	1999	36	1-3	163–164

	D. B.; Wu, Y.	efficacy using general mixture components on finger tapping data from a tweleve month prospective double-blind clinical trial						
Purdon 2000	David, S. R.; Taylor, C. C.; Kinon, B. J.; Breier, A.	The effects of olanzapine, risperidone, and haloperidol on plasma prolactin levels in patients with schizophrenia		Clinical Therapeutics	2000	22	9	1085–1096
Purdon 2000	Jones, B.	Olanzapine versus risperidone and haloperidol in the treatment of schizophrenia		Proceedings of the 151st Annual Meeting of the American Psychiatric Association; 1998 May 30 - Jun 4; Toronto, Ontario, Canada	1998			54
Purdon 2000	Jones, B.	Treatment of cognitive deficits with antipsychotic drugs		Neurobiology of Aging	1998	14	4 S	S152-3
Purdon 2000	Jones, B.; Tollefson, G.	Olanzapine versus risperidone and haloperidol in the treatment of schizophrenia		Schizophrenia Research	1998	29		150–151
Purdon 2001	Purdon, S.	Efficacy in cognition		Proceedings of the 22nd Collegium Internationale Neuro-Psychopharmacologicum Congress; 2000 Jul 9-13; Brussels, Belgium	2000			
Riedel 2005	Riedel, M.; Spellmann, I.; Strassnig, M.; Douhet, A.; Dehning, S.; Opgen-Rhein, M.; Valdevit, R.; Engel, R. R.; Kleindienst, N.; Muller, N.; Moller, H. J.	Effects of risperidone and quetiapine on cognition in patients with schizophrenia and predominantly negative symptoms		European Archives of Psychiatry and Clinical Neuroscience	2007	257	6	360–370
Riedel 2007	Riedel, M.; Muller, N.; Spellmann, I.; Engel, R. R.; Musil, R.; Valdevit, R.; Dehning, S.; Douhet, A.; Cerovecki, A.; Strassnig, M.; Moller, H. J.	Efficacy of olanzapine versus quetiapine on cognitive dysfunctions in patients with an acute episode of schizophrenia		European Archives of Psychiatry and Clinical Neuroscience	2007	257	7	402–412
Ris-int-45	Reveley, M.	Ris-int-45 an international, multicentre, randomised double-blind parallel-group trial comparing		National Research Register	2000			

		the safety and efficacy of risperidone and olanzapine in the treatment of patients with schizophrenia						
Ris-int-45	Reveley, M.	RIS-INT-45 an international, multicentre, randomised double-blind parallel-group trial comparing the safety and efficacy of risperidone and olanzapine in the treatment of patients with schizophrenia		National Research Register	2001	1		
Robinson 2006	Miller, R. L.; McCormack, J.; Sevy, S.; Robinson, D.	Resolution of delusions in first episode of schizophrenia	a gradual process	Schizophrenia Bulletin	2007	33	2	221–222
Robinson 2006	Nct	Preventing morbidity in first-episode schizophrenia		https://ClinicalTrials.gov/	1999			
Robinson 2006	Nct	Preventing morbidity in first-episode schizophrenia		https://ClinicalTrials.gov/	2001			
Robinson 2006	Robinson, D. G.; Gallego, J. A.; John, M.	Challenges in assessing antipsychotic response in biomarker studies of first episode schizophrenia		Schizophrenia Bulletin	2013	39		S350
Robinson 2006	Robinson, D.; Sunday, S.	Should patients with long durations of untreated psychosis be included in studies of first episode schizophrenia?		Proceedings of the 50th Annual Meeting of the American College of Neuropsychopharmacology; 2011 Dec 4-8; Waikoloa, Hawaii	2011			S104
Robinson 2006	Robinson, D. G.; Woerner, M.; Napolitano, B.; Patel, R.; Sevy, S.; Gunduz-Bruce, H.; Soto-Perello, J.; Mendelowitz, A.; Khadivi, A.; Miller, R.; McCormack, J.; Lorell, B.; Lesser, M.; Schooler, N.; Kane, J.	Randomized comparison of olanzapine versus risperidone for the treatment of first episode schizophrenia	four month outcomes	Neuropsychopharmacology	2005	30	Suppl 1	S250
Robinson 2006	Robinson, D. G.; Woerner, M. G.; Napolitano, B.; Patel, R. C.; Sevy, S. M.; Gunduz-	Randomized comparison of olanzapine versus risperidone for the treatment of first-episode schizophrenia	4-month outcomes	American Journal of Psychiatry	2006	163	12	2096–2102

	Bruce, H.; Soto-Perello, J. M.; Mendelowitz, A.; Khadivi, A.; Miller, R.; McCormack, J.; Lorell, B. S.; Lesser, M. L.; Schooler, N. R.; Kane, J. M.							
Robinson 2006	Robinson, D. G.; Woerner, M. G.; Napolitano, B.; Patel, R. C.; Sevy, S. M.; Gunduz-Bruce, H.; Soto-Perello, J. M.; Mendelowitz, A.; Khadivi, A.; Miller, R.; McCormack, J.; Lorell, B. S.; Lesser, M. L.; Schooler, N. R.; Kane, M.	Predictors of outcome after 4 months of treatment for a first episode of schizophrenia		Schizophrenia Bulletin	2007	33	2	456
Robinson 2006	Sevy, S.; Robinson, D. G.; Sunday, S.; Napolitano, B.; Miller, R.; McCormack, J.; Kane, J.	Olanzapine vs. Risperidone in patients with first-episode schizophrenia and a lifetime history of cannabis use disorders	16-week clinical and substance use outcomes	Psychiatry Research	2011	188	3	310–314
Robinson 2006	Sevy, S.; Robinson, D. G.; Napolitano, B.; Gallego, J.; Patel, R. C.; Soto-Perello, J. M.; McCormack, J.; Lorell, B.; Kane, J. M.	Clinical and substance use outcomes of first-episode schizophrenia patients with a lifetime diagnosis of cannabis use disorders randomly assigned to risperidone or olanzapine for 16 weeks		Proceedings of the 12th International Congress on Schizophrenia Research; 2009 Mar 28-Apr 1; San Diego, CA	2009			355–356
Robinson 2006	Szeszko, P. R.; Narr, K. L.; Phillips, O. R.; McCormack, J.; Sevy, S.; Gunduz-Bruce, H.; Kane, J. M.; Bilder, R. M.; Robinson, D. G.	Magnetic resonance imaging predictors of treatment response in first-episode schizophrenia		Schizophrenia Bulletin	2012	38	3	569–578

Robinson 2006	Barbui, C.; Cipriani, A.	Cognitive improvements with antipsychotics	real or practice effect?	Evidence-Based Mental Health	2008	11	2	42
Robinson 2006	Gallego, J. A.; Robinson, D. G.; Sevy, S. M.; Napolitano, B.; McCormack, J.; Lesser, M. L.; Kane, J. M.	Time to treatment response in first-episode schizophrenia	Should acute treatment trials last several months?	Journal of Clinical Psychiatry	2011	72	12	1691–1696
Robinson 2006	Garcia-Ribera, C.; Bennett, N.; Naraine, M.; Sevy, S.; Robinson, D.	Tardive dyskinesia among patients being treated for a first episode of schizophrenia		Proceedings of the 49th Annual Meeting of the American College of Neuropsychopharmacology; 2010 Dec 5-9; Miami, Florida	2010			
Robinson 2006	Garcia-Ribera, C.; Bennett, N.; Naraine, M.; Sevy, S.; Robinson, D.	Tardive dyskinesia among patients being treated for a first episode of schizophrenia		Neuropsychopharmacology	2010	35		S335-S6
Robinson 2006	Garcia-Ribera, C.; Bennett, N.; Naraine, M.; Sevy, S.; Robinson, D.	Tardive dyskinesia and other movement disorders in first episode schizophrenic patients treated with second generation antipsychotics		Schizophrenia Research	2010	117	2-3	387-87
Robinson 2006	Goldberg, T. E.; Burdick, K. E.; McCormack, J.; Napolitano, B.; Patel, R. C.; Sevy, S. M.; Goldman, R.; Lencz, T.; Malhotra, A. K.; Kane, J. M.; Robinson, D. G.	Lack of an inverse relationship between duration of untreated psychosis and cognitive function in first episode schizophrenia		Schizophrenia Research	2009	107	2-3	262–266
Robinson 2006	Goldberg, T. E.; Goldman, R. S.; Burdick, K. E.; Malhotra, A. K.; Lencz, T.; Patel, R. C.; Woerner, M. G.; Schooler, N. R.; Kane, J. M.; Robinson, D. G.	Cognitive improvement after treatment with second-generation antipsychotic medications in first-episode schizophrenia	is it a practice effect?	Archives of General Psychiatry	2007	64	10	1115–1122
Robinson 2006	Lencz, T.; Robinson, D. G.; Napolitano, B.; Sevy, S.; Kane, J.	Drd2 promoter region variation predicts antipsychotic-induced weight gain in first episode schizophrenia		Pharmacogenetics and Genomics	2010	20	9	569–572

	M.; Goldman, D.; Malhotra, A. K.							
Robinson 2006	Lencz, T.; Robinson, D. G.; Xu, K.; Ekholm, J.; Sevy, S.; Gunduz-Bruce, H.; Woerner, M. G.; Kane, J. M.; Goldman, D.; Malhotra, A. K.	DRD2 promotor region variation as a predictor of sustained response to antipsychotic medication in first-episode schizophrenia patients		American Journal of Psychiatry	2006	163	3	529–531
Robinson 2015_1y	Nct	Preventing morbidity in first episode schizophrenia, part II		https://ClinicalTrials.gov/	2006			
Robinson 2015_1y	Robinson, D. G.; Gallego, J. A.; John, M.; Petrides, G.; Hassoun, Y.; Zhang, J. P.; Lopez, L.; Braga, R. J.; Sevy, S. M.; Addington, J.; Kellner, C. H.; Tohen, M.; Naraine, M.; Bennett, N.; Greenberg, J.; Lencz, T.; Correll, C. U.; Kane, J. M.; Malhotra,	A Randomized Comparison of Aripiprazole and Risperidone for the Acute Treatment of First-Episode Schizophrenia and Related Disorders	3-Month Outcomes	Schizophrenia Bulletin	2015	41	6	1227–1236
Robinson 2015_1y	Sarpal, D. K.; Argyelan, M.; Robinson, D. G.; Szeszko, P. R.; Karlsgodt, K. H.; John, M.; Weissman, N.; Gallego, J. A.; Kane, J. M.; Lencz, T.; Malhotra, A. K.	Baseline Striatal Functional Connectivity as a Predictor of Response to Antipsychotic Drug Treatment		American Journal of Psychiatry	2016	173	1	69–77
Robinson 2015_1y	Trampush, J. W.; Lencz, T.; DeRosse, P.; John, M.; Gallego, J. A.; Petrides, G.; Hassoun, Y.; Zhang,	Relationship of Cognition to Clinical Response in First-Episode Schizophrenia Spectrum Disorders		Schizophrenia Bulletin	2015	41	6	1237–1247

	J. P.; Addington, J.; Kellner, C. H.; Tohen, M.; Burdick, K. E.; Goldberg, T. E.; Kane, J. M.; Robinson, D. G.; Malhotra, A. K.							
Robinson 2015_1y	Trampush, J. W.; Robinson, D. G.; Lencz, T.; Kane, J.; Malhotra, A.; Goldberg, T. E.; Beech, D.	Trajectory of neurocognition in first-episode schizophrenia		Neuropsychopharmacology	2013	38		S530-S531
Robinson 2015_1y	Zhang, J. P.; Robinson, D. G.; Gallego, J. A.; John, M.; Yu, J.; Addington, J.; Tohen, M.; Kane, J. M.; Malhotra, A. K.; Lencz, T.	Association of a Schizophrenia Risk Variant at the DRD2 Locus With Antipsychotic Treatment Response in First-Episode Psychosis		Schizophrenia Bulletin	2015	41	6	1248–1255
Robinson 2015_1y	Homan, P.; Argyelan, M.; DeRosse, P.; Szeszko, P. R.; Gallego, J. A.; Hanna, L.; Robinson, D. G.; Kane, J. M.; Lencz, T.; Malhotra, A. K.	Structural similarity networks predict clinical outcome in early-phase psychosis		Neuropsychopharmacology	2019	44	5	915–922
Robinson 2015_1y	Ikuta, T.; Robinson, D. G.; Gallego, J. A.; Peters, B. D.; Gruner, P.; Kane, J.; John, M.; Sevy, S.; Malhotra, A. K.; Szeszko, P. R.	Subcortical modulation of attentional control by second-generation antipsychotics in first-episode psychosis		Psychiatry Research	2014	221	2	127–134
Robinson 2015_1y	Malhotra, A.; Sarpal, D.; Lencz, T.; Argyelan, M.; Ikuta, T.; Karlsgodt, K. H.; Gallego, J.; Kane, J. M.; Szeszko, P.; Robinson, D. G.	Antipsychotic treatment and functional connectivity of the striatum	A prospective controlled study in first-episode schizophrenia	Schizophrenia Bulletin	2015	41		S232

Robinson 2015_1y	Blair, Thies M.; DeRosse, P.; Sarpal, Dk; Argyelan, M.; Fales, Cl; Gallego, Ja; Robinson, Dg; Lencz, T.; Homan, P.; Malhotra, Ak	Interaction of Cannabis Use Disorder and Striatal Connectivity in Antipsychotic Treatment Response		Schizophrenia Bulletin Open	2020		1	sgaa014
Rosen 1972	Rosen, B.; Engelhardt, D. M.; Freedman, N.; Margolis, R.; Rudorfer, L.; Paley, H. M.	Prediction of psychiatric hospitalization. II. The Hospitalization Proneness Scale	a cross-validation	Journal of Abnormal Psychology	1972	80		271–274
Rosenheck 2003_1 year	Nct	CSP #451 - the clinical and economic impact of olanzapine in the treatment of schizophrenia		https://ClinicalTrials.gov/	2000			
Rosenheck 2003_1 year	Nct	To determine if olanzapine is more cost effective than haloperidol for the treatment of schizophrenia. The clinical and economic impact of olanzapine in the treatment of schizophrenia		https://ClinicalTrials.gov/	2001			
Rosenheck 2003_1 year	Perlick, D. A.; Rosenheck, R. A.; Kaczynski, R.; Bingham, S.; Collins, J.	Association of symptomatology and cognitive deficits to functional capacity in schizophrenia		Schizophrenia Research	2008	99	1-3	192–199
Rosenheck 2003_1 year	Rosenheck, R.; Perlick, D.; Bingham, S.	Effectiveness and cost of olanzapine and haloperidol in the treatment of schizophrenia. A randomized controlled trial		Journal of the American Medical Association (JAMA Chinese) [美国医学会杂志：中文版]	2005	24	5	316
Rosenheck 2003_1 year	Rosenheck, R.; Perlick, D.; Bingham, S.; Collins, J.	Effectiveness and cost of olanzapine and haloperidol in the treatment of schizophrenia	a randomized controlled trial	Jama	2004	291	9	1065–1066
Rosenheck 2003_1 year	Rosenheck, R.; Perlick, D.; Bingham, S.; Liu-Mares, W.; Collins, J.; Warren, S.; Leslie, D.; Allan, E.; Campbell, E. C.; Caroff, S.; Corwin, J.; Davis, L.; Douyon, R.; Dunn, L.; Evans,	Effectiveness and cost of olanzapine and haloperidol in the treatment of schizophrenia	a randomized controlled trial	Jama	2003	290	20	2693–2702

	D.; Frecska, E.; Grabowski, J.; Graeber, D.; Herz, L.; Kwon, K.; Lawso							
Rosenheck 2003_1 year	De, Lima M. S.; De, Oliveira Soares B. G.	The value of publishing negative results from a randomized controlled trial	the Rosenhecks study	Revista Brasileira de Psiquiatria	2004	26	2	135
Rosenheck 2003_1 year	Glazer, W. M.	"Effectiveness and cost of olanzapine and haloperidol in the treatment of schizophrenia	a randomized controlled trial": comment	Jama	2004	291	9	1064–1065
Sacchetti 2009	Nct	A study comparing the efficacy and tolerability of ziprasidone vs clozapine for the treatment of schizophrenia in patients who continue to have symptoms on or cannot tolerate other antipsychotic drugs		https://ClinicalTrials.gov/	2008			
Sacchetti 2009	Sacchetti, E.	Efficacy of ziprasidone in the treatment of resistant schizophrenia (organized by Pfizer)		World Psychiatry	2009	8	Suppl 1	
Sacchetti 2009	Sacchetti, E.; Galluzzo, A.; Romeo, F.; Gorini, B.; Warrington, L.	Comparison of ziprasidone and clozapine in subgroups of patients with treatment-resistant schizophrenia		Proceedings of the 160th Annual Meeting of the American Psychiatric Association; 2007 May 19-24; San Diego, CA	2007			
Sacchetti 2009	Sacchetti, E.; Galluzzo, A.; Romeo, F.; Gorini, B.; Warrington, L.	Long-term efficacy of ziprasidone in treatment-resistant schizophrenia	results from a 1-year, open-label extension study	Proceedings of the 160th Annual Meeting of the American Psychiatric Association; 2007 May 19-24; San Diego, CA	2007			
Sacchetti 2009	Sacchetti, E.; Galluzzo, A.; Valsecchi, P.; Romeo, F.; Gorini, B.; Warrington, L.	Comparative efficacy and safety of ziprasidone and clozapine in treatment refractory schizophrenic patients	results of a randomized, double-blind, 18-week trial	Proceedings of the 13th Biennial Winter Workshop on Schizophrenia Research; 2006 Feb 4-10; Davos, Switzerland	2006			
Sacchetti 2009	Sacchetti, E.; Galluzzo, A.; Valsecchi, P.; Romeo, F.; Gorini, B.; Warrington, L.	Comparative efficacy and safety of ziprasidone and clozapine in treatment refractory schizophrenic patients	results of a randomized, double-blind 18-week trial	Proceedings of the 159th Annual Meeting of the American Psychiatric Association; 2006 May 20-25; Toronto, Canada	2006			
Sacchetti 2009	Sacchetti, E.; Galluzzo, A.; Valsecchi, P.; Romeo, F.; Gorini, B.; Warrington, L.	Efficacy and safety of ziprasidone and clozapine in treatment refractory schizophrenic patients	results of a randomized, double-blind, 18-week trial	European Neuropsychopharmacology	2006	16	Suppl 4	S374

Sacchetti 2009	Sacchetti, E.; Galluzzo, A.; Valsecchi, P.; Romeo, F.; Gorini, B.; Warrington, L.	Ziprasidone vs clozapine in schizophrenia patients refractory to multiple antipsychotic treatments	the MOZART study	Schizophrenia Research	2009	110	1-3	80–89
Sacchetti 2009	Sacchetti, E.; Galluzzo, A.; Valsecchi, P.; Romeo, F.; Gorini, B.; Warrington, L.	Ziprasidone vs clozapine in schizophrenia patients refractory to multiple antipsychotic treatments	the MOZART study	Schizophrenia Research	2009	113	1	112–121
Sacchetti 2009	Sacchetti, E.; Galluzzo, A.; Valsecchi, P.; Romeo, F.; Gorini, B.; Warrington, L.	"Ziprasidone vs clozapine in schizophrenia patients refractory to multiple antipsychotic treatments	the MOZART study": corrigendum	Schizophrenia Research	2009	113	1	111
Sacchetti 2009	Sacchetti, E.; Galluzzo, A.; Valsecchi, P.; Romeo, F.; Gorini, B.; Warrington, L.; Garcia, M. R.	Comparative efficacy and safety of ziprasidone and clozapine in treatment refractory schizophrenic patients	results of a randomized, double-blind, 18-week trial	Biological Psychiatry	2006	59	8 Suppl	158S
Sacchetti 2009	Sacchetti, E.; Romeo, F.; Galluzzo, A.; Valsecchi, P.; Gorini, B.; Warrington, L.	Comparative efficacy and safety of ziprasidone and clozapine in treatment refractory schizophrenic patients	results of a randomized, double-blind, 18-week trial	International Journal of Neuropsychopharmacology	2006	9	Suppl 1	S274
Sacchetti 2009	Warrington, L.; Harvey, P. D.; Galluzzo, A.; Sachetti, E.; Romeo, F.	Cognitive benefits of ziparasidone vs. clozapine in treatment resistant schizophrenia	a randomized double-blind comparative study	Neuropsychopharmacology	2006	31	Suppl 1	S243
Sacchetti 2009	A	Double blind, double-dummy multicenter, parallel group comparison of the efficacy and the tolerability of ziprasidone vs. Clozapine in schizophrenic patients who are refractory and/or intolerant to antipsychotic therapy		ClinicalStudyResults.org	2006			
Sacchetti 2009	Harvey, P.; Warrington, L.; Loebel, A.; Romeo, F.; Gorini, B.; Galluzzo, A.; Sachetti, E.	Cognitive effects of ziprasidone and clozapine	results from an 18-week double-blind trial	European Neuropsychopharmacology	2007	17	Suppl 4	S439
Sacchetti 2009	Harvey, P. D.; Galluzzo, A.; Sachetti, E.; Romeo, F.; Warrington, L.	Cognitive benefits of ziparasidone vs. clozapine in treatment resistant schizophrenia	a randomized double-blind comparative study	Schizophrenia Bulletin	2007	33	2	560

Sacchetti 2009	Harvey, P. D.; Sacchetti, E.; Galluzzo, A.; Romeo, F.; Gorini, B.; Bilder, R. M.; Loebel, A. D.	A randomized double-blind comparison of ziprasidone vs clozapine for cognition in patients with schizophrenia selected for resistance or intolerance to previous treatment		Schizophrenia Research	2008	105	1-3	138–143
Sacchetti 2009	Harvey, P. D.; Warrington, L.; Loebel, A. D.; Romeo, F.; Gorini, B.; Galluzzo, A.; Scahetti, E.	Cognitive effects of ziprasidone and clozapine in treatment-resistant schizophrenia	results from an 18-week double-blind trial	Proceedings of the 160th Annual Meeting of the American Psychiatric Association; 2007 May 19-24; San Diego, CA	2007			
Saletu 1994	Saletu, B.; Kufferle, B.; Grunberger, J.; Foldes, P.; Topitz, A.; Anderer, P.	Clinical, EEG mapping and psychometric studies in negative schizophrenia	comparative trials with amisulpride and fluphenazine	Neuropsychobiology	1994	29	3	125–135
Saletu 1994	Berner, P.; Kufferle, B.; Friedmann, A.; Grunberger, J.; Saletu, B.	Treatment of negative symptoms in schizophrenia with neuroleptics		L'Encephale	1989	15	5	457–463
Schneider 2013	Schneider, S.; Bahmer, T. J.; Metzger, F. G.; Reif, A.; Polak, T.; Pfuhlmann, B.; Walter, G.; Eberle, M. C.; Ernst, L. H.; Fallgatter, A. J.; Ehlis, A. C.	Quetiapine and flupentixol differentially improve anterior cingulate cortex function in schizophrenia patients	an event-related potential study	International Journal of Neuropsychopharmacology	2013	16	9	1911–1925
Schoemaker 2010	Naber, D.; Schoemaker, J.; Vrijland, P.; Emsley, R. A.	Long term safety of asenapine in patients with schizophrenia		Proceedings of the 14th Biennial Winter Workshop on Schizophrenia and Bipolar Disorders; 2008 Feb 3-7; Montreux, Switzerland	2008			
Schoemaker 2010	Nct	A phase III, double-blind, randomized, active-controlled, two-armed, multicenter, efficacy and safety assessment (ACTAMESA) of org 5222 and olanzapine in the treatment of patients with schizophrenia or schizoaffective disorder		https://ClinicalTrials.gov/	2005			
Schoemaker 2010	Nct	Long-term efficacy and safety evaluation of asenapine (10-20 mg/day) in subjects with schizophrenia or		https://ClinicalTrials.gov/	2005			

		schizoaffective disorder, in a multicenter trial using olanzapine (10-20 mg/day) as a control						
Schoemaker 2010	Schoemaker, J.; Naber, D.; Vrijland, P.; Panagides, J.; Emsley, R.	Long-term assessment of asenapine vs. Olanzapine in patients with schizophrenia or schizoaffective disorder		PharmacoPsychiatry	2010	43	4	138–146
Schoemaker 2010	Schoemaker, J.; Naber, D.; Vrijland, P.; Panagides, J.; Emsley, R.	Erratum		PharmacoPsychiatry	2011	44	7	343
Schoemaker 2010	Schoemaker, J.; Stet, L.; Naber, D.; Panagides, J.; Emsley, R.	Safety and efficacy of long-term asenapine versus qlanzapine in schizophrenia or schizoaffective disorder patients		Proceedings of the 27th International College of Neuropsychopharmacology Congress; 2010 June 6-10; Hong Kong	2010			
Schoemaker 2010	Schoemaker, J.; Stet, L.; Vrijland, P.; Naber, D.; Panagides, J.; Emsley, R.	Long-term efficacy and safety of asenapine or olanzapine in patients with schizophrenia or schizoaffective disorder	An extension study	PharmacoPsychiatry	2012	45	5	196–203
Schoemaker 2010	The, National Horizon Scanning Centre	Asenapine (Saphris) for schizophrenia		Report	2010			
Schoemaker 2010	Anonymous	A phase iii, double-blind, randomized, active-controlled, two-armed, multicenter, efficacy and safety assessment (actamesa) of org 5222 and olanzapine in the treatment of patients with schizophrenia or schizoaffective disorder		ClinicalStudyResults.org	2006			
Schoemaker 2010	Emsley, R.; Den, Doelder P.; Schoemaker, J.; Naber, D.	Long-term safety of asenapine in patients with schizophrenia		Schizophrenia Research	2008	98		48
Schoemaker 2010	Joep, S.; Stet, L.; Naber, D.; Panagides, J.; Emsley, R.	Long-term safety and efficacy of asenapine versus olanzapine in patients with schizophrenia or schizoaffective disorder		Proceedings of the 163rd Annual Meeting of the American Psychiatric Association; 2010 May 22-26; New Orleans, LA	2010			
Schooler 2005	Oosthuizen, P.; Emsley, R. A.; Roberts, M. C.; Turner, J.; Keyter, L.; Keyter, N. T. M.	Depressive symptoms at baseline predict fewer negative symptoms at follow-up in patients with first-episode schizophrenia		Schizophrenia Research	2002	58		247–252

Schooler 2005	Rabinowitz, J.; Davidson, M.; Kopala, L.	A method for examining efficacy by dosage in flexible dose clinical trials		Schizophrenia Research	2004	67	1	150
Schooler 2005	Rabinowitz, J.; De, Smedt G.; Davidson, M.	Premorbid functioning and outcomes in recent onset schizophrenia		European Neuropsychopharmacology	2003	13	4	S338
Schooler 2005	Rabinowitz, J.; Harvey, P. D.; Eerdekens, M.; Davidson, M.	Premorbid functioning and treatment response in recent-onset schizophrenia		British Journal of Psychiatry	2006	189	1	31–35
Schooler 2005	Rasmussen, M.; Risperiderone, International Study Group	The impact on long term outcome of early intervention with risperidone or haloperidol in first episode psychosis	characteristics at baseline	Proceedings of the 21st Collegium Internationale Neuro-Psychopharmacologicum Congress; 1998 Jul 12-16; Glasgow, UK	1998			
Schooler 2005	Rasmussen, M.; The, R. I. S. I. N. T. Study Group	The impact on long-term outcome of early intervention with risperidone or haloperidol in first episode psychosis	characteristics at baseline	Schizophrenia Research	1999	36	1-3	293
Schooler 2005	Rasmussen, M. FutuRis Study Group	Long-term outcome with risperidone or haloperidol in first episode psychosis		Biological Psychiatry	1999	45		35S
Schooler 2005	Rasmussen, M. R. I. S. I. N. T. Study Group	The impact on long-term outcome of early intervention with risperidone or haloperidol in first episode psychosis	characteristics at baseline	Proceedings of the 37th Annual Meeting of the American College of Neuropsychopharmacology; 1998 Dec 14-18; Las Croabas, Puerto Rico	1998			95
Schooler 2005	Reveley, M.	Ris-int-35 a double blind evaluation of risperidone versus haloperidol on the long-term morbidity of early psychotic patients		National Research Register	2000			
Schooler 2005	Reveley, M.	RIS-INT-35 a double blind evaluation of risperidone versus haloperidol on the long-term morbidity of early psychotic patients		National Research Register	2001	1		
Schooler 2005	Schooler, N.; Davidson, M.; Kopala, L.	Reduced relapse rates in recent onset schizophrenia patients treated with risperidone vs. haloperidol		European Neuropsychopharmacology	2003	13	4	S337
Schooler 2005	Schooler, N.; Rabinowitz, J.; Davidson, M.; Emsley, R.; Harvey, P. D.; Kopala, L.; McGorry, P. D.; Hove, I. V.; Eerdekens, M.;	Risperidone and haloperidol in first-episode psychosis	a long-term randomized trial	American Journal of Psychiatry	2005	162	5	947–953

	Swyzen, W.; Smedt, G. D.							
Schooler 2005	Schooler, N. R.; Emsley, R.; Kopala, L.; Martinez, R.; McGorry, P.	Characteristics of first episode clinical trial subjects		Proceedings of the 2nd International Conference on Early Psychosis; 2000 Mar 31 - Apr 2; New York, New York, USA	2000			
Schooler 2005	Schooler, N. R.; Risperidone, International Study Group	The FutuRIS study - a prospective long-term evaluation of risperidone versus haloperidol in early psychosis patients		Proceedings of the 6th World Congress of Biological Psychiatry; 1997 Jun 22-27; Nice, France	1997			
Schooler 2005	Sharma, T.	A double-blind evaluation of risperidone versus haloperidol on the long-term morbidity of early psychotic patients		National Research Register	2000			
Schooler 2005	Sharma, T.	A double-blind evaluation of risperidone versus haloperidol on the long-term morbidity of early psychotic patients		National Research Register	2001	1		
Schooler 2005	Davidson, M.	Reducing the risk of early transition to psychosis	using long-acting atypical antipsychotics in young patients	Proceedings of the Thematic Conference of the World Psychiatric Association on "Treatments in Psychiatry: An Update"; 2004 Nov 10-13; Florence, Italy	2004			
Schooler 2005	Davidson, M.; Schooler, N.; Rabinowitz, J.	Treatment of cognitive impairment in recent onset psychosis; a comparison of risperidone and haloperidol		Proceedings of the 16th European College of Neuropsychopharmacology Congress; 2003 Sep 20-24; Prague, Czech Republic	2003			
Schooler 2005	Davidson, M.; Schooler, N.; Rabinowitz, J.	Treatment of cognitive impairment in recent onset psychosis; a comparison of risperidone and haloperidol		European Neuropsychopharmacology	2003	13	4	S334
Schooler 2005	De, Smedt G.	Risperidone vs. haloperidol in first episode psychosis		Proceedings of the 11th World Congress of Psychiatry; 1999 Aug 6-11; Hamburg, Germany	1999	2		147
Schooler 2005	Emsley, R.; Davidson, M.; Rabinowitz, J.	Risk for akathisia in patients with recent onset schizophrenia treated with risperidone and haloperidol and its association with sucidality		Schizophrenia Research	2004	67	1	183
Schooler 2005	Emsley, R.; Rabinowitz, J.; Medori, R.	Time course for antipsychotic treatment response in first-episode schizophrenia		American Journal of Psychiatry	2006	163	4	743–745

Schooler 2005	Emsley, R.; Rabinowitz, J.; Medori, R.	Remission in early psychosis	rates, predictors, and clinical and functional outcome correlates	Schizophrenia Research	2007	89	1-3	129–139
Schooler 2005	Good, K. P.; Rabinowitz, J.; Whitehorn, D.; Harvey, P. D.; DeSmedt, G.; Kopala, L. C.	The relationship of neuropsychological test performance with the PANSS in antipsychotic naive, first-episode psychosis patients		Schizophrenia Research	2004	68	1	11–19
Schooler 2005	Harvey, P. D.; Rabinowitz, J.; Eerdekens, M.; Davidson, M.	Treatment of cognitive impairment in early psychosis	a comparison of risperidone and haloperidol in a large long-term trial	American Journal of Psychiatry	2005	162	10	1888–1895
Schooler 2005	Heydebrand, G.; Weiser, M.; Rabinowitz, J.; Hoff, A. L.; DeLisi, L. E.; Csernansky, J. G.	Correlates of cognitive deficits in first episode schizophrenia		Schizophrenia Research	2004	68	1	1–9
Schooler 2005	Kopala, L.; Rabinowitz, J.; Davidson, M.	EPS in recent onset schizophrenia	a comparison of risperidone and haloperidol	Proceedings of the 16th European College of Neuropsychopharmacology Congress; 2003 Sep 20-24; Prague, Czech Republic	2003			
Schooler 2005	Kopala, L.; Rabinowitz, J.; Davidson, M.	Extra-pyramidal signs and symptoms (EPS) in recent onset schizophrenia	a comparison of risperidone and haloperidol	European Neuropsychopharmacology	2003	13	4	S338
Schooler 2005	Kopala, L.; Rabinowitz, J.; Emsley, R.; McGorry, P.	Extra-pyramidal signs and symptoms (EPS) in recent onset schizophrenia	a comparison of risperidone and haloperidol	Schizophrenia Research	2004	67	1	187
Schooler 2005	Kopala, L. C.; Rabinowitz, J.; Emsley, R.; McGorry, P.; Schooler, N.; Harvey, P. D.; Davidson, M.; Honer, W. G.	Extra-pyramidal signs and symptoms (EPS) in recent onset schizophrenia	a comparison of risperidone and haloperidol	Proceedings of the 12th Biennial Winter Workshop on Schizophrenia; 2004 Feb 7-13; Davos, Switzerland	2004			
Schooler 2005	Levine, S. Z.; Rabinowitz, J.	Trajectories and antecedents of treatment response over time in early-episode psychosis		Schizophrenia Bulletin	2010		3	624–632
Serafetinides 1972	Serafetinides, E. A.; Clark, M. L.	Psychological effects of single dose antipsychotic medication		Biological Psychiatry	1973	7	3	263–267
Serafetinides 1972	Serafetinides, E. A.; Collins, S.; Clark, M. L.	Haloperidol, clopenthixol, and chlorpromazine in chronic schizophrenia. Chemically unrelated antipsychotics as		Journal of Nervous and Mental Disease	1972	154	1	31–42

		therapeutic alternatives						
Serafetinides 1972	Serafetinides, E. A.; Willis, D.; Clark, M. L.	Haloperidol, clopenthixol, and chlorpromazine in chronic schizophrenia. II. The electroencephalographic effects of chemically unrelated antipsychotics		Journal of Nervous and Mental Disease	1972	155	5	366–369
Sergi 2007	Nct	The cognitive effects of risperidone and olanzapine		https://ClinicalTrials.gov/	2005			
Sergi 2007	Sergi, M.; Green, M.; Widmark, C.; Reist, C.; Erhart, S.; Braff, D.; Kee, K.; Marder, S.; Mintz, J.	Social Cognition and Neurocognition	Effects of Risperidone, Olanzapine, and Haloperidol	American Journal of Psychiatry	2007	164	10	1585–1592
Sergi 2007	Sergi, M. J.; Green, M. F.; Widmark, C.; Reist, C.; Erhart, S.; Braff, D. L.; Kee, K. S.; Marder, S. R.; Mintz, J.	Social cognition [corrected] and neurocognition	effects of risperidone, olanzapine, and haloperidol [erratum appears in Am J Psychiatry. 2007 Nov;164(11):1766]	American Journal of Psychiatry	2007	164	10	1585–1592
Sergi 2007	Sergi, M. J.; Green, M. F.; Widmark, C.; Reist, C.; Erhart, S.; Braff, D. L.; Kee, K. S.; Mintz, J.	Social cognition and neurocognition	effects of risperidone, olanzapine, and haloperidol	Schizophrenia Bulletin	2007	33	2	478
Sergi 2007	Wynn, J. K.; Green, M. F.; Sprock, J.; Light, G. A.; Widmark, C.; Reist, C.; Erhart, S.; Marder, S. R.; Mintz, J.; Braff, D. L.	Effects of olanzapine, risperidone and haloperidol on prepulse inhibition in schizophrenia patients	a double-blind, randomized controlled trial	Schizophrenia Research	2007	95	1-3	134–142
Sharma 2020	Ctri	To Compare the changes in Neurocognitive profile in patients suffering with schizophrenia on treatment with Aripiprazole and Olanzapine		http://www.ctri.nic.in/Clinicaltrials/pmaindet2.php?trialid=54137	2021			
Shen 2014	Nct	A randomized, double-blind, placebo-controlled, olanzapine-referenced, parallel group safety, efficacy, and tolerability study of sca-136 in subjects		https://ClinicalTrials.gov/	2005			

		with acute exacerbations of schizophrenia						
Shen 2014	Shen, J.; Kobak, K. A.; Zhao, Y.; Alexander, M. M.; Kane, J. M.	Use of remote centralized raters via live 2-way video in a multicenter clinical trial for schizophrenia		Journal of Clinical Psychopharmacology	2008	28	6	691–693
Shen 2014	Shen, J.; Kobak, K. A.; Zhao, Y.; Murphy-Eberenz, K.; Hayes, M.; Alexander, M. G.; Kane, J. M.	The use of remote centralized raters via live two-way video in a multicenter clinical trial for schizophrenia		Proceedings of the 161st Annual Meeting of the American Psychiatric Association; 2008 May 3-8; Washington DC, USA	2008			
Shen 2014	Shen, J. H.; Zhao, Y.; Rosenzweig-Lipson, S.; Popp, D.; Williams, J. B.; Giller, E.; Detke, M. J.; Kane, J. M.	A 6-week randomized, double-blind, placebo-controlled, comparator referenced trial of vabicaserin in acute schizophrenia		Journal of Psychiatric Research	2014	53		14–22
Shen 2014	Shen, J. H. Q.; Zhao, Y.; Rosenzweig-Lipson, S.; Popp, D.; Williams, J. B. W.; Giller, E.; Detke, M. J.; Kane, J.	A 6-week randomized, double-blind, placebo-controlled, comparator referenced, multicenter trial of vabicaserin in subjects with acute exacerbation of schizophrenia		Proceedings of the 50th Annual Meeting of the American College of Neuropsychopharmacology; 2011 Dec 4-8; Waikoloa, Hawaii	2011			S106-S7
Sikich 2004	Sikich, L.	Critical decisions in the treatment of adolescent and pediatric psychosis		Proceedings of the 154th Annual Meeting of the American Psychiatric Association; 2001 May 5-10; New Orleans, Louisiana, USA	2001			
Sikich 2004	Sikich, L.	Critical decisions in the treatment of adolescent and pediatric psychosis		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Sikich 2004	Sikich, L.; Hamer, R.; Malekpour, A.; Mendel, C.; White, R.; Bashford, R.; Sheitman, B.; Lieberman, J.	Double-blind trial comparing risperidone, olanzapine and haloperidol in psychotic children and adolescents		Biological Psychiatry	2002	51	8	217
Sikich 2004	Sikich, L.; Hamer, R. M.; Bashford, R. A.; Sheitman, B. B.; Lieberman, J. A.	A pilot study of risperidone, olanzapine, and haloperidol in psychotic youth	a double-blind, randomized, 8-week trial	Neuropyschopharmacology	2004	29	1	133–145

Sikich 2004	Sikich, L.; Hooper, S. R.; Malekpour, A. H.; Sheitman, B. B.; Lieberman, J. A.	A double blind comparison of typical versus atypical antipsychotic agents on selected neurocognitive functions in children and adolescents with psychotic disorders		Schizophrenia Research	2001	49	1 - 2	245
Sikich 2004	Sikich, L.; Horrigan, J. P.; Lieberman, J. A.; Barnhill, L. J.; Sheitman, B. B.; Courvoisie, H. E.	Comparative use of olanzapine and risperidone in psychotic youth		Proceedings of the 154th Annual Meeting of the American Psychiatric Association; 2001 May 5-10; New Orleans, Louisiana, USA	2001			
Sikich 2004	Sikich, L.; Horrigan, J. P.; Lieberman, J. A.; Barnhill, LJJr; Sheitman, B. B.; Courvoisie, H. E.	Comparative use of olanzapine and risperidone in psychotic youth		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Sikich 2004	Sikich, L.; Williamson, K.; Malekpour, A.; Bashford, R. A.; Hooper, S.; Sheitman, B.; Lieberman, J. A.	Interim results of a randomized controlled trial of haloperidol, risperidone, and olanzapine in psychotic youth		Proceedings of the 38th Annual Meeting of the American College of Neuropsychopharmacology; 1999 Dec 12-16; Acapulco, Mexico	1999			
Sikich 2008	Nct	Treatment of schizophrenia and related disorders in children and adolescents		https://ClinicalTrials.gov/	2003			
Sikich 2008	Sikich, L.; Frazier, J. A.; McClellan, J.; Findling, R. L.; Vitiello, B.; Ritz, L.; Ambler, D.; Puglia, M.; Maloney, A. E.; Michael, E.; De, Jong S.; Slifka, K.; Noyes, N.; Hlastala, S.; Pierson, L.; McNamara, N. K.; Delporto-Bedoya, D.; Anderson, R.; Ham	Double-blind comparison of first- and second-generation antipsychotics in early-onset schizophrenia and schizo-affective disorder	findings from the treatment of early-onset schizophrenia spectrum disorders (TEOSS) study	American Journal of Psychiatry	2008	165	11	1420–1431
Sikich 2008	Taylor, J.; Appel, S.; Bloch, M.	Treatment response over three randomizations in the treatment of early-onset schizophrenia spectrum disorders study (TEOSS)		Schizophrenia Bulletin	2019	45		S261

Sikich 2008	Taylor, J.; Appel, S.; Eli, M.; Bloch, M. H.	Time until Clinical Improvement in the Treatment of Early-Onset Schizophrenia Spectrum Disorders Study (Teoss)		Journal of the American Academy of Child and Adolescent Psychiatry	2019	58		S148
Sikich 2008	Taylor, J.; Jakubovski, E.; Gabriel, D.; Bloch, M.	Identifying youths at risk for antipsychotic-induced weight gain and metabolic dysfunction in the treatment of early onset schizophrenia spectrum disorders (teoss)		Schizophrenia Bulletin	2017	43		S215-S216
Sikich 2008	Taylor, J.; Jakubovski, E.; Gabriel, D.; Bloch, M.	Pretreatment predictors and moderators of antipsychotic-related weight gain in the treatment of early-onset schizophrenia spectrum disorders (TEOSS) study		Neuropsychopharmacology	2017	43	Suppl. 1	S320-S321
Sikich 2008	Taylor, J. H.; Jakubovski, E.; Gabriel, D.; Bloch, M. H.	Predictors and Moderators of Antipsychotic-Related Weight Gain in the Treatment of Early-Onset Schizophrenia Spectrum Disorders Study		Journal of Child and Adolescent Psychopharmacology	2018	28	7	474–484
Sikich 2008	Williams, J. C.; Stevens, H. E.	Treatment of early-onset schizophrenia spectrum disorders (TEOSS) study		50 Studies Every Psychiatrist Should Know	2018	50		55–60
Sikich 2008	Anonymous	Safety concerns prompt changes to study of drugs for early-onset schizophrenia		Brown University Child and Adolescent Psychopharmacology Update	2007	9	10	1, 6-7
Sikich 2008	Baker, R. W.; McElroy, S. L.; Juliar, B. E.; Schuh, L. M.; Shao, L.; Stauffer, V. L.	Manic-like symptoms in patients with schizophrenia treated with olanzapine, haloperidol, and placebo		Schizophrenia Research	2002	53	3 Suppl 1	196–197
Sikich 2008	Findling, R. L.; Johnson, J. L.; McClellan, J.; Frazier, J. A.; Vitiello, B.; Hamer, R. M.; Lieberman, J. A.; Ritz, L.; McNamara, N. K.; Lingler, J.; Hlastala, S.; Pierson, L.; Puglia, M.; Maloney, A. E.; Kaufman, E. M.;	Double-blind maintenance safety and effectiveness findings from the treatment of early-onset schizophrenia spectrum (TEOSS) study		Journal of the American Academy of Child and Adolescent Psychiatry	2010	49	6	583–594

	Noyes, N.; Sikich, L.							
Sikich 2008	Frazier, J. A.; Giuliano, A. J.; Johnson, J. L.; Yakutis, L.; Youngstrom, E. A.; Breiger, D.; Sikich, L.; Findling, R. L.; McClellan, J.; Hamer, R. M.; Vitiello, B.; Lieberman, J. A.; Hooper, S. R.	Neurocognitive outcomes in the treatment of early-onset schizophrenia spectrum disorders study		Journal of the American Academy of Child and Adolescent Psychiatry	2012	51	5	496–505
Sikich 2008	Frazier, J. A.; McClellan, J.; Findling, R. L.; Vitiello, B.; Anderson, R.; Zablotsky, B.; Williams, E.; McNamara, N. K.; Jackson, J. A.; Ritz, L.; Hlastala, S. A.; Pierson, L.; Varley, J. A.; Puglia, M.; Maloney, A. E.; Ambler, D.; Hunt-Harrison, T.; Ham	Treatment of early-onset schizophrenia spectrum disorders (TEOSS)	demographic and clinical characteristics	Journal of the American Academy of Child and Adolescent Psychiatry	2007	46	8	979–988
Sikich 2008	Gabriel, D.; Jakubovski, E.; Taylor, J. H.; Artukoglu, B. B.; Bloch, M. H.	Predictors of treatment response and drop out in the Treatment of Early-Onset Schizophrenia Spectrum Disorders (TEOSS) study		Psychiatry Research	2017	255		248–255
Sikich 2008	McClellan, J.	Risperidone for schizophrenia		Stanley Foundation Research Programs	2009			
Sikich 2008	McClellan, J.; Sikich, L.; Findling, R. L.; Frazier, J. A.; Vitiello, B.; Hlastala, S. A.; Williams, E.; Ambler, D.; Hunt-Harrison, T.; Maloney, A. E.; Ritz, L.; Anderson, R.; Hamer, R. M.; Lieberman, J. A.	Treatment of Early-Onset Schizophrenia Spectrum disorders (TEOSS)	rationale, design, and methods	Journal of the American Academy of Child and Adolescent Psychiatry	2007	46	8	969–978

Sikich 2008	Taylor, J. H.; Appel, S.; Eli, M.; Alexander-Bloch, A.; Maayan, L.; Gur, R. E.; Bloch, M. H.	Time to Clinical Response in the Treatment of Early Onset Schizophrenia Spectrum Disorders Study		Journal of child and adolescent psychopharmacology (J Child Adolesc Psychopharmacol)	2021	31	1	46–52
Sikich 2008	Taylor, Jh; Appel, S.; Eli, M.; Alexander-Bloch, A.; Maayan, L.; Gur, Re; Bloch, Mh	Time to clinical response in the treatment of early onset schizophrenia spectrum disorders study		Journal of Child and Adolescent Psychopharmacology	2020			InPress
Sikich 2008	Anonymous	TEOSS: maintenance safety and effectiveness findings		Brown university child & adolescent psychopharmacology update	2010	12	7	3- 4
Sikich 2008	Busner J	Toward an Abbreviated Positive and Negative Syndrome Scale (PANSS) for Adolescent Schizophrenia Trials: replication, Treatment Sensitivity, and Interrater Reliability		Journal of the American Academy of Child and Adolescent Psychiatry	2022	61	10	S293-S29
Sikich 2008	Busner J // Youngstrom EA // Langfus JA // Findling RL // Daniel DG	Utility of an Optimized 10-Item Pediatric Panss: Comparison to 30-Item Panss in a Large Multisite Industry-Sponsored Trial for Adolescent Schizophrenia		Innovations in Clinical Neuroscience	2022	19		S10
Sikich 2008	Findling RL // Youngstrom EA // McClellan JM // Frazier JA // Sikich L // Daniel DG // Busner J	An Optimized Version of the Positive and Negative Symptoms Scale (PANSS) for Pediatric Trials		Journal of the American Academy of Child & Adolescent Psychiatry	2023	62	4	427-434
Sikich 2008	Youngstrom EA	Toward an Optimized Version of the Positive and Negative Syndrome Scale (PANSS) for Pediatric Trials		Journal of the American Academy of Child and Adolescent Psychiatry	2022	61	10	S293
Simpson 2004	Meyer, J.; Loebel, A.; Nasrallah, H.	Comparative effects of ziprasidone and olanzapine on markers of insulin resistance	Results of a 6-week randomized study in patients with acute schizophrenia	Neuropsychopharmacology	2005	30	Suppl 1	S202-S203
Simpson 2004	Meyer, J.; Loebel, A.; Nasrallah, H.; Parsons, B.	Comparative effects of ziprasidone and olanzapine on markers of insulin resistance	Results of a 6-week randomized study in patients with acute schizophrenia	Proceedings of the 13th Biennial Winter Workshop on Schizophrenia Research; 2006 Feb 4-10; Davos, Switzerland	2006			93
Simpson 2004	Meyer, J.; Loebel, A.; Nasrallah, H.; Templeton, H. B.	Comparative effects of ziprasidone and olanzapine on markers of insulin resistance	Results of a 6-week randomized study in patients with acute schizophrenia	Biological Psychiatry	2006	59	8 Suppl	159S

Simpson 2004	Meyer, J.; Nasrallah, H.; Loebel, A.; Parsons, B.	Comparative effects of ziprasidone and olanzapine on markers of insulin resistance	Results of a 6-week randomized study in patients with acute schizophrenia	Proceedings of the 25th Collegium Internationale Neuro-Psychopharmacologium Congress; 2006 July 9-13; Chicago, Illinois	2006			
Simpson 2004	Meyer, J.; Nasrallah, H.; Loebel, A.; Parsons, B.	Comparative effects of ziprasidone and olanzapine on markers of insulin resistance	Results of a 6-week randomized study in patients with acute schizophrenia	Proceedings of the 13th Biennial Winter Workshop on Schizophrenia Research; 2006 Feb 4-10; Davos, Switzerland	2006			
Simpson 2004	Meyer, J. M.; Loebel, A. D.	Comparative effects of ziprasidone and olanzapine on markers of insulin resistance	Results of a six-week randomized study in patients with acute schizophrenia	Proceedings of the 159th Annual Meeting of the American Psychiatric Association; 2006 May 20-25; Toronto, Canada	2006			
Simpson 2004	O'Sullivan, R.; Fryburg, D.; Siu, C.; Simpson, G.	Insulin resistance in olanzapine and ziprasidone treated subjects	interim results of a double-blind controlled six-week trial	Schizophrenia Research	2001	49	1-2	241
Simpson 2004	Rappard, F.; Meyer, J.; Loebel, A.; Nasrallah, H.	Comparative effects of ziprasidone and olanzapine on markers of insulin resistance	Results of a 6-week randomized study in patients with acute schizophrenia	International Journal of Neuropsychopharmacology	2006	9	Suppl 1	S287
Simpson 2004	Ross, D. E.	"Randomized, controlled, double-blind multicenter comparison of the efficacy and tolerability of ziprasidone and olanzapine in acutely ill inpatients with schizophrenia or schizoaffective disorder"	comment	American Journal of Psychiatry	2005	162	7	1391
Simpson 2004	Simpson, G.; Horne, R. L.; Weiden, P.; Bari, M.; Romano, S. J.	Ziprasidone vs olanzapine in schizophrenia		Proceedings of the 12th World Congress of Psychiatry; 2002 Aug 24-29; Yokohama, Japan	2002			
Simpson 2004	Simpson, G.; Horne, R. L.; Weiden, P. J.; Pigott, T.; Bari, M.; Romano, S. J.	Ziprasidone vs olanzapine in schizophrenia	a double-blind trial	Proceedings of the 11th Congress of the Association of European Psychiatrists; 2002 May 4-8; Stockholm, Sweden	2002	17	Suppl 1	101s
Simpson 2004	Simpson, G.; O'Sullivan, R. L.; Siu, C.	Ziprasidone vs olanzapine in schizophrenia	results of a double-blind trial	European Neuropsychopharmacology	2001	11	3	274
Simpson 2004	Simpson, G.; Weiden, P.; Pigott, T.; Romano, S. J.; Siu, C.	Ziprasidone versus olanzapine in patients with recent-onset schizophrenia		Proceedings of the 3rd International Conference on Early Psychosis; 2002 Sep 25-28; Copenhagen, Denmark	2002			70
Simpson 2004	Simpson, G.; Weiden, P.; Pigott, T.; Romano, Sol; Siu, C.	Ziprasidone vs olanzapine in schizophrenia	results of a 6-month, double-blind continuation study	International Journal of Neuropsychopharmacology	2002	5	Suppl 1	S124
Simpson 2004	Simpson, G. M.;	Randomized, controlled, double-		American Journal of Psychiatry	2004	161	10	1837–1847

	Glick, I. D.; Weiden, P. J.; Romano, S. J.; Siu, C. O.	blind multicenter comparison of the efficacy and tolerability of ziprasidone and olanzapine in acutely ill inpatients with schizophrenia or schizoaffective disorder						
Simpson 2004	Simpson, G. M.; Glick, I. D.; Weiden, P. J.; Romano, S. J.; Siu, C. O.	Correction	"Randomized, controlled, double-blind multicenter comparison of the efficacy and tolerability of ziprasidone and olanzapine in acutely ill inpatients with schizophrenia or schizoaffective disorder"	American Journal of Psychiatry	2005	162	3	644
Simpson 2004	Simpson, G. M.; Loebel, A.; Warrington, L.; Yang, R.	Efficacy and tolerability of ziprasidone and olanzapine in acutely ill inpatients with schizophrenia or schizoaffective disorder	results of a double-blind, six-week study, with a six-month, double-blind, continuation phase	Progress in Neurotherapeutics and Neuropsychopharmacology	2006			149-63, xi
Simpson 2004	Simpson, G. M.; O'Sullivan, R. L.; Siu, C.	Ziprasidone versus olanzapine in schizophrenia	results of a double-blind trial	Proceedings of the 154th Annual Meeting of the American Psychiatric Association; 2001 May 5-10; New Orleans, Louisiana, USA	2001			
Simpson 2004	Simpson, G. M.; O'Sullivan, R. L.; Siu, C.	Ziprasidone versus olanzapine in schizophrenia	results of a double-blind trial	Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Simpson 2004	Simpson, G. M.; O'Sullivan, R. R.; Horne, R. L.; Weiden, P.; Bari, M. A.; Pigott, T.; Siu, C.	Ziprasidone vs olanzapine in schizophrenia		Proceedings of the 7th World Congress of Biological Psychiatry; 2001 Jul 1-6; Berlin, Germany	2001	2	Suppl 1	
Simpson 2004	Simpson, G. M.; Weiden, P.; Pigott, T.; Murray, S.; Siu, C. O.; Romano, S. J.	Six-month, blinded, multicenter continuation study of ziprasidone versus olanzapine in schizophrenia		American Journal of Psychiatry	2005	162	8	1535–1538
Simpson 2004	Simpson, G. M.; Weiden, P.; Pigott, T.; Romano, S. J.; Siu, C.	Ziprasidone vs olanzapine in schizophrenia	6-month continuation study	European Neuropsychopharmacology	2002	12	Suppl 3	S310
Simpson 2004	Simpson, G. M.; Weiden, P.; Pigott, T.; Romano, S. J.; Siu, C.	Ziprasidone versus olanzapine in schizophrenia	six-month continuation study	Schizophrenia Research	2003	60		303
Simpson 2004	Simpson, G. M.; Weiden, P. J.; Pigott, T. A.; Romano, S. J.; Siu, C.	Ziprasidone versus olanzapine in schizophrenia	six-month continuation study	Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			

Simpson 2004	Agid, O.; Siu, C.; Vanderburg, D.; Pappadopulos, E.; Brambilla, C.; Kapur, S.	Scoring algorithm for predicting long-term global functioning in patients with schizophrenia		Schizophrenia Research	2010	117	2-3	256–257
Simpson 2004	Agid, O.; Siu, C. O.; Pappadopulos, E.; Vanderburg, D.; Remington, G.	Early prediction of clinical and functional outcome in schizophrenia		European Neuropsychopharmacology	2013	23		842–851
Simpson 2004	Bowie, C.; Harvey, P. D.; Loebel, A. D.; Warrington, L.	Normalization of cognitive function with long-term ziprasidone or olanzapine		Proceedings of the 157th Annual Meeting of the American Psychiatric Association; 2004 May 1-6; New York, USA	2004			
Simpson 2004	Carnahan, R. M.; Perry, P. J.; Ross, D. E.; Simpson, G. M.	Methodological concerns in a trial of ziprasidone and olanzapine		American Journal of Psychiatry	2005	162	7	1391–1392
Simpson 2004	Del, Valle M. C.; Loebel, A. D.; Murray, S.; Yang, R.; Harrison, D. J.; Cuffel, B. J.	Change in framingham risk score in patients with schizophrenia	a post hoc analysis of a randomized, double-blind, 6-week trial of ziprasidone and olanzapine	Primary Care Companion to the Journal of Clinical Psychiatry	2006	8	6	329–333
Simpson 2004	Fryburg, D. A.; O'Sullivan, R. L.; Siu, C.; Simpson, G.	Insulin resistance in olanzapine and ziprasidone treated subjects	interim results of a double-blind controlled six-week trial	Proceedings of the 39th Annual Meeting of the American College of Neuropsychopharmacology; 2000 Dec 10-14; San Juan, Puerto Rico	2000			
Simpson 2004	Glick, I. D.; Fryburg, D.; O'Sullivan, R. L.; Siu, C.; Simpson, G.	Ziprasidone's benefits versus olanzapine regarding weight and insulin resistance		European Neuropsychopharmacology	2001	11	3	273
Simpson 2004	Glick, I. D.; Fryburg, D.; O'Sullivan, R. L.; Siu, C.; Simpson, G. M.	Ziprasidone's benefits versus olanzapine on weight and insulin resistance		Proceedings of the 154th Annual Meeting of the American Psychiatric Association; 2001 May 5-10; New Orleans, Louisiana, USA	2001			
Simpson 2004	Glick, I. D.; Fryburg, D.; O'Sullivan, R. L.; Siu, C.; Simpson, G. M.	Ziprasidone's benefits versus olanzapine on weight and insulin resistance		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Simpson 2004	Glick, I. D.; O'Sullivan, R. L.; Fryburg, D.; Simpson, G. M. Horn R. L.; Weiden, P.; Pigott, T.; Bari, M. A.; Siu, C.	Ziprasidone vs olanzapine	weight, lipids, insulin	Proceedings of the 7th World Congress of Biological Psychiatry; 2001 Jul 1-6; Berlin, Germany	2001	2	Suppl 1	

Simpson 2004	Harvey, P.; Simpson, G. M.; Loebel, A.	Effect of ziprasidone vs olanzapine on cognition in schizophrenia	a double-blind study	International Journal of Neuropsychopharmacology	2002	5	Suppl 1	S125
Simpson 2004	Harvey, P.; Simpson, G. M.; Loebel, A.	Ziprasidone vs olanzapine for cognitive function in schizophrenia		European Neuropsychopharmacology	2002	12	Suppl 3	S293
Simpson 2004	Harvey, P. D.; Bowie, C.; Loebel, A. D.	Long-term cognitive improvement	ziprasidone versus olanzapine	Proceedings of the 157th Annual Meeting of the American Psychiatric Association; 2004 May 1-6; New York, USA	2004			
Simpson 2004	Harvey, P. D.; Bowie, C. R.; Loebel, A.	Neuropsychological normalization with long-term atypical antipsychotic treatment	results of a six-month randomized, double-blind comparison of ziprasidone vs olanzapine	Journal of NeuroPsychiatry and Clinical Neurosciences	2006	18	1	54–63
Simpson 2004	Harvey, P. D.; Bowie, C. R.; Loebel, A.; Warrington, L.	Cognitive improvement and neuropsychological normalization with ziprasidone or olanzapine	results of a 6-month study	European Neuropsychopharmacology	2004	14	Suppl 3	S294
Simpson 2004	Harvey, P. D.; Bowie, C. R.; Loebel, A.; Warrington, L.	Normalization of cognitive function with long-term ziprasidone or olanzapine		Proceedings of the Thematic Conference of the World Psychiatric Association on "Treatments in Psychiatry: An Update"; 2004 Nov 10-13; Florence, Italy	2004			
Simpson 2004	Harvey, P. D.; Cohen, G.; Loebel, A.	Ziprasidone vs. olanzapine in schizophrenia	6-month cognitive data	Schizophrenia Research	2004	67	1	205
Simpson 2004	Harvey, P. D.; Cohen, G. M.; Loebel, A.	Ziprasidone versus olanzapine in schizophrenia	6-month cognitive data	Proceedings of the 12th Biennial Winter Workshop on Schizophrenia; 2004 Feb 7-13; Davos, Switzerland	2004			
Simpson 2004	Harvey, P. D.; Simpson, G.; Horne, R.; Weiden, P. J.; Bari, M.; Romano, S. J.	Effects of ziprasidone on cognitive function in patients with schizophrenia	results of a double-blind trial vs. olanzapine	Schizophrenia Research	2002	53	3 Suppl 1	195
Simpson 2004	Harvey, P. D.; Simpson, G.; Horne, R.; Weiden, P. J.; Bari, M.; Romano, S. J.	Ziprasidone vs olanzapine	effects on cognition	Proceedings of the 12th World Congress of Psychiatry; 2002 Aug 24-29; Yokohama, Japan	2002			
Simpson 2004	Harvey, P. D.; Simpson, G.; Horne, R.; Weiden, P. J.; Bari, M.; Romano, S. J.	Ziprasidone vs olanzapine for cognitive function in schizophrenia		European Psychiatry	2002	17	Suppl 1	100s
Simpson 2004	Harvey, P. D.; Simpson, G. M.; Loebel, A.	Ziprasidone versus olanzapine in improving cognition in schizophrenia		Proceedings of the 3rd International Conference on Early Psychosis; 2002 Sep 25-28; Copenhagen, Denmark	2002			69–70

Simpson 2004	Harvey, P. D.; Simpson, G. M.; Weiden, P. J.; Loebel, A.	Ziprasidone vs olanzapine for cognitive function in schizophrenia		Poster	2002			
Simpson 2004	Harvey, P. D.; Siu, C. O.; Romano, S.	Randomized, controlled, double-blind, multicenter comparison of the cognitive effects of ziprasidone versus olanzapine in acutely ill inpatients with schizophrenia or schizoaffective disorder		Psychopharmacology	2004	172	3	324–332
Simpson 2004	Masand, P. S.; Loebel, A. D.	Analysis of remission in a six-month double-blind continuation study of ziprasidone versus olanzapine		Proceedings of the 159th Annual Meeting of the American Psychiatric Association; 2006 May 20-25; Toronto, Canada	2006			
Spiegel 1967	Spiegel, D. E.; Spiegel, K. P.	The effects of carphenazine, trifluoperazine and chlorpromazine on ward behavior, physiological functioning and psychological test scores in chronic schizophrenic patients		Journal of Nervous and Mental Disease	1967	144	2	111–116
Spohn 1977	Spohn, H. E.; Lacoursiere, R. B.; Thompson, K.; Coyne, L.	Phenothiazine effects on psychological and psychophysiological dysfunction in chronic schizophrenics		Archives of General Psychiatry	1977	34	6	633–644
Study 3001+3002+3003_52w	Matkovits-Gupta, T.; Cucchiaro, J.; El-Bizri, H.; Fairweather, D.; Klonowski, E.; Gharabawi, RLasser E. V. M. C. R. F. G.	Safety and efficacy of iloperidone in patients with psychotic disorders	a randomized, double-blind multicenter study	Schizophrenia Research	2001	49	1-2 Suppl	238
Study 3001+3002+3003_52w	Matkovits-Gupta, T.; Lasser, R.; Young, F.; Happy, J.; Gharabawi, G.; Cucchiaro, J.; Fairweather, D.	Managing psychotic disorders through balanced receptor blockade	the zomaril tm clinical program	Proceedings of the 11th World Congress of Psychiatry; 1999 Aug 6-11; Hamburg, Germany	1999	2		163
Volavka 2002	Volavka, J.; Czobor, P.; Sheitman, B.; Lindenmayer, J. P.; Citrome, L.; McEvoy, J. P.; Cooper, T. B.; Chakos,	Clozapine, olanzapine, risperidone, and haloperidol in the treatment of patients with chronic schizophrenia and schizoaffective disorder		American Journal of Psychiatry	2002	159	2	255–262

	M.; Lieberman, J. A.							
Volavka 2002	Volavka, J.; Czobor, P.; Sheitman, B.; Lindenmayer, J. P.; Citrome, L.; McEvoy, J. P.; Cooper, T. B.; Chakos, M.; Lieberman, J. A.	"Clozapine, olanzapine, risperidone, and haloperidol in the treatment of patients with chronic schizophrenia and schizoaffective disorder"	erratum	American Journal of Psychiatry	2002	159	12	2132
Volavka 2002	Volavka, J.; Nolan, K. A.; Kline, L.; Czobor, P.; Citrome, L.; Sheitman, B.; Lindenmayer, J. P.; McEvoy, J.; Lieberman, J. A.	Efficacy of clozapine, olanzapine, risperidone, and haloperidol in schizophrenia and schizoaffective disorder assessed with nurses observation scale for inpatient evaluation		Schizophrenia Research	2005	76	1	127–129
Volavka 2002	Bilder, R. M.; Goldman, R. S.; Volavka, J.; Czobor, P.; Hoptman, M.; Sheitman, B.; Lindenmayer, J. P.; Citrome, L.; McEvoy, J.; Kunz, M.; Chakos, M.; Cooper, T. B.; Horowitz, T. L.; Lieberman, J. A.	Neurocognitive effects of clozapine, olanzapine, risperidone, and haloperidol in patients with chronic schizophrenia or schizoaffective disorder		American Journal of Psychiatry	2002	159	6	1018–1028
Volavka 2002	Bilder, R. M.; Goldman, R. S.; Volavka, J.; Czobor, P.; Hoptman, M.; Sheitman, B.; Lindenmayer, J. P.; Citrome, L.; McEvoy, J.; Kunz, M.; Chakos, M.; Cooper, T. B.; Lieberman, J. A.	Neurocognitive effects of clozapine, olanzapine, risperidone, and haloperidol on treatment-resistant patients with schizophrenia and schizoaffective disorder		Proceedings of the International Congress on Schizophrenia Research; 2001 April 28 - May 2; Whistler, British Columbia, Canada	2001			
Volavka 2002	Bilder, R. M.; Goldman, R. S.; Volavka, J.; Czobor, P.; Hoptman, M.; Sheitman, B.; Lindenmayer, J. P.;	Neurocognitive effects of clozapine, olanzapine, risperidone, and haloperidol on treatment-resistant patients with schizophrenia and schizoaffective disorder		European Neuropsychopharmacology	2001	11	3	256

	Citrome, L.; McEvoy, J.; Kunz, M.; Chakos, M.; Lieberman, J. A.							
Volavka 2002	Bilder, R. M.; Goldman, R. S.; Volavka, J.; Czobor, P.; Hoptman, M.; Sheitman, B.; Lindenmayer, J. P.; Citrome, L.; McEvoy, J.; Kunz, M.; Chakos, M.; Lieberman, J. A.	Neurocognitive effects of clozapine, olanzapine, risperidone, and haloperidol on treatment-resistant patients with schizophrenia and schizoaffective disorder		Schizophrenia Research	2002	53	3 Suppl 1	194
Volavka 2002	Citrome, L.; Volavka, J.; Czobor, P.; Sheitman, B.; Lindenmayer, J. P.; McEvoy, J.; Cooper, T. B.; Chakos, M.; Lieberman, J. A.	Effects of clozapine, olanzapine, risperidone, and haloperidol on hostility among patients with schizophrenia		Psychiatric Services	2001	52	11	1510–1514
Volavka 2002	Citrome, L. L.; Volavka, J.; Czobor, P.; Nolan, K.; Lieberman, J. A.; Lindenmayer, J. P.; Sheitman, B. B.	Overt aggression and psychotic symptoms in patients with schizophrenia treated with clozapine, olanzapine, risperidone, or haloperidol		Proceedings of the 156th Annual Meeting of the American Psychiatric Association; 2003 May 17-22; San Francisco, California, USA	2003			
Volavka 2002	Citrome, L. L.; Volavka, J.; Czobor, P.; Sheitman, B. B.; Lindenmayer, J. P.; McEvoy, J. P.; Lieberman, J. A.	Atypical antipsychotics and hostility in schizophrenia	A double-blind study	Proceedings of the 154th Annual Meeting of the American Psychiatric Association; 2001 May 5-10; New Orleans, Louisiana, USA	2001			
Volavka 2002	Citrome, L. L.; Volavka, J.; Czobor, P.; Sheitman, B. B.; Lindenmayer, J. P.; McEvoy, J. P.; Lieberman, J. A.	Atypical antipsychotics and hostility in schizophrenia	a double-blind study	Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Volavka 2002	Czobor, P.; Volavka, J.; Sheitman, B.; Lindenmayer, J. P.; Citrome, L.; McEnvoy, J.; Cooper, T.	Antipsychotic-induced weight gain and therapeutic response	a differential association	Journal of Clinical Psychopharmacology	2002	22	3	244–251

	B.; Chakos, M.; Lieberman, J. A.							
Volavka 2002	De, Luca V.; Vincent, J. B.; Muller, D. J.; Hwang, R.; Shinkai, T.; Volavka, J.; Czobor, P.; Sheitman, B. B.; Lindenmayer, J. P.; Citrome, L.; McEvoy, J. P.; Lieberman, J. A.; Kennedy, J. L.	Identification of a naturally occurring 21 bp deletion in alpha 2c noradrenergic receptor gene and cognitive correlates to antipsychotic treatment		Pharmacological Research	2005	51	4	381–384
Volavka 2002	Hoptman, M. J.; Volavka, J.; Czobor, P.; Gerig, G.; Chakos, M.; Blocher, J.; Citrome, L. L.; Sheitman, B.; Lindenmayer, J. P.; Lieberman, J. A.; Bilder, R. M.	Aggression and quantitative MRI measures of caudate in patients with chronic schizophrenia or schizoaffective disorder		Journal of NeuroPsychiatry and Clinical Neurosciences	2006	18	4	509–515
Volavka 2002	Horowitz, T. L.	Comparative neuropsychological effects of clozapine, risperidone, and haloperidol in treatment-refractory schizophrenia		Dissertation	2000			134
Volavka 2002	Lieberman, J. A.	Risperidone and clozapine in chronic schizophrenia		CRISP Database (https://www-commons.cit.nih.gov/crisp/index.html Accessed 19th February 2001)	2001			
Volavka 2002	Lindenmayer, J. P.; Czobor, P.; Volavka, J.; Citrome, L.; Sheitman, B.; McEvoy, J.; Cooper, T. B.; Chakos, M.; Lieberman, J. A.	Changes in glucose and cholesterol levels in schizophrenia patients treated with typical and atypical antipsychotics		International Journal of Neuropsychopharmacology	2002	5	Suppl 1	S169
Volavka 2002	Lindenmayer, J. P.; Czobor, P.; Volavka, J.; Citrome, L.; Sheitman, B.; McEvoy, J. P.; Cooper, T. B.; Chakos, M.; Lieberman, J. A.	Changes in glucose and cholesterol levels in patients with schizophrenia treated with typical or atypical antipsychotics		American Journal of Psychiatry	2003	160	2	290–296

Volavka 2002	Lindenmayer, J. P.; Czobor, P.; Volavka, J.; Citrome, L. L.; Sheitman, B. B.; McEvoy, J. P.; Cooper, T. B.	Changes in glucose and cholesterol in schizophrenia treated with atypicals		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Volavka 2002	Lindenmayer, J. P.; Czobor, P.; Volavka, J.; Lieberman, J. A.; Citrome, L.; Sheitman, B.; McEvoy, J. P.; Cooper, T. B.; Chakos, M.	Effects of atypical antipsychotics on the syndromal profile in treatment-resistant schizophrenia		Journal of Clinical Psychiatry	2004	65	4	551–556
Volavka 2002	Lindenmayer, J. P.; Czobor, P.; Volavka, J.; Lieberman, J. A.; Citrome, L. L.; Sheitman, B. B.; McEvoy, J. P.	Effects of atypicals on the syndromal profile in treatment-resistant schizophrenia		Proceedings of the 156th Annual Meeting of the American Psychiatric Association; 2003 May 17-22; San Francisco, California, USA	2003			
Volavka 2002	Lindenmayer, J. P.; Czobor, P.; Yolayka, J.; Lieberman, J. A.; McEvoy, J. P.; Citrome, L. L.; Sheitman, B. B.	Do atypicals change the syndrome profile in treatment-resistant schizophrenia?		Proceedings of the 154th Annual Meeting of the American Psychiatric Association; 2001 May 5-10; New Orleans, Louisiana, USA	2001			
Volavka 2002	Lindenmayer, J. P.; Volavka, J.; Lieberman, J. A.; Citrome, L. L.; Sheitman, B.; McEvoy, J. P.; Cooper, T.	Do atypicals change the syndromal profile in treatment-resistant schizophrenia?		Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, Pennsylvania, USA	2002			
Vontour 2005	Nct	Do patients taking aripiprazole learn more in vocational skills training than patients taking olanzapine?		https://ClinicalTrials.gov/	2005			
Voruganti 2007	Nct	A one-year multicentre randomized, double blind, controlled effectiveness study of quetiapine and olanzapine, comparing their relative potential in improving neurocognitive deficits, functional outcomes and quality		https://ClinicalTrials.gov/	2005			

		of life in schizophrenia						
Voruganti 2007	Voruganti, L. P.; Awad, A. G.; Parker, G.; Forrest, C.; Usmani, Y.; Fernando, M. L. D.; Senthilal, S.	Cognition, functioning and quality of life in schizophrenia treatment	results of a one-year randomized controlled trial of olanzapine and quetiapine	Schizophrenia Research	2007	96	1-3	146–155
Wagner 2005	Quednow, B. B.; Wagner, M.; Westheide, J.; Beckmann, K.; Bliesener, N.; Maier, W.; Kuhn, K. U.	Sensorimotor gating and habituation of the startle response in schizophrenic patients randomly treated with amisulpride or olanzapine		Biological Psychiatry	2006	59	6	536–545
Wagner 2005	Wagner, M.; Quednow, B. B.; Westheide, J.; Schlaepfer, T. E.; Maier, W.; Kuhn, K. U.	Cognitive improvement in schizophrenic patients does not require a serotonergic mechanism	randomized controlled trial of olanzapine vs amisulpride	Neuropsychopharmacology	2005	30	2	381–390
Wang 2013	Wang, Ch; Li, Y.; Yang, J.; Su, Ly; Geng, Yg; Li, H.; Wang, Jk; Mu, Jl	A randomized controlled trial of olanzapine improving memory deficits in Han Chinese patients with first-episode schizophrenia		Schizophrenia Research	2013	144	1-3	129–135
Wang 2013b	Wang, Juan; Hu, Maorong; Guo, Xiaofeng; Wu, Renrong; Li, Lehua; Zhao, Jingping	Cognitive effects of atypical antipsychotic drugs in first-episode drug-naive schizophrenic patients		Neural Regeneration Research	2013	8	3	277–286
Wang 2022	Wang D // Wei N // Hu F // Li J // Wang Y // Qian Z // Yang M // Yao M // Xia Y // Yu H // Tu W // Ye M // Qian C // Hu J // Chen J // Hu C // Huang M // Xu Y // Hu S	Paliperidone Extended Release Versus Olanzapine in Treatment-Resistant Schizophrenia: A Randomized, Double-Blind, Multicenter Study		Journal of Clinical Psychopharmacology	2022	42	4	383-390
Wirshing 1999	Wirshing, D. A.; Marder, S. R.; Wirshing, W. C.	Subjective response to atypical antipsychotic medications		Schizophrenia Research	1999	36	1-3	302
Wirshing 1999	Wirshing, D. A.; Marshall, B. D., Jr.; Green, M. F.; Mintz,	Risperidone in treatment-refractory schizophrenia		American Journal of Psychiatry	1999	156	9	1374–1379

	J.; Marder, S. R.; Wirshing, W. C.							
Wirshing 1999	Wirshing, D. A.; Perkins, V.; Marder, S. R.; Wirshing, W. C.	Sexual side effects of atypical antipsychotic medications		Proceedings of the 152nd Annual Meeting of the American Psychiatric Association; 1999 May 15-20; Washington DC, USA	1999			
Wirshing 1999	Wirshing, W. C.; Ames, D.; Green, M.; Marshall, B. D.; Marder, S. R.	Risperidone versus haloperidol in treatment-refractory schizophrenia	preliminary results	Psychopharmacology Bulletin	1995	31	3	633
Wirshing 1999	Wirshing, W. C.; Ames, D.; Marder, S. R.; Marshall, B. D.; Green, M. F.; McGurk, S.	Risperidone vs haloperidol in treatment resistant schizophrenia	preliminary results	Schizophrenia Research	1996	18	2-3	130
Wirshing 1999	Wirshing, W. C.; Ames, D.; Marder, S. R.; Marshall, B. D.; Green, M. F.; McGurk, S. R.	Risperidone in treatment resistant schizophrenia		Proceedings of the 34th Annual Meeting of the American College of Neuropsychopharmacology; 1995 Dec 11-15; San Juan, Puerto Rico	1995			270
Wirshing 1999	Wirshing, W. C.; Ames, D.; Marshall, B. D.; Green, M. F.; McGurk, S.	Risperidone in treatment resistant schizophrenia		Proceedings of the 8th Biennial Winter Workshop on Schizophrenia; 1996 Mar 16-22; Crans Montana, Switzerland	1996			
Wirshing 1999	Wirshing, W. C.; Ames, D.; Palmer, Bray M.; Marshall, B. D.; Green, M. F.; Marder, S. R.	Risperidone versus haloperidol in treatment refractory schizophrenia	preliminary results	Proceedings of the 148th Annual Meeting of the American Psychiatric Association; 1995 May 20-25; Miami, Florida, USA	1995			152
Wirshing 1999	Wirshing, W. C.; Green, M. F.; Ames, D.; Marshall, B. D.; McGurk, S. R.; Mintz, J.; Marder, S. R.	Risperidone vs. haloperidol in treatment-resistant schizophrenia		Proceedings of the 6th World Congress of Biological Psychiatry; 1997 Jun 22-27; Nice, France	1997			
Wirshing 1999	Ames, D.; Wirshing, W.; Marshall, B. D.; Green, M. F.; McGurk, S. R.; Mintz, J.; Marder, S. R.	Treatment resistant schizophrenia	evaluation of risperidone vs. haloperidol	Biological Psychiatry	1997	41		72-73S
Wirshing 1999	Ames, D.; Wirshing,	Risperidone vs haloperidol	relative liabilities for OCD and depression	Proceedings of the 8th Biennial Winter	1996			

	W. C.; Marder, S. R.; Hwang, S. S.; German, C. A.; Mintz, J.; Goldstein, D.			Workshop on Schizophrenia; 1996 Mar 16-22; Crans Montana, Switzerland				
Wirshing 1999	Ames, D.; Wirshing, W. C.; Marder, S. R.; Hwang, S. S.; German, C. A.; Mintz, J.; Goldstein, D.	Risperidone vs. haloperidol	relative liabilities for OCD and depression	Schizophrenia Research	1996	18	2	129
Wirshing 1999	Ames, D.; Wirshing, W. C.; Marder, S. R.; Hwang, S. S.; German, C. A.; Stough, A.	Subjective response to risperidone and haloperidol	preliminary results	Schizophrenia Research	1996	18	2	129
Wirshing 1999	Ames, D.; Wirshing, W. C.; Marder, S. R.; Hwang, S. S.; German, C. A.; Strough, A. B.	Subjective response to risperidone and haloperidol	preliminary results	Proceedings of the 8th Biennial Winter Workshop on Schizophrenia; 1996 Mar 16-22; Crans Montana, Switzerland	1996			
Wirshing 1999	Ames, D.; Wirshing, W. C.; Marshall, B. D.; Green, M. F.; McGurk, S. R.; Mintz, J.; Marder, S. R.	Risperidone vs. haloperidol in treatment resistant schizophrenia		Schizophrenia Research	1997	24	1 - 2	193
Wirshing 1999	Ames, D.; Wirshing, W. C.; Marshall, B. D.; Green, M. F.; McGurk, S. R.; Mintz, J.; Marder, S. R.	Treatment-resistant schizophrenia	efficacy of risperidone versus haloperidol	Proceedings of the 150th Annual Meeting of the American Psychiatric Association; 1997 May 17-22; San Diego, California, USA	1997			
Wirshing 1999	Green, M. F.; Marshall, B. D.; Wirshing, W. C.; Ames, D.; Marder, S. R.; McGurk, S.; Kern, R. S.; Mintz, J.	Risperidone's effects on verbal working memory		Schizophrenia Research	1997	24	1 - 2	214
Wirshing 1999	Green, M. F.; Marshall, B. D., Jr.; Wirshing, W. C.; Ames, D.; Marder, S.	Does risperidone improve verbal working memory in treatment-resistant schizophrenia?		American Journal of Psychiatry	1997	154	6	799–804

	R.; McGurk, S.; Kern, R. S.; Mintz, J.							
Wirshing 1999	Kee, K. S.; Kern, R. S.; Marshall, B. D.; Green, M. F.	Risperidone versus haloperidol for perception of emotion in treatment-resistant schizophrenia - preliminary findings		Proceedings of the 151st Annual Meeting of the American Psychiatric Association; 1998 May 30 - Jun 4; Toronto, Ontario, Canada	1998			
Wirshing 1999	Kee, K. S.; Kern, R. S.; Marshall, B. D., Jr.; Green, M. F.	Risperidone versus haloperidol for perception of emotion in treatment resistant schizophrenia	preliminary findings	Schizophrenia Research	1998	31	2 - 3	159–165
Wirshing 1999	Kern, R. S.; Green, M. F.; Marshall, B. D.; Wirshing, W. C.; Ames, D.; Marder, S. R.; McGurk, S.; Mintz, J.	Risperidone vs haloperidol on reaction time and fine motor speed		Schizophrenia Research	1997	24	1 - 2	215
Wirshing 1999	Kern, R. S.; Green, M. F.; Marshall, B. D., Jr.; Wirshing, W. C.; Wirshing, D.; McGurk, S.; Marder, S. R.; Mintz, J.	Risperidone vs. haloperidol on reaction time, manual dexterity, and motor learning in treatment resistant schizophrenia patients		Biological Psychiatry	1998	44	8	726–732
Wirshing 1999	Kern, R. S.; Green, M. F.; Marshall, B. D., Jr.; Wirshing, W. C.; Wirshing, D.; McGurk, S. R.; Marder, S. R.; Mintz, J.	Risperidone versus haloperidol on secondary memory	can newer medications aid learning?	Schizophrenia Bulletin	1999	25	2	223–232
Wirshing 1999	McGurk, S. R.; Green, M. F.; Wirshing, W. C.; Wirshing, D. A.; Marder, S. R.; Mintz, J. K. R.	Antipsychotic and anticholinergic effects on two types of spatial memory in schizophrenia		Schizophrenia Research	2004	68	2 - 3	225–233
Wirshing 1999	McGurk, S. R.; Green, M. F.; Wirshing, W. C.; Ames, D.; Marshall; Marder, S. R.; Koehn, H.	The effects of risperidone versus haloperidol on frontal lobe functioning in treatment-resistant schizophrenia		Proceedings of the 150th Annual Meeting of the American Psychiatric Association; 1997 May 17-22; San Diego, California, USA	1997			

Wirshing 1999	McGurk, S. R.; Green, M. F.; Wirshing, W. C.; Ames, D.; Marshall, B. D.; Marder, S. R.	Effects of risperidone on spatial working memory		Proceedings of the 148th Annual Meeting of the American Psychiatric Association; 1995 May 20-25; Miami, Florida, USA	1995			68
Wirshing 1999	McGurk, S. R.; Green, M. F.; Wirshing, W. C.; Ames, D.; Marshall, B. D.; Marder, S. R.	The effects of risperidone versus haloperidol on measures of prefrontal functioning in treatment-resistant schizophrenia		Proceedings of the 149th Annual Meeting of the American Psychiatric Association; 1996 May 4-9; New York, USA	1996			
Wirshing 1999	McGurk, S. R.; Green, M. F.; Wirshing, W. C.; Ames, D.; Marshall, B. D.; Marder, S. R.	The effects of risperidone vs. haloperidol on spatial working memory in treatment-resistant schizophrenia		Biological Psychiatry	1996	39		571
Xiao 2021	Xiao, J.; Huang, J.; Long, Y.; Wang, X.; Wang, Y.; Yang, Y.; Hei, G.; Sun, M.; Zhao, J.; Li, L.; Shao, T.; Wang, W.; Kang, D.; Liu, C.; Xie, P.; Huang, Y.; Wu, R.; Zhao, J.	Optimizing and Individualizing the Pharmacological Treatment of First-Episode Schizophrenic Patients: Study Protocol for a Multicenter Clinical Trial		Front Psychiatry	2021			611070
Zhong 2006_cognition	Zhong, K.; Harvey, P.; Brecher, M.; Sweitzer, D.	A randomized, double-blind study of quetiapine and risperidone in the treatment of schizophrenia		Proceedings of the 43rd Annual Meeting of the American College of Neuro-Psychopharmacology; 2004 Dec 12-16; San Juan, Puerto Rico	2004			1–4
Zhong 2006_cognition	Zhong, K.; Harvey, P.; Brecher, M.; Sweitzer, D.	A randomized, double-blind study of quetiapine and risperidone in the treatment of schizophrenia		Neuropsychopharmacology	2004	29	Suppl 1	S232
Zhong 2006_cognition	Zhong, K.; Harvey, P.; Brecher, M.; Sweitzer, D.	A randomized double - blind study of quetiapine and risperidone in the treatment of schizophrenia		Schizophrenia Bulletin	2005	31		508
Zhong 2006_cognition	Zhong, K. X.; Sweitzer, D. E.; Hamer, R. M.; Lieberman, J. A.	Comparison of quetiapine and risperidone in the treatment of schizophrenia	a randomized, double-blind, flexible-dose, 8-week study	Journal of Clinical Psychiatry	2006	67	7	1093–1103
Zhong 2006_cognition	Astra-Zeneca	A multicenter, double-blind, randomized comparison of the efficacy		ClinicalStudyResults.org	2008			

		and safety of quetiapine fumarate (seroquel) and risperidone (risperdal in the treatment of patients with schizophrenia						
Zhong 2006_cognition	Buchanan, R. W.	Important steps in the development of cognitive-enhancing drugs in schizophrenia		American Journal of Psychiatry	2006	163	11	1867–1869
Zhong 2006_cognition	Harvey, P. D.; Brecher, M.; Sweitzer, D.; Zhong, K.	Cognitive function in schizophrenia	effects of quetiapine and risperidone	Proceedings of the 158th Annual Meeting of the American Psychiatric Association; 2005 May 21-26; Atlanta, Georgia, USA	2005			Nr244
Zhong 2006_cognition	Harvey, P. D.; Patterson, T. L.; Potter, L. S.; Zhong, K.; Brecher, M.	Improvement in social competence with short-term atypical antipsychotic treatment	a randomized, double-blind comparison of quetiapine versus risperidone for social competence, social cognition, and neuropsychological functioning	American Journal of Psychiatry	2006	163	11	1918–1925
Zimbroff 2007	Nct	A study comparing the efficacy and safety of ziprasidone and aripiprazole for the treatment of schizophrenia or schizoaffective disorder in hospitalized patients		https://ClinicalTrials.gov/	2008			
Zimbroff 2007	Zimbroff, D.; Warrington, L.; Loebel, A.; Yang, R.; Siu, C.	Comparison of ziprasidone and aripiprazole in acutely ill patients with schizophrenia or schizoaffective disorder	a randomized, double-blind, 4-week study	International Clinical Psychopharmacology	2007	22	6	363–370

Anhang E: Berechnung des primären Outcomes

Where the MCCB composite score was not available, we calculated the overall score for each study and comparison by meta-analysing the domain-specific scores.

Since we extracted arm-based data and the domains represent different cognition measures which can be measured with different scales that could not be summarized like that, we calculated domain-specific standardised mean differences (SMDs) for each contrast (treatment comparison).

We divided the sample sizes (n1 and n2) by the number of domains to avoid that they are "artificially increased" when performing multiple meta-analyses.

```
TestPair <- pairwise(treat=Drug_name,n=IndivArm_n,
                                    mean=IndivArm_mean,sd=IndivArm_sd, data=data1,sm=EffectSizeMeasure, studlab=Study_name_Domaine, allstudies = TRUE)


TestPair <- mutate(TestPair, n1= n1/NumberOfDomaines)

TestPair <- mutate(TestPair, n2= n2/NumberOfDomaines)

DF_PoolDomaines <- filter(TestPair, TestPair$Study_Comparison == StudyComparisonToCalculateOverallScore)

MA_S_SMD <- metacont(mean.e=mean1, sd.e=sd1, n.e=n1,
                     mean.c=mean2, sd.c=sd2, n.c=n2,
                                  data=DF_PoolDomaines,
                 studlab= Study_Comparison, sm="SMD")

DFforest <- data.frame(Study=MA_S_SMD$data$Study_name,
                                    Study_Comparison=MA_S_SMD$studlab,
                       TE=MA_S_SMD$TE, seTE=MA_S_SMD$seTE,
                       n_e=MA_S_SMD$n.e, n_c=MA_S_SMD$n.c,
```

Then, we synthesized all SMDs across the domains of the same treatment comparison in a study using a meta-analytic multivariate fixed-effects model $\boldsymbol{y} \sim MVN(\theta, \boldsymbol{V})$. Specifically, for a study comparing treat A versus treatment B with domains *i=1,…,D*.

$$\begin{pmatrix} y_{AB,1} \\ \vdots \\ y_{AB,D} \end{pmatrix} \sim N\left(\begin{pmatrix} \theta_{AB} \\ \cdots \\ \theta_{AB} \end{pmatrix}, \begin{pmatrix} \sigma^2_{AB,1} & \cdots & \rho\sqrt{\sigma_{AB,1}\sigma_{AB,D}} \\ \vdots & \ddots & \vdots \\ \rho\sqrt{\sigma_{AB,d}\sigma_{AB,1}} & \cdots & \sigma^2_{Ab,D} \end{pmatrix} \right)$$

where $\boldsymbol{y} = (y_{AB,1}, \ldots, y_{AB,i}, \ldots, y_{AB,D})$ is a vector of the *D* observed outcomes (domains), θ is the (average) true outcome, and $\boldsymbol{V}$ is the variance-covariance matrix of the sampling errors $\sigma_{AB,i}$, andρ is the sample correlation of 0.5 between domains.

```
N <-nrow(DFforest)
  V=matrix(rep(0,N*N), nrow = N)
  diag(V)=(DFforest$seTE)^2
  rho=0.5
  for(k in 1:1){
   l=NumberOfObservationsPerStudy[k,2]
   n=l
   for(i in 1:(n-1)){
    for(j in (i+1):n){
     V[i,j]=rho*sqrt(diag(V)[i]*diag(V)[j])
```

```
      V[j,i]=V[i,j]
    }
  }
}
mvMA = rma.mv(yi=TE, V=V, data=DFforest)
```

For example, study Zhong 2006 compared Quetiapine (*A*) vs Risperidone (*B*) and had four cognitive domains (*D=4*) available to calculate the overall score: Attention Vigilance, Social Cognition, Speed of Processing and Verbal Learning. As shown in the table below, the pairwise command was used to create contrast-based data (one row for each contrast and domain of the study) and metacont was used to estimate relevant SMD and standard error (SE) for each domain.

Treat1 (*A*)	Treat2 (*B*)	Domain (*i*)	n1	mean1	sd1	n2	mean2	sd2	SMD ($y_{AB,i}$)	SE ($\sigma_{AB,i}$)
Quetiapine	Risperidone	Attention Vigilance	29.00	-0.66	0.32	32.75	-0.74	0.26	0.27	0.26
Quetiapine	Risperidone	Social Cognition	31.00	-21.41	7.34	35.50	-22.08	6.99	0.09	0.26
Quetiapine	Risperidone	Speed of Processing	33.25	-15.23	6.27	38.00	-15.47	5.60	0.04	0.24
Quetiapine	Risperidone	Verbal Learning	33.75	-34.94	12.98	38.50	-37.89	13.36	0.22	0.24

The 4 domains' estimates are then meta-analysed with the multivariate fixed-effects model in the rma.mv command using the variance-covariance matrix $\boldsymbol{V}$ calculated with the formula described above.

$$\boldsymbol{V} = \begin{pmatrix} 0.066 & 0.032 & 0.030 & 0.030 \\ 0.030 & 0.060 & 0.029 & 0.029 \\ 0.030 & 0.029 & 0.056 & 0.028 \\ 0.030 & 0.029 & 0.028 & 0.056 \end{pmatrix}$$

The overall score for the study Zhong 2006 is the following:

Comparison	overall score ($\hat{\theta}_{AB}$)	overall score SE
Quetiapine vs Risperidone	0.15	0.192

If the study Zhong 2006 had three arms, let's say Quetiapine (*A*), Risperidone (*B*), and Placebo (*C*). The procedure above would be repeated for each pairwise comparison (Quetiapine vs Risperidone (*AB*), Quetiapine vs Placebo (*AC*), Placebo vs Risperidone (*BC*)), so the first table above would have 12 rows in total (3 comparisons × 4 domains). Three different overall scores would be produced, $\hat{\theta}_{AB}$, $\hat{\theta}_{AC}$, and $\hat{\theta}_{BC}$.

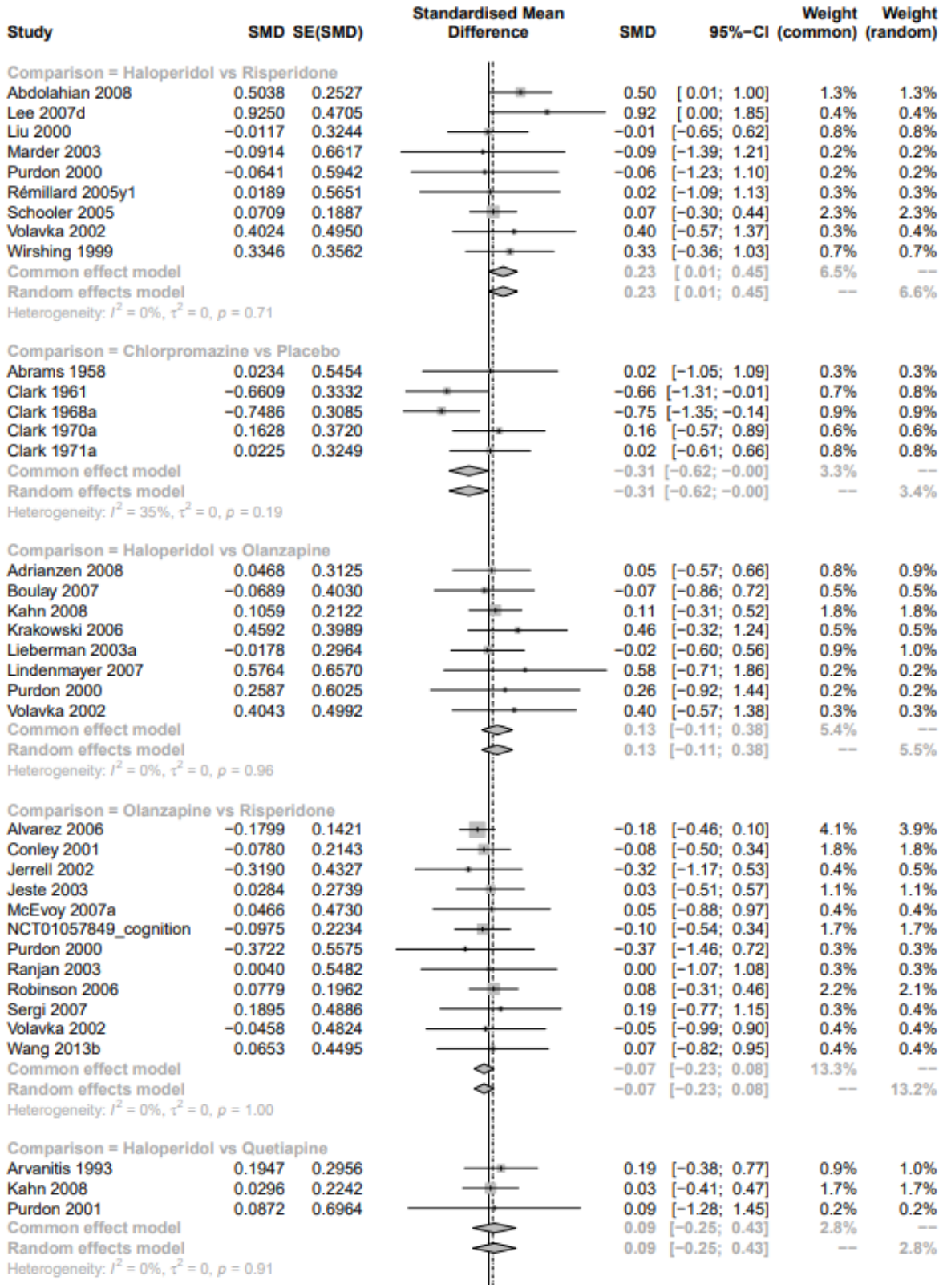
The obtained estimates are then used in netmeta and jags, for frequentist and Bayesian NMA, respectively. For multi-arm studies we used the adjusted standard errors of the estimates, as produced by netmeta.

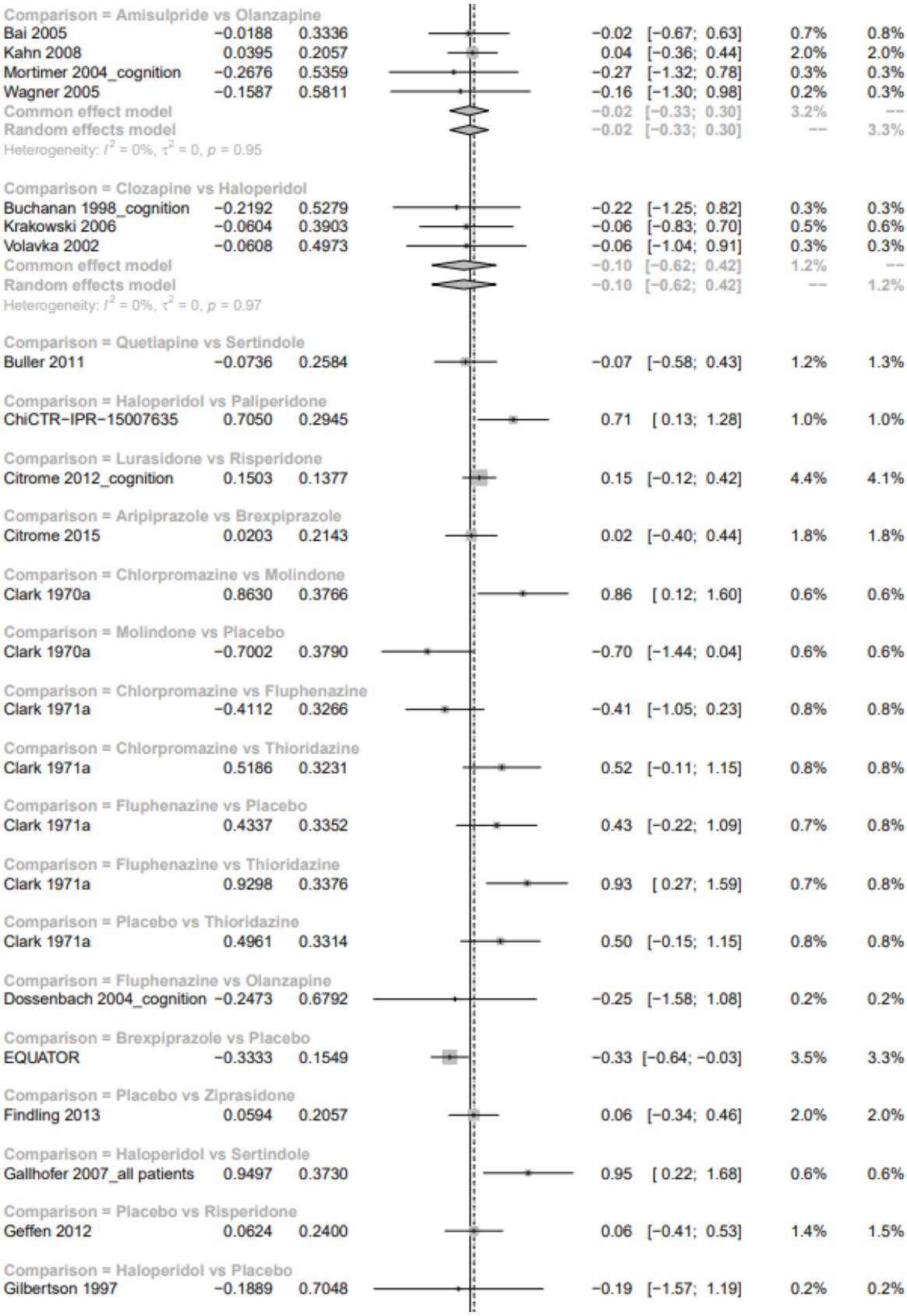
For the studies reporting the composite score, as measured according to the MATRICS initiative (n=3), we did not calculate the overall score by meta-analysing the domains but simply used the original composite score.

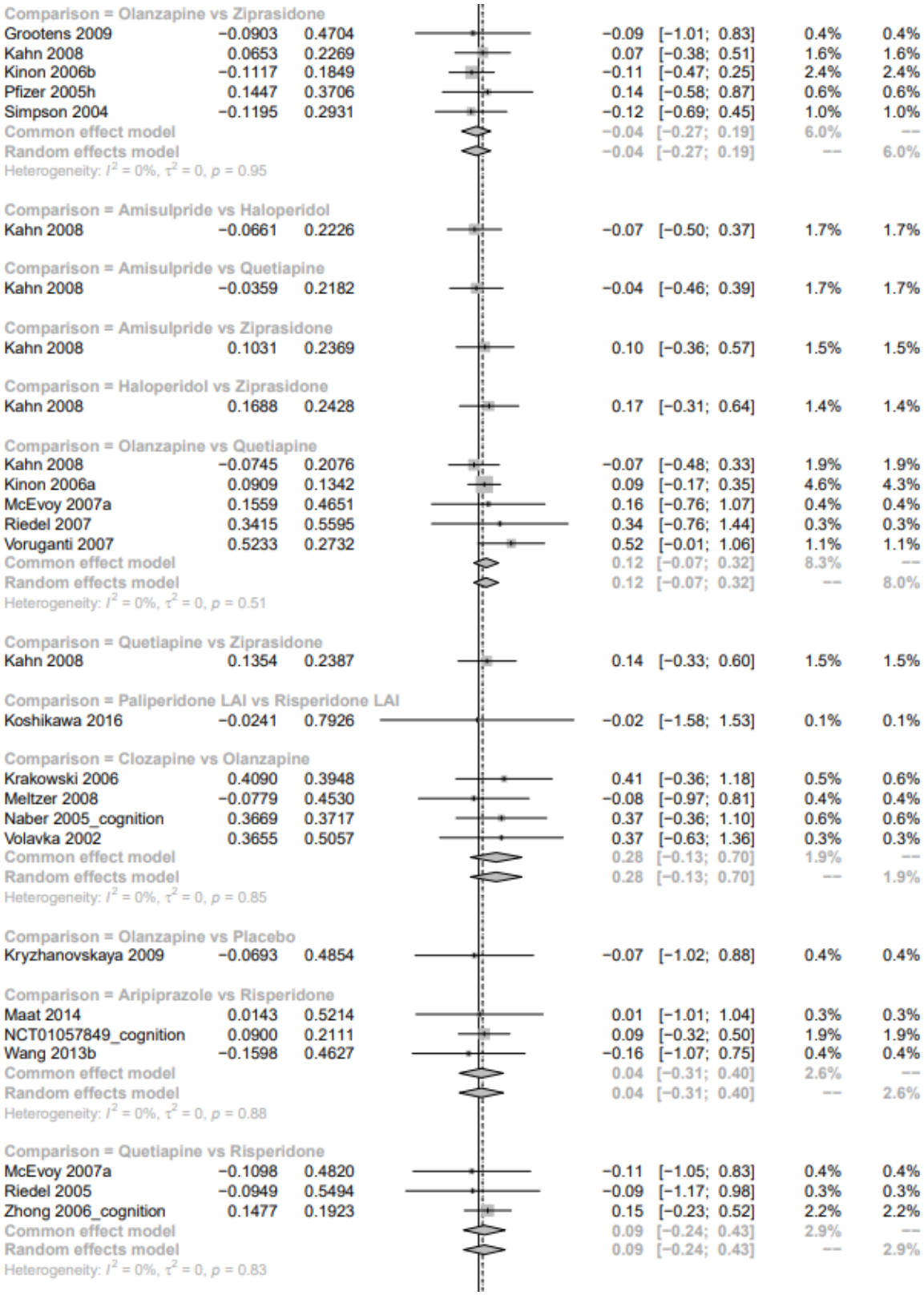
Anhang F: Ergebnisse

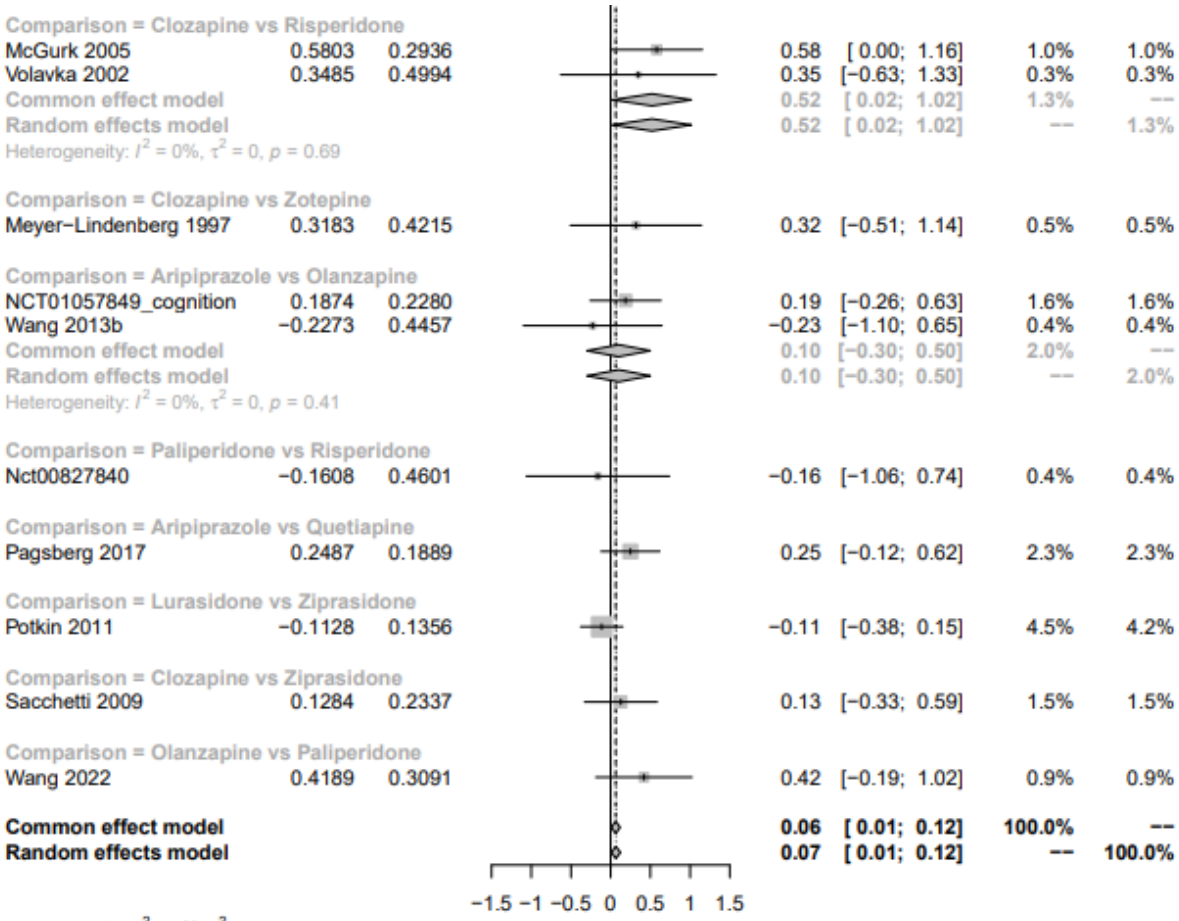
Pairwise meta-analyses

Composite Score



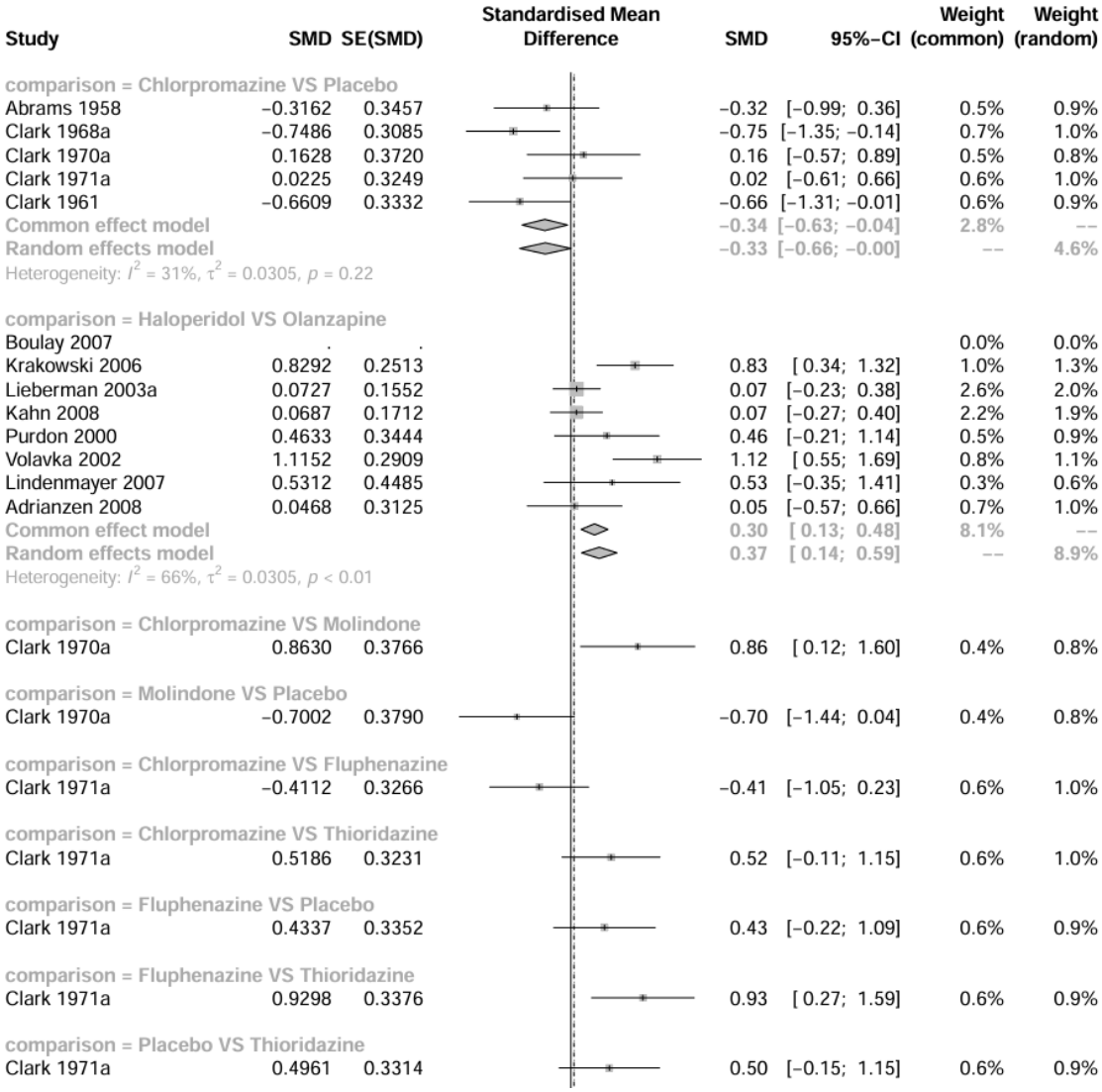

Comparison = Amisulpride vs Olanzapine
Bai 2005 −0.0188 0.3336 −0.02 [−0.67; 0.63] 0.7% 0.8%
Kahn 2008 0.0395 0.2057 0.04 [−0.36; 0.44] 2.0% 2.0%
Mortimer 2004_cognition −0.2676 0.5359 −0.27 [−1.32; 0.78] 0.3% 0.3%
Wagner 2005 −0.1587 0.5811 −0.16 [−1.30; 0.98] 0.2% 0.3%
Common effect model −0.02 [−0.33; 0.30] 3.2% ---
Random effects model −0.02 [−0.33; 0.30] --- 3.3%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.95
Comparison = Clozapine vs Haloperidol
Buchanan 1998_cognition −0.2192 0.5279 −0.22 [−1.25; 0.82] 0.3% 0.3%
Krakowski 2006 −0.0604 0.3903 −0.06 [−0.83; 0.70] 0.5% 0.6%
Volavka 2002 −0.0608 0.4973 −0.06 [−1.04; 0.91] 0.3% 0.3%
Common effect model −0.10 [−0.62; 0.42] 1.2% ---
Random effects model −0.10 [−0.62; 0.42] --- 1.2%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.97
Comparison = Quetiapine vs Sertindole
Buller 2011 −0.0736 0.2584 −0.07 [−0.58; 0.43] 1.2% 1.3%
Comparison = Haloperidol vs Paliperidone
ChiCTR−IPR−15007635 0.7050 0.2945 0.71 [0.13; 1.28] 1.0% 1.0%
Comparison = Lurasidone vs Risperidone
Citrome 2012_cognition 0.1503 0.1377 0.15 [−0.12; 0.42] 4.4% 4.1%
Comparison = Aripiprazole vs Brexpiprazole
Citrome 2015 0.0203 0.2143 0.02 [−0.40; 0.44] 1.8% 1.8%
Comparison = Chlorpromazine vs Molindone
Clark 1970a 0.8630 0.3766 0.86 [0.12; 1.60] 0.6% 0.6%
Comparison = Molindone vs Placebo
Clark 1970a −0.7002 0.3790 −0.70 [−1.44; 0.04] 0.6% 0.6%
Comparison = Chlorpromazine vs Fluphenazine
Clark 1971a −0.4112 0.3266 −0.41 [−1.05; 0.23] 0.8% 0.8%
Comparison = Chlorpromazine vs Thioridazine
Clark 1971a 0.5186 0.3231 0.52 [−0.11; 1.15] 0.8% 0.8%
Comparison = Fluphenazine vs Placebo
Clark 1971a 0.4337 0.3352 0.43 [−0.22; 1.09] 0.7% 0.8%
Comparison = Fluphenazine vs Thioridazine
Clark 1971a 0.9298 0.3376 0.93 [0.27; 1.59] 0.7% 0.8%
Comparison = Placebo vs Thioridazine
Clark 1971a 0.4961 0.3314 0.50 [−0.15; 1.15] 0.8% 0.8%
Comparison = Fluphenazine vs Olanzapine
Dossenbach 2004_cognition −0.2473 0.6792 −0.25 [−1.58; 1.08] 0.2% 0.2%
Comparison = Brexpiprazole vs Placebo
EQUATOR −0.3333 0.1549 −0.33 [−0.64; −0.03] 3.5% 3.3%
Comparison = Placebo vs Ziprasidone
Findling 2013 0.0594 0.2057 0.06 [−0.34; 0.46] 2.0% 2.0%
Comparison = Haloperidol vs Sertindole
Gallhofer 2007_all patients 0.9497 0.3730 0.95 [0.22; 1.68] 0.6% 0.6%
Comparison = Placebo vs Risperidone
Geffen 2012 0.0624 0.2400 0.06 [−0.41; 0.53] 1.4% 1.5%
Comparison = Haloperidol vs Placebo
Gilbertson 1997 −0.1889 0.7048 −0.19 [−1.57; 1.19] 0.2% 0.2%

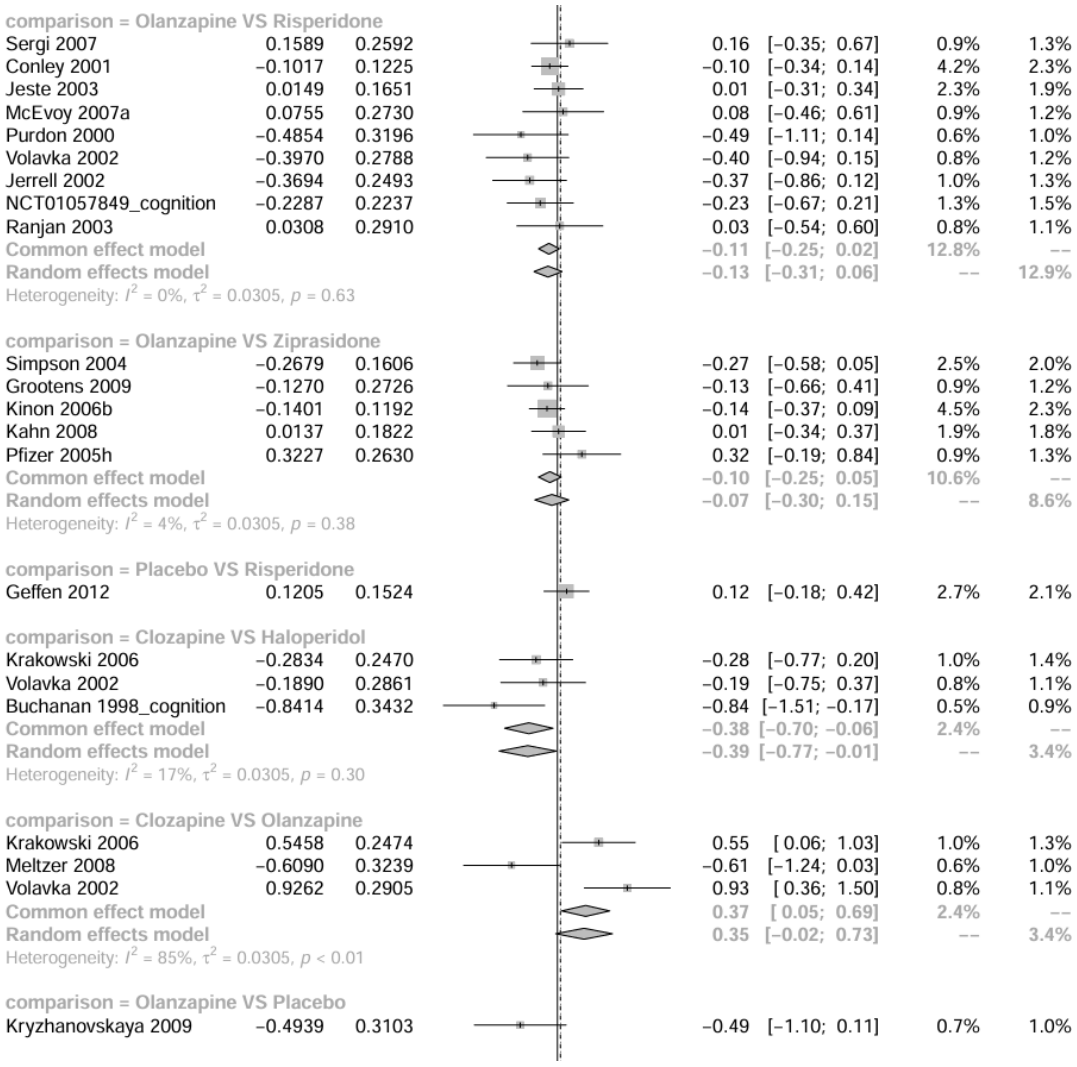

Comparison = Olanzapine vs Ziprasidone
Grootens 2009 −0.0903 0.4704 −0.09 [−1.01; 0.83] 0.4% 0.4%
Kahn 2008 0.0653 0.2269 0.07 [−0.38; 0.51] 1.6% 1.6%
Kinon 2006b −0.1117 0.1849 −0.11 [−0.47; 0.25] 2.4% 2.4%
Pfizer 2005h 0.1447 0.3706 0.14 [−0.58; 0.87] 0.6% 0.6%
Simpson 2004 −0.1195 0.2931 −0.12 [−0.69; 0.45] 1.0% 1.0%
Common effect model −0.04 [−0.27; 0.19] 6.0% --
Random effects model −0.04 [−0.27; 0.19] -- 6.0%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.95
Comparison = Amisulpride vs Haloperidol
Kahn 2008 −0.0661 0.2226 −0.07 [−0.50; 0.37] 1.7% 1.7%
Comparison = Amisulpride vs Quetiapine
Kahn 2008 −0.0359 0.2182 −0.04 [−0.46; 0.39] 1.7% 1.7%
Comparison = Amisulpride vs Ziprasidone
Kahn 2008 0.1031 0.2369 0.10 [−0.36; 0.57] 1.5% 1.5%
Comparison = Haloperidol vs Ziprasidone
Kahn 2008 0.1688 0.2428 0.17 [−0.31; 0.64] 1.4% 1.4%
Comparison = Olanzapine vs Quetiapine
Kahn 2008 −0.0745 0.2076 −0.07 [−0.48; 0.33] 1.9% 1.9%
Kinon 2006a 0.0909 0.1342 0.09 [−0.17; 0.35] 4.6% 4.3%
McEvoy 2007a 0.1559 0.4651 0.16 [−0.76; 1.07] 0.4% 0.4%
Riedel 2007 0.3415 0.5595 0.34 [−0.76; 1.44] 0.3% 0.3%
Voruganti 2007 0.5233 0.2732 0.52 [−0.01; 1.06] 1.1% 1.1%
Common effect model 0.12 [−0.07; 0.32] 8.3% --
Random effects model 0.12 [−0.07; 0.32] -- 8.0%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.51
Comparison = Quetiapine vs Ziprasidone
Kahn 2008 0.1354 0.2387 0.14 [−0.33; 0.60] 1.5% 1.5%
Comparison = Paliperidone LAI vs Risperidone LAI
Koshikawa 2016 −0.0241 0.7926 −0.02 [−1.58; 1.53] 0.1% 0.1%
Comparison = Clozapine vs Olanzapine
Krakowski 2006 0.4090 0.3948 0.41 [−0.36; 1.18] 0.5% 0.6%
Meltzer 2008 −0.0779 0.4530 −0.08 [−0.97; 0.81] 0.4% 0.4%
Naber 2005_cognition 0.3669 0.3717 0.37 [−0.36; 1.10] 0.6% 0.6%
Volavka 2002 0.3655 0.5057 0.37 [−0.63; 1.36] 0.3% 0.3%
Common effect model 0.28 [−0.13; 0.70] 1.9% --
Random effects model 0.28 [−0.13; 0.70] -- 1.9%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.85
Comparison = Olanzapine vs Placebo
Kryzhanovskaya 2009 −0.0693 0.4854 −0.07 [−1.02; 0.88] 0.4% 0.4%
Comparison = Aripiprazole vs Risperidone
Maat 2014 0.0143 0.5214 0.01 [−1.01; 1.04] 0.3% 0.3%
NCT01057849_cognition 0.0900 0.2111 0.09 [−0.32; 0.50] 1.9% 1.9%
Wang 2013b −0.1598 0.4627 −0.16 [−1.07; 0.75] 0.4% 0.4%
Common effect model 0.04 [−0.31; 0.40] 2.6% --
Random effects model 0.04 [−0.31; 0.40] -- 2.6%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.88
Comparison = Quetiapine vs Risperidone
McEvoy 2007a −0.1098 0.4820 −0.11 [−1.05; 0.83] 0.4% 0.4%
Riedel 2005 −0.0949 0.5494 −0.09 [−1.17; 0.98] 0.3% 0.3%
Zhong 2006_cognition 0.1477 0.1923 0.15 [−0.23; 0.52] 2.2% 2.2%
Common effect model 0.09 [−0.24; 0.43] 2.9% --
Random effects model 0.09 [−0.24; 0.43] -- 2.9%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.83

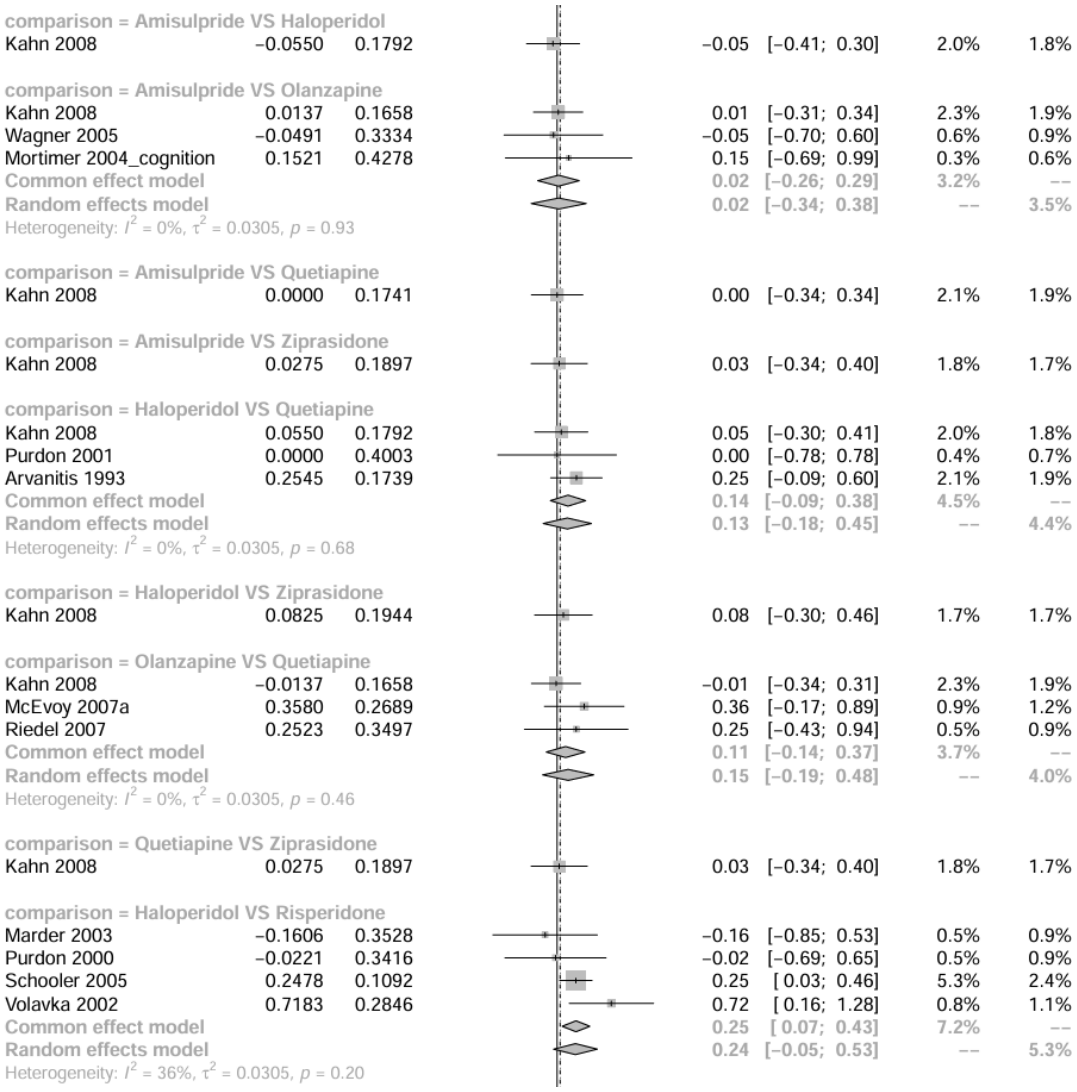


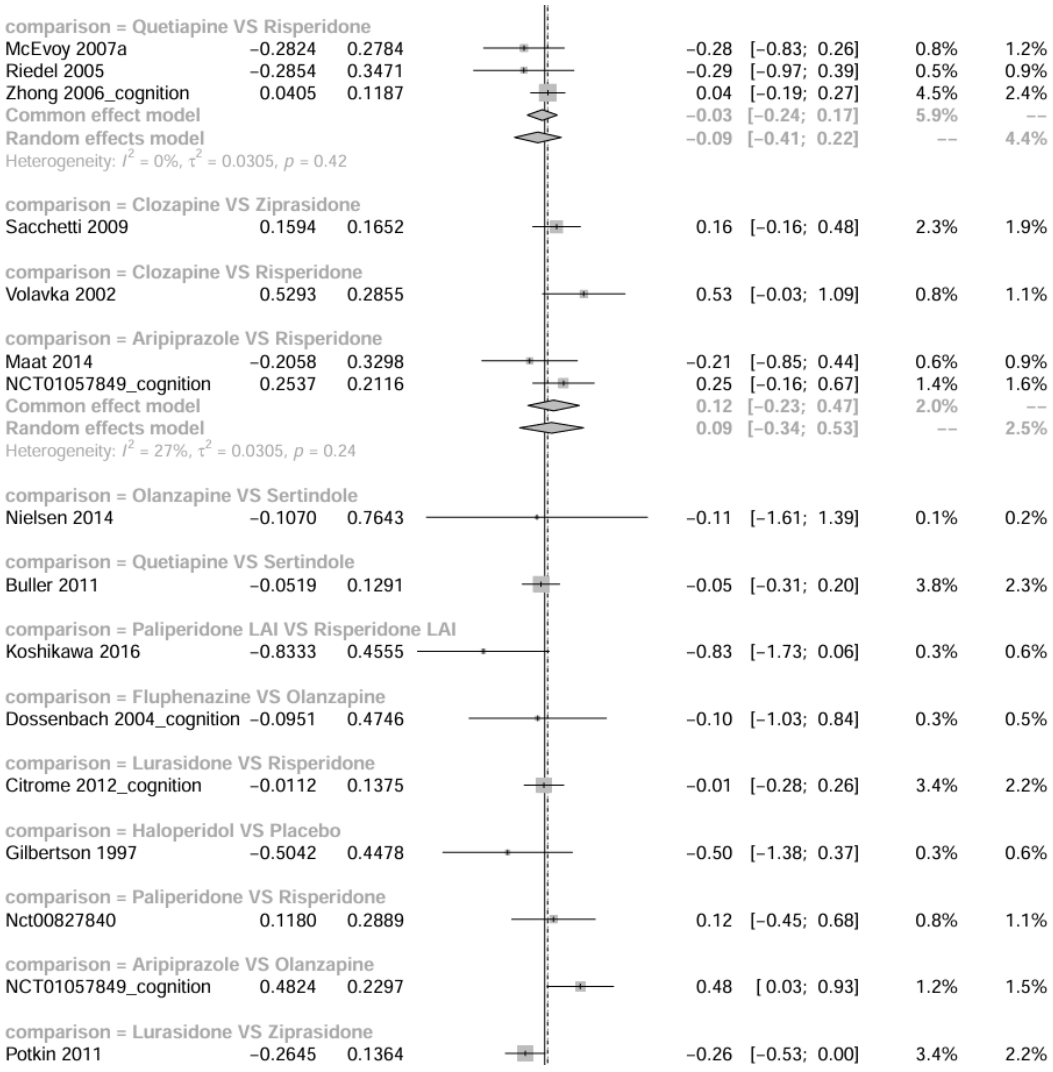
Heterogeneity: I^2 = 0%, τ^2 = 0.0023, p = 0.78
Residual heterogeneity: I^2 = 0%, τ^2 = 0, p = 1.00
Test for subgroup differences (common effect): χ^2_{43} = 63.03, df = 43 (p = 0.02)
Test for subgroup differences (random effects): χ^2_{43} = 63.03, df = 43 (p = 0.02)

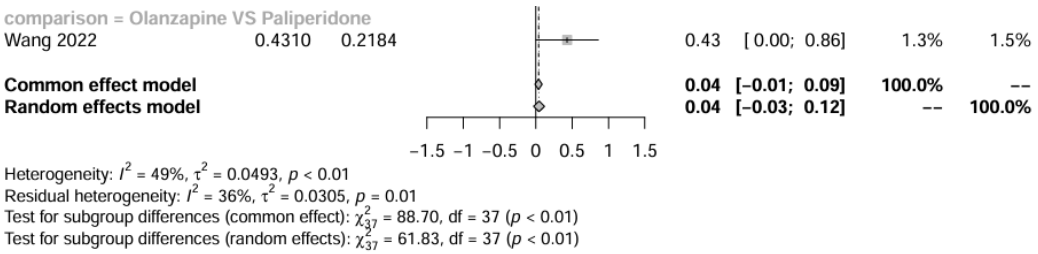
Speed of Processing



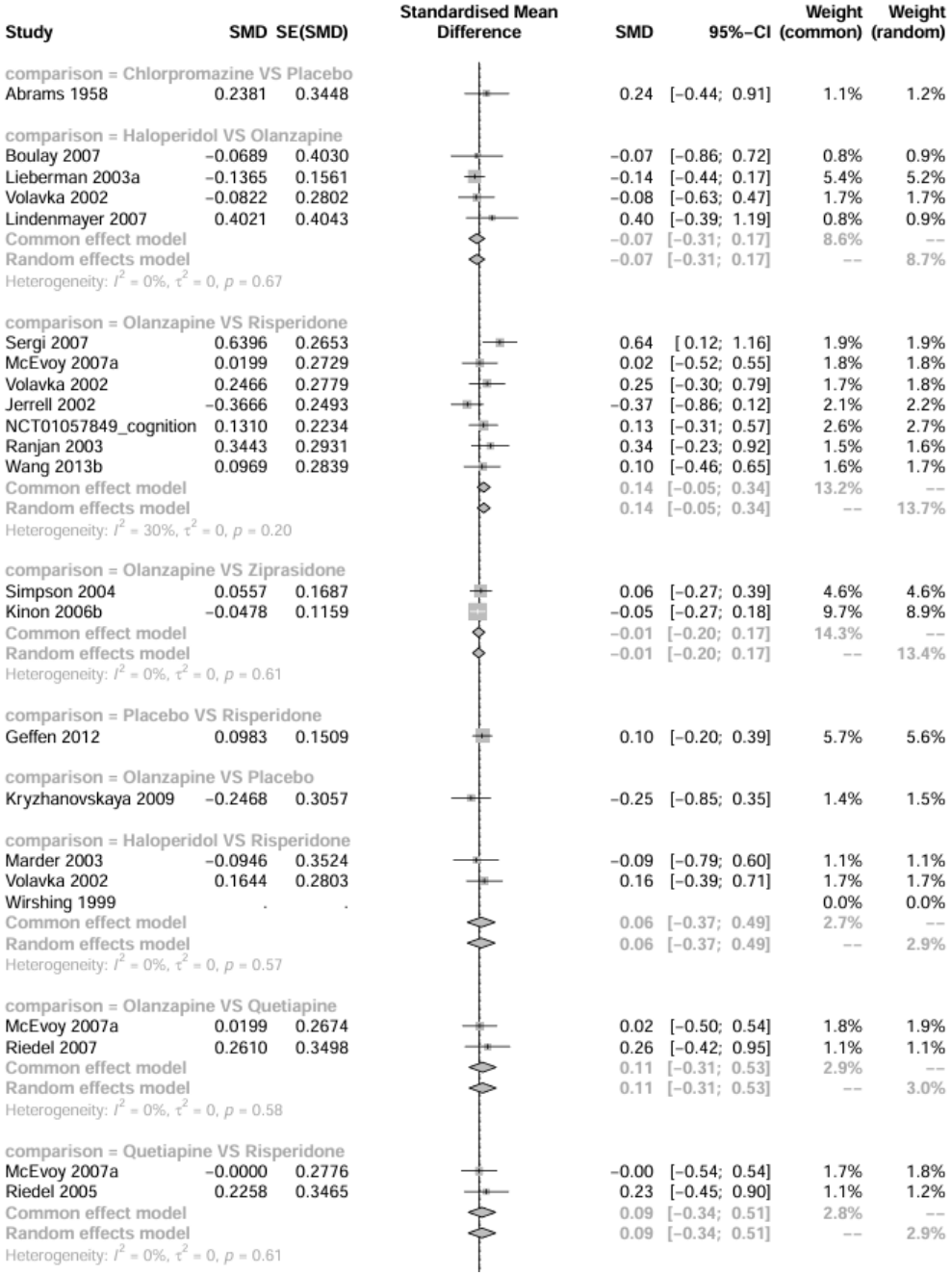

comparison = Olanzapine VS Risperidone
Sergi 2007 0.1589 0.2592 0.16 [−0.35; 0.67] 0.9% 1.3%
Conley 2001 −0.1017 0.1225 −0.10 [−0.34; 0.14] 4.2% 2.3%
Jeste 2003 0.0149 0.1651 0.01 [−0.31; 0.34] 2.3% 1.9%
McEvoy 2007a 0.0755 0.2730 0.08 [−0.46; 0.61] 0.9% 1.2%
Purdon 2000 −0.4854 0.3196 −0.49 [−1.11; 0.14] 0.6% 1.0%
Volavka 2002 −0.3970 0.2788 −0.40 [−0.94; 0.15] 0.8% 1.2%
Jerrell 2002 −0.3694 0.2493 −0.37 [−0.86; 0.12] 1.0% 1.3%
NCT01057849_cognition −0.2287 0.2237 −0.23 [−0.67; 0.21] 1.3% 1.5%
Ranjan 2003 0.0308 0.2910 0.03 [−0.54; 0.60] 0.8% 1.1%
Common effect model −0.11 [−0.25; 0.02] 12.8% --
Random effects model −0.13 [−0.31; 0.06] -- 12.9%
Heterogeneity: I^2 = 0%, τ^2 = 0.0305, p = 0.63
comparison = Olanzapine VS Ziprasidone
Simpson 2004 −0.2679 0.1606 −0.27 [−0.58; 0.05] 2.5% 2.0%
Grootens 2009 −0.1270 0.2726 −0.13 [−0.66; 0.41] 0.9% 1.2%
Kinon 2006b −0.1401 0.1192 −0.14 [−0.37; 0.09] 4.5% 2.3%
Kahn 2008 0.0137 0.1822 0.01 [−0.34; 0.37] 1.9% 1.8%
Pfizer 2005h 0.3227 0.2630 0.32 [−0.19; 0.84] 0.9% 1.3%
Common effect model −0.10 [−0.25; 0.05] 10.6% --
Random effects model −0.07 [−0.30; 0.15] -- 8.6%
Heterogeneity: I^2 = 4%, τ^2 = 0.0305, p = 0.38
comparison = Placebo VS Risperidone
Geffen 2012 0.1205 0.1524 0.12 [−0.18; 0.42] 2.7% 2.1%
comparison = Clozapine VS Haloperidol
Krakowski 2006 −0.2834 0.2470 −0.28 [−0.77; 0.20] 1.0% 1.4%
Volavka 2002 −0.1890 0.2861 −0.19 [−0.75; 0.37] 0.8% 1.1%
Buchanan 1998_cognition −0.8414 0.3432 −0.84 [−1.51; −0.17] 0.5% 0.9%
Common effect model −0.38 [−0.70; −0.06] 2.4% --
Random effects model −0.39 [−0.77; −0.01] -- 3.4%
Heterogeneity: I^2 = 17%, τ^2 = 0.0305, p = 0.30
comparison = Clozapine VS Olanzapine
Krakowski 2006 0.5458 0.2474 0.55 [0.06; 1.03] 1.0% 1.3%
Meltzer 2008 −0.6090 0.3239 −0.61 [−1.24; 0.03] 0.6% 1.0%
Volavka 2002 0.9262 0.2905 0.93 [0.36; 1.50] 0.8% 1.1%
Common effect model 0.37 [0.05; 0.69] 2.4% --
Random effects model 0.35 [−0.02; 0.73] -- 3.4%
Heterogeneity: I^2 = 85%, τ^2 = 0.0305, p < 0.01
comparison = Olanzapine VS Placebo
Kryzhanovskaya 2009 −0.4939 0.3103 −0.49 [−1.10; 0.11] 0.7% 1.0%

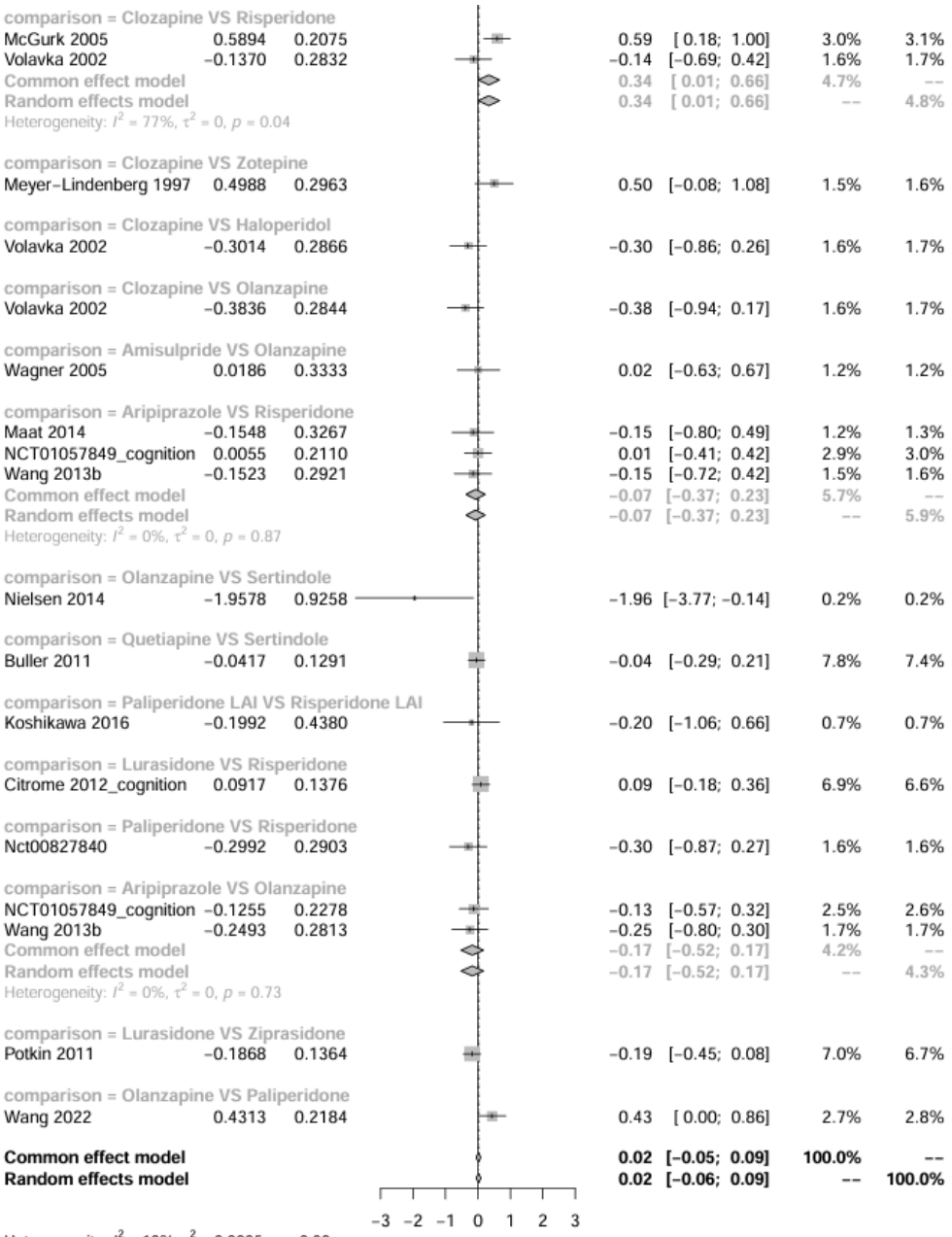

comparison = Amisulpride VS Haloperidol
Kahn 2008 −0.0550 0.1792 −0.05 [−0.41; 0.30] 2.0% 1.8%
comparison = Amisulpride VS Olanzapine
Kahn 2008 0.0137 0.1658 0.01 [−0.31; 0.34] 2.3% 1.9%
Wagner 2005 −0.0491 0.3334 −0.05 [−0.70; 0.60] 0.6% 0.9%
Mortimer 2004_cognition 0.1521 0.4278 0.15 [−0.69; 0.99] 0.3% 0.6%
Common effect model 0.02 [−0.26; 0.29] 3.2% --
Random effects model 0.02 [−0.34; 0.38] -- 3.5%
Heterogeneity: I^2 = 0%, τ^2 = 0.0305, p = 0.93
comparison = Amisulpride VS Quetiapine
Kahn 2008 0.0000 0.1741 0.00 [−0.34; 0.34] 2.1% 1.9%
comparison = Amisulpride VS Ziprasidone
Kahn 2008 0.0275 0.1897 0.03 [−0.34; 0.40] 1.8% 1.7%
comparison = Haloperidol VS Quetiapine
Kahn 2008 0.0550 0.1792 0.05 [−0.30; 0.41] 2.0% 1.8%
Purdon 2001 0.0000 0.4003 0.00 [−0.78; 0.78] 0.4% 0.7%
Arvanitis 1993 0.2545 0.1739 0.25 [−0.09; 0.60] 2.1% 1.9%
Common effect model 0.14 [−0.09; 0.38] 4.5% --
Random effects model 0.13 [−0.18; 0.45] -- 4.4%
Heterogeneity: I^2 = 0%, τ^2 = 0.0305, p = 0.68
comparison = Haloperidol VS Ziprasidone
Kahn 2008 0.0825 0.1944 0.08 [−0.30; 0.46] 1.7% 1.7%
comparison = Olanzapine VS Quetiapine
Kahn 2008 −0.0137 0.1658 −0.01 [−0.34; 0.31] 2.3% 1.9%
McEvoy 2007a 0.3580 0.2689 0.36 [−0.17; 0.89] 0.9% 1.2%
Riedel 2007 0.2523 0.3497 0.25 [−0.43; 0.94] 0.5% 0.9%
Common effect model 0.11 [−0.14; 0.37] 3.7% --
Random effects model 0.15 [−0.19; 0.48] -- 4.0%
Heterogeneity: I^2 = 0%, τ^2 = 0.0305, p = 0.46
comparison = Quetiapine VS Ziprasidone
Kahn 2008 0.0275 0.1897 0.03 [−0.34; 0.40] 1.8% 1.7%
comparison = Haloperidol VS Risperidone
Marder 2003 −0.1606 0.3528 −0.16 [−0.85; 0.53] 0.5% 0.9%
Purdon 2000 −0.0221 0.3416 −0.02 [−0.69; 0.65] 0.5% 0.9%
Schooler 2005 0.2478 0.1092 0.25 [0.03; 0.46] 5.3% 2.4%
Volavka 2002 0.7183 0.2846 0.72 [0.16; 1.28] 0.8% 1.1%
Common effect model 0.25 [0.07; 0.43] 7.2% --
Random effects model 0.24 [−0.05; 0.53] -- 5.3%
Heterogeneity: I^2 = 36%, τ^2 = 0.0305, p = 0.20


comparison = Quetiapine VS Risperidone
McEvoy 2007a −0.2824 0.2784 −0.28 [−0.83; 0.26] 0.8% 1.2%
Riedel 2005 −0.2854 0.3471 −0.29 [−0.97; 0.39] 0.5% 0.9%
Zhong 2006_cognition 0.0405 0.1187 0.04 [−0.19; 0.27] 4.5% 2.4%
Common effect model −0.03 [−0.24; 0.17] 5.9% --
Random effects model −0.09 [−0.41; 0.22] -- 4.4%
Heterogeneity: I^2 = 0%, τ^2 = 0.0305, p = 0.42
comparison = Clozapine VS Ziprasidone
Sacchetti 2009 0.1594 0.1652 0.16 [−0.16; 0.48] 2.3% 1.9%
comparison = Clozapine VS Risperidone
Volavka 2002 0.5293 0.2855 0.53 [−0.03; 1.09] 0.8% 1.1%
comparison = Aripiprazole VS Risperidone
Maat 2014 −0.2058 0.3298 −0.21 [−0.85; 0.44] 0.6% 0.9%
NCT01057849_cognition 0.2537 0.2116 0.25 [−0.16; 0.67] 1.4% 1.6%
Common effect model 0.12 [−0.23; 0.47] 2.0% --
Random effects model 0.09 [−0.34; 0.53] -- 2.5%
Heterogeneity: I^2 = 27%, τ^2 = 0.0305, p = 0.24
comparison = Olanzapine VS Sertindole
Nielsen 2014 −0.1070 0.7643 −0.11 [−1.61; 1.39] 0.1% 0.2%
comparison = Quetiapine VS Sertindole
Buller 2011 −0.0519 0.1291 −0.05 [−0.31; 0.20] 3.8% 2.3%
comparison = Paliperidone LAI VS Risperidone LAI
Koshikawa 2016 −0.8333 0.4555 −0.83 [−1.73; 0.06] 0.3% 0.6%
comparison = Fluphenazine VS Olanzapine
Dossenbach 2004_cognition −0.0951 0.4746 −0.10 [−1.03; 0.84] 0.3% 0.5%
comparison = Lurasidone VS Risperidone
Citrome 2012_cognition −0.0112 0.1375 −0.01 [−0.28; 0.26] 3.4% 2.2%
comparison = Haloperidol VS Placebo
Gilbertson 1997 −0.5042 0.4478 −0.50 [−1.38; 0.37] 0.3% 0.6%
comparison = Paliperidone VS Risperidone
Nct00827840 0.1180 0.2889 0.12 [−0.45; 0.68] 0.8% 1.1%
comparison = Aripiprazole VS Olanzapine
NCT01057849_cognition 0.4824 0.2297 0.48 [0.03; 0.93] 1.2% 1.5%
comparison = Lurasidone VS Ziprasidone
Potkin 2011 −0.2645 0.1364 −0.26 [−0.53; 0.00] 3.4% 2.2%

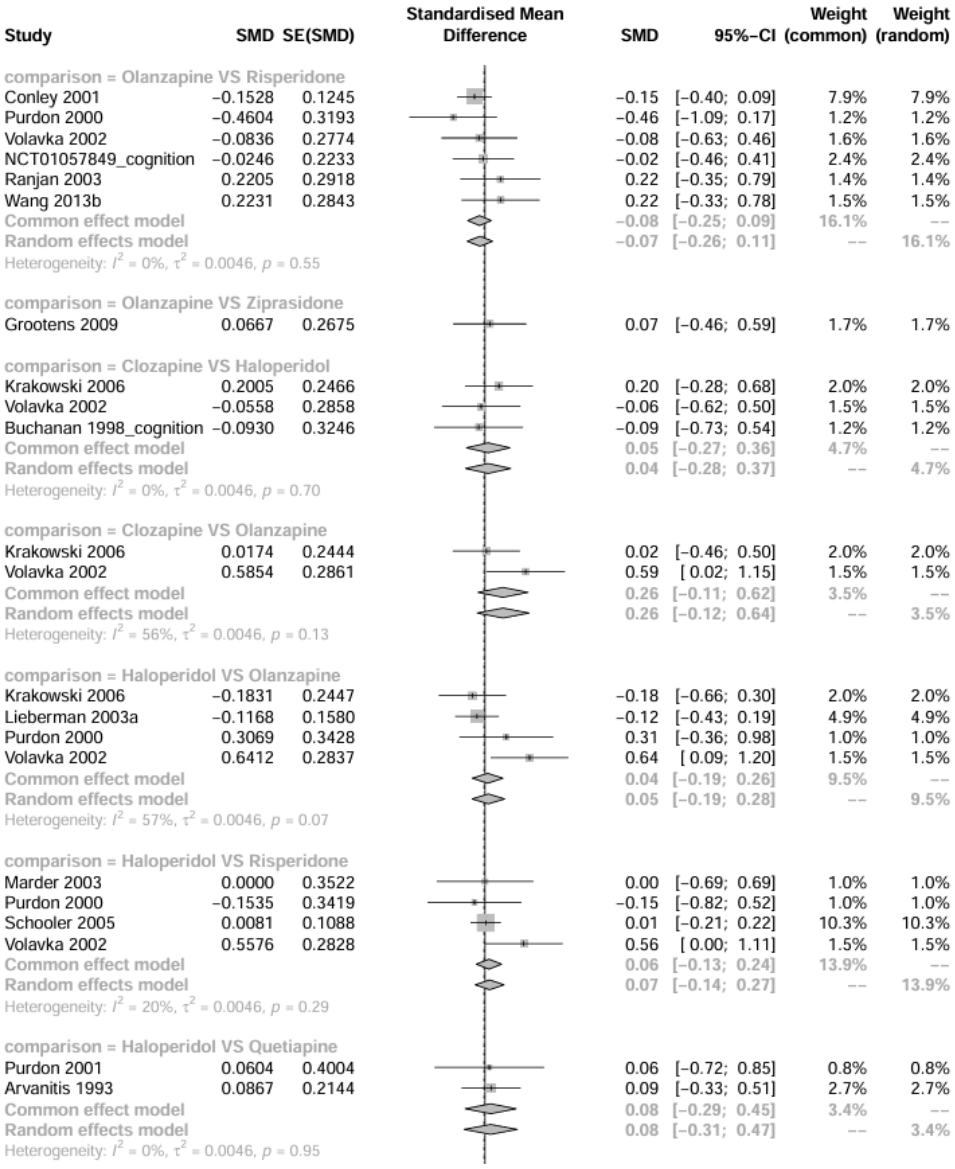

comparison = Olanzapine VS Paliperidone
Wang 2022 0.4310 0.2184 0.43 [0.00; 0.86] 1.3% 1.5%
Common effect model 0.04 [−0.01; 0.09] 100.0% --
Random effects model 0.04 [−0.03; 0.12] -- 100.0%
−1.5 −1 −0.5 0 0.5 1 1.5
Heterogeneity: I^2 = 49%, τ^2 = 0.0493, p < 0.01
Residual heterogeneity: I^2 = 36%, τ^2 = 0.0305, p = 0.01
Test for subgroup differences (common effect): χ^2_{37} = 88.70, df = 37 (p < 0.01)
Test for subgroup differences (random effects): χ^2_{37} = 61.83, df = 37 (p < 0.01)

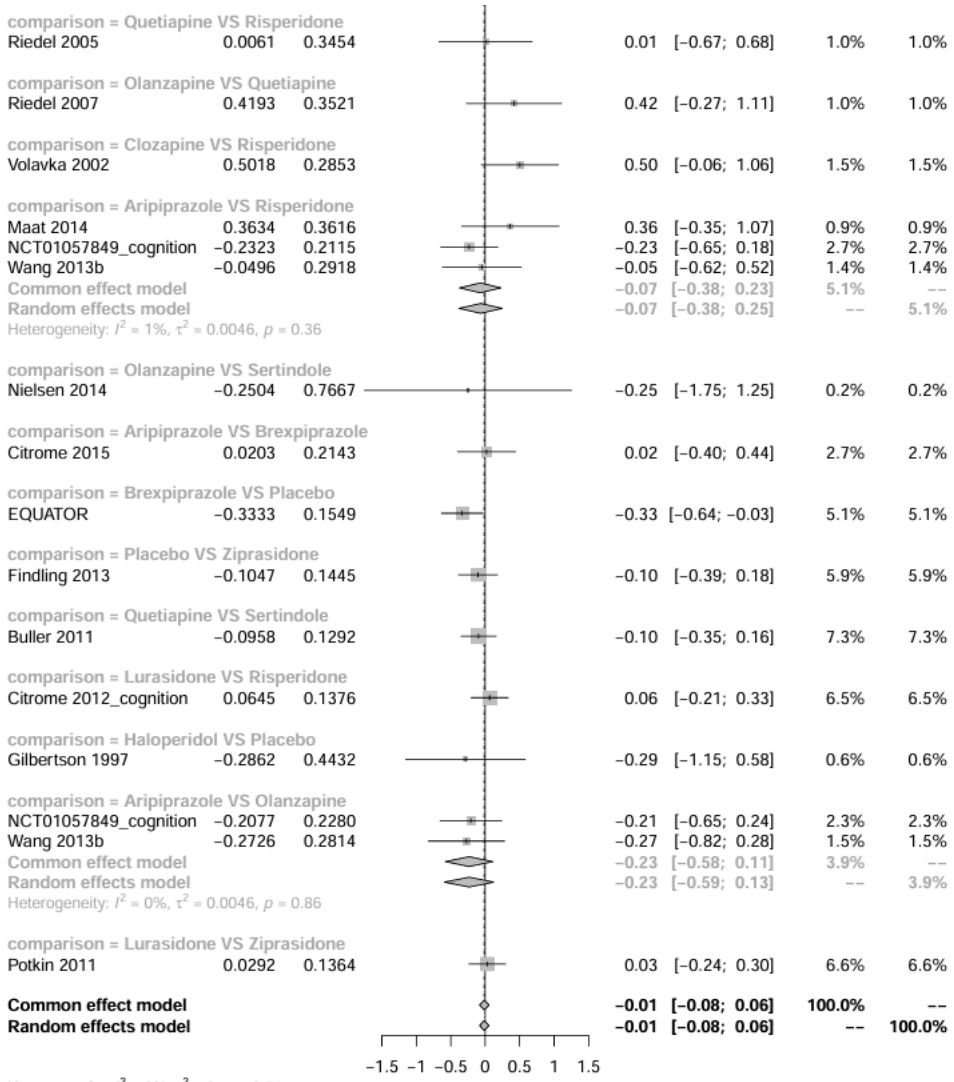
Working Memory



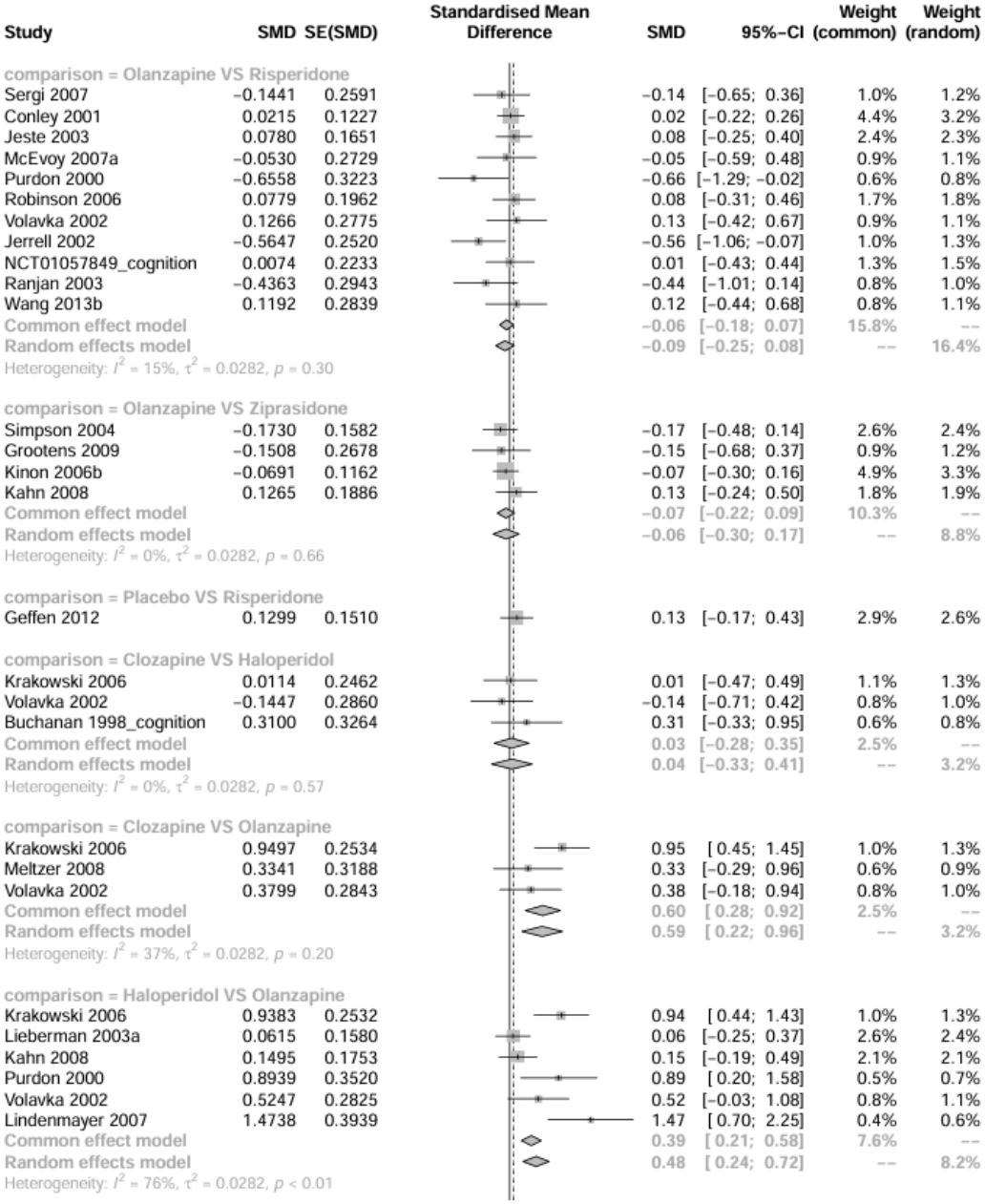

comparison = Clozapine VS Risperidone
McGurk 2005 0.5894 0.2075 0.59 [0.18; 1.00] 3.0% 3.1%
Volavka 2002 −0.1370 0.2832 −0.14 [−0.69; 0.42] 1.6% 1.7%
Common effect model 0.34 [0.01; 0.66] 4.7% --
Random effects model 0.34 [0.01; 0.66] -- 4.8%
Heterogeneity: I^2 = 77%, τ^2 = 0, p = 0.04
comparison = Clozapine VS Zotepine
Meyer−Lindenberg 1997 0.4988 0.2963 0.50 [−0.08; 1.08] 1.5% 1.6%
comparison = Clozapine VS Haloperidol
Volavka 2002 −0.3014 0.2866 −0.30 [−0.86; 0.26] 1.6% 1.7%
comparison = Clozapine VS Olanzapine
Volavka 2002 −0.3836 0.2844 −0.38 [−0.94; 0.17] 1.6% 1.7%
comparison = Amisulpride VS Olanzapine
Wagner 2005 0.0186 0.3333 0.02 [−0.63; 0.67] 1.2% 1.2%
comparison = Aripiprazole VS Risperidone
Maat 2014 −0.1548 0.3267 −0.15 [−0.80; 0.49] 1.2% 1.3%
NCT01057849_cognition 0.0055 0.2110 0.01 [−0.41; 0.42] 2.9% 3.0%
Wang 2013b −0.1523 0.2921 −0.15 [−0.72; 0.42] 1.5% 1.6%
Common effect model −0.07 [−0.37; 0.23] 5.7% --
Random effects model −0.07 [−0.37; 0.23] -- 5.9%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.87
comparison = Olanzapine VS Sertindole
Nielsen 2014 −1.9578 0.9258 −1.96 [−3.77; −0.14] 0.2% 0.2%
comparison = Quetiapine VS Sertindole
Buller 2011 −0.0417 0.1291 −0.04 [−0.29; 0.21] 7.8% 7.4%
comparison = Paliperidone LAI VS Risperidone LAI
Koshikawa 2016 −0.1992 0.4380 −0.20 [−1.06; 0.66] 0.7% 0.7%
comparison = Lurasidone VS Risperidone
Citrome 2012_cognition 0.0917 0.1376 0.09 [−0.18; 0.36] 6.9% 6.6%
comparison = Paliperidone VS Risperidone
Nct00827840 −0.2992 0.2903 −0.30 [−0.87; 0.27] 1.6% 1.6%
comparison = Aripiprazole VS Olanzapine
NCT01057849_cognition −0.1255 0.2278 −0.13 [−0.57; 0.32] 2.5% 2.6%
Wang 2013b −0.2493 0.2813 −0.25 [−0.80; 0.30] 1.7% 1.7%
Common effect model −0.17 [−0.52; 0.17] 4.2% --
Random effects model −0.17 [−0.52; 0.17] -- 4.3%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.73
comparison = Lurasidone VS Ziprasidone
Potkin 2011 −0.1868 0.1364 −0.19 [−0.45; 0.08] 7.0% 6.7%
comparison = Olanzapine VS Paliperidone
Wang 2022 0.4313 0.2184 0.43 [0.00; 0.86] 2.7% 2.8%
Common effect model 0.02 [−0.05; 0.09] 100.0% --
Random effects model 0.02 [−0.06; 0.09] -- 100.0%
−3 −2 −1 0 1 2 3
Heterogeneity: I^2 = 10%, τ^2 = 0.0025, p = 0.30
Residual heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.53
Test for subgroup differences (common effect): χ^2_{22} = 27.32, df = 22 (p = 0.20)
Test for subgroup differences (random effects): χ^2_{22} = 27.32, df = 22 (p = 0.20)

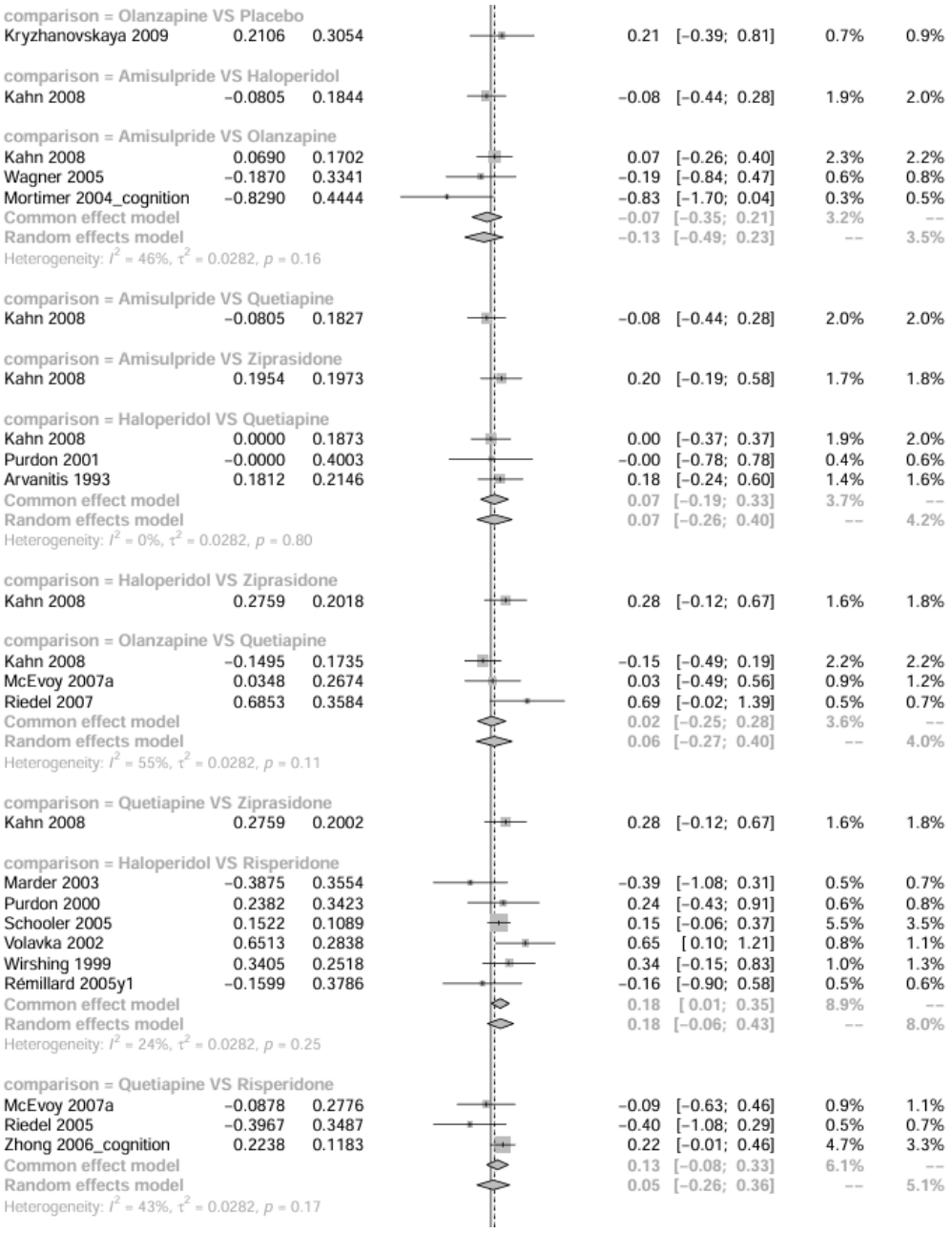
Visual Learning

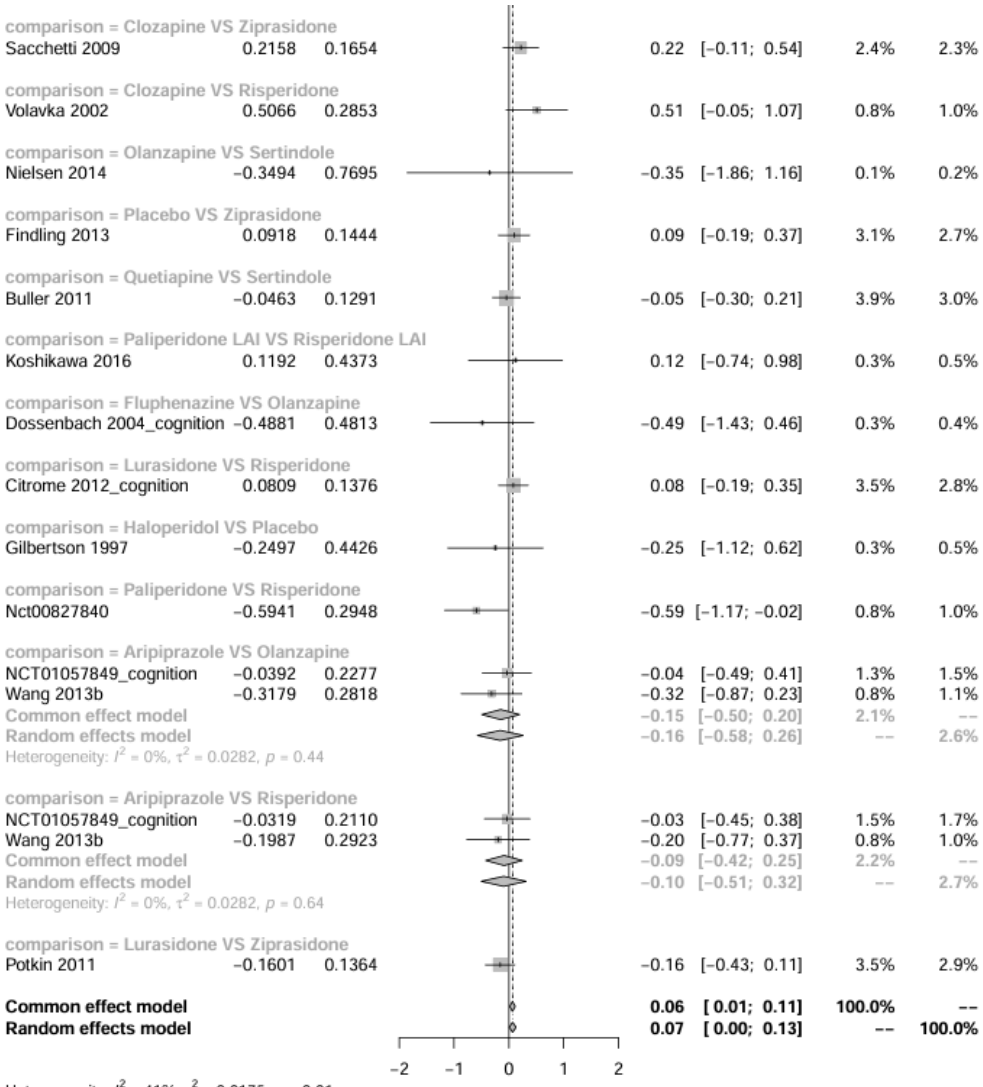



comparison = Quetiapine VS Risperidone
Riedel 2005 0.0061 0.3454 0.01 [−0.67; 0.68] 1.0% 1.0%
comparison = Olanzapine VS Quetiapine
Riedel 2007 0.4193 0.3521 0.42 [−0.27; 1.11] 1.0% 1.0%
comparison = Clozapine VS Risperidone
Volavka 2002 0.5018 0.2853 0.50 [−0.06; 1.06] 1.5% 1.5%
comparison = Aripiprazole VS Risperidone
Maat 2014 0.3634 0.3616 0.36 [−0.35; 1.07] 0.9% 0.9%
NCT01057849_cognition −0.2323 0.2115 −0.23 [−0.65; 0.18] 2.7% 2.7%
Wang 2013b −0.0496 0.2918 −0.05 [−0.62; 0.52] 1.4% 1.4%
Common effect model −0.07 [−0.38; 0.23] 5.1% --
Random effects model −0.07 [−0.38; 0.25] -- 5.1%
Heterogeneity: I^2 = 1%, τ^2 = 0.0046, p = 0.36
comparison = Olanzapine VS Sertindole
Nielsen 2014 −0.2504 0.7667 −0.25 [−1.75; 1.25] 0.2% 0.2%
comparison = Aripiprazole VS Brexpiprazole
Citrome 2015 0.0203 0.2143 0.02 [−0.40; 0.44] 2.7% 2.7%
comparison = Brexpiprazole VS Placebo
EQUATOR −0.3333 0.1549 −0.33 [−0.64; −0.03] 5.1% 5.1%
comparison = Placebo VS Ziprasidone
Findling 2013 −0.1047 0.1445 −0.10 [−0.39; 0.18] 5.9% 5.9%
comparison = Quetiapine VS Sertindole
Buller 2011 −0.0958 0.1292 −0.10 [−0.35; 0.16] 7.3% 7.3%
comparison = Lurasidone VS Risperidone
Citrome 2012_cognition 0.0645 0.1376 0.06 [−0.21; 0.33] 6.5% 6.5%
comparison = Haloperidol VS Placebo
Gilbertson 1997 −0.2862 0.4432 −0.29 [−1.15; 0.58] 0.6% 0.6%
comparison = Aripiprazole VS Olanzapine
NCT01057849_cognition −0.2077 0.2280 −0.21 [−0.65; 0.24] 2.3% 2.3%
Wang 2013b −0.2726 0.2814 −0.27 [−0.82; 0.28] 1.5% 1.5%
Common effect model −0.23 [−0.58; 0.11] 3.9% --
Random effects model −0.23 [−0.59; 0.13] -- 3.9%
Heterogeneity: I^2 = 0%, τ^2 = 0.0046, p = 0.86
comparison = Lurasidone VS Ziprasidone
Potkin 2011 0.0292 0.1364 0.03 [−0.24; 0.30] 6.6% 6.6%
Common effect model −0.01 [−0.08; 0.06] 100.0% --
Random effects model −0.01 [−0.08; 0.06] -- 100.0%
−1.5 −1 −0.5 0 0.5 1 1.5
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.51
Residual heterogeneity: I^2 = 9%, τ^2 = 0.0046, p = 0.35
Test for subgroup differences (common effect): χ^2_{19} = 16.37, df = 19 (p = 0.63)
Test for subgroup differences (random effects): χ^2_{19} = 14.79, df = 19 (p = 0.74)

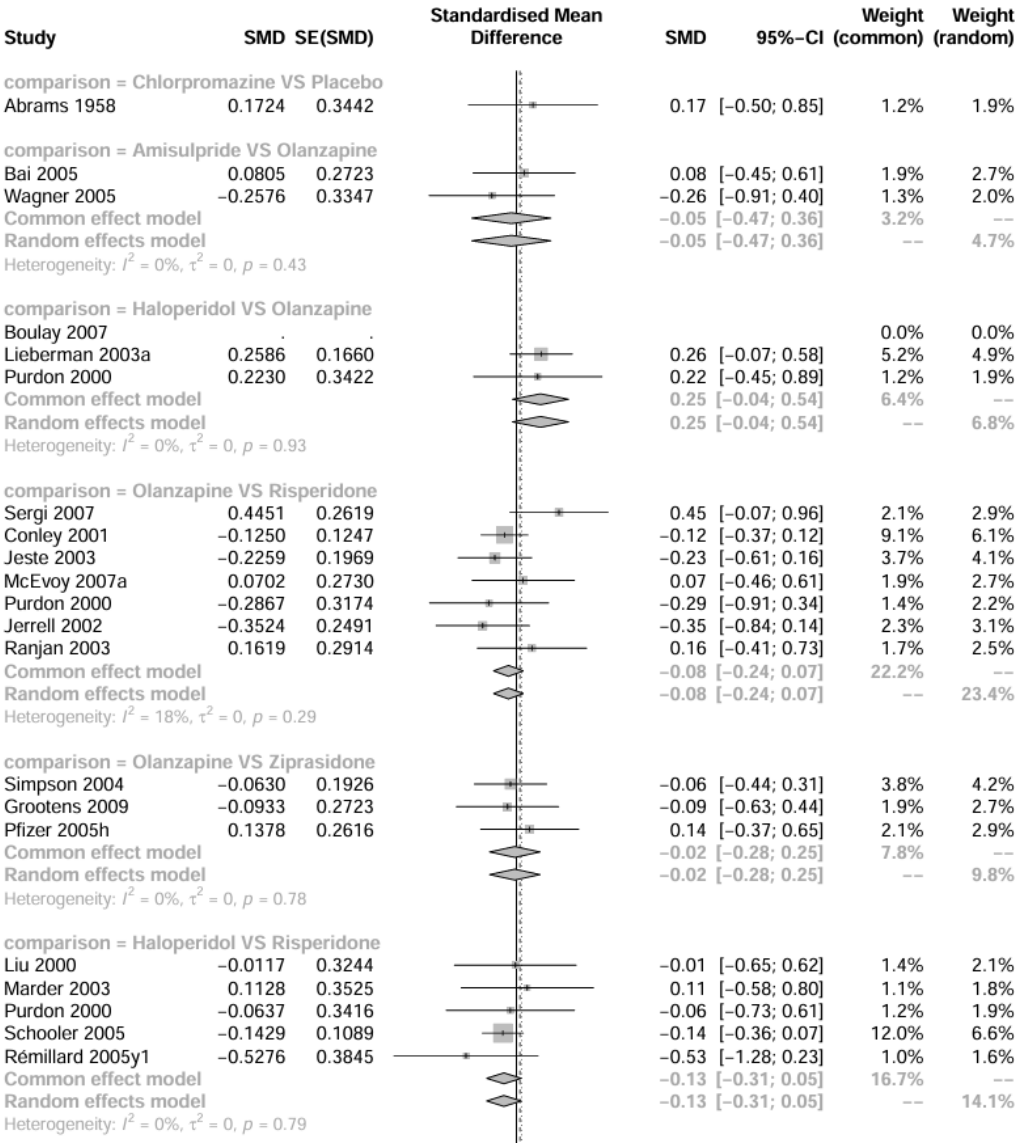
Verbal Learning

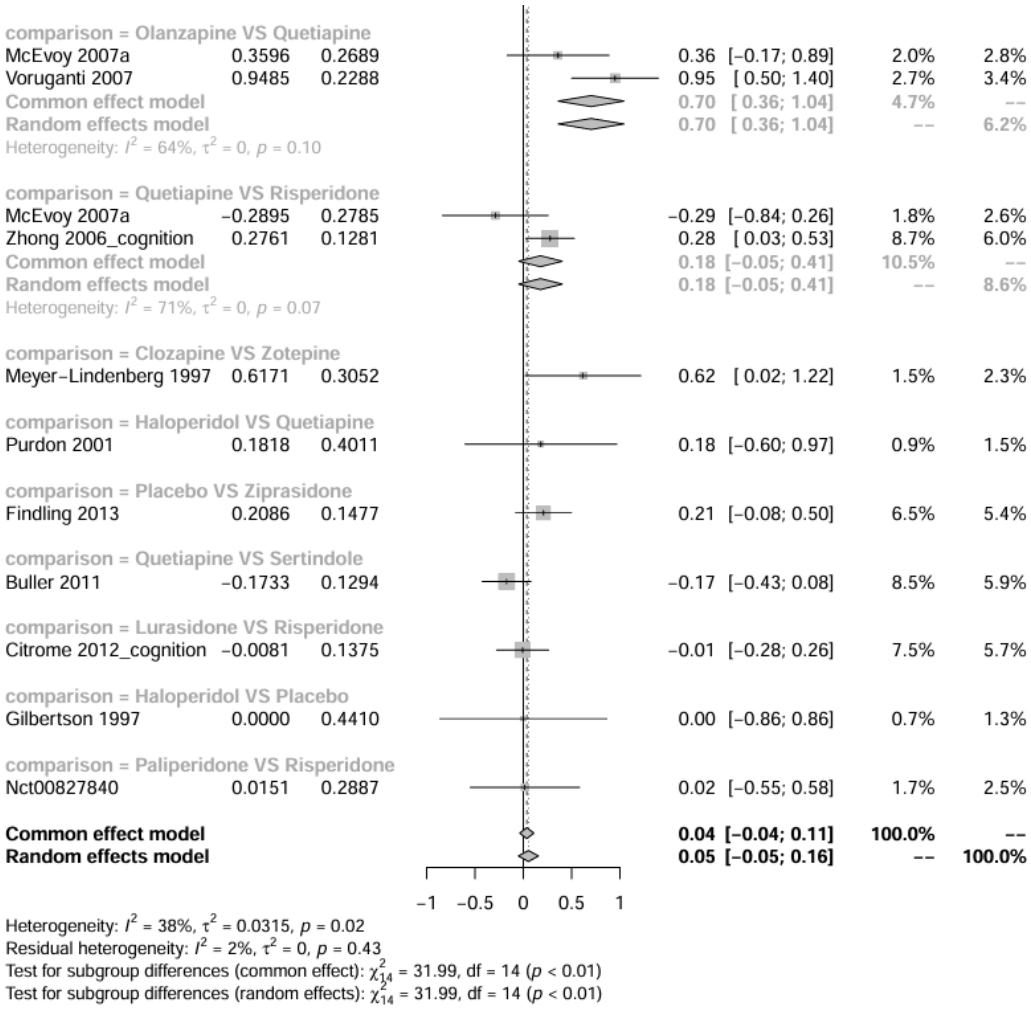



comparison = Olanzapine VS Placebo
Kryzhanovskaya 2009 0.2106 0.3054 0.21 [−0.39; 0.81] 0.7% 0.9%
comparison = Amisulpride VS Haloperidol
Kahn 2008 −0.0805 0.1844 −0.08 [−0.44; 0.28] 1.9% 2.0%
comparison = Amisulpride VS Olanzapine
Kahn 2008 0.0690 0.1702 0.07 [−0.26; 0.40] 2.3% 2.2%
Wagner 2005 −0.1870 0.3341 −0.19 [−0.84; 0.47] 0.6% 0.8%
Mortimer 2004_cognition −0.8290 0.4444 −0.83 [−1.70; 0.04] 0.3% 0.5%
Common effect model −0.07 [−0.35; 0.21] 3.2% --
Random effects model −0.13 [−0.49; 0.23] -- 3.5%
Heterogeneity: I^2 = 46%, τ^2 = 0.0282, p = 0.16
comparison = Amisulpride VS Quetiapine
Kahn 2008 −0.0805 0.1827 −0.08 [−0.44; 0.28] 2.0% 2.0%
comparison = Amisulpride VS Ziprasidone
Kahn 2008 0.1954 0.1973 0.20 [−0.19; 0.58] 1.7% 1.8%
comparison = Haloperidol VS Quetiapine
Kahn 2008 0.0000 0.1873 0.00 [−0.37; 0.37] 1.9% 2.0%
Purdon 2001 −0.0000 0.4003 −0.00 [−0.78; 0.78] 0.4% 0.6%
Arvanitis 1993 0.1812 0.2146 0.18 [−0.24; 0.60] 1.4% 1.6%
Common effect model 0.07 [−0.19; 0.33] 3.7% --
Random effects model 0.07 [−0.26; 0.40] -- 4.2%
Heterogeneity: I^2 = 0%, τ^2 = 0.0282, p = 0.80
comparison = Haloperidol VS Ziprasidone
Kahn 2008 0.2759 0.2018 0.28 [−0.12; 0.67] 1.6% 1.8%
comparison = Olanzapine VS Quetiapine
Kahn 2008 −0.1495 0.1735 −0.15 [−0.49; 0.19] 2.2% 2.2%
McEvoy 2007a 0.0348 0.2674 0.03 [−0.49; 0.56] 0.9% 1.2%
Riedel 2007 0.6853 0.3584 0.69 [−0.02; 1.39] 0.5% 0.7%
Common effect model 0.02 [−0.25; 0.28] 3.6% --
Random effects model 0.06 [−0.27; 0.40] -- 4.0%
Heterogeneity: I^2 = 55%, τ^2 = 0.0282, p = 0.11
comparison = Quetiapine VS Ziprasidone
Kahn 2008 0.2759 0.2002 0.28 [−0.12; 0.67] 1.6% 1.8%
comparison = Haloperidol VS Risperidone
Marder 2003 −0.3875 0.3554 −0.39 [−1.08; 0.31] 0.5% 0.7%
Purdon 2000 0.2382 0.3423 0.24 [−0.43; 0.91] 0.6% 0.8%
Schooler 2005 0.1522 0.1089 0.15 [−0.06; 0.37] 5.5% 3.5%
Volavka 2002 0.6513 0.2838 0.65 [0.10; 1.21] 0.8% 1.1%
Wirshing 1999 0.3405 0.2518 0.34 [−0.15; 0.83] 1.0% 1.3%
Rémillard 2005y1 −0.1599 0.3786 −0.16 [−0.90; 0.58] 0.5% 0.6%
Common effect model 0.18 [0.01; 0.35] 8.9% --
Random effects model 0.18 [−0.06; 0.43] -- 8.0%
Heterogeneity: I^2 = 24%, τ^2 = 0.0282, p = 0.25
comparison = Quetiapine VS Risperidone
McEvoy 2007a −0.0878 0.2776 −0.09 [−0.63; 0.46] 0.9% 1.1%
Riedel 2005 −0.3967 0.3487 −0.40 [−1.08; 0.29] 0.5% 0.7%
Zhong 2006_cognition 0.2238 0.1183 0.22 [−0.01; 0.46] 4.7% 3.3%
Common effect model 0.13 [−0.08; 0.33] 6.1% --
Random effects model 0.05 [−0.26; 0.36] -- 5.1%
Heterogeneity: I^2 = 43%, τ^2 = 0.0282, p = 0.17

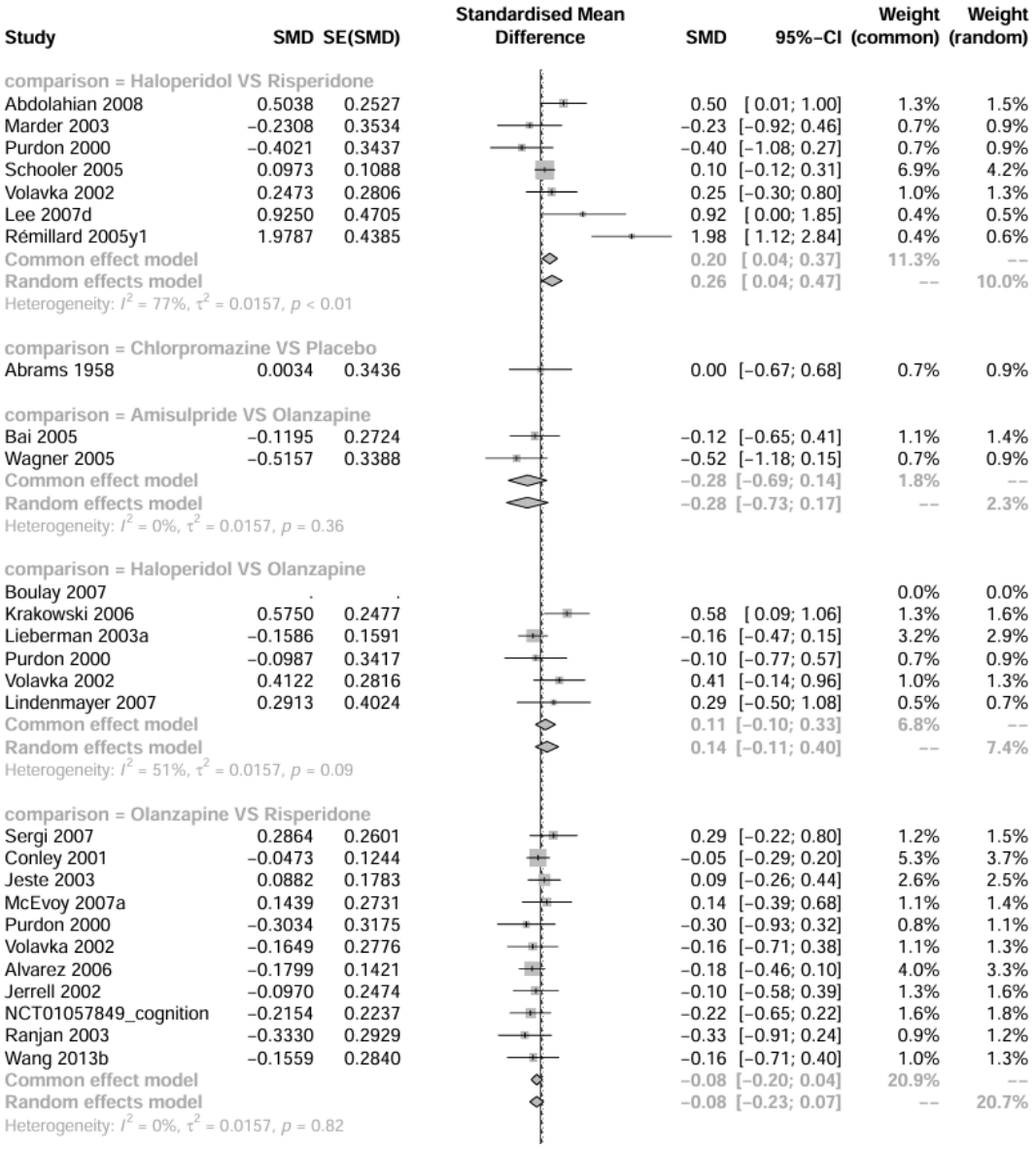

comparison = Clozapine VS Ziprasidone
Sacchetti 2009 0.2158 0.1654 0.22 [−0.11; 0.54] 2.4% 2.3%
comparison = Clozapine VS Risperidone
Volavka 2002 0.5066 0.2853 0.51 [−0.05; 1.07] 0.8% 1.0%
comparison = Olanzapine VS Sertindole
Nielsen 2014 −0.3494 0.7695 −0.35 [−1.86; 1.16] 0.1% 0.2%
comparison = Placebo VS Ziprasidone
Findling 2013 0.0918 0.1444 0.09 [−0.19; 0.37] 3.1% 2.7%
comparison = Quetiapine VS Sertindole
Buller 2011 −0.0463 0.1291 −0.05 [−0.30; 0.21] 3.9% 3.0%
comparison = Paliperidone LAI VS Risperidone LAI
Koshikawa 2016 0.1192 0.4373 0.12 [−0.74; 0.98] 0.3% 0.5%
comparison = Fluphenazine VS Olanzapine
Dossenbach 2004_cognition −0.4881 0.4813 −0.49 [−1.43; 0.46] 0.3% 0.4%
comparison = Lurasidone VS Risperidone
Citrome 2012_cognition 0.0809 0.1376 0.08 [−0.19; 0.35] 3.5% 2.8%
comparison = Haloperidol VS Placebo
Gilbertson 1997 −0.2497 0.4426 −0.25 [−1.12; 0.62] 0.3% 0.5%
comparison = Paliperidone VS Risperidone
Nct00827840 −0.5941 0.2948 −0.59 [−1.17; −0.02] 0.8% 1.0%
comparison = Aripiprazole VS Olanzapine
NCT01057849_cognition −0.0392 0.2277 −0.04 [−0.49; 0.41] 1.3% 1.5%
Wang 2013b −0.3179 0.2818 −0.32 [−0.87; 0.23] 0.8% 1.1%
Common effect model −0.15 [−0.50; 0.20] 2.1% --
Random effects model −0.16 [−0.58; 0.26] -- 2.6%
Heterogeneity: I^2 = 0%, τ^2 = 0.0282, p = 0.44
comparison = Aripiprazole VS Risperidone
NCT01057849_cognition −0.0319 0.2110 −0.03 [−0.45; 0.38] 1.5% 1.7%
Wang 2013b −0.1987 0.2923 −0.20 [−0.77; 0.37] 0.8% 1.0%
Common effect model −0.09 [−0.42; 0.25] 2.2% --
Random effects model −0.10 [−0.51; 0.32] -- 2.7%
Heterogeneity: I^2 = 0%, τ^2 = 0.0282, p = 0.64
comparison = Lurasidone VS Ziprasidone
Potkin 2011 −0.1601 0.1364 −0.16 [−0.43; 0.11] 3.5% 2.9%
Common effect model 0.06 [0.01; 0.11] 100.0% --
Random effects model 0.07 [0.00; 0.13] -- 100.0%
−2 −1 0 1 2
Heterogeneity: I^2 = 41%, τ^2 = 0.0175, p < 0.01
Residual heterogeneity: I^2 = 36%, τ^2 = 0.0282, p = 0.02
Test for subgroup differences (common effect): χ^2_{29} = 53.17, df = 29 (p < 0.01)
Test for subgroup differences (random effects): χ^2_{29} = 38.99, df = 29 (p = 0.10)

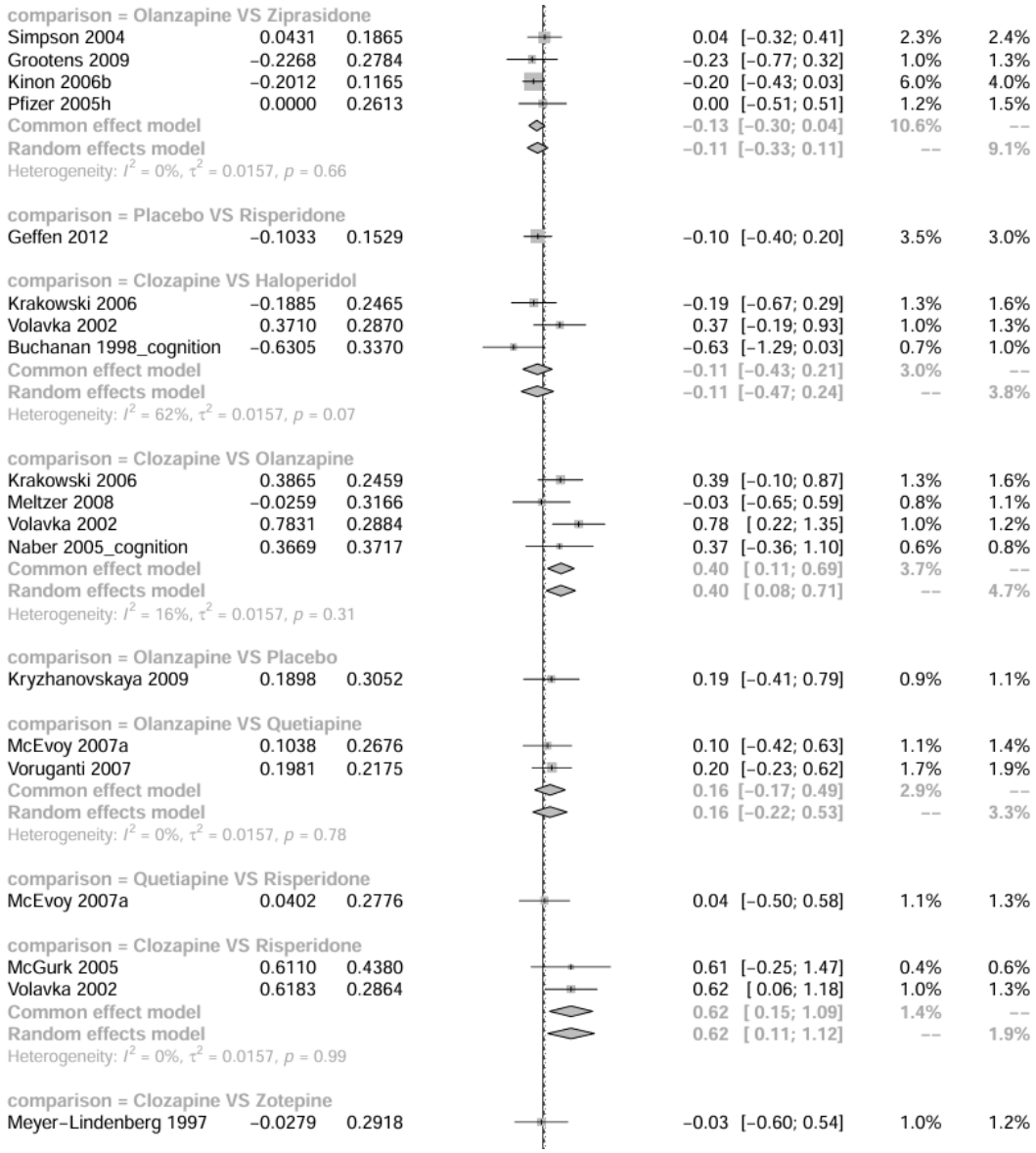
Attention/Vigilance

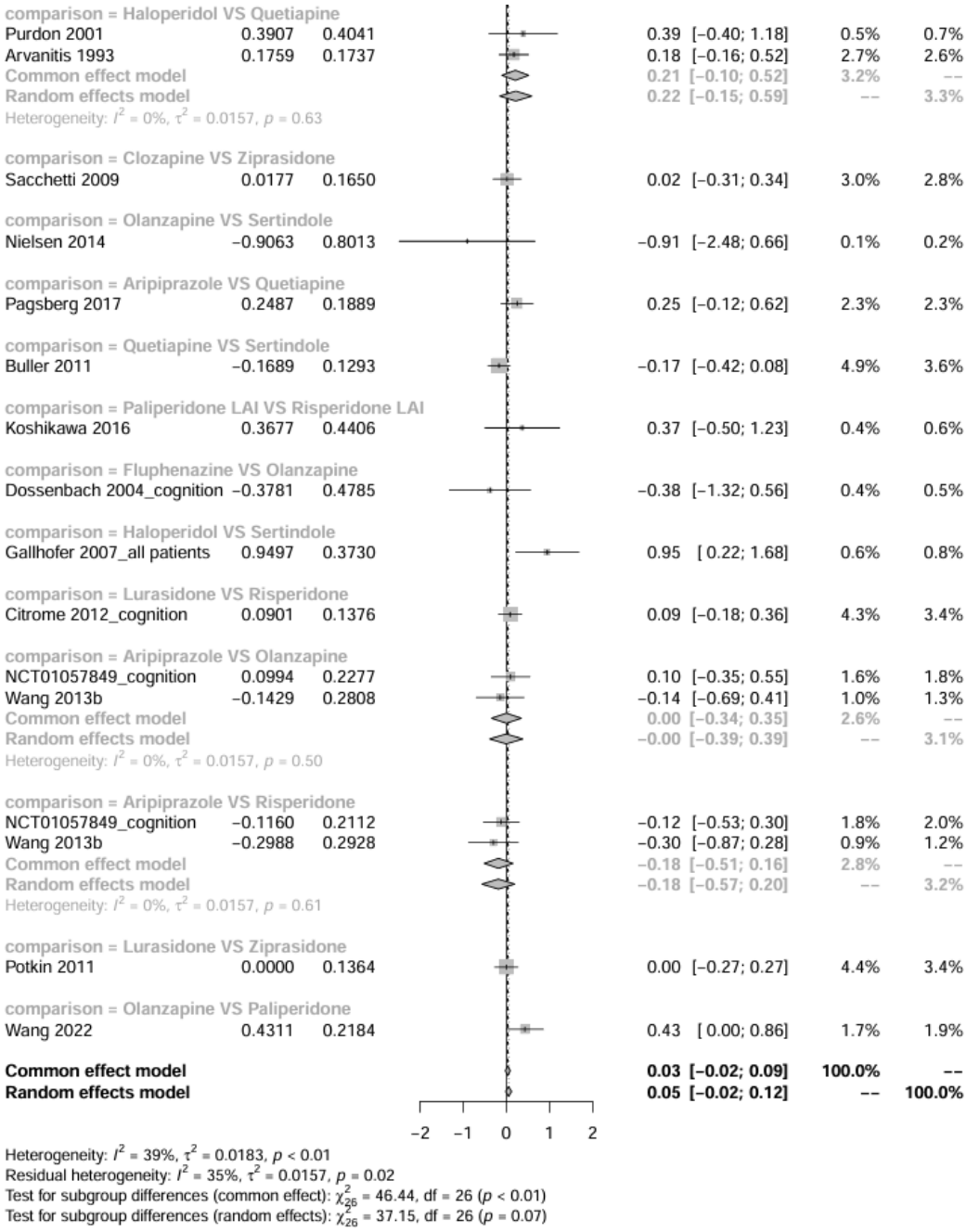



comparison = Olanzapine VS Quetiapine
McEvoy 2007a 0.3596 0.2689 0.36 [−0.17; 0.89] 2.0% 2.8%
Voruganti 2007 0.9485 0.2288 0.95 [0.50; 1.40] 2.7% 3.4%
Common effect model 0.70 [0.36; 1.04] 4.7% --
Random effects model 0.70 [0.36; 1.04] -- 6.2%
Heterogeneity: I^2 = 64%, τ^2 = 0, p = 0.10
comparison = Quetiapine VS Risperidone
McEvoy 2007a −0.2895 0.2785 −0.29 [−0.84; 0.26] 1.8% 2.6%
Zhong 2006_cognition 0.2761 0.1281 0.28 [0.03; 0.53] 8.7% 6.0%
Common effect model 0.18 [−0.05; 0.41] 10.5% --
Random effects model 0.18 [−0.05; 0.41] -- 8.6%
Heterogeneity: I^2 = 71%, τ^2 = 0, p = 0.07
comparison = Clozapine VS Zotepine
Meyer−Lindenberg 1997 0.6171 0.3052 0.62 [0.02; 1.22] 1.5% 2.3%
comparison = Haloperidol VS Quetiapine
Purdon 2001 0.1818 0.4011 0.18 [−0.60; 0.97] 0.9% 1.5%
comparison = Placebo VS Ziprasidone
Findling 2013 0.2086 0.1477 0.21 [−0.08; 0.50] 6.5% 5.4%
comparison = Quetiapine VS Sertindole
Buller 2011 −0.1733 0.1294 −0.17 [−0.43; 0.08] 8.5% 5.9%
comparison = Lurasidone VS Risperidone
Citrome 2012_cognition −0.0081 0.1375 −0.01 [−0.28; 0.26] 7.5% 5.7%
comparison = Haloperidol VS Placebo
Gilbertson 1997 0.0000 0.4410 0.00 [−0.86; 0.86] 0.7% 1.3%
comparison = Paliperidone VS Risperidone
Nct00827840 0.0151 0.2887 0.02 [−0.55; 0.58] 1.7% 2.5%
Common effect model 0.04 [−0.04; 0.11] 100.0% --
Random effects model 0.05 [−0.05; 0.16] -- 100.0%
−1 −0.5 0 0.5 1
Heterogeneity: I^2 = 38%, τ^2 = 0.0315, p = 0.02
Residual heterogeneity: I^2 = 2%, τ^2 = 0, p = 0.43
Test for subgroup differences (common effect): χ^2_{14} = 31.99, df = 14 (p < 0.01)
Test for subgroup differences (random effects): χ^2_{14} = 31.99, df = 14 (p < 0.01)

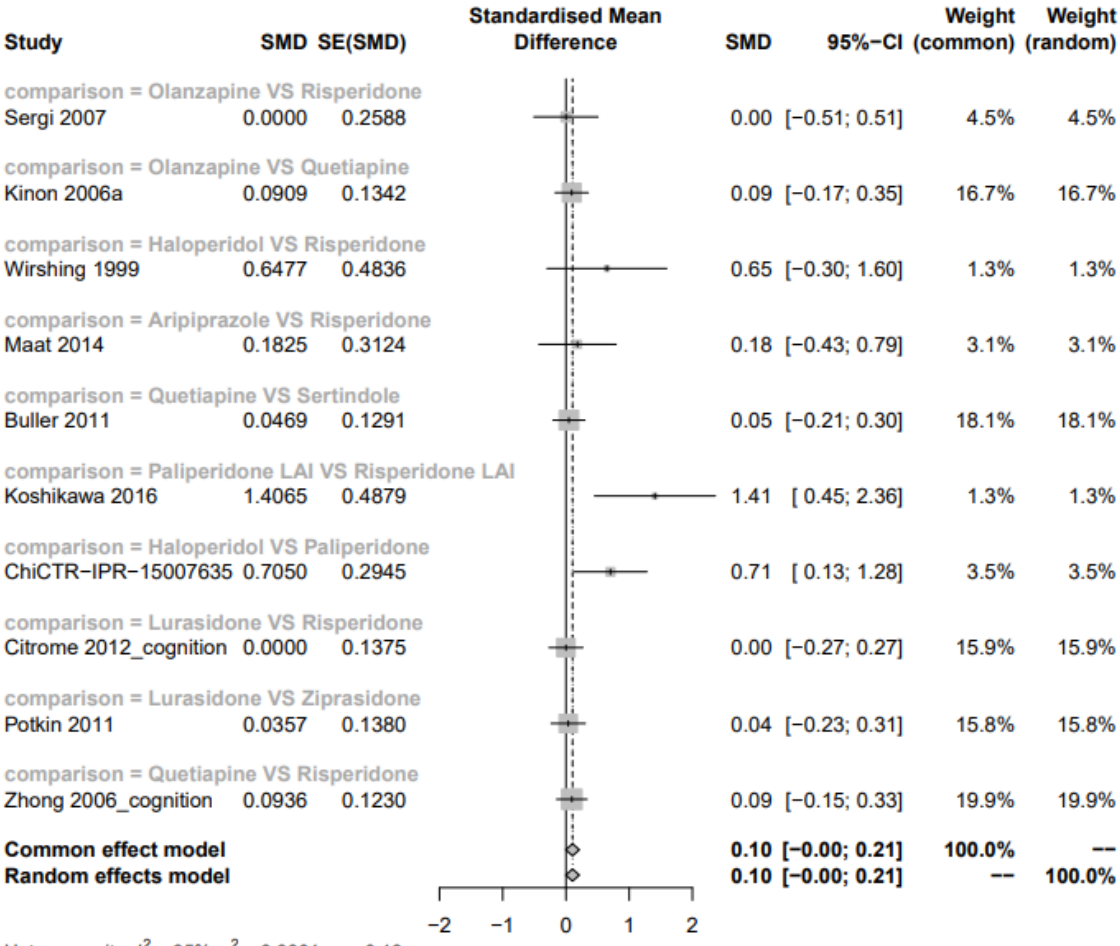
Reasoning and Problem Solving




comparison = Olanzapine VS Ziprasidone
Simpson 2004 0.0431 0.1865 0.04 [−0.32; 0.41] 2.3% 2.4%
Grootens 2009 −0.2268 0.2784 −0.23 [−0.77; 0.32] 1.0% 1.3%
Kinon 2006b −0.2012 0.1165 −0.20 [−0.43; 0.03] 6.0% 4.0%
Pfizer 2005h 0.0000 0.2613 0.00 [−0.51; 0.51] 1.2% 1.5%
Common effect model −0.13 [−0.30; 0.04] 10.6% --
Random effects model −0.11 [−0.33; 0.11] -- 9.1%
Heterogeneity: I^2 = 0%, τ^2 = 0.0157, p = 0.66
comparison = Placebo VS Risperidone
Geffen 2012 −0.1033 0.1529 −0.10 [−0.40; 0.20] 3.5% 3.0%
comparison = Clozapine VS Haloperidol
Krakowski 2006 −0.1885 0.2465 −0.19 [−0.67; 0.29] 1.3% 1.6%
Volavka 2002 0.3710 0.2870 0.37 [−0.19; 0.93] 1.0% 1.3%
Buchanan 1998_cognition −0.6305 0.3370 −0.63 [−1.29; 0.03] 0.7% 1.0%
Common effect model −0.11 [−0.43; 0.21] 3.0% --
Random effects model −0.11 [−0.47; 0.24] -- 3.8%
Heterogeneity: I^2 = 62%, τ^2 = 0.0157, p = 0.07
comparison = Clozapine VS Olanzapine
Krakowski 2006 0.3865 0.2459 0.39 [−0.10; 0.87] 1.3% 1.6%
Meltzer 2008 −0.0259 0.3166 −0.03 [−0.65; 0.59] 0.8% 1.1%
Volavka 2002 0.7831 0.2884 0.78 [0.22; 1.35] 1.0% 1.2%
Naber 2005_cognition 0.3669 0.3717 0.37 [−0.36; 1.10] 0.6% 0.8%
Common effect model 0.40 [0.11; 0.69] 3.7% --
Random effects model 0.40 [0.08; 0.71] -- 4.7%
Heterogeneity: I^2 = 16%, τ^2 = 0.0157, p = 0.31
comparison = Olanzapine VS Placebo
Kryzhanovskaya 2009 0.1898 0.3052 0.19 [−0.41; 0.79] 0.9% 1.1%
comparison = Olanzapine VS Quetiapine
McEvoy 2007a 0.1038 0.2676 0.10 [−0.42; 0.63] 1.1% 1.4%
Voruganti 2007 0.1981 0.2175 0.20 [−0.23; 0.62] 1.7% 1.9%
Common effect model 0.16 [−0.17; 0.49] 2.9% --
Random effects model 0.16 [−0.22; 0.53] -- 3.3%
Heterogeneity: I^2 = 0%, τ^2 = 0.0157, p = 0.78
comparison = Quetiapine VS Risperidone
McEvoy 2007a 0.0402 0.2776 0.04 [−0.50; 0.58] 1.1% 1.3%
comparison = Clozapine VS Risperidone
McGurk 2005 0.6110 0.4380 0.61 [−0.25; 1.47] 0.4% 0.6%
Volavka 2002 0.6183 0.2864 0.62 [0.06; 1.18] 1.0% 1.3%
Common effect model 0.62 [0.15; 1.09] 1.4% --
Random effects model 0.62 [0.11; 1.12] -- 1.9%
Heterogeneity: I^2 = 0%, τ^2 = 0.0157, p = 0.99
comparison = Clozapine VS Zotepine
Meyer−Lindenberg 1997 −0.0279 0.2918 −0.03 [−0.60; 0.54] 1.0% 1.2%

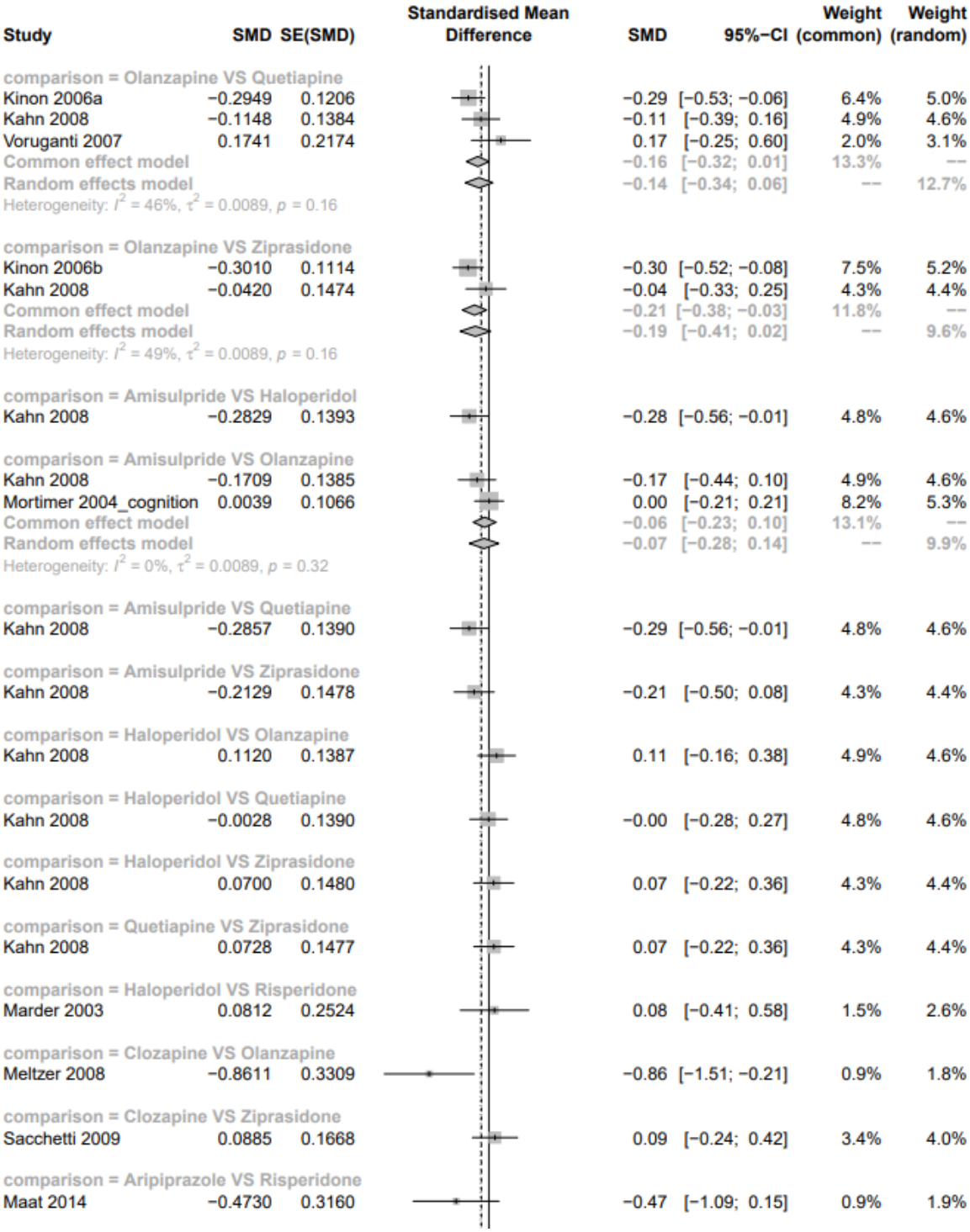

comparison = Haloperidol VS Quetiapine
Purdon 2001 0.3907 0.4041 0.39 [−0.40; 1.18] 0.5% 0.7%
Arvanitis 1993 0.1759 0.1737 0.18 [−0.16; 0.52] 2.7% 2.6%
Common effect model 0.21 [−0.10; 0.52] 3.2% --
Random effects model 0.22 [−0.15; 0.59] -- 3.3%
Heterogeneity: I^2 = 0%, τ^2 = 0.0157, p = 0.63
comparison = Clozapine VS Ziprasidone
Sacchetti 2009 0.0177 0.1650 0.02 [−0.31; 0.34] 3.0% 2.8%
comparison = Olanzapine VS Sertindole
Nielsen 2014 −0.9063 0.8013 −0.91 [−2.48; 0.66] 0.1% 0.2%
comparison = Aripiprazole VS Quetiapine
Pagsberg 2017 0.2487 0.1889 0.25 [−0.12; 0.62] 2.3% 2.3%
comparison = Quetiapine VS Sertindole
Buller 2011 −0.1689 0.1293 −0.17 [−0.42; 0.08] 4.9% 3.6%
comparison = Paliperidone LAI VS Risperidone LAI
Koshikawa 2016 0.3677 0.4406 0.37 [−0.50; 1.23] 0.4% 0.6%
comparison = Fluphenazine VS Olanzapine
Dossenbach 2004_cognition −0.3781 0.4785 −0.38 [−1.32; 0.56] 0.4% 0.5%
comparison = Haloperidol VS Sertindole
Gallhofer 2007_all patients 0.9497 0.3730 0.95 [0.22; 1.68] 0.6% 0.8%
comparison = Lurasidone VS Risperidone
Citrome 2012_cognition 0.0901 0.1376 0.09 [−0.18; 0.36] 4.3% 3.4%
comparison = Aripiprazole VS Olanzapine
NCT01057849_cognition 0.0994 0.2277 0.10 [−0.35; 0.55] 1.6% 1.8%
Wang 2013b −0.1429 0.2808 −0.14 [−0.69; 0.41] 1.0% 1.3%
Common effect model 0.00 [−0.34; 0.35] 2.6% --
Random effects model −0.00 [−0.39; 0.39] -- 3.1%
Heterogeneity: I^2 = 0%, τ^2 = 0.0157, p = 0.50
comparison = Aripiprazole VS Risperidone
NCT01057849_cognition −0.1160 0.2112 −0.12 [−0.53; 0.30] 1.8% 2.0%
Wang 2013b −0.2988 0.2928 −0.30 [−0.87; 0.28] 0.9% 1.2%
Common effect model −0.18 [−0.51; 0.16] 2.8% --
Random effects model −0.18 [−0.57; 0.20] -- 3.2%
Heterogeneity: I^2 = 0%, τ^2 = 0.0157, p = 0.61
comparison = Lurasidone VS Ziprasidone
Potkin 2011 0.0000 0.1364 0.00 [−0.27; 0.27] 4.4% 3.4%
comparison = Olanzapine VS Paliperidone
Wang 2022 0.4311 0.2184 0.43 [0.00; 0.86] 1.7% 1.9%
Common effect model 0.03 [−0.02; 0.09] 100.0% --
Random effects model 0.05 [−0.02; 0.12] -- 100.0%
−2 −1 0 1 2
Heterogeneity: I^2 = 39%, τ^2 = 0.0183, p < 0.01
Residual heterogeneity: I^2 = 35%, τ^2 = 0.0157, p = 0.02
Test for subgroup differences (common effect): χ^2_{26} = 46.44, df = 26 (p < 0.01)
Test for subgroup differences (random effects): χ^2_{26} = 37.15, df = 26 (p = 0.07)

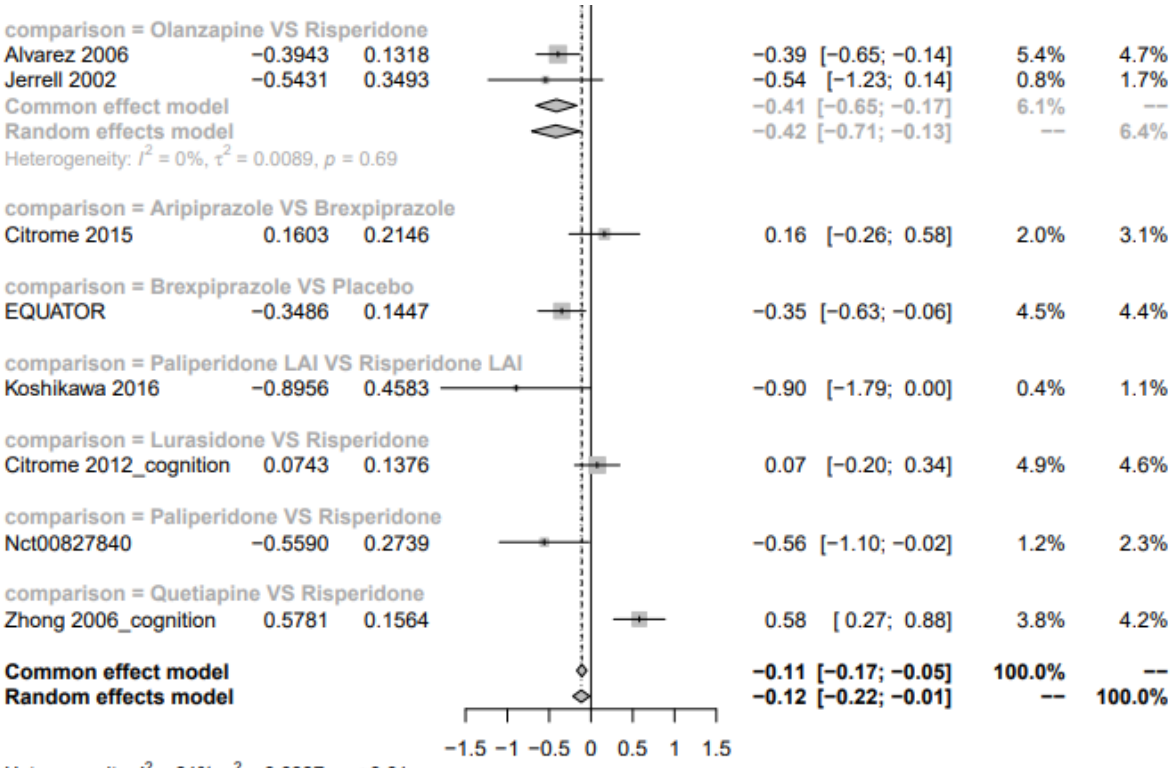
Social Cognition



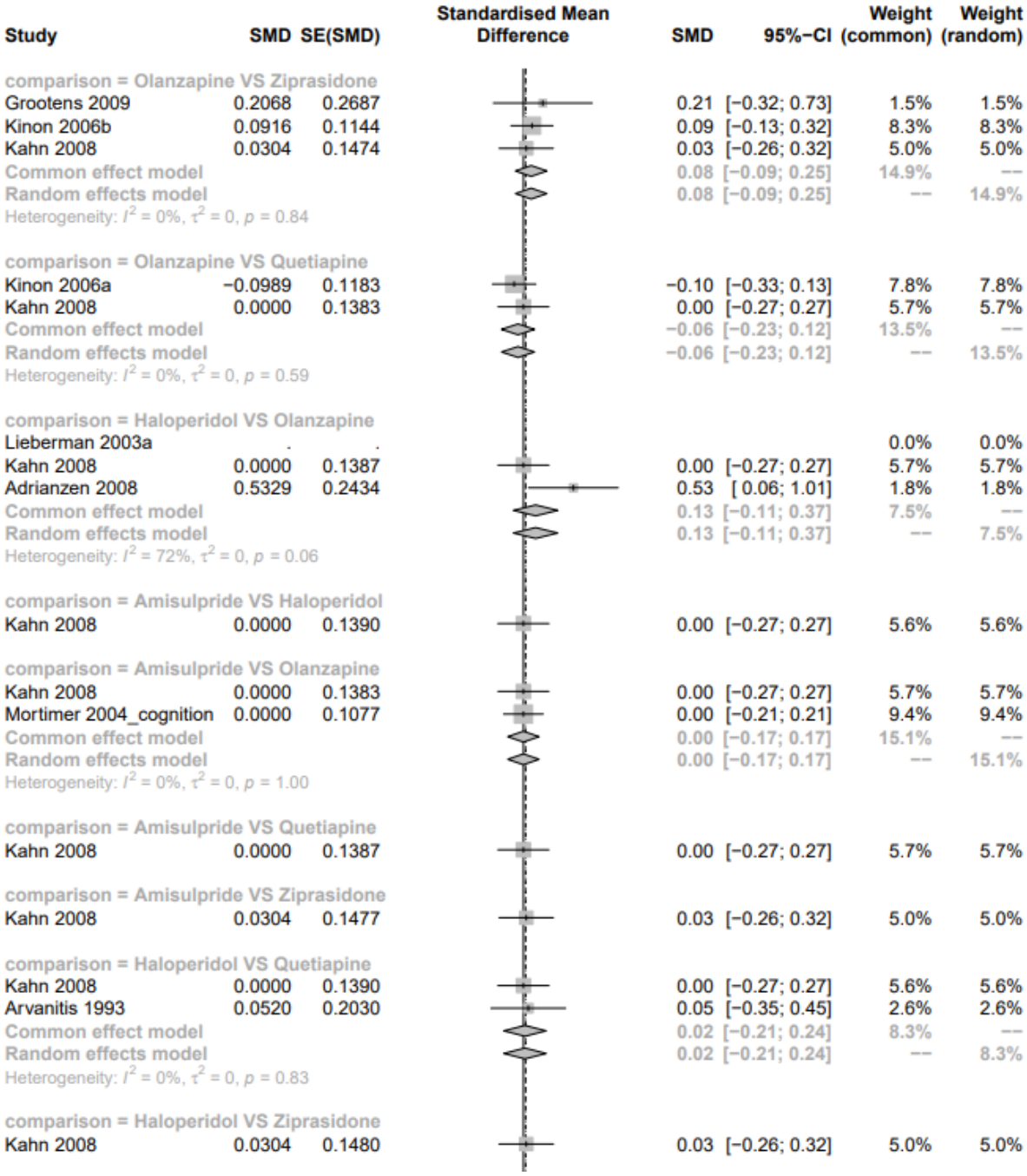
Heterogeneity: I^2 = 35%, τ^2 < 0.0001, p = 0.13
Residual heterogeneity: I^2 = NA%, τ^2 = 0, p = NA
Test for subgroup differences (common effect): χ^2_9 = 13.81, df = 9 (p = 0.13)
Test for subgroup differences (random effects): χ^2_9 = 13.81, df = 9 (p = 0.13)

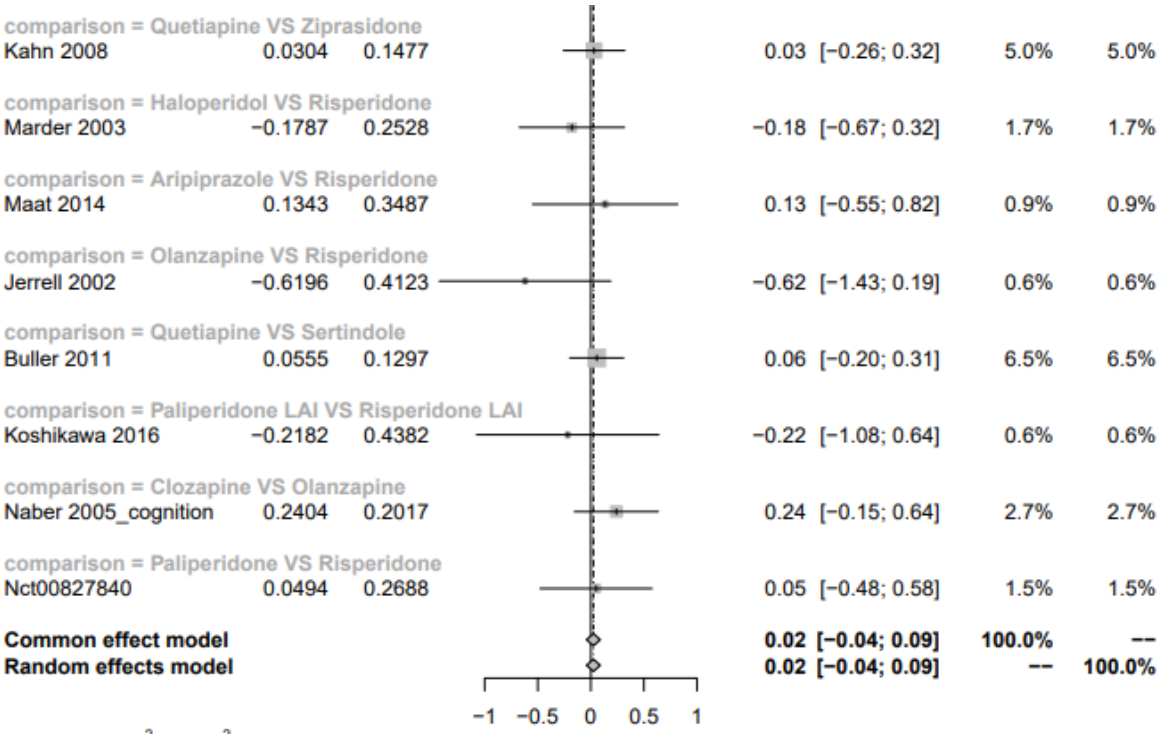
Functioning




comparison = Olanzapine VS Risperidone
Alvarez 2006 −0.3943 0.1318 −0.39 [−0.65; −0.14] 5.4% 4.7%
Jerrell 2002 −0.5431 0.3493 −0.54 [−1.23; 0.14] 0.8% 1.7%
Common effect model −0.41 [−0.65; −0.17] 6.1% --
Random effects model −0.42 [−0.71; −0.13] -- 6.4%
Heterogeneity: I^2 = 0%, τ^2 = 0.0089, p = 0.69
comparison = Aripiprazole VS Brexpiprazole
Citrome 2015 0.1603 0.2146 0.16 [−0.26; 0.58] 2.0% 3.1%
comparison = Brexpiprazole VS Placebo
EQUATOR −0.3486 0.1447 −0.35 [−0.63; −0.06] 4.5% 4.4%
comparison = Paliperidone LAI VS Risperidone LAI
Koshikawa 2016 −0.8956 0.4583 −0.90 [−1.79; 0.00] 0.4% 1.1%
comparison = Lurasidone VS Risperidone
Citrome 2012_cognition 0.0743 0.1376 0.07 [−0.20; 0.34] 4.9% 4.6%
comparison = Paliperidone VS Risperidone
Nct00827840 −0.5590 0.2739 −0.56 [−1.10; −0.02] 1.2% 2.3%
comparison = Quetiapine VS Risperidone
Zhong 2006_cognition 0.5781 0.1564 0.58 [0.27; 0.88] 3.8% 4.2%
Common effect model −0.11 [−0.17; −0.05] 100.0% --
Random effects model −0.12 [−0.22; −0.01] -- 100.0%
−1.5 −1 −0.5 0 0.5 1 1.5
Heterogeneity: I^2 = 61%, τ^2 = 0.0387, p < 0.01
Residual heterogeneity: I^2 = 27%, τ^2 = 0.0089, p = 0.23
Test for subgroup differences (common effect): χ^2_{20} = 57.21, df = 20 (p < 0.01)
Test for subgroup differences (random effects): χ^2_{20} = 43.43, df = 20 (p < 0.01)

Quality of Life





Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.97
Residual heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.64
Test for subgroup differences (common effect): χ^2_{16} = 6.92, df = 16 (p = 0.97)
Test for subgroup differences (random effects): χ^2_{16} = 6.92, df = 16 (p = 0.97)

Network meta-analyses

Composite Score

Description of the network

Below is a description for the network formed by studies examining the Composite Score.

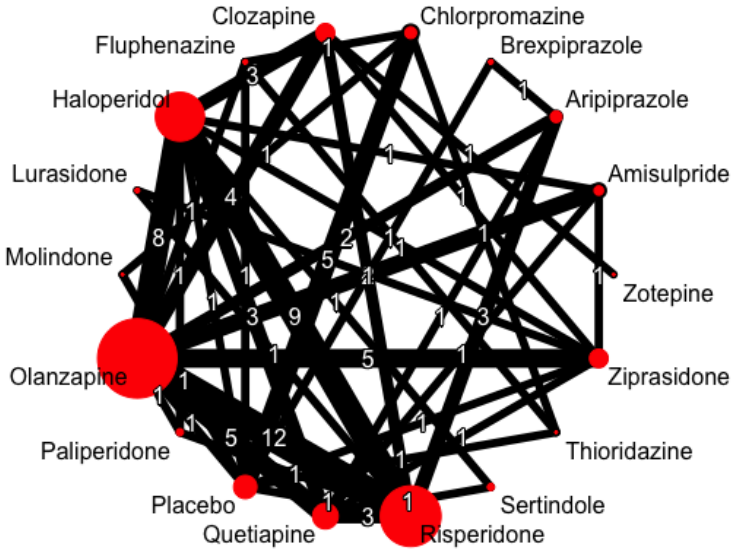
Number of drugs:

```
## [1] 18
```

Number of studies:

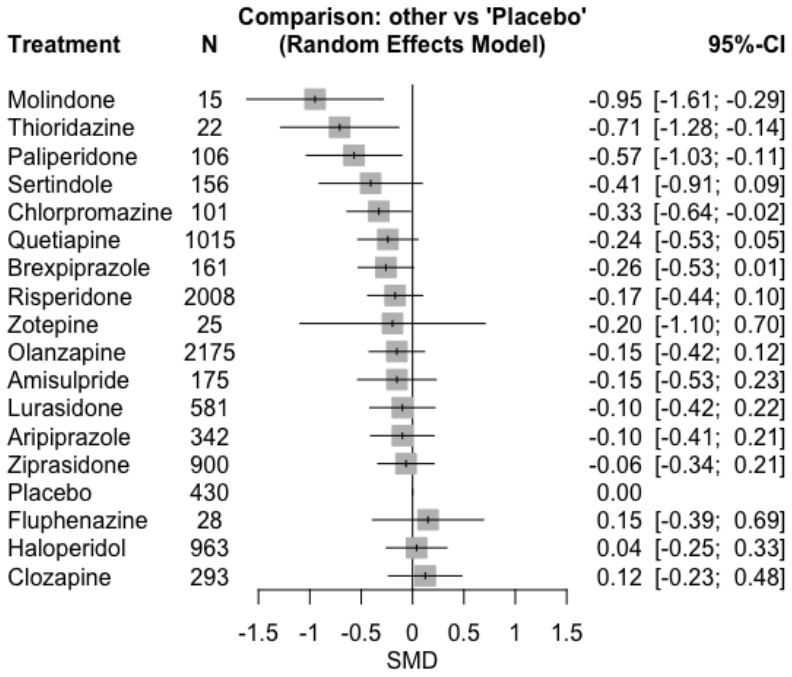
```
## [1] 66
```

The plot below shows the available data



Frequentist network meta-analysis

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0
```

and I-square (total) is

```
## I2= 0 %
```

There is little evidence of inconsistency in the data. There are in total

```
## 42
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 3
```

of them which gives a % of inconsistent loops equal to

```
## 7.1 %
```

The comparisons with inconsistency (according to SIDE p-value<0.10) in the frequentist model are:

```
##                comparison     p
## 95  Haloperidol:Sertindole 0.093
## 121 Olanzapine:Risperidone 0.055
## 140  Quetiapine:Sertindole 0.093
```

The p-value from the design-by-treatment test is

```
## [1] 0.97
```

Bayesian analysis

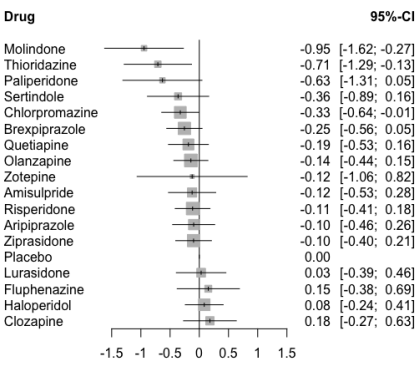
```
## [1] "Note: the treatments have been renamed as follows"
##         old names new names
```

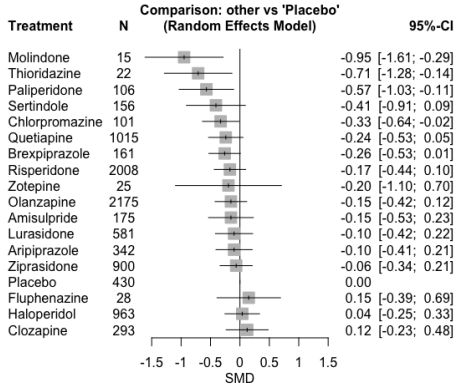
```
## 1     Amisulpride        1
## 2    Aripiprazole        2
## 3   Brexpiprazole        3
## 4  Chlorpromazine        4
## 5       Clozapine        5
## 6    Fluphenazine        6
## 7     Haloperidol        7
## 8      Lurasidone        8
## 9      Molindone        9
## 10     Olanzapine       10
## 11   Paliperidone       11
## 12       Placebo       12
## 13     Quetiapine       13
## 14    Risperidone       14
## 15     Sertindole       15
## 16   Thioridazine       16
## 17    Ziprasidone       17
## 18      Zotepine       18
```

The heterogeneity (tau) is shown below.

```
##    mean     sd   2.5%    25%    50%    75%  97.5%   Rhat   n.eff
## 5.9e-02 4.5e-02 2.5e-03 2.4e-02 5.0e-02 8.5e-02 1.7e-01 1.0e+00 1.3e+03
```

The forest plot of each treatment versus placebo from the Bayesian analysis is shown on the left side below, next to its frequentist counterpart (right side).





Speed of Processing

Description of the network

Below is a description for the network formed by studies examining the secondary outcome Speed Of Processing.

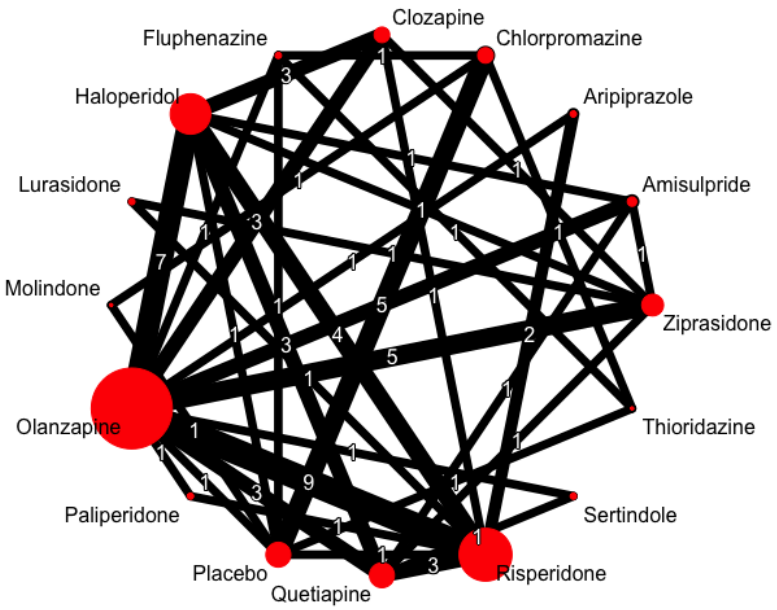
Number of drugs:

```
## [1] 16
```

Number of studies:

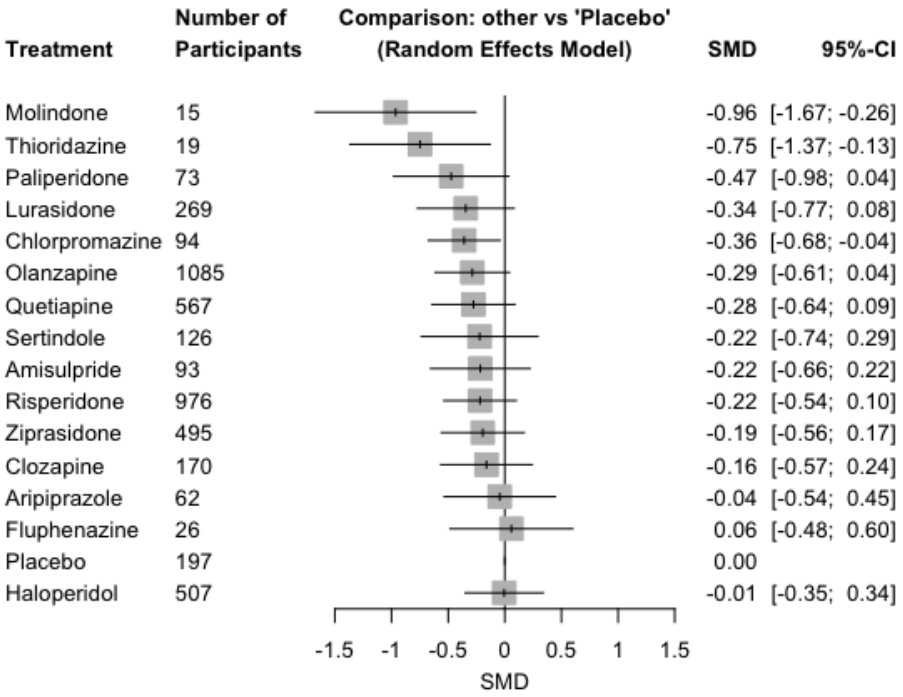
```
## [1] 46
```

The plot below shows the available data.



Frequentist network meta-analysis

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0.143
```

and I-square (total) is

```
## I2= 28.22 %
```

There is some evidence of inconsistency in the data. There are in total

```
## 37
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 2
```

of them which gives a % of inconsistent loops equal to

```
## 5.4 %
```

The comparisons with inconsistency (according to SIDE p-value<0.10) in the frequentist model are:

```
##              comparison     p
## 44 Clozapine:Haloperidol 0.062
## 47  Clozapine:Olanzapine 0.073
```

The p-value from the design-by-treatment test is

```
## [1] 0.008
```

Working Memory

Description of the network

Below is a description for the network formed by studies examining the secondary outcome Working Memory.

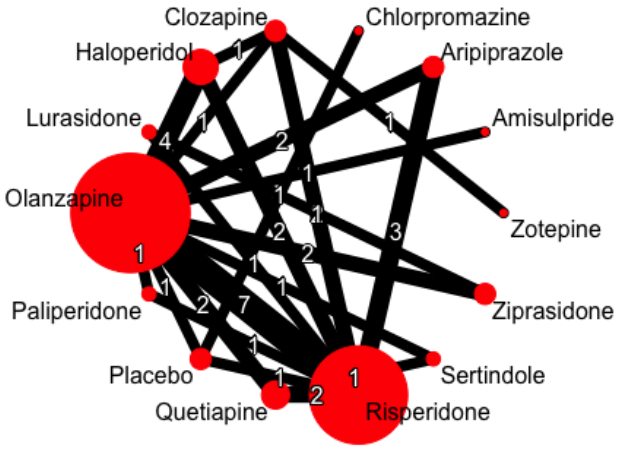
Number of drugs:

```
## [1] 14
```

Number of studies:

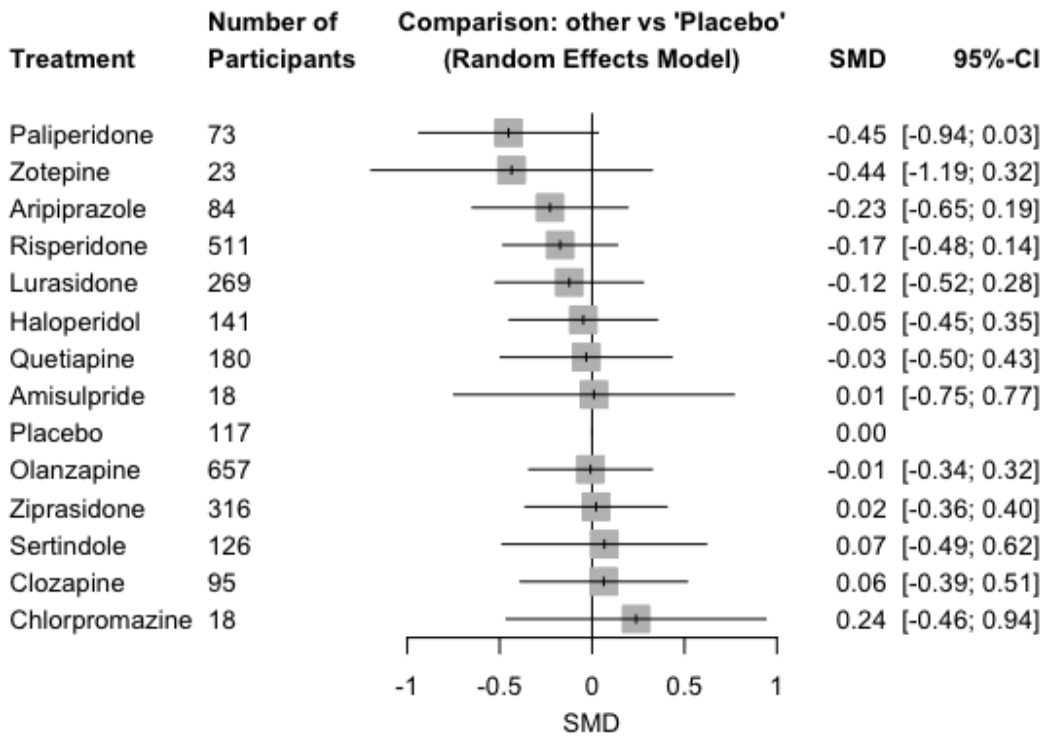
```
## [1] 28
```

The plot below shows the available data.



Frequentist network meta-analysis

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0.096
```

and I-square (total) is

```
## I2= 13.2 %
```

There is some evidence of inconsistency in the data. There are in total

```
## 19
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 4
```

of them which gives a % of inconsistent loops equal to

```
## 21 %
```

The comparisons with inconsistency (according to SIDE p-value<0.10) in the frequentist model are:

```
##              comparison     p
## 37 Clozapine:Haloperidol 0.066
## 39  Clozapine:Olanzapine 0.058
## 68 Olanzapine:Sertindole 0.037
## 83 Quetiapine:Sertindole 0.037
```

The p-value from the design-by-treatment test is

```
## [1] 0.68
```

Visual Learning

Description of the network

Below is a description for the network formed by studies examining the secondary outcome Visual Learning.

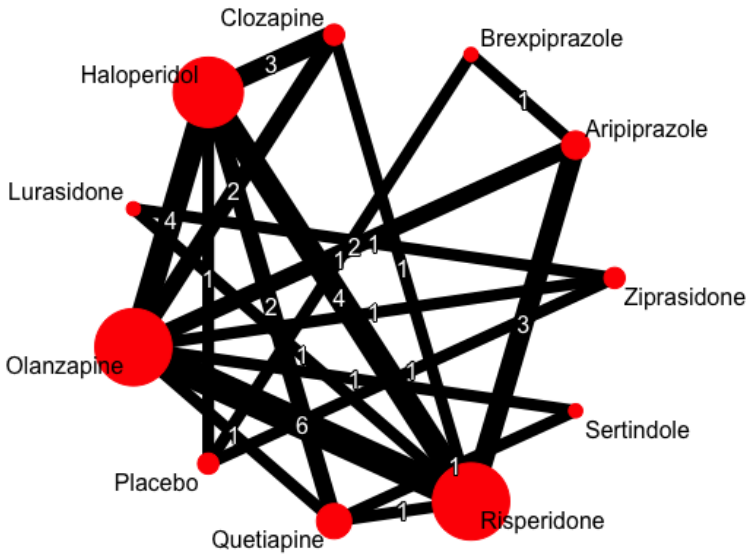
Number of drugs:

```
## [1] 11
```

Number of studies:

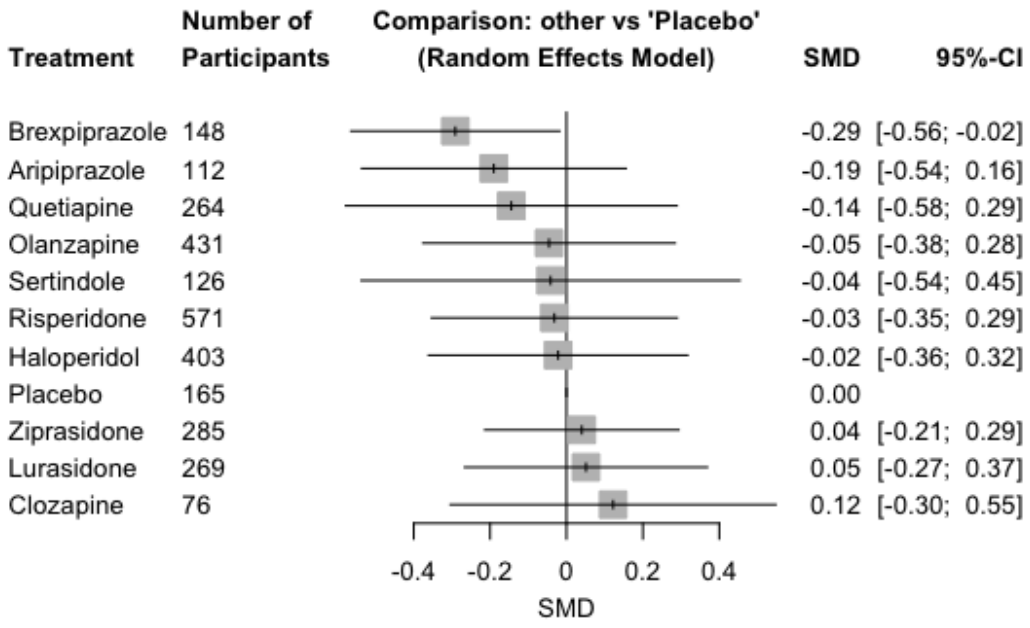
```
## [1] 25
```

The plot below shows the available data.



Frequentist network meta-analysis

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0
```

and I-square (total) is

```
## I2= 0 %
```

There is no evidence of inconsistency in the data. There are in total

```
## 20
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 0
```

of them which gives a % of inconsistent loops equal to

```
## 0 %
```

The p-value from the design-by-treatment test is

```
## [1] 0.49
```

Verbal Learning

Description of the network

Below is a description for the network formed by studies examining the secondary outcome Verbal Learning.

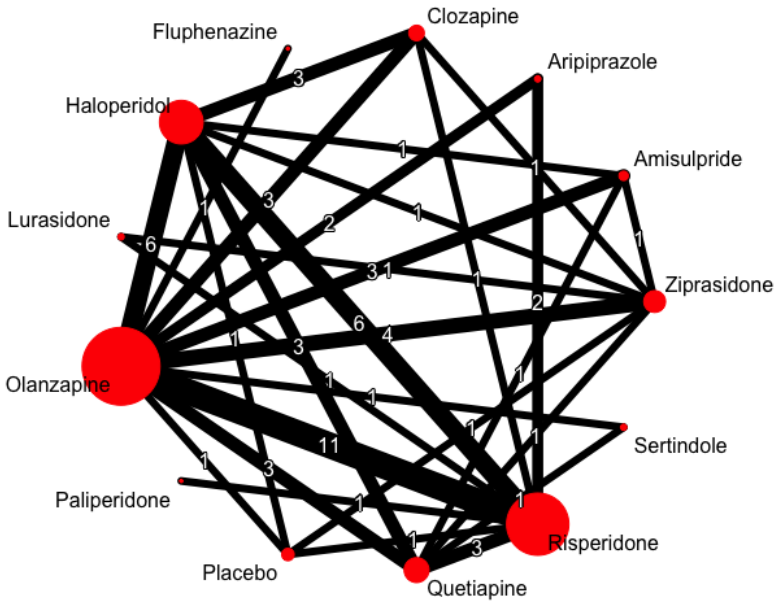
Number of drugs:

```
## [1] 13
```

Number of studies:

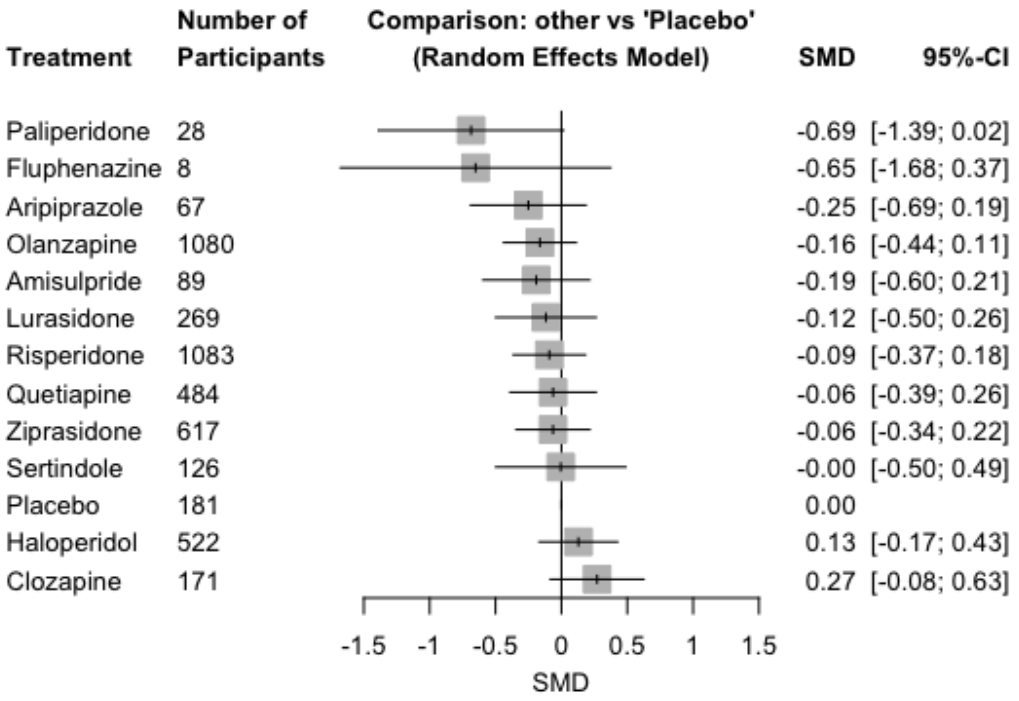
```
## [1] 42
```

The plot below shows the available data.



Frequentist network meta-analysis

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0.149
```

and I-square (total) is

```
## I2= 31.8 %
```

There is little evidence of inconsistency in the data. There are in total

```
## 27
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 2
```

of them which gives a % of inconsistent loops equal to

```
## 7.4 %
```

The comparisons with inconsistency (according to SIDE p-value<0.10) in the frequentist model are:

```
##              comparison     p
## 12 Amisulpride:Ziprasidone 0.066
## 44  Haloperidol:Olanzapine 0.026
```

The p-value from the design-by-treatment test is

```
## [1] 0.59
```

Attention/Vigilance

Description of the network

Below is a description for the network formed by studies examining the secondary outcome Attention Vigilance

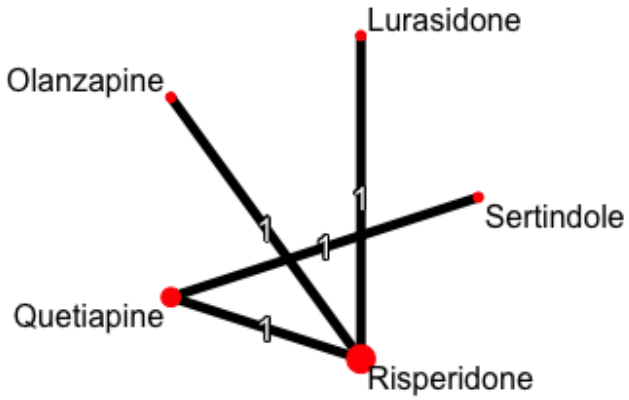
Number of drugs:

```
## [1] 5
```

Number of studies:

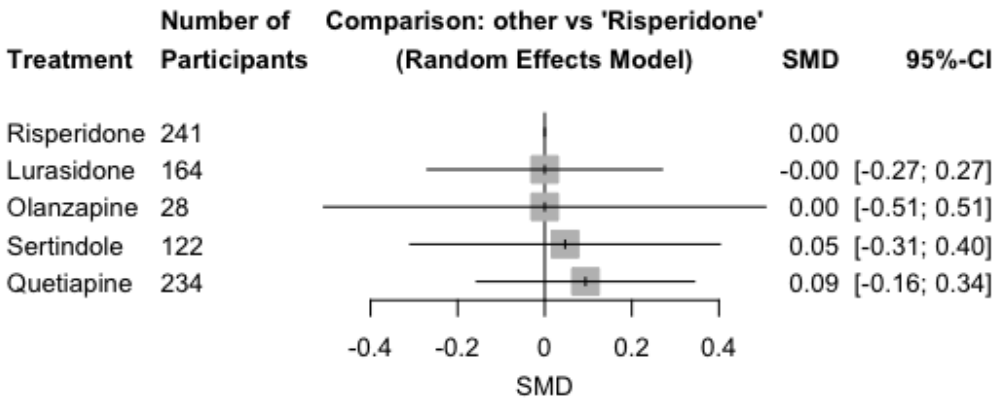
```
## [1] 4
```

The plot below shows the available data



Frequentist network meta-analysis

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= NA
```

and I-square (total) is

```
## I2= NA %
```

The p-value from the design-by-treatment test is

```
## [1] NA
```

Reasoning and Problem Solving

Description of the network

Below is a description for the network formed by studies examining the secondary outcome Reasoning and Solving

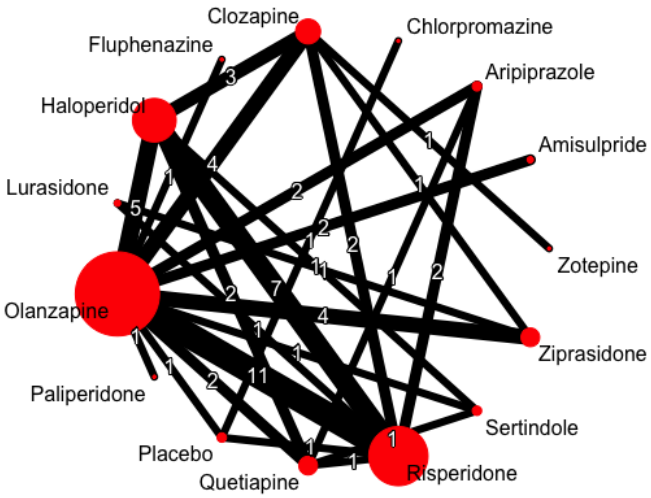
Number of drugs:

```
## [1] 15
```

Number of studies:

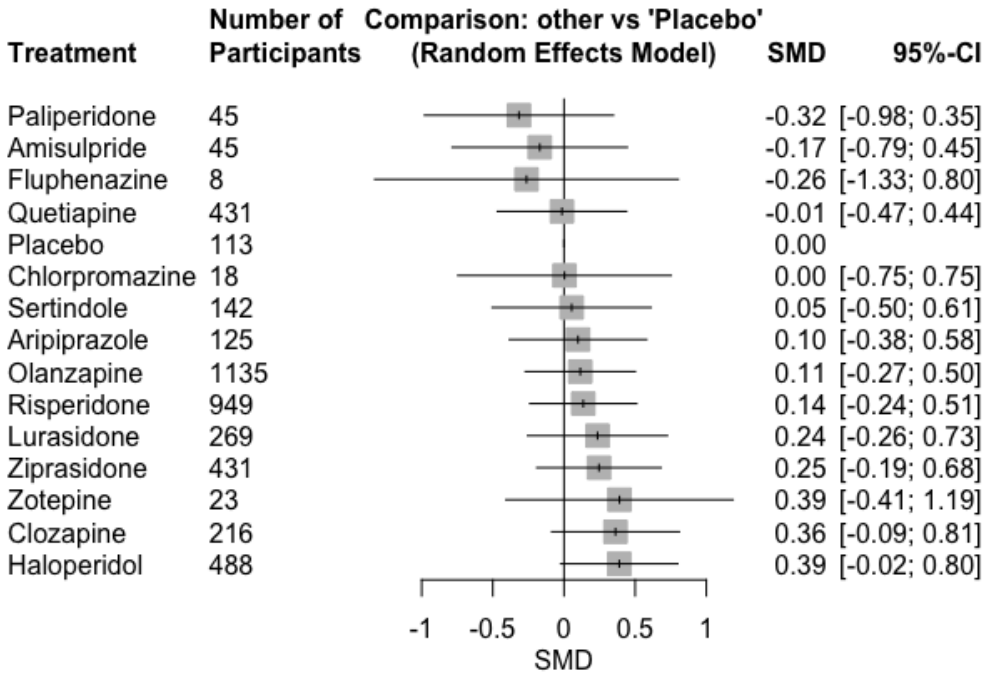
```
## [1] 45
```

The plot below shows the available data



Frequentist network meta-analysis

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0.168
```

and I-square (total) is

```
## I2= 35 %
```

There is some evidence of inconsistency in the data. There are in total

```
## 21
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 2
```

of them which gives a % of inconsistent loops equal to

```
## 9.5 %
```

The comparisons with inconsistency (according to SIDE p-value<0.10) in the frequentist model are:

```
##              comparison     p
## 47  Clozapine:Risperidone 0.099
## 67 Haloperidol:Sertindole 0.079
```

The p-value from the design-by-treatment test is

```
## [1] 0.56
```

Social Cognition

Description of the network

Below is a description for the network formed by studies examining the secondary outcome Social Cognition

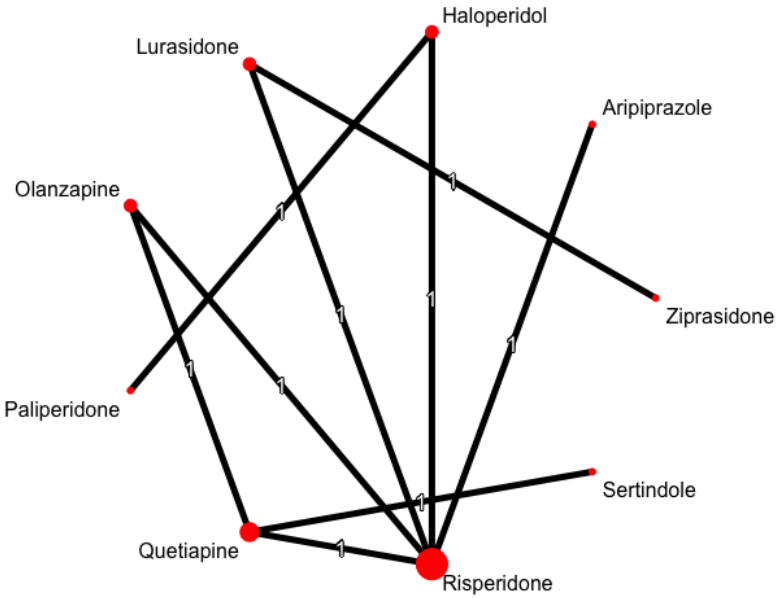
Number of drugs:

```
## [1] 9
```

Number of studies:

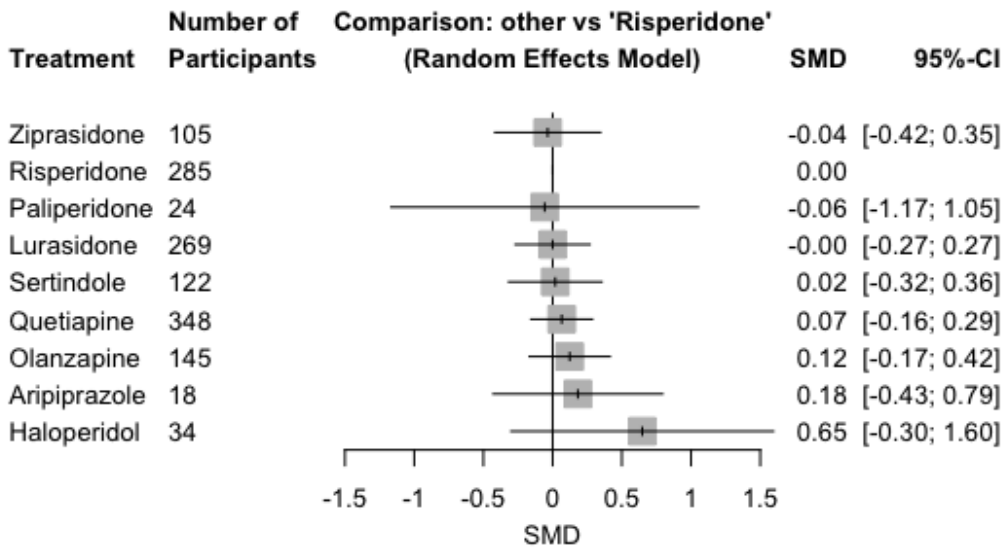
```
## [1] 9
```

The plot below shows the available data



Frequentist network meta-analysis

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0
```

and I-square (total) is

```
## I2= 0 %
```

There is no evidence of local inconsistency in the data. However, there is only one loop in the network.

The p-value from the design-by-treatment test is

```
## [1] 0.56
```

Functioning

Description of the network

Below is a description for the network formed by studies examining the secondary outcome Social Functioning

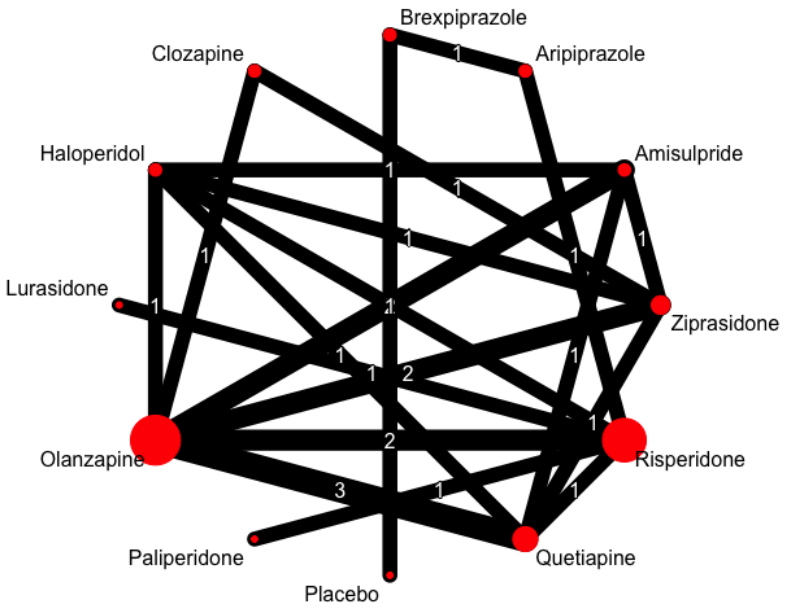
Number of drugs:

```
## [1] 12
```

Number of studies:

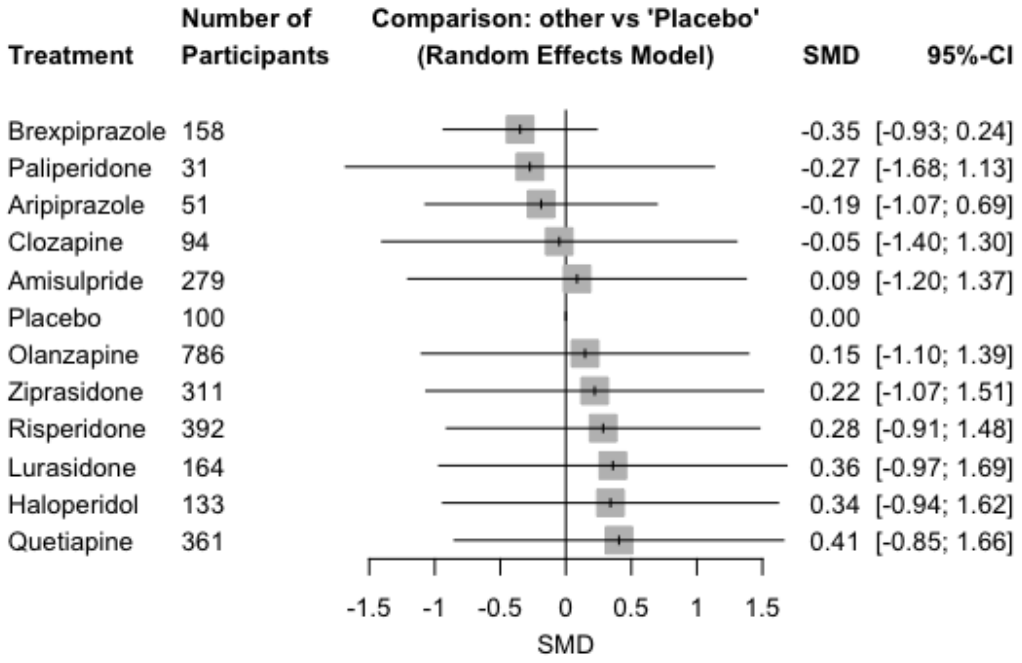
```
## [1] 16
```

The plot below shows the available data



Frequentist network meta-analysis

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0.261
```

and I-square (total) is

```
## I2= 72.91 %
```

There is some evidence of inconsistency in the data. There are in total

```
## 15
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 5
```

of them which gives a % of inconsistent loops equal to

```
## 33.3 %
```

The comparisons with inconsistency (according to SIDE p-value<0.10) in the frequentist model are:

```
##              comparison         p
## 33   Clozapine:Olanzapine 0.03709074
## 38  Clozapine:Ziprasidone 0.03709074
## 54  Olanzapine:Quetiapine 0.06839917
## 55 Olanzapine:Risperidone 0.05639018
## 64 Quetiapine:Risperidone 0.04752982
```

The p-value from the design-by-treatment test is

```
## [1] 0.047
```

Quality of Life

Description of the network

Below is a description for the network formed by studies examining the secondary outcome Quality of Life

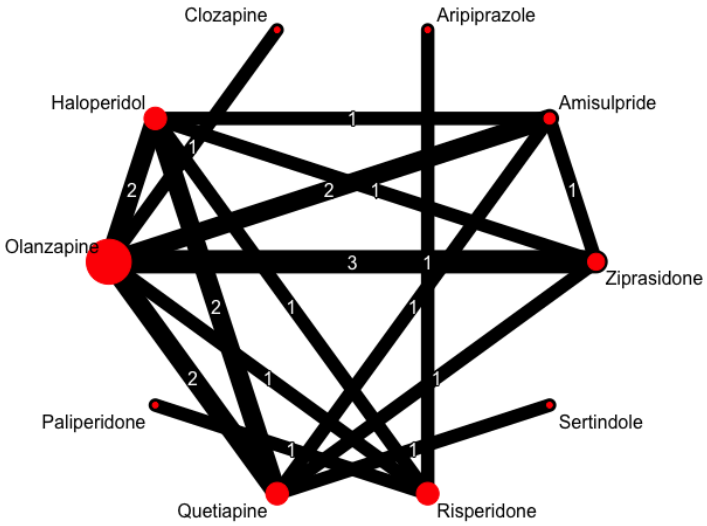
Number of drugs:

```
## [1] 10
```

Number of studies:

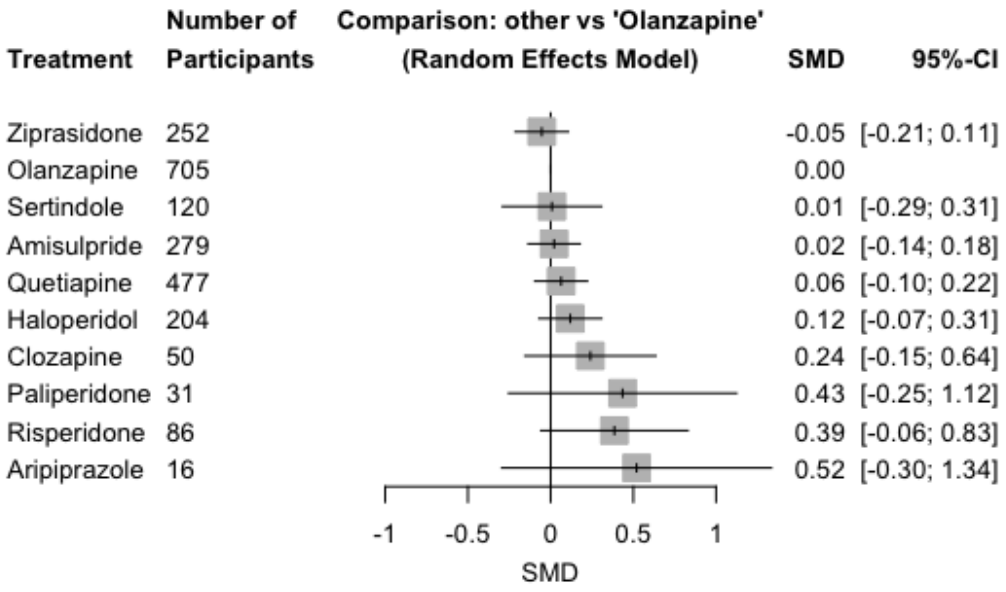
```
## [1] 13
```

The plot below shows the available data



Frequentist network meta-analysis

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0
```

and I-square (total) is

```
## I2= 0 %
```

There is some evidence of inconsistency in the data. There are in total

```
## 12
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 0
```

of them which gives a % of inconsistent loops equal to

```
## 0 %
```

The p-value from the design-by-treatment test is

```
## [1] 0.55
```

Network meta-regressions

We conducted meta-regressions of our primary outcome to examine the following characteristics:

- Baseline severity of symptoms
- Inclusion of acutely ill or stable patients
- Age
- Co-medication with anticholinergics
- Co-medication with benzodiazepines

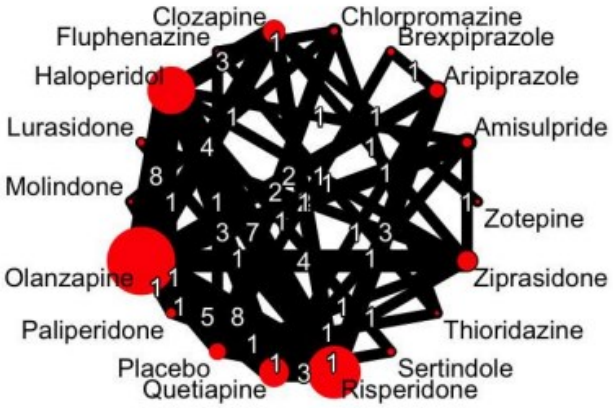
Overall symptoms - Baseline severity

```
[1] "Note: the treatments have been renamed as follows"
```

old names <chr>	new names <dbl>
Amisulpride	1
Aripiprazole	2
Brexpiprazole	3
Chlorpromazine	4
Clozapine	5
Fluphenazine	6
Haloperidol	7
Lurasidone	8
Molindone	9
Olanzapine	10

1-10 of 18 rows Previous 1 2 Next

The network plot for the available data on baseline severity of overall symptoms is shown below



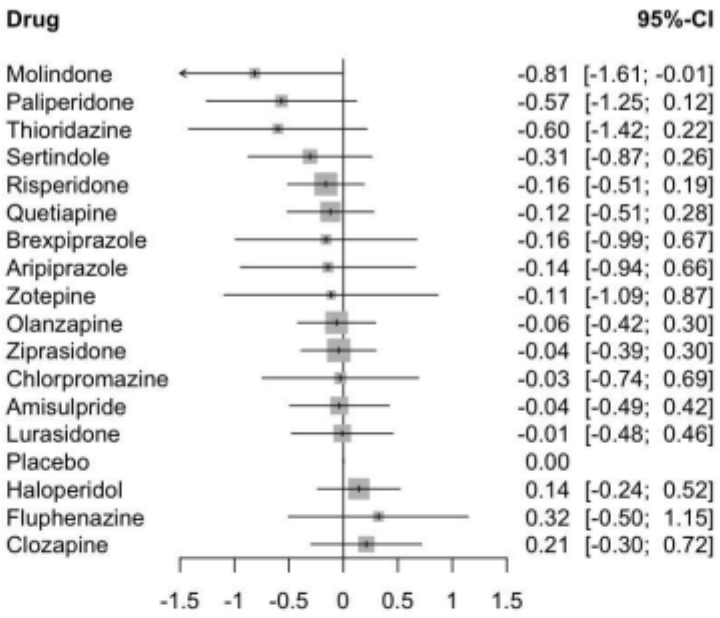
The value of the beta coefficient (equal for all treatments vs Placebo) is shown below.

```
      mean         sd       2.5%        25%        50%        75%      97.5%       Rhat
n.eff
  -0.00577    0.01426   -0.03314   -0.01561   -0.00593    0.00389    0.02221    1.00200 1500.
00000
```

The heterogeneity (tau) is shown below.

```
    mean       sd     2.5%      25%      50%      75%    97.5%     Rhat    n.eff
6.16e-02 4.78e-02 1.83e-03 2.42e-02 5.13e-02 8.87e-02 1.78e-01 1.00e+00 3.30e+03
```

The forest plot at the mean value of the predictor (87.566) is shown below.



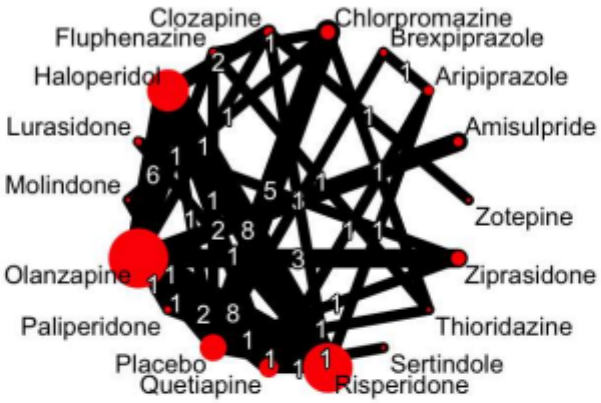
State of symptoms

```
[1] "Note: the treatments have been renamed as follows"
```

old names <chr>	new names <dbl>
Amisulpride	1
Aripiprazole	2
Brexpiprazole	3
Chlorpromazine	4
Clozapine	5
Fluphenazine	6
Haloperidol	7
Lurasidone	8
Molindone	9
Olanzapine	10

1-10 of 18 rows Previous 1 2 Next

The network plot for the available data on symptoms state



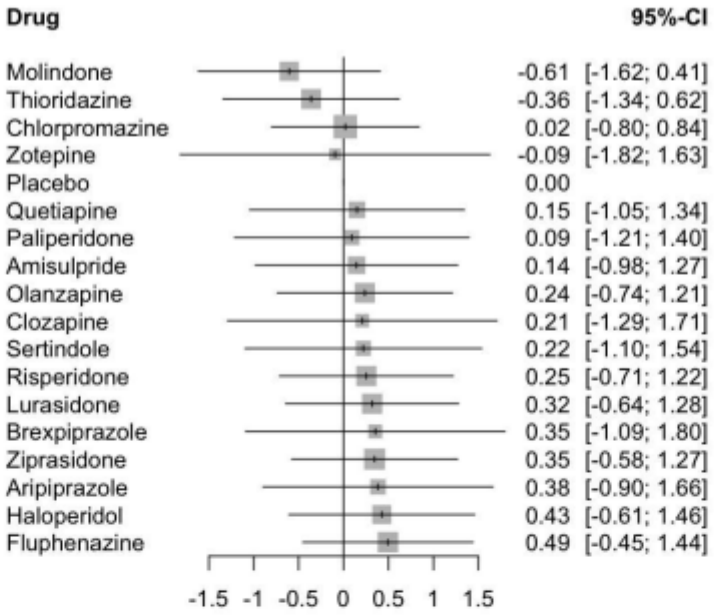
The value of the beta coefficient (equal for all treatments vs Placebo) is shown below.

mean	sd	2.5%	25%	50%	75%	97.5%	Rhat	n.eff
0.3389	0.3899	-0.4138	0.0767	0.3329	0.6049	1.0937	1.0149	280.0000

The heterogeneity (tau) is shown below.

mean	sd	2.5%	25%	50%	75%	97.5%	Rhat	n.eff
8.62e-02	6.29e-02	3.98e-03	3.63e-02	7.46e-02	1.23e-01	2.35e-01	1.01e+00	1.40e+03

The forest plot for acute state of symptoms is shown below.



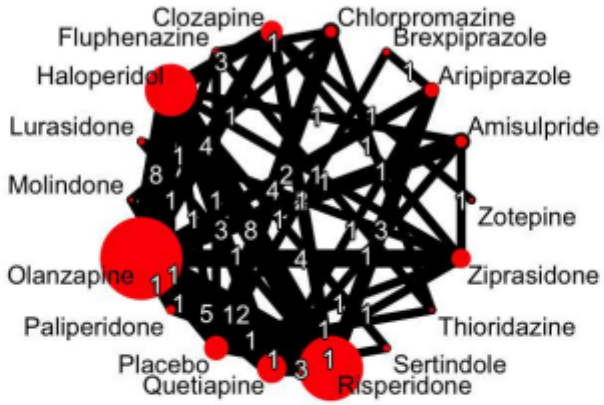
Mean age at baseline

```
[1] "Note: the treatments have been renamed as follows"
```

old names <chr>	new names <dbl>
Amisulpride	1
Aripiprazole	2
Brexpiprazole	3
Chlorpromazine	4
Clozapine	5
Fluphenazine	6
Haloperidol	7
Lurasidone	8
Molindone	9
Olanzapine	10

1-10 of 18 rows Previous 1 2 Next

The network plot for the available data on mean age at baseline



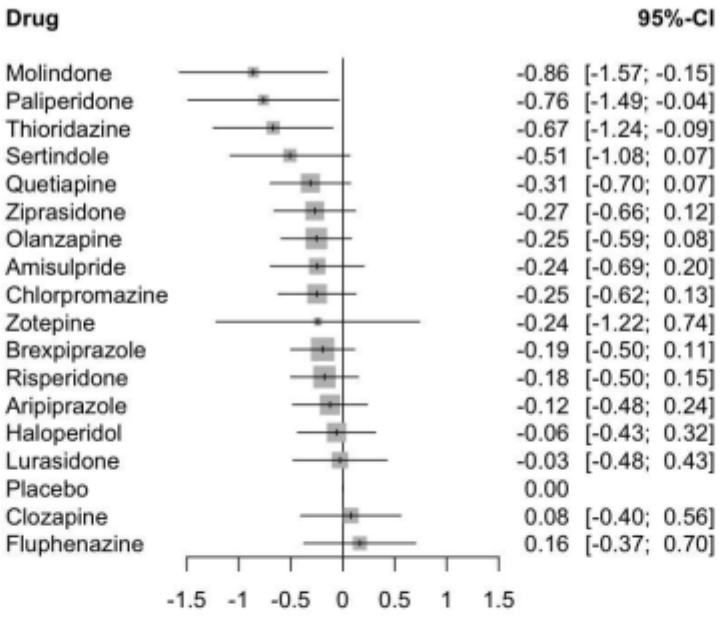
The value of the coefficients (equal) is shown below.

```
      mean         sd       2.5%        25%        50%        75%      97.5%       Rhat
n.eff
   0.01643    0.01289   -0.00890    0.00776    0.01639    0.02506    0.04190    1.00130 4700.
00000
```

The heterogeneity (tau) is shown below.

```
    mean       sd     2.5%      25%      50%      75%    97.5%     Rhat    n.eff
6.10e-02 4.39e-02 4.56e-03 2.65e-02 5.22e-02 8.62e-02 1.67e-01 1.00e+00 2.20e+04
```

The forest plot at the mean value of the predictor 33.767 is shown below.



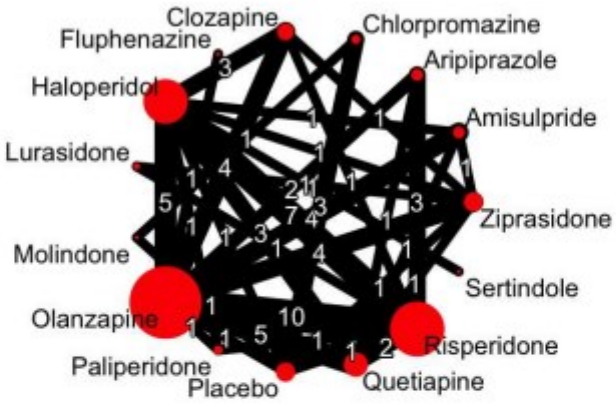
Co-medication with anticholinergics

```
[1] "Note: the treatments have been renamed as follows"
```

old names <chr>	new names <dbl>
Amisulpride	1
Aripiprazole	2
Chlorpromazine	3
Clozapine	4
Fluphenazine	5
Haloperidol	6
Lurasidone	7
Molindone	8
Olanzapine	9
Paliperidone	10

1-10 of 15 rows Previous 1 2 Next

The network plot for the available data on co-medication with anticholinergics



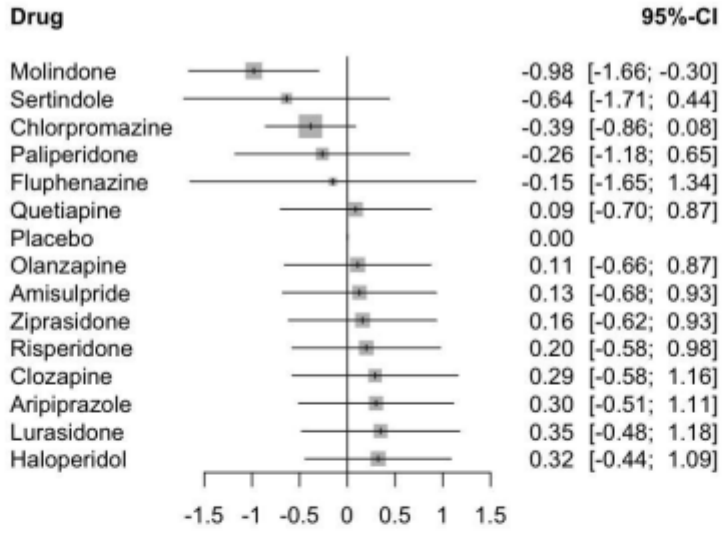
The value of the coefficients (equal) is shown below.

mean	sd	2.5%	25%	50%	75%	97.5%	Rhat	n.eff
2.55e-01	3.68e-01	-4.71e-01	4.36e-03	2.61e-01	5.06e-01	9.73e-01	1.00e+00	8.00e+04

The heterogeneity (tau) is shown below.

mean	sd	2.5%	25%	50%	75%	97.5%	Rhat	n.eff
0.05642	0.04213	0.00298	0.02364	0.04703	0.08048	0.15850	1.01211	420.00000

The forest plot for those without anticholinergics medication is shown below.



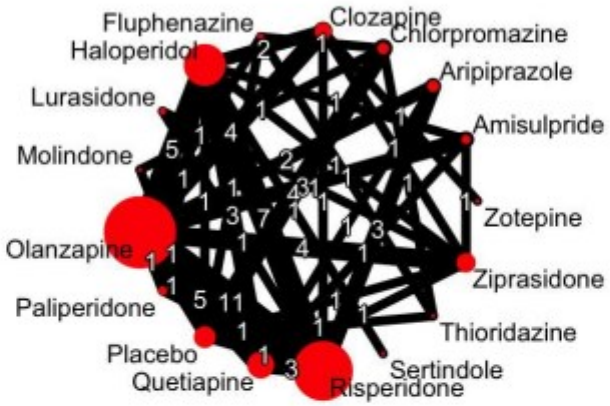
Co-medication with benzodiazepines

```
[1] "Note: the treatments have been renamed as follows"
```

old names <chr>	new names <dbl>
Amisulpride	1
Aripiprazole	2
Chlorpromazine	3
Clozapine	4
Fluphenazine	5
Haloperidol	6
Lurasidone	7
Molindone	8
Olanzapine	9
Paliperidone	10

1-10 of 17 rows Previous 1 2 Next

The network plot for the available data on co-medication with benzodiazepines



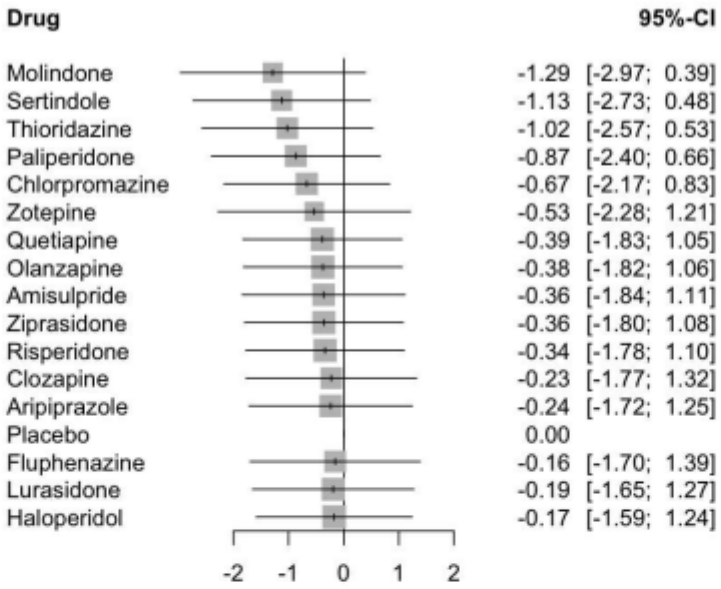
The value of the coefficients (equal) is shown below.

mean	sd	2.5%	25%	50%	75%	97.5%	Rhat	n.eff
-0.316	0.747	-1.936	-0.781	-0.289	0.167	1.215	1.010	240.000

The heterogeneity (tau) is shown below.

mean	sd	2.5%	25%	50%	75%	97.5%	Rhat	n.eff
0.0614	0.0474	0.0023	0.0235	0.0518	0.0886	0.1749	1.0056	880.0000

The forest plot for those without benzodiazepine medication is shown below.



Network meta-regression results: betas, tau, and comparison with unadjusted results.

Covariate	Beta coefficient	tau
Overall symptoms severity at baseline	-0.006 (-0.033, 0.022)	0.062 (0.002, 0.178)
Baseline Age	0.016 (-0.009, 0.042)	0.061 (0.005, 0.167)
State of symptoms	0.339 (-0.414, 1.094)	0.086 (0.004, 0.235)
Anticholinergics allowed	0.255 (-0.471, 0.973)	0.056 (0.003, 0.159)
Benzodiazepines allowed	-0.316 (-1.936, 1.215)	0.061 (0.002, 0.175)
Unadjusted results NMA	–	0.059 (0.003, 0.17)

From the results of the network-meta regression it does not appear that heterogeneity is explained by any of the examined effect modifiers.

Sensitivity analyses

We undertook sensitivity analyses for our primary outcome, by excluding:

- Open-label studies
- Overall high risk of bias studies
- Studies that did not use operationalized criteria for diagnosis
- Studies with a duration shorter than 12 weeks
- Studies with an extracted composite score
- Studies with specific patient characteristics
- Studies with unfair dose comparisons

Special patient characteristics were: treatment resistant patients, patients with predominant negative symptoms, first episode patients, stable patients, elderly patients, children or adolescents, drug abuse, prodromal patient, patients in remission

Concerning the evaluation of unfair doses, we checked if clearly unfair doses of antipsychotics were compared to each other in individual studies (Gardner et al. 2010). We considered a comparison unfair if the dose in olanzapine equivalents -as calculated by the method of Gardner et al.- in one arm was more than twice or less than half of that of another arm of the same study, or the dose was not reported in one arm. The dose ratio to placebo was always judged “fair”.

Only studies that did not have the composite score (overall score calculated from the available domains)

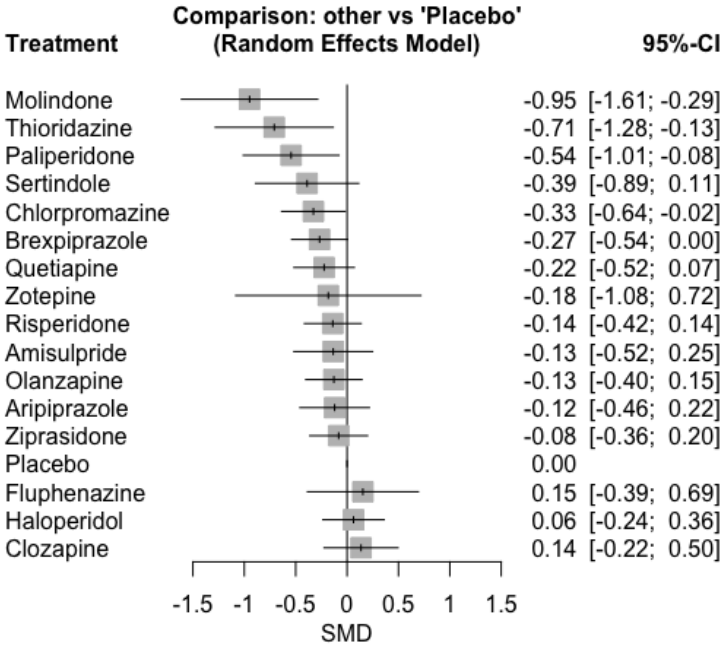
Number of drugs:

```
## [1] 17
```

Number of studies:

```
## [1] 63
```

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0
```

and I-square (total) is

```
## I2= 0 %
```

There is still some evidence of inconsistency in the data. There are in total

```
## 40
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 2
```

of them which gives a % of inconsistent loops equal to

```
## 5 %
```

The comparisons with inconsistency (according to SIDE p-value<0.10) in the model are:

```
##                 comparison     p
## 88  Haloperidol:Sertindole 0.096
## 123  Quetiapine:Sertindole 0.096
```

The p-value from the design-by-treatment test is

```
## [1] 0.97
```

Only blinded studies

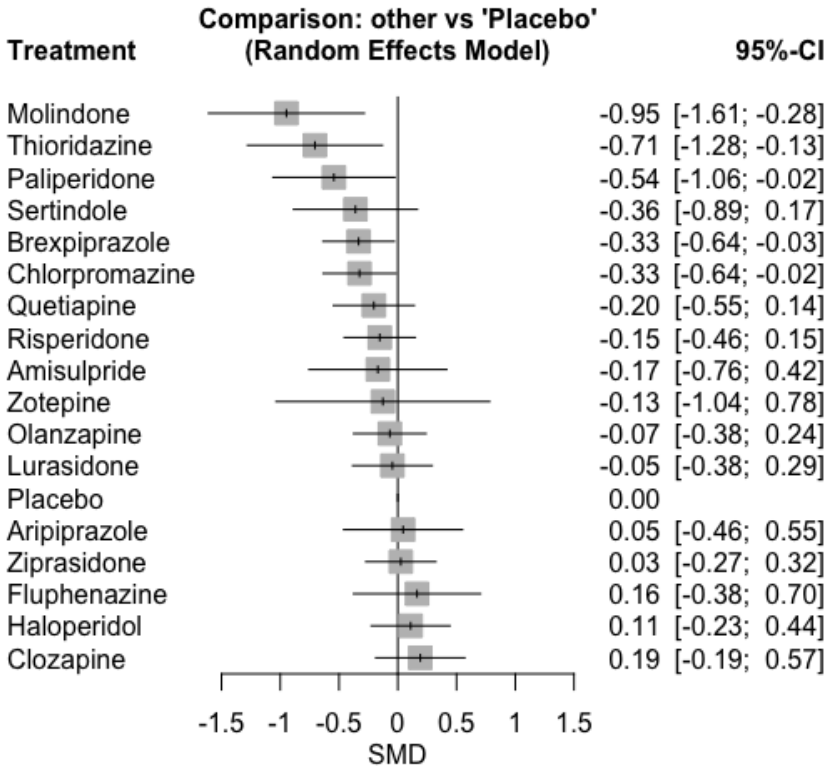
Number of drugs:

```
## [1] 18
```

Number of studies:

```
## [1] 57
```

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0
```

and I-square (total) is

```
## I2= 0 %
```

There is no evidence of inconsistency in the data. There are in total

```
## 30
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 0
```

of them which gives a % of inconsistent loops equal to

```
## 0 %
```

The p-value from the design-by-treatment test is

```
## [1] 0.97
```

Only studies that used operationalized criteria for diagnosis

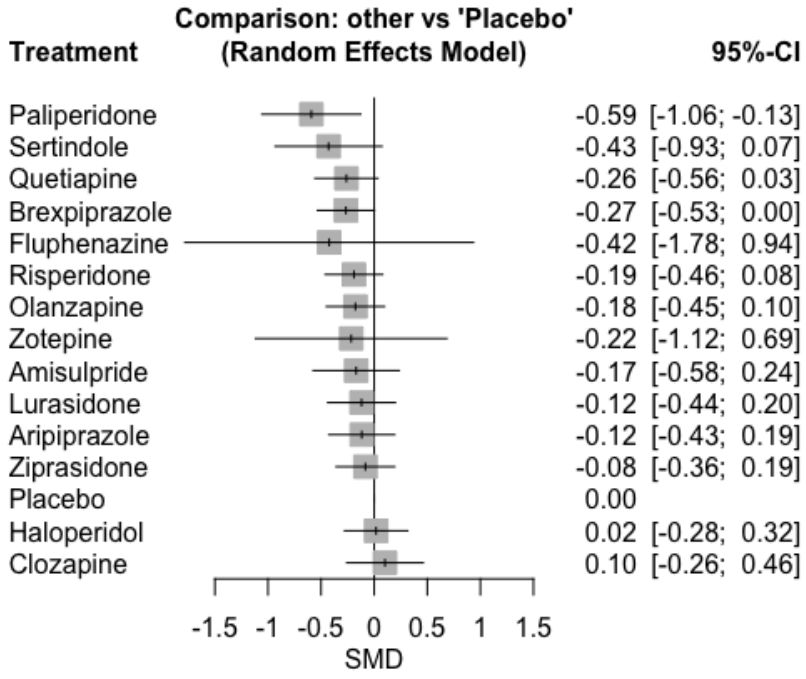
Number of drugs:

```
## [1] 15
```

Number of studies:

```
## [1] 60
```

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0
```

and I-square (total) is

```
## I2= 0 %
```

There is still some evidence of inconsistency in the data. There are in total

```
## 33
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 3
```

of them which gives a % of inconsistent loops equal to

```
## 9.1 %
```

The comparisons with inconsistency (according to SIDE p-value<0.10) in the model are:

```
##              comparison     p
## 67 Haloperidol:Sertindole 0.093
## 81 Olanzapine:Risperidone 0.062
## 97  Quetiapine:Sertindole 0.093
```

The p-value from the design-by-treatment test is

```
## [1] 1
```

Only studies with duration of at least 12 weeks

The network for this sensitivity analysis is disconnected so the subnetworks are analysed separately.

Subnetwork 1

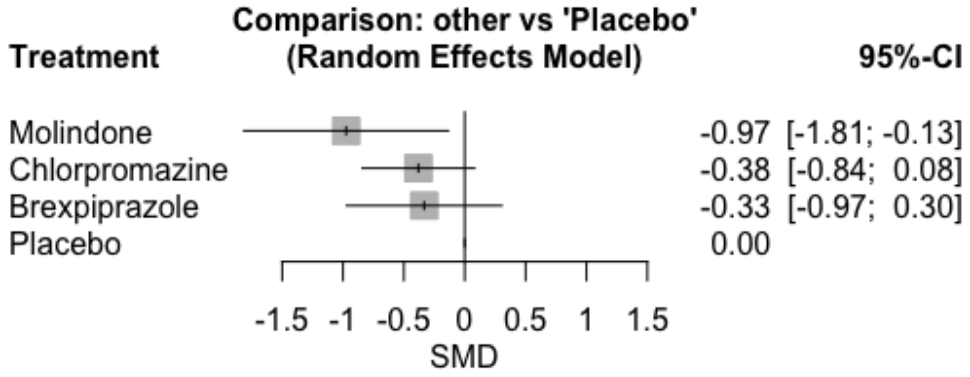
Number of drugs:

```
## [1] 4
```

Number of studies:

```
## [1] 5
```

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0.286
```

and I-square (total) is

```
## I2= 37.1 %
```

Subnetwork 2

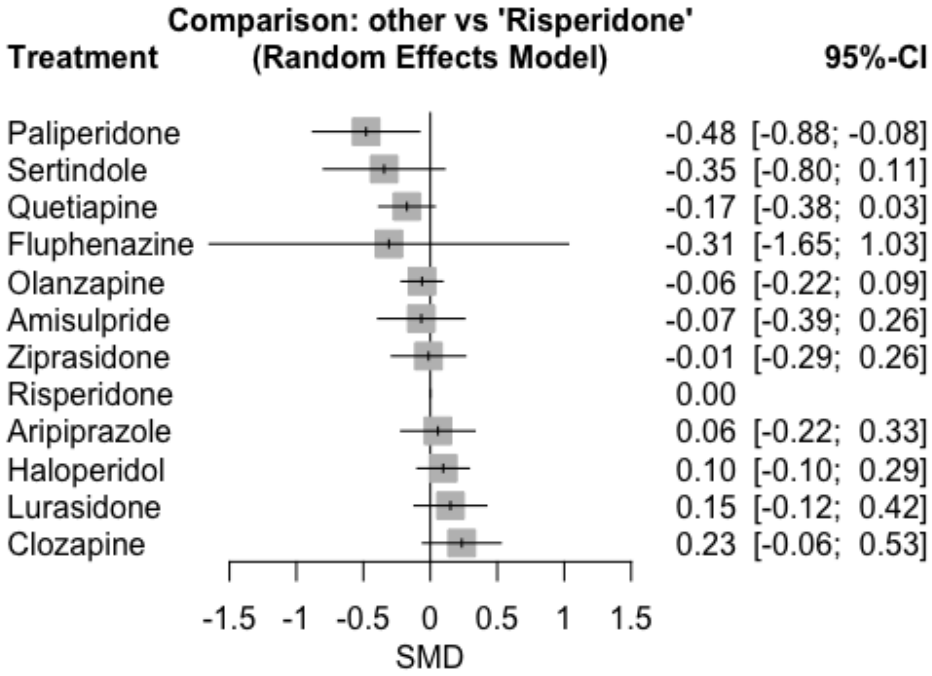
Number of drugs:

```
## [1] 12
```

Number of studies:

```
## [1] 37
```

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0
```

and I-square (total) is

```
## I2= 0 %
```

Non-special populations

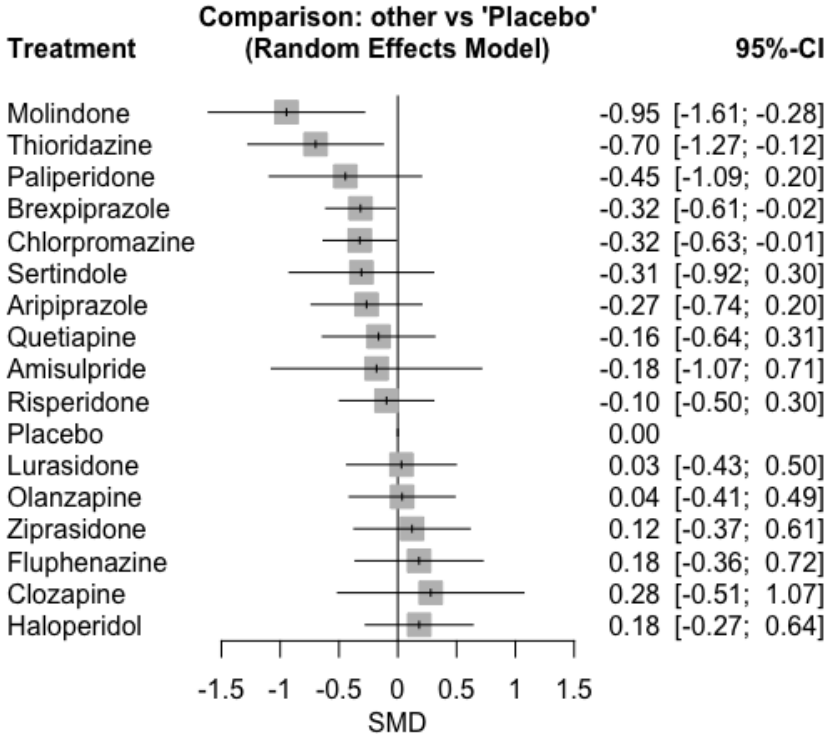
Number of drugs:

```
## [1] 17
```

Number of studies:

```
## [1] 38
```

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0
```

and I-square (total) is

```
## I2= 0 %
```

There is still little evidence of inconsistency in the data. There are in total

```
## 29
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 1
```

of them which gives a % of inconsistent loops equal to

```
## 3.4 %
```

The comparisons with inconsistency (according to SIDE p-value<0.10) in the model are:

```
##              comparison     p
## 112 Olanzapine:Risperidone 0.092
```

The p-value from the design-by-treatment test is

```
## [1] 0.33
```

Only studies with at least 3 domains

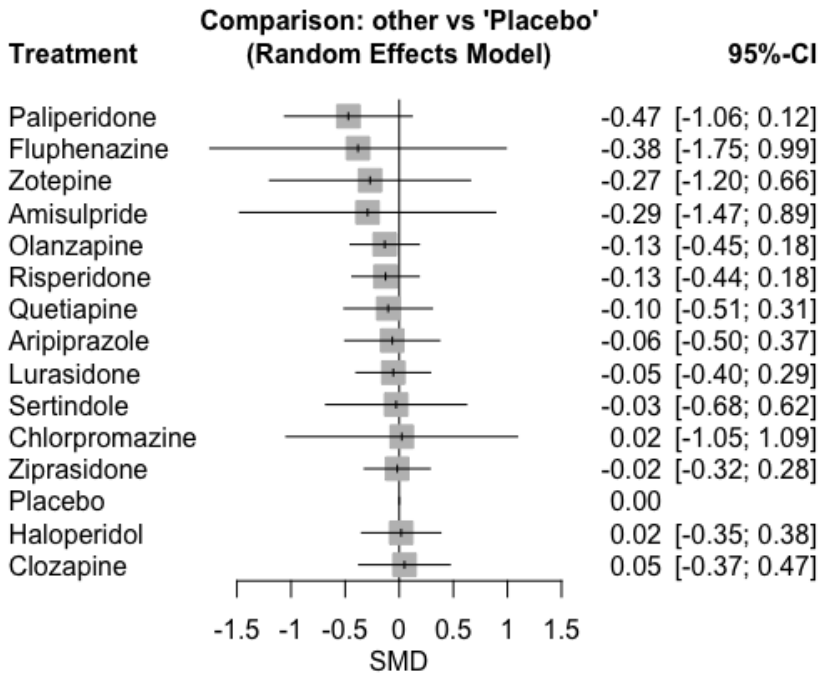
Number of drugs:

```
## [1] 15
```

Number of studies:

```
## [1] 42
```

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0
```

and I-square (total) is

```
## I2= 0 %
```

There is no evidence of inconsistency in the data. There are in total

```
## 21
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 0
```

of them which gives a % of inconsistent loops equal to

```
## 0 %
```

The p-value from the design-by-treatment test is

```
## [1] 1
```

Excluding studies at high risk of bias

Study Pagsberg 2017 of Aripripazole vs Quetiapine is disconnected from the rest of the network so it was removed.

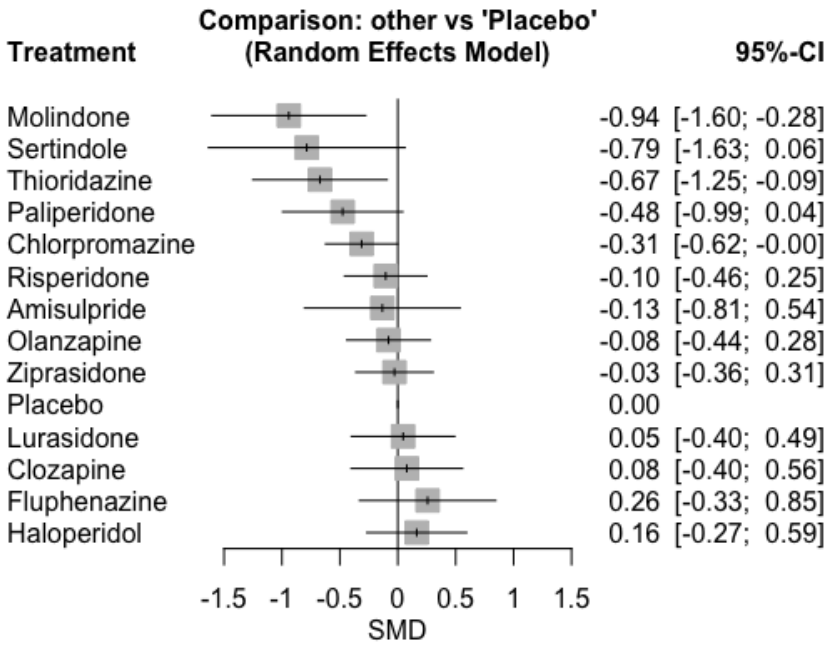
Number of drugs:

```
## [1] 14
```

Number of studies:

```
## [1] 27
```

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0
```

and I-square (total) is

```
## I2= 0 %
```

There is no evidence of inconsistency in the data. There are in total

```
## 19
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 0
```

of them which gives a % of inconsistent loops equal to

```
## 0 %
```

The p-value from the design-by-treatment test is

```
## [1] 0.83
```

Excluding studies with unfair dose

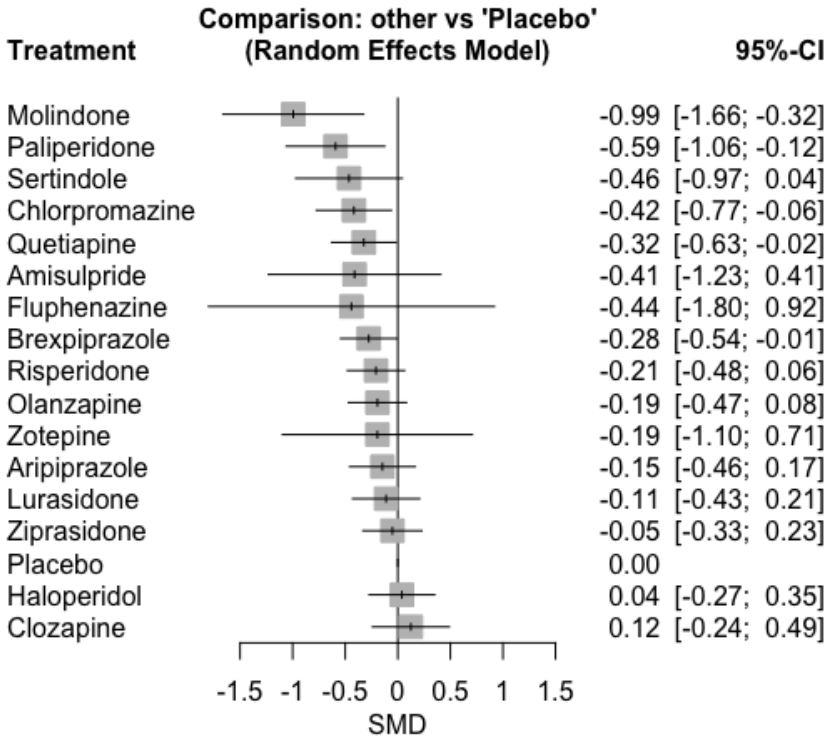
Number of drugs:

```
## [1] 17
```

Number of studies:

```
## [1] 59
```

Below are the relative treatment effects from the NMA model.



The heterogeneity standard deviation is estimated at

```
## tau= 0
```

and I-square (total) is

```
## I2= 0 %
```

There is still some evidence of inconsistency in the data. There are in total

```
## 29
```

comparisons included in a loop in the network, and there is inconsistency (according to SIDE p-value<0.10) in

```
## 3
```

of them which gives a % of inconsistent loops equal to

```
## 10 %
```

The comparisons with inconsistency (according to SIDE p-value<0.10) in the model are:

```
##                 comparison     p
## 50  Chlorpromazine:Molindone 0.074
## 103        Molindone:Placebo 0.074
## 112   Olanzapine:Risperidone 0.053
```

The p-value from the design-by-treatment test is

```
## [1] 0.98
```

League-Tables

The league tables for the primary and secondary outcomes are presented below. All league tables are based on frequentist analyses; an additional league table was created for the primary outcome using a Bayesian analysis. Treatments are presented in order of effect ranking. Results of the network meta-analysis are reported in the left lower half and results of pairwise meta-analyses in the right upper half.

Sensitivity analyses refer to the primary outcome.

Composite Score (Bayesian-Analysis)

Amisulpride	-0.03(-0.47,0.41)	0.13(-0.34,0.59)	0.2(-0.3,0.69)	-0.31(-0.75,0.14)	-0.28(-0.92,0.37)	-0.21(-0.53,0.12)	-0.15(-0.61,0.3)	0.82(0.07,1.61)	0.02(-0.28,0.33)	0.51(-0.19,1.18)	-0.12(-0.54,0.28)	0.06(-0.27,0.4)	-0.01(-0.34,0.33)	0.24(-0.27,0.75)	0.59(-0.11,1.29)	-0.03(-0.38,0.33)	0(-0.95,0.92)					
0.03(-0.41,0.47)	Aripiprazole	0.16(-0.19,0.5)	0.23(-0.25,0.71)	-0.28(-0.75,0.2)	-0.25(-0.87,0.39)	-0.18(-0.55,0.18)	-0.13(-0.56,0.32)	0.85(0.1,1.62)	0.05(-0.28,0.38)	0.53(-0.16,1.23)	-0.1(-0.46,0.27)	0.09(-0.29,0.47)	0.02(-0.3,0.35)	0.27(-0.31,0.83)	0.61(-0.05,1.31)	0(-0.37,0.4)	0.03(-0.94,0.96)					
-0.13(-0.59,0.34)	-0.16(-0.5,0.19)	Brexpiprazole	0.07(-0.36,0.5)	-0.44(-0.95,0.06)	-0.41(-1.02,0.21)	-0.34(-0.73,0.06)	-0.29(-0.76,0.21)	0.69(-0.04,1.43)	-0.11(-0.48,0.27)	0.38(-0.33,1.09)	-0.25(-0.56,0.05)	-0.07(-0.48,0.35)	-0.14(-0.51,0.24)	0.11(-0.47,0.68)	0.45(-0.22,1.11)	-0.16(-0.55,0.24)	-0.13(-1.1,0.83)					
-0.2(-0.69,0.3)	-0.23(-0.71,0.25)	-0.07(-0.5,0.36)	Chlorpromazine	-0.51(-1.05,0.03)	-0.48(-1.02,0.09)	-0.41(-0.85,0.03)	-0.36(-0.89,0.16)	0.62(-0.06,1.32)	-0.18(-0.6,0.23)	0.31(-0.42,1.04)	-0.33(-0.63,0)	-0.14(-0.6,0.3)	-0.21(-0.63,0.2)	0.04(-0.59,0.64)	0.38(-0.21,0.97)	-0.23(-0.66,0.21)	-0.2(-1.16,0.79)					
0.31(-0.14,0.75)	0.28(-0.2,0.75)	0.44(-0.06,0.95)	0.51(-0.03,1.05)	Clozapine	0.03(-0.63,0.71)	0.1(-0.27,0.46)	0.15(-0.33,0.61)	1.13(0.35,1.92)	0.33(0.02,0.68)	0.81(0.12,1.49)	0.18(-0.27,0.64)	0.37(-0.03,0.75)	0.3(-0.07,0.66)	0.55(-0.01,1.11)	0.89(0.14,1.63)	0.28(-0.13,0.71)	0.3(-0.52,1.12)					
0.28(-0.37,0.92)	0.25(-0.39,0.87)	0.41(-0.21,1.02)	0.48(-0.09,1.02)	-0.03(-0.71,0.63)	Fluphenazine	0.07(-0.54,0.68)	0.12(-0.55,0.78)	1.1(0.28,1.92)	0.3(-0.29,0.88)	0.79(-0.06,1.63)	0.15(-0.37,0.68)	0.34(-0.28,0.95)	0.27(-0.31,0.85)	0.52(-0.23,1.25)	0.86(0.18,1.51)	0.25(-0.33,0.85)	0.28(-0.78,1.36)					
0.21(-0.12,0.53)	0.18(-0.18,0.55)	0.34(-0.06,0.73)	0.41(-0.03,0.85)	-0.1(-0.46,0.27)	-0.07(-0.68,0.54)	Haloperidol	0.05(-0.33,0.43)	1.03(0.3,1.78)	0.23(0.03,0.42)	0.72(0.13,1.31)	0.08(-0.24,0.41)	0.27(0.02,0.51)	0.2(-0.02,0.41)	0.45(-0.01,0.91)	0.79(0.12,1.45)	0.18(-0.1,0.47)	0.21(-0.69,1.09)					
0.15(-0.3,0.61)	0.13(-0.32,0.56)	0.29(-0.21,0.76)	0.36(-0.16,0.89)	-0.15(-0.61,0.33)	-0.12(-0.78,0.55)	-0.05(-0.43,0.33)	Lurasidone	0.98(0.2,1.78)	0.18(-0.18,0.52)	0.66(-0.05,1.36)	0.03(-0.4,0.46)	0.22(-0.18,0.62)	0.15(-0.16,0.46)	0.39(-0.16,0.95)	0.74(0.03,1.44)	0.13(-0.28,0.55)	0.15(-0.81,1.09)					
-0.82(-1.61,-0.07)	-0.85(-1.62,-0.1)	-0.69(-1.43,0.04)	-0.62(-1.32,0.06)	-1.13(-1.92,-0.35)	-1.1(-1.92,-0.28)	-1.03(-1.78,-0.3)	-0.98(-1.78,-0.2)	Mölindone	-0.8(-1.53,-0.1)	-0.32(-1.27,0.62)	-0.95(-1.64,-0.29)	-0.76(-1.51,-0.02)	-0.83(-1.58,-0.13)	-0.58(-1.43,0.23)	-0.24(-1.14,0.6)	-0.85(-1.59,-0.13)	-0.82(-1.98,0.28)					
-0.02(-0.33,0.28)	-0.05(-0.38,0.28)	0.11(-0.27,0.48)	0.18(-0.2,0.6)	-0.33(-0.68,0.02)	-0.3(-0.88,0.29)	-0.23(-0.42,-0.03)	-0.18(-0.52,0.18)	0.8(0.1,1.53)	Olanzapine	0.49(-0.14,1.11)	-0.14(-0.43,0.16)	0.04(-0.17,0.24)	-0.03(-0.2,0.14)	0.22(-0.23,0.67)	0.57(-0.09,1.2)	-0.05(-0.28,0.2)	-0.02(-0.93,0.86)					
-0.51(-1.18,0.19)	-0.53(-1.23,0.16)	-0.38(-1.09,0.33)	-0.31(-1.04,0.42)	-0.81(-1.49,-0.12)	-0.79(-1.63,0.06)	-0.72(-1.31,-0.13)	-0.66(-1.36,0.05)	0.32(-0.62,1.27)	-0.49(-1.11,0.14)	Paliperidone	-0.63(-1.31,0.04)	Placebo	0.19(-0.16,0.53)	Quetiapine	-0.07(-0.32,0.18)	Risperidone	0.25(-0.22,0.72)	Sertindole	0.35(-0.44,1.09)	Thioridazine	Ziprasidone	Zotepine
0.12(-0.28,0.54)	0.1(-0.27,0.46)	0.25(-0.05,0.56)	0.33(0,0.63)	-0.18(-0.64,0.27)	-0.15(-0.68,0.37)	-0.08(-0.41,0.24)	-0.03(-0.46,0.4)	0.95(0.29,1.64)	0.14(-0.16,0.43)	0.63(-0.04,1.31)	0.44(-0.2,1.08)	-0.19(-0.53,0.16)	0.11(-0.18,0.41)	0.36(-0.18,0.88)	0.71(0.12,1.28)	0.1(-0.21,0.41)	0.12(-0.82,1.05)					
-0.06(-0.4,0.27)	-0.09(-0.47,0.29)	0.07(-0.35,0.48)	0.14(-0.3,0.6)	-0.37(-0.75,0.03)	-0.34(-0.95,0.28)	-0.27(-0.51,-0.02)	-0.22(-0.62,0.18)	0.76(0.02,1.51)	-0.04(-0.24,0.17)	0.44(-0.2,1.08)	-0.19(-0.53,0.16)	Quetiapine	-0.07(-0.32,0.18)	Risperidone	0.25(-0.22,0.72)	Sertindole	0.35(-0.44,1.09)	Thioridazine	Ziprasidone	Zotepine		
0.01(-0.33,0.34)	-0.02(-0.35,0.3)	0.14(-0.24,0.51)	0.21(-0.2,0.63)	-0.3(-0.66,0.07)	-0.27(-0.85,0.31)	-0.2(-0.41,0.02)	-0.15(-0.46,0.16)	0.83(0.13,1.58)	0.03(-0.14,0.2)	0.52(-0.12,1.15)	-0.11(-0.41,0.18)	0.07(-0.18,0.32)	Risperidone	0.25(-0.22,0.72)	Sertindole	0.35(-0.44,1.09)	Thioridazine	Ziprasidone	Zotepine			
-0.24(-0.75,0.27)	-0.27(-0.83,0.31)	-0.11(-0.68,0.47)	-0.04(-0.64,0.59)	-0.55(-1.11,0.01)	-0.52(-1.25,0.23)	-0.45(-0.91,0.01)	-0.39(-0.95,0.16)	0.58(-0.23,1.43)	-0.22(-0.67,0.23)	0.27(-0.46,0.99)	-0.36(-0.88,0.18)	-0.18(-0.61,0.26)	-0.25(-0.72,0.22)	Sertindole	0.35(-0.44,1.09)	Thioridazine	Ziprasidone	Zotepine				
-0.59(-1.29,0.11)	-0.61(-1.31,0.05)	-0.45(-1.11,0.22)	-0.38(-0.97,0.21)	-0.89(-1.63,-0.14)	-0.86(-1.51,-0.18)	-0.79(-1.45,-0.12)	-0.74(-1.44,-0.03)	0.24(-0.6,1.14)	-0.57(-1.2,0.09)	-0.08(-0.94,0.83)	-0.71(-1.28,-0.12)	-0.52(-1.17,0.16)	-0.59(-1.23,0.06)	-0.35(-1.09,0.44)	Thioridazine	Ziprasidone	Zotepine					
0.03(-0.33,0.38)	0(-0.4,0.37)	0.16(-0.24,0.55)	0.23(-0.21,0.66)	-0.28(-0.71,0.13)	-0.25(-0.85,0.33)	-0.18(-0.47,0.1)	-0.13(-0.55,0.28)	0.85(0.13,1.59)	0.05(-0.2,0.28)	0.53(-0.12,1.18)	-0.1(-0.41,0.21)	0.09(-0.21,0.38)	0.02(-0.26,0.29)	0.27(-0.25,0.76)	0.61(-0.05,1.28)	Ziprasidone	0.02(-0.91,0.94)	Zotepine				
0(-0.92,0.95)	-0.03(-0.96,0.94)	0.13(-0.83,1.1)	0.2(-0.79,1.16)	-0.3(-1.12,0.52)	-0.28(-1.36,0.78)	-0.21(-1.09,0.69)	-0.15(-1.09,0.81)	0.82(-0.28,1.98)	0.02(-0.86,0.93)	0.51(-0.56,1.6)	-0.12(-1.05,0.82)	0.06(-0.85,0.99)	-0.01(-0.9,0.91)	0.24(-0.74,1.25)	0.59(-0.53,1.66)	-0.02(-0.94,0.91)	Zotepine					

Speed of Processing

Molindone	.	.	-0.86 [-1.65; -0.07]	.	.	.	.	.	.	.	.	-0.70 [-1.49; 0.09]	.
-0.22 [-1.13; 0.70]	Thioridazine	.	-0.52 [-1.21; 0.17]	.	.	.	.	.	.	-0.93 [-1.65; -0.21]	.	-0.50 [-1.20; 0.21]	.
-0.49 [-1.36; 0.38]	-0.28 [-1.06; 0.51]	Paliperidone	.	-0.43 [-0.94; 0.08]	.	.	0.12 [-0.51; 0.75]	.	.	.	.	.	.
-0.62 [-1.44; 0.20]	-0.40 [-1.14; 0.33]	-0.13 [-0.62; 0.36]	Lurasidone	.	.	.	-0.01 [-0.40; 0.38]	-0.26 [-0.65; 0.12]	.	.	.	.	.
-0.61 [-1.31; 0.10]	-0.39 [-1.01; 0.23]	-0.11 [-0.71; 0.48]	0.01 [-0.51; 0.54]	Chlorpromazine	.	.	.	.	.	-0.41 [-1.11; 0.29]	-0.33 [-0.65; -0.01]	.	.
-0.68 [-1.45; 0.10]	-0.46 [-1.15; 0.22]	-0.19 [-0.59; 0.22]	-0.06 [-0.36; 0.24]	-0.07 [-0.52; 0.37]	Olanzapine	0.14 [-0.18; 0.45]	-0.11 [-1.63; 1.42]	-0.02 [-0.36; 0.32]	-0.12 [-0.30; 0.05]	-0.08 [-0.29; 0.13]	-0.36 [-0.72; 0.00]	-0.48 [-1.01; 0.05]	0.10 [-0.88; 1.07]	-0.49 [-1.16; 0.18]	-0.35 [-0.57; -0.14]
-0.69 [-1.48; 0.11]	-0.47 [-1.18; 0.23]	-0.20 [-0.64; 0.25]	-0.07 [-0.41; 0.27]	-0.08 [-0.56; 0.39]	-0.01 [-0.21; 0.19]	Quetiapine	-0.05 [-0.43; 0.33]	-0.00 [-0.44; 0.44]	-0.08 [-0.37; 0.21]	0.03 [-0.44; 0.49]	.	.	.	.	-0.14 [-0.43; 0.16]
-0.74 [-1.61; 0.13]	-0.53 [-1.32; 0.27]	-0.25 [-0.82; 0.32]	-0.12 [-0.62; 0.38]	-0.06 [-0.48; 0.35]	-0.05 [-0.42; 0.31]	Sertindole	.	.	.	.	.	.	.	.	.
-0.75 [-1.58; 0.08]	-0.53 [-1.28; 0.21]	-0.26 [-0.76; 0.24]	-0.13 [-0.54; 0.29]	-0.14 [-0.68; 0.39]	-0.06 [-0.40; 0.28]	-0.01 [-0.50; 0.49]	Amisulpride	.	0.03 [-0.44; 0.49]	.	.	.	.	.	-0.05 [-0.50; 0.39]
-0.75 [-1.52; 0.03]	-0.53 [-1.21; 0.15]	-0.25 [-0.66; 0.15]	-0.13 [-0.42; 0.17]	-0.14 [-0.58; 0.30]	-0.06 [-0.26; 0.14]	-0.00 [-0.42; 0.41]	0.00 [-0.32; 0.32]	Risperidone	.	-0.53 [-1.16; 0.10]	-0.10 [-0.51; 0.31]	.	-0.12 [-0.53; 0.29]	-0.25 [-0.51; 0.02]	
-0.77 [-1.56; 0.02]	-0.55 [-1.26; 0.15]	-0.28 [-0.72; 0.16]	-0.15 [-0.44; 0.14]	-0.16 [-0.64; 0.31]	-0.09 [-0.27; 0.09]	-0.08 [-0.33; 0.17]	-0.03 [-0.47; 0.41]	-0.02 [-0.36; 0.31]	-0.02 [-0.23; 0.19]	Ziprasidone	-0.16 [-0.59; 0.27]	.	.	.	-0.08 [-0.56; 0.39]
-0.80 [-1.61; 0.01]	-0.59 [-1.31; 0.14]	-0.31 [-0.78; 0.16]	-0.18 [-0.56; 0.19]	-0.20 [-0.70; 0.31]	-0.13 [-0.38; 0.13]	-0.12 [-0.42; 0.19]	-0.06 [-0.54; 0.41]	-0.06 [-0.44; 0.33]	-0.06 [-0.33; 0.22]	-0.03 [-0.30; 0.24]	Clozapine	.	.	.	-0.39 [-0.75; -0.03]
-0.92 [-1.78; -0.06]	-0.70 [-1.48; 0.07]	-0.43 [-0.98; 0.12]	-0.30 [-0.77; 0.17]	-0.31 [-0.89; 0.26]	-0.24 [-0.63; 0.15]	-0.23 [-0.65; 0.19]	-0.18 [-0.73; 0.38]	-0.17 [-0.66; 0.32]	-0.17 [-0.55; 0.20]	-0.15 [-0.57; 0.27]	-0.12 [-0.57; 0.34]	Aripiprazole	.	.	.
-1.02 [-1.89; -0.15]	-0.81 [-1.49; -0.12]	-0.53 [-1.23; 0.17]	-0.40 [-1.05; 0.24]	-0.42 [-0.98; 0.15]	-0.34 [-0.93; 0.24]	-0.34 [-0.94; 0.27]	-0.28 [-0.99; 0.43]	-0.27 [-0.93; 0.38]	-0.28 [-0.86; 0.31]	-0.25 [-0.86; 0.35]	-0.22 [-0.85; 0.41]	-0.10 [-0.79; 0.59]	Fluphenazine	0.43 [-0.28; 1.15]	.
-0.96 [-1.67; -0.26]	-0.75 [-1.37; -0.13]	-0.47 [-0.98; 0.04]	-0.34 [-0.77; 0.08]	-0.36 [-0.68; -0.04]	-0.29 [-0.61; 0.04]	-0.28 [-0.64; 0.09]	-0.22 [-0.74; 0.29]	-0.22 [-0.66; 0.22]	-0.22 [-0.54; 0.10]	-0.19 [-0.56; 0.17]	-0.16 [-0.57; 0.24]	-0.04 [-0.54; 0.45]	0.06 [-0.48; 0.60]	Placebo	0.50 [-0.42; 1.43]
-0.96 [-1.74; -0.17]	-0.74 [-1.44; -0.05]	-0.47 [-0.90; -0.04]	-0.34 [-0.66; -0.02]	-0.35 [-0.81; 0.11]	-0.28 [-0.45; -0.12]	-0.27 [-0.49; -0.06]	-0.22 [-0.64; 0.20]	-0.21 [-0.53; 0.11]	-0.21 [-0.39; -0.04]	-0.19 [-0.41; 0.03]	-0.16 [-0.42; 0.11]	-0.04 [-0.45; 0.37]	0.06 [-0.53; 0.66]	0.01 [-0.34; 0.35]	Haloperidol

Working Memory

Paliperidone	.	.	-0.30 [-0.90; 0.30]	.	.	.	.	.	-0.43 [-0.90; 0.04]	.	.	.	.
-0.02 [-0.81; 0.77]	Zotepine	.	.	.	.	.	.	.	.	.	.	-0.50 [-1.11; 0.11]	.
-0.22 [-0.69; 0.24]	-0.21 [-0.96; 0.54]	Aripiprazole	-0.08 [-0.39; 0.24]	.	.	.	.	.	-0.18 [-0.55; 0.20]	.	.	.	.
-0.28 [-0.66; 0.10]	-0.26 [-0.96; 0.43]	-0.05 [-0.35; 0.24]	Risperidone	-0.09 [-0.42; 0.24]	-0.06 [-0.51; 0.39]	-0.09 [-0.54; 0.36]	.	-0.10 [-0.45; 0.25]	-0.15 [-0.35; 0.06]	.	.	-0.32 [-0.68; 0.03]	.
-0.33 [-0.78; 0.12]	-0.31 [-1.05; 0.43]	-0.10 [-0.49; 0.28]	-0.05 [-0.31; 0.21]	Lurasidone	.	.	.	.	.	-0.19 [-0.51; 0.14]	.	.	.
-0.40 [-0.85; 0.04]	-0.39 [-1.12; 0.34]	-0.18 [-0.56; 0.20]	-0.13 [-0.40; 0.15]	-0.08 [-0.43; 0.28]	Haloperidol	.	.	.	-0.06 [-0.33; 0.21]	.	.	0.30 [-0.29; 0.89]	.
-0.42 [-0.92; 0.08]	-0.40 [-1.18; 0.37]	-0.20 [-0.64; 0.25]	-0.14 [-0.50; 0.21]	-0.09 [-0.52; 0.34]	-0.02 [-0.44; 0.41]	Quetiapine	.	.	-0.11 [-0.55; 0.33]	.	-0.04 [-0.36; 0.27]	.	.
-0.46 [-1.24; 0.31]	-0.45 [-1.43; 0.53]	-0.24 [-0.98; 0.51]	-0.18 [-0.88; 0.52]	-0.13 [-0.87; 0.60]	-0.06 [-0.78; 0.67]	-0.04 [-0.81; 0.72]	Amisulpride	.	0.02 [-0.66; 0.70]	.	.	.	.
-0.45 [-0.94; 0.03]	-0.44 [-1.19; 0.32]	-0.23 [-0.65; 0.19]	-0.17 [-0.48; 0.14]	-0.12 [-0.52; 0.28]	-0.05 [-0.45; 0.35]	-0.03 [-0.50; 0.43]	0.01 [-0.75; 0.77]	Placebo	0.25 [-0.38; 0.88]	.	.	.	-0.24 [-0.94; 0.46]
-0.44 [-0.82; -0.07]	-0.43 [-1.13; 0.28]	-0.22 [-0.52; 0.09]	-0.16 [-0.33; 0.01]	-0.11 [-0.39; 0.16]	-0.04 [-0.29; 0.21]	-0.02 [-0.38; 0.33]	0.02 [-0.66; 0.70]	0.01 [-0.32; 0.34]	Olanzapine	-0.01 [-0.24; 0.22]	-1.96 [-3.78; -0.13]	0.38 [-0.20; 0.97]	.
-0.47 [-0.90; -0.05]	-0.46 [-1.19; 0.27]	-0.25 [-0.61; 0.11]	-0.19 [-0.44; 0.05]	-0.14 [-0.41; 0.12]	-0.07 [-0.39; 0.25]	-0.05 [-0.46; 0.35]	-0.01 [-0.72; 0.70]	-0.02 [-0.40; 0.36]	-0.03 [-0.24; 0.18]	Ziprasidone	.	.	.
-0.52 [-1.11; 0.07]	-0.50 [-1.33; 0.33]	-0.29 [-0.83; 0.25]	-0.24 [-0.70; 0.23]	-0.19 [-0.71; 0.33]	-0.11 [-0.63; 0.40]	-0.10 [-0.41; 0.21]	-0.06 [-0.88; 0.77]	-0.07 [-0.62; 0.49]	-0.07 [-0.54; 0.39]	-0.04 [-0.55; 0.46]	Sertindole	.	.
-0.52 [-1.01; -0.02]	-0.50 [-1.11; 0.11]	-0.29 [-0.73; 0.15]	-0.24 [-0.57; 0.10]	-0.19 [-0.61; 0.23]	-0.11 [-0.51; 0.29]	-0.10 [-0.57; 0.38]	-0.05 [-0.82; 0.71]	-0.06 [-0.51; 0.39]	-0.07 [-0.43; 0.28]	-0.04 [-0.44; 0.36]	0.00 [-0.56; 0.57]	Clozapine	.
-0.69 [-1.54; 0.16]	-0.67 [-1.71; 0.36]	-0.47 [-1.28; 0.35]	-0.41 [-1.18; 0.36]	-0.36 [-1.17; 0.45]	-0.29 [-1.09; 0.52]	-0.27 [-1.11; 0.57]	-0.23 [-1.26; 0.80]	-0.24 [-0.94; 0.46]	-0.25 [-1.02; 0.53]	-0.22 [-1.02; 0.58]	-0.17 [-1.06; 0.72]	-0.17 [-1.01; 0.66]	Chlorpromazine

Visual Learning

Brexpiprazole	-0.02 [-0.44; 0.40]	.	.	.	.	.	-0.33 [-0.64; -0.03]	.	.	.	.	.
-0.10 [-0.44; 0.23]	Aripiprazole	.	-0.23 [-0.58; 0.11]	.	-0.07 [-0.38; 0.23]	.	.	.	.	.	.	.
-0.15 [-0.60; 0.31]	-0.05 [-0.44; 0.35]	Quetiapine	-0.42 [-1.11; 0.27]	-0.10 [-0.35; 0.16]	0.01 [-0.67; 0.68]	-0.08 [-0.45; 0.29]	.	.	.	.	.	.
-0.25 [-0.61; 0.11]	-0.14 [-0.41; 0.12]	-0.10 [-0.41; 0.21]	Olanzapine	-0.25 [-1.75; 1.25]	-0.08 [-0.25; 0.09]	-0.04 [-0.26; 0.19]	.	0.07 [-0.46; 0.59]	.	.	-0.26 [-0.62; 0.11]	
-0.25 [-0.77; 0.27]	-0.15 [-0.61; 0.31]	-0.10 [-0.35; 0.15]	-0.00 [-0.40; 0.39]	Sertindole	.	.	.	.	.	.	.	
-0.26 [-0.61; 0.09]	-0.16 [-0.42; 0.10]	-0.11 [-0.42; 0.20]	-0.01 [-0.16; 0.13]	-0.01 [-0.40; 0.38]	Risperidone	-0.06 [-0.24; 0.13]	.	.	-0.06 [-0.33; 0.21]	-0.50 [-1.06; 0.06]		
-0.27 [-0.64; 0.10]	-0.17 [-0.45; 0.12]	-0.12 [-0.42; 0.17]	-0.02 [-0.19; 0.14]	-0.02 [-0.40; 0.36]	-0.01 [-0.16; 0.14]	Haloperidol	-0.29 [-1.15; 0.58]	.	.	-0.05 [-0.36; 0.27]		
-0.29 [-0.56; -0.02]	-0.19 [-0.54; 0.16]	-0.14 [-0.58; 0.29]	-0.05 [-0.38; 0.28]	-0.04 [-0.54; 0.45]	-0.03 [-0.35; 0.29]	-0.02 [-0.36; 0.32]	Placebo	-0.10 [-0.39; 0.18]	.	.		
-0.33 [-0.67; 0.01]	-0.23 [-0.57; 0.10]	-0.18 [-0.59; 0.22]	-0.09 [-0.37; 0.20]	-0.08 [-0.55; 0.39]	-0.07 [-0.35; 0.20]	-0.06 [-0.36; 0.24]	-0.04 [-0.29; 0.21]	Ziprasidone	-0.03 [-0.30; 0.24]	.		
-0.34 [-0.71; 0.03]	-0.24 [-0.57; 0.08]	-0.20 [-0.58; 0.19]	-0.10 [-0.36; 0.17]	-0.09 [-0.54; 0.36]	-0.08 [-0.32; 0.15]	-0.07 [-0.34; 0.20]	-0.05 [-0.37; 0.27]	-0.01 [-0.24; 0.22]	Lurasidone	.		
-0.41 [-0.86; 0.04]	-0.31 [-0.69; 0.07]	-0.27 [-0.67; 0.13]	-0.17 [-0.46; 0.13]	-0.16 [-0.63; 0.30]	-0.15 [-0.45; 0.15]	-0.14 [-0.43; 0.14]	-0.12 [-0.55; 0.30]	-0.08 [-0.48; 0.31]	-0.07 [-0.44; 0.30]	Clozapine		

Verbal Learning

Paliperidone	.	.	.	.	.	-0.59 [-1.24; 0.05]	.	.	.	.	.	.
-0.03 [-1.22; 1.15]	**Fluphenazine**	.	-0.49 [-1.48; 0.50]	.	.	.	.	.	.	.	.	.
-0.43 [-1.17; 0.30]	-0.40 [-1.45; 0.65]	**Aripiprazole**	-0.16 [-0.56; 0.25]	.	.	-0.10 [-0.49; 0.30]	.	.	.	.	.	.
-0.52 [-1.18; 0.14]	-0.49 [-1.48; 0.50]	-0.09 [-0.44; 0.27]	**Olanzapine**	0.12 [-0.23; 0.47]	.	-0.08 [-0.24; 0.08]	0.06 [-0.27; 0.38]	-0.07 [-0.29; 0.16]	-0.35 [-1.89; 1.19]	0.21 [-0.46; 0.88]	-0.47 [-0.70; -0.24]	-0.59 [-0.95; -0.23]
-0.49 [-1.22; 0.23]	-0.46 [-1.50; 0.58]	-0.06 [-0.53; 0.41]	0.03 [-0.29; 0.34]	**Amisulpride**	.	.	-0.08 [-0.54; 0.38]	0.20 [-0.29; 0.68]	.	.	-0.08 [-0.55; 0.38]	.
-0.57 [-1.28; 0.15]	-0.53 [-1.57; 0.50]	-0.13 [-0.59; 0.32]	-0.05 [-0.35; 0.26]	-0.07 [-0.50; 0.35]	**Lurasidone**	0.08 [-0.32; 0.48]	.	-0.16 [-0.56; 0.24]	.	.	.	.
-0.59 [-1.24; 0.05]	-0.56 [-1.56; 0.44]	-0.16 [-0.51; 0.19]	-0.07 [-0.21; 0.06]	-0.10 [-0.43; 0.23]	-0.03 [-0.33; 0.27]	**Risperidone**	-0.06 [-0.35; 0.24]	.	.	-0.13 [-0.55; 0.29]	-0.18 [-0.42; 0.05]	-0.51 [-1.14; 0.12]
-0.62 [-1.30; 0.06]	-0.59 [-1.60; 0.42]	-0.19 [-0.59; 0.21]	-0.10 [-0.31; 0.11]	-0.13 [-0.48; 0.22]	-0.05 [-0.41; 0.30]	-0.03 [-0.24; 0.18]	**Quetiapine**	0.28 [-0.21; 0.77]	-0.05 [-0.43; 0.34]	.	-0.07 [-0.39; 0.25]	.
-0.62 [-1.30; 0.06]	-0.59 [-1.59; 0.42]	-0.19 [-0.58; 0.20]	-0.10 [-0.28; 0.08]	-0.13 [-0.47; 0.22]	-0.05 [-0.35; 0.24]	-0.03 [-0.23; 0.18]	0.00 [-0.26; 0.26]	**Ziprasidone**	.	-0.09 [-0.50; 0.32]	-0.28 [-0.77; 0.22]	-0.22 [-0.65; 0.22]
-0.68 [-1.46; 0.09]	-0.65 [-1.72; 0.43]	-0.25 [-0.79; 0.30]	-0.16 [-0.58; 0.27]	-0.19 [-0.69; 0.32]	-0.11 [-0.62; 0.40]	-0.09 [-0.51; 0.34]	-0.06 [-0.43; 0.32]	-0.06 [-0.51; 0.39]	**Sertindole**	.	.	.
-0.69 [-1.39; 0.02]	-0.65 [-1.68; 0.37]	-0.25 [-0.69; 0.19]	-0.16 [-0.44; 0.11]	-0.19 [-0.60; 0.21]	-0.12 [-0.50; 0.26]	-0.09 [-0.37; 0.18]	-0.06 [-0.39; 0.26]	-0.06 [-0.34; 0.22]	-0.00 [-0.50; 0.49]	**Placebo**	0.25 [-0.67; 1.17]	.
-0.81 [-1.48; -0.15]	-0.78 [-1.78; 0.22]	-0.38 [-0.76; 0.00]	-0.29 [-0.46; -0.12]	-0.32 [-0.65; 0.01]	-0.25 [-0.58; 0.08]	-0.22 [-0.39; -0.05]	-0.19 [-0.42; 0.03]	-0.19 [-0.42; 0.03]	-0.13 [-0.57; 0.30]	-0.13 [-0.43; 0.17]	**Haloperidol**	-0.04 [-0.40; 0.32]
-0.96 [-1.66; -0.25]	-0.92 [-1.94; 0.10]	-0.52 [-0.95; -0.09]	-0.43 [-0.69; -0.18]	-0.46 [-0.85; -0.07]	-0.39 [-0.77; -0.01]	-0.36 [-0.63; -0.09]	-0.33 [-0.65; -0.02]	-0.33 [-0.61; -0.06]	-0.28 [-0.76; 0.21]	-0.27 [-0.63; 0.08]	-0.14 [-0.41; 0.13]	**Clozapine**

Attention/Vigilance

Risperidone	-0.00 [-0.27; 0.27]	-0.00 [-0.51; 0.51]	.	-0.09 [-0.34; 0.16]
0.00 [-0.27; 0.27]	Lurasidone	.	.	.
-0.00 [-0.51; 0.51]	-0.00 [-0.57; 0.57]	Olanzapine	.	.
-0.05 [-0.40; 0.31]	-0.05 [-0.49; 0.40]	-0.05 [-0.67; 0.57]	Sertindole	-0.05 [-0.30; 0.21]
-0.09 [-0.34; 0.16]	-0.09 [-0.46; 0.27]	-0.09 [-0.66; 0.47]	-0.05 [-0.30; 0.21]	Quetiapine

Reasoning and Problem Solving

Paliperidone	.	.	.	.	.	.	.	-0.43 [-0.97; 0.11]	.	.	.	.	.	.
-0.15 [-0.87; 0.58]	Amisulpride	.	.	.	.	.	.	-0.28 [-0.76; 0.19]	.	.	.	.	.	.
-0.05 [-1.18; 1.08]	0.09 [-1.01; 1.20]	Fluphenazine	.	.	.	.	.	-0.38 [-1.37; 0.62]	.	.	.	.	.	.
-0.30 [-0.90; 0.30]	-0.16 [-0.70; 0.39]	-0.25 [-1.28; 0.78]	Quetiapine	.	.	-0.17 [-0.58; 0.25]	-0.25 [-0.74; 0.25]	-0.16 [-0.56; 0.25]	0.04 [-0.60; 0.68]	.	.	.	.	-0.23 [-0.64; 0.19]
-0.32 [-0.98; 0.35]	-0.17 [-0.79; 0.45]	-0.26 [-1.33; 0.80]	-0.01 [-0.47; 0.44]	Placebo	-0.00 [-0.75; 0.75]	.	.	-0.19 [-0.87; 0.49]	-0.10 [-0.55; 0.34]	.	.	.	.	.
-0.32 [-1.32; 0.68]	-0.17 [-1.14; 0.80]	-0.27 [-1.57; 1.04]	-0.02 [-0.89; 0.86]	-0.00 [-0.75; 0.75]	Chlorpromazine	.	.	.	.	.	.	.	.	.
-0.37 [-1.05; 0.31]	-0.22 [-0.86; 0.41]	-0.32 [-1.40; 0.76]	-0.07 [-0.43; 0.30]	-0.05 [-0.61; 0.50]	-0.05 [-0.99; 0.88]	Sertindole	.	0.91 [-0.70; 2.51]	.	.	.	.	.	-0.95 [-1.75; -0.15]
-0.42 [-1.04; 0.21]	-0.27 [-0.84; 0.30]	-0.36 [-1.40; 0.68]	-0.11 [-0.45; 0.22]	-0.10 [-0.58; 0.38]	-0.10 [-0.99; 0.80]	-0.04 [-0.52; 0.43]	Aripiprazole	-0.00 [-0.42; 0.42]	-0.19 [-0.60; 0.23]	.	.	.	.	.
-0.43 [-0.97; 0.11]	-0.28 [-0.76; 0.19]	-0.38 [-1.37; 0.62]	-0.13 [-0.39; 0.13]	-0.11 [-0.50; 0.27]	-0.11 [-0.95; 0.73]	-0.06 [-0.48; 0.36]	-0.02 [-0.33; 0.30]	Olanzapine	-0.08 [-0.25; 0.09]	.	-0.11 [-0.36; 0.15]	.	-0.39 [-0.73; -0.06]	-0.16 [-0.43; 0.12]
-0.45 [-1.01; 0.11]	-0.31 [-0.81; 0.19]	-0.40 [-1.40; 0.61]	-0.15 [-0.42; 0.12]	-0.14 [-0.51; 0.24]	-0.13 [-0.97; 0.71]	-0.08 [-0.50; 0.34]	-0.04 [-0.35; 0.28]	-0.02 [-0.17; 0.12]	Risperidone	-0.09 [-0.52; 0.34]	.	.	-0.62 [-1.15; -0.08]	-0.28 [-0.52; -0.04]
-0.55 [-1.19; 0.08]	-0.41 [-0.99; 0.18]	-0.50 [-1.55; 0.55]	-0.25 [-0.66; 0.16]	-0.24 [-0.73; 0.26]	-0.23 [-1.13; 0.66]	-0.18 [-0.70; 0.34]	-0.14 [-0.58; 0.30]	-0.12 [-0.45; 0.21]	-0.10 [-0.43; 0.22]	Lurasidone	0.00 [-0.42; 0.42]	.	.	.
-0.56 [-1.14; 0.02]	-0.42 [-0.94; 0.11]	-0.51 [-1.53; 0.51]	-0.26 [-0.59; 0.07]	-0.25 [-0.68; 0.19]	-0.24 [-1.11; 0.63]	-0.19 [-0.66; 0.27]	-0.15 [-0.52; 0.23]	-0.13 [-0.35; 0.08]	-0.11 [-0.36; 0.13]	-0.01 [-0.33; 0.31]	Ziprasidone	.	-0.02 [-0.48; 0.44]	.
-0.71 [-1.59; 0.18]	-0.56 [-1.41; 0.29]	-0.65 [-1.87; 0.57]	-0.40 [-1.15; 0.34]	-0.39 [-1.19; 0.41]	-0.39 [-1.48; 0.71]	-0.34 [-1.15; 0.47]	-0.29 [-1.06; 0.47]	-0.28 [-0.98; 0.43]	-0.25 [-0.96; 0.46]	-0.15 [-0.92; 0.61]	-0.14 [-0.86; 0.58]	Zotepine	0.03 [-0.63; 0.69]	.
-0.68 [-1.27; -0.08]	-0.53 [-1.07; 0.01]	-0.63 [-1.65; 0.40]	-0.38 [-0.72; -0.03]	-0.36 [-0.81; 0.09]	-0.36 [-1.23; 0.52]	-0.31 [-0.78; 0.16]	-0.26 [-0.65; 0.12]	-0.25 [-0.49; 0.00]	-0.23 [-0.49; 0.04]	-0.13 [-0.51; 0.26]	-0.12 [-0.40; 0.17]	0.03 [-0.63; 0.69]	Clozapine	-0.12 [-0.49; 0.26]
-0.70 [-1.28; -0.13]	-0.56 [-1.07; -0.04]	-0.65 [-1.66; 0.36]	-0.40 [-0.67; -0.14]	-0.39 [-0.80; 0.02]	-0.38 [-1.24; 0.47]	-0.33 [-0.75; 0.08]	-0.29 [-0.63; 0.05]	-0.27 [-0.46; -0.09]	-0.25 [-0.44; -0.07]	-0.15 [-0.51; 0.21]	-0.14 [-0.42; 0.13]	0.00 [-0.71; 0.71]	-0.03 [-0.30; 0.24]	Haloperidol

Social Cognition

Ziprasidone	.	.	-0.04 [-0.31; 0.23]	.	.	.	.	.
-0.04 [-0.42; 0.35]	Risperidone	.	-0.00 [-0.27; 0.27]	.	-0.09 [-0.33; 0.15]	-0.00 [-0.51; 0.51]	-0.18 [-0.79; 0.43]	-0.65 [-1.60; 0.30]
0.02 [-1.15; 1.20]	0.06 [-1.05; 1.17]	Paliperidone	.	.	.	.	.	-0.71 [-1.28; -0.13]
-0.04 [-0.31; 0.23]	0.00 [-0.27; 0.27]	-0.06 [-1.20; 1.08]	Lurasidone	.	.	.	.	.
-0.05 [-0.56; 0.45]	-0.02 [-0.36; 0.32]	-0.08 [-1.24; 1.08]	-0.02 [-0.45; 0.41]	Sertindole	-0.05 [-0.30; 0.21]	.	.	.
-0.10 [-0.54; 0.34]	-0.07 [-0.29; 0.16]	-0.12 [-1.25; 1.01]	-0.07 [-0.42; 0.28]	-0.05 [-0.30; 0.21]	Quetiapine	-0.09 [-0.35; 0.17]	.	.
-0.16 [-0.64; 0.32]	-0.12 [-0.42; 0.17]	-0.18 [-1.33; 0.97]	-0.12 [-0.52; 0.27]	-0.10 [-0.45; 0.24]	-0.06 [-0.30; 0.18]	Olanzapine	.	.
-0.22 [-0.94; 0.50]	-0.18 [-0.79; 0.43]	-0.24 [-1.51; 1.03]	-0.18 [-0.85; 0.49]	-0.16 [-0.86; 0.54]	-0.12 [-0.77; 0.53]	-0.06 [-0.74; 0.62]	Aripiprazole	.
-0.68 [-1.71; 0.34]	-0.65 [-1.60; 0.30]	-0.71 [-1.28; -0.13]	-0.65 [-1.63; 0.34]	-0.63 [-1.63; 0.38]	-0.58 [-1.56; 0.39]	-0.52 [-1.52; 0.47]	-0.47 [-1.59; 0.66]	Haloperidol

Functioning

Brexpiprazole	.	-0.16 [-0.82; 0.50]	.	.	-0.35 [-0.93; 0.24]	.	.	.	.	.	.	.
-0.07 [-1.35; 1.20]	Paliperidone	.	.	.	.	.	.	-0.56 [-1.30; 0.18]	.	.	.	.
-0.16 [-0.82; 0.50]	-0.09 [-1.18; 1.01]	Aripiprazole	.	.	.	.	-0.47 [-1.28; 0.33]	.	.	.	.	.
-0.30 [-1.52; 0.92]	-0.22 [-1.20; 0.75]	-0.14 [-1.16; 0.89]	Clozapine	.	.	-0.86 [-1.69; -0.04]	0.09 [-0.52; 0.70]	.	.	.	.	.
-0.43 [-1.58; 0.72]	-0.36 [-1.25; 0.53]	-0.27 [-1.21; 0.67]	-0.14 [-0.76; 0.49]	Amisulpride	.	-0.08 [-0.48; 0.32]	-0.21 [-0.80; 0.37]	.	.	-0.28 [-0.86; 0.30]	-0.29 [-0.86; 0.29]	.
-0.35 [-0.93; 0.24]	-0.27 [-1.68; 1.13]	-0.19 [-1.07; 0.69]	-0.05 [-1.40; 1.30]	0.09 [-1.20; 1.37]	Placebo	.	.	.	.	-0.11 [-0.69; 0.47]	-0.10 [-0.45; 0.24]	
-0.50 [-1.60; 0.61]	-0.42 [-1.25; 0.40]	-0.33 [-1.22; 0.55]	-0.20 [-0.74; 0.34]	-0.06 [-0.43; 0.31]	-0.15 [-1.39; 1.10]	Olanzapine	-0.18 [-0.58; 0.23]	-0.44 [-0.92; 0.04]	.	-0.07 [-0.66; 0.52]	-0.07 [-0.66; 0.51]	
-0.57 [-1.71; 0.58]	-0.49 [-1.38; 0.39]	-0.41 [-1.34; 0.53]	-0.27 [-0.77; 0.23]	-0.13 [-0.59; 0.32]	-0.22 [-1.51; 1.07]	-0.07 [-0.43; 0.28]	Ziprasidone	.	-0.07 [-0.65; 0.50]	-0.08 [-0.79; 0.63]	-0.58 [-1.17; 0.02]	
-0.63 [-1.67; 0.41]	-0.56 [-1.30; 0.18]	-0.47 [-1.28; 0.33]	-0.33 [-0.97; 0.30]	-0.20 [-0.69; 0.29]	-0.28 [-1.48; 0.91]	-0.14 [-0.50; 0.22]	-0.06 [-0.54; 0.41]	Risperidone	Lurasidone	.		
-0.71 [-1.90; 0.48]	-0.63 [-1.57; 0.31]	-0.55 [-1.54; 0.44]	-0.41 [-1.27; 0.45]	-0.27 [-1.03; 0.48]	-0.36 [-1.69; 0.97]	-0.21 [-0.89; 0.47]	-0.14 [-0.89; 0.61]	-0.07 [-0.65; 0.50]	Haloperidol			
-0.69 [-1.83; 0.45]	-0.62 [-1.49; 0.26]	-0.53 [-1.46; 0.40]	-0.39 [-1.05; 0.26]	-0.26 [-0.75; 0.24]	-0.34 [-1.62; 0.94]	-0.19 [-0.62; 0.23]	-0.12 [-0.61; 0.37]	-0.06 [-0.52; 0.40]	0.02 [-0.72; 0.76]	Quetiapine		
-0.75 [-1.87; 0.36]	-0.68 [-1.52; 0.16]	-0.59 [-1.49; 0.30]	-0.46 [-1.05; 0.14]	-0.32 [-0.75; 0.11]	-0.41 [-1.66; 0.85]	-0.26 [-0.56; 0.04]	-0.19 [-0.61; 0.24]	-0.12 [-0.51; 0.27]	-0.05 [-0.74; 0.65]	-0.06 [-0.52; 0.39]		

Quality of Life

Ziprasidone	-0.08 [-0.25; 0.09]	.	-0.03 [-0.32; 0.26]	-0.03 [-0.32; 0.26]	-0.03 [-0.32; 0.26]	.	.	.	.
-0.05 [-0.21; 0.11]	Olanzapine	.	-0.00 [-0.17; 0.17]	-0.06 [-0.23; 0.12]	-0.13 [-0.37; 0.11]	-0.24 [-0.64; 0.15]	.	-0.62 [-1.43; 0.19]	.
-0.06 [-0.39; 0.27]	-0.01 [-0.31; 0.29]	Sertindole	.	-0.06 [-0.31; 0.20]	.	.	.	.	.
-0.07 [-0.28; 0.13]	-0.02 [-0.18; 0.14]	-0.01 [-0.34; 0.31]	Amisulpride	0.00 [-0.27; 0.27]	0.00 [-0.27; 0.27]	.	.	.	.
-0.12 [-0.32; 0.09]	-0.06 [-0.22; 0.10]	-0.06 [-0.31; 0.20]	-0.04 [-0.24; 0.16]	Quetiapine	-0.02 [-0.24; 0.21]	.	.	.	.
-0.17 [-0.40; 0.05]	-0.12 [-0.31; 0.07]	-0.11 [-0.43; 0.21]	-0.10 [-0.32; 0.12]	-0.06 [-0.26; 0.14]	Haloperidol	.	.	-0.18 [-0.67; 0.32]	.
-0.29 [-0.72; 0.13]	-0.24 [-0.64; 0.15]	-0.23 [-0.73; 0.26]	-0.22 [-0.64; 0.21]	-0.18 [-0.60; 0.25]	-0.12 [-0.56; 0.32]	Clozapine	.	.	.
-0.49 [-1.19; 0.21]	-0.43 [-1.12; 0.25]	-0.43 [-1.17; 0.31]	-0.41 [-1.11; 0.29]	-0.37 [-1.07; 0.33]	-0.32 [-0.99; 0.36]	-0.19 [-0.99; 0.60]	Paliperidone	0.05 [-0.48; 0.58]	.
-0.44 [-0.90; 0.02]	-0.39 [-0.83; 0.06]	-0.38 [-0.90; 0.14]	-0.36 [-0.83; 0.10]	-0.32 [-0.78; 0.13]	-0.27 [-0.69; 0.16]	-0.15 [-0.74; 0.45]	0.05 [-0.48; 0.58]	Risperidone	-0.13 [-0.82; 0.55]
-0.57 [-1.40; 0.25]	-0.52 [-1.34; 0.30]	-0.51 [-1.37; 0.35]	-0.50 [-1.32; 0.33]	-0.46 [-1.28; 0.36]	-0.40 [-1.21; 0.40]	-0.28 [-1.19; 0.63]	-0.08 [-0.95; 0.78]	-0.13 [-0.82; 0.55]	Aripiprazole

Sensitivity analyses

Only studies without (extracted) composite score

Molindone	.	.	.	-0.86 [-1.60; -0.12]	.	.	.	.	.	.	.	.	-0.70 [-1.44; 0.04]	.	.	.
-0.24 [-1.09; 0.61]	Thioridazine	.	.	-0.52 [-1.15; 0.11]	.	.	.	.	.	.	.	.	-0.50 [-1.15; 0.15]	-0.93 [-1.59; -0.27]	.	.
-0.40 [-1.21; 0.41]	-0.16 [-0.90; 0.57]	Paliperidone	.	.	.	.	.	-0.16 [-1.06; 0.74]	.	-0.42 [-1.02; 0.19]	.	.	.	.	-0.71 [-1.28; -0.13]	.
-0.56 [-1.39; 0.27]	-0.32 [-1.08; 0.44]	-0.16 [-0.73; 0.42]	Sertindole	.	.	0.07 [-0.43; 0.58]	.	.	.	.	.	.	.	.	-0.95 [-1.68; -0.22]	.
-0.62 [-1.28; 0.04]	-0.38 [-0.96; 0.19]	-0.22 [-0.77; 0.34]	-0.06 [-0.65; 0.53]	Chlorpromazine	.	.	.	.	.	.	.	.	-0.31 [-0.62; 0.00]	-0.41 [-1.05; 0.23]	.	.
-0.68 [-1.40; 0.04]	-0.44 [-1.08; 0.19]	-0.28 [-0.78; 0.23]	-0.12 [-0.66; 0.42]	-0.06 [-0.47; 0.35]	Brexpiprazole	.	.	.	.	.	-0.02 [-0.44; 0.40]	.	-0.33 [-0.64; -0.03]	.	.	.
-0.73 [-1.45; 0.00]	-0.49 [-1.12; 0.15]	-0.32 [-0.73; 0.09]	-0.17 [-0.59; 0.26]	-0.10 [-0.53; 0.32]	-0.04 [-0.39; 0.30]	Quetiapine	.	0.09 [-0.24; 0.43]	0.04 [-0.39; 0.46]	-0.12 [-0.32; 0.07]	-0.25 [-0.62; 0.12]	0.14 [-0.33; 0.60]	.	.	-0.09 [-0.43; 0.25]	.
-0.77 [-1.88; 0.35]	-0.53 [-1.59; 0.54]	-0.36 [-1.31; 0.58]	-0.21 [-1.17; 0.76]	-0.14 [-1.10; 0.81]	-0.09 [-1.01; 0.84]	-0.04 [-0.92; 0.84]	Zotepine	.	.	.	.	.	.	.	.	-0.32 [-1.14; 0.51]
-0.81 [-1.53; -0.09]	-0.57 [-1.20; 0.06]	-0.41 [-0.80; -0.01]	-0.25 [-0.69; 0.19]	-0.19 [-0.60; 0.22]	-0.13 [-0.47; 0.21]	-0.08 [-0.26; 0.09]	-0.04 [-0.91; 0.83]	Risperidone	.	0.07 [-0.09; 0.24]	0.08 [-0.60; 0.76]	.	-0.06 [-0.53; 0.41]	.	-0.23 [-0.45; -0.01]	-0.52 [-1.02; -0.02]
-0.81 [-1.58; -0.05]	-0.57 [-1.26; 0.11]	-0.41 [-0.88; 0.06]	-0.25 [-0.76; 0.26]	-0.19 [-0.68; 0.30]	-0.13 [-0.56; 0.30]	-0.09 [-0.40; 0.22]	-0.05 [-0.96; 0.86]	-0.00 [-0.31; 0.30]	Amisulpride	-0.02 [-0.33; 0.30]	.	0.10 [-0.36; 0.57]	.	.	-0.07 [-0.50; 0.37]	.
-0.82 [-1.54; -0.10]	-0.58 [-1.21; 0.05]	-0.42 [-0.80; -0.03]	-0.26 [-0.70; 0.18]	-0.20 [-0.61; 0.21]	-0.14 [-0.48; 0.20]	-0.09 [-0.25; 0.06]	-0.05 [-0.92; 0.81]	-0.01 [-0.14; 0.12]	-0.01 [-0.29; 0.28]	Olanzapine	0.23 [-0.65; 1.10]	-0.04 [-0.27; 0.19]	-0.07 [-1.02; 0.88]	0.25 [-1.08; 1.58]	-0.13 [-0.38; 0.11]	-0.28 [-0.70; 0.13]
-0.83 [-1.57; -0.08]	-0.59 [-1.25; 0.07]	-0.42 [-0.91; 0.06]	-0.27 [-0.77; 0.24]	-0.21 [-0.66; 0.25]	-0.15 [-0.48; 0.19]	-0.10 [-0.39; 0.19]	-0.06 [-0.97; 0.85]	-0.02 [-0.32; 0.29]	-0.01 [-0.41; 0.39]	-0.01 [-0.31; 0.29]	Aripiprazole	.	.	.	.	.
-0.87 [-1.59; -0.15]	-0.63 [-1.26; 0.01]	-0.46 [-0.89; -0.03]	-0.31 [-0.78; 0.16]	-0.25 [-0.66; 0.17]	-0.19 [-0.54; 0.17]	-0.14 [-0.38; 0.09]	-0.10 [-0.98; 0.77]	-0.06 [-0.28; 0.16]	-0.05 [-0.38; 0.27]	-0.05 [-0.24; 0.15]	-0.04 [-0.38; 0.30]	Ziprasidone	-0.06 [-0.46; 0.34]	.	-0.17 [-0.64; 0.31]	-0.13 [-0.59; 0.33]
-0.95 [-1.61; -0.29]	-0.71 [-1.28; -0.13]	-0.54 [-1.01; -0.08]	-0.39 [-0.89; 0.11]	-0.33 [-0.64; -0.02]	-0.27 [-0.54; 0.00]	-0.22 [-0.52; 0.07]	-0.18 [-1.08; 0.72]	-0.14 [-0.42; 0.14]	-0.13 [-0.52; 0.25]	-0.13 [-0.40; 0.15]	-0.12 [-0.46; 0.22]	-0.08 [-0.36; 0.20]	Placebo	-0.43 [-1.09; 0.22]	0.19 [-1.19; 1.57]	.
-1.10 [-1.93; -0.27]	-0.86 [-1.51; -0.22]	-0.70 [-1.40; 0.00]	-0.54 [-1.26; 0.18]	-0.48 [-1.03; 0.07]	-0.42 [-1.02; 0.18]	-0.38 [-0.97; 0.22]	-0.34 [-1.38; 0.70]	-0.29 [-0.88; 0.30]	-0.29 [-0.93; 0.36]	-0.28 [-0.87; 0.30]	-0.27 [-0.90; 0.35]	-0.24 [-0.83; 0.36]	-0.15 [-0.69; 0.39]	Fluphenazine	.	.
-1.01 [-1.74; -0.29]	-0.77 [-1.41; -0.13]	-0.61 [-1.00; -0.22]	-0.45 [-0.89; -0.01]	-0.39 [-0.82; 0.04]	-0.33 [-0.69; 0.03]	-0.29 [-0.48; -0.09]	-0.25 [-1.12; 0.63]	-0.20 [-0.36; -0.04]	-0.20 [-0.51; 0.11]	-0.19 [-0.36; -0.03]	-0.18 [-0.51; 0.14]	-0.14 [-0.38; 0.09]	-0.06 [-0.36; 0.24]	0.09 [-0.51; 0.69]	Haloperidol	0.10 [-0.42; 0.62]
-1.08 [-1.84; -0.33]	-0.84 [-1.52; -0.17]	-0.68 [-1.14; -0.22]	-0.52 [-1.03; -0.02]	-0.46 [-0.93; 0.01]	-0.40 [-0.82; 0.01]	-0.36 [-0.66; -0.06]	-0.32 [-1.14; 0.51]	-0.27 [-0.55; 0.00]	-0.27 [-0.65; 0.11]	-0.26 [-0.53; 0.00]	-0.26 [-0.64; 0.13]	-0.22 [-0.50; 0.07]	-0.14 [-0.50; 0.22]	0.02 [-0.61; 0.65]	-0.07 [-0.36; 0.21]	Clozapine

Only blinded studies

Molindone	.	.	.	-0.86 [-1.60; -0.12]	.	.	.	.	.	.	-0.70 [-1.44; 0.04]	.	.	.	.
-0.24 [-1.09; 0.61]	Thioridazine	.	.	-0.52 [-1.15; 0.11]	.	.	.	.	.	.	-0.50 [-1.15; 0.15]	.	.	-0.93 [-1.59; -0.27]	.	.
-0.40 [-1.24; 0.44]	-0.16 [-0.93; 0.61]	Paliperidone	.	.	.	.	.	-0.42 [-1.02; 0.19]	.	.	.	.	.	.	-0.71 [-1.28; -0.13]	.
-0.59 [-1.43; 0.26]	-0.34 [-1.12; 0.43]	-0.18 [-0.79; 0.42]	Sertindole	.	0.07 [-0.43; 0.58]	.	.	.	.	.	.	.	.	.	-0.95 [-1.68; -0.22]	.
-0.61 [-1.34; 0.11]	-0.37 [-1.02; 0.28]	-0.21 [-0.81; 0.39]	-0.03 [-0.64; 0.58]	Brexpiprazole	.	.	.	.	.	.	-0.33 [-0.64; -0.03]	.	.	.	.	.
-0.62 [-1.28; 0.04]	-0.38 [-0.95; 0.19]	-0.22 [-0.82; 0.38]	-0.03 [-0.64; 0.57]	-0.01 [-0.44; 0.43]	Chlorpromazine	.	.	.	.	.	-0.31 [-0.62; 0.00]	.	.	-0.41 [-1.05; 0.23]	.	.
-0.74 [-1.49; 0.00]	-0.50 [-1.16; 0.16]	-0.34 [-0.80; 0.12]	-0.16 [-0.58; 0.27]	-0.13 [-0.59; 0.33]	-0.12 [-0.58; 0.34]	Quetiapine	0.09 [-0.24; 0.43]	.	.	-0.18 [-0.40; 0.04]	.	.	-0.25 [-0.62; 0.12]	.	-0.18 [-0.71; 0.36]	.
-0.79 [-1.52; -0.07]	-0.55 [-1.19; 0.09]	-0.39 [-0.83; 0.05]	-0.21 [-0.65; 0.24]	-0.18 [-0.61; 0.25]	-0.17 [-0.60; 0.26]	-0.05 [-0.25; 0.15]	Risperidone	.	-0.00 [-0.22; 0.21]	-0.15 [-0.42; 0.12]	-0.06 [-0.53; 0.41]	.	.	-0.23 [-0.45; -0.01]	-0.52 [-1.02; -0.02]	.
-0.78 [-1.66; 0.11]	-0.54 [-1.35; 0.28]	-0.37 [-1.03; 0.28]	-0.19 [-0.86; 0.48]	-0.16 [-0.82; 0.50]	-0.16 [-0.82; 0.50]	-0.03 [-0.57; 0.50]	0.02 [-0.51; 0.54]	Amisulpride	-0.10 [-0.60; 0.40]	.	.	.	.	.	.	.
-0.82 [-1.95; 0.30]	-0.58 [-1.65; 0.49]	-0.42 [-1.38; 0.55]	-0.23 [-1.20; 0.74]	-0.21 [-1.17; 0.75]	-0.20 [-1.16; 0.76]	-0.08 [-0.96; 0.81]	-0.03 [-0.90; 0.84]	-0.04 [-1.05; 0.96]	Zotepine	.	.	.	.	.	-0.32 [-1.14; 0.51]	.
-0.88 [-1.61; -0.15]	-0.64 [-1.28; 0.01]	-0.48 [-0.91; -0.05]	-0.29 [-0.74; 0.15]	-0.27 [-0.70; 0.17]	-0.26 [-0.69; 0.17]	-0.14 [-0.32; 0.05]	-0.09 [-0.24; 0.07]	-0.10 [-0.60; 0.40]	-0.06 [-0.93; 0.81]	Olanzapine	.	-0.07 [-1.02; 0.88]	.	-0.08 [-0.35; 0.19]	0.25 [-1.08; 1.58]	-0.18 [-0.52; 0.16]	-0.28 [-0.70; 0.13]
-0.90 [-1.65; -0.16]	-0.66 [-1.32; 0.00]	-0.50 [-0.98; -0.02]	-0.31 [-0.80; 0.17]	-0.29 [-0.74; 0.17]	-0.28 [-0.73; 0.17]	-0.16 [-0.44; 0.12]	-0.11 [-0.33; 0.11]	-0.12 [-0.68; 0.43]	-0.08 [-0.97; 0.81]	-0.02 [-0.26; 0.22]	Lurasidone	.	.	-0.11 [-0.38; 0.15]	.	.
-0.95 [-1.61; -0.28]	-0.71 [-1.28; -0.13]	-0.54 [-1.06; -0.02]	-0.36 [-0.89; 0.17]	-0.33 [-0.64; -0.03]	-0.33 [-0.64; -0.02]	-0.20 [-0.55; 0.14]	-0.15 [-0.46; 0.15]	-0.17 [-0.76; 0.42]	-0.13 [-1.04; 0.78]	-0.07 [-0.38; 0.24]	-0.05 [-0.38; 0.29]	Placebo	.	0.06 [-0.34; 0.46]	-0.43 [-1.09; 0.22]	0.19 [-1.19; 1.57]	.
-0.99 [-1.83; -0.16]	-0.75 [-1.51; 0.01]	-0.59 [-1.18; 0.00]	-0.41 [-0.97; 0.16]	-0.38 [-0.97; 0.21]	-0.37 [-0.96; 0.22]	-0.25 [-0.62; 0.12]	-0.20 [-0.62; 0.22]	-0.21 [-0.86; 0.43]	-0.17 [-1.13; 0.79]	-0.11 [-0.53; 0.30]	-0.09 [-0.56; 0.37]	-0.05 [-0.55; 0.46]	Aripiprazole	.	.	.	.
-0.97 [-1.70; -0.25]	-0.73 [-1.37; -0.09]	-0.57 [-1.04; -0.10]	-0.39 [-0.86; 0.09]	-0.36 [-0.78; 0.07]	-0.35 [-0.78; 0.07]	-0.23 [-0.49; 0.03]	-0.18 [-0.39; 0.03]	-0.20 [-0.73; 0.34]	-0.15 [-1.03; 0.72]	-0.09 [-0.30; 0.11]	-0.07 [-0.29; 0.15]	-0.03 [-0.32; 0.27]	0.02 [-0.43; 0.47]	Ziprasidone	.	-0.13 [-0.59; 0.33]	.
-1.11 [-1.94; -0.28]	-0.87 [-1.51; -0.22]	-0.71 [-1.44; 0.02]	-0.52 [-1.26; 0.21]	-0.50 [-1.12; 0.12]	-0.49 [-1.04; 0.06]	-0.37 [-0.98; 0.25]	-0.32 [-0.91; 0.28]	-0.33 [-1.11; 0.44]	-0.29 [-1.34; 0.75]	-0.23 [-0.83; 0.36]	-0.21 [-0.83; 0.41]	-0.16 [-0.70; 0.38]	-0.12 [-0.84; 0.60]	-0.14 [-0.74; 0.46]	Fluphenazine	.	.
-1.06 [-1.80; -0.32]	-0.81 [-1.47; -0.16]	-0.65 [-1.08; -0.22]	-0.47 [-0.91; -0.03]	-0.44 [-0.89; 0.01]	-0.44 [-0.89; 0.02]	-0.31 [-0.54; -0.08]	-0.26 [-0.44; -0.08]	-0.28 [-0.82; 0.26]	-0.24 [-1.11; 0.64]	-0.18 [-0.37; 0.02]	-0.16 [-0.43; 0.11]	-0.11 [-0.44; 0.23]	-0.06 [-0.50; 0.37]	-0.08 [-0.34; 0.17]	0.05 [-0.56; 0.67]	Haloperidol	0.10 [-0.42; 0.62]
-1.14 [-1.90; -0.38]	-0.90 [-1.58; -0.22]	-0.74 [-1.23; -0.24]	-0.55 [-1.06; -0.05]	-0.52 [-1.01; -0.04]	-0.52 [-1.00; -0.03]	-0.40 [-0.71; -0.08]	-0.35 [-0.62; -0.07]	-0.36 [-0.93; 0.21]	-0.32 [-1.14; 0.51]	-0.26 [-0.53; 0.01]	-0.24 [-0.56; 0.08]	-0.19 [-0.57; 0.19]	-0.15 [-0.63; 0.34]	-0.17 [-0.45; 0.12]	-0.03 [-0.67; 0.61]	-0.08 [-0.38; 0.21]	Clozapine

Only studies with operationalized criteria for diagnosis

Paliperidone	.	.	.	-0.16 [-1.06; 0.74]	-0.42 [-1.02; 0.19]	.	.	.	.	.	.	-0.71 [-1.28; -0.13]	.
-0.16 [-0.73; 0.41]	Sertindole	0.07 [-0.43; 0.58]	.	.	.	.	.	.	.	.	.	-0.95 [-1.68; -0.22]	.
-0.33 [-0.74; 0.08]	-0.17 [-0.59; 0.25]	Quetiapine	.	0.09 [-0.24; 0.43]	-0.12 [-0.32; 0.07]	.	0.04 [-0.39; 0.46]	.	-0.25 [-0.62; 0.12]	0.14 [-0.33; 0.60]	.	-0.09 [-0.43; 0.25]	.
-0.33 [-0.83; 0.17]	-0.16 [-0.70; 0.37]	0.00 [-0.34; 0.35]	Brexpiprazole	.	.	.	.	.	-0.02 [-0.44; 0.40]	.	-0.33 [-0.64; -0.03]	.	.
-0.17 [-1.55; 1.22]	-0.01 [-1.41; 1.40]	0.16 [-1.18; 1.50]	0.16 [-1.21; 1.53]	Fluphenazine	.	-0.25 [-1.58; 1.08]	.	.	.	.	.	.	.
-0.40 [-0.79; -0.01]	-0.24 [-0.68; 0.20]	-0.07 [-0.24; 0.10]	-0.08 [-0.40; 0.25]	-0.23 [-1.57; 1.10]	Risperidone	0.07 [-0.08; 0.23]	.	-0.15 [-0.42; 0.12]	-0.04 [-0.40; 0.31]	.	-0.06 [-0.53; 0.41]	-0.23 [-0.45; -0.01]	-0.52 [-1.02; -0.02]
-0.42 [-0.80; -0.03]	-0.25 [-0.69; 0.18]	-0.09 [-0.24; 0.07]	-0.09 [-0.42; 0.24]	-0.25 [-1.58; 1.08]	-0.01 [-0.14; 0.11]	Olanzapine	0.02 [-0.34; 0.37]	.	-0.10 [-0.50; 0.30]	-0.04 [-0.27; 0.19]	-0.07 [-1.02; 0.88]	-0.13 [-0.38; 0.11]	-0.28 [-0.70; 0.13]
-0.38 [-1.32; 0.57]	-0.21 [-1.18; 0.75]	-0.05 [-0.92; 0.83]	-0.05 [-0.97; 0.87]	-0.21 [-1.80; 1.38]	0.03 [-0.84; 0.89]	0.04 [-0.83; 0.91]	Zotepine	.	.	.	.	.	-0.32 [-1.14; 0.51]
-0.42 [-0.91; 0.07]	-0.26 [-0.78; 0.27]	-0.09 [-0.42; 0.24]	-0.10 [-0.54; 0.35]	-0.25 [-1.62; 1.11]	-0.02 [-0.35; 0.31]	-0.01 [-0.32; 0.31]	-0.05 [-0.97; 0.87]	Amisulpride	.	0.10 [-0.36; 0.57]	.	-0.07 [-0.50; 0.37]	.
-0.47 [-0.91; -0.03]	-0.31 [-0.79; 0.17]	-0.14 [-0.40; 0.11]	-0.15 [-0.52; 0.22]	-0.30 [-1.65; 1.05]	-0.07 [-0.28; 0.14]	-0.06 [-0.28; 0.17]	-0.10 [-0.98; 0.79]	-0.05 [-0.42; 0.32]	Lurasidone	-0.11 [-0.38; 0.15]	.	.	.
-0.47 [-0.92; -0.03]	-0.31 [-0.79; 0.17]	-0.14 [-0.39; 0.10]	-0.15 [-0.47; 0.17]	-0.31 [-1.66; 1.05]	-0.07 [-0.31; 0.16]	-0.06 [-0.30; 0.18]	-0.10 [-0.99; 0.80]	-0.05 [-0.44; 0.33]	-0.00 [-0.31; 0.30]	Aripiprazole	.	.	.
-0.51 [-0.93; -0.09]	-0.35 [-0.81; 0.11]	-0.18 [-0.40; 0.04]	-0.18 [-0.52; 0.16]	-0.34 [-1.68; 1.00]	-0.11 [-0.30; 0.08]	-0.09 [-0.27; 0.08]	-0.13 [-1.01; 0.74]	-0.09 [-0.43; 0.26]	-0.04 [-0.25; 0.17]	-0.03 [-0.31; 0.24]	Ziprasidone	-0.06 [-0.46; 0.34]	-0.17 [-0.64; 0.31]	-0.13 [-0.59; 0.33]
-0.59 [-1.06; -0.13]	-0.43 [-0.93; 0.07]	-0.26 [-0.56; 0.03]	-0.27 [-0.53; 0.00]	-0.42 [-1.78; 0.94]	-0.19 [-0.46; 0.08]	-0.18 [-0.45; 0.10]	-0.22 [-1.12; 0.69]	-0.17 [-0.58; 0.24]	-0.12 [-0.44; 0.20]	-0.12 [-0.43; 0.19]	-0.08 [-0.36; 0.19]	Placebo	0.19 [-1.19; 1.57]	.
-0.61 [-1.00; -0.22]	-0.45 [-0.88; -0.01]	-0.28 [-0.47; -0.08]	-0.28 [-0.63; 0.06]	-0.44 [-1.78; 0.90]	-0.21 [-0.37; -0.05]	-0.19 [-0.36; -0.03]	-0.23 [-1.11; 0.64]	-0.19 [-0.52; 0.15]	-0.14 [-0.39; 0.12]	-0.14 [-0.40; 0.13]	-0.10 [-0.32; 0.12]	-0.02 [-0.32; 0.28]	Haloperidol	0.10 [-0.42; 0.62]
-0.69 [-1.15; -0.23]	-0.53 [-1.03; -0.03]	-0.36 [-0.66; -0.07]	-0.37 [-0.77; 0.04]	-0.53 [-1.88; 0.83]	-0.29 [-0.56; -0.02]	-0.28 [-0.54; -0.01]	-0.32 [-1.14; 0.51]	-0.27 [-0.67; 0.13]	-0.22 [-0.54; 0.10]	-0.22 [-0.56; 0.12]	-0.18 [-0.46; 0.10]	-0.10 [-0.46; 0.26]	-0.08 [-0.37; 0.20]	Clozapine

Only studies with duration of at least 12 weeks (Subnetwork 1)

Molindone	-0.86 [-1.79; 0.06]	.	-0.70 [-1.63; 0.23]
-0.59 [-1.43; 0.25]	Chlorpromazine	.	-0.38 [-0.84; 0.08]
-0.64 [-1.70; 0.41]	-0.05 [-0.83; 0.74]	Brexpiprazole	-0.33 [-0.97; 0.30]
-0.97 [-1.81; -0.13]	-0.38 [-0.84; 0.08]	-0.33 [-0.97; 0.30]	Placebo

Only studies with duration of at least 12 weeks (Subnetwork 2)

Paliperidone	.	.	-0.42 [-1.02; 0.19]	.	.	-0.16 [-1.06; 0.74]	.	-0.71 [-1.28; -0.13]	.	.	.
-0.13 [-0.71; 0.44]	Sertindole	0.07 [-0.43; 0.58]	.	.	.	.	.	-0.95 [-1.68; -0.22]	.	.	.
-0.30 [-0.72; 0.11]	-0.17 [-0.59; 0.25]	Quetiapine	-0.11 [-0.31; 0.09]	0.04 [-0.39; 0.46]	0.14 [-0.33; 0.60]	-0.10 [-0.81; 0.61]	-0.25 [-0.62; 0.12]	-0.09 [-0.43; 0.25]	.	.	.
-0.17 [-1.56; 1.22]	-0.04 [-1.44; 1.37]	0.13 [-1.21; 1.48]	Fluphenazine	-0.25 [-1.58; 1.08]	.	.	.	.	.	.	.
-0.42 [-0.81; -0.03]	-0.28 [-0.72; 0.16]	-0.11 [-0.28; 0.06]	-0.25 [-1.58; 1.08]	Olanzapine	0.00 [-0.32; 0.33]	-0.04 [-0.32; 0.24]	-0.10 [-0.28; 0.08]	-0.10 [-0.50; 0.30]	-0.16 [-0.41; 0.10]	.	-0.28 [-0.70; 0.13]
-0.41 [-0.89; 0.07]	-0.28 [-0.79; 0.24]	-0.11 [-0.43; 0.21]	-0.24 [-1.61; 1.12]	0.01 [-0.29; 0.30]	Amisulpride	0.10 [-0.36; 0.57]	.	.	-0.07 [-0.50; 0.37]	.	.
-0.47 [-0.92; -0.01]	-0.33 [-0.82; 0.16]	-0.16 [-0.44; 0.12]	-0.30 [-1.65; 1.06]	-0.05 [-0.29; 0.19]	-0.05 [-0.41; 0.30]	Ziprasidone	.	.	-0.17 [-0.64; 0.31]	.	-0.13 [-0.59; 0.33]
-0.48 [-0.88; -0.08]	-0.35 [-0.80; 0.11]	-0.17 [-0.38; 0.03]	-0.31 [-1.65; 1.03]	-0.06 [-0.22; 0.09]	-0.07 [-0.39; 0.26]	-0.01 [-0.29; 0.26]	Risperidone	-0.05 [-0.42; 0.33]	-0.06 [-0.34; 0.21]	-0.15 [-0.42; 0.12]	-0.52 [-1.02; -0.02]
-0.54 [-1.00; -0.07]	-0.40 [-0.89; 0.09]	-0.23 [-0.50; 0.03]	-0.37 [-1.72; 0.99]	-0.12 [-0.38; 0.15]	-0.12 [-0.51; 0.26]	-0.07 [-0.42; 0.28]	-0.06 [-0.33; 0.22]	Aripiprazole	.	.	.
-0.58 [-0.97; -0.18]	-0.44 [-0.88; 0.00]	-0.27 [-0.49; -0.05]	-0.41 [-1.75; 0.94]	-0.16 [-0.34; 0.02]	-0.16 [-0.49; 0.16]	-0.11 [-0.39; 0.17]	-0.10 [-0.29; 0.10]	-0.04 [-0.34; 0.26]	Haloperidol	.	0.06 [-0.54; 0.66]
-0.63 [-1.11; -0.15]	-0.50 [-1.02; 0.03]	-0.32 [-0.67; 0.02]	-0.46 [-1.83; 0.91]	-0.21 [-0.52; 0.10]	-0.22 [-0.64; 0.20]	-0.16 [-0.55; 0.22]	-0.15 [-0.42; 0.12]	-0.09 [-0.48; 0.29]	-0.05 [-0.39; 0.28]	Lurasidone	.
-0.71 [-1.18; -0.25]	-0.58 [-1.09; -0.07]	-0.41 [-0.72; -0.09]	-0.54 [-1.90; 0.82]	-0.30 [-0.57; -0.02]	-0.30 [-0.70; 0.09]	-0.25 [-0.56; 0.06]	-0.23 [-0.53; 0.06]	-0.18 [-0.55; 0.20]	-0.14 [-0.45; 0.17]	-0.08 [-0.48; 0.31]	Clozapine

Only non-special population

Molindone	.	.	.	-0.86 [-1.60; -0.12]	.	.	.	.	.	.	-0.70 [-1.44; 0.04]	.	.	.	.	.	.	.	.	.
-0.25 [-1.10; 0.60]	Thioridazine	.	.	-0.52 [-1.15; 0.11]	.	.	.	.	.	.	-0.50 [-1.15; 0.15]	.	.	.	.	-0.93 [-1.59; -0.27]	.	.	.	.
-0.50 [-1.43; 0.42]	-0.25 [-1.11; 0.60]	Paliperidone	.	.	.	.	.	.	-0.16 [-1.06; 0.74]	.	.	.	.	.	.	.	.	-0.71 [-1.28; -0.13]	.	.
-0.63 [-1.35; 0.10]	-0.38 [-1.03; 0.26]	-0.13 [-0.82; 0.57]	Brexpiprazole	.	.	-0.02 [-0.44; 0.40]	.	.	.	-0.33 [-0.64; -0.03]	.	.	.	.	.	.	.	.	.	.
-0.62 [-1.29; 0.04]	-0.38 [-0.95; 0.20]	-0.12 [-0.83; 0.59]	0.01 [-0.42; 0.43]	Chlorpromazine	.	.	.	.	.	-0.31 [-0.62; 0.00]	.	.	.	.	-0.41 [-1.05; 0.23]	.	.	.	.	.
-0.64 [-1.54; 0.26]	-0.39 [-1.22; 0.44]	-0.14 [-0.80; 0.53]	-0.01 [-0.67; 0.66]	-0.01 [-0.69; 0.67]	Sertindole	0.07 [-0.43; 0.58]	.	.	.	.	.	.	.	.	.	.	.	-0.95 [-1.68; -0.22]	.	.
-0.68 [-1.49; 0.13]	-0.43 [-1.17; 0.31]	-0.18 [-0.94; 0.58]	-0.05 [-0.45; 0.34]	-0.06 [-0.62; 0.50]	-0.04 [-0.77; 0.69]	Aripiprazole	.	0.01 [-1.01; 1.04]	.	.	.	.	.	.	.	.	.	.	.	.
-0.78 [-1.60; 0.03]	-0.54 [-1.27; 0.20]	-0.28 [-0.84; 0.27]	-0.15 [-0.69; 0.39]	-0.16 [-0.72; 0.40]	-0.15 [-0.57; 0.28]	-0.10 [-0.72; 0.52]	Quetiapine	0.15 [-0.23; 0.52]	.	.	.	-0.49 [-0.97; -0.01]	.	.	.	.	.	-0.18 [-0.71; 0.36]	.	.
-0.77 [-1.88; 0.34]	-0.52 [-1.57; 0.53]	-0.26 [-1.21; 0.68]	-0.14 [-1.07; 0.79]	-0.14 [-1.08; 0.80]	-0.13 [-1.04; 0.78]	-0.09 [-1.06; 0.89]	0.02 [-0.81; 0.84]	Amisulpride	.	.	.	-0.22 [-0.99; 0.55]	.	.	.	.	.	.	.	.
-0.85 [-1.62; -0.08]	-0.60 [-1.29; 0.08]	-0.35 [-0.87; 0.17]	-0.22 [-0.70; 0.25]	-0.23 [-0.73; 0.27]	-0.21 [-0.69; 0.26]	-0.17 [-0.73; 0.39]	-0.07 [-0.34; 0.21]	-0.08 [-0.89; 0.72]	Risperidone	-0.06 [-0.53; 0.41]	-0.15 [-0.42; 0.12]	0.07 [-0.26; 0.41]	.	.	.	.	.	-0.25 [-0.60; 0.10]	.	.
-0.95 [-1.61; -0.28]	-0.70 [-1.27; -0.12]	-0.45 [-1.09; 0.20]	-0.32 [-0.61; -0.02]	-0.32 [-0.63; -0.01]	-0.31 [-0.92; 0.30]	-0.27 [-0.74; 0.20]	-0.16 [-0.64; 0.31]	-0.18 [-1.07; 0.71]	-0.10 [-0.50; 0.30]	Placebo	.	.	.	.	-0.43 [-1.09; 0.22]	.	.	0.19 [-1.19; 1.57]	.	.
-0.98 [-1.79; -0.17]	-0.73 [-1.46; 0.00]	-0.48 [-1.04; 0.09]	-0.35 [-0.88; 0.18]	-0.35 [-0.91; 0.20]	-0.34 [-0.86; 0.18]	-0.30 [-0.91; 0.31]	-0.19 [-0.55; 0.16]	-0.21 [-1.04; 0.61]	-0.13 [-0.37; 0.12]	-0.03 [-0.50; 0.43]	Lurasidone	.	.	-0.11 [-0.38; 0.15]	.	.	.	.	.	.
-0.98 [-1.78; -0.19]	-0.74 [-1.45; -0.02]	-0.48 [-1.02; 0.06]	-0.35 [-0.87; 0.16]	-0.36 [-0.90; 0.18]	-0.35 [-0.83; 0.14]	-0.30 [-0.90; 0.30]	-0.20 [-0.49; 0.09]	-0.22 [-0.99; 0.55]	-0.13 [-0.36; 0.10]	-0.04 [-0.49; 0.41]	-0.01 [-0.30; 0.29]	Olanzapine	.	-0.03 [-0.44; 0.37]	0.25 [-1.08; 1.58]	-0.41 [-1.18; 0.36]	-0.13 [-0.54; 0.28]	.	.	.
-1.07 [-1.89; -0.24]	-0.82 [-1.56; -0.08]	-0.57 [-1.15; 0.02]	-0.44 [-0.99; 0.12]	-0.44 [-1.02; 0.13]	-0.43 [-0.97; 0.11]	-0.39 [-1.02; 0.24]	-0.28 [-0.66; 0.09]	-0.30 [-1.13; 0.53]	-0.22 [-0.51; 0.08]	-0.12 [-0.61; 0.37]	-0.09 [-0.33; 0.15]	-0.08 [-0.39; 0.22]	Ziprasidone	.	.	.	.	.	.	.
-1.13 [-1.96; -0.30]	-0.88 [-1.53; -0.23]	-0.63 [-1.44; 0.19]	-0.50 [-1.11; 0.12]	-0.50 [-1.06; 0.05]	-0.49 [-1.27; 0.29]	-0.45 [-1.16; 0.26]	-0.34 [-1.03; 0.34]	-0.36 [-1.37; 0.65]	-0.28 [-0.91; 0.36]	-0.18 [-0.72; 0.36]	-0.15 [-0.83; 0.53]	-0.14 [-0.80; 0.51]	-0.06 [-0.75; 0.63]	Fluphenazine	.	.	.	.	.	.
-1.23 [-2.26; -0.20]	-0.98 [-1.95; -0.01]	-0.73 [-1.55; 0.10]	-0.60 [-1.43; 0.23]	-0.60 [-1.45; 0.24]	-0.59 [-1.39; 0.21]	-0.55 [-1.43; 0.34]	-0.44 [-1.16; 0.27]	-0.46 [-1.49; 0.57]	-0.38 [-1.07; 0.32]	-0.28 [-1.07; 0.51]	-0.25 [-0.97; 0.47]	-0.24 [-0.92; 0.43]	-0.16 [-0.89; 0.57]	-0.10 [-1.03; 0.83]	Clozapine	.	.	.	.	.
-1.13 [-1.93; -0.33]	-0.88 [-1.60; -0.16]	-0.63 [-1.12; -0.14]	-0.50 [-1.02; 0.02]	-0.51 [-1.05; 0.04]	-0.49 [-0.95; -0.03]	-0.45 [-1.05; 0.16]	-0.35 [-0.64; -0.05]	-0.36 [-1.18; 0.46]	-0.28 [-0.53; -0.03]	-0.18 [-0.64; 0.27]	-0.15 [-0.48; 0.18]	-0.15 [-0.42; 0.13]	-0.06 [-0.42; 0.30]	-0.00 [-0.67; 0.67]	0.10 [-0.58; 0.77]	Haloperidol	.	.	.	.

Only studies with at least 3 domains

Paliperidone	.	.	-0.42 [-1.02; 0.19]	-0.16 [-1.06; 0.74]	.	.	.	.	.	.	.	.	.	.
-0.09 [-1.51; 1.34]	Fluphenazine	.	-0.25 [-1.58; 1.08]	.	.	.	.	.	.	.	.	.	.	.
-0.20 [-1.22; 0.82]	-0.11 [-1.71; 1.49]	Zotepine	.	.	.	.	.	.	.	.	.	.	.	-0.32 [-1.14; 0.51]
-0.18 [-1.42; 1.07]	-0.09 [-1.84; 1.66]	0.02 [-1.42; 1.47]	Amisulpride	-0.16 [-1.30; 0.98]	.	.	.	.	.	.	.	.	.	.
-0.34 [-0.84; 0.17]	-0.25 [-1.58; 1.08]	-0.14 [-1.03; 0.75]	-0.16 [-1.30; 0.98]	Olanzapine	-0.06 [-0.27; 0.15]	0.23 [-0.47; 0.93]	-0.10 [-0.50; 0.30]	.	.	.	-0.08 [-0.35; 0.19]	-0.07 [-1.02; 0.88]	-0.24 [-0.62; 0.14]	-0.24 [-0.74; 0.26]
-0.34 [-0.86; 0.17]	-0.25 [-1.60; 1.09]	-0.14 [-1.04; 0.75]	-0.17 [-1.32; 0.99]	-0.01 [-0.18; 0.16]	Risperidone	-0.09 [-0.43; 0.24]	-0.04 [-0.40; 0.31]	-0.15 [-0.42; 0.12]	.	.	.	-0.06 [-0.53; 0.41]	-0.08 [-0.39; 0.23]	-0.35 [-1.33; 0.63]
-0.37 [-0.95; 0.21]	-0.28 [-1.65; 1.09]	-0.17 [-1.10; 0.76]	-0.19 [-1.37; 0.99]	-0.03 [-0.34; 0.27]	-0.02 [-0.30; 0.25]	Quetiapine	.	.	-0.07 [-0.58; 0.43]	.	.	.	-0.18 [-0.71; 0.36]	.
-0.41 [-1.00; 0.19]	-0.32 [-1.69; 1.06]	-0.21 [-1.15; 0.74]	-0.23 [-1.41; 0.96]	-0.07 [-0.40; 0.26]	-0.06 [-0.39; 0.26]	-0.04 [-0.46; 0.38]	Aripiprazole	.	.	.	.	.	.	.
-0.42 [-0.97; 0.14]	-0.33 [-1.68; 1.03]	-0.21 [-1.12; 0.69]	-0.24 [-1.40; 0.93]	-0.08 [-0.32; 0.17]	-0.07 [-0.29; 0.15]	-0.05 [-0.39; 0.30]	-0.01 [-0.39; 0.37]	Lurasidone	.	.	-0.11 [-0.38; 0.15]	.	.	.
-0.44 [-1.21; 0.33]	-0.35 [-1.81; 1.10]	-0.24 [-1.30; 0.82]	-0.26 [-1.55; 1.02]	-0.11 [-0.70; 0.49]	-0.10 [-0.68; 0.48]	-0.07 [-0.58; 0.43]	-0.04 [-0.69; 0.62]	-0.03 [-0.64; 0.59]	Sertindole	.	.	.	.	.
-0.49 [-1.71; 0.73]	-0.40 [-2.14; 1.33]	-0.29 [-1.71; 1.12]	-0.32 [-1.91; 1.28]	-0.16 [-1.27; 0.96]	-0.15 [-1.26; 0.96]	-0.13 [-1.27; 1.02]	-0.09 [-1.24; 1.07]	-0.08 [-1.20; 1.04]	-0.05 [-1.30; 1.20]	Chlorpromazine	.	0.02 [-1.05; 1.09]	.	.
-0.45 [-0.99; 0.09]	-0.36 [-1.71; 0.98]	-0.25 [-1.14; 0.64]	-0.27 [-1.43; 0.88]	-0.12 [-0.32; 0.09]	-0.11 [-0.33; 0.11]	-0.08 [-0.43; 0.26]	-0.05 [-0.42; 0.33]	-0.04 [-0.25; 0.18]	-0.01 [-0.62; 0.60]	0.04 [-1.07; 1.15]	Ziprasidone	-0.06 [-0.46; 0.34]	.	-0.13 [-0.59; 0.33]
-0.47 [-1.06; 0.12]	-0.38 [-1.75; 0.99]	-0.27 [-1.20; 0.66]	-0.29 [-1.47; 0.89]	-0.13 [-0.45; 0.18]	-0.13 [-0.44; 0.18]	-0.10 [-0.51; 0.31]	-0.06 [-0.50; 0.37]	-0.05 [-0.40; 0.29]	-0.03 [-0.68; 0.62]	0.02 [-1.05; 1.09]	-0.02 [-0.32; 0.28]	Placebo	0.19 [-1.19; 1.57]	.
-0.49 [-1.04; 0.06]	-0.40 [-1.75; 0.95]	-0.29 [-1.19; 0.61]	-0.31 [-1.48; 0.85]	-0.15 [-0.40; 0.09]	-0.14 [-0.38; 0.09]	-0.12 [-0.44; 0.20]	-0.08 [-0.47; 0.30]	-0.07 [-0.38; 0.23]	-0.05 [-0.64; 0.55]	0.01 [-1.12; 1.14]	-0.04 [-0.33; 0.25]	-0.02 [-0.38; 0.35]	Haloperidol	0.10 [-0.42; 0.62]
-0.52 [-1.12; 0.08]	-0.43 [-1.80; 0.94]	-0.32 [-1.14; 0.51]	-0.34 [-1.53; 0.84]	-0.18 [-0.51; 0.15]	-0.17 [-0.51; 0.16]	-0.15 [-0.57; 0.27]	-0.11 [-0.57; 0.34]	-0.10 [-0.47; 0.26]	-0.08 [-0.74; 0.58]	-0.03 [-1.17; 1.12]	-0.07 [-0.39; 0.26]	-0.05 [-0.47; 0.37]	-0.03 [-0.39; 0.33]	Clozapine

Excluding studies with high risk of bias

Molindone	.	.	.	-0.86 [-1.60; -0.12]	.	.	.	.	.	-0.70 [-1.44; 0.04]	.	.	.	.
-0.15 [-1.23; 0.92]	Sertindole	.	.	.	.	.	.	.	.	.	.	.	.	-0.95 [-1.68; -0.22]
-0.27 [-1.12; 0.58]	-0.11 [-1.14; 0.91]	Thioridazine	.	-0.52 [-1.15; 0.11]	.	.	.	.	.	-0.50 [-1.15; 0.15]	.	.	-0.93 [-1.59; -0.27]	.
-0.47 [-1.31; 0.38]	-0.31 [-1.15; 0.53]	-0.20 [-0.97; 0.58]	Paliperidone	.	-0.16 [-1.06; 0.74]	.	-0.42 [-1.02; 0.19]	.	.	.	.	.	.	-0.71 [-1.28; -0.13]
-0.63 [-1.29; 0.03]	-0.47 [-1.38; 0.43]	-0.36 [-0.94; 0.22]	-0.16 [-0.77; 0.44]	Chlorpromazine	.	.	.	.	.	-0.31 [-0.62; 0.00]	.	.	-0.41 [-1.05; 0.23]	.
-0.84 [-1.59; -0.08]	-0.68 [-1.46; 0.10]	-0.57 [-1.25; 0.11]	-0.37 [-0.78; 0.04]	-0.21 [-0.68; 0.27]	Risperidone	.	-0.05 [-0.33; 0.24]	.	.	-0.06 [-0.53; 0.41]	-0.15 [-0.42; 0.12]	-0.35 [-1.33; 0.63]	.	-0.23 [-0.53; 0.06]
-0.81 [-1.75; 0.14]	-0.65 [-1.63; 0.33]	-0.54 [-1.43; 0.35]	-0.34 [-1.05; 0.36]	-0.18 [-0.92; 0.56]	0.03 [-0.59; 0.65]	Amisulpride	-0.05 [-0.62; 0.51]	.	.	.	.	.	.	.
-0.86 [-1.62; -0.11]	-0.71 [-1.51; 0.10]	-0.59 [-1.28; 0.09]	-0.40 [-0.81; 0.02]	-0.23 [-0.71; 0.24]	-0.02 [-0.27; 0.22]	-0.05 [-0.62; 0.51]	Olanzapine	-0.07 [-0.36; 0.21]	.	.	-0.12 [-0.78; 0.54]	.	.	-0.47 [-1.25; 0.31]
-0.91 [-1.66; -0.17]	-0.76 [-1.58; 0.07]	-0.64 [-1.31; 0.03]	-0.45 [-0.92; 0.02]	-0.28 [-0.74; 0.17]	-0.08 [-0.39; 0.24]	-0.10 [-0.72; 0.51]	-0.05 [-0.30; 0.20]	Ziprasidone	-0.06 [-0.46; 0.34]	.	-0.13 [-0.59; 0.33]	.	.	.
-0.94 [-1.60; -0.28]	-0.79 [-1.63; 0.06]	-0.67 [-1.25; -0.09]	-0.48 [-0.99; 0.04]	-0.31 [-0.62; 0.00]	-0.10 [-0.46; 0.25]	-0.13 [-0.81; 0.54]	-0.08 [-0.44; 0.28]	-0.03 [-0.36; 0.31]	Placebo	.	.	-0.43 [-1.09; 0.22]	.	.
-0.99 [-1.79; -0.19]	-0.83 [-1.66; -0.01]	-0.72 [-1.45; 0.01]	-0.52 [-1.01; -0.03]	-0.36 [-0.90; 0.19]	-0.15 [-0.42; 0.12]	-0.18 [-0.85; 0.49]	-0.13 [-0.49; 0.24]	-0.07 [-0.49; 0.34]	-0.05 [-0.49; 0.40]	Lurasidone	.	.	.	.
-1.02 [-1.84; -0.20]	-0.86 [-1.74; 0.01]	-0.75 [-1.50; 0.00]	-0.55 [-1.11; 0.00]	-0.39 [-0.96; 0.18]	-0.18 [-0.62; 0.25]	-0.21 [-0.91; 0.48]	-0.16 [-0.56; 0.24]	-0.11 [-0.48; 0.27]	-0.08 [-0.56; 0.40]	-0.03 [-0.54; 0.48]	Clozapine	.	.	-0.06 [-1.04; 0.91]
-1.20 [-2.06; -0.34]	-1.04 [-2.08; -0.01]	-0.93 [-1.59; -0.27]	-0.73 [-1.52; 0.05]	-0.57 [-1.15; 0.01]	-0.36 [-1.05; 0.33]	-0.39 [-1.28; 0.50]	-0.34 [-1.03; 0.35]	-0.29 [-0.96; 0.39]	-0.26 [-0.85; 0.33]	-0.21 [-0.95; 0.53]	-0.18 [-0.94; 0.58]	Fluphenazine	.	.
-1.10 [-1.90; -0.31]	-0.95 [-1.68; -0.22]	-0.84 [-1.56; -0.11]	-0.64 [-1.05; -0.23]	-0.48 [-1.01; 0.06]	-0.27 [-0.54; 0.00]	-0.30 [-0.95; 0.36]	-0.24 [-0.57; 0.09]	-0.19 [-0.58; 0.19]	-0.16 [-0.59; 0.27]	-0.12 [-0.50; 0.26]	-0.09 [-0.57; 0.40]	0.09 [-0.64; 0.82]	Haloperidol	.

Excluding studies with unfair dose

Molindone	.	.	-0.86 [-1.60; -0.12]	.	.	.	.	.	.	.	.	.	.	.	-0.70 [-1.44; 0.04]	.	.
-0.40 [-1.22; 0.42]	Paliperidone	.	.	.	.	.	-0.16 [-1.06; 0.74]	-0.42 [-1.02; 0.19]	.	.	.	.	.	.	.	-0.71 [-1.28; -0.13]	.
-0.53 [-1.37; 0.31]	-0.13 [-0.70; 0.45]	Sertindole	0.07 [-0.43; 0.58]	.	.	.	.	.	.	.	.	.	.	.	-0.95 [-1.68; -0.22]	.	.
-0.58 [-1.24; 0.09]	-0.17 [-0.76; 0.41]	-0.05 [-0.67; 0.57]	Chlorpromazine	.	.	.	.	.	.	.	.	.	.	.	-0.42 [-0.77; -0.06]	.	.
-0.67 [-1.41; 0.07]	-0.27 [-0.69; 0.15]	-0.14 [-0.56; 0.28]	-0.09 [-0.56; 0.38]	Quetiapine	.	.	0.09 [-0.24; 0.43]	-0.18 [-0.40; 0.04]	.	-0.25 [-0.62; 0.12]	.	.	.	.	-0.19 [-0.77; 0.38]	.	.
-0.58 [-1.64; 0.48]	-0.18 [-1.05; 0.68]	-0.05 [-0.94; 0.84]	-0.01 [-0.90; 0.89]	0.09 [-0.70; 0.88]	Amisulpride	.	.	-0.22 [-0.99; 0.55]	.	.	.	.	.	.	.	.	.
-0.55 [-2.07; 0.96]	-0.15 [-1.54; 1.24]	-0.02 [-1.42; 1.38]	0.02 [-1.38; 1.43]	0.12 [-1.22; 1.46]	0.03 [-1.51; 1.57]	Fluphenazine	.	-0.25 [-1.58; 1.08]	.	.	.	.	.	.	.	.	.
-0.72 [-1.44; 0.00]	-0.32 [-0.82; 0.19]	-0.19 [-0.72; 0.35]	-0.14 [-0.59; 0.31]	-0.05 [-0.40; 0.30]	-0.14 [-0.97; 0.70]	-0.16 [-1.54; 1.21]	Brexpiprazole	.	.	-0.02 [-0.44; 0.40]	.	.	.	.	-0.33 [-0.64; -0.03]	.	.
-0.79 [-1.51; -0.06]	-0.38 [-0.78; 0.01]	-0.26 [-0.70; 0.19]	-0.21 [-0.66; 0.24]	-0.12 [-0.30; 0.07]	-0.20 [-0.99; 0.58]	-0.23 [-1.57; 1.10]	-0.07 [-0.40; 0.26]	Risperidone	0.07 [-0.08; 0.23]	.	-0.04 [-0.40; 0.31]	-0.15 [-0.42; 0.12]	.	-0.06 [-0.53; 0.41]	-0.28 [-0.52; -0.03]	-0.52 [-1.02; -0.02]	
-0.80 [-1.52; -0.08]	-0.40 [-0.79; -0.01]	-0.27 [-0.71; 0.17]	-0.22 [-0.68; 0.23]	-0.13 [-0.30; 0.04]	-0.22 [-0.99; 0.55]	-0.25 [-1.58; 1.08]	-0.08 [-0.41; 0.25]	-0.01 [-0.14; 0.11]	Olanzapine	.	-0.10 [-0.50; 0.30]	.	-0.08 [-0.35; 0.19]	-0.07 [-1.02; 0.88]	-0.15 [-0.45; 0.15]	-0.28 [-0.70; 0.13]	
-0.80 [-1.92; 0.32]	-0.40 [-1.35; 0.55]	-0.27 [-1.24; 0.70]	-0.22 [-1.19; 0.75]	-0.13 [-1.01; 0.75]	-0.22 [-1.38; 0.95]	-0.25 [-1.84; 1.34]	-0.08 [-1.00; 0.84]	-0.01 [-0.89; 0.86]	0.00 [-0.87; 0.87]	Zotepine	.	.	.	.	.	-0.32 [-1.14; 0.51]	
-0.85 [-1.59; -0.11]	-0.45 [-0.90; 0.00]	-0.32 [-0.80; 0.16]	-0.27 [-0.75; 0.20]	-0.18 [-0.42; 0.07]	-0.26 [-1.07; 0.54]	-0.29 [-1.65; 1.06]	-0.13 [-0.45; 0.19]	-0.06 [-0.30; 0.18]	-0.05 [-0.29; 0.19]	-0.05 [-0.95; 0.85]	Aripiprazole	.	.	.	.	.	
-0.88 [-1.62; -0.14]	-0.48 [-0.92; -0.04]	-0.35 [-0.84; 0.13]	-0.31 [-0.79; 0.17]	-0.21 [-0.48; 0.06]	-0.30 [-1.11; 0.51]	-0.33 [-1.68; 1.02]	-0.16 [-0.54; 0.21]	-0.10 [-0.31; 0.12]	-0.08 [-0.31; 0.15]	-0.08 [-0.97; 0.81]	-0.04 [-0.35; 0.28]	Lurasidone	.	-0.11 [-0.38; 0.15]	.	.	
-0.94 [-1.67; -0.22]	-0.54 [-0.97; -0.11]	-0.41 [-0.89; 0.06]	-0.37 [-0.82; 0.09]	-0.27 [-0.52; -0.02]	-0.36 [-1.16; 0.44]	-0.39 [-1.74; 0.96]	-0.23 [-0.57; 0.12]	-0.16 [-0.36; 0.05]	-0.14 [-0.34; 0.05]	-0.14 [-1.02; 0.73]	-0.10 [-0.39; 0.20]	-0.06 [-0.27; 0.15]	Ziprasidone	-0.06 [-0.46; 0.34]	.	-0.13 [-0.59; 0.33]	
-0.99 [-1.66; -0.32]	-0.59 [-1.06; -0.12]	-0.46 [-0.97; 0.04]	-0.42 [-0.77; -0.06]	-0.32 [-0.63; -0.02]	-0.41 [-1.23; 0.41]	-0.44 [-1.80; 0.92]	-0.28 [-0.54; -0.01]	-0.21 [-0.48; 0.06]	-0.19 [-0.47; 0.08]	-0.19 [-1.10; 0.71]	-0.15 [-0.46; 0.17]	-0.11 [-0.43; 0.21]	-0.05 [-0.33; 0.23]	Placebo	0.19 [-1.19; 1.57]	.	
-1.03 [-1.77; -0.29]	-0.63 [-1.02; -0.24]	-0.50 [-0.95; -0.06]	-0.46 [-0.93; 0.02]	-0.36 [-0.59; -0.14]	-0.45 [-1.24; 0.34]	-0.48 [-1.82; 0.86]	-0.32 [-0.68; 0.05]	-0.25 [-0.43; -0.07]	-0.23 [-0.42; -0.05]	-0.23 [-1.11; 0.65]	-0.19 [-0.47; 0.10]	-0.15 [-0.42; 0.12]	-0.09 [-0.34; 0.16]	-0.04 [-0.35; 0.27]	Haloperidol	0.06 [-0.54; 0.66]	
-1.12 [-1.88; -0.36]	-0.72 [-1.18; -0.25]	-0.59 [-1.10; -0.08]	-0.54 [-1.05; -0.03]	-0.45 [-0.76; -0.13]	-0.54 [-1.35; 0.28]	-0.57 [-1.92; 0.79]	-0.40 [-0.81; 0.01]	-0.33 [-0.61; -0.05]	-0.32 [-0.59; -0.04]	-0.32 [-1.14; 0.51]	-0.27 [-0.62; 0.08]	-0.24 [-0.56; 0.09]	-0.18 [-0.47; 0.12]	-0.12 [-0.49; 0.24]	-0.09 [-0.39; 0.22]	Clozapine	

Erklärungen zum Eigenanteil

Das Projekt „Antipsychotika und ihre Effekte auf die kognitive Funktion: eine systematische Übersichtsarbeit, paarweise Metaanalyse und Netzwerk-Metaanalyse“ wurde von Lena Feber unter Supervision von Herrn Prof. Stefan Leucht über die gesamte Projektlaufzeit geleitet. Sie war an allen Arbeitsschritten federführend beteiligt. Hierzu zählten das Literaturscreening, die Registrierung, Erstellung und Einreichung von zwei Protokollen, Datenextraktion, Evaluation des Risk of Bias und CINeMA, Begleitung der statistischen Analysen, Interpretation der Ergebnisse und die Verfassung der Endpublikation. Zur Qualitätssicherung wurden diese Schritte von einem zweiten Reviewer unterstützt, die Hauptverantwortung lag jedoch jederzeit und bei allen Arbeitsschritten bei der Verfasserin dieser Doktorarbeit.

Das Projekt wurde zudem unterstützt durch die folgenden Personen mit den entsprechenden Funktionen:

Dr. Farhad Shokraneh: allgemeine Literaturrecherche

Professor Georgia Salanti und Dr. Virginia Chiocchia: Durchführung spezifischer statistischer Analysen und Beratung bezüglich der Methodik

Professor Rolf Engel und Professor Richard Keefe: Beratung zur Bewertung neuropsychologischer Testverfahren

Dr. Natalie Peter, Xiao Lin, Dr. Daniel Prates-Baldez: Unterstützung der Arbeitsschritte in der Funktion als zweiter Reviewer. Hauptverantwortlich und in der Funktion als erster Reviewer war bei allen Arbeitsschritten Lena Feber

Dr. Irene Bighelli, Dr. Johannes Schneider-Thoma und Dr. Spyridon Siafis: klinische und methodische Beratung

Wulf-Peter Hansen: Beiträge aus Patientenperspektive

Alle beteiligten Personen haben ihr Einverständnis erteilt, durch sie gewonnene Beiträge auch in dieser Doktorarbeit einzubringen.

Danksagung

Mein besonderer Dank gilt meinem Doktorvater, Prof. Stefan Leucht, für die Möglichkeit dieser Arbeit. Vielen Dank für diese lehrreiche Zeit, das entgegengebrachte Vertrauen und die Unterstützung. Ich möchte mich auch herzlich bei meinen Betreuern Prof. Robert Perneczky und Prof. Frank Padberg bedanken.

Weiterhin möchte ich mich bei allen Personen bedanken, die bei dieser Arbeit mitgewirkt haben: Dr. Natalie L. Peter, Dr. Virginia Chiocchia, Dr. Johannes Schneider-Thoma, Dr. Spyridon Siafis, Dr. Irene Bighelli, Wulf-Peter Hansen, Xiao Lin, Dr. Daniel Prates-Baldez, Prof. Georgia Salanti, Prof. Richard S. E. Keefe, Prof. Rolf R Engel und Prof. Stefan Leucht. Einen großen Dank an Dr. Natalie L. Peter für die Zusammenarbeit und an Dr. Johannes Schneider-Thoma für die Unterstützung. Ebenfalls ist die Zusammenarbeit mit Prof. Rolf R. Engel hervorzuheben. Vielen Dank für Ihre Geduld, Zuverlässigkeit und Verfügbarkeit bei allen Fragen zur Bewertung der Testverfahren.

Ich danke allen Mitgliedern der Arbeitsgruppe für die freundschaftliche Atmosphäre, ganz besonders meinen Kolleginnen und Kollegen Dr. Natalie L. Peter, Shimeng Dong, Nurul Husna Salahuddin, Jing Tian, Dr. Spyridon Siafis, Dr. Angelika Burschinski und Dr. Irene Bighelli.

Abschließend gilt ein großer Dank meiner Familie und Freunden, die mich während dieser Zeit begleiteten und stets motivierten.

Affidavit

LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN | Promotionsbüro Medizinische Fakultät | MMRS

Eidesstattliche Versicherung

Feber, Lena

Name, Vorname

Ich erkläre hiermit an Eides statt, dass ich die vorliegende Dissertation mit dem Titel:

Antipsychotika und ihre Effekte auf die kognitive Funktion:

Eine systematische Übersichtsarbeit, paarweise Metaanalyse und Netzwerk-Metaanalyse

selbständig verfasst, mich außer der angegebenen keiner weiteren Hilfsmittel bedient und alle Erkenntnisse, die aus dem Schrifttum ganz oder annähernd übernommen sind, als solche kenntlich gemacht und nach ihrer Herkunft unter Bezeichnung der Fundstelle einzeln nachgewiesen habe.

Ich erkläre des Weiteren, dass die hier vorgelegte Dissertation nicht in gleicher oder in ähnlicher Form bei einer anderen Stelle zur Erlangung eines akademischen Grades eingereicht wurde.

München, 23.10.2024 — Lena Feber

Ort, Datum — Unterschrift Doktorandin bzw. Doktorand

Publikationsliste

Feber L, Peter NL, Chiocchia V, Schneider-Thoma J, Siafis S, Bighelli I, Hansen WP, Lin X, Prates-Baldez D, Salanti G, Keefe RSE, Engel RR, Leucht S. Antipsychotic Drugs and Cognitive Function: A Systematic Review and Pairwise Network Meta-Analysis. JAMA Psychiatry. 2024 Oct 16. doi: 10.1001/jamapsychiatry.2024.2890. Epub ahead of print. PMID: 39412783

Feber, L., Peter, N., Schneider-Thoma, J. *et al.* Antipsychotic drugs and their effects on cognitive function: protocol for a systematic review, pairwise, and network meta-analysis. *Syst Rev* **12**, 54 (2023). https://doi.org/10.1186/s13643-023-02213-5

Feber L, Peter N. Antipsychotic drugs and their effects on cognitive function: a systematic review, pairwise and network meta-analysis. 2022. Available from: crd.york.ac.uk/PROSPERO/display_record.php?RecordID=312483 (2023, December 10)

Feber, L. (2023, December 01). Antipsychotika und ihre Effekte auf die kognitive Funktion: Eine systematische Übersichtsarbeit, paarweise Metaanalyse und Netzwerk-Metaanalyse (Vortrag). DGPPN congress, Berlin, Germany

Feber, L. (2022, November 23-26). Antipsychotika und ihre Effekte auf die kognitive Funktion: Eine systematische Übersichtsarbeit, paarweise Metaanalyse und Netzwerk-Metaanalyse (Posterpräsentation). DGPPN congress, Berlin, Germany

Feber, L. (2022, April 3-7). Antipsychotic drugs and their effects on cognitive function. Systematic review, pairwise and network meta-analysis (Posterpräsentation). SIRS congress, Florence, Italy