# TECHNICAL COMMENTARY

NeuRA
Discover. Conquer. Cure.
BIPOLAR DISORDERS LIBRARY

# All antidepressants

## Introduction

Most antidepressants increase serotonin or noradrenaline and are effective for the treatment of unipolar depression. However, as they may increase the risk of phase shifting from depression to mania in people with bipolar disorder, they are generally used only when the depressive phase is severe and shows poor response to mood stabilizers or antipsychotics.

## Method

We have included only systematic reviews (systematic literature search, detailed methodology with inclusion/exclusion criteria) published in full text, in English, from the year 2010 that report results separately for people with a diagnosis of bipolar or related disorders. Reviews were identified by searching the databases MEDLINE, EMBASE, and PsycINFO. Hand searching reference lists of identified reviews was also conducted. When multiple copies of review topics were found, the most recent and/or comprehensive review was included. Reviews with pooled data are prioritised for inclusion.

Review reporting assessment was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist that describes a preferred way to present a meta-analysis[1]. Reviews reporting less than 50% of items have been excluded from the library. The PRISMA flow diagram is a suggested way of providing information about studies included and excluded with reasons for exclusion. Where no flow diagram has been presented by individual reviews, but identified studies have been described in the text, reviews have been checked for this item. Note that early reviews may have been guided by less stringent reporting checklists than the PRISMA, and that some reviews may have been limited by journal guidelines.

Evidence was graded using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group approach where high quality evidence such as that gained from randomised controlled trials (RCTs) may be downgraded to moderate or low if review and study quality is limited, if there is inconsistency in results, indirect comparisons, imprecise or sparse data and high probability of reporting bias. It may also be downgraded if risks associated with the intervention or other matter under review are high. Conversely, low quality evidence such as that gained from observational studies may be upgraded if effect sizes are large or if there is a dose dependent response. We have also taken into account sample size and whether results are consistent, precise and direct with low associated risks (see end of table for an explanation of these terms)[2]. The resulting table represents an objective summary of the available evidence, although the conclusions are solely the opinion of staff of NeuRA (Neuroscience Research Australia).

## Results

We found two reviews that met our inclusion criteria[3, 4].

- Moderate to high quality evidence suggests second generation antidepressants (with or without mood stabilisers), are a more effective long-term prophylactic treatment for relapse to depression than placebo (with or without mood stabilisers).
- Moderate to low quality evidence suggests no differences in relapse rates to depression or mania between antidepressants and mood stabilisers.
- Moderate quality evidence suggests ~19% of people with bipolar depression taking antidepressants switch to mania. Switching rates are highest in people with a family history of affective disorders, previous suicide attempts, depression polarity of the index episode, lifetime psychotic features, and rapid-cycling course. Rates were lowest in people taking concurrent lithium.



Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au 
To donate, phone 1800 888 019 or visit www.neura.edu.au

*Fornaro M, Anastasia A, Novello S, Fusco A, Solmi M, Monaco F, Veronese N, De Berardis D, de Bartolomeis A*

## Incidence, prevalence and clinical correlates of antidepressant-emergent mania in bipolar depression: a systematic review and meta-analysis

**Bipolar Disorders 2018; 20: 195-227**

View review abstract online

| **Comparison 1** | **Rates of treatment-emergent mania in people with bipolar depression on antidepressants.** |
|---|---|
| **Summary of evidence** | **Moderate quality evidence (large samples, inconsistent, direct, unable to assess precision) suggests ~19% of people with bipolar depression taking antidepressants switch to mania. Rates are higher in people with a family history of affective disorders, previous suicide attempts, depression polarity of the index episode, lifetime psychotic features, and rapid-cycling course. Rates were lower in people taking concurrent lithium.** |
| **Relapse to depression** | |
| *Overall rates of treatment-emergent mania;*<br>51 studies, N = 10,098, overall mean rate = 18.8%, 95%CI 14.7% to 23.7%, $I^2$ = 95.5%<br>Subgroup analyses revealed rates were lower in people taking concurrent lithium than in people taking concurrent antipsychotics or anticonvulsants. Family history of affective disorders, previous suicide attempts, depression polarity of the index episode, lifetime psychotic features, and rapid-cycling course were all related to high rates of treatment-emergent mania. Cross-sectional and retrospective studies reported higher rates than prospective studies and RCTs.<br>There was no evidence of publication bias. | |
| **Consistency in results** | Inconsistent |
| **Precision in results** | Unable to assess; standardised CIs not reported. |
| **Directness of results** | Direct |

*Liu B, Zhang Y, Fang H, Liu J, Liu T, Li L*

## Efficacy and safety of long-term antidepressant treatment for bipolar disorders - A meta-analysis of randomized controlled trials

## All antidepressants

| **Journal of Affective Disorders 2017; 223: 41-8**<br>View review abstract online | |
|---|---|
| **Comparison 1** | **Long-term treatment (≥4 months) with antidepressants vs. placebo.** |
| **Summary of evidence** | **Moderate to high quality evidence (medium to large samples, consistent, precise, direct) suggests antidepressants, particularly second generation antidepressants, are a more effective long-term prophylactic treatment for relapse to depression than placebo, with no particular efficacy for relapse to mania.** |
| **Relapse to depression** | |
| *Small, significant effect of fewer relapses with antidepressants;*<br>10 RCTs, N = 637, RR = 0.64, 95%CI 0.49 to 0.83, $p = 0.0009$, $I^2 = 0\%$<br>Subgroup analyses revealed patients with bipolar II benefited more from long-term antidepressant treatment than patients with bipolar I. Second generation antidepressants resulted in greater reduction in new depressive episodes than first generation antidepressants. There were no differences according to funding source (pharmacy vs. non-pharmacy), treatment duration (≤6 m vs. >6 m), sample size, or sex ratio.<br>Authors report no evidence of publication bias. | |
| **Relapse to mania** | |
| *No significant differences between groups;*<br>10 RCTs, N = 602, RR = 1.21, 95%CI 0.82 to 1.80, $p < 0.05$, $I^2 = 0\%$<br>There were no differences according to type of bipolar, type of antidepressant, funding source (pharmacy vs. non-pharmacy), or treatment duration (≤6 m vs. >6 m). | |
| **Risks** | Not reported |
| **Consistency in results**[‡] | Consistent |
| **Precision in results**[§] | Precise for relapse to depression, but not relapse to mania. |
| **Directness of results**[‖] | Direct |
| **Comparison 2** | **Long-term treatment (≥4 months) with antidepressants + mood stabilisers vs. placebo + mood stabilisers** |
| **Summary of evidence** | **Moderate quality evidence (medium to large samples, unable to assess consistency, precise, direct) suggests antidepressants + mood stabilisers are a more effective long-term prophylactic treatment for relapse to depression than placebo + mood** |

| | |
|---|---|
| | **stabilisers, with no particular efficacy for relapse to mania.** |
| **Relapse to depression** | |
| *Small, significant effect of fewer relapses with antidepressant + mood stabilisers;* 7 RCTs, N = 532, RR = 0.70, 95%CI 0.50 to 0.97, $p = 0.03$, $I^2$ not reported | |
| **Relapse to mania** | |
| *No significant differences between groups;* 10 RCTs, N = 602, RR = 1.26, 95%CI 0.77 to 2.05, $p > 0.05$, $I^2$ not reported | |
| **Risks** | Not reported |
| **Consistency in results** | Unable to assess. |
| **Precision in results** | Precise for relapse to depression, imprecise for relapse to mania. |
| **Directness of results** | Direct |
| **Comparison 3** | **Long-term treatment (≥4 months) with antidepressants vs. mood stabilisers** |
| **Summary of evidence** | **Moderate to low quality evidence (medium-sized samples, consistent, imprecise, direct) suggests no differences in relapse rates to depression or mania between antidepressants and mood stabilisers. Antidepressants were more likely to cause manic/hypomanic episodes than mood stabilisers.** |
| **Relapse to depression** | |
| *No significant differences between groups;* 5 RCTs, N = 227, RR = 0.71, 95%CI 0.48 to 1.09, $p = 0.09$, $I^2 = 0\%$ | |
| **Relapse to mania** | |
| *No significant differences between groups;* 5 RCTs, N = 227, RR = 1.11, 95%CI 0.57 to 2.16, $p > 0.05$, $I^2$ not reported | |
| **Risks** | *Medium-sized effect of more manic/hypomanic episodes with antidepressants;* 4 RCTs, N = 172, RR = 2.35, 95%CI 1.42 to 3.91, $p = 0.001$, $I^2 = 0\%$ |
| **Consistency in results** | Consistent for depression, unable to assess mania. |
| **Precision in results** | Imprecise |



Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au
To donate, phone 1800 888 019 or visit www.neura.edu.au

| **Directness of results** | Direct |
|---|---|

## Explanation of acronyms

CI = Confidence Interval, $I^2$ = the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance), N = number of participants, *p* = statistical probability of obtaining that result ($p < 0.05$ generally regarded as significant), RCT = randomised controlled trial, RR = risk ratio, vs. = versus

## All antidepressants

### Explanation of technical terms

* Bias has the potential to affect reviews of both RCT and observational studies. Forms of bias include; reporting bias – selective reporting of results; publication bias - trials that are not formally published tend to show less effect than published trials, further if there are statistically significant differences between groups in a trial, these trial results tend to get published before those of trials without significant differences; language bias – only including English language reports; funding bias - source of funding for the primary research with selective reporting of results within primary studies; outcome variable selection bias; database bias - including reports from some databases and not others; citation bias - preferential citation of authors. Trials can also be subject to bias when evaluators are not blind to treatment condition and selection bias of participants if trial samples are small[5].

---

† Different effect measures are reported by different reviews.

Prevalence refers to how many existing cases there are at a particular point in time. Incidence refers to how many new cases there are per population in a specified time period. Incidence is usually reported as the number of new cases per 100,000 people per year. Alternatively some studies present the number of new cases that have accumulated over several years against a person-years denominator. This denominator is the sum of individual units of time that the persons in the population are at risk of becoming a case. It takes into account the size of the underlying population sample and its age structure over the duration of observation.

Reliability and validity refers to how accurate the instrument is. Sensitivity is the proportion of actual positives that are correctly identified (100% sensitivity = correct identification of all actual positives) and specificity is the proportion of negatives that are correctly identified (100% specificity = not identifying anyone as positive if they are truly not).

Mean difference scores refer to mean differences between treatment and comparison groups after treatment (or occasionally pre to post treatment) and in a randomised trial there is an assumption that both groups are comparable on this measure prior to treatment. Standardised mean differences are divided by the pooled standard deviation (or the standard deviation of one group when groups are homogenous) which allows results from different scales to be combined and compared. Each study's mean difference is then given a weighting depending on the size of the sample and the variability in the data. Less than 0.4 represents a small effect, around 0.5 a medium effect, and over 0.8 represents a large effect[5].

Odds ratio (OR) or relative risk (RR) refers to the probability of a reduction (< 1) or an increase (> 1) in a particular outcome in a treatment group, or a group exposed to a risk factor, relative to the comparison group. For example, a RR of 0.75 translates to a reduction in risk of an outcome of 25% relative to those not receiving the treatment or not exposed to the risk factor. Conversely, a RR of 1.25 translates to an increased risk of 25% relative to those not receiving treatment or not having been exposed to a risk factor. A RR or OR of 1.00 means there is no difference between groups. A medium effect is considered if RR > 2 or < 0.5 and a large effect if RR > 5 or < 0.2[6]. lnOR stands for logarithmic OR where a lnOR of 0 shows no difference between groups. Hazard ratios measure the effect of an explanatory variable on the hazard or risk of an event.



Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au



To donate, phone 1800 888 019 or visit www.neura.edu.au

Correlation coefficients (eg, r) indicate the strength of association or relationship between variables. They can provide an indirect indication of prediction, but do not confirm causality due to possible and often unforseen confounding variables. An r of 0.10 represents a weak association, 0.25 a medium association and 0.40 and over represents a strong association. Unstandardised (*b*) regression coefficients indicate the average change in the dependent variable associated with a 1 unit change in the independent variable, statistically controlling for the other independent variables. Standardised regression coefficients represent the change being in units of standard deviations to allow comparison across different scales.

---

‡ Inconsistency refers to differing estimates of effect across studies (i.e. heterogeneity or variability in results) that is not explained by subgroup analyses and therefore reduces confidence in the effect estimate. $I^2$ is the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance) - 0% to 40%: heterogeneity might not be important, 30% to 60%: may represent moderate heterogeneity, 50% to 90%: may represent considerable heterogeneity and over this is considerable heterogeneity. $I^2$ can be calculated from Q (chi-square) for the test of heterogeneity with the following formula[5];

$$I^2 = \left(\frac{Q - df}{Q}\right) \times 100\%$$

---

§ Imprecision refers to wide confidence intervals indicating a lack of confidence in the effect estimate. Based on GRADE recommendations, a result for continuous data (standardised mean differences, not weighted mean differences) is considered imprecise if the upper or lower confidence limit crosses an effect size of 0.5 in either direction, and for binary and correlation data, an effect size of 0.25. GRADE also recommends downgrading the evidence when sample size is smaller than 300 (for binary data) and 400 (for continuous data), although for some topics, these criteria should be relaxed[7].

---

‖ Indirectness of comparison occurs when a comparison of intervention A versus B is not available but A was compared with C and B was compared with C that allows indirect comparisons of the magnitude of effect of A versus B. Indirectness of population, comparator and/or outcome can also occur when the available evidence regarding a particular population, intervention, comparator, or outcome is not available and is therefore inferred from available evidence. These inferred treatment effect sizes are of lower quality than those gained from head-to-head comparisons of A and B.



Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au
To donate, phone 1800 888 019 or visit www.neura.edu.au

## References

1. Moher D, Liberati A, Tetzlaff J, Altman DG, PRISMAGroup (2009): Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *British Medical Journal* 151: 264-9.
2. GRADEWorkingGroup (2004): Grading quality of evidence and strength of recommendations. *British Medical Journal* 328: 1490.
3. Fornaro M, Anastasia A, Novello S, Fusco A, Solmi M, Monaco F*, et al.* (2018): Incidence, prevalence and clinical correlates of antidepressant-emergent mania in bipolar depression: a systematic review and meta-analysis. *Bipolar Disorders* 20: 195-227.
4. Liu B, Zhang Y, Fang H, Liu J, Liu T, Li L (2017): Efficacy and safety of long-term antidepressant treatment for bipolar disorders - A meta-analysis of randomized controlled trials. *Journal of Affective Disorders* 223: 41-8.
5. CochraneCollaboration (2008): Cochrane Handbook for Systematic Reviews of Interventions. Accessed 24/06/2011.
6. Rosenthal JA (1996): Qualitative Descriptors of Strength of Association and Effect Size. *Journal of Social Service Research* 21: 37-59.
7. GRADEpro (2008): [Computer program]. Jan Brozek, Andrew Oxman, Holger Schünemann. *Version 32 for Windows*.



Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au
To donate, phone 1800 888 019 or visit www.neura.edu.au