CRD summary
This review concluded there was good support for the pharmacological and psychotherapeutic treatment of attention deficit hyperactivity disorder in adults. It is likely that the review was affected by multiple sources of error and bias, which means that the conclusions should not be regarded as reliable.

Authors' objectives
To review the literature on pharmacological and psychotherapeutic treatment for adult attention deficit hyperactivity disorder (ADHD) with a particular emphasis on comorbidity.

Searching
The following databases were searched to January 2007 and search terms were not reported: PubMed, EMBASE, PsycINFO and the Cochrane Library. References from included studies were also searched for relevant papers.

Study selection
Randomised controlled trials (RCTs) were eligible if they compared treatment using a listed drug or any form of psychotherapy with a placebo or no intervention. Listed drugs were methylphenidate, dexamphetamine/amphetamine, atomoxetine, bupropion, or imipramine. The population was adults (over 18 years) diagnosed with ADHD according to recognised criteria (Diagnostic and Statistical Manual of mental disorders IV or International Classification of Diseases 10), although studies using older versions of these criteria were also included. The outcomes were required to be "clinically important" and could include ADHD symptoms, depression, anxiety, and quality of life. Trials which focused on variables such as driving performance and neurocognitive and neuroimaging effects were excluded.

The included RCTs were mostly of pharmacotherapy covering all of the listed drugs and three looked at psychotherapy, using forms of cognitive-behavioural therapy. The most frequently reported outcome measure was the clinician rated Clinical Global Impression (CGI) scale, while a variety of ADHD specific scales were also reported. Depression and anxiety scales were frequently used. The pharmacotherapy trials lasted between five days and 20 weeks and most were rated as having low levels of comorbidity. The psychotherapy trials lasted between eight and 15 weeks, with some reporting further follow-up after two or 12 months. All of these were rated as low for comorbidity. The population details were reported by drug type in the paper.

The authors did not state how the papers were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
The authors did not state how the data were extracted nor how many reviewers performed the data extraction.

Methods of synthesis
The trials were grouped according to intervention: methylphenidate, amphetamines, non-stimulants (including atomoxetine, bupropion, desipramine, and tomodetoxetin), and psychotherapy. The results were presented in narrative and table formats.

Results of the review
A total of 36 RCTs were included with 33 of pharmacotherapy and three of psychotherapy. Adverse effects were reported to be negligible in all trials.

Methylphenidate: Eighteen RCTs studied methylphenidate for adult ADHD (n=991 patients*, range 8 to 221). Seven
trials used a high dose and five found significant ADHD symptom relief in favour of methylphenidate. Ten trials used a medium-to-low dose and the results were evenly split with five finding positive effects and five finding no effect. One trial used several fixed doses and found a significant effect, with no significant dose-effect relationship. When looking at those four studies with a high level of current comorbidity, the results were mixed with some studies showing benefits for the comorbid conditions and others showing negative effects.

Amphetamines: Six RCTs (n=464, range 17 to 255) studied amphetamines (dexamphetamine or mixed amphetamine salts). All six trials reported significant benefits for ADHD symptoms over placebo. All trials were classed as low for comorbidity and none demonstrated any effect on the comorbid conditions.

Non-stimulants: Eight RCTs reported on the use of non-stimulants (n=888*, range 21 to 280). Four trials used bupropion with mixed results; two reported significant benefits, while another two found no difference compared with placebo. Three trials on atomoxetine/tomoxetine found positive effects on ADHD symptoms although one also reported a negative effect on depression scores. One trial on desipramine reported a large benefit compared with placebo.

Psychotherapy: Three RCTs of cognitive-behavioural therapy were included (n=109, range 31 to 43). Two trials looked at cognitive therapy alone compared with waiting-list control and found beneficial effects from the active treatment. One trial assessed medical treatment plus cognitive therapy versus medical treatment alone and found the combined treatment was more effective. This trial also reported a beneficial effect on comorbid conditions (anxiety and depression).

*there was a discrepancy between the patient numbers reported in the text and those in the tables, numbers as per the text have been reported here.

Authors' conclusions
There was good support for the pharmacological and psychotherapeutic treatment of ADHD in adults, but additional measures should be taken to address comorbidities and treatment adherence.

CRD commentary
This review addressed a clear question with reasonable inclusion criteria. The searches covered the major databases, but do not appear to have explored the grey literature, therefore publication bias may be present. No mention was made of any language restrictions, but all included papers appear to have been in English, the presence of language bias cannot be excluded. No validity assessment was reported, which makes it difficult to judge the quality of the primary studies. The authors did not report details of the study selection or data extraction procedures, the usual practice is to use two reviewers to minimise reviewer error and bias. The narrative synthesis was not clearly presented and some trials appear to have included concurrent psychotherapy, but this was not fully described. No justification was given for not exploring a quantitative synthesis.

Overall this review was vulnerable to multiple important sources of bias and error, therefore the conclusions should not be regarded as reliable.

Implications of the review for practice and research
Practice: The authors stated that clinicians have good support for pharmacological and psychotherapeutic treatment of ADHD in adults, but long term follow-up and measures to prevent discontinuation of treatment are required.

Research: The authors stated that future research should explore the impact of treatment on outcomes other than the core ADHD symptoms such as comorbid disorders, quality of life, and functional impairment. The impact of comorbidities and ADHD subgroups should be investigated as predictors of treatment outcome.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.