CRD summary
This review found no evidence that pharmacological interventions prevented cognitive decline, but that cognitive training exercises may be beneficial. There were numerous problems with the reporting of the review and the trials were limited in number and of moderate quality. The results cannot be considered reliable, but the author’s conclusions reasonably reflect this and are broadly appropriate.

Authors' objectives
To assess the effectiveness of both pharmacological and non-pharmacological methods for the prevention of cognitive decline in healthy, older adults.

Searching
MEDLINE, EMBASE, CINAHL, and Cochrane Central Register of Controlled Trials (CENTRAL) were searched for publications in English from inception to October 2011. Search terms were presented.

Study selection
Randomised controlled trials (RCTs) that investigated either pharmacological or non-pharmacological methods for preventing cognitive decline were eligible. Participants had to be aged 65 or over with normal cognition or mild cognitive impairment. Any form of cognitive decline was eligible, including mild cognitive impairment, dementia or worsening cognitive function.

Most of the included trials evaluated pharmacological interventions including dementia medications (donepezil and memantine), hormonal therapies (such as oestrogen and testosterone), gingko, vitamins, and fatty acids. A small number of trials evaluated cognitive training and physical exercise.

It was not stated how many reviewers selected studies for inclusion.

Assessment of study quality
Trial quality was assessed using the Cochrane risk of bias criteria developed by the Effective Practice and Organisation of Care group. These criteria assessed randomisation, blinding, similarity of baseline outcomes, contamination and selective reporting.

It was not stated how many reviewers performed the quality assessment.

Data extraction
Trials were categorised according to the type of intervention used and their results on effectiveness extracted, as reported in the publications (typically as p-values).

It was not stated how many reviewers performed the data extraction.

Methods of synthesis
No formal meta-analysis was reported. Results from individual trials were reported, categorised according to the type of intervention used.

Results of the review
There were 65 studies in the review. Thirty-two trials included participants with normal cognition, 22 included participants with mild cognitive impairment, and 11 included both types of participant. The overall quality of the trials was judged to be moderate; most trials had limitations in methodology or analysis.

Three trials (89 participants) investigated donepezil or memantine. One trial found an improvement only in semantic recall when using donepezil. The other trials found no evidence of a benefit.
Oestrogen was used in seven trials (10,792 women). Three of these trials found a relative decline in cognitive function and an increase in dementia with oestrogen (hazard ratio 1.8, 95% confidence interval: 1.2 to 2.6). Testosterone was used in three trials (144 men), with conflicting results. Dehydroepiandrosterone hormonal therapy was used in three trials (317 participants), with no evidence of any effect.

Gingko was used in two trials (348 participants), with no evidence of any effect.

Vitamins and fatty acids (6,779 participants) also were found not to have any effect.

Three trials (244 participants, table 1) investigated physical exercise. Results were inconclusive, with statistically significant benefits for some aspects of cognitive function, but not for others.

Cognitive training was used in three trials (3,321 participants), with some evidence that it may be beneficial.

**Authors’ conclusions**

There was no consistent evidence that pharmacological interventions prevented cognitive decline; oestrogen use may have led to a decline in memory. Formal cognitive training may have a benefit in preventing cognitive decline.

**CRD commentary**

This review addressed an appropriate clinical question, with broad inclusion criteria. The search was broadly appropriate, but was limited to publications in English and unpublished material did not appear to have been sought, so relevant trials may have been missed. The review was generally not well reported, so it was unclear whether any action was taken to reduce reviewer error or bias.

No meta-analysis was conducted and only broad summary results for the trials were presented; this risked the over-interpretation of statistically significant findings in individual trials. There were generally few trials or participants for any specific type of intervention. The trials were found to be of moderate quality; the authors noted many problems in this area, including selective reporting, short follow-up times and a lack of certainty around the clinical significance of many results.

For all these reasons, the results of this review cannot be considered to be reliable. However, the authors’ conclusions recognise this and are generally appropriate.

**Implications of the review for practice and research**

**Practice:** The authors recommended that physical exercise should be encouraged for all patients.

**Research:** The authors suggested that further studies should investigate the benefits of cognitive training, particularly using easily accessible methods such as sudoku or crossword puzzles.

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