



# HerbClip™

Laura Bystrom, PhD  
Amy Keller, PhD

Mariann Garner-Wizard  
Heather S Oliff, PhD

Shari Henson  
Risa Schulman, PhD

*Executive Editor* – Mark Blumenthal

*Managing Editor* – Lori Glenn

*Consulting Editors* – Dennis Awang, PhD, Thomas Brendler, Francis Brinker, ND, Allison McCutcheon, PhD, Risa Schulman, PhD

*Assistant Editor* – Tamarind Reaves

AMERICAN  
BOTANICAL  
COUNCIL

**File: ■ Ginkgo (*Ginkgo biloba*)**  
**■ Cognition**  
**■ Meta-analysis**

**HC 111256-464**

**Date: January 15, 2013**

**RE: Meta-analysis Determines Clinical Trials of Ginkgo Extract in Healthy Adults Show Little Effect for Cognitive Enhancement**

Laws KR, Sweetnam H, Kondel TK. Is *Ginkgo biloba* a cognitive enhancer in healthy individuals? A meta-analysis. *Hum Psychopharmacol*. 2012;27(6):527-533.

Ginkgo (*Ginkgo biloba*) leaf standardized extract is used to improve memory and learning. Meta-analyses evaluating ginkgo in people with Alzheimer's disease or schizophrenia have been published. According to the authors, there are no meta-analyses in healthy individuals; only qualitative reviews with varying conclusions. [Note: However, a systematic review of 16 clinical trials in normal, healthy adults taking ginkgo extract was published in the American Botanical Council's peer-reviewed journal, *HerbalGram*, in 2005 and 13 of these trials showed positive conclusions for memory enhancement, speed of processing abilities, time for mental functions, etc.<sup>1</sup>] Hence, the purpose of this study was to conduct a meta-analysis of the cognitive-enhancing properties of ginkgo in healthy individuals.

Scopus, Medline, and Google Scholar were searched from inception through March 2012 with the keywords *Ginkgo biloba*, cogniti\*, and neuropsych\*. Included studies measured memory, executive function, or attention in humans; had a double-blind, randomized, controlled design; explained the dosing regimen and testing structure; and presented appropriate data to derive effect scores. Only chronic effects were included in the meta-analysis. The extract/formulation of the ginkgo used in each study was recorded but was not a defining criterion.

Data from the included clinical trials were subjected to various statistical computations and a meta-analysis was conducted on the extracted data.

A total of 1121 studies that met the search criteria were identified, and 10 clinical trials containing 13 datasets were used in the analysis. In the analysis of memory, executive function, and attention, the weighted mean effect size was close to 0, and the differences between the ginkgo and control groups were not significant. There was no evidence of publication bias. Effect size was not significantly related to age, time period of the trial, daily dose, total dose over the course of the trial, total sample size, or ginkgo formulation. Two of the most clinically tested brands of ginkgo extract were used in most

of the studies: EGb 761® (Dr. Willmar Schwabe GmbH & Co. KG; Karlsruhe, Germany) and LI 1370 (Lichtwer Pharma AG; Berlin, Germany).

The authors conclude that ginkgo has no significant impact on memory, executive function, or attention in healthy subjects. The authors point out that meta-analyses increase the power to detect small differences, even when the individual study sample sizes are small or if they contain nonsignificant findings. Studies with a small sample size may be underpowered to detect statistical differences, and nonsignificant findings may result. Combining all of the data into a meta-analysis is like having a huge study that is adequately powered to detect small or large statistical differences between treatments. If a meta-analysis were conducted properly (i.e., the combined data need to be from studies of a similar design), then the conclusions would be considered authoritative. This study was statistically robust; however, the authors combined data from 4 different ginkgo formulations, 4 different doses, and 6 different treatment durations, so the conclusions are not authoritative. Unfortunately, there are not enough studies that have a similar design to do an authoritative meta-analysis.

—Heather S. Oliff, PhD

#### **Reference**

<sup>1</sup>Crews WD Jr, Harrison DW, Griffin ML, et al. The neuropsychological efficacy of ginkgo preparations in healthy and cognitively intact adults: A comprehensive review. *HerbalGram*. 2005;(67):43-62.

The American Botanical Council has chosen not to reprint the original article.

---

The American Botanical Council provides this review as an educational service. By providing this service, ABC does not warrant that the data is accurate and correct, nor does distribution of the article constitute any endorsement of the information contained or of the views of the authors.

ABC does not authorize the copying or use of the original articles. Reproduction of the reviews is allowed on a limited basis for students, colleagues, employees and/or members. Other uses and distribution require prior approval from ABC.