

## Research Literature Review Paper Outline

- I. Introduction to the State of the Science Paper
  - a. Purpose of the Review
    - i. To examine current research available on ginkgo biloba used in the healthcare setting
    - ii. To examine the benefits and hindrances of using ginkgo biloba to treat dementia
    - iii. Know and understand current treatment modalities for dementia/Alzheimer's Disease
    - iv. Compare results to use of traditional pharmacological methods
    - v. Understand costs of dementia to U.S.
    - vi. Understand costs and availability of ginkgo biloba
    - vii. Compare cost of pharmacological meds and ginkgo biloba
- II. How the Search was Conducted
  - a. Key words used to search
    - i. Ginkgo biloba
    - ii. Dementia and Alzheimer's
    - iii. Alternative treatments and dementia
    - iv. Ginkgo biloba and dementia
    - v. Cost of dementia
  - b. Inclusion and exclusion criteria
    - i. Pertaining to nursing practice
    - ii. Research articles within the last 5 years
    - iii. No studies done on animals
- III. Results of the Literature Review
  - a. Pharmacological methods
    - i. Cholinesterase Inhibitors
      1. donepezil, galantamine, and rivastigmine

- a. All used for mild to moderate AD with donepezil being the most popular
- b. can cause N/V/D/A, and CNS effects such as insomnia, confusion, agitation and headache
- ii. N-methyl-D-aspartate (NMDA) receptor antagonists
  1. memantine
    - a. used for advanced stages of AD
    - b. can cause diarrhea, insomnia, dizziness, headache and hallucinations
- b. Benefits of using Ginkgo biloba extract
  - i. anti-apoptosis
  - ii. anti-inflammatory effects
  - iii. neuroprotection
  - iv. anxiolytic
  - v. MAO-inhibitory effects
  - vi. ROS scavenging
  - vii. antioxidant effects
  - viii. protective effects on mitochondria
  - ix. increase microcirculatory blood flow
- c. Dosages for Ginkgo biloba
  - i. 120 mg/day – this reflects the OTC availability
  - ii. 160 mg/day
  - iii. 240 mg/day
    1. this showed the most improvement which may indicate that even higher doses should be studied to accurately assess dose-effectiveness
- d. Ginkgo side effects – moderate concentrations seem to be well tolerated
  - i. increase risk of bleeding if used with antiplatelet or anticoagulants
  - ii. apathy/indifference

- iii. anxiety – should be studied more, because Ginkgo b. has anxiolytic effects
  - iv. irritability; depression
  - v. sleep disturbances
  - vi. seizures – contains a seizure inducing chemical and should be avoided in susceptible patients
  - vii. dizziness, headache
  - viii. dry mouth
  - ix. transient cyanosis of nails and lips and allergic skin reactions in rare cases
- e. Cost of Dementia
- i. The incidence of dementia is steadily rising in developed countries
  - ii. Alzheimer’s dementia, alone, costs over \$100 billion annually
    - 1. Third most expensive pathology
  - iii. With aging population, costs may more than double by 2040 if prevalences and per-person costs remain the same.

#### IV. Conclusion

- a. Recommendations for further research
- b. What was done well
  - i. Methods for studies are well documented
  - ii. Thorough documentation of all the information that the studies yielded
  - iii. Unwanted effects are listed for not only Ginkgo b. but the “conventional” treatments, too
- c. What needs to be improved
  - i. Need to be observed longer – longest observation was for 2 years with 6 month check-ins
  - ii. Need to try different/higher doses to identify the benefits and risks
  - iii. Need larger sample sizes
  - iv. Inclusion and exclusion criteria allowed for not needed participants, such as the ones without a diagnosis of dementia
  - v. There are possibilities that there was underreporting during the studies

1. hospitalizations or participants not sticking to dose regimen
  2. Side effects associated with co-morbidity or another pharmacological medicine
- vi. Need further study on drug interactions that occur with Ginkgo b. besides antiplatelets and anticoagulants
- vii. Need further research on the cost and availability of Ginkgo biloba