# Protocol Physical Exercise Cognitive Reserve Systematic Review

# Protocol: Physical Activity Modalities and Cognitive Reserve in Aging - Network Meta-Analysis  
  
## PROSPERO Registration  
PROSPERO Registration Number: [To be assigned upon submission]  
  
## Research Question  
Which type of physical activity (aerobic, resistance, mind-body like yoga/tai chi) most effectively enhances cognitive reserve and delays dementia onset in adults over 60?  
  
## Objectives  
1. To conduct a systematic review and network meta-analysis comparing the effectiveness of different physical activity modalities on cognitive reserve in adults aged ≥60 years  
2. To rank the effectiveness of aerobic exercise, resistance training, and mind-body exercises (yoga, tai chi) for cognitive reserve enhancement and dementia prevention  
3. To assess the relative effectiveness of these interventions using indirect comparisons where direct head-to-head trials are limited  
  
## Background  
Cognitive reserve refers to the brain's resilience to neuropathological damage and the effectiveness of compensatory mechanisms. Physical activity has been associated with cognitive benefits in aging populations, but different exercise modalities may have varying effects on cognitive reserve. While individual studies have examined specific exercise types, there is no comprehensive synthesis comparing all three major modalities. Network meta-analysis will allow ranking of these interventions and indirect comparisons.  
  
## Methods  
  
### Inclusion Criteria  
1. \*\*Population\*\*: Adults aged ≥60 years, community-dwelling, without diagnosed dementia at baseline  
2. \*\*Interventions\*\*: Aerobic exercise, resistance training, mind-body exercises (yoga, tai chi), or combinations thereof  
3. \*\*Controls\*\*: Sedentary control groups, usual care, or active control groups  
4. \*\*Outcomes\*\*: Measures of cognitive reserve (composite cognitive scores, executive function, global cognition) or dementia prevention (incidence of dementia, cognitive decline)  
5. \*\*Study Design\*\*: Randomized controlled trials (RCTs), cluster RCTs...