

Exercise and Lifelong Brain Health

Introduction ①

Understanding Cognitive Decline and Dementia ②

The Role of Exercise for Brain Health ③

Exercise Programming for Brain Health ④

Final Quiz

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Introduction

Course Objectives

Upon completion of this course, participants will be able to:

- Describe the basic pathophysiology, epidemiology, risk factors, stages of cognitive decline, and signs of Alzheimer's disease and other forms of dementia,
- Convey the role of physical activity and cardiorespiratory fitness to preserve brain health, and
- Implement exercise strategies to enhance brain health and reduce the risk of dementia.

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Understanding Cognitive Decline and Dementia

Stages of Alzheimer's Disease

Mild (early-stage)

Moderate (middle-stage)

Severe (late-stage)

Cerebral Cortex

Hippocampus

Severe Cortical Atrophy

Severely Enlarged Ventricles

Severe Shrinkage of Hippocampus

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The Role of Exercise for Brain Health

How Does Exercise Improve Cognition?

Vascular

- Increased cerebral perfusion
- Reduced risk of CVD

Neuronal

- Increased neuroplasticity, neurogenesis, synaptogenesis

Molecular

- Increased molecular growth factors

Structural

- Increased gray matter and brain volume

Psychological

- Decreased depression
- Stress management
- Social engagement

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Exercise Programming for Brain Health

Cognitive Cone Drill – Playing Cards

Number Cards

Face Cards

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Exercise Programming for Brain Health

Open Versus Closed Activities

Open skill activities are performed in a dynamic, changing, and unpredictable environment that requires active decision making and ongoing adaptability in which participants must alter responses to randomly occurring external stimuli. Open skill activities are predominantly perceptual and externally paced.

Closed skill activities take place in a relatively stable, predictable, and static environment in which movements follow set patterns. Closed skill activities tend to follow a self-determined pace, involve lower cognitive demands, and require less decision-making.

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