Maintaining the Edge: Exercise Enhances Mind and Body

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Presentation at Faculty/Staff Fitness and Wellness Lunch
Effects of Aerobic Exercise on Health: American College of Sports Medicine

• Aerobic exercise increases exercise capacity, endurance & skeletal muscle strength
• Prevents development of coronary artery disease and reduces symptoms in patients with the disease
• Exercise reduces risk of: Type 2 Diabetes, osteoporosis, obesity, depression and cancer of the breast and colon.
Cognitive Performance vs Age
Terminal drop: Increased cognitive decline in proximity to death
Cognitive Performance vs Age
What cognitive functions decline the most with aging?

• Working memory- current content of consciousness; ability to manipulate information in memory

• Executive functions- control attention
Working memory:

Repeat back (sub-vocally to yourself) in reverse order
037
Repeat back (sub-vocally to yourself) in reverse order
Backwards digit span

• Component of most tests of intelligence and normal aging
• Retention and manipulation considered critical component of cognition
What cognitive functions decline the most with aging?

• Working memory- current content of consciousness; ability to manipulate information in memory

• Executive functions- control attention
The Simon Task
When you see **BLUE**, use your **LEFT** hand to tap table

When you see **RED**, use your **RIGHT** hand to tap table
Effect size = strength of effect of variables across 18 different intervention studies with adults age 55-71+. Effect for executive function tasks significantly greater than for other tasks.

Exercise is aerobic; Control is stretching/toning.
VO2 Max and Cognition

• VO2 max is “gold standard” measure of cardiorespiratory fitness (VO2max = maximum oxygen consumption during exercise)
• Predicts cognitive function.
Horizontal axis= age
50-90
Functions:
Solid=21 VO2max
Broken=29 VO2 max
Dashed=37 VO2 max

1,400 research participants
Exercise and Abnormal Aging

• Significant positive effects of aerobic exercise on cognitive functioning also found for people in early stages of Alzheimer’s disease
• AD associated with shrinking of hippocampus
• Non-human animals show increased cell proliferation and survival in hippocampus with exercise
Erickson et al. 2011

Blue- aerobic
Red-stretching
Increase in fitness associated with increase in hippocampal volume

Erickson et al 2009
Consider financial implications:

- In 2006, adults 65 years and older = about 13% of the population
- Consumed 36% of personal health care

Consider Human implications

- No pharmacological intervention delays or prevents Alzheimer’s disease at present time
- No pharmacological intervention delays or prevents age-related memory decline
- Evidence suggests exercise delays both
Brain Oxygen-Boosting Miracle Energizes Mind, Mood and Memory

New pill sharpens focus, clears away brain fog, erases 15 years of lost memory power!
Brain Scan Before

Brain Scan After

Memory pill ingredient “…lights up aging brains like a Christmas tree! 100% Energizing!”