The Benefits of Exercise

- Increased synapses
- Enhanced cognition
- Increased blood flow
- Enhanced neurogenesis
- Increased growth factors
- Changed genetic patterns
- Reduced grey matter loss

Strengthening synapses:

- Physical activity = increased neural cell production
- Mental activity = increased synaptic activity
- Aerobic Exercise = continued reinforcement and strength of synaptic connections.
- Same molecular mechanism believed to underlie long-term memory formation.

Improved concentration and attention:

- Brain imaging studies: highly-fit older adults have faster reaction times than their less-fit counterparts.
- Exercisers better able to focus on relevant information and ignore irrelevant cues, indicating better attention.


Attenuated Grey Matter Loss

- Highly fit people: less decrease in cortical gray matter than is normally seen with aging, which may suggest a protective effect of exercise against nerve cell death.
- Most pronounced in areas involved in executive cognition that typically decline most with aging.


Changing gene patterns:

- Exercise: changes in the expression patterns of a wide array of genes, with some becoming more active and some showing less activity.
- Genes (i.e. VGF) that become more active usually ones that aid structure and adaptability of synapses, suggesting a direct role for exercise in synapse density.

Increased Brain-derived Neurotrophic Factors (BDNF)

- Growth factors (neurotrophins) play vital roles in nourishing and supporting nerve cells.
- BDNF (for brain-derived neurotrophic factor) is a protein that builds and maintains the brain's cell circuitry & increases significantly during voluntary exercise.


Exercise promotes neurogenesis:

- Neurogenesis = production of new nerve cells
- Significant increases occur in the hippocampus (the area of the brain involved in short term memory).


Exercise Enhances brain blood flow:

- Exercise = increased density & size of brain capillaries for increased O2
- Supports survival of new neurons & facilitates faster “firing” by neurons.
- Increases neurotransmitters i.e. serotonin
- Mood elevation


Exercise Benefit: Pain Management?

Continuous exercise contributes to the brain's release of endorphins. Endorphins reduce the intensity of pain sensed by the brain.

Just Remember!: Mental Activity

- Stimulating mental activity = reading a book, listening to a lecture, playing a board game, anything that promotes mental stimulation.
- New complex ideas

FOCUS

Change your physical routine to keep challenging your brain!
Just Remember!: Physical Activity

- Being physically active is just as important as mental activity
- Changes chemicals in the brain that repair and protect it
- 4-5 x week 30-45 minutes a day good for heart and mind

WHICH ONE IS YOUR BRAIN?

QUESTION & ANSWERS