



PRESENTS...

## The Aging Brain

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Section I

## **AGING IN THE BRAIN**



# True or False?

Irreversible cognitive and mental decline are unavoidable consequences of aging that *cannot* be altered.

**MYTH**

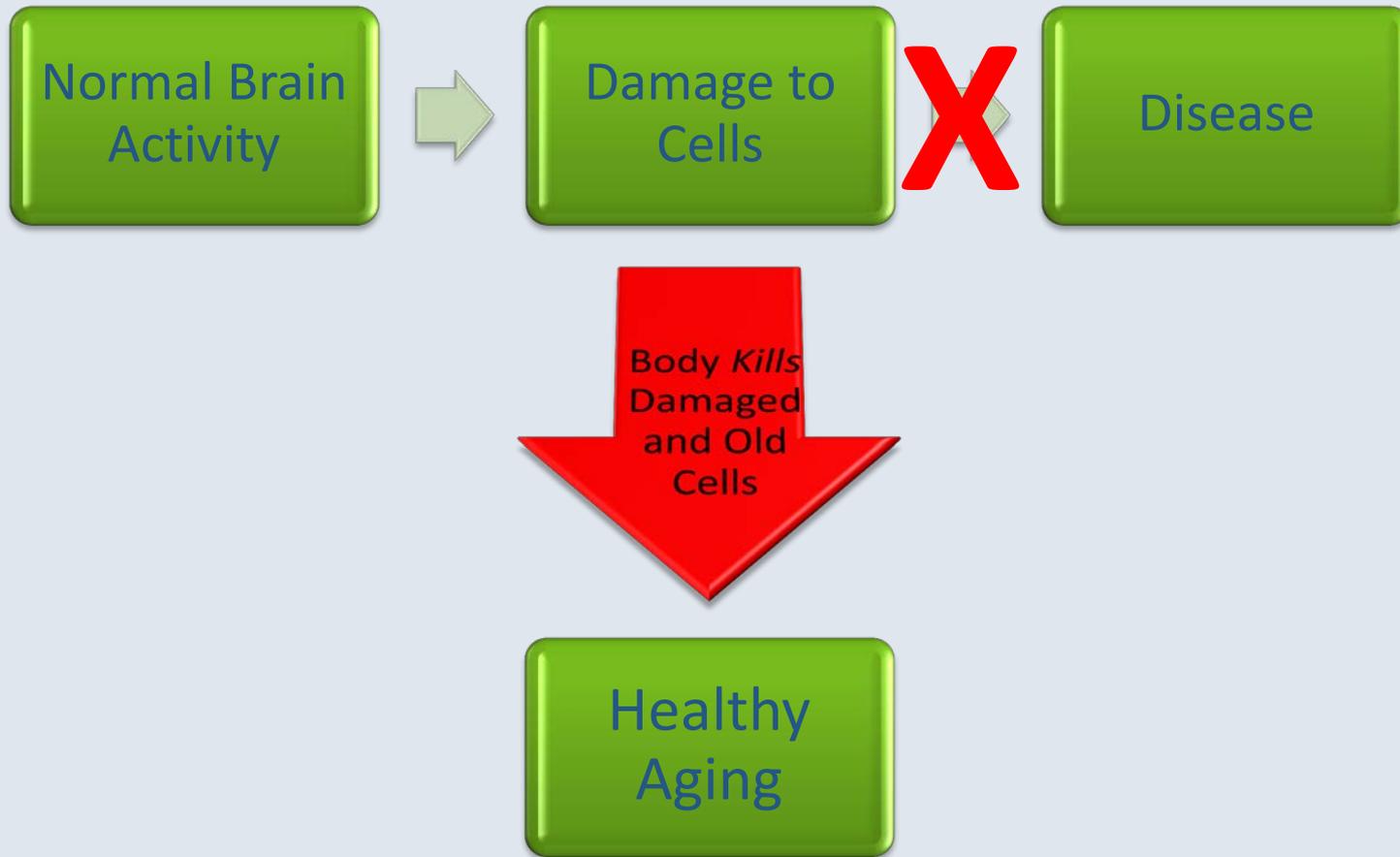
- The latest research shows that in healthy aging brains, new synapses form and nerve cells regenerate

Alzheimer's Association: 25 years of supporting science and shaping the Alzheimer Research Agenda. *Alzheimers Dement* 2005;1.

# Healthy Brain Aging

- Medicine tends to focus on diseases *of* aging; yet aging is not a disease!
- Many perfectly normal brain changes occur as we age:
  - Structural: loss of brain plasticity, thinning cortex
  - Hormonal: decreased production of dopamine and serotonin (both related to learning and memory)

# Why the Brain Ages



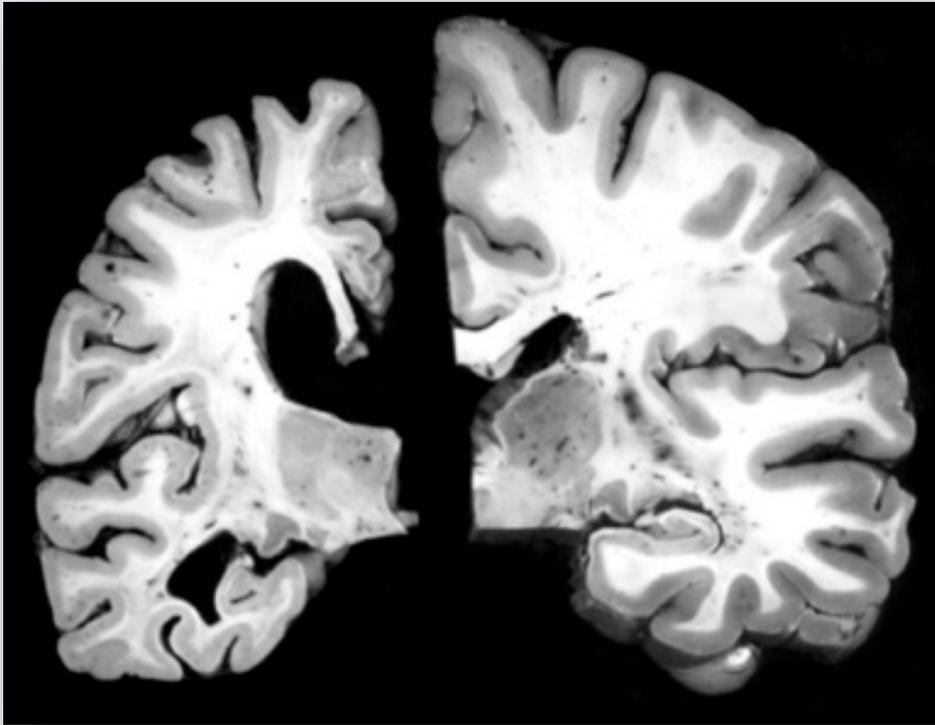
# How Cells are Damaged

- Free radicals (i.e. from diet, pollution, etc.) cause oxidative damage (why we need *antioxidants!*)
  - Causes wrinkled skin, stiff joints, hardening arteries, deteriorating vision, many forms of cancer, etc.





# Diseased vs. Healthy Brain



70 year old diseased brain on left; 70 year old healthy brain on right.



# Preventing Cognitive Decline

- Mounting evidence that cognitive decline can be slowed by controlling the major risk factors
- The “Healthy Brain Initiative” Identifies:
  1. Preventing and treating vascular disease
  2. Curbing physical inactivity



# Healthy Heart, Healthy Brain

- When blood flow to the brain is impeded, brain function begins to deteriorate
  - Can occur in an instant: stroke
  - Or can occur gradually over time: hypertension, diabetes, atherosclerosis

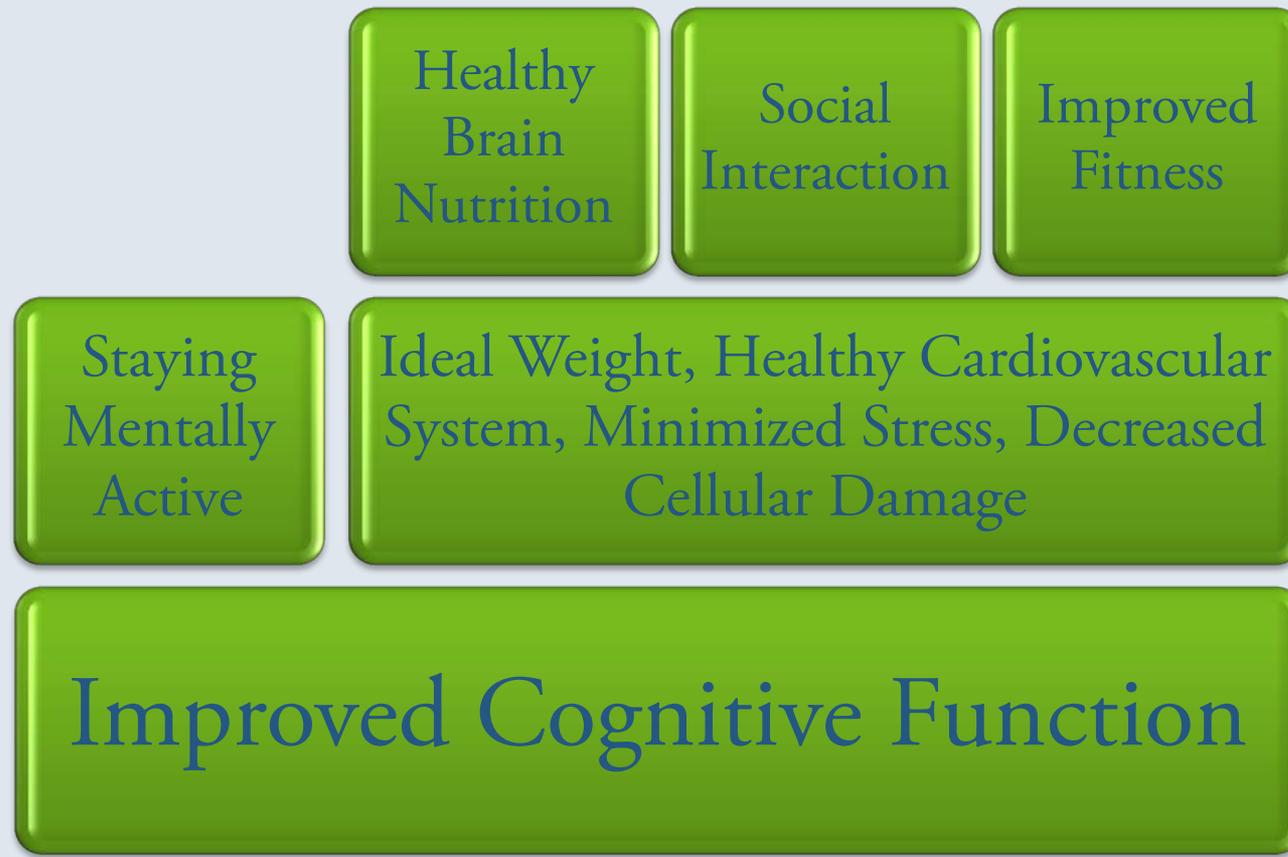
# Preserving Brain Health

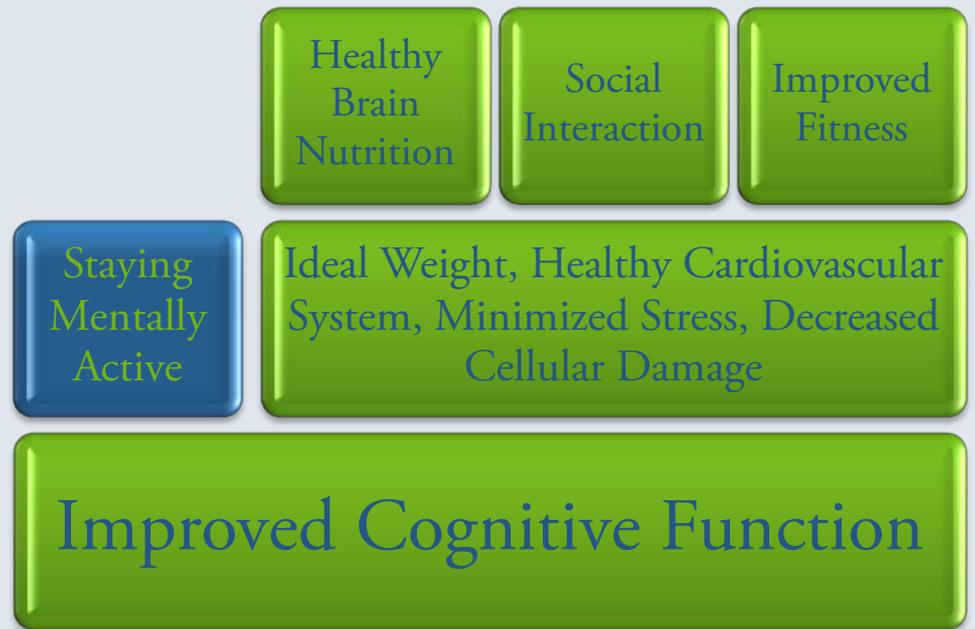
1. Controlling: blood pressure, diabetes, cholesterol, and weight
2. Quitting smoking
3. Reducing stress levels
4. Becoming more physically active

Albert MS, Brown DR, Buchner D, et al. The healthy brain and our aging population: translating science to public health practice. *Alzheimers Dement* 2007;3(suppl 1):S3-S5.



# Integrative Approach to Brain Health





## Section II

# STAYING MENTALLY ACTIVE



## Use it or Lose it!

- Just like a muscle, the brain must be exercised in order to stay strong
  - Challenging your brain and learning new information keeps the brain active
  - Forms new connections in the brain, and may even form new nerve cells, according to new research

# Challenge your Brain!

- The bairn is cpaalbe of amanizg thigns, and loevs a cahllegne!
  - Isn't it amazing the brain can comprehend completely jumbled words?
- Great ways to exercise your brain:
  - Crossword, Sudoku, and Word Jumble puzzles
  - Play Chess, Checkers, and Scrabble
  - Throw away your calculator! Do simple math problems in your head.
  - Avoid monotonous tasks: take different routes to familiar places

# Solve Brain Teasers!

<b>YELLOW</b>	<b>BLUE</b>	<b>ORANGE</b>
<b>BLACK</b>	<b>RED</b>	<b>GREEN</b>
<b>PURPLE</b>	<b>YELLOW</b>	<b>RED</b>
<b>ORANGE</b>	<b>GREEN</b>	<b>BLACK</b>
<b>BLUE</b>	<b>RED</b>	<b>PURPLE</b>
<b>GREEN</b>	<b>BLUE</b>	<b>ORANGE</b>

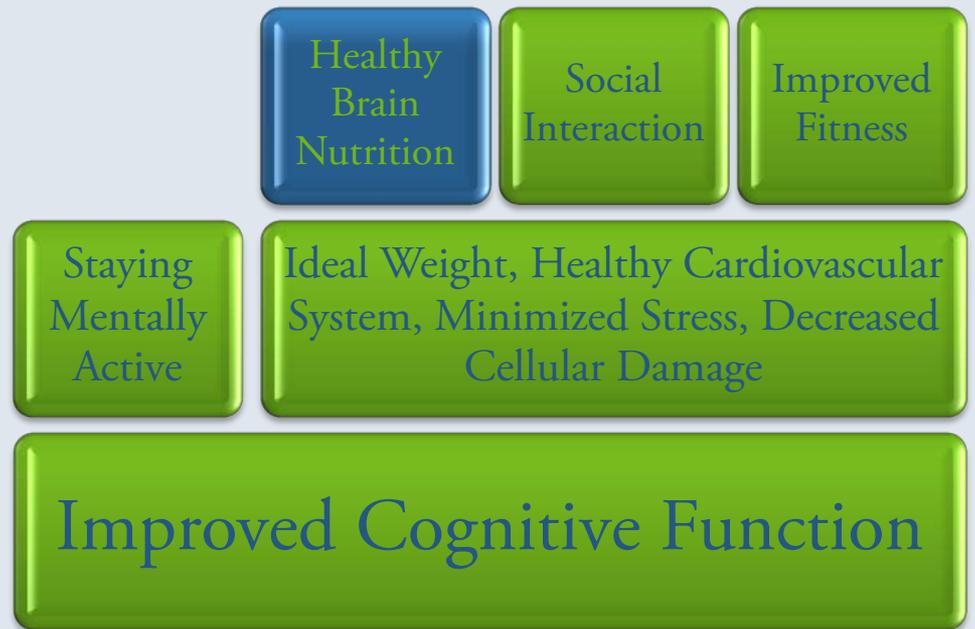
As quickly as you can, say aloud the color of each word!





# Learn Something New Everyday!

- Higher levels of education are correlated with the lowest levels of dementia
  - Learning something new forms stronger brain cell connections
  - Read often, study a new language, learn or play an instrument



## Section III

# HEALTHY BRAIN NUTRITION



# Brain Foods

- Increase Healthy Fats
  - Mono- and Poly-unsaturated fats protect brain cells from damage
- Decrease Unhealthy Fats
  - Saturated and *trans*-fats damage brain cells, increase `bad` cholesterol and increase risk of developing heart disease, stroke, Alzheimer`s and other forms of dementia



## Omega-3 Fatty Acids

- Greatly reduce cardiovascular risk and normalize cholesterol levels, both risk factors for cognitive decline
- Found mainly in fish, but also walnuts and sesame/sunflower seeds
  - Aim for 2-4 servings of fish/week
  - Highly recommend 2000 mg of fish oil/day

# Brain Foods

- Antioxidants
  - Protect brain cells from oxidative damage
  - High in Vitamins A, C, E, B12 and Minerals Zinc and Selenium
  - Reduce risk of heart disease, stroke, diabetes and many other diseases





# Foods High in Antioxidants

## Fruits & Vegetables

- Brightly coloured fruits and vegetables have the highest levels of naturally occurring antioxidant levels.
- Vegetables
  - Kale, spinach, Brussels sprouts, alfalfa sprouts, broccoli, beets, red bell pepper, onion, sweet potatoes and garlic.
- Fruits
  - Plums, blueberries, blackberries, strawberries, raspberries, plums, oranges, red grapes, pomegranates and cherries.

## Fish

- Cold water fish are high in omega-3 fatty acids
- Choose salmon, trout, halibut, white fish, tilapia

## Nuts, Seeds & Legumes

- High in Vitamin E and other antioxidants
- Choose: Quinoa, almonds, walnuts, pecans, sesame seeds, sunflower seeds, flax seeds, pumpkin seeds, lentils, brazil nuts

# Whole Foods Eating

- **Nutritious:** contains all daily requirements for vitamins and minerals without causing **inflammation**
- **Highly Antioxidant:** protects your cells by neutralizing oxidative damage
- **Low Glycemic Load:** no spikes in blood sugar → prevents diabetes and stabilizes energy levels
- **Protects cardiovascular system**
  - Lowers cholesterol
  - Lowers blood pressure
  - Promotes healthy weight





## Vitamin B12

- A toxic substance called homocysteine forms in the body as part of normal metabolism, and must be neutralized by Vitamin's B12, B6, and B9
- High levels of homocysteine causes vascular damage in the brain
- B12 deficiency causes the brain to literally shrink!
- B12 is found in meat products
  - Also consider sublingual and injectable B12

# Medicinal Herbs

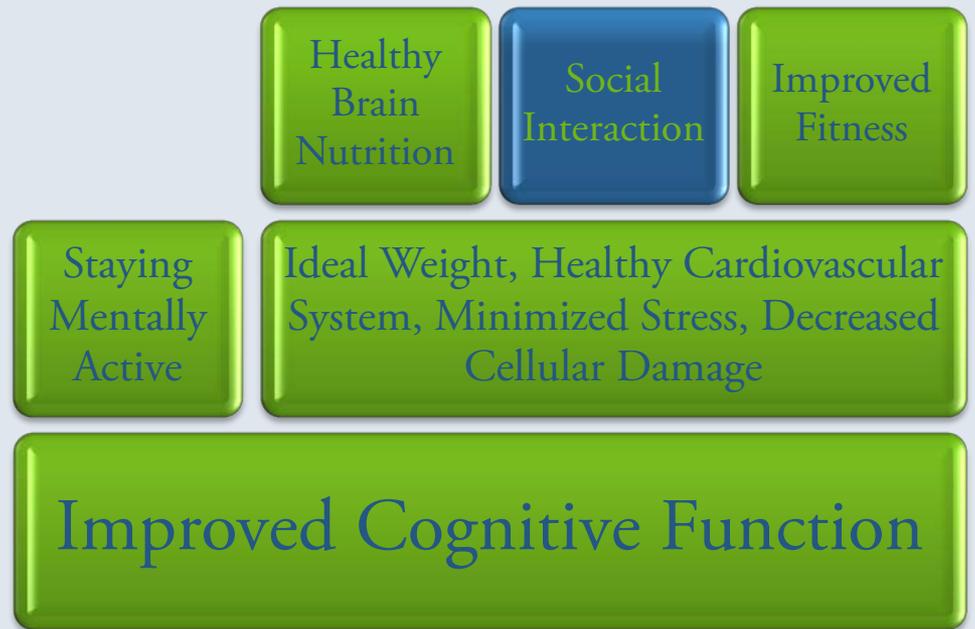
- What herb do you think of when it comes to memory?
  - Ginkgo!
  - Traditionally used as a memory aid, and has since demonstrated an ability to increase blood flow to the brain
  - However, in clinical trials, it is only shown effective in delaying progression of Alzheimer's patients, and not improving memory in healthy adults



# Medicinal Herbs Continued

- Bacopa: preliminary studies show an improvement in cognition, especially in mentally fatigued individuals
- Green Tea: building evidence that it may improve mental performance
- Rosemary: increases blood flow to the brain, and may improve learning and memory (lacking specific clinical trials)





Section IV

## SOCIAL INTERACTION



## Social Activity maintains Brain Health

- Study of 800 men and women over 75 found that there was a significant decrease in dementia with social engagement
- Those who added physical and mental activities had an even lower risk of developing dementia

# Social Interactions Reduce Cognitive Decline

The following have been shown to reduce dementia and improve cognitive function

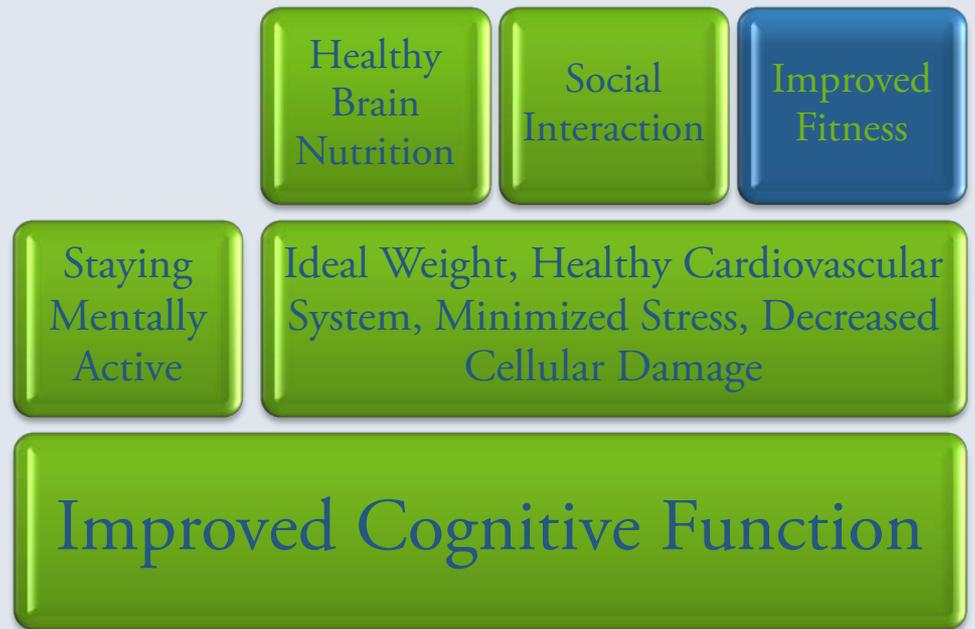
- Sports and Clubs
- Cultural Activities
- Emotional Support Systems
- Close Personal Relationships





# Adding Social Experiences

- Volunteer for local organizations and committees
- Be an active member in your community
- Join clubs and sports teams
  - Bridge, Dancing, Golf tournaments, Shuffleboard, Gardening, Walking
- Travel



Section V

## IMPROVED FITNESS



**What is the single most important thing you can do for your brain health?**

**EXERCISE!**



## Cardiovascular Fitness = Brain Fitness

Multiple studies show that regular aerobic exercise

- Increases blood flow to brain bringing more oxygen and improving cell health
- Increases brain volume (i.e. increases new brain cell formation)
- Improves brain plasticity (improves learning)
- Improves academic performance
- Decreases risk of stroke, heart attack, type II diabetes and many other diseases associated with cognitive decline

# How Much Exercise?

- Complicated and individualized
  - Depends on age, pre-existing health conditions, and fitness level
- In general, more is better, consistently (i.e. every day) to a frequency and intensity that does not cause extreme fatigue or injury
  - Could I be more vague?





## Exercise Duration

- Most experts agree that the best ‘*return on investment*’ is on the first **30 minutes** of low-impact exercise/day
  - i.e. walking
  - Additional exercise is still highly valuable, but the rate of health benefit falls off after 30 minutes
  - So simple, yet less than 15% of Canadians do it, according to Statistics Canada!

# The Real Question...

“Can you limit your sitting and sleeping to *just* 23.5 hours per day?”

~ Dr. Mike Evans, Associate Professor, U of T



# Exercise & Brain Health

- The most effective exercise programs for the brain will include a mental and a social component
  - Walking Clubs
  - Shuffle Board
  - Golfing
  - Aquafit
  - Gardening
  - Cycle Clubs
  - Yoga





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**Thank You!**