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**PD WEEK 2022**

**SEMAINE DE PP 2022**

# The impact of physical activity on brain health

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Leveraging movement for more productive and less stressful workdays

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# Overview

- Physical activity in Canada
- Benefits of physical activity
- Physical activity and the brain
  - Overall brain function
  - Mental health
  - Cognition
- Tips and tricks





# Physical Activity

...any bodily movement produced by skeletal muscles that results in energy expenditure.

(Caspersen, 1985)

# The 24-Hour Movement Behaviour Guidelines

## PHYSICAL ACTIVITY

Performing a variety of types and intensities of physical activity, which includes:



- **Moderate to vigorous aerobic physical activities** such that there is an accumulation of at least 150 minutes per week
- Muscle strengthening activities using major muscle groups at least twice a week



- Several hours of **light physical activities**, including standing

## SLEEP



Getting 7 to 9 hours of good-quality sleep on a regular basis, with consistent bed and wake-up times

## SEDENTARY BEHAVIOUR



Limiting sedentary time to 8 hours or less, which includes:

- No more than 3 hours of recreational screen time
- Breaking up long periods of sitting as often as possible

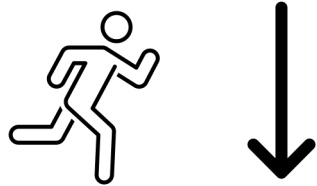
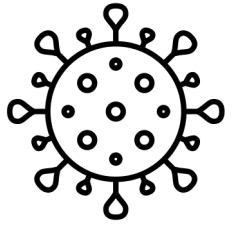




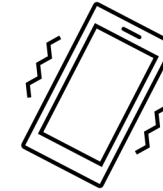
# Physical Activity in Canada

- Only 49% of adults in Canada are meeting national guidelines
  - Males > Females
  - Young > Old
  - Seasonality effects
- Adults are sedentary for 9.6 hours per day (GoC, 2017)
- Adults spend 25 hours per week on screens (GoC, 2019)
- Lack of physical activity = 4<sup>th</sup> leading risk factor for premature death and chronic disease in Canada and globally (WHO, 2019)

# COVID-19 Implications



Physical Activity



Screen Use / Sedentary Behaviours

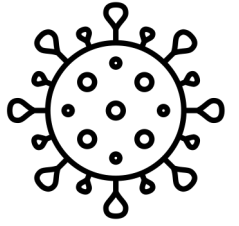


Outdoor Time



Work-From-Home

# COVID-19 Implications



# The Benefits of Physical Activity



Physical



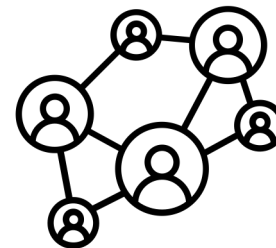
Mental



Environmental



Cognitive



Social



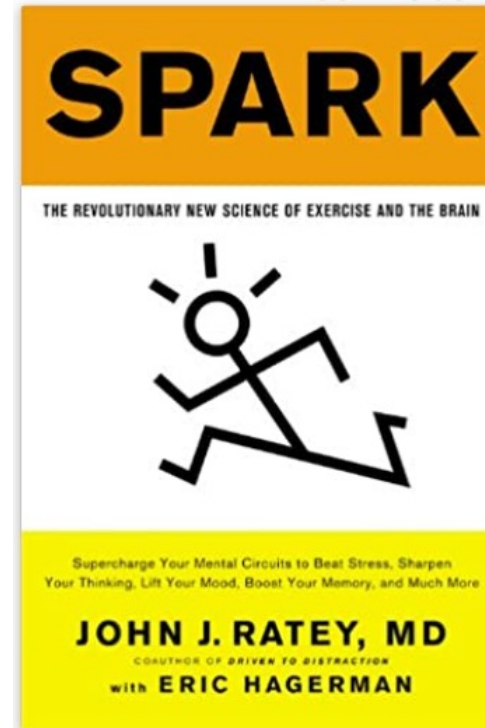
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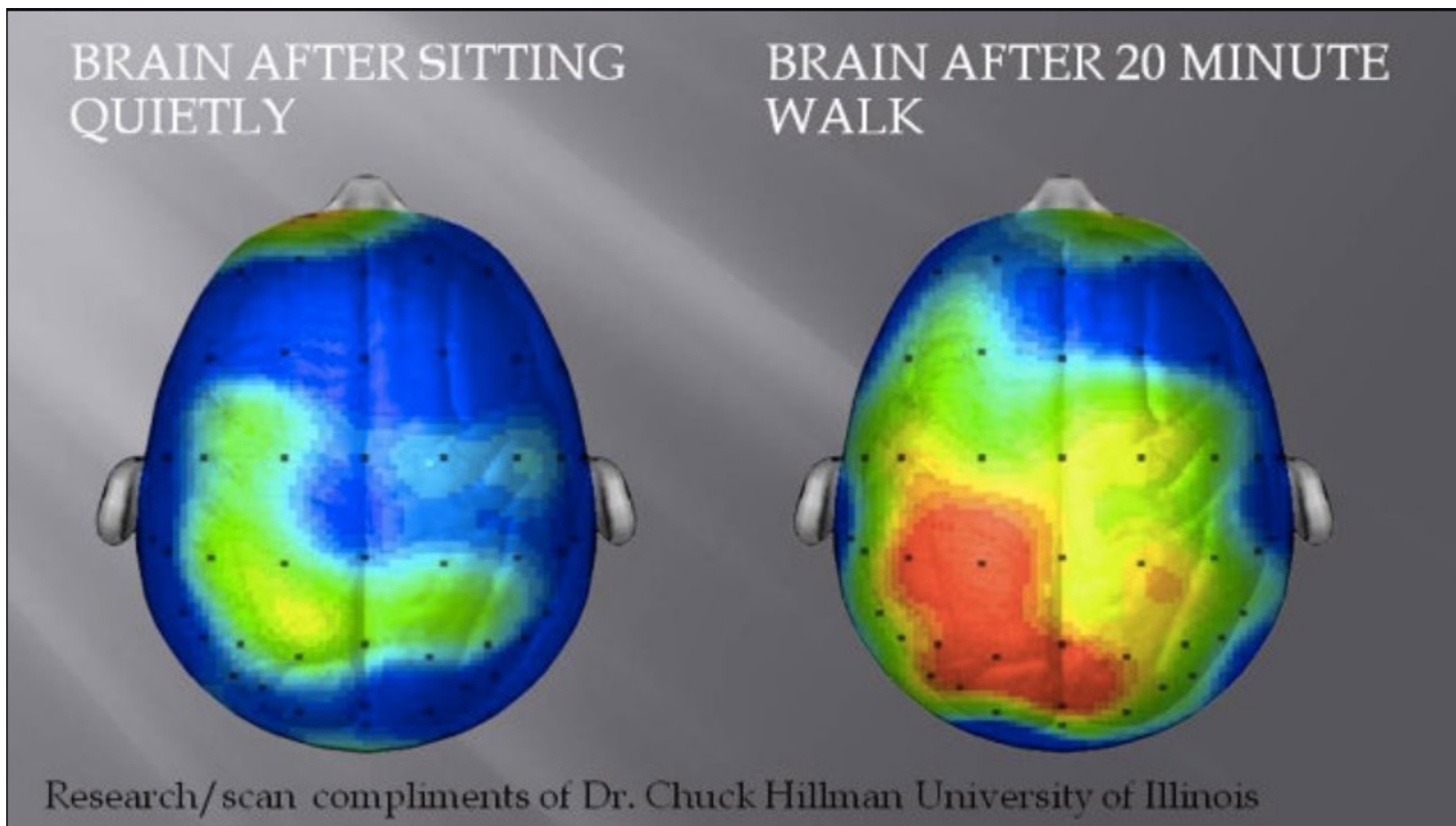
Let's take a closer look....



# This Phenomenon is Gaining Mainstream Traction



# This Is Your Brain on Drugs Exercise





# The Physical Activity-Brain Connection

- Every step you take, every mile you pedal or every lap you swim, you're enhancing your brain health.
- Exercising can increase the thickness of your cerebral cortex and improve the integrity of your white and grey matter.
- Exercise also promotes neuroplasticity, which is your brain's ability to form new neural connections.
- Physical activity also helps:
  - Improve blood flow to your brain
  - Reduce inflammation
  - Lower levels of stress hormones
  - Increase BDNF levels (which maintains and regenerates neurons)

# Mental Health



- Encourages the pituitary gland to release endorphins
- Reduces sensitivity to stress, depression, and anxiety (or symptoms thereof)
- Results in a surge in neurotransmitters (e.g., dopamine and serotonin) – which helps boost moods
- Decreases the amount of cortisol and adrenaline circulating in the body – which helps decrease stress
- Improves self-esteem, -confidence, and -worth
- Improves sleep – quantity and quality





# Healthy Ageing

- Prevents and delays overall cognitive decline and “brain ageing”
- Helps prevent and treat dementia and Alzheimer’s disease
- Reduces the impairment of brain cells and loss of coordination related to Parkinson’s disease

# Cognition



- Physical activity leads to better performance in subjects such as mathematics, reading/language, and science.
- Active individuals are better able to pay attention and to focus and concentrate on a given task for a longer period of time.
- Physical activity is associated with better memory and recall (hippocampus).
- Physical activity also helps with convergent and divergent thinking, leading to improvements in creative problem-solving and decision making.
- Active individuals display better executive function and experience less difficulty in performing challenging and demanding tasks, and are also less likely to make more mistakes on these tasks.

# Taking a Closer Look at Productivity



- Over a shorter time-frame, physical activity can give you more energy throughout the day.
- Physical exercise stimulates the development of new **mitochondria** within your cells, meaning that your body will be able to produce **more ATP** over time.
  - That gives you more energy to exert yourself physically, but it also means more energy for your brain, boosting your mental output and stamina.



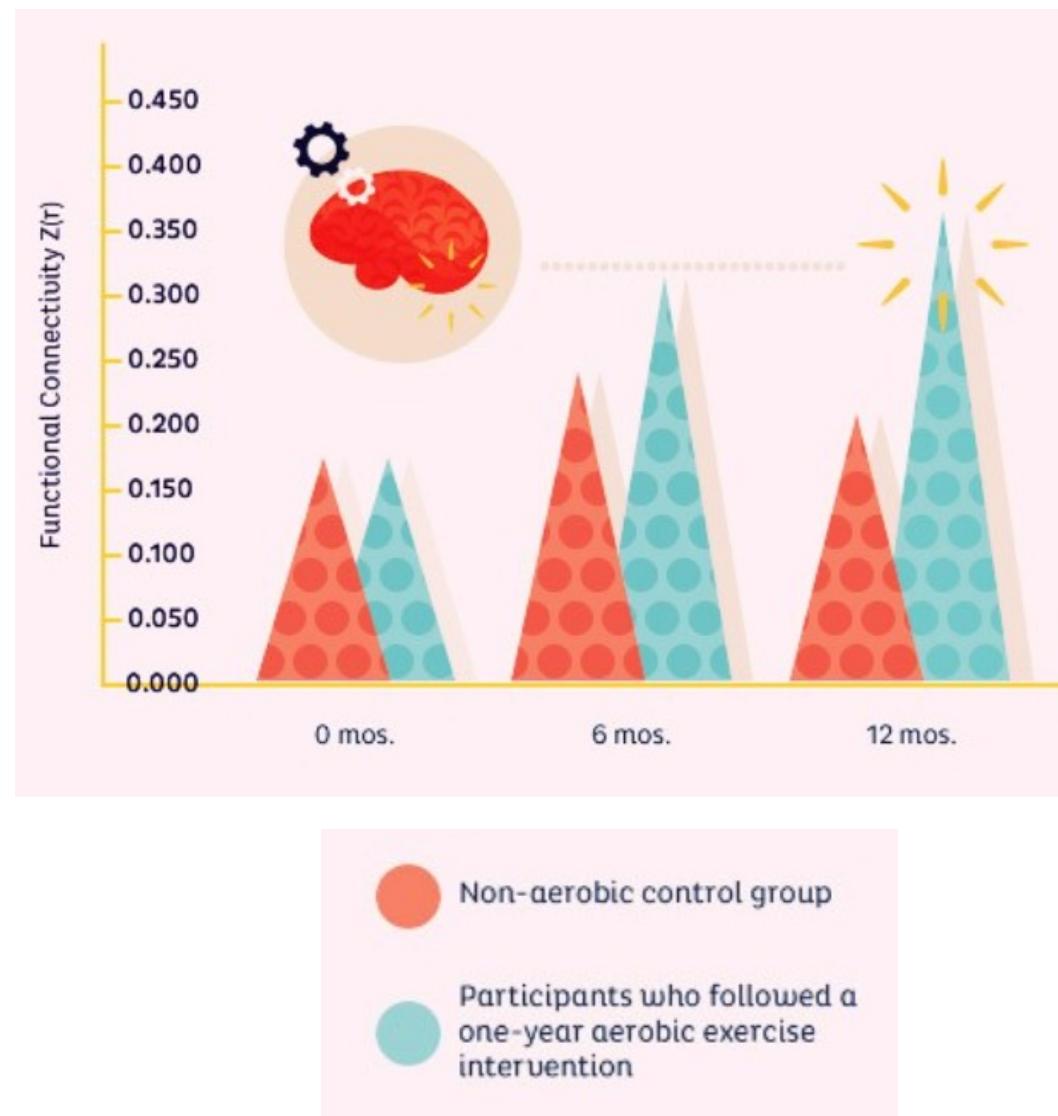
# What the Science Has to Say



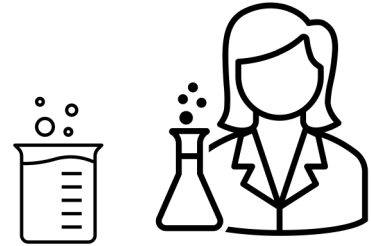
- Coulsen et al., (2008) showed that workday exercise, not only improves well-being but participants noted a 72% improvement in time management and workload completed on days when they exercised.
- A review conducted in 2012 found that workplaces that incorporated 'Sit less, move more' policies or cultures showed that employees improved productivity loss, lost workday productivity, and reported lower rates of staff absenteeism overall.

# Cardio for the win!

- A US workplace study found that participating in cardiovascular activity increased connectivity in the temporal lobe.
- Specifically, employees who participated in a 1-yr walking program demonstrated better brain connectivity.



# What the Science Has to Say



- Yang et al. (2019) concluded that even among people who didn't meet the activity guidelines (150mins/week), each **hour** of light-intensity physical activity and achieving 7,500 steps/day was associated with **higher total brain volume**.
  - This is equivalent to approximately 1.4 to 2.2 years less brain aging!!

**Now, let's put this into practice...**

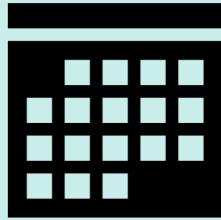


# How much exercise do you need for your brain health?



- **Aerobic exercises** are the ones to focus on
  - Tip: exercises that get your heart rate up are the best for your brain.
- However, there is also evidence to suggest **resistance training** 2x/week is positively related to inhibition response processes
- For best results: aim for **150mins of moderate-to-vigorous of physical activity/week**
- Remember: a lifetime of regular exercise is best for optimal brain health, but it's never too late to start. You will always reap benefits from moving your body – regardless of age, duration, and intensity.

# Consider Typical Work Culture



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Over-  
Programmed

Sleep Deprived



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Stressed

“More = More”  
Culture



# Ask Yourself the Following Questions...



- Are you currently active?
  - Is it something value?
  - Is it something you enjoy?
- What's your sleep like?
- What's your screen use like? Other sedentary behaviours?
- What's the biggest barriers to you getting active?
- When life gets busy or you get stressed, is physical activity one of the first things that gets “dropped”?
- Would you consider the people closest to you to be “active”?
- Does your workplace support a culture that encourages movement?

# Leveraging Behaviour Change Techniques



- Goal setting – SMART
- Barrier Identification
- Action Planning
- Self-Monitoring

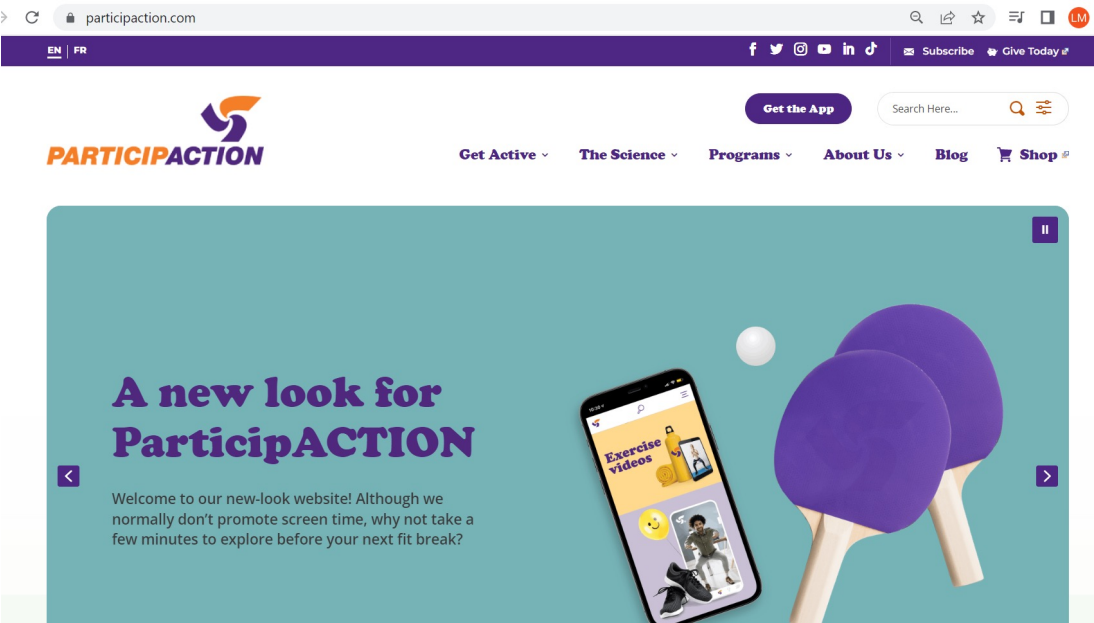


# Tips & Tricks



- Take an audit of your typical daily schedule – where does it make sense for you “sneak in” some movement?
- Take the stairs (if possible)
- Consider standing or walking meetings – in-person or virtual
- Park further away or get off public transit a stop or two sooner
- Embrace active transportation
- Get outdoors – often and all year round!
- Sample different activities/sports
- Break up extended periods of sitting or sedentary behaviours – take mini movement breaks
- Start slow, then work your way up

# Resources



# In Closing

1

**Something is better than nothing, more is always better**

There's no such thing as "bad" physical activity.

2

**Create the culture**

Be an active champion in your workplace.

Find ways to "sneak it in" throughout your workday.

3

**Have fun!**

If you don't enjoy it, you won't keep it up.



Thank you!  
Questions?



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