“Holistic” Approaches – The Brain Heart Connection

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Outline

• The brain and heart are connected
• Interventions can help both at the same time
• Risk factor management
• Health behaviour approaches
• Impacts on physical and mental health
• Find 1 thing for yourself
“Holistic”

- Holistic medicine tries to treat the "whole person" rather than focusing too narrowly on single symptoms.
- It emphasizes the connections between the mind and the body.
Brain Health is Connected to Heart Health

By keeping your heart healthy, you also lower your risk for brain problems such as stroke and dementia.
Unhealthy Heart, Unhealthy Brain

• A heart attack happens when plaque buildup or a blood clot blocks blood flow to the heart.

• A stroke, sometimes called a “brain attack,” happens when a clot or a plaque blocks a blood vessel in the brain or when a blood vessel in the brain bursts. When this happens, brain tissue dies, which can lead to memory loss and disability.

• A type of dementia called vascular dementia can happen as a result of a series of small, “silent” strokes, sometimes called “mini-strokes.” Dementia can cause memory loss, slowed thinking, and personality changes.
Steps to Heart and Brain Health

1. Control blood pressure
2. Get diabetes under control
3. Manage cholesterol
4. Eat healthy foods
5. Limit alcohol
6. Don’t smoke
7. Be physically active
8. Cognitive training
9. Sleep well
10. Stress less

“Risk Factors”

“Health Behaviours”
Step 1. Control your blood pressure.

• High blood pressure is a leading cause of heart disease and stroke.
• Over time, high blood pressure puts too much stress on blood vessels.
• Uncontrolled high blood pressure in midlife also raises your risk for dementia later in life.
Blood Pressure control predicts stroke
Blood Pressure control predicts cognitive decline

Sara Teles de Menezes. Hypertension, Prehypertension, and Hypertension Control, Volume: 77, Issue: 2, Pages: 672-681, DOI: (10.1161/HYPERTENSIONAHA.120.16080)
Step 1. Control your blood pressure.

- Know your numbers by getting your blood pressure checked regularly.
- If your blood pressure is high, work with your doctor, nurse, or health care team to manage it.
- One way to manage your blood pressure is to take your medicines as prescribed.
- Other ways include eating well and being active!
Step 2 – Get diabetes under control

Diabetes causes high blood sugar, which can damage blood vessels and nerves. This damage raises the risk for heart disease, stroke, and dementia.
Diabetes and Cognition

Saedi et al. World Journal of Diabetes
2016 September 15; 7(17): 412-422

- There is strong evidence that diabetes mellitus increases the risk of cognitive impairment and dementia.
- Insulin signaling dysregulation and small vessel disease may be important contributing factors in Alzheimer’s disease and vascular dementia pathogenesis, respectively.
- Optimal glycemic control in type 1 diabetes and identification of diabetic risk factors and prophylactic approach in type 2 diabetes are very important in the prevention of cognitive complications.
- Hypoglycemic attacks in children and elderly should be avoided.
• Greater awareness of link between diabetes and cognitive dysfunction
• Improved systematic screening and diagnosis of cognitive impairment and dementia in those with type 2 diabetes
• Personalized management of diabetes in people with cognitive dysfunction (accounting for age and frailty)
Step 3 – Cholesterol

www.health.harvard.edu
Lower LDL Cholesterol = Lower Heart Risk Lower Stroke Risk
Step 4. Eat Healthy Foods

• Eat plenty of vegetables, fruits, whole grains, and low-fat dairy, and include seafood rich in omega-3 fatty acids (such as salmon) each week.
• Limit foods with added sugars and saturated fats
• **Lower your sodium** (salt) intake.
Nutrition Education in Cardiac Rehab

- Focus on evidence based, individualized nutrition counseling for patients and their families
- Group education on heart healthy eating using the Mediterranean and DASH diets as a base for a more plant based, whole food diet.
- Online nutrition resources and videos through Health e-University and www.cardiaccollege.ca
Mediterranean Diet

Heart Health:
- 30% lower risk of MI or CVA
- 50-70% lower risk of recurrent cardiac events.

Brain Health:
- 27% lower risk of mild cognitive impairment
- 36% lower risk of Alzheimer’s Disease
Dietary Approaches to Stop Hypertension (DASH) Diet

- Lower BP in 12 weeks
- 7-10 fruits and veggies, all whole grains, nuts and seeds daily, 2-3 low fat dairy, limits salt and sugar.
- Improvements in cognitive performance (psychomotor speed and memory/learning), especially when combined with exercise
Visit www.cardiaccollege.ca

- Resources on:
  - Healthy eating tips
  - Recipes
  - Mediterranean Diet Score
## Brain Health Food Guide

### Foods to Include

<table>
<thead>
<tr>
<th>Vegetables to Include</th>
<th>Servings</th>
<th>Serving Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Of this, be sure to include:</td>
<td>2 or more times a day</td>
<td>1/2 cup except for Raw Leafy Greens</td>
</tr>
<tr>
<td>Raw Leafy Greens (e.g. lettuce, spinach, mixed greens, kale, cabbage)</td>
<td>1 time a day</td>
<td>1 medium-sized piece for Raw Leafy Greens</td>
</tr>
<tr>
<td>Cruciferous Vegetables (e.g. broccoli, cauliflower, Brussels sprouts, kohlrabi, cabbage, bok choy)</td>
<td>3 times a week</td>
<td></td>
</tr>
<tr>
<td>Fruit Total</td>
<td>4 or more times a day</td>
<td>1 medium or 1/2 cup</td>
</tr>
<tr>
<td>Of this, be sure to include:</td>
<td>2 or more times a week</td>
<td>1/4 cup nuts or 2 teaspoon nut butter</td>
</tr>
<tr>
<td>Unsaturated fats or All-natural Nut Butters Total (e.g. almond butter, peanut butter)</td>
<td>1 times a day</td>
<td>1/4 cup nuts or 2 teaspoon nut butter</td>
</tr>
<tr>
<td>Of this, be sure to include:</td>
<td>2 or more times a week</td>
<td>1/4 cup nuts or 2 teaspoon nut butter</td>
</tr>
<tr>
<td>Beans or Legumes (e.g. chickpeas, lentils, navy beans)</td>
<td>3 or more times a week</td>
<td>1/2 cup</td>
</tr>
<tr>
<td>Fish or Seafood Total (not battered or fried)</td>
<td>2 or more times a week</td>
<td>3-4 oz.</td>
</tr>
<tr>
<td>Of this, be sure to include:</td>
<td>2 or more times a week</td>
<td>3-4 oz.</td>
</tr>
<tr>
<td>Tasty fish (e.g. salmon, trout, sardines)</td>
<td>2 or more times a week</td>
<td>3-4 oz.</td>
</tr>
</tbody>
</table>

- Choose whole grains (e.g. oats, brown rice, whole pasta, 100% whole wheat or whole grain bread, quinoa, Nutgur, barley, whole grain pastas and breads) instead of refined grains (e.g. white rice, white pasta, white bread).
- Use low-fat milk (2% or 1%), yogurt (0-2%), and cheese (about 22%).
- Use olive oil (as your main cooking oil for cooking, salad dressings, and added to bread and sauces).

### Foods to Limit

<table>
<thead>
<tr>
<th>Any Meat and Poultry Total</th>
<th>Servings</th>
<th>Serving Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Of this, be sure to limit:</td>
<td>1 or less per day</td>
<td>3-4 oz.</td>
</tr>
<tr>
<td>Red and processed meats (e.g. hot dogs, bacon, ham, lunch meats, hot dogs, poultry, red meat, processed)</td>
<td>less than 1 per week</td>
<td></td>
</tr>
<tr>
<td>Butter, cream, or high fat dairy products (e.g. sour cream, cream cheese)</td>
<td>1/2 or less per week</td>
<td>1 teaspoon butter, 1 teaspoon cream</td>
</tr>
<tr>
<td>White breads (e.g. bread, rolls, bagels, pitas tortillas)</td>
<td>1 or less per week</td>
<td>1 slice bread or roll</td>
</tr>
<tr>
<td>Pre-packaged foods and ready meals (e.g. canned soup, instant noodles, frozen appetizers, and sauces)</td>
<td>3 or less servings per week for all these foods</td>
<td></td>
</tr>
<tr>
<td>Potato chips, crisps, pretzels, or other salty snacks or fried foods</td>
<td>3 or less servings week in total for all these foods</td>
<td></td>
</tr>
<tr>
<td>Store-bought dairy desserts (e.g. ice cream, frozen yogurt, pudding, custard)</td>
<td>3 or less servings week in total for all these foods</td>
<td></td>
</tr>
<tr>
<td>Baked goods (especially store-bought)</td>
<td>3 or less servings week in total for all these foods</td>
<td></td>
</tr>
<tr>
<td>Candy and chocolates</td>
<td>3 or less servings week in total for all these foods</td>
<td></td>
</tr>
<tr>
<td>Pop, sweetened fruit juice or any other sugary drink</td>
<td>3 or less servings week in total for all these foods</td>
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[www.baycrest.org/BrainHealthFoodGuide](http://www.baycrest.org/BrainHealthFoodGuide)
Brain Health Food Guide

• Simple diet changes can have a powerful effect on brain health.

• After only 4 months of eating well, older adults performed as if they were 9 years younger on tests of reading and writing speed.

• Individuals who ate well for 4 years did not experience any memory loss.

www.baycrest.org/BrainHealthFoodGuide
Step 5. Limit Alcohol

• If you drink alcohol, drink in moderation.
• Drinking too much alcohol raises blood pressure, which can lead to stroke and increase the risk of some kinds of heart disease.
• Alcohol negatively impacts mood and cognition
Mental Health During the Pandemic

Almost 38% of Canadians reported “feelings of loneliness or isolation”.

Loneliness led to 4x higher prevalence of:
- Major depressive disorder (29% vs 6%)
- Generalized anxiety disorder (25% vs 6%); and
- Probable PTSD (13% versus 2%).

In comparison to older adults (65 + years), individuals aged 18-24 years had a 3x higher prevalence of major depressive disorder, generalized anxiety disorder, and probable PTSD.

Generational Differences: What are people up to during a pandemic?

“Millennials” & “Generation X”: Increased alcohol consumption.

“Generation X”: Increased use of tobacco.

“Millennials”: Increased cannabis and junk food consumption. Coincidence?!

“Baby Boomers”: Engaged in exercise outdoors.

“Greatest/Silent Generation”: Engaged in exercise indoors.

Alcohol intake. A good way to take the edge off?

Anxiety and Alcohol:
- “A band-aid for a bullet wound”.
- Feelings of “relaxation” are short-lived.
- Disrupts the balance of chemicals in the brain that regulates mood.

Long-term abuse of alcohol can lead to anxiety.

The risk for either having an anxiety disorder or alcohol use disorder is about three times greater if the other disorder is present.

Depression & Alcohol:
- Drinking heavily and regularly is associated with symptoms of depression.
- Cause and effect remains unclear.

Depression can follow on from heavy drinking.

Reducing or stopping drinking can improve mood.
Step 6 – Don’t smoke

- Smoking damages blood vessels and makes blood more likely to clot, which can lead to heart disease and stroke. Smoking is the leading cause of preventable death in the United States and Canada.
- If you don’t smoke, don’t start.
- If you do smoke, learn how to quit.
Smoking may temporarily increase cognitive functioning (improving some components of attention and memory). Acute nicotine effects may improve (i) cognitive performance above smokers' normal levels, and (ii) cognitive disruption resulting from nicotine abstinence.

Both neurobiological effects act as reinforcers to nicotine use, greatly contributing to the development of nicotine dependence.

However, heavy smoking is associated with cognitive impairment and cognitive decline in middle age.
Step 7 – Be physically active

• Lack of physical activity contributes to high blood pressure, diabetes and heart disease.
• Most Canadians don’t get the 150 minutes of moderate-intensity activity per week the guidelines recommend.
• Find ways to get your heart pumping for at least 150 minutes per week. Take the stairs, schedule a walk at lunch, or do jumping jacks during commercial breaks.
• Learn more about how to get enough physical activity.
**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

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**SLEEP**

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

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**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

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Physical activity. The mind-body connection!

<table>
<thead>
<tr>
<th>Depression &amp; Anxiety</th>
<th>Physical Activity Behaviour</th>
<th>Potential Effect</th>
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<tbody>
<tr>
<td></td>
<td>Running (15 mins) OR walking (60 mins) per day...</td>
<td>...Reduces risk of major depression by 26%.</td>
</tr>
<tr>
<td></td>
<td>30 minutes of moderate to vigorous physical activity per day.....</td>
<td>...a 48% lower risk of depression.</td>
</tr>
<tr>
<td></td>
<td>Exercise is now a recommended treatment for clinical depression in Canada.</td>
<td>...just as effective as some traditional treatments.</td>
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</table>

Regular Exercise & Other Benefits

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<tr>
<td>Improved cognitive function</td>
<td>Boost self-confidence</td>
</tr>
<tr>
<td>Increased sleep quality</td>
<td>Improved immunity</td>
</tr>
</tbody>
</table>

Exercise Your Brain

Aerobic activity, the kind of exercise that raises your heart rate and makes you sweat, appears to increase the size of the hippocampus, the brain area involved in verbal memory and learning.

The benefits of exercise come directly from its ability to reduce insulin resistance, reduce inflammation, and stimulate the release of growth factors—chemicals that affect the health of brain cells and the growth of new blood vessels in the brain.
Brain-Derived Neurotrophic Factor: A Key Molecule for Memory in the Healthy and the Pathological Brain

Magdalena Miranda, Juan Facundo Morici, María Belén Zanoni and Pedro Bekinschtein

Laboratory of Memory Research and Molecular Cognition, Institute for Cognitive and Translational Neuroscience, Instituto de Neurología Cognitiva, CONICET, Universidad Favaloro, Buenos Aires, Argentina
Higher BDNF = Bigger Hippocampus = Better Mood and Memory
Marzolini S, Oh P et al. 2008, 2018
A greater ↑ muscle mass was independently associated with > improvement in cognition

Marzolini S, Oh, P. et al., Neurorehab Neural Repair
Step 8 – Train your brain

Positive factors +
Mental stimulation +
Active lifestyle +
Social stimulation +
Cognitive remediation +
Physical activity +

Healthy cognitive reserve

Better cognitive reserve is protective against age-related changes

Negative factors –
Poor education –
Mood disturbances –
Poor nutrition –
Alcohol/drug abuse –
Poor health –

https://www.researchgate.net/figure/Contributing-factors-of-cognitive-reserve
Step 9 - Sleep

Restful sleep may be the brain's opportunity to clear out toxic beta-amyloid waste products that are associated with memory loss.

- Poor sleep quality has been linked with high blood pressure, cholesterol-clogged arteries, heart failure, heart attack and stroke, diabetes, and obesity.
- Sleep apnea
- is closely tied to stroke risk.
Step 10 - Stress

• In stressful situations, your body releases a flood of chemicals such as cortisol and epinephrine (adrenaline).
• Chronic stress can interfere with your mood, sleep, and appetite. It may also trigger inflammation, a known instigator of heart disease.
• Your brain is the sensor for many forms of stress, which trigger the outpouring of these brain chemicals.
• In addition to waves of stress hormones surging through the body, the heart and brain are linked through a series of direct nerve pathways. In cases of sudden extreme stress, a storm of abnormal brain signaling can provoke irregular heartbeats or, in rare cases, an immediate heart attack.
“Regular physical activity and management of cardiovascular risk factors (e.g. diabetes, obesity, smoking, and hypertension) are associated with a reduced risk of cognitive decline and may reduce the risk of dementia.

Further, a **healthy diet** and lifelong learning/cognitive training may also reduce the risk of cognitive decline.”

Summary

• The brain and heart are connected
• Interventions can help both at the same time
• Risk factor management (BP, DM, Chol)
• Health behaviour approaches (eat, move, think, sleep, feel well)
• Big impacts on physical and mental health
• Find 1 thing for yourself

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