



## Living Well for Brain Health

### What are the risk factors for dementia?

Anything that can increase a person's risk of developing dementia is labelled a risk factor for dementia. None of the risk factors mean that a person will inescapably develop dementia. Similarly, avoiding risk factors does not guarantee that a person will never develop dementia. However, it does make it more probable.

Most of the research establishing possible links between a risk factor and the development of dementia has been done on Alzheimer's Disease and Vascular Dementia, the two most common types of dementia. However, it seems that these risk factors also apply for other types of dementia.

Here is a list of risk factors that have been associated with higher risks of developing dementia

- Risk genes
- Age
- Sex (depending on the dementia, usually female)
- Low levels of formal education
- Smoking
- High blood pressure
- Problems with cholesterol
- Obesity and lack of physical activity
- Diabetes
- Excessive alcohol consumption
- Depression
- Head injuries

### What are risk genes?

Familial dementia is due to alterations in specific genes (or mutations) that lead to dementia. These genes have a 50% chance of being passed from parent to child. Sporadic dementia has no familial link. Therefore, it is not hereditary. The vast majority of dementia is sporadic. However, some risk genes may be passed from parent to child.

A risk gene does not directly cause dementia nor guarantee a person will develop dementia. Nonetheless, it increases the risk to develop dementia. Risk genes can also be referred to as a genetic predisposition. Usually, a risk gene by itself only slightly increases a person's risk. It is believed that risk genes can interact with other risk factors including other risk genes to influence the global risk of developing dementia. Indeed, in the case of dementia, genes are usually not the only deciding factor for whether a person develops dementia.



## What are brain and cognitive reserves?

The concept of reserve is to explain why people show symptoms whereas others don't when they have the same amount of damage in the brain related to dementia. Reserve is divided into two kinds: brain reserve and cognitive reserve. Brain reserve is the ability of the brain to tolerate more damage to the brain before symptoms start to appear. Cognitive reserve is the idea that the brain actively tries to cope by using compensatory mechanisms. Therefore, an individual that possesses a high brain reserve would be able to tolerate more damage before showing symptoms whereas an individual with high cognitive reserve would cope better with the same amount of damage.

These concepts highlight the benefits of addressing risk factors. Indeed, by modifying some risk factors and by changing some aspects of our lifestyle, brain and cognitive reserves can be increased<sup>1</sup>.

## What is the best prevention?

There are some factors that you cannot change, but some that you can. Therefore, the best prevention would be to modify the risk factors that are modifiable. It is believed that reducing these risk factors may increase your brain and cognitive reserves. Therefore, people adopting a healthy lifestyle may increase their brain and cognitive reserves and this may prevent, delay or slow down the progression of dementia compared to people that have less brain and cognitive reserves.

Here are seven steps you can take to reduce your probability of developing dementia

1. Take care of your cardiovascular health
  - Track your numbers and keep them in the recommended ranges; track your blood pressure, cholesterol, blood sugar and weight
2. Be physically active
  - Regularly engage in moderate to vigorous physical activities
3. Avoid smoking and excessive alcohol consumption
4. Follow a healthy diet by eating well-balanced meals and reducing processed food consumption
5. Enjoy social activities
  - Stay connected socially and decrease social isolation
6. Mentally challenge your brain
7. Protect your head from injuries by wearing a helmet when you are involved in sporting activities

Remember that anything that is good for prevention will also slow down the progression of dementia.

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<sup>1</sup> Stern, Y. (2012). Cognitive reserve in ageing and Alzheimer's disease. *The Lancet Neurology*, 11(11), 1006-1012.



## How to approach risk reduction?

Some studies have noted that when people improved various aspects related to cardiovascular health as well as reduced their smoking behaviour, a decline in dementia prevalence (number of cases) or incidence (rate of new cases) was observed. This suggests that medical as well as public health interventions to lower cardiovascular risk factors had additional benefits for cognition.

Since cardiovascular risk factors are connected to a healthy lifestyle, it appears insufficient to only focus on one aspect of a healthy lifestyle to reduce a person's risk of developing dementia. Indeed, a most effective strategy would be to address multiple risk factors at the same time. Studies have found that combining many lifestyle interventions (physical activity, nutritional changes, management of cardiovascular risk factors, mental stimulation and social activities) improved significantly overall cognitive performance as well as executive functions (like thinking and planning)<sup>2</sup>.

The evidence is now strong enough to conclude that adopting healthy behaviours known to help with diseases like diabetes and cardiovascular diseases are also effective to reduce the risk of dementia and cognitive decline.

This type of approach can easily be achieved by combining activities. Indeed, walking with a friend promotes being physically **and** socially active. Learning a new skill can often also be combined with social interactions or physical activity by parking the car farther from the destination.

## What does it mean to be physically active?

Physical activity increases brain and cognitive reserves. Physical activity is described by any movement that increases heart rate and breathing, and any movement that requires the use of energy. The goal is to decrease sedentary behaviour, that is activities that require little movement like watching television and using motorized transportation, and to increase physical activities.

The level of physical activity required varies according to the age and the physical abilities of an individual. A person needs to consult with their doctor before changing their physical activity routines to safely adopt a healthier lifestyle. It is also important to start slowly and to increase gradually the amount of physical activity. Achieving more physical activities will provide greater benefits. The goal is to increase the frequency and duration of physical activity gradually to reach the guidelines. These guidelines are supported by the Heart and Stroke Foundation of Canada and the Canadian Society for Exercise Physiology<sup>3</sup>.

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<sup>2</sup> Ngandu, T., Lehtisalo, J., Solomon, A., Levälähti, E., Ahtiluoto, S., Antikainen, R., ... & Lindström, J. (2015). A 2 year multidomain intervention of diet, exercise, cognitive training, and vascular risk monitoring versus control to prevent cognitive decline in at-risk elderly people (FINGER): a randomised controlled trial. *The Lancet*, 385(9984), 2255-2263.

<sup>3</sup> [http://www.csep.ca/cmfiles/guidelines/csep\\_guidelines\\_handbook.pdf](http://www.csep.ca/cmfiles/guidelines/csep_guidelines_handbook.pdf)



## Guidelines

To achieve health benefits, it is recommended that adults of 65 years of age and older accumulate at least 150 minutes (2 hours and 30 minutes) of moderate to vigorous aerobic physical activities per week. Ideally, these would be achieved in periods of 10 minutes at a time or more. It is also recommended to add muscle and bone strengthening activities as well as exercise to enhance balance to prevent falls.

An easy way to assess the intensity of an activity is the “talking versus singing” test. A moderate-intensity activity is when you are able to talk, but that you are not able to sing. A vigorous-intensity activity no longer allows you to say more than a few words without having to pause for your breath.

Here are some ideas of activities:

- Walking briskly or walking a dog
- Bicycling
- Taking dance lessons
- Gardening
- Bowling
- Hiking
- Yoga
- Parking the car farther away from your destination
- Taking the stairs instead of the elevator

To help introduce these new activities remember to:

- Begin today by starting small and building up
- Do activities that you enjoy and continue doing them
- Ask a friend or a family member to join you and have fun
- Move safely to avoid head injury and prevent falls

Remember that dementia also tends to progress more quickly when physical health is not maintained.

## **What does it mean to stay mentally active?**

Participation in mentally stimulating activities also increases brain and cognitive reserves. There is a growing body of evidences showing that social isolation is a risk factor for dementia<sup>4</sup>. It is believed that social isolation may result in cognitive inactivity which is linked to faster cognitive decline.



You can stay mentally active by participating in any mentally stimulating activities. Here are some examples:

- Completing challenging puzzles or playing games that have a strategic component
- Learning a new skill or hobby like playing a musical instrument
- Engaging in ongoing learning like learning a new language
- Visiting galleries
- Participating in activities that exposes your brain to new things

Remember that challenging your brain can easily be achieved through social interactions by engaging in those activities with a friend or a family member.

## What does it mean to eat a healthy diet?

It is important to understand that there is no magical ingredient or nutrient that will protect a person from developing dementia. However, by adopting an overall healthy diet, a person will increase their brain and cognitive reserves. A person may be prescribed supplements by their doctor to ensure a sufficient intake of certain vitamins and nutrients. Supplements and vitamins should never be taken to replace other medications prescribed by your doctor or to substitute a healthy diet. Eating excessively one type of “good” food or “compensating” with supplements will not counter-balance an otherwise unhealthy eating habit. Therefore, it is recommended to reduce to a minimum processed foods and increase the intake of fruit and vegetables as much as possible.

Here are some foods you should eat

- Fruits
- Vegetables
- Lean meats, fish and poultry
- Nuts, beans, whole grains
- Water
- Proper portion sizes

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<sup>4</sup> Livingston, G., Sommerlad, A., Orgeta, V., Costafreda, S. G., Huntley, J., Ames, D., ... & Cooper, C. (2017). Dementia prevention, intervention, and care. *The Lancet*.



Here are some foods you should avoid

- Processed food
- Deep-fried food
- Sodas
- Candies and pastries

Here are some tips to achieve a healthy diet<sup>5</sup>

- Don't eat things that would not eventually rot.
- Avoid food that is advertised on television.
- Stop eating while you are still a little hungry.
- Don't buy food that can be served through the window of your car.
- When grocery shopping, stay out of the middle of the supermarket. The perimeter of the supermarket contains the fresh food.
- Enjoy meals with people you love.
- If possible, cook your own meals or buy them through agencies that provide healthy options instead of ready-to-eat prepackaged foods.

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<sup>5</sup> Pollan, M. (2008). In defense of food: An eater's manifesto. Penguin; Pollan, M. (2009). Food rules: An eater's manual. Penguin.