

WHAT SORT OF PHYSICAL ACTIVITY AND HOW MUCH DO YOU NEED TO DO?

It is not possible to provide a physical activity formula that is optimum for brain health and function, or for lowering dementia risk. The evidence to date comes from a wide variety of studies. These measure physical activity in different ways, look at different types and intensities of activity, and use different durations and frequencies of exercise sessions. The good news is that when we put the evidence together, it does show that many forms of physical activity are beneficial for brain health and cognitive function.

Physical activity is generally grouped into four categories. Because each of these focus on improving particular functions of the body, you'll get the most benefit from regularly engaging in some of each kind.

Aerobic or endurance exercise is physical activity that increases your breathing and heart rates. Performed regularly it improves endurance and the health and fitness of your lungs, heart and blood vessels. It includes activities like walking, jogging, swimming, cycling and even energetic housework. Aerobic activity has been shown to enhance brain plasticity, increase brain blood flow and improve cognitive function, and is associated with reduced dementia risk. Guidelines recommend adults do at least 30 minutes and children at least 60 minutes of moderate-intensity aerobic activity on most days of the week, preferably every day.

Strength training is physical activity that utilises weights or resistance, including your own body weight, to work muscles. Performed regularly it improves muscle strength and tone, as well as the health and fitness of tendons, bones and joints. Only a few studies have investigated the effects of strength training on brain function, and results have been mixed. Strength training has been shown to be beneficial in preventing and managing diabetes, an important risk factor for dementia. Some studies have found that exercise programs combining aerobic and strength training are more beneficial than either alone. Guidelines recommend we do strength exercises for each major muscle group for 30 minutes at least twice a week.



Flexibility exercises are those that stretch your muscles. Performed regularly they help your joints and muscles to stay limber and flexible. There are numerous types of stretching exercises you can do, and activities like yoga, pilates and tai chi include controlled stretching often in conjunction with strength and balance. Stretching exercises are not thought to provide as much benefit for the brain as other types of activity, but they are very important for your muscles. Flexibility exercises can be done as often as you like.

Balance exercises help to improve balance and coordination and reduce the risk of falls. They include movements that test your balance and activities like tai chi. Lower-body strength exercises, yoga and pilates can also help improve your balance. As with stretching, balance exercises may not be essential for brain health, but are nonetheless very important to include in your routine, especially for older people. Guidelines recommend older adults do balance exercises at least 3 times a week.

Of course, many physical activities combine elements of more than one of these types of exercise. Experts classify the four types because it is important to consciously try and include all four in the activities you choose to do. It is also very important to choose activities that you enjoy and will be able to stick with for long-term benefits. And seek the advice of your doctor and an exercise professional for guidance on safety, planning and getting the most out of your physical activity.



WHAT IS THE TAKE-HOME MESSAGE?

Engaging in regular physical activity is great for your brain, body and heart. Physical inactivity has emerged as an important risk factor for cognitive impairment and dementia. The good news is that you can do something about this. People doing regular physical activity at all ages have better cognitive abilities, better brain health and a lower risk of developing dementia. Physical activity may also help maintain abilities and slow decline in people with cognitive impairment or dementia.

Whatever your stage of life, being fit and healthy matters.



Your Brain Matters is an evidence-based program that promotes brain healthy lifestyles and seeks to reduce the risk of dementia in the Australian population. It provides you with three key messages to maximise your brain health:

- Keeping your brain active matters
- Being fit and healthy matters
- Looking after your heart matters

For more information on Your Brain Matters, and for tips on how to live a brain healthy lifestyle, visit yourbrainmatters.org.au



Fitness Australia is working in partnership with Alzheimer's Australia to promote the benefits of physical activity for brain health.



PHYSICAL ACTIVITY FOR BRAIN HEALTH AND FIGHTING DEMENTIA

A summary of the evidence presented in Alzheimer's Australia's Paper 36



PHYSICAL ACTIVITY CAN IMPROVE YOUR BRAIN HEALTH AND REDUCE YOUR RISK OF DEMENTIA

Alzheimer's Australia's **Your Brain Matters™** program provides evidence-based advice that healthy and active lifestyles are associated with better brain function and lower dementia risk. One important element of Your Brain Matters is regular physical activity. Physical activity includes planned exercise and sport, as well as other activities which involve bodily movement and are done as part of playing, working, transport, household chores and leisure activities.

The benefits of physical activity for the health of your body and your heart are well known. Physical activity also has a significant positive impact on your brain health. People who do regular physical activity have healthier brains, they have better memory, planning and other thinking skills, and they have less chance of developing dementia.

For the complete evidence paper *Physical Activity for Brain Health and Fighting Dementia*, which includes references for the information presented here, visit yourbrainmatters.org.au

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WHY ARE WE CONCERNED ABOUT BRAIN HEALTH?

We would all like to maintain good memory and a sharp mind throughout life. That depends on the health of our brains. We expect brain function to slow down as we grow older, but many people fear being affected by dementia.

Dementia is characterised by a decline in cognitive abilities (the thinking functions of the brain) that impacts significantly on daily life. Lost abilities may include memory, attention, language, planning, judgement, spatial skills and social skills. Dementia is not a normal consequence of ageing; it is caused by brain disease, most commonly Alzheimer's disease, but there are over a hundred causes of dementia. Someone with dementia experiences a progressive decline in functioning as their brain is damaged by disease. However, there is evidence that additional factors contribute to the symptoms of dementia and that by keeping the brain as healthy as possible, we can delay the onset of dementia and slow its progression.

It is estimated that over 320,000 Australians are living with dementia in 2013. Without a significant medical breakthrough, that is expected to increase to around 900,000 by 2050. While approximately 1 in 10 people over the age of 65 have dementia, a further 1 in 5 have mild cognitive impairment and are at significantly increased risk of progressing to dementia.



CAN WE MAKE A DIFFERENCE?

There is no cure for dementia, but you can reduce your risk. Research has found that about half of Alzheimer's disease cases are potentially attributable to risk factors you can change. Around 13% (over 4 million) of Alzheimer's disease cases worldwide were found to be attributable to physical inactivity. In the USA, a higher 21% of cases were found to be attributable to physical inactivity, a figure that is likely to be similar for Australia where our modern lifestyle means we're less active than we should be. The researchers found that if a quarter of inactive people became more active, this could prevent nearly 1 million cases of Alzheimer's disease worldwide.

An Australian study showed that if 5% of inactive people became active every 5 years, this would reduce Australian dementia prevalence by 11% in 2051. That equates to around 100,000 fewer Australians living with dementia, simply by getting more Australians to do regular physical activity.

HOW DOES PHYSICAL ACTIVITY HELP YOUR BRAIN?

We are still learning how physical activity affects brain biology and function. We now know that the brain continues to grow new cells and connections between them throughout life, helping us continue to learn. This is sometimes referred to as brain plasticity. We also know that the brain requires adequate blood flow to receive the oxygen and nutrients it needs to function well. Physical activity supports both these important aspects of brain biology.

Physical activity enhances brain plasticity and the growth and survival of brain cells. Brain imaging studies have shown that people doing regular moderate-intensity physical activity, compared to those who are inactive, have increased brain volume in regions important for memory, learning, concentration and planning. They also have increased connectivity between brain regions, and they have better cognitive function. This suggests that they have more brain cells and more connections between them, helping their brain to function more effectively. Older adults who are physically active have brain volumes and connectivity typical of younger adults. It is normal for the brain to shrink a little as we grow older, but this age-related shrinkage is reduced in people who do regular physical activity.

The health of blood vessels in the brain is vital for healthy brain function. Diabetes, high blood pressure, high cholesterol and obesity can damage blood vessels and lead to vascular disease in the brain, a major contributor to dementia. Physical activity reduces the risk of these conditions, helps to keep blood vessels healthy, and supports the growth of new small vessels. Physical activity also increases blood flow to the brain, providing both long-term and immediate benefits. Studies have demonstrated improved cognitive performance in the hours following physical exercise.



CAN PHYSICAL ACTIVITY REDUCE YOUR RISK OF DEMENTIA?

Many studies have investigated the relationship between how much physical activity people do at different stages of life and their chances of developing dementia in late-life, demonstrating that physical activity at all ages may protect against dementia. Most of the evidence comes from studies involving older adults whose level of physical activity and cognitive abilities are measured and then they are followed up a few years later. These show that older adults doing regular physical activity have a lower risk of decline in their cognitive abilities and of developing dementia, compared to those who are inactive.

Fewer studies have investigated the association between midlife or earlier physical activity and late life cognitive impairment. Most have found that midlife exercise is associated with a lower risk of later developing dementia. Given that the diseases that cause dementia gradually damage the brain over many years before symptoms emerge, it makes a lot of sense to address brain health as early as possible.

However, it is also never too late. Studies of exercise interventions for older inactive people have confirmed that even moderate exercise can improve cognitive performance. A review of the evidence concluded that people who were not previously physically active can show improved cognitive functioning after exercising for as little as four months.

CAN PHYSICAL ACTIVITY SLOW THE PROGRESSION OF DEMENTIA?

Regular physical activity may also reduce the rate of decline in people with mild cognitive impairment or dementia. Only a small number of studies have been conducted involving people with dementia, but some have demonstrated improvements in cognitive function or less decline in cognitive abilities, slower decline in activities of daily living, improved physical fitness, and improved wellbeing. More exercise intervention studies have involved people with mild cognitive impairment, and most of these demonstrate improvement in cognitive function is associated with increased physical activity.

