

Exercise and the immune system

by Adam Fry, PhD

Regular exercise is known to provide numerous benefits to both physical and mental health, including cardiovascular and metabolic diseases, obesity, and depression. But, with COVID-19 at the forefront of everyone's mind, we've been looking at whether exercise can improve your immune system.

The Immune System

The overall function of the immune system is to prevent or fight infection. This requires a coordinated response from a complex collection of organs, tissues, and cells that make up the immune system. These include:

- White blood cells, which circulate in the blood stream and help to identify and destroy pathogens including viruses such as COVID-19. There are numerous types of white blood cell that play different roles in combating infection.
- Mucus secreting cells, which are found in the airways and provide mucus to catch debris and pathogens, preventing them from accessing the lungs. These cells may be disabled by COVID-19 causing the respiratory symptoms associated with the virus.
- The skin, which provides a barrier to pathogens entering the body.
- Bone marrow, which produces various cells of the immune system.
- Lymph system, which helps transports cells of the immune system and remove unwanted materials.

Regular exercise and the immune system

Moderate exercise can strengthen the immune system increasing protection from infections. Research has found stronger immune responses in regular exercisers when presented with challenges to their immune system in the lab. Moreover, compared to those who are inactive, those completing moderate exercise on most days of the week might experience half the

occurrence of symptoms of infection. However, like most benefits of exercise, it is regular participation in exercise that is most strongly associated with benefits to the immune system, so don't rush out to sprint around the park after the onset of symptoms. Along with exercise, healthy nutrition and good sleep are both important to the immune function. (Luckily, exercise can improve sleep quality too!)

Aging and the immune system

There is a known decline in immune function with aging. Older individuals have impaired responses to challenges to their immune system, which puts them at an increased risk of infection. This is also why older individuals are considered at higher risk of serious complications due to COVID-19. Fortunately, the benefits of exercise on the immune system are present at all ages. Older individuals who exercise regularly show stronger immune responses. There is also some evidence to suggest regular exercise and higher cardiorespiratory fitness can delay or limit the decline in immune system function that occurs with aging. Overall, regular physical activity contributes to the protection of older individuals from disease, and importantly, it's never too late to start.

Exercise recommendations

Current physical activity guidelines recommend adults in the United States should accumulate 150-300 minutes of moderate intensity physical activity per week, or 75-150 minutes of vigorous activity per week, or a combination of both. In practice, this means we should aim to exercise on most days of the week for at least 30 minutes on each day. This can be spread throughout the day and involve activities such as brisk walking, cycling, and indoor activities such as strength exercises. These recommendations can be daunting to people not already exercising regularly so they should remember that some exercise is a lot better than none.

Exercising under stay at home orders

The 'shutdown' might provide challenges and barriers to your usual exercise routine. However, it may also provide opportunities. You may have some extra flexibility with your time that you could use to make a positive commitment to your physical activity routine. Additionally, it may also offer the opportunity to try something new.

For those of you looking for expert guidance, Alex Bunt – Mount Sinai’s strength and conditioning guru – has released an at-home training program that requires no gym equipment. It comes in beginner, intermediate and advanced levels and is available free of charge.