

# Health Risks of Physical Inactivity

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## STORY AT-A-GLANCE

- > The stay-at-home measures used to reduce the spread of COVID-19 may have impacted your exercise habits, which can result in unanticipated health concerns
- > Inactivity can reduce insulin sensitivity and lower protein synthesis in your body; not all older adults can recover after returning to normal activity levels
- > Inactivity is associated with an increased risk of noncommunicable conditions including cardiovascular disease, Type 2 diabetes, low back pain and mental health disorders
- > Regular exercise and physical activity also reduce your risk of infections due to anti-inflammatory influence and immune regulation

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Decades of fitness research remind us that physical activity is one of the best preventive measures available. It's one of the pillars of good health alongside nutrition, sleep and hydration. Evidence has demonstrated the effect that exercise has on sleep quality, mental health, heart disease and metabolic conditions.

For example, in one meta-analysis<sup>1</sup> of 305 randomized controlled trials including 339,274 participants, researchers compared exercise with drug interventions on mortality in diabetes and heart disease. They found there was no statistically detectable difference in those who used exercise or who took medication in the prevention of

coronary heart disease and diabetes. In fact, exercise was found to be more helpful than prescription drugs for those who'd had a stroke.

Physical activity is also a key factor for longevity. Those who engage in regular exercise have a reduced risk from all-cause mortality.<sup>2</sup> As discussed in another study published in JAMA,<sup>3</sup> researchers concluded "cardiorespiratory fitness was inversely associated with all-cause mortality" and it "is a modifiable indicator of long-term mortality."

## **Pursue Active Stay-at-Home Measures**

In a recent paper published in the Journal of Sport and Health Science, scientists caution that the official recommendations to restrict movement do not mean physical activity should also be limited.<sup>4</sup> The clear health benefits associated with activity ought to encourage people to get at least 30 minutes of moderate exercise each day.

Stuart Phillips, Ph.D., is a professor at McMaster University in the department of kinesiology. He is raising a concern that the prolonged stay-in-place orders during the COVID-19 pandemic may result in unanticipated health issues related to inactivity.<sup>5</sup>

He recently shared information with Canadian Olympic athletes on how to reduce the impact of the lockdown on performance and how to avoid injury as they return to intense training after the restrictions are lifted. On his university webpage, he commented:<sup>6</sup>

*"As we protect ourselves against the risks of COVID-19, we are spending more time sitting and less time walking, or being physically active. Extended periods of inactivity have a really detrimental effect on our health. Our physical health has never been more important than now."*

Phillips led a team that recently published a paper in The Journals of Gerontology<sup>7</sup> in which they evaluated the effect of two weeks of inactivity on insulin sensitivity. The team engaged 22 overweight, prediabetic adults who were between the ages of 65 and 73 years and asked them to limit their activity to 1,000 steps per day.

This was done to mimic the level of activity a hospitalized person or someone who is housebound may experience after an illness.<sup>8</sup> They found that the two-week period of reduced activity led to a lower rate of protein synthesis and deteriorating control over their blood sugar.

However, unlike younger adults, some of the older individuals' parameters did not recover after returning to their normal activity levels. Phillips explained the implications of this data during the pandemic:<sup>9</sup>

*"The reduced steps experimental model demonstrates what an older person who got the flu might experience if they were hospitalized for three or four days with respiratory issues and then convalesced at home for two weeks. The vast majority of people are at home during this pandemic. For older people, a decline in health may be compounded by both physical deconditioning and social isolation."*

## **Inactivity Increases Several Health Risks**

If staying at home has reduced your activity level and raised the number of hours you're sitting, then you may be placing your health at risk; this comes with long-term effects.

The World Health Organization believes that their data show physical inactivity as a leading cause of disability and disease throughout the world.<sup>10</sup> It is estimated 3.2 million deaths each year could be linked to physical inactivity.

Much of the research on fitness and exercise has been on the impact it has on noncommunicable diseases and longevity.<sup>11</sup> In one assessment of the associated risks, researchers estimated that by getting rid of inactivity, 6% to 10% of all major noncommunicable diseases could be eliminated.

These results prompted headlines comparing inactivity to smoking, as the number of deaths is nearly the same.<sup>12</sup> People who are less active have a higher potential risk of high blood pressure, Type 2 diabetes, coronary heart disease, depression and anxiety.<sup>13</sup> Other effects from inactivity include:<sup>14</sup>

Fewer calories being burned	Muscle weakness
Poor aerobic fitness	Bone loss
Reduction in metabolism	Poor blood circulation
Increasing inflammation	Potential hormonal imbalance

## **Avoid Back Pain or Worsening Medical Conditions**

Another risk of inactivity is lower back pain, one of the more common health complaints and a major cause of disability.<sup>15</sup> It is also one of the more common triggers for an opioid pain prescription that may lead to dependence. Exercise and nonexercise movement are two foundational treatments for lower back pain.

In a systematic review of the literature,<sup>16</sup> researchers found that those who exercised lowered their risk of developing back pain by 33%. They also found that exercise reduced the severity in those who had back pain at the start of an intervention. The researchers concluded that a combination of strength training with stretching or aerobic exercises done two to three times a week is recommended for the prevention of lower back pain.

During periods of self-isolation, people with underlying medical conditions may experience a worsening of their health with inactivity. In a commentary in *Nature Reviews Rheumatology*,<sup>17</sup> the authors warn of the potential dangers for those who have rheumatic diseases.

People with these conditions have an increased risk of infection or complications from respiratory illnesses, such as COVID-19. Sedentary behavior was prevalent before the stay-at-home orders. The negative clinical effects in the pediatric population with rheumatoid diseases include muscle atrophy, weakness, fatigue, insulin resistance and reduced physical capacity.

Although bedrest was a treatment used in the past, data show this leads to joint destruction. Since inactivity may increase with social distancing and quarantining, those with rheumatoid disease who were hypoactive before the pandemic may risk worsening of their disease, symptoms and comorbidities if they don't become more active.

## **How Exercise Improves Your Immune System**

There is strong epidemiological evidence that regular exercise and physical activity reduce the number of infectious diseases older adults will experience.<sup>18</sup> While there is ample evidence of its long-term benefits on health, the effect of a single session continues to be analyzed.

One study was conducted to explore the assertion that after exercising just once, the body has a heightened immune surveillance and regulation function. The authors of this investigation also believe there is a physiological limitation to or delay in aging of the immune system with regular physical activity.

In a second review<sup>19</sup> scientists summarized research evidence including the results of acute and chronic exercise on the immune system and the effect on immunosenescence (immune system aging). The data show a logical and inverse relationship in the risk of illness for those who exercise moderately.

Leading physiologists James Turner and John Campbell recently published an analysis in which they argued that a higher number of infections are more likely to be linked to<sup>20</sup> "inadequate diet, psychological stress, insufficient sleep, travel and, importantly, pathogen exposure at social gathering events like marathons – rather than the act of exercising itself." Turner commented:<sup>21</sup>

*"But people should not overlook the importance of staying fit, active and healthy during this period. Provided it is carried out in isolation – away from others – then regular, daily exercise will help better maintain the way the immune system works – not suppress it."*

Writing in the American College of Sports Medicine, Richard Simpson, Ph.D., believes exercise during the COVID-19 pandemic is necessary to positively impact the immune system and counter the stressful effects of isolation. Simpson writes of the importance to seniors, saying:<sup>22</sup>

*"Exercise is especially beneficial for older adults who are more susceptible to infection in general and have also been identified as a particularly vulnerable population during this COVID-19 outbreak."*

## **Lack of Exercise Jeopardizes Older Adults**

Unfortunately, the trend for inactivity rises with age.<sup>23</sup> In addition to the health risks and immune compromise associated with physical inactivity in seniors, it also increases the risk for balance problems, broken bones and disability.

In older adults with arthritis, a lack of physical activity has been associated with a measurable decline in the ability to do activities of daily living such as meal preparation, grocery shopping, taking medications and managing money.<sup>24</sup>

In this study, functional ability deteriorated more in women and minorities, which the researchers attributed to a higher number of comorbidities such as diabetes, stroke, depression and cognitive impairment. In another study of older adults, scientists found that at the end of a 10-year follow-up period, those who were sedentary were more likely to have trouble walking.<sup>25</sup>

## **Develop a Healthy At-Home Activity Routine**

Working or staying home can open the door for poor movement routines. If you previously had to get out of your chair at the office every 30 minutes or if you had a job that required you to spend hours on your feet every day, binge watching television or playing games on your computer can throw a wrench in those habits.

As a rule, getting even a little bit of exercise is better than nothing. Avoid sitting as much as possible, as the simple act of bearing weight on your legs helps reduce your risk of unwanted health conditions.

There are a variety of ways to use safe, simple and easy exercises at home that also reduce your potential for exposure to airborne viral infections such as COVID-19. Here are several suggestions to help you improve the amount of time you're out of your chair so you get at least 30 minutes of exercise each day:

**My BEST Recommendation** is blood flow restricted training and would strongly encourage you to try it. This strategy allowed me to gain about 20 pounds of muscle mass in my first year and increase my deadlift to 400 pounds. My body changed so much my ring size actually increased.

This is exciting as muscle mass is one of the most important characteristics you want as you age. Not only will it decrease frailty, but the additional glucose receptors on the muscle will make sure your glucose stays in a healthy range. Below are other important strategies you can implement, but they pale in comparison to strength training.

- **Activity snacks** – Phillips suggested<sup>26</sup> "Prolonged periods of sitting should be broken up with 'activity snacks' like a little walk or going up and down a flight of stairs. A short daily walk has amazing properties from not just a physical but a psychological perspective. We don't have to run a marathon."

In other words, small movements may have big benefits. Consider taking a walk in the morning and another in the afternoon as the weather permits. Getting outdoors has additional benefits for your immune system, specifically from your exposure to the sun that may boost your vitamin D production.

- **Nonexercise Movement** – This type of activity may be as important as exercise. Make it a point to get up from your chair at least every 30 minutes or more to stretch and move around. If you are working from home or spending more time in front of a computer or television screen than what is considered healthy, opt for using a Swiss ball.

These large, inflatable balls can be ordered online and most come with a pump. Sitting on one at your desk or while watching television encourages movement and helps strengthen your core muscles.

- **Strengthening** — With inactivity you can lose muscle mass and strength. You don't need a gym or fancy equipment to get a workout. In fact, you don't even have to leave home. For more on how to get a strength training workout at home, see "No Time for the Gym Today? Try This at Home."
- **Indoor Exercise** — Getting some aerobic activity and exercise at home is not nearly as challenging as you might imagine. If you don't have a favorite aerobic workout video, consider climbing the stairs or purchasing a stationary bike, which can be delivered straight to your door.

## Sources and References

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- <sup>4</sup> [Journal of Sport and Health Science, 2020; 9\(2\):103](#)
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- <sup>7</sup> [The Journals of Gerontology, 2018;73\(8\):1070](#)
- <sup>10</sup> [World Health Organization](#)
- <sup>11</sup> [Lancet, 2012;380\(9838\):219](#)
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- <sup>13, 23</sup> [Johns Hopkins Medicine](#)
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- <sup>22</sup> [American College of Sports Medicine, March 30, 2020](#)
- <sup>24</sup> [Northwestern University, April 13, 2005](#)
- <sup>25</sup> [Reuters, September 7, 2017](#)