Promoting Physical Activity During the COVID-19 Pandemic: Implications for Obesity and Chronic Disease Management

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Physical activity is important for prevention and management of numerous chronic diseases, including cardiovascular disease and type 2 diabetes.¹⁻³ People with higher levels of physical activity have lower all-cause mortality, improved immune function, and better recovery from upper respiratory and microbial infections.⁴⁻⁸ In contrast, people who are sedentary and obese have increased mortality and hospitalizations from such infections.^{5,9-12} Obesity was recently linked to an increased risk of severe (and often fatal) complications from influenza A virus H1N1 infection during the 2009 pandemic.⁵ While there is still a lot to learn regarding the novel coronavirus disease 2019 (COVID-19), lessons can be learned from the impact that both physical activity and obesity have had on disease progression during recent influenza outbreaks.⁹

Increased Severity of COVID-19 Symptoms in Obese and Sedentary Populations

COVID-19 is a respiratory disease caused by severe acute respiratory syndrome-coronavirus 2 (SARS-CoV-2). The highly contagious and transmissible characteristics, including asymptomatic transmission, of SARS-CoV-2, as well as the absence of a proven treatment, have accelerated the spread of the disease and have overwhelmed hospitals worldwide.¹³ While SARS-CoV-2 affects all demographic sectors, COVID-19 disproportionately affects older adults and those with pre-existing conditions.^{14,15} A study of more than 5,200 hospitalized patients with COVID-19 reported a strong association between obesity and critical illness.¹² Patients under age 60 years who were overweight were twice as likely to be hospitalized as their leaner counterparts, while those with obesity were three times as likely to need intensive care. These findings contribute to the growing body of evidence that obesity and other chronic conditions likely predispose an individual to increased risks associated with contraction of infectious diseases.¹⁰⁻¹²

Given that nearly 40% of Americans¹⁶ could be classified as obese and more than 75% do not meet the physical activity guidelines,¹ a meaningful proportion of the United States may be at an elevated risk for critical complications if they contract COVID-19. Excess adiposity compromises immune function and impedes the body's acute and adaptive responses to infections.^{6,9} Particularly, patients with obesity-related metabolic disorders have chronic levels of inflammation and circulating cytokines that result in dysregulated immune responses and impaired maturation of B and T cells.^{5,9}

Importance of Physical Activity to Attenuate the Impact of COVID-19

Federal, state, and local governments have issued a series of prevention and mitigation policies to help reduce the burden of COVID-19.¹⁷ These policies include social distancing, stay-at-home orders, telework recommendations, and closures of schools and non-essential business.¹⁸ While these policies are essential in reducing transmission of the virus and the overall burden of the pandemic, they have fostered an environment of physical inactivity and deconditioning.¹⁹⁻²¹ Similar to obesity, physical inactivity increases the severity of symptoms and risk of mortality in those with chronic diseases or acute respiratory infections.^{3,4,6,8,9,22} The inhibited immune response and blunting of macrophage activation appears to be associated with the diminished insulin sensitivity that occurs with reduced physical activity.^{7,23} Exercise increases a person's physiologic reserve, thereby lowering the risk of mortality from cardiovascular and metabolic diseases, as well as many types of cancer.^{3,4,20-22,24} Exercise also provides immunological benefits that are mediated by enhanced immuno-surveillance via augmented macrophage responses, increased circulation of immunoglobulins and anti-inflammatory cytokines, and an attenuation of inflammation.⁶⁻⁹ Therefore, it is important to encourage physical activity that abides by state and local mitigation policies to assist with disease management and increase physiologic reserve beyond the immediate SARS-CoV-2 pandemic.^{20,25}

Practical Exercise Guidance During the COVID-19 Pandemic

The public health strategies put forth to limit person-to-person transmission of the virus have made it difficult for many to maintain structured exercise programs that necessitate recreational facilities, team sport complexes, and fitness centers.⁸ On the other hand, while the social-distancing measures may limit the opportunity for many to participate in structured exercise programs, they have also increased potential opportunities for leisure-time physical activity such as family walks, hiking, canoeing, gardening, yard maintenance, and other outdoor activities. Traditional aerobic endurance activities such as jogging, running, biking, and rowing are still very effective means of meeting physical activity guidelines given that one either can safely take part in these activities outdoors (while maintaining appropriate social distancing) or has ergometer equipment in their home. Pilates, yoga, and dancing are also excellent activities for those unable to exercise outside of the home. These latter activities require minimal equipment and there is an abundance of classes that are available through videos or online. Moreover, these workouts are a great alternative to traditional

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aerobic activities, as they are scalable and can be adapted for beginners to more advanced athletes. Body weight, isometric, resistance band, and hand-held weight exercises can also be an acceptable alternative to traditional resistance training regimens. The American College of Sports Medicine provides some valuable resources on how to stay physically active during a pandemic.²⁶ Additionally, the COVID-19 Taskforce of the National Strength and Conditioning Association has provided helpful strategies and guidelines for athletes and team sports administrators to carefully plan safe returns to training.²⁷

Social support, a key component for many individuals to start or maintain a physical activity program, is particularly challenging in the current pandemic environment. A benefit of personal training, group fitness classes, and team sports is the accountability and social support that they provide. This support helps to improve adherence to exercise programs and meet physical activity and health-related goals. Social media, virtual support groups, and fitness apps with community support can help to provide the encouragement and motivation necessary to facilitate these behavior changes.²⁸

Additional precautions should be implemented as stay-at-home orders/recommendations are relaxed.²¹ It is important for everyone to continue to practice proper social distancing and to employ aggressive personal hygiene and sanitation protocols in public gyms and fitness centers. The Centers for Disease Control and Prevention (CDC) has provided guidance about ways to protect yourself and others when returning to recreational facilities.²⁹ The CDC has also provided considerations for youth sports³⁰ and summer camps.³¹ While many of these suggestions vary, they both share a continuum of theoretical risk. The lowest level of risk for youth sports involves physical conditioning and skill-building drills in the home environment with family members, whereas close-contact, team competitions against people from different geographic locations presents the highest level of risk.

Physical activity is essential for maintaining proper health and physical function even during a pandemic. Maintaining proper physical conditioning can improve immune function and potentially protect a person from serious complications related to respiratory infections. Given the high transmissibility of the SARS-CoV-2, however, one must remain vigilant about seeking safe physical activity environments and following guidance from health officials to limit the spread of the virus.

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