RUNNING, THE IMMUNE SYSTEM, AND COVID-19 CONCERNS

INTRODUCTION

With the start of the cold and flu season, and recently the rising cases of COVID-19, the relationship between running and illness often comes up. While avid runners hate to modify their training regimen, most dedicated runners have already made significant changes to prevent catching and spreading serious illness. Whether you're a lifelong runner or new to running, it's important to understand the complex impact running has on the immune system.

THE IMMUNE SYSTEM 101

The immune system is quite complex, with multiple factors playing a role:

- White Blood Cells: There are many different types of white blood cells that play various roles in fighting infection.
- Hormones: Cortisol and adrenaline have multiple effects on the immune system, including modulating how white blood cells work.
- Physiologic Factors: Body temperature and blood oxygen levels are also important in understanding how the body responds to infection.
- Other Factors: Sleep, stress, diet, medications and medical history all affect how the immune system functions.

RUNNING AND THE IMMUNE SYSTEM

Effects of endurance running on immune system parameters have been well studied. A group of runners had blood drawn at regular intervals while running for three hours. Researchers looked at their white blood cells and hormone levels at regular intervals. In this study, there was an initial increase in most types of white blood cells and both cortisol and adrenaline levels. Following the endurance exercise, there was a subsequent reduction in some types of white blood cells. These perturbations of the immune system returned to normal with 24 hours of recovery. While this may be interesting, what does it actually mean for a runner?

There is a relationship between the intensity and duration of runs and immune function. Moderately intense workouts tend to strengthen the immune system. For most people, this means an hour run at a steady pace. Running 10 miles or more or running to exhaustion can actually temporarily weaken the immune system. This impairment of immune function generally lasts only for a few hours, although for some people, it may take several days, especially for those with an already weakened immune system. Marathon runners have been observed to be up to six times more likely to get the common cold after a race.

SO WHAT CAN YOU DO?

The answer is not to avoid long or hard runs, but rather run smarter. Prevention is key. Simple steps can be taken to reduce your risk of illness. Wear a face covering while running (see "Tips for Running With a Face Covering"), keep a safe physical distance of at least 6 feet, and limit your time spent in public or crowded spaces, especially after longer distance runs. Continue proper hand hygiene by washing your hands regularly, avoid touching your face and the front of your mask, and consider carrying a small bottle of hand sanitizer. Maintain a strong immune system by sleeping 7-8 hours per night, eating healthy foods (including sufficient carbohydrates to maintain your glycogen stores and plenty of fruits and vegetables) to prevent or fight off most common illnesses. The data is currently mixed as to whether antioxidant supplements are of benefit to runners

trying to prevent infection. Supplementation of vitamins is only helpful if someone is deficient in a vitamin (more is not better). Also, getting your annual influenza vaccine will help prevent coming down with the flu, which will truly take you away from running for some time.

With regards to training, try to avoid overcrowded running trails and let the immune system fully recover after a particularly intense or long work-out. If this is not a possibility, a simple way to bolster the immune system is to make sure glycogen stores are replete between work-outs. Additionally, increasing training intensity gradually will help your body adjust to tough work-outs without running down your immune system.

BUT WHAT IF YOU'RE ALREADY SICK?

In most cases of common illnesses such as a viral upper respiratory tract infection (common cold), there are no definitive recommendations. Study results are mixed, with some showing a benefit from rest and some showing no difference between resting and continuing to run. In general, runners with illnesses more serious than a head cold should consider taking time off (aka "The neck rule:" if your symptoms remain above the neck (stuffy nose, headache, sore throat) it may be OK to continue to exercise in moderation). If you are having fevers, productive cough, or having vomiting/diarrhea, a period of rest until your symptoms resolve is recommended. Significant exercise after you've had a recent fever may predispose you to exertional heat stroke, which can be a life-threatening emergency in an endurance athlete. If you have COVID-19, had a high-risk exposure, or tested positive for the disease, please stay home and follow isolation guidelines to prevent the spread to others.

RUNNING AFTER RECOVERING FROM COVID-19 AND OTHER ILLNESSES

There is limited information on return to running after COVID-19. After a common cold or flu, it is recommended to gradually re-acclimate to exercise before going "all out" (such as in a race) after you've recently been sick with a fever. Likewise, runners who had asymptomatic or mild COVID-19 should slowly return to activity while monitoring for chest pain, shortness of breath, dehydration, or overheating. Seek medical evaluation if any of these symptoms develop. A general guideline is to take another week off from significant exertion after your isolation period is over and you're asymptomatic. In moderate to severe cases of COVID-19, and especially if you required hospitalization, consult with a medical professional before return to running. You may need further diagnostic studies to avoid detrimental complications associated with COVID-19.