

UW Medicine

SPORTS, SPINE &
ORTHOPEDIC HEALTH

Running And The Immune System

INTRODUCTION

As the fall weather rolls in and cold and flu season starts, the relationship between running and illness often comes up. While many avid runners hate to change their training regimen, especially if they are training for a race, most are willing take a break to avoid a serious illness. The impact running has on the immune system is complicated but worth understanding for serious runners.

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 the 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 to 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 a few hours, although for some people, especially those with an already weakened immune system, it may take several days. What has been observed is that marathon runners are 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 such as washing hands regularly, sleeping 7-8 hours per night, and eating healthy foods (including sufficient carbohydrates to maintain your glycogen stores and plenty of fruits and vegetables) can prevent 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 the one 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.

In regards to training, the best thing one can do is 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 to 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. 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; so 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.

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