

## Andes Run Wells Blog 2: The immune system

Today I want to highlight the physiology of extreme exercise and staying healthy while under pressure and stress. Our immune system is a complicated - it works to fight off viruses, bacteria and other pathogens. White blood cells are a critical component of the system. It's pretty amazing - like chemical and biological warfare inside the body. When the system works well we are able to fight off invaders and stay healthy. When the system is overwhelmed or is not working effectively we get sick.



We've been moving well through the foothills of the Andes for the last 2 days. The team seems to be recovering from the initial shock of running a marathon +++ as well as camping and all the other challenges of making an expedition work. With the crazy amount of exercise as well as heat exposure and now altitude it is no surprise that first Bob Cox and then Ray Zahab got respiratory tract infections.

A fascinating paradox in human physiology is the concept of a J-shaped relationship between exercise training and health. The "J-shaped hypothesis" suggests that, in general, people who exercise regularly experience fewer illnesses and infections than those who do not. The relationship is based on research that measured the number of upper respiratory tract infections (URTIs), such as the common cold, that people experience every year. Although this relationship was developed based on the incidence of URTIs, more recent studies have explored the relationship between exercise and

other diseases. They have found that exercise affords protection against many diseases, even cancer. Increasing the amount of exercise beyond moderate levels does not improve immunity further. Quite the opposite happens. When athletes train at volumes and intensities excessively higher than normal for extended periods, they experience a significant increase in the number of illnesses.



When we consider the J shaped relationship it's easy to understand why the runners are getting sick early on. The high volume of running, and the environment are very stressful. The immune system is compromised and it's easy to get sick. We've been increasing their vitamins like vitamin C as well as minerals like zinc to help their immune system and speed the recovery of the runners. It's a testament to just how fast ultra endurance athletes adapt because this morning on day 4 everyone is already feeling much better, despite waking up at 12,000 ft elevation.

So, in general, regular physical activity helps to strengthen the immune system and results in fewer infections than would be expected if a person did not exercise. But extreme exercise can cause the immune system to be compromised for a short period of time. **For all the people who are participating in the physical activity challenge - not only will you have a higher level of fitness, but your immune system will be stronger. Keep it up!**