

Exercising in smoke - Ross McKinnon Physiotherapist

We are off to another challenging summer for training in the smoke. We experienced similar conditions in 2018 and had to modify and adapt to the challenges that the forest fire smoke presents. The good news is that at the 2019 Nationals Team Telemark had some best-ever results and BC as a province also had amazing results.

The recommendations below are built on advice provided by Dr. Michael Kennedy from the University of Alberta who is a former XC ski racer and researcher on lung health in winter athletes. One of the challenges with forest fire smoke is that the particles are in a wide spectrum of sizes, from the large particles you see (i.e. ash) to very small particles (0.2 microns). The smaller particles penetrate deeply into the lungs, and your body finds it hard to clean them out. These particles are not easily filtered out of the air. This means that you have to use high-quality filters (our usual COVID masks are not effective). There is some evidence that it might be the length of time in the smoke rather than the intensity of the workout that is more detrimental.

Some recommendations:

1. When the smoke level is high on the AQHI above a 4 or 5 it would be best to exercise indoors. As it is difficult to put in larger volumes of training indoors mixing up the type of training is important.
2. If you are training outdoors look to train in the morning or evening when the air quality is often better as there is typically more wind and a lower AQHI at these times.
3. Be creative. Consider travelling or using higher elevation training to avoid poor air quality. Utilize the great ski resorts that are close by to get above the smoke, if the smoke is settling in the valley floor.
4. Consider purchasing furnace filters with a high micro-particle performance rating (MPR) to help filter air from the outside. The higher the MPR the more resistance to air flow so it is harder on the furnace fan, but in turn, the cleaner the air that it has filtered.
5. If you do train outside in poor air quality invest in some in N95 or RESPRO masks. Masks will reduce exposure to the upper respiratory tracks and lungs.
 1. N95 masks should be purchased from local safety supply stores as fit is very important. The better the seal the better the protection.
 2. N95 masks can be purchased with a one-way valve which reduces vapour build-up, makes exhaling easier, and makes them less hot.
 3. I have used a N95 mask and can train at Zone 1 and have adequate ventilation. I haven't tried the RESPRO brand which can filter to 2.5 microns, with an optional 'gold' filter to 0.99 microns.
 4. The RESPRO masks are about \$80 plus \$35 for the better filter
 5. The N95 masks are between \$3 and \$4 a mask
6. Shower immediately after an outdoor workout so that you don't shed particles all over your house
7. For irritated eyes use eye drops

8. To reduce nasal irritation, you can use products such as FLONASE as an mucosal health aid

Some resources:

- An excellent podcast on this topic
 - <https://podcasts.apple.com/ca/podcast/environmental-pollution-health-and-performance-with/id1490521721?i=1000528220910>
- Kelowna AQHI data
 - AQHI - https://www.env.gov.bc.ca/epd/bcairquality/data/aqhi.html?id=AQHI-Central_Okanagan
 - Raw data - <https://www.env.gov.bc.ca/epd/bcairquality/data/station.html?id=E317850>
- Resources on N95 masks
 - <https://www.cdph.ca.gov/Programs/EPO/Pages/Wildfire%20Pages/N95-Respirators-FAQs.aspx>
 - <https://www.doh.wa.gov/Portals/1/Documents/Pubs/334-353.pdf>