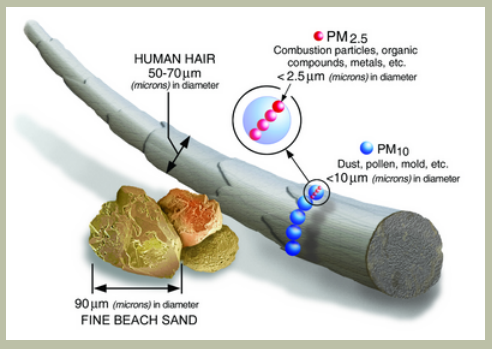
# Training Considerations for Athletes During Wildfire Smoke Events

## What makes wildfire smoke so unhealthy?

Wildfire smoke is a mixture of air pollutants that can cause long-term negative health effects. The air pollutant of greatest concern in Montana is fine-particulate matter (PM2.5), which poses a significant health risk because it can penetrate deep into the lungs and enter the bloodstream. While larger particulate matter exists, our respiratory system is generally able to filter out these particles more effectively.

Since PM2.5 can penetrate deep into the lungs and bloodstream, this can trigger an inflammatory response resulting in serious effects on the cardiovascular system. Those with pre-existing conditions are at greatest risk of severe health impacts. However, all individuals may experience negative health impacts such as breathing difficulties, irritation, and increased infections following exposure to PM2.5..




**When the outdoor Air Quality Index (AQI) reaches unhealthy levels of concern, activities should be moved inside and high intensity exercise should be avoided.**

## Indoor air quality is often as unhealthy, or even worse than outdoor air quality due to the infiltration of smoke in indoor air.

Common infiltration points include open windows and doors, cracks and poorly sealed doors and windows, and aging HVAC systems. Larger areas, like gymnasiums, may remain at safe levels longer due to the greater volume of air but may still accumulate unhealthy levels of PM2.5 during significant smoke events. Therefore, it may still be unsafe to host physical activities there.

### If there's no difference, why can't we just stay outside?

Research indicates that being inside will normally decrease the intensity of activity, which, in turn slows down breathing rates and the amount of particulate matter inhaled. In addition, you can improve indoor air quality by running HEPA air purifiers and keeping doors and windows closed in workout areas.

## How do I adapt indoor practices?

When developing practice plans for poor air quality days, think about strategies that will improve team performance but will keep breathing rates lowered. A cardiovascular conditioning workout is ill-advised, but there are plenty of other options:

- Walkthroughs
- Strength Training
- Lower Intensity Drills
- Stretching/Mobility Work
- Other Sport Specific, Low Intensity Work

***Important Precautions:***

- *Be aware of athletes with chronic conditions and keep rescue medications close*
- *Keep athletes hydrated*
- *Watch for signs of nausea, shortness of breath, dizziness, coughing and wheezing*

## What do I tell parents and athletes?

Frontload parent communication with analogies they will understand. For example, when an athlete suffers a knee injury, the inflammation from that injury is visible. Wildfire smoke induced inflammation is internal but is just as detrimental to athlete performance and their health. Team practices provide social and mental health benefits, in addition to physical benefits, so even a mobility workout is productive. Focus on providing safe alternatives in a clean air space before canceling practices all together.

**Finally, encourage athletes to 1) rehydrate, 2) eat foods rich in antioxidants (berries, apples, black beans), 3) get extra sleep, and 4) sleep in a room with a HEPA air purifier (when possible).** Staying well-hydrated helps the liver and kidneys to remove toxins and additional recovery efforts will help reduce systemic inflammation caused by smoke exposure.

For more information about wildfire smoke, visit airquality.mt.gov