

Air Quality

In September 2018, the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports updated its 2016 guidance related to student-athlete practice and competition activities in poor air quality conditions: This guidance is provided below:

There are three reasons why otherwise healthy athletes are at special risk for inhaling pollutants. First, as physical activity increases minute ventilation, the number of pollutants that are inhaled relative to when the athlete is at rest are increased. Second, during activity, a larger proportion of air is inhaled through the mouth, which bypasses the body's built-in nasal filtration system. Third, pollutants are inhaled more deeply and may diffuse into the bloodstream more quickly during physical activity. These risks are heightened in athletes with pre-existing pulmonary or cardiac conditions.¹

An important and standardized national air quality resource is the National Weather Service's (NWS) Air Quality Forecast System. This system "provides the US with ozone, particulate matter and other pollutant forecasts with enough accuracy and advance notice to take action to prevent or reduce adverse effects." (Accessed 7/14/18;).

A key component of this forecast system is the NWS Air Quality Index (AQI).² The AQI provides real-time monitoring and alerts in response to changing air quality levels. The AQI accounts for five different pollutants, including: 1) ground-level ozone; 2) particle pollution (also known as particulate matter); 3) carbon monoxide; 4) sulfur dioxide; and 5) nitrogen dioxide. Of these, ground-level ozone and particulate matter are the most common and most concerning pollutants for outdoor physical activity. The AQI is a single number, presented on a scale of 0 – 500, where 0 indicated no air quality problems and 500 indicates the most hazardous levels of air pollution. A specialized version of the AQI for particle pollution is also available and should be consulted in those situations when threats to air quality come from wildfires, road dust, and agricultural operations.²

When threatening or dangerous air quality levels are present the AQI increases, and the National Weather Service (NWS) issues a corresponding air quality alert. Those alerts and their corresponding behavioral modification recommendations for particle pollution can be found at <https://www.airnow.gov>.²

Consistent with this information, the Committee on Competitive Safeguards and Medical Aspects of Sports offers the following general guidance to member institutions trying to make decisions about the appropriateness of practice or competition in degrading air quality situations:

- Attentive monitoring of local AQI and associated air quality alerts, especially during times of extreme environmental conditions, is recommended. This monitoring is best performed by the primary athletics healthcare providers trained to monitor environmental impacts on student-athlete health and safety. However, schools may choose to delegate this responsibility to another staff member with knowledge and training about environmental monitoring.
- Member schools should consider shortening or canceling outdoor athletic events (practices and competitions) in accordance with AQI guidance. Exposure should be managed more conservatively for student-athletes with pre-existing pulmonary or cardiac conditions, which may exacerbate the complications of these conditions and lead to an acute medical emergency. Specifically, at an AQI of 100 or higher, schools should consider removing sensitive athletes from outdoor practice or competition venues and should closely monitor all athletes for respiratory difficulty.² Reduce heavy or prolonged exertion in sensitive individuals.

- At AQIs of over 150, outdoor activities should be shortened, and exertion should be minimized by decreasing the intensity of activity. Sensitive athletes should be moved indoors.²
- At AQIs of 200 or above, serious consideration should be given to rescheduling the activity or moving it indoors. Prolonged exposure and heavy exertion should be avoided.² Avoid all outdoor physical activity for sensitive individuals .
- At AQIs of 300 or above, outdoor activities should be moved indoors or canceled if indoor activity is not an option.²
- School emergency action plans should guide the emergency care response in these circumstances, and staff should rehearse the plan at a minimum of once a year.

References

1. Carlisle AJ, Sharp NC. Exercise and outdoor ambient air pollution. Br J Sports Med. 2001;35(4):214-222.
2. United States Environmental Protection Agency. Air quality guide for particle pollution. 2016; <https://www.airnow.gov/index.cfm?action=pubs.agguidepart>. Accessed July 18, 2018.