Sustainability in Athletic Training: A Review of Health Implications Associated With the Environmental Degradation and a Practical Plan for Initiating Green Techniques

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Athletic trainers (ATs) are charged with the prevention of injuries and illnesses. Heat illnesses, asthma, and respiratory disorders, as well as nutritional deficiencies, are among those illnesses associated with environmental degradation.1-3 In the effort to prevent these diseases, ATs need to re-examine their own clinical practices and work to establish policies and procedures that support green techniques.4 The purpose of this critical review is to explore the health ramifications associated with degradation of the Earth, raise awareness of athletic training’s impact on the environment, and provide specific interventions ATs can implement to become more environmentally sustainable.

Environmental Degradation

Environmental degradation is defined as “the deterioration in environmental quality from ambient concentrations of pollutants and other activities and processes such as improper land use.”5 An increase in energy use and an overconsumption of materials leads to an associated rise of greenhouse gases.6 Some greenhouse gases, such as carbon dioxide, occur naturally in the environment and as a result of human activity. Other greenhouse gases, such as methane, are created and emitted solely through human activity.

When greenhouse gases accumulate faster than they can be removed, they accrue in the lower atmosphere and trap energy provided by the sun. This entrapment warms the Earth and instigates climate change. Climate change is any significant change in measures of climate (i.e., temperature, precipitation, or wind) lasting for an extended period (i.e., a decade or longer).7 Some amount of climate change is natural. However, when climate change occurs more quickly than normal,
it can have broad effects on the Earth’s ecosystem. Climate variability (i.e., extreme temperatures, floods, and droughts) is expected to increase as the world’s temperature rises.

**Environmental Impact of Athletic Training**

The practice of athletic training necessitates a large quantity of resources that are both natural and manufactured. A 2012 study surveyed ATs on selected issues relating to knowledge, attitude, and perceptions regarding selective issues relating to environmental sustainability in their clinical practice. Overall, ATs reported a positive attitude toward environmental sustainability and an adequate knowledge of green techniques. However, waste from athletic training duties were a major concern, with the largest offenders being plastics, water, and paper used for administrative purposes.

**Health Ramifications**

The health of the environment is closely linked to the health of its population. Climate change can impact health in a number of ways; however, this discussion will be limited to only those conditions that are most likely to affect patients of ATs. These include the effects of heat directly (i.e., heat stroke) and indirectly (i.e., cardiovascular and pulmonary strain), as well as increased rates of allergies and asthma due to air pollution.

**Effects of Heat**

There is a relationship between temperature and mortality rates. The temperature when mortality rates are at the lowest is the optimal climate (i.e., comfort zone) for the population. As temperatures diverge from the comfort zone, mortality rates increase. This relationship varies according to average climate. The population of warmer climates is more sensitive to cold extremes, whereas the population of colder climates is more sensitive to heat. Taking into consideration the increase in the Earth’s average temperature, future trends suggest a decrease in cold-related mortalities and an increase in heat-related deaths. Studies suggest some members of the population are at a greater risk of heat illness than others. The elderly (who have a decreased physical capacity for thermoregulation) and women are most at risk. The mentally ill, children, those with thermally stressful occupations, and those with pre-existing illnesses also show an increased risk.

**Effects of Air Pollution**

Evidence suggests air pollutants play a role in exacerbating symptoms of both asthma and allergies. There is strong evidence relating two of the six major air pollutants, ozone and carbon monoxide, to the incidence of asthma and other respiratory conditions.

Some interventions have been proposed to reduce exposure to irritants and allergens in the effort to reduce acute respiratory events. During times of high pollutant counts, those with a history of asthma or other respiratory conditions are urged to limit exercise outdoors, stay indoors, keep windows and doors closed, use air conditioning with special filters, and thoroughly wash daily to remove allergens from the skin. Additionally, physically active individuals are encouraged to avoid training or prolonged physical activity along busy roads or on particularly hot, sunny days.

**Athletic Training Interventions**

Creating an infrastructure for action is recommended before instituting environmentally sustainable changes. An infrastructure for action is described as a basic plan to support and report environmental initiatives. At a minimum, this plan should include a method for gathering, tracking, reporting, and communicating data associated with green efforts. Some institutions have established teams to coordinate green initiatives. If this is true for your organization, partnering with this committee may allow expanded access to resources and data. If this type of team does not exist in your organization, consider proposing the idea to senior-level administration.

Once the infrastructure is in place, consider making a list of all environmentally friendly activities already practiced by members of the athletic training department, as well as those that could be improved. Then, prioritize efforts into those actions that need immediate attention versus those that are long-term goals.

Next, document the baseline costs, energy use, and wastes associated with current practices. To obtain this information, you may need to contact your facilities manager or conduct an energy audit. After baseline measures are obtained, this data should be tracked.