

CHAPTER – 5

Effects of Environment on Sports

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In this chapter, we describe the environmental problems facing athletes. Weather and climate affect sport badly. Each sport has suitable weather condition. Like soccer and cricket is played in sunny weather. Most of the time, the cricket game is stopped because of rainy weather. Soccer players feel hard to play in slippery ground.

Usually, outdoor games are affected by weather. Indoor games like badminton, table tennis, snooker, basketball, etc are not very much influenced. Here, these are some environment factors that affect the sports:

1. Pollution

Pollution is the introduction of contaminants into a natural environment that causes instability, disorder, harm or discomfort to the environment i.e. physical systems or living organisms. Pollution can take the form of chemical substances or energy, such as noise, heat, or light. Pollutants, the elements of pollution, can be foreign substances or energies, or naturally occurring; when naturally occurring, they are considered contaminants when they exceed natural levels.

Types of Pollution

There are many types of pollution discussed below:

Water Pollution

The important sources of water pollution are domestic wastes, industrial effluents and agricultural wastes. Other sources include oil spills, atmospheric deposition, marine dumping, radioactive waste, global warming and eutrophication. Among these, domestic waste (domestic sewage) and industrial waste are the most important sources contributing to water pollution.

Land Pollution

Land pollution basically is about contaminating the land surface of the Earth through dumping urban waste matter indiscriminately, dumping of industrial waste, mineral exploitation, and misusing the soil by harmful agricultural practices. Land pollution includes visible litter and waste along with the soil itself being polluted. The soil gets polluted by the chemicals in pesticides and herbicides used for agricultural purposes along with waste matter being littered in urban areas such as roads, parks, and streets.

Noise Pollution

Noise pollution is a type of energy pollution in which distracting, irritating, or damaging sounds are freely audible. As with other forms of energy pollution (such as heat and light pollution), noise pollution contaminants are not physical particles, but rather waves that interfere with naturally-occurring waves of a similar type in the same environment. Thus, the definition of noise pollution is open to debate, and there is no clear border as to which sounds may constitute noise pollution.

In the narrowest sense, sounds are considered noise pollution if they adversely affect wildlife, human activity, or are capable of damaging physical structures on a regular, repeating basis. In the broadest sense of the term, a sound may be considered noise pollution if it disturbs any natural process or causes human harm, even if the sound does not occur on a regular basis.

Thermal Pollution

Waste Heat - A pollutant as dangerous to waters as more tangible forms of waste. Human activity can change normal temperature: By altering environment of watercourse: Road building, logging, poundments, diverting flows for irrigation. Adding or removing heat. On national scale, an industrial cooling water is a first-order source of heat. Electro power generation uses 80% of cooling waters. Best single index of thermal pollution lies in projecting future electric power generation. Past experience has indicated that thermal pollution has not multiplied as fast as power generation because of improvements in thermal plant efficiency and development of hydropower.

Nuclear plants - waste even higher proportion of heat than fossil-fuel plants. Heat rejection is expected to increase nine fold by the year 2000. Problem is one of managing tremendous amounts of waste heat in a manner that will maintain or enhance physical, chemical and biological nature of our water resources.

Chemical Pollution

Chemical pollution is when certain compounds are left or disposed of in the environment. The chemicals disrupt the processes of the ecosystem. This causes the biological elements to be killed or harmed. One example is of us humans carrying toxic waste or chemicals across the ocean. This tends to result in a leak. This is how the chemicals get released. Another way is purposely.

We constantly are discarding things, we do not want in the ocean in forests and in deserts. This causes a chemical or a toxic substance. Causes are simply people. These noxious liquids are acetone cyanohydrins, carbon disulphide, cresols, naphthalene and tetraethyl lead.

In some parts of the world, the bodies of whales and dolphins washing ashore are so highly contaminated that they qualify as toxic waste and have to be specially disposed of. There are many different sources of chemical pollution, including:

- domestic sewage
- industrial discharges
- seepage from waste sites
- atmospheric fallout
- domestic run-off
- accidents and spills at sea
- operational discharges from oil rigs
- mining discharges and
- agricultural run-off.

Sound Pollution

Noise, by definition, is unwanted sound. What is pleasant to some ears may be extremely unpleasant to others, depending on a number of factors. The natural environment contains many sources of noise - wind, volcanoes, oceans, and animal sounds are all familiar intrusions accepted at various levels. Man-made noises - from machines, automobiles, trains, planes, explosives and firecrackers, etc. - are more contentious. Both kinds of noise affect sleep, hearing, communication, as well as mental and physical health.

Pollution is a noun derived from the verb pollute, meaning: to foul. It is now increasingly understood that pollution from noise is an important component of air pollution, which was previously understood as being limited to material pollution.

Noise is an inescapable by-product of the industrial environment, which is increasing with advances in industrialization and urbanization. Even in non-industrial areas, noise from such activities as printing, auto-repair, grinding, affects those living in the immediate surroundings.

Noise not only causes irritation or annoyance but also constricts the arteries, and increases the flow of adrenaline and forces the heart to work faster. Continuous noise causes an increase in the cholesterol level resulting in permanent constriction of blood vessels, making one prone to heart attacks and strokes. Health experts are of the opinion that excessive noise can also lead to neurosis and nervous breakdown.

Water Pollution

When toxic substances enter lakes, streams, rivers, oceans, and other water bodies, they get dissolved or lie suspended in water or get deposited on the bed.

This results in the pollution of water whereby the quality of the water deteriorates, affecting aquatic ecosystems. Pollutants can also seep down and affect the groundwater deposits.

Today, many people dump their garbage into streams, lakes, rivers, and seas, thus making water bodies the final resting place of cans, bottles, plastics, and other household products. The various substances that we use for keeping our houses clean add to water pollution as they contain harmful chemicals.

In the past, people mostly used soaps made from animal and vegetable fat for all types of washing. But most of today's cleaning products are synthetic detergents and come from the petrochemical industry. Most detergents and washing powders contain phosphates, which are used to soften the water among other things. These and other chemicals contained in washing powders affect the health of all forms of life in the water.

The effects of water pollution are not only devastating to people but also to animals, fish, and birds. Polluted water is unsuitable for drinking, recreation, agriculture, and industry. It diminishes the aesthetic quality of lakes and rivers. More seriously, contaminated water destroys aquatic life and reduces its reproductive ability. Eventually, it is a hazard to human health. Nobody can escape the effects of water pollution.

Air Pollution

Air pollution occurs when the air contains gases, dust, smoke or smell in harmful amounts. That is amounts which could be harmful to the health or comfort of humans and animals or which could cause damage to plants and materials.

'The presence in the atmosphere of one or more contaminants in such quality and for such duration as is injurious, or tends to be injurious, to human health or welfare, animal or plant life.' It is the pollution of air by the discharge of harmful substances. Air pollution can cause health problems and it can also damage the environment and property. It has caused thinning of the protective ozone layer of the atmosphere, which is leading to climate change.

Modernization and progress have led to air getting more and more polluted over the years. Industries, vehicles, increase in the population, and urbanization are some of the major factors responsible for air pollution. The following industries are among those that emit a great deal of pollutants into the air: thermal power plants, cement, steel, refineries, petro chemicals, and mines.

Air pollution results from a variety of causes, not all of which are within human control. Dust storms in desert areas and smoke from forest fires and grass fires contribute to chemical and particulate pollution of the air. The source of

pollution may be in one country but the impact of pollution may be felt elsewhere

The substances that cause air pollution are called pollutants.

Pollutants that are pumped into our atmosphere and directly pollute the air are called primary pollutants. Primary pollutant examples include carbon monoxide from car exhausts and sulfur dioxide from the combustion of coal.

Effects Air Pollution

Air pollution is responsible for major health effects. Every year, the health of countless people is ruined or endangered by air pollution. Many different chemicals in the air affect the human body in negative ways. Older people are highly vulnerable to diseases induced by air pollution. Those with heart or lung disorders are under additional risk. Children and infants are also at serious risk.

Because people are exposed to so many potentially dangerous pollutants, it is often hard to know exactly which pollutants are responsible for causing sickness. Because a mixture of different pollutants can intensify sickness, it is often difficult to isolate those pollutants that are at fault.

Many diseases could be caused by air pollution without their becoming apparent for a long time. Diseases such as lung cancer and heart disease may all eventually appear in people exposed to air pollution.

Causes of Air Pollution

When was the last time you stepped out of your house and inhaled clean and fresh air that really refreshed all your senses? Here's a look at some of the causes of air pollution that has resulted in the thick smog which most city dwellers are subjected to.

Air pollution is something that we cannot really ignore now-a-days. This is evident from the moment, we step out of our house and are greeted with black colored smog that hits us directly reminding us that breathing clean air is more of a distant dream. It is so easy for us to endlessly shout and talk wildly about the causes of air pollution and its ill effects, but little do we realize that each person is responsible for all the causes of air pollution and the situation that we face today.

Take a look around you at the miserable state of affairs. The thick smog that is seen in the morning hours is not really due to somebody else but rather due to each and every one of us. Here is a look at the causes of air pollution and how it can affect us if the matter is not taken care of at this stage itself.

Carbon Dioxide

Carbon dioxide is one the main pollutants that causes air pollution. This is because, although living beings do exhale carbon dioxide, this gas is harmful when emitted from other sources, which are caused due to human activity. An additional release of carbon dioxide happens due to various such activities.

Carbon dioxide gas is used in various industries such as the oil industry and the chemical industry. The manufacturing process of most products would require the use of this gas. There are various human activities that add to the increased proportions of carbon dioxide in the atmosphere.

The release of other harmful gases all adds to the state that we see today. Although carbon dioxide plays an important role in various other processes like photosynthesis, breathing an excess of the same also causes harmful effects towards one's health.

Carbon Monoxide

Carbon monoxide is another such gas which, although was present in the atmosphere earlier, is now considered to be a major pollutant. An excess of the same has a harmful effect on our system. There are many reasons why carbon monoxide can be released into the atmosphere as a result of human activities. This is also produced due to any fuel burning appliance and appliances such as gas water heaters, fireplaces, wood stoves, gas stoves, gas dryers which add to the increased proportion of this gas into the atmosphere.

Sulfur Dioxide

Sulfur dioxide is yet another harmful pollutant that causes air pollution. Sulfur dioxide is emitted largely to the excessive burning of fuels, petroleum refineries, chemical and coal burning power plants etc. Nitrogen dioxide when combined with sulfur dioxide can even cause a harmful reaction in the atmosphere that can cause bitter rain.

Nitrogen Dioxide

Nitrogen dioxide is one more gas that is emitted into the atmosphere as a result of various human activities. An excess of nitrogen dioxide mainly happens due to most power plants seen in major cities, the burning of fuels due to various motor vehicles and other such sources, whether industrial or commercial that cause the increase in the levels of nitrogen dioxide.

These and a number of other hazardous air pollutants are emitted with the various numbers of activities that we carry out during the day which are the main causes of air pollution.

How you can help to prevent Air Pollution:

- Carpool- This will help to reduce the number of vehicles on the already congested roads.
- Always keep your car tuned properly so that it remains in a good condition.
- Save energy- Try to use minimum amounts of natural gas and even electricity. Whenever possible, avoid the use of air conditioner and use a fan instead.
- Always buy recycled products.
- Reuse things such as paper and plastic bags, paper etc. This will contribute a lot towards reducing the effects of air pollution and global warming.
- Avoid the use of firecrackers. You don't really need it to express your feeling of happiness.
- Go in for water-based paints instead of varnishes.
- If you really cannot avoid using your car, plan your work systematically to reduce air pollution.

2. Drinking (Alcohol) and Athletic Performance

Alcohol may provide as much as 20 percent of calories in the diet of some drinkers. On the surface, alcohol consumption seems harmless and a normal part of the college experience. However, research overwhelmingly suggests that alcohol use and athleticism do not go hand in hand. Although it may not be realistic to eliminate the use of alcohol altogether, intensive efforts should be made in this direction because of the detrimental side effects listed below.

Dehydration

Alcohol is a powerful diuretic that can cause severe dehydration and staggering electrolyte imbalances. Severe dehydration can require several days to a week for full recovery. While dehydrated, an athlete is at greater risk for musculoskeletal injuries including: cramps, muscle pulls, and muscle strains. Also, dehydration can lead to severe brain impairment and even death when coupled with extreme temperatures and intense practices (most notable during two-a-days). Dehydration leads to decreased appetite and muscle wasting (you lose muscle mass). A loss of muscle mass results in a decrease in strength and performance. Decreased food consumption associated with appetite loss will result in fatigue and over training, which may further heighten injury risk.

Testosterone

Alcohol, when consumed in amounts typical with indulge drinkers (most common among college athletes), can dramatically decrease serum testosterone levels. Decreases in testosterone are associated with decreases in aggression, lean muscle mass, muscle recovery and overall athletic performance. This can also cause testicular shrinkage, breast enlargement, and decreased sperm development in males. In females, this may cause an increase in the production of estradiol, (a form of estrogen) which may increase the risk of breast cancer.

Performance

Alcohol will also impair reaction time and mental acuity for up to several days after consumption. The delayed reaction time and reduced mental acuity is of severe consequence to the athlete. Performance will be reduced and injury risk increased. Alcohol consumption will cause a decrease in hand-eye coordination and will impair judgment. Alcohol also interferes with lactic acid breakdown and can result in increased soreness after exercise. Alcohol can also cause nausea, vomiting, and drowsiness for days after consumption.

Fat Storage

Alcohol has seven calories per gram. Fat has nine calories per gram. Alcohol is stored much like fat in the body. Also, alcohol deaminates (destroys) amino acids and stores them as fat. Alcohol consumption, therefore, increases fat storage and adversely effects body composition (increase % body fat).

Powerful energy pathways (like glycolysis) are impaired and large amounts of lactic acid are produced, this result in decreased energy, decreased muscle recovery, and increased muscle soreness. Also, alcohol is usually consumed in addition to the person's normal food intake. Since alcohol has seven calories per gram these extra calories can add up really fast increasing the person's bodyweight and percent body fat.

Social

Alcohol acts as a central nervous system depressant and can impair judgment leading to injuries (both to other people and oneself). Alcohol use has been associated with numerous homicides, suicides, fatal auto accidents, and fights resulting in incarceration. Decreased impairment of judgment and decreased inhibition (ability to say, "No") has resulted in numerous cases of date rape and other gender related crimes.

Long-Term Use

Long-term alcohol use may lead to weakened heart muscle, impotency, altered brain and nerve functions, elevated triglycerides, fat deposits in the liver,

abnormalities in blood-clotting, pancreatitis, liver failure, vitamin deficiencies, skin abnormalities, and even **death!!!!**

As you can see, alcohol prevents athletes from reaching their ultimate playing potential. If one or more players on a team were to be in this condition during the game, this can have negative effects on the team as a whole. Every member of the team needs to play at his best at all times in order to have a team of champions. Do not let alcohol abuse be the reason; you do not play at your best.

Sleep

Alcohol has a detrimental effect on both the quality of sleep and on daytime attention. Sleep problems are common in alcoholics and also in some people who have completely stopped drinking. The effects of alcohol on sleep and attention are complicated to define and have considerable variability in individuals.

Alcohol seems to accelerate falling asleep, at least in subjects who do not tend to fall asleep immediately. The negative effects arise later and affect the quality and duration of sleep. Undisturbed progression of these two phases of sleep is essential for an individual's well being. Alcohol disturbs or interrupts the sequence of paradoxical sleep and light sleep. Thus, alcoholics and some people who have stopped drinking complain about disturbed and fragmented sleep, frightening dreams and sleeplessness.

The disturbing effects of alcohol last well into the night, even when alcohol has been eliminated. This is not a phenomenon specific to alcohol; it is seen with other calming products. Snoring is abnormally frequent after taking alcoholic drinks in the evening before going to bed. This is due to the relaxing effects of alcohol on the muscles.

Alcohol and Attention

The calming action of alcohol has variable degrees of effect on attention, reducing it and producing diminished performance. This action is particularly noticeable in subjects who lack sleep or who tend to be lethargic. Alcohol seems to reduce the ability of an individual to waken, even if consumed in moderate amounts, to the point where driving ability is affected, not just in the hours after consumption, but sometimes for days afterwards.

Negative effects of Alcohol in Sport

Although widely used as well as being considered socially acceptable, alcohol is still a drug and so will affect your body and your behavior. The long term effects of excessive alcohol consumptions can cause permanent damage to

organ tissue. The behavioral problems associated with alcohol consumption include but are not limited to: disinhibition, aggression, intolerance and rowdiness. None of these behaviors are conducive to a successful performance in sports.

The chemical effects of alcohol can affect your body physiologically. The fine motor movements which require mental acuteness, such as balance, are negatively affected by alcohol. After a night of average alcohol consumption, your anaerobic performance can decrease by anything up to 25%.

Alcohol also suppresses appetite, preventing you from adequately providing yourself with enough nutrition, and also dehydrates you. It also reduces the quality of your sleep meaning you are likely to feel tired and poorly rested rather than invigorated and ready to exercise. All these effects contribute to an unhealthy diet which, if the surface effects of alcohol aren't enough already, will damage your physical performance.

Alcohol effects on cardiovascular endurance

First, alcohol is a diuretic, meaning that it makes you urinate a lot more often than usual. When you are dehydrated, less blood is able to make its way to the working muscles. With reduced blood delivery comes less oxygen and nutrient delivery as well. The reduction in both oxygen and nutrients are what cause the pre-mature fatigue. It is recommended that you avoid heavy drinking for at least 72 hours prior to your fight or training session to ensure optimal performance.

Alcohol effects on strength

Alcohol has depressant effects on the central nervous system. The central nervous system also happens to play a major role when it comes to strength. When neural function is not optimal, maximal strength will be hugely inhibited. If alcohol consumption affects your strength in the weight room, you can rest assured that it is affecting the power of your strikes and your effectiveness on the mat as well. Strength, speed, power, agility – they all rely on the efficiency of the central nervous system.

Alcohol consumption also effects your hormone levels. Testosterone; which is a male sex hormone produced in the testes, plays a major role when it comes to strength and aggression. However, heavy alcohol consumption has been shown to decrease testosterone levels so you will get the opposite effect. Rather than being aggressive, a fighter with low testosterone levels will be more hesitant to engage in combat.

3. Smoking affect Sports Performance

Cigarettes have been shown to severely increase your risk of serious health problems in regular smokers and those who have been exposed to large amounts of smoke. Some of these health risks include cancer, emphysema and bronchitis. For this reason, it is not surprising that smoking can also have negative effects on athletic performance.

Causes of Smokers to be less fit than non-smokers

To achieve peak performance, your heart and lungs need oxygen-rich blood. When you inhale tobacco smoke, you introduce carbon monoxide into your system. (Carbon monoxide is just one of the 3,000 plus chemicals found in tobacco.) When carbon monoxide combines with hemoglobin, a substance in the red blood cells that enables the blood to carry oxygen through the body, the ability to transport oxygen is reduced. As a result, less oxygen is delivered to your body's cells and to your heart and lungs.

This decrease in oxygen will reduce your physical endurance, making it more difficult for you not only to do well in sports but also to do everyday things, such as walking up stairs.

Effects of Smoking on Physical Fitness

A number of physical endurance studies have shown that that smokers reach exhaustion before non-smokers do and can't run as far or as fast as non-smokers. Additional results noted that smokers:

- Obtained less benefit from physical training
- Had less muscular strength and flexibility
- Experienced disturbed sleep patterns
- Suffered from shortness of breath almost three times as often as non-smokers

Smoking also affects your bones and joints, putting you at increased risk for developing the following conditions:

- Hip fractures
- Low back pain

Smoking affects the physical performance

Young people who smoke experience the same negative effects of tobacco that adult smokers do. This includes not only lower physical endurance and performance compared to their non-smoking peers, but also shortness of breath, increased sports-related injuries, and poorer overall health.

Smoking among teens and pre-teens can also slow down their lung growth, impair lung function, and cause their hearts to beat faster than those of non-

smokers. In addition, young people who are heavy smokers experience coughing, and more frequent and severe respiratory illnesses.

Unfortunately for both adult and young smokers, many of the effects of smoking can be:

Lack of Blood Oxygen

When you exercise, your heart rate increases in order to meet the blood oxygen demands of your muscles. Generally, the faster your heart rate, the more oxygen your muscles need. Cigarettes contain carbon monoxide, which binds to the hemoglobin in your blood more effectively than even oxygen, which means that your muscles are unable to get the oxygen that they require during exercise. This makes your heart work even harder.

Narrowed Blood Vessels

In addition to reducing your body's oxygen intake, smoking also narrows your blood vessels. This occurrence makes pumping blood throughout your body a slower and more difficult process while playing sports. It also puts extra strain on your heart every time it pumps, because it has to work harder in order to supply your body with the blood oxygen it needs to function.

Increased Resting Heart Rate

Your resting heart rate is also increased from smoking. Your resting heart rate is how many beats per minute your heart produces when not being active. This number is greatly increased in smokers due to the extra work your heart must endure in order to meet all physiological demands of your body. This also means that when exercising, your heart rate could possibly rise to dangerous levels in order to meet the physical demands you're requesting of it.

Airway Resistance

Airway resistance refers to the rate at which air enters and exits your lungs. According to The Non-smokers Movement of Australia, one inhalation of a cigarette can increase this resistance by up to three times. Other factors such as tar build-up, inflamed mucous membranes and reduced air capacity will also increase airway resistance, making it more and more difficult to produce the oxygen your body needs when playing sports.

Lungs Performance

One of the main impacts of smoking on athletic performance is a decrease in lungs function. The lungs consist of delicate membranes which are able to filter oxygen out of the air and send it into the bloodstream. Oxygen is essential for muscle function, especially during exercise, when muscles demand more oxygen.

Smoking breaks down tiny hairs called cilia which are meant to prevent foreign bodies, such as dust and other particles, from interfering with respiration. Eventually the lungs become less efficient in drawing oxygen from the air, which can lead to asthma, bronchitis and other lung ailments. For athletes, this means a decrease in stamina and performance, as muscles that get inadequate oxygen become fatigued more quickly. Smokers also tend to suffer from shortness of breath more often than nonsmokers, as their muscles and heart demand more oxygen than their lungs are able to supply.

Injury

Another disadvantage of smoking for athletes is that it can lead to greater chance of injury. When the muscles, heart and brain do not receive enough oxygen, mental and physical acuity can drop. This can cause athletes to make poor decisions, use bad form when exercising, or even become dizzy or faint. Smoking can also reduce the strength of bones and inhibit the body's ability to repair skin, ligaments and tendons. This means that any injuries a smoker does sustain may take longer to heal, which means more time sitting on the bench.

4. High Altitude Problems

Different medical problems are encountered in sport at high altitudes and are made worse with rapid ascent. Performances at high altitudes are helped by reduced wind resistance and gravity, and worsened by the reduced oxygen pressure and by the dropping temperatures.

Problems encountered at high altitudes include the following:

Acute Mountain Sickness (AMS) (over 8,000 feet)

With non-specific symptoms such as headache, dizziness, nausea, vomiting, irritability and insomnia from hyperventilation and associated acid-base disturbances. It is usually a temporary condition affecting the first 2 or 3 days of a rapid ascent over 2000m. There is mild tachycardia and peripheral oedema. Symptomatic treatment is usually adequate (rest, hydration, analgesics), in

severe cases return to lower altitudes is advisable and the use of acetazolamide (125 mg bid) may help (beware diuretic effect on plasma volume).

High Altitude Pulmonary Oedema (HAPE) (over 10,000 feet)

A life threatening (non-cardiac) condition occurring in the first few days of an ascent and manifests with symptoms dyspnoea, blood-stained (pink) frothy sputum, coughing and chest discomfort/pain. Signs of tachycardia and tachypnoea, low grade fever and cyanosis. It is more common in the presence of inter-current cardio-respiratory conditions. O₂ desaturation (moderate to severe) with relative hypoventilation. Treatment is immediate descent, oxygen, nifedipine and dexamethasone.

High Altitude Cerebral Oedema (HACE) (above 12,000 feet)

A rare condition with severe headache, confusion, hallucination, impaired consciousness or coma. Signs of ataxia, focal neurological/visual signs, retinal haemorrhage. Usually associated with rapid ascents above 4000m. Moderate oxygen desaturation. Treatment is URGENT return to low altitude, oxygen and intravenous corticosteroids.

5. Smog affects Sports

The constituents of smog affect the human cardio-respiratory system and pose a health threat. Smog can experience acute symptoms ranging from eye irritation and shortness of breath to serious asthmatic attacks. Under extreme conditions, smog can cause mortality, especially in the case of the infirm and elderly.

Smog can also harm vegetation and likely leads to significant losses in the yields from forests and agricultural crops in affected areas.

Smog is a periodic phenomenon because specific meteorological conditions are required for it to accumulate near the ground.

There are basically two types of smog. One has sulfur dioxide as the main component and is the result of burning coal, oil, and other fossil fuels for heat and in manufacturing processes.

The other type, photochemical smog, is mainly produced by automobile emissions, power plants, and other industrial processes. It contains hydrocarbons, nitrogen dioxide, and carbon monoxide. Nitrogen dioxide and hydrocarbons react chemically when they are “cooked” by sunlight and convert oxygen into ozone.

Ozone is the major ingredient of photochemical smog. It is a colorless, strong, toxic gas. Most of what you see as smog is the particulate matter that is the

result of incomplete burning. However, what you cannot see does the most damage to your lungs.

Smog cause Health Problems

Breathing smoggy air can result in eye, nose, and throat irritation, acute and chronic bronchitis, asthma, headache, and malaise. The typical symptoms are burning, dying eyes and throat, cough, and shortness of breath. Smog can cause reduced lung function that may last for as long as a week after exposure.

Exercising in smoggy air can make these effects even worse. A spectator at an athletic event during a first-stage smog alert may not notice the effects. However, the athletes participating in the event may have as much as a 25 percent decrease in lung function. This results in poor performance, shortness of breath, burning in the chest, and a general feeling of malaise.

Children and older adults are usually more susceptible to the deleterious effects of smog, as are people with asthma, bronchitis, and other chronic lung and heart disease. For someone with asthma or bronchitis, the air pollution that necessitates an alert can bring on an attack. Chronic exposure to ozone, one of the primary components of automobile smog, has damaged lung structure in test animals. It is reasonable to assume the same results in human beings, although ethically it is unacceptable to do similar research on them.

In addition to the respiratory system, smog affects the cardiovascular system. This is primarily the result of breathing carbon monoxide. Because it is produced by automobiles, the levels are highest near expressways, in underground parking garages, and so forth. Carbon monoxide reduces the oxygen-carrying ability of the blood and therefore the amount of oxygen supplied to the heart.

Avoid from Smog

Exercise in the morning hours, when ozone levels are low. Also, exercise away from automobile traffic. Try to avoid driving during the heavy commuting times. Your automobile provides little protection from smog.

If there is smog alert where you live, minimize your driving as much as possible and stay indoors. This will reduce your exposure by as much as 50 percent as well as reduce your contribution to the problem. If you are susceptible to the effects of smog, it is a good idea to reduce your exposure. The automobile is very closely associated with smog, and for good reason. Approximately half of the photochemical smog is produced by automobiles.

Because photochemical smog depends on sunlight to produce ozone, smoggy conditions usually begin to increase around 1pm. They do not start to dissipate

until after 7 pm., when most commuters are home and the sun is going down. If you must commute during rush hours, be aware that you may return home with a headache. It could be the result of breathing smoggy air and not the result of stress.

6. Effects of Rain on Sports

Rain can affect temperature regulation and impact on safe sports participation in a variety of conditions. For warmer weather, rain may help with temperature regulation. For colder weather, rain will lower core body temperature. Rain affects an outside playing surface for an athlete. Conditions become slippery which increases the risk of injury due to falls, collisions from not being able to stop effectively and lack of control of sporting equipment.

Football, soccer, outdoor track, and baseball conditioning all have one thing in common: they are all sports that practice outdoors. Sometimes, rain is not a problem when it comes to outdoor practices. Even at the little league or boys and girls club levels, practices are not cancelled unless there is thunder and lightning.

But when the rain starts out as a slight drizzle and becomes a downpour that looks like the skies have been opened, no activities can stand a chance. Days of bad weather like the weather we've had during the past two weeks can prove to be a problem in the future for these teams that need all the practice they can get to be the best they can be.

The aftermath of bad rain can have a negative impact as much as the actual rain itself can. When fields are muddy and full of puddles, it is hard for the players to be able to play and train at their typical level. If you have been playing soccer for a long time, you know how to get your foot on the ball even in slippery grass. But every player is not that experienced. The same goes with football, even the most experienced player can not control a spiral when the pigskin has been through a puddle of mud and back. Luckily for the volleyball team, their practices are always indoors. The true effects of the rain on Oxon Hill's athletic performance will be more visible after the next few games are played.

Another weather factor that can impact your performance is rain. How rain impacts performance really depends on the amount of rain. If there is a light drizzle coming down on you while you run, then the cooling effect of the moisture on your body can actually help enhance your performance.

If the precipitation is more extreme, leading to conditions where you are getting totally drenched, then your performance is going to be hindered for a couple of reasons. First, your performance suffers during heavy rain because, whether

consciously or not, you run more cautiously in order to prevent slipping on the wet surface that you are running on. Also, heavy rain can get your clothing so wet that you can develop blisters very quickly which can become painful.

7. Effects of Temperature on Sports

Humans are **homeotherms** (homeo, “same,” and therm, “temperature”), which means our body temperature is regulated to remain close to a set point—in our case, 98.6°F or 37°C. If body temperature falls too far below or rises too far above this “normal” temperature, serious bodily injury can result, so the body must maintain precise control over its temperature to avoid a life-threatening situation.

Extreme Heat

When your body is subjected to prolonged extreme heat, you can suffer from heat sickness or stroke, exhaustion or dehydration. Extra caution should be taken in high heat situations, especially when exercising or training, because the body’s core temperature can rise when the mercury soars.

Scientists have found that in some cases, although it may be more uncomfortable to exercise in hot weather, heat may not necessarily lead to a decrease in power.

Extreme heat may cause a decrease in performance due to the body’s heat production and the heat gained by the environment. Adaptation and fluid replacement are imperative for optimal performance under these circumstances.

Humidity is also a factor. It can be just as disabling to those at sea level as decreased oxygen is for people at higher elevations. The highly water-vapor-saturated air can hinder the amount of internal heat that you release into the environment, thereby affecting the body’s ability to maintain its temperature. Humid air also shuts down the body’s main cooling mechanism, the evaporation of sweat on the skin.

Taking extra steps to cool the skin’s surface can increase comfort in hot and humid situations. For example, new lighter materials that wick sweat away from skin’s surface can help with cooling by facilitating better sweat evaporation. Physiologists continue to explore new methods of artificial cooling methods and how they can bolster performance in high temperature conditions.

Artificial cooling technologies may also have a great benefit for spinally-injured athletes, who have a higher risk of heat strain and illness.

Speculation that women experience thermoregulatory differences at various stages of the menstrual cycle has existed for some time. Some evidence suggests that female hormones may help to start the cooling process early during heat exposure, resulting in greater heat loss. Only recently have studies begun to examine such questions.

Extreme Cold

Very cold environments can also cause physiological stress to the body. The main priority in chilly climates is maintaining body heat to avoid conditions like hypothermia and frostbite. When coupled with low temperatures, factors like wind and moisture can make cold weather even more treacherous.

Physiologists study how the body reacts to extremely low temperatures, how people can best function in the cold, and what we can learn from animals that function well in these environments (like hibernators).

Like extreme heat, extreme cold has the potential to decrease human performance. A drop in core temperature can lead to extensive bodily damage. By generating heat during exercise, the body may be able to produce enough heat to delay. Additionally, hormones play a key role in helping to regulate the body's response to extreme cold.

And unlike extremely hot conditions, cold weather can sometimes be a preserving influence, slowing reactions down enough to pause extensive bodily damage for a period of time. For example, sudden exposure to extreme cold (like falling through the ice into freezing water) may cause "metabolic arrest". This slowing of the metabolism could act to preserve life until a drowning victim is resuscitated.

Hibernating animals adjust their physiology to increase the tolerance of their organs to very low temperatures. This behavior could lead to advances in various biomedical treatments, including human organ preservation.

8. Wind Effects Sports

Wind has a great effect on many sports, such as athletic events, football, baseball, golf, tennis and many others. Any game that involves objects flying through the air is affected by wind. In the simplest explanation, wind affects the direction the ball goes. In football and soccer, kickers must determine which way the wind is blowing, as it will carry the ball once it is in the air. Golf players need to determine wind direction, and how spin will interact with the ball as it nears the ground. Wind blowing towards the home plate in baseball is not as conducive for home runs.