

FIT SOCIETY®

PAGE

A Quarterly Publication of the
American College of Sports Medicine

WINTER ACTIVITIES AND SPORTS

get ready for outdoor winter play: prepare yourself for the cold

by Michel B. Ducharme, Ph.D.

Another cold winter is quickly approaching, and as we get older, many of us seem to have a more difficult time coping with the cold. As a result, winter is often not as appealing as it was in our youth when we might have spent hours playing on ice or in the snow. Of course, in those years we had no concern for the difficult driving conditions and other winter hazards. Just as it is wise to prepare your car for winter, you can again enjoy those winter activities by preparing yourself for the cold.

What to do when the mercury drops

There are a number of physiological differences between exercising in the cold as compared to exercising in a warmer climate. The most obvious effect is an increase in body heat loss due to the surrounding environment. This effect will be greatly enhanced by movement due to the wind chill, which is the combined cooling effect of cold air and wind. Normally, a thin layer of warm, still air insulates us from the outside temperature. This is the boundary layer. The blowing wind takes this protective layer away, reduces skin temperature, and makes us feel colder. It is particularly important to be aware of the effect of the wind chill on the

development of cold injuries. You can learn more about the new wind chill index introduced in North America at www.windchill.ec.gc.ca.

Exercising in the cold will also increase the energy requirement related to the cost of moving over snow in heavy clothing and boots. This higher energy requirement has been linked to an increased depletion of body fat stores as compared to performing a similar exercise in a warmer climate. Also, the drier cold air in winter is responsible for an increased water loss through breathing, which may lead to long-term dehydration unless water intake is increased.

Depending on the severity of the cold, a number of risks are inherent to outdoor winter activities. The most obvious is the risk of developing cold injuries. Local cold injuries develop mainly on the face and the extremities such as the fingers and toes. Non-freezing cold injuries (also called wet-type injuries) such as "chilblain" and "immersion foot" can develop on feet that are exposed to cool temperatures (32-50° F) and high humidity or

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Letter from the Editor

Welcome to the Winter 2001-2002 issue of the *ACSM Fit Society*® Page. For many of us, keeping warm in the winter months is the primary objective. For those who participate in outside activities in winter, keeping warm and dry is of critical concern. While there are numerous fun-filled outdoor activities during the winter months, exposure to the environment can present the body with unique challenges. Keeping warm and reducing the risk of cold-induced injuries takes sound thought and appropriate preparation. In this edition of the newsletter, sports medicine and exercise science experts examine Winter Activities and Sports. The features will provide keys to helping you prepare for exercise outdoors these winter months. Additionally, attention is given to exercise-induced asthma, a common condition encountered during outdoor exercise in winter. As always, we have regular features including the Athlete's Kitchen and our popular Question and Answer section.

We hope you enjoy this issue of the *ACSM Fit Society*® Page and find information that you can use to enhance your and your family's health and wellness. If you have any questions or comments please be sure to contact us.

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Q&A with ACSM

by Bryan W. Smith, M.D., Ph.D.

Q: My teenager has been diagnosed with exercise-induced asthma but gets jittery and her heart races when she takes the medicine. Is there another medicine to prevent exercise-induced asthma?

A: Your teenager's symptoms are side effects of a class of medicines called beta-agonists. Beta-agonists are the first-line medication for prevention and acute treatment of exercise-induced asthma. They relax smooth muscle in the airways and are more than 90 percent effective. However, there are side effects such as rapid heart beat, feeling nervous or restless, trembling, dizziness and nausea that can be a problem for some individuals. Another class of medications, called Khellin derivatives, is more than 70 percent effective in preventing exercise-induced asthma. These medicines, called Intal and Tilade, prevent airway inflammation, which most people experience in exercise-induced asthma. These medications have minimal side effects but provide no relief if the

exercise-induced asthma attack occurs. They are very good choices for young children.

Q: As the 2002 Winter Olympic games in Salt Lake City approach, the public is hearing more about athletes and blood doping. What is blood doping and why is it banned by the Olympics?

A: A drug such as erythropoietin which increases red blood cell volume or the actual process of blood doping, transfusing back one's own stored blood to increase red blood cell volume, fall under the banned performance drug listing because they meet two essential criteria. First, the drug must be shown to enhance performance. Blood doping enhances endurance exercise performance by increasing the oxygen-carrying capacity of the blood. Endurance athletes who blood dope derive an unfair, increased endurance advantage. Secondly, and just as important, the drug has been determined to

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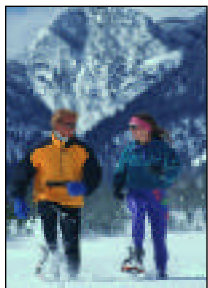
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cause physiological harm in the manner used to enhance performance. Several deaths have been documented from blood doping. Increasing one's red blood cell volume to dangerous levels can cause increased blood clotting and an increased risk for a stroke.

Q: I'm going downhill skiing this winter for the first time. Can I get frostbite? If so, how can I reduce the risk?

A: It is possible to get frostbite if you don't pay attention to clothing and equipment needs in cold outdoor activities such as downhill skiing. First, the more extreme the weather and wind chill, the greater the potential for frostbite or frostnip. When the temperature approaches zero, be very careful and consider abbreviating your activities. Do not wear tight or restrictive clothing or boots that restrict blood flow to the extremities. Eye protection is extremely important in downhill skiing to prevent frostbite of the cornea.

Feature



THINK LAYERS WHEN DRESSING FOR EXERCISE IN THE COLD

by Catherine O'Brien, M.S.

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Whether or not you get cold during outdoor activities depends on certain factors including environmental conditions, how much heat your body produces, and whether your body conserves or loses that heat. Humans have two primary physiological responses to cold: vasoconstriction and shivering. Vasoconstriction decreases blood flow to the skin, reducing the rate of heat loss. Shivering increases body heat production. Although these mechanisms maintain body temperature during brief, mild cold exposure, humans really depend on "behavioral thermoregulation," such as shelter, clothing and physical activity, to stay warm. By wearing clothing with appropriate insulation and wind protection, and by generating heat through physical activity, people can continue to exercise throughout the coldest months of the year.

Stay dry, stay warm

There are two important concepts to keep in mind when dressing for winter activities: layering and staying dry. Multiple layers of clothing allow adjustments for various environmental conditions and activity levels. For example, during strenuous activity, a single, thin layer of clothing may provide sufficient insulation, even in very cold weather. However, when exercise ceases, the decreased heat production and continued increased blood flow to the muscles and skin will hasten body cooling, requiring additional clothing layers for both insulation and wind protection.

An effective cold-weather clothing system can be designed using only three layers. A thin inner layer acts to wick moisture away from the skin, reducing evaporative heat loss. The primary insulation is provided by the middle layer, which also transfers moisture to the outer shell. A windproof and waterproof outer shell made of breathable material provides protection from wind

and rain while allowing moisture to escape.

The goal of a cold-weather clothing system is to create a "microenvironment" that conserves heat while providing adequate ventilation to prevent moisture accumulation. Its function depends on using fabrics that insulate well and do not readily absorb moisture. How well a material insulates relates to how much air is trapped within the fibers; for two fabrics that weigh the same, the thicker one will insulate better. Whether the material absorbs or transfers water is especially important, because wet clothing greatly reduces insulation. Because cotton and wool readily absorb moisture and become heavy and bulky when wet, they are poor choices for winter activities. Polyester and polypropylene fabrics are lightweight, do not readily absorb moisture, and wick sweat away from the skin to allow it to be evaporated from the outermost clothing layer. These fabrics are more appropriate for cold-weather clothing.

Although outer-shell garments may be made of materials described as "breathable," meaning they allow water vapor to pass through them, sweating can easily exceed the vapor transfer rate, resulting in the accumulation of moisture on the inside. For this reason, outer shells should not be worn during exercise unless it is raining, and should be designed with substantial venting, such as zippers in the armpit area. Maintaining dry clothing becomes more important the longer you are exposed to cold. For a mountaineer, wet clothing can lead to life-threatening hypothermia, but for a jogger who will return shortly to a hot shower, sweaty clothes may not be a problem.

Consider this

The same clothing principle (use layers and stay dry) apply to gloves, socks and hats, although there are some additional

considerations for proper protection in cold weather. Wearing a thin liner glove protects against contact frostbite, which can occur when bare hands touch cold objects, such as metal or stone. Care should be taken not to wear thick socks that may cause boots to fit too snugly and constrict blood flow. Also, even breathable footwear rarely keeps the feet dry, particularly when exercise increases foot perspiration. For prolonged outdoor activities, it may be necessary to change socks periodically. Finally, windblock fleece is an ideal material for hats or headbands, because it allows moisture evaporation while preventing wind penetration. Hats and gloves are good options for fine-tuning the amount of insulation required as body heat balance changes; they can easily be stowed in a pocket when not needed.

The Wind Chill Index is a valuable guide for alerting people to the increased cooling effect of wind versus air temperature alone. As the wind chill temperature falls, insulation and wind protection must be increased to protect against hypothermia. When the ambient air temperature falls below freezing, exposed skin will become more susceptible to frostbite, and precautions should be taken to protect skin from exposure. Sports participants in mountainous areas, such as skiers, are particularly susceptible to frostbite, because of increased wind speed at higher elevations and the additional effective wind created as they ski downhill. Facemasks and goggles are important protection in these sports.

Winter is a great time to be outside, and with proper clothing, there's no reason to be cold!

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Feature



LET IT SNOW, LET IT SNOW, LET IT SNOW — BUT BE AWARE OF WINTER HAZARDS

by Stephen G. Rice, M.D., Ph.D., M.P.H., FACSM and Ross Ellis, M.D.

The weather outside is delightful, and it is time to dust off your boots and mittens. Old Man Winter hopes you will get outdoors this year to enjoy some healthy seasonal pastimes. Cold air, ice and snow, often thought of as obstacles, instead represent a call to the outdoors, an exciting challenge, and an opportunity for fun. Certainly, an active lifestyle requires year-round mobility. Before we all jump in the bobsled, however, a few safety tips are always worth keeping in mind.

What to watch out for

First, one summer hazard also applies to winter: sun damage! Open-air winter enthusiasts must remember that reflected ultraviolet rays, especially when combined with harsh, dry wind, commonly burn the sensitive neck and chin areas. One tip is obvious: use sunscreen! Also helpful (guys love this one) is to postpone shaving and washing until after facing the elements, since hair and skin oils offer natural protection. Those with light-sensitive eyes should include polarized sunglasses or ski goggles among their “must have” winter activity equipment items.

The most common cold injury is frostbite. Literally, frostbite is localized freezing of a body part, which can result in the loss of that part. Prevention of frostbite relies mostly on common sense (dry, warm protection of vulnerable body parts) with knowledge of one important warning: the process of developing frostbite can be painless. The most vulnerable areas include the face, the fingers and the toes. The genitalia for men and nipples for women also need to be protected. Many individuals only notice frostbite when it's too late, when the skin is white, hard and

insensitive. Consequently, for prolonged outdoor activity, prevention of frostbite often requires a timed and deliberate warming ritual (like briefly placing your hands in your armpits every 20 or 30 minutes). Despite preventive efforts, if frostbite does occur, the cardinal rule is that re-warming should not be initiated if there is any chance of re-freezing. Also, treatment should not include rubbing the skin. Warmth, but not excessive (>109° F) warmth, is the definitive treatment. Professional medical help should be sought if the question of frostbite arises.

Another type of cold injury is hypothermia, or whole-body drop in temperature. The most common setting for this to occur is recreational hiking in the mountains where the combination of changing weather conditions and physical capabilities can place individuals in a high-threat setting. Pay close attention to both temperature and wind speed. The “wind-chill factor” effect can dramatically increase the risk of hypothermia by blowing away the pocket of warm air we each generate around ourselves as we function in the cold environment. Another hypothermia risk factor is an unexpected plunge into freezing water while snowmobiling, skiing, hiking, ice fishing or skating.

Hypothermia begins with intense shivering and the inability to perform complex tasks, then progresses to violent shivering, slurred speech, sluggish thinking and memory loss. The cessation of shivering is an ominous sign. Early recognition and prompt action can prevent progressing to loss of consciousness and other life-threatening complications. Transportation to a medical facility is recommended. Professional help is particularly useful in this case because the pro-

cess of re-warming can cause medical complications such as heart rhythm abnormalities.

Cold, dry air is notorious for causing the air passages in your lungs to constrict, causing a sensation of chest tightness or persistent dry cough. People who have asthma know all too well how this feels. But many people who have never been told they have asthma can be susceptible to these breathing issues when exerting themselves outside in winter. This is called exercise-induced bronchospasm (EIB) or exercise-induced asthma (EIA).

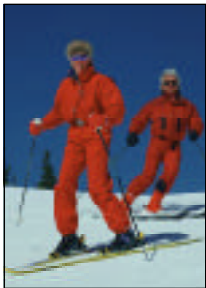
Prevention

Prevention of cold injury includes several approaches. Increased heat production is achieved by eating nutritious meals before activity and snacks at regular intervals during activity. Dehydration can be avoided through frequent water breaks (drinking even when not thirsty). Muscular activity generates body heat through exercise. The “layer principle” of clothing adapts well to outdoor sports. This means wearing three or more layers of insulation rather than one or two thick layers of clothing. The goals are to maintain the warm air pocket we generate close to our body (preventing chilling), to insulate our body from the cold air and to avoid overheating and sweating (which reduces the insulative value of clothing).

The preferred fabrics for winter sports are those that insulate well and continue to insulate even when wet. Wool, wool/synthetic blends, polypropylene, treated polyesters and hollow polyesters work well. Cotton should be avoided. Pile and down garments are less useful because

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Feature



PROPER USE AND SAFETY IMPORTANT FOR WINTER SPORTS EQUIPMENT

by Ann C. Snyder, Ph.D.

Winter sports usually involve activities on ice or snow and, for the most part, involve propelling the body much faster than it usually goes. Thus, equipment that allows for sufficient control at these speeds is important. Many different activities fall into the area of winter sports, but among the most popular are downhill and cross-country (or Nordic) skiing; snowboarding; figure, speed, and hockey skating; and snowshoeing.

The most important piece of equipment for most winter sports is the boot. Not only must the boot keep the foot warm and protected from snow and ice, but it must also be the point of control. The boot must be comfortable, yet snug, with no loss of circulation to the foot (*i.e.*, the foot is well supported, but relaxed). Toes should be able to move up and down, but not sideways. When boots are laced or snapped in place, there should be no heel movement. In order to have boots fit properly, adult boots are usually 1/2 to 1-1/2 sizes smaller than regular shoes, while children's boots are usually 1/2 size smaller. The reason for a smaller boot size is so the boot functions as an extension of the foot and leg, allowing the body control of the boot, and therefore, the ski or skate. Most other equipment is sport-specific.

Skating

The different activities within skating have different skate boots and blade lengths in response to the need for speed and maneuverability in the sport. For instance, long-track speed skaters (who skate on a 400-meter oval) have minimal direction changes and want to go as fast as possible, so their skates have long, flat blades with low-cut boots. Hockey players, however, need to maxi-

mize maneuverability and require maximal ankle support since their sport requires frequent changes of speed and direction. Hockey skates need to have short curved blades with high-cut boots. The demands on figure skaters are between those of hockey and speed skaters. Figure skates have high boots and medium-length blades. Short-track speed skaters (who skate 110-meter ovals on hockey rinks) have skates that have much shorter blades than long-track speed skaters and high-top boots due to the many required turns.

After the stick and puck, the other equipment needs in hockey are purely for protection. A helmet with a full-face guard should fit properly, with no wobble when the head is moved from side to side. Shoulder pads, pants, shin guards, elbow pads and gloves are all recommended for additional protection. Like hockey players, short-track speed skaters need to wear elbow and knee pads and a helmet to protect them when they fall.

Skiing and Snowboarding

Snowboarding is one of the newer winter sports, with a board like a short, fat ski. Freestyle boards are wide and flexible; alpine/racing boards are stiff, strong and narrow; and free-riding boards fall between the two in shape and size. The board has two bindings (one for each foot) and also a stomp (or non-skid) pad. Three styles of boots are generally available for snowboarding: soft boots, which are soft, flexible, allow plenty of ankle movement and use high-back buckle bindings; hard boots, which have sturdy plastic shells for greater control and use a mouse trap-type plate binding; and hybrid step-in boots which are soft boots that use a step-in binding. All snowboarders should use a leash, which

attaches the front leg to the front binding, preventing the board from sliding away should the boots come out of the bindings.

Downhill skiing requires skis, boots, bindings and poles. The higher end skis provide more stability at high speeds by dampening the vibration. However, if high speeds are not obtained, lower end skis are fine. An individual's body weight and ability determine bindings for downhill skis, so being honest on both accounts will insure proper bindings.

Cross-country (or Nordic) skiing has evolved into a number of different activities, including classic striding/touring and skating. Classic skis are generally longer and wider than skating skis. Traction during cross-country skiing is obtained by applying wax to the ski or using waxless skis. The binding and boot combination are dependent on the type of skiing, with classic boots generally low-cut and skating boots generally high-cut. The poles are used throughout the length of the stride. For classic skiing, the pole is shorter than for skate skiing, where the pole is planted further back with the skating stride.

Clothing for skiing and snowboarding should include polypropylene clothes next to the body, with layers of clothes on top of that. For downhill skiing and snowboarding, waterproof and wind-resistant clothing should be the outer layer. Waterproof gloves are also necessary, and a helmet is recommended (especially for snowboarding). Cross-country skiers should wear wind-resistant clothing, light gloves, and a hat (depending on the environmental conditions).

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Winter Play

(Continued from page 1)

wetness with inadequate protection. Chillblain is a moderate form of frostbite that usually develops in areas with little padding or on bony protuberances under pressure (e.g., from wet shoes). It would manifest itself as painful, reddish swelling that would feel hot after exposure to cold and be sensitive to pressure. Immersion foot (commonly called trench foot) develops after long exposure to mild coolness in a damp environment or in water. It causes neural and vascular damage to the tissues, which then become inflamed.

When the ambient temperature decreases below the freezing point, particularly below -13° , freezing injuries such as frostnip (very superficial and reversible freezing of the skin) or the more serious frostbite (deeper freezing of tissues that can affect muscles and bones and lead to gangrene and amputation) can develop mainly on the face, extremities and even genitals. Watch for any marked blanching of the skin, numbness, loss of tactile sensation, or sharp localized stinging as the first warning signs of frostbite.

Hypothermia is another cold injury that can develop when body heat loss surpasses the heat produced internally, a condition that will decrease deep body temperature below its normal value of

98.6° . Initially, the body will respond to this imbalance by initiating violent shivering in an effort to produce enough heat. If the extra heat is not sufficient, deep body temperature will further decrease and early symptoms of hypothermia will develop: slurred speech, mental confusion, disorientation, and poor coordination are accompanied by mood changes such as depression and introversion.

Preparation is key to enjoying winter season

To minimize the risks of developing cold injuries, proper clothing that protects not only against cold, but also against wind and moisture, is required. Ensure non-restrictive blood circulation to the extremities (avoid tight lacing), and stay hydrated, dehydration increases the risk of frostbite. Avoid the accumulation of sweat in clothing, a factor that will deteriorate the insulative properties of the clothing and promote body heat loss. Purchase properly designed clothing with vents that can control excess metabolic heat and sweat produced by the body during exercise. It is far more effective to control sweat accumulation into clothing by the proper use of vents than to rely on breathable fabrics, which are not effective below 14° .

The usual recommendation of dressing

in loose clothing layers still holds. As a rule of thumb, if you feel cool at the start of the activity, you will minimize sweating later on. But do not forget to warm up first. An important recommendation to avoid cold injuries is to listen to your body's warning signals; cold feet and hands and shivering are the first signs of negative body heat content.

Respiratory problems are common during exercise in the cold. This includes cold-induced bronchospasm, an increase in nasal airflow resistance due to the swelling of the nasal mucosa. It is particularly common in individuals susceptible to exercise-induced bronchospasm and in the elderly recovering from a heart attack. The combination of cold and exercise can also trigger an asthma attack in people with that medical condition, in addition to increased vulnerability to upper respiratory infections. The simple use of a scarf or a respiratory heat exchanger can decrease the occurrence and severity of those respiratory problems.

Preparing yourself for winter activities is a matter of awareness and common sense. Load up on carbohydrates, avoid alcohol and tobacco, stay hydrated and warm, put on your UV protection glasses, and enjoy the winter season.

Winter Hazards

(Continued from page 4)

their thickness produces excessive insulation, causing overheating and sweating. These garments are most useful during the warm-up and cool-down period. Wind protection is achieved by wearing a windproof outer jacket and pants. Using a waterproof fabric also helps, and hoods should have drawstrings.

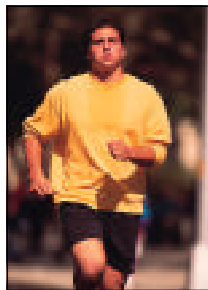
Keep your feet warm by wearing an inner sock made of polypropylene and an outer heavy woolen sock, especially when running in cold weather. Make sure your footwear is large enough to accommodate the extra pairs of socks. Dry feet are happy feet!

As with all sporting activities, warm-up and stretching prior to activity will help

you perform your activities more easily and with less chance of injury, such as muscle strains (pulls). When practical, conduct your warm-up exercises indoors before stepping out into the cold for your outdoor activity.

With knowledge, planning and proper protection, you can stay active and healthy all winter. Go for it!

ACSM Current Comment



EXERCISE-INDUCED ASTHMA

by Lester B. Mayers, M.D., and Kenneth W. Rundell, Ph.D., FACSM

ACSM Current Comments are statements written by leading health and fitness experts on behalf of the

American College of Sports Medicine. Current Comments identify and explain sports medicine and exercise science-related topics of interest to the public. The entire series can be found on the ACSM Web site at www.acsm.org.

The terms “exercise-induced asthma” (EIA) and “exercise-induced bronchospasm” (EIB) are used synonymously to describe acute lung airway narrowing occurring during and/or after physical activity. EIA is considered a more inclusive term. The bronchospastic response is thought to result from a summation of specific events, including smooth muscle contraction of the airway, bronchial mucosal edema, and mucus plug formation. The pathogenesis of these events is associated with the generation of inflammatory mediators including leukotrienes, prostaglandins, and other immune system factors from airway mast cells, epithelial cells, and macrophages interacting with in-situ hormonal components of the lungs.

The underlying factors governing the initiation of EIB are not clearly understood. Changes in airway temperature (cooling and rewarming), alterations in mucosal osmolarity (airway drying), and congestion of the bronchial arteries, resulting in bronchial mucosal vascular engorgement, have all been suggested as causes. At present, it seems that the bronchial blood flow/bronchial heat exchange relationship influences the development of airway narrowing following exercise-related overbreathing. EIB typically occurs after ventilation with large quantities of air, especially cold, dry air that contains environmental pollutants and/or allergens. The frequency and

severity of the reaction reflects the underlying allergic predisposition of the individual, the degree of overbreathing, coldness and/or dryness of inspired air, the burden of environmental agents inhaled, and the intensity of exercise. As a result, seasonal fluctuations in the bronchospastic response have been identified. After the occurrence of an EIB episode, approximately 50 percent of patients experience a relative refractory period lasting for up to two hours wherein another exercise challenge will fail to produce EIB or will produce a lesser reaction. Late asthmatic responses occurring six to eight hours after the initial bronchospasm also occur in about 50 percent of the EIB population, but are typically mild.

The method used to detect the EIB response critically affects the estimates of prevalence. Although the convenient peak flow meter is adequate for use with highly reactive and symptomatic individuals, it is relatively insensitive in mildly affected persons or elite athletes in whom small reductions in bronchial airflow may lead to a significant decrease in performance. In addition, peak flow measurements are critically effort-dependent, so this diagnostic technique may not be absolutely reliable. Spirometric measurements and maximal mid-expiratory flow rates are acceptably accurate and reproducible, as effort variation is detectable from the configuration of the tracings.

The intensity of the exercise challenge used to induce the EIB response is another important variable. Standard clinical protocols to provoke EIB apply exercise bouts of five to eight minutes at a level just below the lactate threshold (LT), 70-85 percent of maximal heart rate reserve. This work rate has been selected because the subject may not complete the exercise challenge at a higher intensity, and a more severe test promotes

catecholamine release producing bronchodilation. A major problem with this standard protocol is identifying the LT for an individual, given the wide range of fitness levels in the general population. With elite athletes, sub-LT exercise is typically not sufficient to produce EIB. Additionally, laboratory-based exercise challenges are rarely performed in the environmental circumstances (e.g. cold, dry air) that produced the symptoms suggesting EIB.

As a result, the prevalence of EIB is reported to be ten to 50 percent, depending upon the study population, exercise protocol, detection measurement and environmental conditions. For the general population, an incidence of 10 to 15 percent is a reasonable figure. Most moderately to severely allergic subjects will demonstrate some level of EIB. Recent studies show the frequency to be 20 to 75 percent (depending upon the sport) among elite cold weather athletes. The majority (73 percent) of the athletes who met diagnostic criteria during “field evaluations” did not meet the criteria when retested using the standard laboratory protocol.

Medications to modify or prevent the EIB response include bronchodilators, anti-inflammatory compounds such as inhaled cromolyn, nedocromil, and corticosteroids, and a variety of medications including antihistamines, calcium channel blockers, and inhaled heparin. More recently, immune system modifiers are available, including leukotriene or neurokinin receptor inhibitors and lipoxygenase inhibitors.

An important question to study in view of the wide use of pharmacological prophylaxis by elite winter sports athletes is whether or not bronchospasm is a natural phenomenon that serves as a physiological mechanism to protect the lower

(Continued on page 9, see Asthma)

The Athlete's Kitchen



EXERCISE & WEIGHT CONTROL: MYTHS, TRUTHS AND GENDER DIFFERENCES?

by Nancy Clark, M.S., R.D., FACSM

"I'm training for a marathon with hopes of losing weight..."

"Why does my husband shed pounds when he starts an exercise program and I don't?"

"Does exercising with an empty stomach burn more fat?"

Active people commonly link exercise with weight loss. They believe the more they exercise, the more weight they'll lose. Yet that is not always the case. Many exercisers end up discouraged when they fail to lose weight despite regular workouts. Women in particular commonly complain about lack of results from their exercise program. Men, in comparison, seem to simply add on exercise, (subtract beer and fatty foods) and lose weight with ease.

If you are feeling frustrated by a lack of weight loss from your current exercise program, keep reading. This article might help you understand some myths about exercise and weight control.

Myth: Exercise kills your appetite.

Exercise may temporarily kill your appetite, but hunger will catch up with you within one to two hours. Appetite is partly regulated by temperature control. Hence, if you feel hot after a hard workout, you may experience a temporary drop in appetite. However, if you are chilled, such as after swimming, you may feel ravenous.

The effect of exercise on appetite varies according to gender. Regularly exercising male rats tend to lose their appetite and drop weight; female rats get a big-

ger appetite, eat more and maintain weight. Limited human research supports those findings. Post-exercise appetite also varies according to body fatness. Studies with obese women who added moderate exercise to their sedentary lifestyle indicate they did not eat more, hence they lost weight. Diet and exercise studies with men suggest the fatter they were, the more weight they lost (in comparison to their less-fat peers) because they failed to compensate for the calories burned during exercise.

Myth: The more you exercise, the more weight you'll lose.

Often, the more you exercise, the hungrier you get and the more you eat. For example, you may spend an hour on the StairMaster burning off 500 calories, and then devour twelve Oreos (600 calories) in less than six minutes. After a hard workout, your body is hungry. Your soul may also be hungry for a reward. After all, you now deserve a treat for having survived the workout, right?

Men who add on exercise are likely to lose more weight than women. In one study with previously sedentary, normal weight men and women who participated in an 18-month marathon training program, the men increased their intake by about 500 calories per day; the women increased by only 60 calories, despite having added on 50 miles/week of running. The men lost about five pounds of fat, the women none. Similarly, other studies suggest normal-weight women fail to lose fat when they add on exercise.

The effects of exercise on weight loss are complex and unclear. Nature seems to efficiently replenish the fat stores of lean athletes and prevent them from wasting away. Lean female athletes, in particu-

lar, struggle harder than do males to lose body fat and maintain an even leaner physique. In terms of evolution, nature wants women to have fat and be fertile; men are supposed to be lean hunters.

Myth: You'll lose weight fastest if you exercise at low intensity (i.e., do "fat-burning exercise") on an empty stomach.

"Fat-burning exercise," a low intensity workout that burns proportionally more fat than carbohydrates (glycogen), is deemed optimal for weight loss. Aerobic exercisers commonly believe they will lose more body fat if they exercise before eating, because fat will be the predominant fuel. Wrong. For fat/weight control, you need to look at the whole day's calorie balance, not just what you burn during exercise. If, over the course of the whole day, you create a calorie deficit by burning off more calories than you eat, you'll lose body fat. However, if you consume more calories than you expend (as can easily happen if overeating at night), you'll end up gaining fat.

The biggest benefits of low-impact, fat-burning exercise are 1) you are less likely to get injured, and 2) you are able to exercise for longer and thereby burn more total calories. The truth is, intense exercise may actually contribute to lower percent body fat. Research on 1,366 women and 1,257 men suggests those who did high-intensity exercise tended to have less body fat than those who did lower intensity "fat-burning" exercise.

Myth: Injured athletes gain weight due to lack of exercise.

Weight gained during injury is generally due to overeating, not underexercising.

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Sports Equipment

(Continued from page 5)

Snowshoeing

Snowshoeing is increasing in popularity, which has led to many advances in the sport. Snowshoes are now made of wood, aluminum and plastic frames. Frame design, webbing, size, weight and toe turnup are all important factors in determining proper snowshoes. Bindings connect the boot to the snowshoe and must allow the heel to rise and the foot to hinge in the up-and-down direction with the snowshoe. To assist with both as-

cents and descents, some kind of traction device must be attached to the bottom of the snowshoe. As with skiing, poles can assist with snowshoeing. Recommended clothing for snowshoeing is similar to that of skiing and depends on environmental conditions.

Winter sports can be very fast and exciting, but most equipment is quite expensive. Proper fit is crucial not only for safety purposes, but also to reduce ex-

penses. Shortcuts cannot be taken in boots, blades, skis, boards or helmets, as injury may occur. Magazines generally review equipment and specialty stores will have knowledgeable salespeople who can help with correct sizing and purchases. Leagues and specialty stores often organize trade-ins and swap programs so that appropriate equipment can be obtained at reduced prices, and winter sports may be performed safely and enjoyably.

Asthma

(Continued from page 7)

airways from the noxious insult of exposure to large volumes of cold dry air. Similar airway-narrowing is a common response to inhalation of such irritant gases as sulfur dioxide (SO₂) and nitrogen dioxide (NO₂), both of which can

occur in high concentrations in ice rinks.

For most asthmatic patients, and the majority of people who do not suffer clinical asthma but exhibit EIB, individualized prophylactic treatment is safe and effective, allowing full participation in sports

activities. In addition, proper timing of preparticipation warmup exercise enables some athletes to utilize the refractory period to attenuate the bronchospastic response during exercise and achieve optimal performance.

Athlete's Kitchen

(Continued from page 8)

Overeating happens when injured athletes eat lumber-jack portions, regardless of their activity level, and ignore the decreased appetite that accompanies decreased exercise. Injured athletes who sit around bored, lonely and depressed may also find comfort in food (despite discomfort with weight gain).

When injured, some very thin athletes migrate to their natural weight, the weight they would naturally maintain without rigorous exercise and restricted calories. Although they may perceive this as "get-

ting fat," they may be simply "catching up" and attaining the physique appropriate for their genetic code.

The bottom line: nature does an excellent job of defending a healthy weight despite adverse conditions. Given that extreme amounts of exercise can be interpreted as a famine (due to the high calorie deficit), "food efficiency" may develop in people who maintain a chronic energy deficit. Women are especially protected by nature and fail to lose as much fat as do men (who are supposed

to be leaner so they can more efficiently hunt and gather food).

If you are exercising to lose weight, I encourage you to separate exercise and weight. Yes, you should exercise for health, fitness, stress relief and, most importantly, for enjoyment. (After all, the "E" in exercise stands for enjoyment.) I discourage you from exercising to burn off calories. Under those conditions, exercise feels like punishment for having excess body fat. Grueling exercise fails to get integrated into a life-long, health promotion plan.