

March 8, 2017



Competition-Coaching Introduction L2T

Step 8:

Safety and Risk Management



Reference Material
for Dryland Workshop



PARTNERS IN COACH EDUCATION

The National Coaching Certification Program is a collaborative program of the Government of Canada, provincial/territorial governments, national/provincial/territorial sport organizations, and the Coaching Association of Canada.



The programs of this organization are funded in part by Sport Canada.



Canadian Heritage
Sport Canada

Patrimoine
canadien

Table of content

8.1 Sport Safety

- 8.1.1 Roller Skiing
- 8.1.2 Bicycling
- 8.1.3 Heat and Humidity
- 8.1.4 Head Injuries and Concussions
- 8.1.5 Exercising With Asthma
- 8.1.6 Cold Weather and Competitions
- 8.1.7 Backcountry Skiing
- 8.1.8 Eye Protection

This section on Safety and Risk Management complements the information provided in section 6 of the Introduction to Community Coaching Reference Material, and is directed primarily at supporting you, as a developing coach, in your role working with children in the Learning to Train stage of development.

This section is also intended to provide you with materials that will assist you if you choose to work with athletes in the Training to Train stage and beyond.

8.1 Sport Safety

By its very nature, physical activity can present some risk of injury and one of your key responsibilities as a coach is to manage the potential risks that present themselves during practice, competition or special activity.

Material in this section highlights some of the specific areas of risk that are a concern at this stage in an athlete's development.

8.1.1 Roller Skiing

Roller skiing is an integral part of the sport of cross-country skiing, providing one of the most enjoyable and highly specific forms of ski training that can be practised in the dryland training season. Roller skiing is also a sporting activity that is characterized by important legal and safety issues:

- ❑ The effective practice of roller skiing requires extended stretches of relatively smooth pavement. There are few venues where such conditions have been created exclusively or primarily for the use of roller skiers. Therefore, most roller skiing takes place on public roads and highways. In some municipalities or provinces, this practice is limited or prohibited by legislation.
- ❑ Several factors contribute to the existence of a considerable risk of injury during roller skiing. These include the relative instability of roller ski wheels, the lack of brakes, a hard road surface, the exposure to motor vehicles travelling at relatively high speeds and the inexperience of either roller skiing participants or motor vehicle drivers in sharing the road.

Cross Country Canada exercises leadership in this area in the form of a policy document that serves to:

- ❑ help manage the risk to its membership;
- ❑ reduce the exposure of CCC, its member Divisions and registered clubs to legal liability for related accidents, as identified in CCC's insurance contract; and
- ❑ contribute to the adherence by roller skiers to prudent and responsible practices that will gain the respect of the Canadian public, thereby protecting the right to roller ski on public roads wherever such practices are permitted.

CCC Roller Skiing Policy

- ❑ **Aim.** The aim of this policy is to state the CCC approach to managing these issues and to establish guidelines for procedures to be followed by CCC members engaged in roller skiing.
- ❑ **Authority.** This policy is developed by the National Ski Team Committee (NSTC) and promulgated under the authority of the Board.
- ❑ **Definition.** For the purposes of this policy, roller skiing includes all dryland training conducted on roller skis, roller blades (in-line skates) and scooters.
- ❑ **General Guidelines.** The following guidelines describe the procedures to be adopted by CCC members at all times when roller skiing:
 - ✓ Think safety first.
 - ✓ It is the responsibility of the individual to ensure that he/she possesses the skills to roller ski safely in the selected terrain. It is also the responsibility of the individual to ski in a safe, non-hazardous manner.
 - ✓ Choose terrain that matches ability. Avoid areas with steep downhill, stop signs at the bottom of hills, railroad crossings, potholes or other hazards.
 - ✓ Wear protective clothing. A hard-shell, regulation helmet (ANSI, CSA or Snell) is mandatory. Inexperienced roller skiers should also wear leather-palmed gloves, wrist guards, knee pads and elbow pads.
 - ✓ Ski under control. If in doubt, walk down steep hills or intentionally fall before reaching an unsafe speed.
 - ✓ Do not wear “iPods” or other electronic devices that will decrease your ability to hear and react to any situation that may occur.
- ❑ **Roller Skiing on Public Roads.** The following guidelines describe the procedures to be adopted by CCC members when roller skiing on roads that are also being used by automobile traffic:
 - ✓ If roller skiing must be conducted on public roads, select roads with minimal traffic.
Roads with wide shoulders are preferable.
 - ✓ Refrain from roller skiing where the practice is prohibited by law. In such situations, work through your Club or Division to negotiate road closures for periods set aside for roller ski training.
 - ✓ Roller ski when traffic is light and visibility is good. Do not ski when visibility is poor.
 - ✓ Obey the rules of the road. Skiers must adhere to traffic signals and posted signs.
 - ✓ Where possible, conduct technique sessions in areas with controlled vehicle access.
 - ✓ For time trials, competitions or similar events, on public roads where traffic is permitted during the event, put out large signs that say: “Caution – Roller Skiers Training. Drive Carefully” or similar warnings. If a large event is scheduled, it is desirable also to post marshals to warn motorists of the activity.
 - ✓ Wear clothing that is light or bright in colour, in order to be more visible to motorists. The use of fluorescent clothing or vests is endorsed as an extra step that should be considered.

March 8, 2017

- ✓ Roller ski only in a single file and on the right side of the road travelling with the traffic, like a bicycle, or as required by local regulations.
- ✓ Scan the road for traffic and maintain situational awareness at all times, creating time to react to traffic as it approaches.
- ✓ When being passed by a car, yield as much room as possible. If practising skating technique, switch to classic as a vehicle passes so as to take less room on the road.
- ✓ Be polite to drivers. A good relationship and good reputation with those with whom roller skiers must share the road is an important element in ensuring safety and protecting the privilege to use roads and highways for this purpose.

❑ **Insurance Implications.** The adoption by CCC of this policy has important insurance implications. Lack of compliance with the guidelines contained in this policy on the part of CCC members engaged in roller skiing may result in a breach of the CCC insurance policy and liability coverage may be denied.

8.1.2 Bicycling

Bicycling is a popular form of physical activity and transport. Between 86% and 90% of Canadian children aged 10 to 14 are cyclists. Once your cross-country ski program begins to include dryland activities (practice sessions, camps, etc.), it is inevitable that you will have to consider this form of off-season exercise and how you want to deal with it. Knowing how to incorporate cycling into your program SAFELY is therefore essential information for every cross-country ski coach.

Incidents causing injury are understandable, predictable and up to 90% preventable. The most frequent causes of bicycle incidents causing injury are:

- ❑ Loss of control – due to hitting a rut, bump or loose gravel, riding double, stunt riding, a foot slipping from the pedal.
- ❑ Mechanical problems – brake failure, changing gears, chain slippage, loose pedals.
- ❑ Entanglement – feet, loose clothing, packages, etc. get caught in wheels or chains.
- ❑ Cyclist ignorance – of safety practices and traffic laws.

It is important for you and the other administrators/coaches working with your program to have a plan as to when and how you want to include bicycling activities. Together you should determine what the safety rules will be, which roads are acceptable to use, which roads are out-of-bounds, etc.

Insurance Implications

It is also important to learn the limitations of your club's CCC liability insurance policy. Does it include "road cycling" for training purposes and for recreational purposes? Does the insurance coverage extend to off-the-road "mountain biking" training activities and off-the-road "mountain biking" recreational activities? Does it matter which type of bike you use in these different scenarios? Each year, before undertaking cycling activities, you should check with your club officials to determine what restrictions apply. Lack of compliance with standard safety precautions and the insurance policy guidelines may result in a

YOUR BIKE INJURY FACT SHEET

- Over 100 Canadians die each year from bike injuries. Children aged five to 14 account for about half of these deaths.
- Every year, over 50,000 children are seriously injured in bike related mishaps.
- Survivors with brain injury may suffer seizures, intellectual and memory impairment and personality changes.
- The human skull can be shattered by an impact of 7-10 km/hr, and children's skulls are more vulnerable than adults.
- A fall from 60 cm (two feet) can cause permanent brain damage; a fall at a speed of 20 km/hr can result in death.
- Head injuries account for 75% of all deaths from bike injuries.
- 85% of bike injuries **do not** involve a motor vehicle.
- 85% of incidents between cyclists and cars are due to rider error.
- Only 2-11% of bicycle riders always wear a helmet.
- Wearing a bicycle helmet reduces the risk of head injury by 85% and of brain injury by 88%.**

8.1.3 Heat and Humidity

As your athletes get older and their fitness requirements increase, your ski program will extend further into the summer months. Knowing how to exercise safely during that period should therefore become an important part of the knowledge base of coaches working with cross- country ski programs for athletes in the Learning to Train stage and older.

The information contained in this section will help you implement training and competition practices that will reduce the risk of injuries related to heat and humidity.

The Challenge of Exercising in the Heat

- During exercise, the muscles produce heat. This heat must be dissipated or the body runs the risk of overheating. Overheating can result in serious, potentially life-threatening injuries.

March 8, 2017

- ❑ Sweating is one of the heat-dissipating mechanisms of the body. When sweat evaporates, it cools off the body.
- ❑ Most sport activities lead to heat production and sweating. Evaporation of sweat works best when the air is dry. In moist, damp air, sweat cannot evaporate easily, and cooling off is harder.
- ❑ If the air temperature is high during vigorous activity, athletes can lose a significant amount of water through sweating.
- ❑ High temperatures and high relative humidity make it hard for the body to dissipate heat; heavy sweating occurs, but the water loss does not help cool off the body. Under these conditions, athletes run the risk of overheating.
- ❑ Water loss as a result of heavy sweating can lead to dehydration. Dehydration can reduce performance, decrease the body's ability to dissipate heat and endanger health.
- ❑ During exercise in the heat, adequate hydration is a must. Athletes must drink water whenever the risk of dehydration is present.
- ❑ Thirst is not a good indicator of a need for water. In fact, dehydration has already started if an athlete feels thirsty.
- ❑ In most exercise conditions, the rate at which athletes lose water exceeds the rate at which they can absorb it by drinking. Exercise in a hot environment accentuates this.
- ❑ Athletes therefore need to drink fluids before they are thirsty.
- ❑ Because their sweating mechanism is not fully developed, children run a higher risk of overheating when exercising in the heat. In addition, children tend to not drink enough during exercise, especially if the drink is not flavoured.

Steps to Take to Avoid Heat Injuries

- ❑ Give athletes enough time to get used to the environment they will face in competition.
- ❑ Insisting on heat acclimatization may mean not entering competitions or adjusting duration and intensity of training if athletes cannot train in a similar climate for approximately two weeks beforehand.
- ❑ To protect athletes (especially young children) from the potentially harmful effects of ultraviolet (UV) rays, have them do the following:
 - ✓ Wear clothes that cover the upper part of the body, the neck, the arms and the legs.
 - ✓ Use sun screen lotion (protection factor of 30 or more) on exposed skin, including the face and hands.
 - ✓ Avoid exposing their body to the sun without effective protection when the UV index is high.
 - ✓ If possible, train in the shade.
- ❑ Before exercise, athletes should drink 400 to 600 ml of fluid.
- ❑ During exercise, athletes should drink 150 to 250 ml of fluid every 15 minutes. Remind athletes to drink, lead by example, and never restrict athletes from drinking during

March 8, 2017

a practice or competition.

- ❑ After exercise, athletes should re-hydrate by drinking as much fluid as thirst dictates; athletes may have to force themselves to drink.
- ❑ Beverages should be cool (8° to 10°C) and not excessively sweet (children prefer flavoured sport drinks, and using them encourages children to drink).
- ❑ Tell athletes to bring a personal water bottle with cold fluids to each practice or competition; inform parents about the importance of hydration; make sure each bottle is clean and well identified.
- ❑ Tell athletes to monitor their hydration level by checking their urine. If it is dark, if there is not much of it, and if it has a strong smell, athletes are probably dehydrated and should force themselves to drink.

Note: Pay particular attention to these steps during the first few hot days of spring or summer, when athletes are not yet acclimated to hot and humid weather.

The Humidex

- ❑ The humidex is a useful guide to assessing the risk of exercising in hot and humid conditions.
- ❑ The humidex describes how hot and humid weather feels to the average person.
- ❑ The humidex combines the temperature and humidity into one number to reflect the perceived temperature.
- ❑ Because it takes into account both heat and humidity, the humidex provides useful information about the risks of exercising in the heat.

March 8, 2017

- ❑ The table below shows the humidex value for various air temperatures and levels of relative humidity. For instance, if the air temperature is 25°C and the relative humidity is 70%, the humidex is 32°C. This means that the sensation of heat when it is 25°C and the relative humidity is 70% is about the same as when it is 32°C and the air is dry (20% relative humidity).

← Relative Humidity (%) →

	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
20						20	20	21	22	22	23	24	24	25	25	26	27	27
21						21	22	22	23	24	24	25	26	26	27	28	29	29
22					22	22	23	24	25	25	26	27	27	28	29	30	30	31
23					23	24	24	25	26	27	28	28	29	30	31	31	32	33
24					24	25	26	27	28	28	29	30	31	32	33	33	34	35
25				25	26	26	27	28	29	30	31	32	33	33	34	35	36	37
26				26	27	28	29	30	31	32	33	33	34	35	36	37	38	39
27				27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
28			28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
29			29	30	31	32	33	35	36	37	38	39	40	41	42	43	45	46
30			30	31	33	34	35	36	37	39	40	41	42	43	44	46	47	48
31			32	33	34	35	37	38	39	40	42	43	44	45	47	48	49	50
32		32	33	34	36	37	38	40	41	42	44	45	46	48	49	50	51	53
33		33	34	36	37	39	40	41	43	44	46	47	48	50	51	53	54	55
34		34	36	37	39	40	42	43	45	46	48	49	51	52	53	55	56	58
35		36	37	39	40	42	43	45	47	48	50	51	53	54	56	57	59	
36		37	39	40	42	44	45	47	49	50	52	53	55	57	58	60		
37	37	38	40	42	44	45	47	49	51	52	54	56	58	59				
38	38	40	42	43	45	47	49	51	53	54	56	58	60					
39	39	41	43	45	47	49	51	53	55	57	59							
40	41	43	45	47	49	51	53	55	57	59								

Guidelines for Exercising at Different Humidex Values

The guidelines below are provided for a heat-acclimated, well-hydrated person. If the humidex is above 30°C, and especially if it exceeds 35°C:

- ❑ Tell athletes to bring extra water or sport drinks, ensure there will be access to water during the practice or competition, and bring a big jug of fluids.
- ❑ Tell athletes to dress in loosely fitting, lightweight, light-coloured clothes.
- ❑ Plan for low-intensity activities.
- ❑ Plan for shorter work bouts, with frequent and longer pauses.

March 8, 2017

- Schedule practices early in the morning or during the evening; avoid the hours between 10 AM and 6 PM.
- Consider changing the location of the practice to a shaded area, or ask athletes to bring umbrellas to create shade during breaks.
- Consider exercising indoors, in a facility with air conditioning.
- Consider alternatives to physical exercise.

Humidex Value	Discomfort at Rest	Risk of Overheating During Exercise
Below 24°C	None	Low to moderate
25 to 29°C	None	Moderate
30 to 39°C	Some	High – Children should be monitored closely
40 to 45°C	Great	Very high – Exercise is not advised for children, older people, or individuals with a poor fitness level
Above 45°C	Great risk of overheating even at rest	Extreme – Exercise is not advised for any athlete

8.1.4 Head Injuries and Concussions

Head injuries and concussions can occur in any sport, either in practice sessions or during competitions. Because of the potentially serious consequences of injuries to the head, coaches must take certain safety precautions to help prevent such injuries and enforce strict safety procedures if injuries do occur.

The information contained in this section is not designed to train coaches on how to implement a medical treatment or to offer medical advice if a concussion occurs. Rather, its purpose is to provide some recommendations on *how to manage situations involving head injuries in a responsible manner*. It is important to note that there is currently a lack of consensus in the medical community regarding precise grading scales and criteria for returning to training or competition following a concussion. It is recommended that all coaches complete the coaching association of Canada's '**Making Head Way**' online e-learning module to supplement the information found in this section. The module can be found [here](#). You will require a NCCP # to complete the module and you should expect to spend 60-90 minutes completing a module. Each completed module will be recorded on your coaching transcript as professional development.

What Is a Concussion?

A concussion is an injury to the brain that results from a blow to the head or to another part of the body that allows the transmission of impact forces to the head. A concussion manifests itself as a temporary alteration in mental state; it may also be accompanied by physical symptoms.

Some Common Causes of Concussions

The situations that may result in head injuries vary greatly from sport to sport. Producing a comprehensive list of possible causes is therefore difficult. However, some common causes include:

- Direct blows to the head, face, jaw or neck.
- Collisions from the blind side or hits from behind.
- Hard fall on the buttocks or a whiplash effect.
- Poor quality of protective sport equipment (shock absorption), failure to wear protective head equipment or improper adjustment of such equipment.
- The environment (e.g. obstacles near a playing surface).
- Significant differences in the skill level, age or size of athletes involved in activities with physical contact or risk of impact.
- Poor physical condition or insufficient strength in the neck and upper-body musculature.

The following information is presented as a series of guidelines only. Head injuries must be treated by a qualified medical professional.

Symptoms of a Concussion

Symptoms of a concussion include headache, dizziness, loss of consciousness, nausea, lethargy, memory loss, confusion or disorientation (lack of awareness of time, place, date), vacant stare, lack of focus, ringing in the ears, seeing stars or flashing lights, speech impairment, balance impairment and problems with sight. Other signs may include a major decrease in performance, difficulty following directions, slow responses to simple questions and inappropriate or unusual reactions (laughing, crying) or behaviours (change in personality, illogical responses to sport situations).

Managing an Athlete with Symptoms of a Concussion

Take the following short-term measures if an athlete suffers a concussion:

- Arrange to have an unconscious athlete with significant changes in mental state following a head injury transported to the emergency department of the nearest hospital by ambulance. This is a serious situation, and the athlete *must be seen by a medical doctor immediately*. In such a situation, the *Emergency Action Plan (EAP) must be implemented*.
- Do not allow an athlete showing *any* symptoms of a concussion to return to the current practice or competition.
- Do not leave an athlete showing symptoms of a concussion alone, and make sure that he or she is monitored for any deterioration in his or her condition. The athlete

March 8, 2017

should be medically evaluated as soon as possible after the injury. The circumstances of the injury should be recorded and communicated to the medical personnel.

- ❑ If any of the symptoms of concussion reoccur, the athlete's condition should be considered serious, and the individual *must* go to hospital immediately.

A person can suffer from a concussion without losing consciousness.

Managing an Athlete's Return After a Concussion

Although an athlete may have received authorization to return to regular training and competition, this must be done gradually. The athlete must be re-evaluated periodically during the weeks that follow his or her return to ensure that there are no recurring symptoms.

Listed below are a series of steps to help coaches manage the return to training or competition of an athlete who has suffered a concussion. Each step should take at least one day, although each step may be longer or shorter depending on individual circumstances (Step 5 applies predominantly to sports that involve body contact).

- ❑ **Step 1:** No activity - complete rest; if no symptoms are observed for one full day, proceed to Step 2.
- ❑ **Step 2:** Low-intensity continuous exercise, such as walking, jogging or cycling on a stationary bicycle; if no symptoms are observed, proceed to Step 3.
- ❑ **Step 3:** Low-intensity, sport-specific activity without contact; if no symptoms are observed, proceed to Step 4.
- ❑ **Step 4:** Moderate-intensity, sport-specific training activities without body contact; if no symptoms are observed, proceed to Step 5.
- ❑ **Step 5:** Regular practice with body contact if it is required by the sport (no hard impact); if no symptoms are observed, proceed to Step 6.
- ❑ **Step 6:** Return to regular training and to competition.

If symptoms do recur, the athlete must *immediately* stop any form of activity and be examined by a medical doctor before resuming training or competition. It is extremely important for the athlete, the coach and the medical personnel to be open and frank when evaluating the athlete's condition. If recurring symptoms are not disclosed, the athlete may suffer permanent damage.

Repeated Concussions

Some data suggest that after a first concussion, athletes are at greater risk of future concussions. If an athlete has a history of repeated concussions, he or she should participate in sport activities only after obtaining *full clearance* to do so from a medical professional.

8.1.5 Exercising With Asthma

Improved physical fitness will help reduce the severity of asthma in most people, because the lungs and heart don't need to work as hard when trained. Therefore, it is

March 8, 2017

important for an individual with asthma to maintain a good level of fitness! However, if one of the children registered in your program is asthmatic and intends to begin exercising in that setting, the asthma should be under control before he/she starts.

Although many young athletes may be seen using inhalers, sport participation does not cause asthma in children.

What Is Asthma?

- ❑ **Asthma** is a common respiratory problem that affects about 10% of the population. It is characterized by shortness of breath. This is due to the contraction of the smooth muscle around the airways.
- ❑ **Exercise induced asthma (EIA)** is an asthmatic attack triggered by exercise. The cooling and drying of the respiratory tract when moving large amounts of dry air during intense exercise is considered to be the main cause, and it can occur from five minutes to six hours after exercise. Because of this, cross-country skiers are at high risk. Approximately 80% of asthmatics experience EIA, whereas only 2-3% of the non-allergenic population experience EIA.

What Are the Symptoms?

- ❑ Coughing, wheezing or shortness of breath - more than you would expect for the level of exertion.
- ❑ Shortness of breath, worse near the beginning of intense exercise (the first 15- 20 minutes). This shortness of breath may lessen as the exercise continues.
- ❑ Shortness of breath is usually worse when breathing cold, dry air than warm, moist air.

If the child has EIA experiences only, pre-exercise treatment is usually sufficient. However, if the child has mild asthma whose symptoms are intensified due to exercise, he/she will likely need daily anti-inflammatory therapy *in addition* to pre-exercise treatment.

Suggestions That May Help Your Asthmatic Athletes

- ❑ Inhale a bronchodilator (e.g. Ventolin, Berotec, Pro-Air) or a bronchial anti-inflammatory (e.g. Intal, Fivent, Tilade) about 15 minutes prior to exercise.
- ❑ When beginning an exercise session, perform a prolonged, gradual warm-up, with a low heart rate, and increase the intensity slowly. A good warm-up is essential.
- ❑ Breathing through a balaclava, mask or scarf will humidify the air slightly on very cold, dry days.
- ❑ On very cold days, delay high intensity workouts to a warmer part of the day, or miss that session.
- ❑ Avoid exercising at times of day or in locations where pollutants or pollens are at their maximum.
- ❑ When preparing for a competition, do an extended warm-up, with a gradual increase in intensity and with vigorous exercise at the intensity just below your maximal exercise level (short-term burst activities like sprints are thought to intensify EIA more than

March 8, 2017

steady-state exercise).

- ❑ Taking two grams (2000 mg) of Vitamin C one hour before a competition may provide some protection against an asthma attack.
- ❑ If post-exercise attacks are a problem, asthmatic athletes should develop a post-event strategy together with you to ensure timely use of their medication. Someone who knows how to use the “puffers” should be waiting at the finish line and be free to stay with them for a period of time following the event. Explain to them that it is not sufficient to leave the medication in the car or with an official who is not free to drop everything if they are having an attack.
- ❑ Many “puffers” do not work well if they have been outside in the extreme cold for long cold periods. Treat them like video camera batteries and keep them warm.
- ❑ After a workout or a competition a lengthy graduated warm-down provides a slow warming down of the airways, which lowers the risk of EIA. An abrupt stop may cause asthma symptoms to return.

Note: Competing on very cold, dry days should be undertaken with caution. Susceptible athletes should always take the precautions mentioned above, and in addition they should be encouraged to balance the importance of the event with their long term health, and to make their decision with care.

Disclaimer: This information is designed to aid coaches in managing asthma-related symptoms during exercise in cold weather. It is not a substitute for qualified medical advice. If your athletes experience asthmatic conditions before, during or after skiing, encourage them to seek medical advice without delay.

8.1.6 Cold Weather and Competitions

In most regions of Canada severe cold weather can occur when a competition is being held. Because of the potential risk involved, coaches should (1) prepare their athletes for this possibility in advance, and (2) take certain precautions when dealing with such situations.

Developing athletes don't usually have access to the high tech clothing that can provide them with the best protection from the cold. Most young athletes cannot afford clothing of this kind if they are going to outgrow it in a year, and as a result this age group may often be more vulnerable to severe weather conditions than adults.

To help you educate your athletes the following list has been developed for a handout.

Cold Weather Tips for Your Athletes

The following guidelines will help your athletes deal with conditions of extreme cold weather:

- ❑ Don't be afraid to wear extra clothing during a competition. In cold weather conditions, vests can be an important addition and it may also be reasonable to wear two layers of synthetic (polyester) underclothing. Balaclavas and neckwarmers may be warranted

March 8, 2017

as well. Wear a warm hat and replace racing gloves with warmer mitts. Even older athletes at high level events may choose to compete with warm ups on, especially if there are long fast down hills and windy sections along the course.

- ❑ Male skiers should always consider wearing windproof underwear if they are wearing a lycra racing suit.
- ❑ Creams, lotions and jellies can reduce the direct exposure of the skin to the air. However, to be effective they must not have a water base. Many athletes have had success with petroleum jelly and Dermatone.
- ❑ Ski glasses/goggles can keep the wind out of your eyes, but they can also cause a “wind tunnel” effect on other parts of your face. For eye comfort, blink more often than usual. This is particularly true if you wear contact lenses.
- ❑ Individuals have a different tolerance to cold weather. Consider this when you make your decision on what to wear, or whether to enter the competition or not. For more information on exercise induced asthma in cold weather conditions refer to section 8.1.5 above.
- ❑ If you are 10 years of age or younger and the temperature is going to be colder than -15C at start time, you should seriously consider not entering the race.
- ❑ Take extra care that your nutritional needs are met on the morning of the race.
- ❑ Bring extra foods and fluids to the race site in case there is a delay.
- ❑ Ensure that your warm-up is done correctly. If you are following a proper warm-up routine you should be physically prepared for your race and able to ski at the appropriate pace right from the start. Regardless of the temperature, the “feeling” should be the same. What changes as the temperature drops is how the warm-up is done to get and maintain this “feeling”. Typically a good warm-up increases the core temperature, uses muscles and techniques at the intensity level required during the race, and sets the appropriate arousal level without your being fatigued at the start. On a cold day you may wish to cut the warm-up short because you are afraid of becoming cold. However, your warm-up should be long enough and intense enough for you to break into a sweat. To maintain this warmed up state, you need to minimize the amount of time you are in damp or wet clothing. In these conditions a well-prepared athlete will put on dry gloves/mitts and hat after the warm-up and before the start.
- ❑ In these conditions you should change at least your gloves and hat, and other clothing as well if you can, as soon as you have completed your race and before you do your warm-down.
- ❑ Keep in mind that cross-country skiers are at risk in cold weather situations because exhaustion and dehydration are both influencing factors with respect to hypothermia. In such conditions, it is especially important to do your warm-down with another skier. You could be unaware of your condition and put yourself at risk by skiing onto an unused part of the course alone.
- ❑ Take responsibility for your own safety.

Cold Weather Considerations for Race Officials That Coaches Should Know

March 8, 2017

- ❑ The basic considerations for determining postponement, alteration or cancellation of a competition are:
 - ✓ temperature;
 - ✓ wind;
 - ✓ the duration of exposure;
 - ✓ shelter, clothing and other protection against the cold; and
 - ✓ the ability of the organizers to meet the extra demands required to ensure the safety of everyone involved.

Did you know?

Races

303.2.2: With air temperatures below -20C (temperature measured at the coldest point of the course and without wind factor) and competition distances less than or equal to 15 km, the Jury must postpone or cancel the competition. With competition distances greater than 15 km and temperatures less than -18C without wind factor, the Jury must postpone or cancel the competition.

With any difficult weather conditions (eg. strong winds, high air humidity, heavy snow, icy track conditions), at any air temperature, the Jury may, on consultation with the Team Leaders of the participating teams and the doctor responsible for the competition, postpone, cancel or shorten the competition.

Loppets

387.2.1: Between -15 and -25C, recommendations regarding cold weather protection should be made available to the participants. Under such conditions it is the responsibility of the participants to seek the information and to follow the recommendations given by the organizer.

387.3.1: If the temperature in a major portion of the course is -25C or below, the competition shall be delayed or cancelled.

Excerpts for Canadian competitions from CCC Rules & Regulations (2006)

- ❑ Always take into consideration the age and experience level of the field of skiers when determining whether to alter or cancel a competition. The rules that govern “races” were established for experienced, healthy elite athletes at high level competitions. -20C is the coldest temperature at which you can hold the event. Under some circumstances, modifications or cancellation should occur at temperatures warmer than -20C.
- ❑ Adequate controls must be established to insure the recommendations are being followed and the health and safety of competitors are protected.
- ❑ It is possible to have a situation where it is best to cancel the events for athletes ten years of age and younger, shorten the distances for remaining athletes 18 years of age and

March 8, 2017

younger, and retain the events originally scheduled for older athletes. For example, if the temperature is between -15C and -20C, whether other factors such as wind chill are involved or not, you may wish to shorten some distances (i.e. a 5 km event for Juveniles could be shortened to

3.5 km), while retaining the original distances for the adult categories. Or, you may choose to shorten the distances for all age groups.

- ❑ The Jury has the option of delaying the start time if it appears that the temperature will rise to an acceptable level later in the day. This decision can create new problems, however, and should be carefully thought through. It is possible that skiers will be at greater risk skiing at -19C after an extended period of repeated delays, (i.e. 2-3 hours) than they were at -21C two or three hours earlier.
- ❑ Some additional factors to consider before delaying the start time would be:
 - ✓ Is there adequate shelter for all the competitors close by the staging area, or will they be cramped into crowded, humid vehicles for an extended period of time with no place to change their clothes before they compete?
 - ✓ Will there be food and fluids available at the race site that all the competitors can access? For example, athletes may have traveled two or three hours to get to the race site that morning and they may not have the extra refreshments they will require for a lengthy delay. They may never have been to this race site before and they may not have been aware that refreshments were not available at the site.

Each of the above could influence how well the athlete handles the cold temperature when the race finally does get underway.

- ❑ If there is any possibility of a delayed start, enough advance warning must be given to the coaches and athletes to allow them to make appropriate decisions regarding warm-up routines.
- ❑ Ensure an adequate supply of wool blankets and refreshments (drinks prepared at the correct temperature!) at the finish line.
- ❑ Station someone trained in First Aid at the finish line. Have them (1) check each athlete for frostbite, and (2) ask each athlete a few questions to check out their responses.
- ❑ One of your greatest frustrations will be the variations in the temperature readings between one thermometer and another. Long before you host your event select a reliable model and purchase enough of them to cover all the bases.
- ❑ Don't hold the competition unless you are prepared for the conditions!

8.1.7 Backcountry Skiing

The following article by Knox Williams offers eight steps to help you discover that skiers can ski the backcountry safely, provided they take the time to learn about the activity first.

Into the Backcountry

You live in a part of the world that has splendid scenery. You take advantage of every opportunity to get outdoors. Of the seasons, you love winter the best. You would like very much to take up backcountry skiing.

But there are inherent risks, and you don't know how to get started – safely!

I have been in the avalanche business for 25 years, and I have read far too many avalanche articles that seem to have one purpose, to scare the reader. This article is different. I am going to give you an eight-step plan for learning about avalanches *so that you will understand and respect them, not fear them*. Learning respect should be your goal, because you then have the knowledge and confidence to travel where you like with a good idea of what the real risks are.

“All the avalanche experts are dead”, I was told when I first began my avalanche education (and didn't know an avalanche from a snowball). That's bunk! I didn't believe that then, and I certainly don't now. You don't have to die in an avalanche, or be scared badly enough to wish you were dead, to have avalanche savvy. However, you will have to work at learning about snow and avalanches before you gain the confidence to judge the risk and make a “go or no go” decision.

Like life, avalanche education is “hard by the yard, but a cinch by the inch”. What I mean by this is don't try to swallow the whole avalanche pill of knowledge at once: it will choke you. Rather, take your education in small doses; it will eventually develop into a clear picture. You will discover two things on your quest for knowledge. First, attaining an avalanche education is a life-long endeavor. No matter how much you learn, every winter will bring new revelations and challenges. Second, *you will be studying in the most wonderful classroom on this planet – the lofty domain of mountains*.

With this in mind, here are my “eight steps to reducing your avalanche risk.” Some involve time and work on your part, and others are offered as simple tips, but taken altogether, they are guaranteed to improve your odds in a risky situation.

❑ **Step #1. Get Smart!**

The smart *first step* is to learn from the avalanche experts. This will take a commitment of time and effort on your part. Let's divide the task into three parts:

- ✓ *First*, do some reading. There are several good and entertaining books available. Four of the best are: “The ABC of Avalanche Safety” by E. LaChapelle; “Snow Sense: A Guide to Evaluating Snow Avalanche Hazard” by J. Fredston and D. Fesler; “Avalanche Safety for Skiers and Climbers” by T. Daffern; and “Staying Alive in Avalanche Terrain” by B. Tremper. These are carried by large bookstores and all good outdoor recreation stores.
- ✓ *Second*, check out the videos on avalanche safety. Three that I recommend are: “Avalanche Awareness: A Question of Balance”; “Winning the Avalanche Rescue: Not a Second To Waste”; and “Avalanche Rescue Beacons: A Race Against Time”. These are available for sale or rent at most outdoor recreation stores.

March 8, 2017

✓ Third, wherever available, take an Avalanche Awareness Course. For more information on courses, including Online Avalanche Courses, contact the Canadian Avalanche Association (CAA) web site at <http://www.avalanche.ca>.

- ❑ **Step #2. Call the Hotlines.** There is a toll free hotline (1-800-667-1105) for you to call to get the latest information on mountain weather, snow and avalanche conditions. This is updated daily, seven days of the week, from November through April.
- ❑ **Step #3. Identify Avalanche Terrain.** Avalanches run repeatedly year after year in the same areas - slopes called avalanche paths. Avalanches most often start on slopes of 30-45 degrees but sometimes start on slopes as shallow as 25 degrees and as steep as 50 degrees. Knowing the slope angle is “rule number one” in recognizing avalanche terrain, for once slopes angles reach 30 degrees, you are in potential avalanche terrain regardless of all the other factors.

Although many avalanches start on large open slopes near or above timberline, they can also start on smaller, low-elevation slopes such as gullies, road cuts and small openings in the trees. Avalanches seldom start in dense trees, but once started they can flow through moderately dense forest.

Finally, avalanches are more likely on slopes that face away from the prevailing wind. These “leeward” slopes collect snow that blows over the ridge. This snow builds into wind slabs and is more dangerous than the shallow, harder snow on the windward side of the ridge.

- ❑ **Step #4. Steal Nature’s Signs.** Sometimes the snow shows clear and present danger signs of avalanche. The best clue is fresh avalanches, which tells you that some slopes have already stressed out and that others may be near breaking point. Also watch for snow that collapses beneath you or sends cracks shooting ahead. These are signs that the snow cannot hold you up. Some weather signs that the hazard could be worsening fast are heavy snowfall – more than one inch per hour – or strong winds creating blowing snow and snow plumes off the ridges.

Keep observing and evaluating all day long. Keep asking yourself these four questions: *Is the terrain capable of producing an avalanche? Could the snow slide? Is the weather contributing to instability? Is there a safer route?*

- ❑ **Step #5. Test the Snow.** Look for test slopes where you can dig snowpits and perform stress tests. A test slope is a small, steep slope – preferably 30 degrees or steeper – where you will not be in danger of causing an avalanche, but is near enough to a larger slope that you are concerned about. You can learn all about snowpits from one of the books listed above or from an avalanche course, but your procedure should be something like this: with your shovel, dig a hole several feet wide and four to five feet deep (or to the ground.) Smooth the pit wall and then look at and feel the snow for changes in layering, texture and strength. Next, perform several “shovel shear” tests, followed by a “rutschblock” test. These tests will answer many of your questions about the local snow strength. (It’s always good practice to fill in your snowpits afterward to keep someone else from skiing into them.)

There are other tests you can do on skis to test for unstable slabs. In a safe location on a small slope or on the very edge of a large slope, jump on your skis or do a quick ski

March 8, 2017

cut on a steep traverse to see if you can make the snow fracture. Finally, if you are on a ridge above a steep slope, try kicking off blocks from a small cornice. Do so by very carefully stomping with one ski to cause a refrigerator-size block to fall onto the slope below. This test simulates the weight of one or more skiers on the slope without putting anyone at risk.

- ❑ **Step #6. Travel Smart.** There are several rules of backcountry travel that will help to minimize your avalanche risk. Here is a quick list:
 - ✓ **One at a time.** If your group comes to a slope that you are nervous about, only one person at a time should go onto the slope. Whether crossing or going up or down, do so one at a time while all others act as spotters from a safe location. This way, should an avalanche occur, there will be only one victim and lots of rescuers.
 - ✓ **Avoid the center.** The greatest danger on any steep slope comes when you are in the middle of it. Should an avalanche break, you have no escape route. So avoid the center of open slopes. Cross it at the very top or bottom. Go up it or down along the edges. These positions give you a much better chance to escape.
 - ✓ **Stay on shallow slopes.** You can always travel avalanche-free on slopes up to 25 degrees, and more than 95% of the time you are safe on slopes up to 30 degrees. To measure angles exactly, you should buy an inexpensive slope meter (about \$35 in mountain recreation shops.) One caution, however; be extra cautious whenever steeper slopes lie above shallow ones. Though avalanches won't start on shallow slopes, it is possible that you could trigger an avalanche far above you, placing you in harm's way.
 - ✓ **Should you travel alone?** While nothing may be so companionable as one's self, there is no greater way to increase your avalanche risk than to travel alone. You have no one to save you from partial or shallow burials.
- ❑ **Step #7. Take Your Pulse.** In other words, check your attitude! It can get you in trouble. Are you so goal-orientated – to climb this peak or ski that bowl – that you are willing to take unwarranted risk? Are you so close to reaching your goal that you overlook clear and present danger signs? Are you letting group dynamics or peer pressure cloud judgment? Are you letting haste or fatigue get you in trouble? To prevent accidents from happening, you must control the human factor in your decision-making.
- ❑ **Step #8. Be Ready for Rescue.** Thousands of skiers, climbers and snowmobilers have triggered avalanches and lived to tell about it. After all, statistics show that for every 15 people caught one will die while 14 will live. Some people were just lucky; the avalanche spit them out at the last moment. Others lived because they did things that helped. There are three parts to the rescue equation that will reduce your risk: what equipment to carry; what to do if you are caught; and what to do if a friend is caught.
 - ✓ **Rescue gear.** A small shovel and an avalanche rescue beacon are two items that everyone who goes into steep terrain should not be without. The beacon makes for a quick find of a buried victim, and the shovel is absolutely necessary for digging avalanche debris. Most avalanche victims cannot survive a burial of 30 minutes or longer, and beacons and shovels are the best way for quick recovery.

Modern avalanche beacons are expensive, more than \$300 each, and it takes at least two to make the system work, but it is the best investment you can make for your

March 8, 2017

personal avalanche safety. After you buy a beacon, you'll need to practise with it to become a good rescuer. This kind of practice is a lot of fun.

- ✓ **If you are caught, what can you do to improve your odds of survival?** It's always best to avoid getting caught in the first place, for the speeds and forces that avalanche victims are subject to can cause severe harm even if the group is prepared for rescue. Still though, there are things you can do.

Many victims survived because they were able to escape to the side. Others were able to grab a tree. Many others, once swept downhill, were able to swim with the moving snow, similar to body-surfing in the ocean. This may let you end up on top. If you can't make it to the surface, try to make (before the avalanche stops) an airspace in front of your face, which will give you breathing space. If all goes well, your companions will find you quickly with their beacons.

- ✓ **If a friend is caught, what can you do to hasten a speedy recovery?** Watch the victim on his descent. Go immediately to the last-seen area and search downhill from there. Turn your beacon, search for surface clues and probe debris. Do not abandon the search too soon or send searchers out for additional help. You are the buried victim's best chance for survival.

So there they are, my eight steps for avalanche safety. To summarize, let's see how you can reduce your avalanche risk on a typical day tour. First, be prepared before you leave home. Armed with avalanche knowledge (#1) and the day's forecast (#2), and equipped for rescue and survival (#8), you have taken the first steps to avoid disaster. You probably started the day with a plan or goal; don't be afraid to change it if necessary (#7). Once in the backcountry, your tour will probably take you in or near avalanche terrain (#3). Right away, start looking for clues of unstable snow (#4), and whenever necessary, test the snow (#5). If there are obvious danger signs, don't go, alter your route. Without any clear and present danger, still proceed with caution (#6). If you follow these steps, you will never be caught off-guard.

8.1.8 Eye Protection

The depletion of the ozone layer has become a serious problem for the health and welfare of the world's population. As the ozone layer depletes, we are becoming more and more exposed to harmful ultraviolet (UV) radiation. This affects all parts of our bodies, including our eyes.

Some Facts About UV Radiation

- Reflections off the surface of the earth increase the effect of UV. Earth and grass reflect 5%, sand 17%, water 20% and snow 85%.
- Clouds and haze may actually increase the amount of radiation reaching the ground - although dark clouds may reduce it.
- UV radiation is almost 17 times worse in the winter and spring months than it is in the summer months.
- At noon, the amount of radiation is greater than it is at other times of the day.

March 8, 2017

- ❑ Altitude increases radiation. There is a 16% increase for every 1000 metres above sea level.

To protect your athletes from the potentially harmful effects of ultraviolet rays

- ❑ Wear a hat or cap with a visor.
- ❑ Wear eyewear with UV protection when participating in outdoor sports, and particularly in winter sports. You may wish to use polarized lenses as they remove reflections off the snow and are impact resistant.

Winter Eye Injuries

Other possible winter eye injuries include:

- ❑ **Freezing of the cornea.** This is caused when an athlete who is not wearing protective eyewear tries to keep his/her eyes open during a strong, cold wind.
- ❑ **Eyelashes freezing together.**
- ❑ **Snowblindness.** This is caused by the effect of the sun on snow. It can be prevented by good sunglasses with side shields, or goggles. It is just as necessary on cloudy or overcast days as it is in full sunlight when an athlete is on the snow. Snowblindness can even occur during a snow storm if the cloud cover is thin.
- ❑ **Contact with a ski pole.** Mass start races, sprint races, the exchange zone in relay events and some games/exercises used to teach ski skills may increase the risk of eye injury. In these situations wrap-around eye protection is recommended.

March 8, 2017

REFERENCES

Planning a Practice: Planning for Safety, version 1.1, Coaching Association of Canada, 2007.

To Cancel or Not to Cancel – That Is the Question, Ski Cross Country, 1998.

Ministry of Transportation & Highways Motor Vehicle Branch; Bike Smarts, 1995.

Williams, K., Backcountry Safety - Trail and Timberline, Ski Cross Country, 1999.

Summary and Agreement Statement of the 1st International Symposium on Concussion in Sport (Vienna, 2001); Clinical Journal of Sports Medicine, Vol. 12, No. 1, pages 6-11, 2002.

Canadian Academy of Sports Medicine (CASM), Guidelines for the Assessment and Management of Sports Related Concussion, May 2000.

Kelly, J. P.; Rosenberg, J. Practice parameter: The Management of Concussions in Sport. Neurology 48:581-585, 1997.

Wojtys, E. et al. Concussion in Sports, The American Journal of Sports Medicine, Volume 27, Number 5, 1999.

Sports Eye Injuries, UV and the Effects on the Eye, A Sight for Sport Eyes, 2007.

Outdoor Action Guide to Hypothermia and Cold, Rick Curtis Copyright 1995-2007, Outdoor Action Program, Princeton University.

Sport Medicine Council of Alberta; NCCP Level 3 Technical Manual. Cross Country Skiing. Exercising With Asthma, Ski Cross Country, 1998.

Focus, A Newsletter for your eyes. Atrium Optometric Group, Excellence in Eye Care, Winter, 2006.