ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 6

EO M121.06 – IDENTIFY ENVIRONMENTAL INJURIES

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-701/PG-001, *Green Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to introduce the cadets to environmental injuries.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of the lesson the cadet shall be expected to recognize the effects that hot and cold weather may have on the body, and how to identify and prevent environmental injuries.

IMPORTANCE

Cadets need to know how to recognize hot-and-cold weather dangers and treatment of these effects. Knowing how to properly identify various hot-and-cold related injuries and take proper preventative measures will ensure a safe, fun and meaningful training experience in any weather conditions.

Teaching Point 1 **Explain how to identify cold-related injuries.**

Time: 15 min Method: Interactive Lecture

This teaching point contains substantial background information to be used by the instructor in the development of a lesson plan. During delivery, the emphasis shall be placed on the **preventative** measures detailed throughout. A detailed discussion of cold weather injuries is provided in EO C121.04 (Section 13).

FROSTBITE

Frostbite is the freezing of tissue in the body. As blood flow slows down, the fluid between cells can freeze. As ice crystals form on them, the cells become dehydrated. Frostbite acts locally on parts of the body such as fingers, toes, chin, nose and ears. It is a constant hazard during activities occurring in sub-zero temperatures, especially when accompanied by strong winds.

Signs and symptoms of frostbite stages:

Surface Frostbite. Also known as superficial frostbite or frostnip, it affects only the skin and causes little damage. Only the outer layer of the skin is frozen. It may occur from contact with cold metal or severe wind chill. After the nipped area is warmed, the layer of frozen skin becomes red, and after a few days, the skin will peel, looking similar to sunburn. Signs and symptoms include:

- skin turns white and numb;
- tissues beneath the affected area are still soft;
- casualty may not feel it; and
- may notice white spot.

Deep Frostbite. Frostnip has progressed into underlying tissue. It may feel hard on the surface, and soft below. Blisters will usually appear within 24 hours of warming. It needs proper warming, not just an application of heat. If it progresses even further, the injury extends into deeper tissue and into the muscle. Blisters containing fluid, blood-filled blisters, delayed blisters or lack of blisters forming within 48 hours of warming indicate deep frostbite. It may cause loss of tissue and permanent damage, including the loss of parts, or all of the affected area. Proper field care can often mean the difference between temporary disabilities and permanent injuries.

Signs and symptoms include:

- pain or numbness in the fingers, toes, heels, and entire hands and feet;
- tissue is hard all around the affected area;
- the frostbitten part is cold and white (sometimes purple); and
- no pain, or feeling of any kind, in the extremity that is frozen.

Prevention

Surface. Is common on the face and is associated with naturally occurring wind, or wind from a moving vehicle. A good parka tunnel will usually prevent frostbite because it holds a pocket of warm air around the face. In strong winds, cover the nose and cheeks with a face mask, scarf, or any piece of warm fabric. Since frostbite is often not felt, the first warning may come from a companion who notices a white spot on your face. Frostbite is also common on the hands if doing work, or if coming into direct contact with cold metal.

Deep. Often occurs when exposed to freezing temperatures with no chance to warm-up, or when hands and feet become wet and freeze. It is important to eat often to maintain body warmth, drink often to avoid dehydration, and rest enough to avoid fatigue while restoring circulation. Warm numb and painful feet immediately.

Treatment

Do not use snow, oil, rubbing, massage or pressure.

Surface. Serves as a warning. A frozen nose is the most common type of surface frostbite. Most minor frostbite can usually be thawed with body heat. Place a warm palm against a frostbitten cheek or ear, and place frostbitten hands against your chest, between your thighs, or under your armpits. Surface frostbite that produces blisters may require the casualty to be evacuated for medical attention.

Deep. Remove all constricting clothing such as boots, gloves or socks, without causing further damage to the frostbitten area. The frozen part should be placed against an unfrozen part of the body or exposed to warm air. Rapid thawing by the application of external heat is the safest way to relieve frostbite. Clean and dress the area to avoid infection. Do not exercise the injured person, or warm them in front of an open fire. Seek immediate medical attention.

SIGNS AND SYMPTOMS OF HYPOTHERMIA

Cold exposure, or hypothermia, is the drop of the vital core temperature of the body. Exposure can be divided into three levels – mild, moderate and severe. It is hard to tell where one level starts and the next stops without a special thermometer.

Signs and symptoms of hypothermia stages:

Mild Exposure. During mild exposure the casualty:

- is awake;
- shivering;
- can answer questions intelligently;
- may be slurring their speech;
- is losing interest in what they are doing; and
- is complaining that they are cold.

Moderate Exposure. During moderate exposure the casualty:

- is confused and illogical;
- does not want to move much, and may be sleepy;
- is clumsy and stumbles;
- stops shivering;
- shows signs of muscle stiffness;
- has slow breath and pulse rates;
- may have a fruity odour to their breath;
- may have dilated pupils; and
- may urinate in clothing.

The casualty is in great danger and is close to severe hypothermia, unconsciousness and death.

Severe Exposure. Moderate exposure quickly becomes severe exposure. At this point the casualty is in a coma, and is close to death. In severe exposure, the casualty:

- is barely conscious;
- has slow, shallow breathing and a weak, slow, irregular or absent pulse; and
- has pale, very cold, perhaps bluish skin.

During this time, the casualty will appear dead. It is important to remember that though they may look dead, there still may be a faint pulse, and some respiration. You can not determine if someone is dead until the body has warmed up and there is still no sign of life.

Prevention

There are a number of things a person can do to help prevent exposure:

- prepare for the worst and take extra clothing;
- avoid overheating and sweating. Wear loose, layered clothing that breathes. Cotton wets easily and dries slowly. Wool is warm, even when wet, and modern fabrics such as polypropylene and polyester are superior next to the skin;
- avoid long term cooling. Take breaks for hot drinks, and try to get out of the wind. Do not continue on if you are getting seriously cold;
- eat often to provide fuel for your body. Sugars and starches work most quickly;
- drink lots. Dehydration is a major contributor to exposure. Hot, sweet drinks are best, but you can also drink cold water. Do not eat snow if you are cold;
- keep your big muscles moving. This creates heat. Keep wiggling your toes and fingers if they are cold. Wiggling them will not warm you up too much, but moving the larger muscles of the arms and legs will. Swing your arms vigorously, and place the hands in the armpits; and
- check your companions often. If they get clumsy, start to shiver, slur their speech, or act strangely, you can suspect exposure. Remember that people suffering from exposure do not always feel it.

Treatments

Mild Exposure. If you think that your companion is suffering from mild exposure, you should:

- stop travelling;
- prevent any further loss of body heat;
- get them into shelter;
- replace any wet clothing;
- allow shivering to continue as it is the body trying to warm up; and
- give them food and hot drinks.

Rewarming with skin-to-skin contact or sleeping bags is the best way to help the person.

Moderate Exposure. If the casualty is suffering from moderate exposure, treat them for mild exposure, except:

- avoid rough handling and do not let them walk; and
- do not give fluids to drink until they are awake and understand what is going on. This will prevent choking.

Never handle anyone in moderate exposure roughly, or allow them to move much, as this affects the heart and can cause it to fail quickly.

Severe Exposure. There must be medical treatment at this time. There is some treatment that you can give to a casualty showing signs of severe exposure. They are:

If there is any breathing or a pulse, you should:

- handle the casualty very gently;
- prevent further heat loss; and
- move them gently to medical care.

If medical attention is not available, and you are far from help, you should:

- immediately and gently move them into warm shelter;
- apply heavily wrapped warm water bottles to sides of their neck, chest, and groin. Do not put them anywhere else; and
- keep them warm and let them recover very slowly without moving them.

It is very important that the water bottles be only slightly warm, as too much heat will damage the skin. Do not rub the hands, feet, or legs or move them if you do not have to. If the casualty recovers, the hearing is the first to return, then the sight. They may then lose control of their bowels.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

Q1. What is the most common type of superficial frostbite?

Q2. What are the three types of exposure?

Q3. What are some things you can do to prevent exposure?

ANTICIPATED ANSWERS

A1. A frozen nose.

A2. Mild, moderate and severe.

A3. Any of the following: take extra clothing, avoid sweating and long term cooling, eat often, drink lots, keep active, and check each other often.

Teaching Point 2 **Explain how to identify heat-related injuries.**

Time: 10 min Method: Interactive Lecture

HEAT CRAMPS

The instructor shall present the following information, with emphasis being placed on the treatment and prevention of the various ailments. The instructor should remember, when planning the lesson, to emphasize the importance of notifying a supervisor or senior cadet of any signs or symptoms being noticed.

Heat cramps are caused by the loss of salt during excessive sweating, as a result of a failure of the natural cooling mechanisms in the body to control the body's temperature. This is a warning sign of heat exhaustion, and occurs in the muscles doing the most work, such as the arms, legs and abdomen.

Symptoms:

- Shallow breathing.
- Vomiting.
- Dizziness.

Treatment:

- Move to shade.
- Rest.
- Drink water with a little salt dissolved in it (only a pinch to a half litre).

HEAT EXHAUSTION

Heat exhaustion is caused by exposure to high temperatures and humidity, with loss of body fluids through excessive sweating. It can occur without direct exposure to the sun; just being in a hot building with poor ventilation may cause it.

Symptoms:

- Pale face.
- Cold sweaty skin.
- Weak pulse.
- Dizziness.
- Weakness and possible cramps.

Treatments:

- Move to shade.
- Rest.
- Drink water with a little salt dissolved in it (only a pinch to a half litre).

HEATSTROKE

Heatstroke is caused by the failure of the brain to regulate the heat mechanisms of the body, and will cause a cessation of sweating (cooling). Heatstroke can occur after a few hours of exposure to intense heat, but usually occurs after a few days of prolonged exposure (i.e. heat wave, or a holiday in the tropics). People from temperate climates who have not had a chance to acclimatize are at a higher risk of being affected. During strenuous activities and high temperatures the chances of heatstroke occurring are increased.

Symptoms:

- Hot dry skin.
- Flushed face and feverish (sweating stops).
- Rise in temperature.
- Pulse is rapid and strong.
- Severe headache, often with vomiting.
- Unconsciousness may follow.

Treatments:

- Lay in the shade with head and shoulders slightly raised.
- Remove outer clothing, cool body by wetting underclothing with TEPID water (cold water may push the core temperature up) and fanning.
- Spray or sprinkle water over casualty.
- Causality should be placed in a cool damp area with plenty of ventilation.
- When consciousness returns give water to drink.
- When temperature returns to normal replace clothing, and keep warm to prevent chill.

SUNBURN

Sunburn occurs when skin is burned by exposure to the sun or ultraviolet light. The skin will burn when the amount of exposure to the sun or ultraviolet light source exceeds the ability of the body's protective pigment to protect the skin. The best prevention for sunburn is to remain covered as much as possible, and to apply sunscreen with a SPF rating of 29 or higher to exposed skin.

Sunburn in a very light skinned person may occur in less than 15 minutes of midday sun exposure, while a dark skinned person may tolerate the same exposure for hours. Actual sunburn, with blisters, is a real danger, especially with pale and sensitive skin types. If more than two thirds of the body is affected it can prove fatal.

Treatment:

- avoid further exposure;
- keep in the shade;
- cover all blisters with dressings (DO NOT BURST); and
- seek medical assistance.

SORE EYES

Sore eyes may be due to glare. This is more common when on a lake or ocean, in the desert, or on snow covered locations. It is caused by overexposure to the sun or dust particles.

Treatment:

- rest in the shade;
- cover eyes after washing out foreign objects;
- use a mask and darken below eyes with charcoal to avoid recurrence; and
- wear sunglasses.

DEHYDRATION

Dehydration is a condition that occurs when a person loses more fluids than they consume. The human body is made up of about two thirds water and when someone gets dehydrated, it means the amount of water in the body has dropped below the level needed for normal body function (low fuel).

To avoid dehydration one must drink plenty of water. It is recommended that a person drink 1.2 litres (six to eight glasses) of water every day. When exercising consumption of water should increase to one litre of water per hour of exercise on top of the normal daily amount. Water intake should also be increased if exercising in warmer conditions or during hotter weather periods as one will sweat more and lose fluid from the body.

Results and Symptoms of Fluid Loss:

Fluid Loss 1 to 5 percent	Fluid Loss 6 to 10 percent	Fluid Loss 11 to 20 percent
• Thirst • Vague discomfort • Lack of appetite • Flushed skin • Impatience • Sleepiness • Nausea	• Dizziness • Headache • Laboured breathing • No saliva • Indistinct speech • Unable to walk	• Delirium/disorientated • Swollen tongue • Unable to swallow • Dim vision • Numbed and shrivelled skin

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

Q1. What are three heat related injuries?

Q2. If you were exposed to ultraviolet light for a prolonged period of time, what would occur?

Q3. What are the symptoms of heat stroke?

ANTICIPATED ANSWERS

A1. Heatstroke, dehydration, heat exhaustion.

A2. Sunburn.

A3. Hot dry skin, flushed face and feverish (sweating stops), rise in temperature, pulse rapid and strong, severe headache, often with vomiting, unconsciousness may follow.

END OF LESSON CONFIRMATION

QUESTIONS

Q1. Describe the preventative steps to take to avoid exposure to hyperthermia?

Q2. How can a cadet avoid dehydration?

Q3. How can a cadet prevent sunburn?

ANTICIPATED ANSWERS

A1. Any of the following: take extra clothing, avoid sweating and long-term cooling, eat often, drink plenty of water, keep active, and check each other often.

A2. To avoid dehydration one must drink plenty of water. It is recommended that a person drink 1.2 litres (six to eight glasses) of water every day. When exercising, consumption of water should increase to one litre of water per hour of exercise on top of the normal daily amount. Water intake should also be increased if exercising in warmer conditions or during hotter weather periods as one will sweat more and lose fluid from the body.

A3. The best prevention for sunburn is to remain covered as much as possible, and to apply sunscreen with a minimum SPF rating of 30 to any exposed skin.

CONCLUSION

HOMEWORK/READING/PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Cadets should now be better prepared to recognize environmental related injuries, and injuries to which they are susceptible while participating in field training exercises in any season.

INSTRUCTOR NOTES/REMARKS

This lesson should be delivered prior to the bivouac exercise.

REFERENCES

C2-004 (ISBN 1-896713-00-9) Tawrell, P. (1996). *Camping and Wilderness Survival: The Ultimate Outdoors Book.* Green Valley, ON: Paul Tawrell.

C2-008 (ISBN 0-00-265314-7) Wiseman, J. (1999). *The SAS Survival Handbook.* Hammersmith, London: Harper Collins Publishers.

C2-009 (ISBN 0-684-85909-2) Harvey, M. (1999). *The National Outdoor Leadership School's Wilderness Guide.* New York, NY: Fireside.