ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 13

EO C121.04 – RECOGNIZE THE EFFECTS OF COLD WEATHER

Total Time: 60 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 the effects of cold weather.

INTRODUCTION

REVIEW

The pertinent review for this lesson will include:

QUESTIONS

Q1. What layers make up the layering system?

Q2. What would be a good base layer material?

Q3. Name two benefits of the self-inflating pads.

ANTICIPATED ANSWERS

A1. Base layer, insulating layer, and outer layer.

A2. Polypropylene.

A3. Very comfortable, warmer, lightweight and better thermal insulation.

OBJECTIVES

By the end of the lesson the cadet shall be expected to recognize the effects that cold weather can have on the body, and how to treat and prevent cold-related injuries and conditions.

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IMPORTANCE

Cadets need to know how to prevent, recognize, and treat cold weather injuries. Knowing how to properly identify various cold-related injuries and taking proper preventative measures will ensure a safe, fun, and meaningful training experience in cold weather.



While the cadet will learn to prevent, recognize and treat basic cold weather injuries and conditions, it is to be made clear that immediate reporting to an adult supervisor or senior cadet should be the first action if there is ever any question or concern.

Teaching point 1 **Discuss facts about injuries that occur in cold weather.**

Time: 10 min Method: Interactive Lecture

FACTS ABOUT INJURIES THAT OCCUR IN COLD WEATHER

Bleeding. Wounds bleed easily in cold weather because the low temperature prevents the blood from clotting. Increased bleeding increases the chance of going into shock. Also, wounds open to the cold weather will freeze quickly. The body loses heat around the wound as blood soaks the skin. Further, the clothing is usually torn around an open wound, allowing for further heat escape.

Shock. Shock is a condition that is caused by the reduction of effective circulation blood volume. It can be caused by a number of things including severe injuries, loss of blood and pain. The normal reaction of the body to severe cold is very similar in its reaction to shock. Therefore, shock will develop more rapidly and progress more deeply in extreme cold than in normal temperatures. Signs of shock include apprehension, sweating, thirst, pale skin, faint and rapid pulse, and cold and clammy skin.

Serious Injuries. Just like training in warm weather, medical attention should be sought for all serious injuries such as; broken limbs, deep or severe lacerations, respiratory illnesses, etc.



Signs are things that you can **see** on the victim. Symptoms are things that the victim **tells** you they feel.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

Q1. Why do wounds bleed more easily in cold weather?

Q2. What are some signs of shock?

Q3. Is pale skin a sign or a symptom?

ANTICIPATED ANSWERS

A1. The cold weather prevents blood from clotting.

A2. Any of the following: apprehension, sweating, thirst, pale, faint, rapid pulse, and cold clammy skin.

A3. Pale skin is a sign. It can be seen by an observer.

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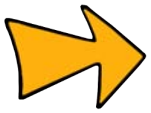
Teaching point 2 **Identify cold weather injuries.**

Time: 10 min Method: Interactive Lecture

COLD WEATHER INJURIES

Snow Blindness. Snow blindness is caused by the infrared or ultra-violet rays reflecting from a snow covered surface. These rays, unlike visible light rays, are readily absorbed by clear or coloured glass. Snow blindness is greatest on dull, cloudy days or when crystalline snow mist is present. Resting in darkness is the best treatment. Symptoms usually appear within six to eight hours, and include an irritating feeling in the eyes, blurred vision, pain, and the eyes feeling hot and sticky.



Most minor cases of snow blindness will recover within 18 hours without medical attention. A severe case may take three to four days to recover.

Immersion Foot. A cold injury resulting from exposure to temperatures near freezing. The temperature does not have to be below 0°C for it to occur. In the early stages, the feet and toes are pale and feel cold, numb, and stiff. Often walking becomes difficult. If no treatment is given, the feet will swell and become very painful. In extreme cases the flesh dies, and amputation is needed.



It is difficult to feel immersion foot in the early stages. In order to assist in prevention of immersion foot, be sure to keep feet clean and dry, checking them often. Rub and massage them when changing socks.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

Q1. When do symptoms of snow blindness usually appear?

Q2. What causes immersion foot?

Q3. What are some serious injuries that will require medical attention?

ANTICIPATED ANSWERS

A1. Symptoms of snow blindness usually appear in six to eight hours.

A2. Immersion foot is caused by exposure to temperatures near freezing.

A3. Severe lacerations, respiratory difficulties, and broken limbs are some serious injuries.

Teaching point 3 **Explain frostbite.**

Time: 10 min Method: Interactive Lecture

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

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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 outer layer of skin and causes little damage. It may result from direct 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/or
- partner may notice a 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 (e.g. hands). 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/or
- 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 nose and cheeks with a facemask, 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 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 a surface frostbite. Most minor surface frostbite can usually be thawed using 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 arm pits. Surface frostbite that produces blisters may require evacuation 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 open fire. Do not allow the frostbitten part to become frozen again. Evacuate for medical attention.

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CONFIRMATION OF TEACHING POINT 3

QUESTIONS

Q1. What are the two stages of frostbite?

Q2. What layer of skin is frozen if you have surface frostbite?

Q3. What is the most common body area affected by surface frostbite?

ANTICIPATED ANSWERS

A1. Surface and deep.

A2. Only the outer layer of the skin.

A3. A frozen nose.

Teaching point 4 **Explain hypothermia.**

Time: 10 min Method: Interactive Lecture

SIGNS AND SYMPTOMS OF HYPOTHERMIA

Cold exposure, or hypothermia, is the cooling of the body's core temperature. 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 breath;

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- 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 an indetectible 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. Modern fabrics such as polypropylene and polyester are superior next to the skin.
- Avoid long term cooling. The effects of cold exposure are cumulative, making long term exposure dangerous. 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. It is important, in addition to the main meals provided to you during winter training activities, to have healthy, high-energy snacks for consumption between meals. Food items such as trail mix (nuts, fruits, grains) will burn longer in the body, providing a more sustainable energy level for cadets. Items like chocolate are metabolized too quickly, and will lead to a cadet “crashing”, or running out of energy too soon.
- 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, as it may contribute to lowering your body’s temperature even farther.
- 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, stamp your feet, and place the hands in the armpits.
- 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;

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- allow shivering to continue as it is the body trying to warm up; and
- give them food and hot drinks.

Re-warming 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;
- do not give fluids to drink until they are awake, and understand what is going on. This will prevent choking; and
- seek medical attention.

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 lose control of their bowels.

CONFIRMATION OF TEACHING POINT 4

QUESTIONS

Q1. What are the three types of exposure?

Q2. What are some things you can do to prevent exposure?

Q3. What is the best way to re-warm someone with mild exposure?

ANTICIPATED ANSWERS

A1. Mild, moderate and severe.

A2. Any of the following: take extra clothing, avoid sweating and long term cooling, eat often, drink lots, keep active, and check each other often.

A3. Skin-to-skin contact or a sleeping bag.

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Though a person may look like they are dead, they may still be breathing, and need medical attention immediately.

Teaching point 5 **Discuss winter hygiene.**

Time: 10 min Method: Interactive Lecture

BODY CLEANLINESS

To stay healthy on cold weather exercises, it is important to keep clean. While the body tries to stay warm, perspiration can clog pores in the skin and the clothes, making you feel colder. It is not always easy to properly clean yourself, because of the lack of sanitary facilities, but there are some rules that will keep you healthier and feeling better longer.

Washing. Wash your face and hands daily. Though there are no baths around, you should try to wash your feet, crotch and armpits at least twice a week - and more often if possible. These are areas where most of the heat of the body is lost; therefore, there is more perspiration in these areas.

Shaving. Shave every day. It is best to do it before bed as the body is warmer and it should be easier. Shaving in the morning may also strip the skin of essential oils.

Teeth. Teeth should be cleaned daily. If you do not have a toothbrush, wrap gauze around your finger and rub over your teeth. Cleaning the teeth will help prevent germs from growing as well as make you feel better.

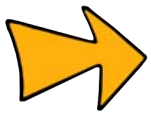
Changing Clothes. Underwear and shirts should be changed at least twice weekly. If not, then they should be crumpled, shaken out, and aired out for about two hours. As clothes become dirty, warm air is not able to circulate around the body, increasing your chances of overheating.

Foot Care. Socks should be changed and feet washed as often as possible, but at least twice a week. Boots and socks should be removed every night and the feet massaged and dried. Use foot powder if you have it.

BODY FLUIDS

In order to keep the body in the healthiest and cleanest state for winter camping, you must drink plenty of fluids. Dehydration is one of the largest contributors to cold-related illnesses such as exposure. The body loses a lot of fluid through evaporation, conduction, respiration, radiation and convection. The fluid must be replaced so the body is able to function effectively in the cold weather.

The body needs to expunge bodily fluids such as urine, and waste, on a regular basis to maintain its healthy state.



Keeping clean will make you feel more comfortable and help motivate you to train and enjoy the activities associated with training in cold weather.

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CONFIRMATION OF TEACHING POINT 5

QUESTIONS

Q1. How often should you wash your hands?

Q2. Why must you drink plenty of fluids while in cold weather?

Q3. True or false: Cadets will use the washroom less often in the winter.

ANTICIPATED ANSWERS

A1. You should wash your hands daily.

A2. You have to drink lots of fluids to replace the ones your body has lost.

A3. False. A cadet will still need to go the bathroom as often as they normally would.

END OF LESSON CONFIRMATION



The instructor may chose to utilize an activity where the cadets will be given a card detailing a sign or symptom of an environmental injury or condition. The cadet will then, as a means of confirming understanding of the material, act out the illness associated with the sign or symptom on the card. This will demonstrate an understanding on the part of the cadet acting out the associated ailment, as well as gauge the understanding of the cadets required to guess the injury or condition.

Alternately, the following questions can be asked.

QUESTIONS

Q1. What are some signs of shock?

Q2. When do symptoms of snow blindness usually appear?

Q3. What causes immersion foot?

Q4. What are some serious injuries that will require medical attention?

Q5. What layer is frozen when you have superficial frostbite?

Q6. What is the most common body area affected by superficial frostbite?

Q7. What are the three types of exposure?

Q8. What are some things you can do to prevent exposure?

Q9. What is the best way to re-warm someone with mild exposure?

Q10. How often should you wash your hands?

ANTICIPATED ANSWERS

A1. Any of the following: apprehension, sweating, thirst, pale skin, faint, rapid pulse, and cold, clammy skin.

A2. Symptoms of snow blindness usually appear in six to eight hours.

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A3. Immersion foot is caused by exposure to temperatures near freezing.

A4. Severe lacerations, respiratory difficulties, and broken limbs are some serious injuries.

A5. Only the outer layer of the skin.

A6. A frozen nose.

A7. Mild, moderate and severe.

A8. Any of the following: take extra clothing, avoid sweating and long term cooling, eat often, drink lots, keep active, and check each other often.

A9. Skin-to-skin contact or a warm blanket.

A10. You should wash your hands daily.

CONCLUSION

HOMEWORK/READING/PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Every year people are injured, including dying of exposure, because they don't recognize the risk factors and the signs and symptoms of cold weather injuries in time to prevent the injury. Cadets can be proactive in the recognition of signs and symptoms and can protect their buddies from injury by being aware that anyone, even an officer, can suffer a cold weather injury.

INSTRUCTOR NOTES/REMARKS

This period may be conducted as a stand alone lesson or as pre-training to EO C121.05 (Participate in Cold Weather Training).

This lesson is best delivered under the supervision of a cold weather instructor.

REFERENCES

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