

LESSON 12: Cold Weather Injuries

TYPE OF INSTRUCTION: Lecture and demonstration

TRAINING TIME: 3 Hours

TOOLS, EQUIPMENT, AND MATERIALS: None.

PERSONNEL: One instructor, MOS 91S or AOC 72 series

INSTRUCTIONAL AIDS: Projection equipment, screen, PowerPoint presentations

REFERENCES: FM 21-10, Field Hygiene and Sanitation; FM 4-25.12, Unit Field Sanitation Team.

STUDY ASSIGNMENT: FM 4-25.12, Chapter 2.

STUDENT UNIFORM AND EQUIPMENT: Duty uniform; Soldier's Guide and pencil/pen; FM 21-10; FM 4-25.12

TRANSPORTATION REQUIREMENTS: None

Section I. INTRODUCTION

Show Slide FSTCC0012-1: Title

OPENING STATEMENT: History is filled with examples of the significant impact of cold on military operations. Among U.S. Army and Army Air Force troops, there were over 90,000 cold injuries requiring medical treatment during World War II, and another 10,000 during the Korean War, accounting for 10% of all casualties experienced during these conflicts. Given that the average air temperature recorded when cold injuries were experienced during World War II was 30° F, and that temperatures this low are experienced over about 60% of the earth's surface, leaders must appreciate cold-weather effects on soldier health and performance. Cold injuries can also occur when air temperatures are above freezing.

Show Slide FSTCC0012-2: Lesson Objectives

NOTE: Inform the students of the enabling learning objectives for this lesson.

LESSON OBJECTIVES

After completing the lesson, you should be able to:

- 12-1. Define the types of cold injury.
- 12-2. Select the factors that influence cold injury.
- 12-3. Select the measures to prevent cold injuries.
- 12.4. Determine the wind-chill temperature.

Section II. EXPLANATION

Show Slide FSTCC0012-3: Introduction to Cold Injury

12-1. COLD INJURIES

Cold injury is defined as tissue damage caused by extreme cold. The type of injury sustained depends upon three factors; the degree of cold to which the body is exposed, the duration of the exposure, and the environmental factors present at the time of exposure. When speaking about specific cold injuries it is important to remember that cold injuries can occur at both freezing and non-freezing temperatures. Thus, cold injuries are classified as either freezing or non-freezing.

NOTE: Remember, it is up to the medical specialist to recognize the signs and symptoms of all forms of cold injury. Your role as a member of the FST is to enforce individual PMM and make recommendations to the commander regarding the implementation of your unit's preventive medicine measures. Understanding the conditions under which cold injuries occur will allow you to make informed recommendations that will, in turn, keep the soldiers in your unit healthy and combat ready.

Show Slide FSTCC0012-4: Categories of Cold Injuries

a. **Category 1 - Freezing.** These injuries occur when temperatures are at or below 32° Fahrenheit or 0° Celsius.

Show Slide FSTCC0012-5: Frostbite

(1) Frostbite. Frostbite results from the crystallization of tissue in the skin and adjacent tissue. Frostbite can be categorized as superficial or deep. Depending upon the windchill factor, duration of exposure and adequacy of protection, severe injury could occur at lower elevations within a matter of minutes or take as long as several hours.

Show Slide FSTCC0012-6: High Altitude Frostbite

(2) High altitude frostbite. This type of frostbite results from exposure to temperatures between -20° Fahrenheit and -80° Fahrenheit at high altitudes. At these very low temperatures, severe injury could be instantaneous.

Show Slide FSTCC0012-7: Chilblain

b. Category 2 – Non-freezing.

(1) Chilblain. The injury results from repeated, prolonged exposure of bare skin to temperatures from 60° Fahrenheit down to 32° Fahrenheit accompanied by high humidity. Chilblain is not usually serious enough to require evacuation or causes permanent impairment. It is considered the only cold injury that is not of significant military importance.

Show Slide FSTCC0012-8: Hypothermia

(2) Hypothermia. The destructive influence of cold on the body is known as hypothermia. Hypothermia occurs when the body loses heat faster than it can produce it.

(a) Hypothermia can be classified as mild, moderate, or severe.

(b) Hypothermia can occur in temperatures above freezing. When it occurs in temperatures below freezing, it is often accompanied by frostbite.

(c) Hypothermia can occur rapidly during cold water immersion (one hour or less when water temperature is below 45° Fahrenheit).

(d) Because normal physical activity causes the body to lose heat, physically active individuals are more prone to hypothermia.

Show Slide FSTCC0012-9: Fatigue and Hypothermia

(e) Fatigued individuals are more prone to hypothermia because exhaustion causes a sudden dilation of the blood vessels resulting in a more rapid loss of body heat.

Show Slide FSTCC0012-10: Trench Foot

(3) Trench foot. Trench foot is a very serious injury that may result in permanent nerve or tissue damage. Trench foot results from exposure to wet, cold conditions in temperatures below 50° Fahrenheit. The average duration of exposure resulting in trench foot is three days.

(a) Trench foot is associated with immobilization, usually standing; and in situations where there is a high dependence on the lower extremities, such as in long walks or marches.

(b) Trench foot is likely to occur when soldiers wear cold, wet boot and socks for prolonged periods.

NOTE: Soldiers wearing rubberized or tight-fitting boots are at risk for trenchfoot regardless of weather conditions, since sweat accumulates inside these boots and keeps the feet wet.

Show Slide FSTCC0012-11: Immersion Foot

(4) Immersion foot. Immersion foot is an injury sustained as a result of prolonged exposure (usually in excess of 12 hours) in water at temperatures below 50° Fahrenheit. Immersion foot can also occur at tropical temperatures in water at 70° Fahrenheit when exposure exceeds several days.

Show Slide FSTCC0012-12: Snow Blindness

(5) Snow blindness. Snow blindness occurs when the ultraviolet rays of the sun are reflected from a snow-covered surface into the eyes. It is important to note that this reflection exists even on cloudy days.

Show Slide FSTCC0012-13: Dehydration

(6) Dehydration. It is important to remember that dehydration is just as prevalent in cold regions as it is in hot regions. Be aware that the cold weather makes dehydration very difficult to detect. Follow the guidelines presented in Lesson 11 regarding water needs for soldiers especially during periods of high activity.

Show Slide FSTCC0012-14: Factors that Influence Cold Injury

12-2. FACTORS THAT INFLUENCE COLD WEATHER INJURIES

There are certain factors that influence the incidence, prevalence, type and severity of the injuries that occur as a result of exposure to the cold. Cold injuries are very predictable in that there are certain factors that, when present together, can result in cold injury. It is the combination and severity of these factors that will dictate the amount and type of injury sustained.

Show Slide FSTCC0012-15: Agent Factors

a. **Agent factors**. There is only one agent factor. It is the cold. While the effects of cold in cold injury are apparent, determining them is difficult. The effects of cold are considered in terms of body heat loss. And because of the ways that various

host and environmental factors modify the rate of body heat loss, you can not assume that a certain type of injury will be sustained in a certain temperature.

Show Slide FSTCC0012-16: Environmental Factors

b. **Environmental factors.** These are the things, other than the cold, that are in the soldier's environment at the time of exposure. There are three primary environmental factors that influence cold injury.

Show Slide FSTCC0012-17: Effects of Weather

(1) Weather. All aspects of weather; wind temperature, precipitation and humidity modify the rate of body heat loss.

(a) Wind. Wind increases heat loss from skin exposed to cold air and can increase the risk of frostbite. The effects of cold weather are intensified as air movement passing the body increases. This effect is known as windchill and is experienced as a result of wind blowing against the body. Soldiers will also experience this effect when they move themselves quickly through space, such as taking a ride in an open vehicle, running, or skiing.

(b) Water. Water can conduct heat away from the body much faster than air of the same temperature. When clothing becomes wet due to snow, rain, splashing water, immersion, or accumulated sweat, the body's loss of heat accelerates. Performing physical exercise before cold exposure increases heat loss.

(c) Temperature and humidity. These factors are often considered together because of their relationship to one another. For instance, low temperatures and relatively low humidity, when combined, produce an environment that makes soldiers very susceptible to frostbite. Higher temperatures (30°F to 50°F) together with moisture are usually associated with trench foot.

Show Slide FSTCC0012-18: Combat Action

(2) Combat action. An increase in the incidence of cold injury is expected as exposure increases. Exposure increases when physical activity is extremely low.

(a) Because of their potential for immobility, soldiers on guard duty should exercise greater awareness of cold injury prevention.

(b) Soldiers on active defense or offense have an increased likelihood of sustaining cold injury. This may be due to several factors including immobility while under fire, prolonged exposure, lack of opportunity to rewarm and change clothing, inability to perform basic personal hygiene practices, fatigue, or a lack of nutrition.

Show Slide FSTCC0012-19: Clothing Principles

(3) Clothing. Adequate clothing properly worn is essential to survival. Clothing for cold weather combat is designed to accommodate a variety of weather conditions and activity levels. Cold weather clothing protection is based on the principles of insulation, layering and ventilation. By understanding these principles, soldiers can vary their clothing to optimize performance and stay comfortable.

(a) Clothing that becomes wet from perspiration loses much of its insulating value. Therefore, care must be taken when performing high-activity tasks to prevent perspiration from accumulating in the clothing.

(b) Insulation depends on the amount of air trapped within the garment and properties of the material. When clothing is dirty or in bad repair, the material tend to be packed down, which compromises insulation.

(c) A standard number of layers can not be prescribed for universal wear during winter months. Therefore, follow these guidelines when determining clothing requirements and making clothing recommendations.

(d) Clothing should be flexible enough to allow outer layers to be removed for comfort and to permit the escape of perspiration during periods of increased physical exertion or in higher temperatures.

(e) Clothing must be loose enough to avoid constriction.

(4) Metal objects and liquid fuels. When these items are left outdoors in the cold they can pose a serious hazard. Both, metal objects and liquid fuels, can conduct heat away from the skin very rapidly. Fuels and solvents remain liquid at very low temperatures and become super cooled. Skin contact with fuel or metal at below freezing temperatures can result in nearly instantaneous freezing. Fuel handlers should use great care not to allow exposed skin to come into contact with spilled fuel or the metal nozzles and valves of fuel delivery systems.

Show Slide FSTCC0012-20: Host Factors

c. **Host Factors**. Host factors are those factors that are unique to the soldiers, themselves.

Show Slide FSTCC0012-21: Rank

(1) Rank. Rank is a highly significant factor. Personnel in higher ranks are less likely to suffer from cold injury for a number of reasons; experience level, leadership, receptivity to training, and significantly less exposure.

Show Slide FSTCC0012-22: History of Cold Injury

(2) History of cold injury. Individuals who have experienced a cold injury in the past are at greater risk of experiencing a cold injury than other soldiers. These soldiers may be more sensitive to the effects of cold, or they may not have learned how to properly protect themselves. It is also highly likely that the cold injury sustained will occur to the same part of the body.

Show Slide FSTCC0012-23: Fatigue

(3) Level of fatigue. The fatigue level of a soldier contributes to cold injury because a fatigued soldier is less likely to perform PMM. This is seen most often in personnel who have been in combat for 30 days or more without rest.

(a) Mental weariness may lead to apathy which may cause a soldier to neglect his physical needs for survival.

(b) Frequent rotation of troops from the front line can lessen the impact of fatigue.

(c) Soldiers who are sleep-deprived will not be able to sustain physical activity and will increase their risk for hypothermia

Show Slide FSTCC0012-24: Discipline, Training and Experience

(4) Discipline, training, and experience. Well-trained and well-disciplined soldiers are better able to care for themselves through personal hygiene and PMM.

NOTE: This is the one host factor over which FST members can have a profound impact. The PMM necessary for survival in the cold must be continuously stressed to the troops to enable them to cope with cold injury problems.

Show Slide FSTCC0012-25 Age and Dehydration

(5) Age. Persons >45 years old may be less cold tolerant than younger persons, due to either a decline in physical fitness (will fatigue sooner due to working at higher % of maximal aerobic capacity) or inability to conserve heat as well as their younger counterparts.

(6) Dehydration. Dehydration can increase susceptibility to cold injury by decreasing physical performance and cognitive function of the soldier.

Show Slide FSTCC0012-26 Psychosocial Factors

(7) Psychosocial factors. Psychosocial factors are those influences that stem from how a soldier interfaces with those around him and with his environment.

(a) Cold injury tends to occur more often in individuals who have a passive or negative attitude.

(b) Soldiers who display little muscle activity or those who don't feel it necessary to carry extra footwear or change out of their wet socks are also at a higher risk.

Show Slide FSTCC0012-27 Geographic Origin

(8) Geographical origin. In the Army, you will meet people from all over the globe. This is important because among Caucasians the geographic origin of the soldier seems to be a significant host factor. People who originate from warmer climates are more susceptible to cold injury.

Show Slide FSTCC0012-28 Race

(9) Race. In terms of numbers at risk, and independent of geographic origin, African American soldiers appear to be considerably more vulnerable to frostbite than their Caucasian counterparts.

NOTE: Be aware that it is more difficult to detect the changes in skin color associated with the progression of frostbite with dark complexions. This fact makes it even more important for small unit leaders and battle buddies to frequently check their soldiers' status in cold weather operations.

Show Slide FSTCC0012-29 Nutrition

(10) Poor nutrition. Individuals who do not eat regularly or do not eat complete and balanced meals are more susceptible to cold injury.

(11) Alcohol. Alcohol can lower blood sugar levels and decrease shivering. Also, alcohol increases urine formation, leading to dehydration, which can further degrade the body's ability to perform. Most importantly, alcohol blunts the senses and impairs judgment, so the individual may not feel the signs and symptoms of developing cold injury.

Show Slide FSTCC0012-30: Nutrition

NOTE: Soldiers who wear adequate clothing and are properly protected from the cold will not require additional calories during cold weather operations. Each of these soldiers can exist on the military rations.

Show Slide FSTCC0012-31: Activity Level

(12) Activity level. Soldiers who participate in too little or too much activity increase their risk of cold injury.

(a) Overactivity, which causes rapid breathing, can result in large amounts of body heat loss. Additionally, perspiration can get trapped in the clothing markedly reducing the insulating quality of the uniform.

(b) Immobility causes decreased heat production, increasing the danger of damage to the extremities.

Show Slide FSTCC0012-32: Drugs and Medications

(13) Drugs and medications. As in the case of heat injury, some medications increase a soldier's susceptibility to cold injury.

(a) Tobacco and alcohol decrease peripheral (e.g. hands) circulation and make a soldier more susceptible to frostbite.

(b) Blood pressure medications reduce the circulation making the soldier more susceptible to injury to the extremities.

Show Slide FSTCC0012-33: FST Role in Prevention

12-3. FST ROLE IN PREVENTION

It is important to note that, except in unusual situations, cold injuries are preventable. Success in prevention requires vigorous command leadership, prior planning, and the provision of cold-weather equipment and clothing. Your role as an FST member is to provide specific preventive medicine measures directed toward conserving body heat, avoiding unnecessary exposure of personnel to cold moisture, and educating personnel on the activities and factors that favor cold injury. You must employ any or all of the following elements to your program of prevention.

Show Slide FSTCC0012-34: Using Meteorological Data

a. **Meteorological data.** All commanders must be familiar with and use meteorological data such as humidity, temperature, and wind. As you know from our previous discussions, all these weather elements influence the risk of cold injury.

(1) Weather conditions for each 12-hour period are typically predicted using meteorological data in conjunction with the existing weather conditions. This allows the commander to judge the severity of the environment and anticipate the hazards facing his troops over the next twelve hours.

(2) The commander may use this data to determine the necessity of shortening exposure times of individuals engaged in patrols, on guard, or in motor movement of unheated vehicles. This may occur despite the availability of adequate clothing and equipment.

(3) This data is also used to ensure that the proper clothing is provided for the anticipated weather conditions.

Show Slide FSTCC0012-35: The Cold Injury Officer

b. **The cold injury officer.** Each platoon or comparably sized unit should have a cold injury officer or NCO. In many cases, this may be an FST member. This person is selected for their leadership interest and ability to supervise others in simple, but constant, PMM. Frequent observation of the soldiers in the unit is the most important role of the cold injury officer. There are many roles the cold injury officer should expect to perform.

(1) Look at soldiers' exposed skin and extremities for early signs and symptoms of cold injury.

(2) Check all soldiers daily for good personal hygiene, especially of the feet. Remind the soldiers to change their socks at appropriate intervals and do what they can to keep them clean and dry.

(3) Encourage soldiers to avoid constricting their extremities by wearing tight-fitting clothes or footgear.

Show Slide FSTCC0012-36: The Buddy System

c. **The buddy system.** You need to train the soldiers in your unit to observe their buddy for evidence of cold injury and instruct them on the proper methods used to rewarm blanched body parts.

Show Slide FSTCC0012-37: WARNING

WARNING: Do not ignore the initial signs of frostbite – cessation of the sensation of cold or discomfort followed by a pleasant feeling of warmth.

NOTE: Blanching is evidenced by skin that loses its natural color.

(1) If blanching is recognized on the fingers, rewarm them by holding the fingers against the skin of the abdomen or in an armpit. Hold the blanched area until the skin rewarms and returns to its normal color.

(2) If blanching is noticed in the toes, hold them against your buddy's bare chest or abdomen while protecting your toes from the wind.



WARNING: Rewarming should ALWAYS be done by holding, NOT rubbing, the blanched area.

Show Slide FSTCC0012-38: Clothing

d. **Clothing.** The Extended Cold Weather Clothing System (ECWCS) will provide protection of the head, torso, and extremities from 40° to -60°F (4.4° to -51.1°C). The ensemble uses the layering principal to conserve body heat. Loose layers of clothing with air space between them, under an outer wind- and water-resistant garment, provide maximum protection. The ensemble is generally comprised of four layers: Polypropylene undershirt/drawers, fiber pile shirt/pants, polyester batting coat and trouser liner, and extended cold weather (GORE-TEX^Æ) camouflage parka and trousers. You should remind the soldiers in your unit of the following basic clothing principles.

(1) Clothing should be layered. Soldiers should have the flexibility to remove clothing layers during periods of high activity or warming temperatures.

(2) Soldiers should ventilate the body during physical activity to avoid the accumulation of sweat in the uniform.

(3) Clothing should be kept as clean and dry as possible. Dirt, grease, and mineral salts from sweat cause the uniform to facilitate heat loss more rapidly.

(4) Clothing and footgear should not constrict. This means that soldiers should be advised against wearing all tight-fitting socks, boots, trousers, underwear, sweaters, or jackets.

(5) Clothing and footgear should be inspected daily for holes and rips.

(6) Ground forces personnel in cold areas should be equipped with insulated rubber combat boots. Frequent changes of socks are important with these boots because of the increased sweating and retention of sweat inside the boot.



NOTE: Although sweating in these boots does not cause a loss of insulation, it does lead to the softening of the soles of the feet.

Trauma to the soles, which can be produced simply by walking, can lead to skin loss and may require hospitalization.

NOTE: See Table 2-6 in FM 4-25.12 (Figure 12-2) for further information on suggested clothing layering for physical training and work.

Show Slide FSTCC0012-39: IPMM

e. **Individual preventive medicine measures (IPMM).** Soldiers should be instructed as to how they can protect themselves from the ill effects of the cold.

Show Slide FSTCC0012-40: Wear or Carry Adequate Clothing

(1) Make sure soldiers wear or carry adequate clothing for the anticipated weather conditions.

Show Slide FSTCC0012-41: Benefits of Layering

(2) Remind soldiers of the benefits of layering loose-fitting clothing. First, wearing layers permits air to circulate between them and act as an insulator. Secondly, loose clothing permits good blood circulation to all body parts. Layering permits soldiers to remove excess clothing when near a fire or in a warm enclosure.

Show Slide FSTCC0012-42: Protect Your Hands

(3) Advise soldiers to keep their hands well protected. Mittens offer better protection against the cold than gloves. This is partly due to the fact that mittens are less constrictive than gloves. They also allow room for air to circulate around the fingers. The air circulating within the mitten provides the maximum insulating value.

NOTE: Keeping the hands well insulated is important because it takes a long time to recondition the hands to normal usage levels. Therefore, soldiers should be warned against lengthy exposure of the bare hands and wrists that may cause stiffening and reduce the blood circulation.

WARNING: Soldiers should never touch metal, snow, or other cold objects with their bare hands.

Show Slide FSTCC0012-43: Avoid Immobility

(4) Tell soldiers to do what they can do to avoid immobility in the cold. They should walk around or do some sort of light exercise periodically. If this is impossible, then they should shift positions occasionally. Remind soldiers that it is especially important to move their toes, feet, legs, fingers, and arms to prevent cold injury.

NOTE: Inform soldiers that in situations where they must sit or stand for long periods, it is beneficial to find some cardboard or other insulating material to sit or stand on to insulate themselves from the cold surface.

Show Slide FSTCC0012-44: Protect Soldiers “At Risk”

(5) Remember that certain groups of individuals require greater protection from the cold. Identify them, and supervise these people closely to ensure they are safe from cold injury.

(6) Shelter from the elements is secondary only to defending against enemy actions.

(7) Be prepared for sudden weather changes.

(8) Avoid cold injuries by using a buddy system and frequent self checks especially when individuals are not active or their duties require them to remove their gloves.

(9) Drivers and passengers should always have a sleeping bag and extra cold-weather clothing when traveling by vehicle away from the unit bivouac location.

NOTE: The groups of soldiers you need to concern yourself with are the fatigue group, the racial group, the geographical origin group, the negative attitude group, and the group of individuals with previous cold injury.

Show Slide FSTCC0012-45: Understand the Effects of Windchill

f. **Windchill.** As wind speed increases, the danger of cold injury increases. Knowing how to determine the effects of wind speed on chilling the body will allow you to make the best possible recommendations for PMM to your commander and provide the best guidance to the soldiers in your unit.

Show Slide FSTCC0012-46: The Windchill chart

(1) Windchill chart.

(a) Notice that the maximum wind speed on the chart is forty miles per hour. This is due to the fact that wind speeds greater than forty miles per hour have little additional effect on the rate at which the body is cooled.

Show Slide FSTCC0012-47: Data Along the Top of the Chart

(b) Along the top is the thermometer reading in degrees Fahrenheit.

Show Slide FSTCC0012-48: The Body of the Chart

(c) Within the body of the chart are three categories and their associated descriptions. Your recommendations will be made based upon the level of threat of cold injury represented by each of these categories.

Show Slide FSTCC0012-49: Determine the Windchill

12-4. DETERMINE THE WINDCHILL

It is important to note that you, as an FST member, will not be issued a thermometer. In addition, the exact temperature may not be known by anyone in your unit. Therefore, it will not be possible to accurately calculate windchill.

- a. Locate the wind speed in the left-hand column.
- b. Locate the temperature along the top of the chart.
- c. Locate the point on the chart where these two numbers intersect.

Table 2-5. Windchill Chart

ESTIMATED WIND SPEED (IN MPH)	ACTUAL TEMPERATURE READING (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	EQUIVALENT CHILL TEMPERATURE (°F)											
CALM	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(WIND SPEEDS GREATER THAN 40 MPH HAVE LITTLE ADDITIONAL EFFECT.)	LITTLE DANGER IN LESS THAN ONE HOUR WITH DRY SKIN. MAXIMUM DANGER OF FALSE SENSE OF SECURITY.			INCREASING DANGER DANGER FROM FREEZING OF EXPOSED FLESH WITHIN ONE MINUTE.				GREAT DANGER FLESH MAY FREEZE WITHIN 30 SECONDS.				
NOTE: 1. TRENCH FOOT AND IMMERSION FOOT MAY OCCUR AT ANY POINT ON THIS CHART. 2. $F = \frac{9}{5} C + 32$.												

Figure 12-1. Windchill Chart

CAUTION: This chart is only good for predicting frostbite to exposed flesh. Any clothing or material that stops or reduces the wind will give a degree of protection to the covered area. **UNDER NO CIRCUMSTANCES** should you try to predict the amount of protection offered by such clothing when using the windchill chart. You could end up putting your soldiers at additional risk.

NOTE: Another important fact is that wet clothing or boots results in heat loss nearly equal to that of exposed flesh.

Table 2-6. Leader's Guide For the Prevention of Cold Injuries Due to Exposure to Temperatures Below 50°F

INFORMATION IS PROVIDED TO ASSIST LEADERS IN RISK DECISION-MAKING AND CONTROL DEVELOPMENT AS PART OF THE RISK MANAGEMENT PROCESS. RISK DECISIONS AND CONTROLS ARE IMPLEMENTED INTO UNIT TRAINING PLANS AND THAT TRAINING IS SUPERVISED. THESE GUIDELINES ARE GENERALIZED FOR WORLDWIDE USE. COMMANDERS OF UNITS WITH EXTENSIVE EXTREME COLD WEATHER TRAINING AND SPECIALIZED EQUIPMENT MAY OPT TO USE LESS CONSERVATIVE GUIDELINES.

WORK INTENSITY	LITTLE DANGER	INCREASED DANGER	GREAT DANGER
HIGH DIGGING FOXHOLE, RUNNING, MARCHING WITH RUCKSACK, MAKING OR BREAKING BIVOUAC.	INCREASED SURVEILLANCE; BY SMALL UNIT LEADERS; BLACK GLOVES OPTIONAL-MANDATORY BELOW 0° F; INCREASED HYDRATION.	EXTENDED COLD WEATHER CLOTHING SYSTEM OR EQUIVALENT; MITTENS WITH LINERS; NO FACIAL CAMOUFLAGE; EXPOSED SKIN COVERED AND KEPT DRY; REST IN WARM, SHELTERED AREA; VAPOR BARRIER BOOTS BELOW 0° F.	POSTPONE NON-ESSENTIAL TRAINING; ESSENTIAL TASKS ONLY WITH LESS THAN 15-MINUTE EXPOSURE; WORK GROUPS OF NO LESS THAN 2 PERSONNEL; COVER ALL EXPOSED SKIN.
LOW WALKING, MARCHING WITHOUT RUCKSACK, DRILL AND CEREMONY.	INCREASED SURVEILLANCE; COVER EXPOSED FLESH WHEN POSSIBLE; MITTENS WITH LINER AND NO FACIAL CAMOUFLAGE BELOW 10° F; FULL HEAD COVER BELOW 0° F. KEEP SKIN DRY- ESPECIALLY AROUND NOSE AND MOUTH.	RESTRICT NONESSENTIAL TRAINING; 30- TO 40-MINUTE WORK CYCLES WITH FREQUENT SUPERVISORY SURVEILLANCE FOR ESSENTIAL TASKS. SEE ABOVE.	CANCEL OUTDOOR TRAINING.
SEDENTARY SENTRY DUTY, EATING, RESTING, SLEEPING, CLERICAL WORK.	SEE ABOVE; FULL HEAD COVER AND NO FACIAL CAMOUFLAGE BELOW 10° F COLD-WEATHER BOOTS BELOW 0° F; SHORTEN DUTY CYCLES; PROVIDE WARMING FACILITIES.	POSTPONE NONESSENTIAL TRAINING; 15- TO 20-MINUTE WORK CYCLES FOR ESSENTIAL TASKS; WORK GROUPS OF NO LESS THAN 2 PERSONNEL; NO EXPOSED SKIN.	CANCEL OUTDOOR TRAINING.
RECOMMENDED CLOTHING			
FIELD UNIFORM	POLYPRO (T/B); ECWCS (T/B); BALACLAVA TRIGGER FINGER MITTENS; GORE-TEX® BOOTS	POLYPRO (T/B); FIBER PILE (T/B); ECWCS (T/B); BALACLAVA/PILE CAP; ECW MITTENS; BOOTS ECW	POLYPRO (T/B); FIBER PILE; POLYESTER BATTING COAT AND TROUSER LINER; ECWCS (T/B); BALACLAVA/PILECAP BOOTS ECW (TYPE II)
PT UNIFORM	PFU; SWEATS (T/B); NECK GATOR; BLACK KNIT CAP; BLACK GLOVES W/INSERTS	PFU; SWEATS (T/B); POLYPRO (T/B); BLACK KNIT CAP; NECK GATOR; BALACLAVA; TRIGGER FINGER MITTENS	PFU; SWEATS (T/B) POLYPRO (T/B); BLACK KNIT CAP; NECK GATOR; BALACLAVA; TRIGGER FINGER MITTENS

GORE-TEX® Boots—Matterhorn/Rocky Mountain or similar GORE-TEX® Insulated leather boots. **ECWCS**—Extended Cold Weather Clothing System (GORE-TEX®); T/B—Top and Bottom; PFU—physical fitness uniform.

Figure 12-2 Leader's Guide For the Prevention of Cold Injuries Due to Exposure to Temperatures Below 50°F

Section III. SUMMARY

Show Slide FSTCC0012-50: Summary

NOTE: Review the main points with the audience. Ask and answer questions to ensure understanding of the material presented in this lesson.

CLOSING STATEMENT: Directing cold injury prevention measures in your unit requires that you know the circumstances under which cold injury is likely to occur. You must also be able to inform the soldiers in your unit of the factors that influence cold injury and encourage them to follow the basic guidelines of prevention. In addition, you should be able use the information obtained from the windchill chart to provide your commander with appropriate guidance aimed at preventing cold injury to the soldiers in your unit.