

A photograph of a baseball player in a white pinstriped uniform sliding into a base. The player is wearing a red helmet and is in a dynamic, low-to-the-ground position. The background is a blurred green field. The text is overlaid on the right side of the image.

Concepts of Athletic Training

**FIFTH
EDITION**

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Chapter 18

Thermal Injuries

Thermal Injuries

Temperature-related health emergencies sometimes result in death.

- The majority, if not all, of these deaths could be prevented if the environment is taken into consideration before allowing an event to begin.
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- Heat is a byproduct of metabolism.

Thermal Injuries (continued)

- Exercise increases metabolic rate and can elevate body temperature to 104 °F.
- Excess heat must be eliminated.
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Thermoregulation

Excess body heat is lost through:

- Radiation:
-
- Convection:
- Evaporation:
 - The most efficient way during exercise on dry land.
 -
 - Coaches should reduce exercise demands during period of high humidity and temperature.

Thermoregulation (continued)

Acclimatization is a process in which the body adjusts to continuous and significant climate changes

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- In hot conditions, athletes need 4-10 L of fluids daily to avoid dehydration.
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- Fluid needs increase as the rate of sweating increases.

Dehydration

Minimal dehydration (less than 2% body weight loss) generally does not affect health or performance.

- Signs and Symptoms include:
 - Dry mouth
 -
 - Irritability or crankiness
 -
 -
 - Excessive fatigue
 -

Dehydration (continued)

Management

- Remove athlete from participation and move him/her to cool location
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- If dehydration is minor (less than 2% body weight loss) and symptoms are relieved, athlete can return to participation
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Heat Cramps

Heat cramps generally develop in the muscles being exercised.

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Signs and Symptoms include:

- Severe muscle cramps in arms or legs
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- Profuse sweating



Heat Cramps (continued)

Management

- Athlete should immediately cease exercising
-
- Have athlete perform static stretching of involved muscles.

Heat Exhaustion

Although heat exhaustion is not a life-threatening condition, it can be a precursor to heatstroke, a true medical emergency.

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- Coach should constantly monitor athletes for signs and symptoms of heat exhaustion when they must practice in extreme heat and humidity

Heat Exhaustion (continued)

The signs and symptoms include:

- Moist, clammy skin
-
- General muscle fatigue and/or cramps
-
- Severe thirst
- Headache
-
- Body temperature that ranges from 97-104°F



Heat Exhaustion (continued)

Management

- Athlete should immediately cease exercising
-
- Move athlete to cool location and place into a supine position with legs elevated 8-12 inches
-
- If athlete is not fully recovered within 30 minutes, seek medical attention
-

Heat Stroke

Heat stroke occurs when the body is unable to cool itself and a radical elevation of body temperature occurs, sometimes exceeding 106°F

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Exertional heat stroke occurs in athletes exercising in warm, humid conditions

- This condition is usually related to excess body fluid losses combined with inadequate evaporative cooling

Heat Stroke (continued)

Signs or symptoms include:

- Sweating may or may not be present
-
- Mental confusion and possible loss of consciousness
-
- Severe motor disturbances and loss of coordination
- Rapid and strong pulse
-



Heat Stroke (continued)

Management

- Heat stroke is a true medical emergency. Death can result if not treated correctly and promptly
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- If the above personnel are not on site, summon EMS
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Heat Stroke (continued)

- Wrap athlete in wet towels or sheets, and place cold packs on neck, head, groin, and under armpits
-
- Keep athlete in semi-seated position

Prevention of Exertional Heat Illnesses

Heat-related illness causing death is totally preventable

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- For every pound of weight lost, the athlete should consume 24 oz. of fluid
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Prevention of Exertional Heat Illnesses (continued)

- The athlete should consume 7-10 oz. of fluids every 10-20 minutes during activity
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- Athlete should avoid wearing restrictive clothing
 - Dark colors may facilitate heat buildup
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Cold-Related Health Problems

- Hypothermia involves the rapid loss of body heat, resulting in total body cooling
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 - Extremely lean athletes are at risk because they have little insulating body fat
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Cold-Related Health Problems (continued)

Signs and symptoms include:

- In mild cases, shivering, loss of motor functioning, speech slurring, confusion, and memory loss
-
- Athlete will be semiconscious or unconscious



Cold-Related Health Problems (continued)

Management of mild hypothermia

- Move athlete to a source of heat and out of the cold
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-
- Warm athlete with an electronic blanket or hot packs placed around head and neck, armpits, groin and chest

Cold-Related Health Problems (continued)

Management of severe hypothermia (body temperature below 90°F)

- Transport athlete immediately to a health care facility
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- Prevent further heat loss by moving athlete to a warm place and by gently removing cold, wet clothing
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Cold-Related Health Problems (continued)

Prevention of Hypothermia

- Assess risk by learning to use a wind-chill chart (table 18.3 on page ____)
-
- Learn to recognize early warning signs of hypothermia

Cold-Related Health Problems (continued)

Prevention of hypothermia (continued)

- Dress appropriately for cold weather
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- Make sure to remain hydrated and consume adequate calories to generate body heat
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Frostbit and Frostnip

Frostbite occurs when tissues freeze after excessive exposure to cold

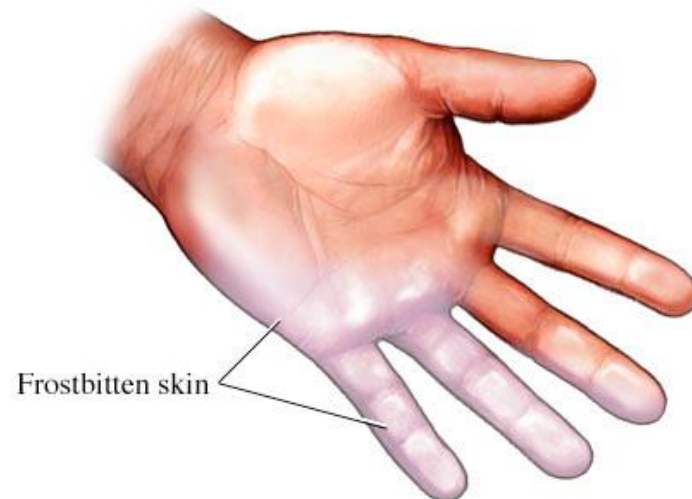
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Frostnip is less severe and involves only outer skin layers.

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Frostbite and Frostnip (continued)

Severe damage occurs when frostbitten tissue is thawed and refrozen



Frostbite and Frostnip (continued)

Signs and symptoms of superficial freezing include:

- White or grayish-yellow skin color
-
- Affect part feels very cold and numb
-
- Skin surface feels hard and crusty
-

Frostbite and Frostnip (continued)

Signs and symptoms of deep freezing include:

- Affected body part feels hard, solid, and cannot be depressed
 -
 -
- The painfully cold body part suddenly stops hurting



Frostbite and Frostnip (continued)

First Aid (Time Out 18.2 on page ____)

- Get medical attention immediately
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- If medical help is delayed, slow re-warming is necessary
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Cold Urticaria

- Cold urticarial involves a localized skin reaction to cold that involves edema and severe itching
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- Mechanism is unknown; it may be allergic reaction
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- Athletes taking penicillin or oral contraceptives also have a higher incidence



Cold Urticaria (continued)

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- Medical referral may be warranted if symptoms recur
- Antihistamines can control edema and itching
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