

# 13

## Training and Overuse Injuries

In this chapter you will learn about:

- ◆ Treatment and prevention of injuries.
- ◆ When to seek medical care.
- ◆ Returning to duty.
- ◆ Overtraining syndrome.

**One** of the hazards of physical training is becoming injured. Sustaining either a sudden injury or an overuse injury can mean loss of work days, forced rest, and pain for a period of days to weeks. The goal of this chapter is not to have you treat your own injuries, but rather to be informed so that you will seek appropriate help when needed. Central to rapid recovery from training-related injuries is a step-wise reconditioning program which starts immediately after the injury. Such programs are designed to arrest the inflammatory process, promote healing and accelerate the return to full duty.

### Injuries: Treatment and Prevention

A variety of injuries can occur during physical training. [Table 13-1](#) has a brief description of acute and overuse injuries, as well as their treatment and prevention. Both sudden-onset and recurring injuries can result in inflammation (localized warmth, swelling, redness and pain). If left unchecked the inflammatory response rapidly leads to:



- ◆ Tissue swelling.
- ◆ Loss of normal function.
- ◆ Decreased range of motion of the joint.
- ◆ Stiffness.
- ◆ Weakness.

**Table 13-1. Injuries, Treatments, and Prevention**

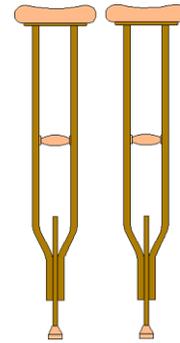
<b>Injury</b>	<b>Treatment</b>	<b>Prevention</b>
<b>Delayed-Onset Muscle Soreness</b> - Muscle pain occurring in deconditioned muscle 12-72+ hours after training.	Ice, stretch, warm-up. Do not use NSAIDs.	Resolves as muscle adapts to training. Slowly increase training intensity.
<b>Contusions</b> - Swelling and bleeding (bruising) in the muscle, tendon, or bone due to a direct blow.	Ice	Wear protective gear.
<b>Muscle Cramp</b> - Muscle pain caused by prolonged activity, high heat or humidity, dehydration, and poor conditioning.	Rehydrate ( <a href="#">Chapter 2</a> ), stretch, massage with ice.	Allow time to adjust to training and climate; drink frequently.
<b>True Fractures</b> - Break or chip in the bone.	Seek medical help.	Use protective gear; recondition.
<b>Stress Fractures</b> - Pain and weakening of the bone caused by excessive stress and use.	Seek medical help.	Reduce high-impact activities, cross-train, use proper gear, slowly increase training.
<b>Sprains</b> - Acute or overuse injury to ligaments (connective tissue that joins bone to bone).	RICE.* Seek medical help.	Follow medical advise; slowly increase training intensity, use proper gear.
<b>Strains, Tendonitis</b> - Acute or overuse injury to muscle or tendons (connective tissue that joins muscle to bone).	RICE. Seek medical help.	See "Sprains."
<b>Heat Injuries (cramp, exhaustion, heat stroke)</b> - Painful muscle contractions, nausea, fatigue, fever, or dizziness from dehydration and electrolyte depletion; fevers >104°F can damage vital organs and result in death.	Place person in a cool location and rehydrate. Seek medical help.	Acclimate to climate, avoid exercise in extreme heat, avoid substances that cause dehydration ( <a href="#">Chapter 12</a> ), stay well hydrated ( <a href="#">Chapter 2</a> ).
<b>Cold Injuries (hypothermia, frost bite, trench foot)</b> - Body temperature <95°F causing shivers, slurred speech, clumsiness, and freezing of exposed body parts.	Gently place the person in dry blankets with another warm person.	Wear proper gear, stay dry, avoid exercise in extreme cold, stay well hydrated ( <a href="#">Chapter 2</a> ).

RICE = rest, ice, compression, and elevation. See [page 102](#).

The treatment of any injury should focus on controlling the inflammation and allowing full joint range of motion for a rapid return to daily activities. To accelerate healing, you must first decrease the inflammatory process. Treatment steps to achieve this include:

## **RICE = Rest + Ice + Compression + Elevation**

- ◆ **Rest** - partial or no weight-bearing of the extremity, using crutches for locomotion. “Relative Rest” means decreasing activities that cause pain and replacing them with activities that are pain-free.
- ◆ **Ice** - as soon as possible apply ice, wrapped in a bag or towel, to the injured area. Ice for 20 minutes every two hours on the first day, then 3 times a day until the swelling has decreased. To prevent nerve damage, do not ice for longer than 20 minutes at a time. Never apply ice directly to the skin or to an open wound!
- ◆ **Compression** - wrap the injury for periods of 2-4 hours. Never sleep with a compression wrap unless medically advised.
- ◆ **Elevation** - place the injury above the level of the heart, allowing gravity to reduce the swelling.



## **Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)**

In addition to RICE, non-steroidal anti-inflammatory drugs (NSAIDs) are often used to decrease the symptoms due to inflammation and fever associated with injury. Although NSAIDs are usually available over-the-counter, these medications should not be taken lightly. In the case of an acute injury which involves bleeding, bruising, or swelling, NSAIDs should not be started until after the bleeding has stopped (may take days) and the swelling has stabilized. Some side-effects of NSAIDs include:



- ◆ Nausea, heartburn, vomiting, ulcers, and bleeding.
- ◆ Increased blood pressure.
- ◆ Decreases the ability of blood to clot.
- ◆ Worsening of asthma.
- ◆ Potential kidney damage with long-term use.

Some of the most common NSAIDs are aspirin (Bayer, Aspirin, Ecotrin),

ibuprofen (Advil, Motrin), and ketoprofen (Orudis). Remember: NSAIDs should not be used with alcohol. If you have stomach or gastrointestinal problems, check with your doctor for the appropriate pain reliever.

## When to Seek Medical Care

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Table 13-1 provides the description, prevention, and treatment for some training injuries. Knowing the differences between these injuries will help you safely administer first aid treatment, should they occur, and help you determine when you need to seek medical treatment. Some conditions demand immediate medical attention, including:

- ◆ Numbness.
- ◆ Joint dislocation.
- ◆ Suspected fracture.
- ◆ Any hip pain which causes a limp.
- ◆ Back pain that radiates into the thigh, leg or foot.
- ◆ Severe pain or pain limiting activity for 3 to 5 days.
- ◆ Any lower extremity injury in which the individual is unable to bear weight.

## Return to Duty

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After the pain and swelling are reduced and full range of motion is possible, ask your physician or physical therapist to design a reconditioning exercise program with the overall goal of **returning to full activity**. The exercises prescribed will be specific to the site and type of injury, and will work towards maximizing:

- ◆ Flexibility.
- ◆ Strength.
- ◆ Endurance.
- ◆ Power.
- ◆ Speed.
- ◆ Specific Duty Tasks.

# Overtraining Syndrome

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Overtraining can negatively affect physical and mental performance. Moreover, it can increase the likelihood of sustaining an injury. Overtraining is exactly what the word implies: **too much physical activity**.

The **overtraining syndrome** can present with a wide range of physiologic or psychological symptoms which vary widely among individuals (See [Table 13-2](#)). Overtraining is generally associated with endurance sports, such as swimming or running. The best indicators of overtraining include a 10-15 beat elevation in (morning) resting heart rate and an altered mood state, such as feelings of frustration, anger, depression or apathy. Cross-training, rest, monitoring of morning heart rate, assessing mood and taking time off from certain physical activities will all reduce overtraining symptoms and injuries. The person who continues training despite the symptoms listed in [Table 13-2](#) will only become more overtrained, continue to have decreases in performance, and will be at an increased risk for injury.



**Table 13-2. Symptoms of Overtraining Syndrome**

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|--|----------------------------------|
| ◆ Decreases in performance and strength. | ◆ Feeling “burned-out” or stale. |
| ◆ Difficulty making decisions.           | ◆ Difficulty concentrating.      |
| ◆ Chronically fatigued.                  | ◆ Angry and irritable.           |
| ◆ Lacking motivation.                    | ◆ Muscle soreness.               |
| ◆ Disturbances in mood.                  | ◆ Increased distractibility.     |
| ◆ Feelings of depression.                | ◆ Difficulty sleeping.           |
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