Sprains and strains

Introduction

Sprains and strains are common injuries with which patients present in the pharmacy. They may be caused by repetitive activities or by a single event.

Sprains

Ligaments are strong flexible bands of fibrous tissue around joints that connect one bone to another. Ligaments usually stretch within their limits, and then return to their normal position. When a ligament is forced to stretch beyond its normal range, a sprain occurs. A severe sprain causes actual tearing of the elastic fibres. It is most common for a sprain to occur in the ankle, knee, wrist and thumb.

Symptoms of a sprain may include the following:

- Joint or muscle pain
- Joint stiffness
- Tenderness
- Swelling and inflammation
- Bruising
- Loss of movement in the affected body part.

Classification

Sprains are classified from grade 1 to grade 3 based upon clinical signs and functional loss. The amount of force determines the grade of the sprain.

Grade 1 sprain

This type of sprain results from mild stretching of a ligament, with some damage to its fibres. Patients experience mild swelling and tenderness. On examination, there appears to be no joint instability and the patient is able to bear weight and ambulate with minimal pain.

Grade 2 sprain

A grade 2 sprain is a more severe injury involving a partial tearing of the ligament. Patients have moderate pain, swelling and tenderness. On examination, there is mild to moderate joint instability, with some restriction of range of motion and loss of function. Weight bearing and ambulation are painful. These patients should be referred to the doctor.

Grade 3 sprain

A grade 3 sprain involves complete tearing of the ligament. Patients have severe pain, swelling and tenderness. On examination, there is significant mechanical instability and significant loss of function and motion. Patients are unable to bear weight or ambulate. These patients must be referred to the doctor.

Strains

A strain injury occurs when the muscle fibres stretch or tear. Strains usually occur when the muscle has been stretched beyond its limits or when it has been forced to contract too quickly. Strains can occur suddenly or develop over time. Strains often occur in the muscles of the lower back, neck, hamstring (muscles that run down the back of the leg), calf or thigh during an accident or from strenuous activities, including exercise.

The symptoms of a muscle strain may include the following:

- Muscle pain or weakness
- Muscle spasm or tightness
- Swelling and inflammation
- Bruising
- Inability to use the muscle

Classification

Strains are described in relation to the severity of damage, according to three grades.

Grade 1 strain

This type of strain usually causes stretching of a few of the muscle fibres.

Grade 2 strain

This type of injury affects some of the muscle fibres, resulting in significant damage and tearing.

Grade 3 strain

This type of injury involves a complete rupture of the muscle.

Management of sprains and strains

Initial management goals are to limit inflammation and swelling and to maintain range of motion. Most minor sprains and strains only need a period of protection in order to heal, and can usually be treated with self-care techniques, such as rest, ice/cooling, compression and elevation (RICE) therapy.

Early mobilisation, strengthening exercises and coordination exercises are important after sprains and strains. The return to full activity must occur gradually.

Sprains

Apply the RICE guidelines in the case of a Grade 1 sprain:

Rest: It is important to rest the injured limb to facilitate recovery. Rest is achieved by limiting weight bearing. Patients may use...
crutches for an ankle sprain until they are able to walk with a normal gait.

**Ice:** Ice should be applied immediately to keep the swelling down. Ice or a cold gel pack should be applied every 1-2 hours, for 15 minutes each time. A thin towel should be placed between the ice (or other cold object) and the skin. The ice or other cold object should be used for at least 6 hours after the injury. However, it has been found to be helpful to use ice for longer periods, even up to two days after the injury occurred.

**Compression:** If applied early, compression with an elastic bandage immobilises and supports the injured area, and minimises swelling.

**Elevation:** The affected limb should be elevated to further alleviate swelling, e.g. an injured ankle should be elevated by raising the foot above the level of the heart. The RICE guidelines can also be used in the case of a Grade 2 sprain. However, more time should be allowed for healing to occur. The doctor may also use a device to immobilise or splint an ankle if it has been sprained.

A Grade 3 sprain can be associated with permanent instability. A short cast or a cast brace may be used for 2-3 weeks. Later, treatment may include exercise and physical therapy. The goal is to increase strength and range of motion as balance improves over time.

**Heat only**

The application of heat can be both comforting and effective in reducing pain. However, heat should never be applied immediately after an injury has occurred, because heat application at the acute stage will dilate blood vessels and increase blood flow into the affected area: the opposite effect of what is needed. After the acute phase is over (one or two days after the injury), heat may be useful.

**Medication**

Topical or systemic over-the-counter (OTC) treatment may be used to reduce pain and inflammation, e.g. analgesics, such as paracetamol or nonsteroidal anti-inflammatory drugs, such as ibuprofen. However, patients with severe sprain injuries should be referred to the doctor.

**Muscle strains**

A muscle strain usually gets better on its own, but can take days to weeks to heal completely. Treatment includes applying the RICE guidelines to relieve symptoms. Topical or systemic OTC treatment may be used to control pain and inflammation. If the patient is experiencing considerable pain or has a severe muscle strain, he or she should be referred to the doctor. After the pain has subsided, the doctor or physiotherapist may recommend gentle exercises and stretching to help strengthen the muscles, and to prevent them from getting too stiff. It’s important to let the muscle heal before playing sport or engaging in activities which require the use of the injured muscle.

**Prevention**

The best way to prevent sprains and strains is to maintain good strength, muscle balance and flexibility.

The following steps may lower the risk of acquiring a sprain or strain injury:

- Warm up and stretch before doing exercises and vigorous activities.
- Stretch or “warm down” after exercise.
- Use the correct footwear for activities.
- Avoid sports and activities for which you have not trained.
- Engage in regular strengthening and conditioning exercises.
- Pay attention to the body’s warning signs to slow down when feeling pain or fatigue.

**Conclusion**

Pharmacist’s assistants are frequently asked for advice on how to treat injuries such as sprains and strains. Most sprains and strains resolve with time, and simple practical advice, combined with topical or systemic OTC treatment, may help relieve symptoms during the recovery period.

**Bibliography**

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