

Sample Topic

Sprains and Strains



The Medical Disability Advisor: Workplace Guidelines for Disability Duration

Fifth Edition

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Editor-in-Chief

The Most Widely-Used Duration Guidelines in the Industry
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Sprains and Strains

Related Terms

- Joint Separation
- Muscle Pull
- Muscle Tear
- Stretched Ligaments
- Subluxation
- Torn Ligaments

Medical Codes

- **ICD-9-CM:** 840, 840.8, 840.9, 841, 842, 843, 844, 845, 846, 847, 848, 848.9, 905.7
- **ICD-10:** S03, S03.4, S03.5, S13, S13.4, S13.5, S13.6, S23, S23.3, S23.4, S23.5, S33, S33.5, S33.6, S33.7, S43, S43.4, S43.5, S43.6, S43.7, S53, S53.4, S63, S63.5, S63.6, S73, S73.1, S83, S83.4, S83.5, S83.6, S93, S93.4, S93.5, S93.6, T03, T03.0, T03.1, T03.2, T03.3, T03.4, T03.8, T03.9, T09.2, T11.2, T13.2, T14.3, T14.6, T92.3, T93.3

Definition

Sprains are injuries to the fibrous bands that connect bones and stabilize joints (ligaments). Strains are injuries to muscles. Sprains and strains generally involve stretching or tearing of tissue and are defined by the amount of damage caused to the ligament or muscle.

A first-degree injury is a stretching of the ligament (sprain) or muscle (strain) with the tissue fibers remaining intact. Second-degree sprains and strains show evidence of stretching and tearing of some fibers, but the ligament or muscle remains partially intact. A third-degree injury is complete disruption of the ligament or muscle.

By bridging across the joint from bone to bone, ligaments function as hinges. A sprain of the ligament disrupts the joint, allowing it to move outside of its normal range of motion (subluxation), or in the case of a third-degree sprain, resulting in a complete displacement (dislocation). A dislocated joint may involve all the ligaments in a joint, in which case the joint has no stability, or may involve individual ligaments, in which case some of the joint's stability remains.

Muscles lose strength and function when injured. While first-degree strains may be the result of a bruise (contusion) or overstretching, a second-degree strain involves injury to the muscle tendon junction (musculotendinous junction). Third-degree strains involve tearing or disruption of the muscle fibers and the sheath (fascia) around it.

A common sprain is of the ankle joint, which caused by twisting the joint beyond its normal range of motion. A common strain is of the quadriceps muscle, which pulls or tears from accelerating quickly when running.

Risk: Risk increases with participation in sports and activities that involve lifting and bending.

Diagnosis

History: A known injury can result in sprains or strains, but sometimes the actual event is subtle and there may not be any immediate symptoms. The individual may complain of pain, loss of function, change in sensation in the case of muscle strains, or may feel a defect or swelling along the body of the muscle. The individual may have heard a “pop” or “snap” or experienced a sensation of the joint slipping with continued instability or something tearing in ligament injuries. There is usually swelling, lack of function or stability, bruising (ecchymosis) and pain in the affected area.

Physical exam: Inspection reveals swelling of the soft tissue, swelling within a joint (effusion), bruising (ecchymosis), tenderness, inability to use a muscle, or changes in joint stability. There may be some deformity of a joint in the case of sprains. Complete muscle tears (third-degree strain) could appear as a ball or knot under the skin. Touching (palpation) the area in either sprains or strains may produce diffuse or point specific pain. In sprains, joints should be tested for laxity, and evaluation of muscle strength is important in strains. The individual may have decreased active and passive motion that is limited by pain and loss of function. In general, ligamentous sprains are indicated if passive joint motion reproduces complaints, whereas a musculotendinous strain is indicated if resisted joint motion reproduces the complaint. A neurological examination is necessary as the tendons and nerves often lie very close to each other and damage can occur to both.

Tests: X-rays may reveal fractures caused by the muscle pulling away from the bone (avulsion fracture) or from dislocations. Stress x-rays evaluate the severity of a sprain. Arthrograms, a test used to view the joint space, are infrequently used now that MRI is available. MRI is useful to determine the integrity of the muscle or ligament.

Treatment

First and second-degree sprains are treated with rest, ice, compression, and elevation (RICE). Early movement and activity therapy should be explored. If needed, rest may be accomplished with supportive devices such as splints, casts, slings or crutches. Individuals can usually bear partial weight on leg and foot injuries, which promotes normal motion while providing rest. In second-degree sprains, ligament tissue does not grow back together, but immobilization of the area allows scar tissue to form, which provides joint stability. Third-degree sprains are either immobilized or repaired surgically (joint capsulorrhaphy or ligament repair/reconstruction). Regaining normal joint function is essential as quickly as possible while guarding against abnormal motion. Physical therapy is very important during the healing process.

First-degree muscle strains repair with little intervention except applications of compression and ice and/or heat. It is important to protect against further injury during this time, especially through either too little or too much activity. Second-degree strains rarely require surgery, unless complete loss of function

has occurred and the other muscles near the injury cannot compensate. Cosmetic deformity is sometimes an indication for surgery to repair the torn muscle or tendon. Third-degree muscle strains sometimes require surgical repair to restore function. Muscle tissue will regenerate and heal, but physical therapy is important to regain the full range of motion, muscle length and strength.

Prognosis

With proper rehabilitation, first and second-degree injuries should heal without significant change in function. Third-degree injuries are much more significant, and while resolution of pain can be expected over time, there may be a degree of impairment.

Residual lifestyle-limiting symptoms are common 6 to 18 months after an ankle sprain.

Differential Diagnoses

- Bursitis
- Cysts
- Fractures or dislocations
- Infections
- Joint deformity and laxity caused by inflammatory joint disease
- Muscle tumors
- Shin splints (tibial periostitis)
- Synovitis

Specialists

- Chiropractor
- Orthopedic Surgeon
- Physiatrist
- Physical Therapist
- Sports Medicine Internist

Rehabilitation[†]

The primary focus of rehabilitation for sprains and strains is to control pain and restore function. The involved body part and the severity of the injury will dictate the type and intensity of rehabilitation required.

PRICE (protection, rest, ice, compression, elevation) may be followed for the first 48 hours or until the swelling has stabilized (Braddom). If the lower extremity is involved, temporary use of an assistive device may be necessary to promote pain-free and normal ambulation. A compressive wrap may be useful for controlling edema and providing some stability during healing.

The next phase of rehabilitation should focus on range of motion and strength of involved structures. Modalities, such as heat and ice, may be used to facilitate motion and control edema. Early in this phase of treatment, individuals should be instructed in a home exercise program to be continued daily, with all exercises progressed as tolerated (Biundo). Proprioceptive exercises are recommended, especially if unweighting of the lower extremity is required (i.e. ambulation with an assistive device).

The therapist should consider those factors that may have led to the development of this condition. If work tasks are suspected as contributing to the symptoms, an ergonomic evaluation is advised to modify work tasks or other risk factors that may have led to sprains and strains (Lincoln). If leisure activities are suspect, the individual should be instructed in adjustments that might lessen the likelihood of developing painful symptoms.

Additional information may provide insight into the rehabilitation needs of these individuals (Huang).

FREQUENCY OF REHABILITATION VISITS

Nonsurgical	
Specialist	Guidelines
Physical Therapist	Up to 12 visits within 6 weeks

The table above represents a range of the usual acceptable number of visits for uncomplicated cases. It provides a framework based on the duration of tissue healing time and standard clinical practice.

Comorbid Conditions

- Diabetes
- Hypothyroid conditions
- Inflammatory diseases
- Neurological disease
- Psychosocial conditions
- Vascular disease

Complications

There is often bleeding into the tissues (hematoma) when a sprain or strain occurs. Bleeding into a joint space (hemarthrosis) may require removal (evacuation, aspiration). Rarely, deposits of calcium in the areas of bleeding in the muscle (myositis ossificans) can lead to stiffness and pain in the muscle. Damage to the surface (articular) cartilage in joints with lax ligaments is possible.

Lack of treatment, especially exercise, often delays recovery because the injury is thought to be slight. Lack of exercise as treatment can result in poor repair and reflex inhibition, which can lead to reinjury during or after the healing phase as a result of the area not being protected.

Factors Influencing Duration

Factors include the location of the injury, the degree of the injury, and how it affects the individual's job performance. Surgery may lengthen the period of disability. Re-injury caused by early return to activity will delay full recovery. For hip level sprains and strains, duration depends on severity of injury.

Length of Disability

Length of disability is dependent on the relationship of the injury to job requirements. Return to work that stresses the injured area before complete healing has occurred is likely to cause reinsurance and further delay recovery.

In addition to the following disability duration table, please see the tables specific to each of the following sprains-and-strains topics: Acromioclavicular Joint, Ankle, Back, Cervical Spine (Neck), Elbow, Foot, Hand or Fingers, Knee, Rotator Cuff (Capsule), and Wrist.

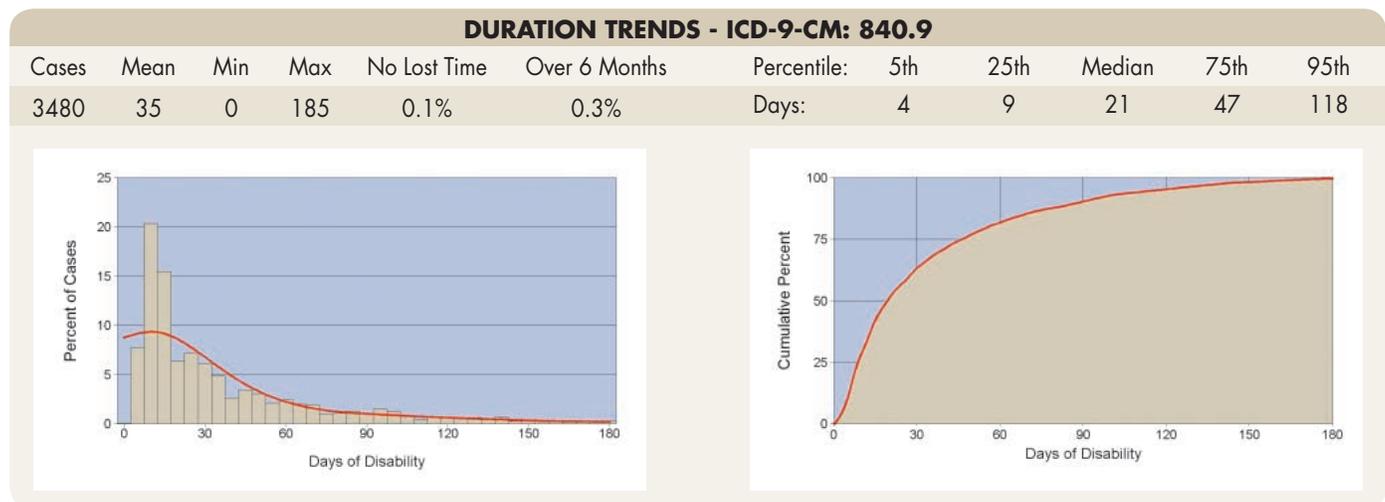
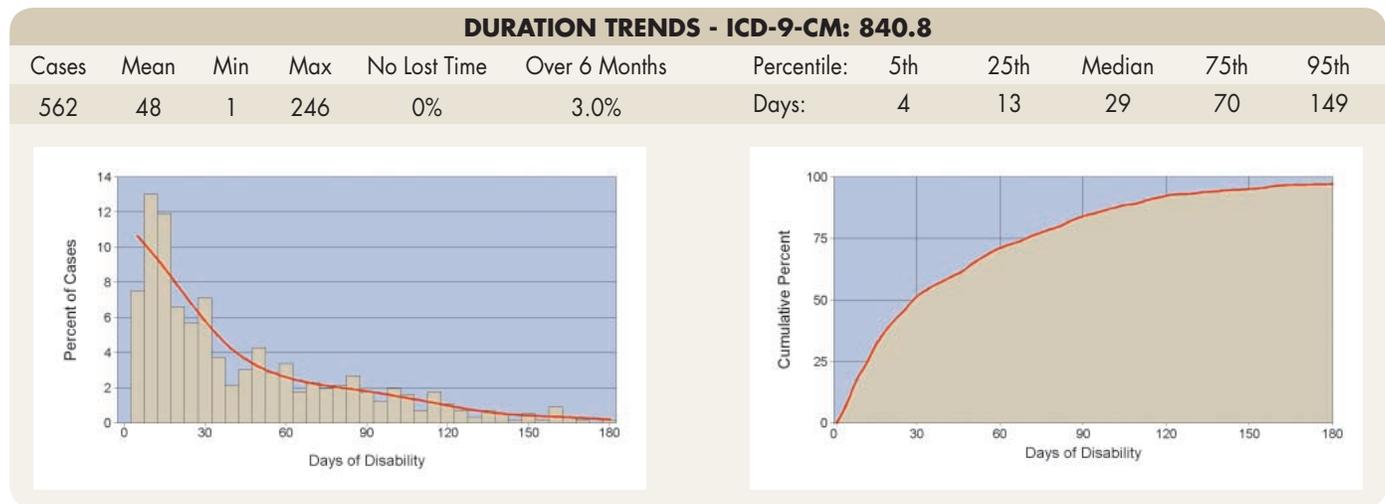
Supportive treatment, shoulder sprain or strain (second-degree).

DURATION IN DAYS			
Job Classification	Minimum	Optimum	Maximum
Sedentary	1	7	14
Light	1	7	14
Medium	7	14	21
Heavy	14	21	42
Very Heavy	14	21	56

Return to Work

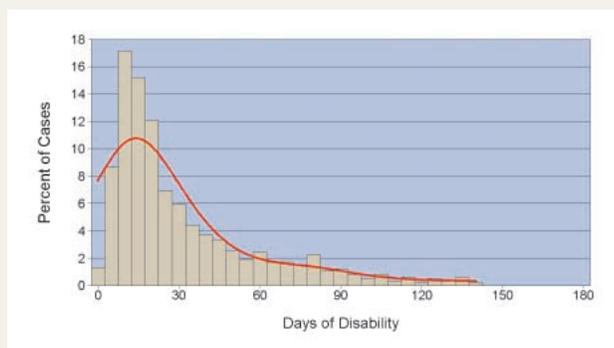
A return to activity and early return to work are important, in spite of discomfort, because this results in better outcomes. Modified duties should be sought, if needed. If the lower extremity is involved, use of assistive devices such as crutches, casts and braces may be necessary. If the upper extremity is involved, restrictions may include little to no use of arm, hand, or shoulder, with limited lifting and carrying. Dexterity may be affected by the injury and use of protective splints. Back strain may be totally incapacitating for a period of time during recovery. Use of medications for management of pain and inflammation may require review of drug policies. Safety issues may need to be evaluated.

Reference Data



DURATION TRENDS - ICD-9-CM: 848, 848.9

Cases	Mean	Min	Max	No Lost Time	Over 6 Months	Percentile:	5th	25th	Median	75th	95th
993	29	0	137	1.3%	0%	Days:	3	10	19	40	90



Note: Differences may exist between the duration tables and the reference graphs. Duration tables provide expected recovery periods based on the type of work performed by the individual. The reference graphs reflect the actual experience of many individuals across the spectrum of physical conditions, in a variety of industries, and with varying levels of case management. Selected graphs combine multiple codes based on similar means and medians.

Failure to Recover

Regarding diagnosis:

- Does the individual complain of pain, loss of function or change in sensation?
- Did individual hear a “pop” or “snap”? Experience a sensation of the joint slipping?
- Are swelling, lack of function or stability, and ecchymosis present?
- On exam is soft tissue swelling present? Effusion? Ecchymosis? Tenderness?
- Is individual unable to use a muscle or are there changes in joint stability?
- Is there a ball or a knot under the skin? Joint deformity?
- Is the individual exquisitely tender to palpation?
- Is there any laxity in the joint?
- What were the results of the neurological exam?
- Has the individual had plain x-rays and stress x-rays? MRI?
- Have conditions with similar symptoms been ruled out?

Regarding treatment:

- Is the injury first-, second-, or third-degree?
- Has it been treated with rest, ice, compression and elevation (RICE)?
- Was it necessary to immobilize the area?
- Was surgery necessary?

Regarding prognosis:

- Is the individual active in physical therapy? Does the individual have a home exercise program?
- Is the individual’s employer able to accommodate any necessary restrictions?
- Does the individual have any conditions that may affect ability to recover?
- Does the individual have any complications such as hemarthrosis or myositis ossificans?
- Was any damage done to the cartilage?

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