

Strain / Sprain Injuries

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Definition

A **strain** is an injury involving overstretching or tearing of a muscle or musculotendinous unit.

A **sprain** is an injury to a ligament resulting from excessive or abnormal force applied to a joint.

Injury Classification

Strains and sprains are commonly graded based on severity:

- **Grade I:** Mild injury involving microscopic tearing (approximately 0–50%)
- **Grade II:** Partial tear (approximately 50–90%) with moderate functional impairment
- **Grade III:** Complete rupture of the muscle or ligament with significant instability

Synonyms: Muscle pull, ligament sprain, muscle tear, ligament tear

Clinical Presentation / Symptoms

- Localized pain and tenderness at the injury site
- Swelling and/or bruising in more significant injuries
- Pain with active or passive movement of the affected structure
- Reduced strength and functional limitation
- Sensory changes or guarding around the injured area
- A possible audible or palpable “pop” at the time of injury, more common in Grade II–III injuries

Diagnostic Approach

Diagnosis is primarily clinical and based on a detailed history and physical examination. Common considerations include:

- Mechanism of injury (acute trauma vs. overuse)
- Location and severity of pain
- Functional limitations and stability testing

Imaging may be used when indicated:

- X-rays to rule out fractures or bony injury
- MRI or ultrasound to assess soft tissue damage and determine injury severity

Grade I injuries may present with delayed onset of symptoms, often appearing hours to days after the initial insult.

Management and Treatment

Treatment depends on injury severity and tissue involved.

Acute Phase Management

- Protection and relative rest
- Ice application (intermittent use, typically 15–20 minutes per session)
- Compression with appropriate bandaging when indicated
- Elevation of the injured limb when applicable
- Temporary immobilization or bracing for more significant injuries

Rehabilitation Phase

- Manual therapy and soft tissue mobilization
- Therapeutic exercise focusing on gradual restoration of strength and mobility
- Neuromuscular re-education and proprioceptive training
- Modalities such as electrical stimulation or therapeutic ultrasound when appropriate
- Gradual return-to-activity progression to reduce reinjury risk
- Early, controlled movement is important for optimal tissue healing and functional recovery.

Medical and Interventional Options

- Over-the-counter analgesics such as NSAIDs or acetaminophen
- Corticosteroid injections in select inflammatory cases (used cautiously due to potential effects on tissue healing)
- Surgical repair is indicated for complete (Grade III) ruptures or severe instability

Prognosis

- **Grade I–II injuries:** Excellent prognosis with full recovery expected in most cases
- **Grade III injuries:** Often require surgical intervention and prolonged rehabilitation; recovery may take several months to a year
- Early diagnosis, appropriate load management, and adherence to rehabilitation significantly improve outcomes

Duration of Care

Typical recovery timelines may include:

- **Grade I:** ~1–4 weeks; approximately 6–12 visits over 2–4 weeks
- **Grade II:** ~2–12+ weeks (variable); approximately 12–16+ visits over 6–12 weeks
- **Grade III:** Often surgical referral followed by extended rehabilitation (months)

These timelines are general guidelines and may vary based on patient factors, injury location, and compliance with rehabilitation.