
Ankle Sprain

Goals (with measurable parameters and with specific timelines)

- Pain Relief/Reduction
- Protect injured ligaments against re-injury
- Increased ROM
- Increased Strength
- Maximize Gait
- Maximize Functional Independence
- Increased balance and proprioception
- Independent home exercise program
- Maximize ability to return to previous vocational, avocational and recreational activities

Age Specific Considerations

- Patients with osteoporosis may be more likely to fracture than sprain**
- Decreased proprioception with age

Treatment Planning / Interventions

Established Pathway ___ Yes, see attached. No

Established Protocol ___ Yes, see attached. No

Interventions most commonly used for this case type/diagnosis.

This section is intended to capture the most commonly used interventions for this case type/diagnosis. It is not intended to be either inclusive or exclusive of appropriate interventions.

Timing of phases varies with severity of sprain and individual healing process.

Acute Phase - Days 1-3:

Goals are aimed at decreasing effusion and pain, protecting from further injury and allowing protected gait as tolerated. Early mobilization can lead to earlier return to work and patient comfort. Also, early mobilization of joints following ligamentous injury actually stimulates collagen bundle orientation and promotes healing although full ligamentous strength is not re-established for several months.

- Pain and Swelling Management: RICE (rest, ice, compression, elevation)

Evidence found for elevation and cold therapy in minimizing edema. No strong evidence for ace wrap, compression pneumatic device, ultrasound, elastoplast. One study stated contrast bath contraindicated to reduce edema in posterior ankle sprains.

Refer also to ultrasound practice standard for additional information and appropriate selection of ultrasound. Can also consider electrical stimulation (high volt or interferential). Refer to practice standard for indications.

- Protection of injured ligaments from further injury: (taping, splints, AirCast Boot, Air Stirrup, Swedo Lace Up splint, cast for severe injuries).

Swedo Lace Up is painful to don in the acute stage; effective in subacute and chronic stages. Air Stirrup splint is easy to don in early stages. AirCast Boot or even a Cast may be needed for severe injuries or fracture. Boot may also be indicated if patient cannot normalize gait with splint. Device such as AirCast boot which restricts motion and protects healing ligamentous tissues but allows weightbearing may help recovery and return to activity. It also allows non weight-bearing exercise, ie ROM, out of the boot.

A study which compared various ankle braces found the Sport Stirrup to be the most supportive but the Kallassy was the most comfortable and preferred of the four (Aircast Sport Stirrup, Ankle Ligament Protector, Swedo-O and Kallassy).

Taping can be open basketweave for acute injuries in athletes. Taping does not provide same degree of protection as strong evertor muscles but muscles may fail to protect against inversion injury due to muscle onset latency therefore external devices may provide protection by doubling resistance to inversion. The patient may experience problems with loosening of the tape though.

- Gait - weight-bearing as tolerated

The higher the grade of sprain the longer period of time required for pain-free weight-bearing. May need assistive devices to normalize pain free gait.

Sub-Acute Phase - 2-4 days to 2 weeks:

The subacute phase focuses on decreasing and eliminating pain, increasing pain free ROM, protecting from re-injury with bracing or splints, limiting loss of strength and modalities to decrease effusion.

- Pain and Swelling Management:

Modalities can be used to decrease pain and swelling: ice, electrical stimulation (Interferential, HVGS). There is limited evidence for ultrasound. *Refer also to acute phase above.*

- Joint mobilization: Talocrural and subtalar joints

Adding talocrural joint mobilization to RICE protocol to treat ankle inversion injuries can lead to fewer treatments to regain pain free dorsiflexion and improve stride speed.

The patient may have a restricted posterior glide of the talocrural joint even with restoration of dorsiflexion. If restricted, patient may have residual joint dysfunction.

Need to determine if the tarsal cuboid is subluxed in a plantar or dorsal direction. This subluxation could be caused by plantar flexion and inversion stresses at the ankle and could result in pain and impaired joint function. Refer to article and/or standard for procedure.

- ROM within pain-free range:

- Start with dorsiflexion and plantarflexion

- Add inversion and eversion as pain and tenderness over ligaments decrease

- Stretch gastroc/soleus complex - start with non weight bearing and then progress to weight bearing positions.

- Toe curls

- Ankle alphabet

- Stationery bike

- Progress gait training: increase weight bearing and decrease need for assistive device as tolerated (as pain decreases and balance allows)
- Strengthening: isometrics to limit loss of strength
- Protection: wean from splints or braces as tolerated and as pain and swelling decrease or provide external support if needed for support or protection (refer to section on protection under Acute Stage). Closed weave taping indicated in sub-acute to chronic stages.

Rehabilitative Phase - 2-6 weeks post-injury

The focus of this phase is on regaining ROM and strength, increasing endurance and neuromuscular performance.

As patient is able to tolerate full weight-bearing:

- ROM: regain full pain-free ROM
- Joint Mobilization: continue as needed
- Stretching: Achilles tendon, gastrocnemius, soleus (may also need to stretch into plantarflexion, eversion and inversion)
- Strengthening Exercises: DF, PF, eversion, inversion, open chain progressing to closed chain

- Active progressing to resistive (concentric and eccentric) as pain decreases and ROM increases

- Using free weights and exercise bands

- Closed chain as ability to weight-bear increases, ie bilateral toe raises progressing to single leg, bilateral squats progressing to single leg squats, step-ups and step-down exercises (preparation for stairs if necessary)

Study showed improvements in dorsiflexor and evertor strength and in joint position sense for inversion, dorsiflexion and plantar flexion after ankle strengthening exercises in subjects with functionally unstable ankles. Joint position sense changes thought to be due to muscle spindle sensitivity changes in central mechanisms related to spindles and not mechanoreceptor sensitivity.

- Proprioception Training: Progress from sitting to standing on both and then single leg, eyes open to eyes closed, and reaching with dynamic challenge on level and progressing to uneven surfaces

- Wobble Board

- BAPS

- Foam pad

- Pillow

Studies show effectiveness of wobble board training in preventing functional instability, balance training in improving ankle joint proprioception and single leg standing, and of combined ankle disk training and non-elastic tape on decreasing postural sway . In another study, proprioception training and peroneal muscle strengthening are affirmed as important in the rehabilitation after ankle injury.

- Gait Training: wean from assistive devices as tolerated

- Endurance Activities: swimming, biking, walking, etc.

Functional Phase - 6 weeks post-injury

The goal of this phase is to prepare for return to full activity and function; add sports specific exercises with goal of returning to sports and recreational activity. Return to sports should be based on patient's ability to perform sports-specific activities and when patient has full ankle ROM, normal ankle strength especially of peroneals and dorsiflexors, and no pain or tenderness.

- Progressive strengthening
- Coordination and Agility training - Activities to consider depending on patient's ability, recovery and type of vocational/recreational activity the patient will return to:
 - Lunges
 - Hopping (progress bilateral, to injured leg only, whole foot to toes only)
 - Step exercises - forward, side to side
 - Running should be progressed when the patient can walk at a fast pace without pain, starting on smooth surfaces and progressing to uneven surfaces
 - Cutting exercises
 - Figure 8's, zig-zags
 - Jump rope
- Stairmaster, treadmill, exercise biking

Prophylactic Phase - Prevention of Re-Injury

- Strengthening including dorsiflexion and peroneals
- Functional proprioceptive drills - speed, balance, coordination and agility
- Cardiovascular endurance training
- Stretching to increase dorsiflexion
- Proper footwear
- Prophylactic External Support - Determine if there is a need (chronic instability and/or decreased proprioception) for brace, splint, orthotics, or taping and obtain physician order as needed. Consider lace-up ankle brace (Swedo) or ankle taping especially for sports with high incidence of ankle injuries (basketball, volleyball, soccer, tennis, and other sports which involve high frequency of stopping, starting and twisting).

Molded orthotics helped to improve balance scores in the ankle sprain group and to decrease ankle pain during jogging for those with an ankle sprain. Control of the subtalar joint may decrease stress on the injured ligaments (ATFL stressed with excessive pronation) and lead to decreased pain and increased function.

Orthotics may be useful in reducing increased postural sway seen in patients with ankle injury and facilitating recovery and return to activity.

Frequency and Duration - 2x/week for 4-8 weeks (3x/week for first 2 weeks may be indicated for severe pain, swelling or functional impairment)

Patient / family education-during each phase include instruction in:

- ☐ Pain and swelling management
- ☐ Re-injury prevention
- ☐ Home exercises
- ☐ Use of assistive device, brace or splint
- ☐ Footwear

Recommendations and referrals to other providers:

- ☐ Orthopedist
- ☐ Orthotist
- ☐ Rheumatologist
- ☐ Podiatrist

Re-evaluation / assessment

Standard Time Frame - every 30 days or less

Other Possible Triggers - significant change in symptoms, re-injury, or chronic instability and or pain after 8-12 weeks of intervention.

Factors which may limit progress or present as complications

Include but not limited to and may require referral back to MD or other specialist:

- Chronic ankle instability- feeling of being unstable, swelling with activity
- Impingement - scarring of ATFL and joint capsule can lead to intra-articular meniscoid tissue
- Peroneal tendon subluxation -detachment of peroneal retinaculum at insertion on fibula
- Talar dome fracture
- Anterior process fracture of calcaneus - bony rather than ligament point tenderness
- Chronic Regional Pain Syndrome

Refer also to differential diagnosis above.

Planning

Commonly Expected outcomes at discharge

- ☐ Independent functional mobility
- ☐ Minimal to no pain or swelling
- ☐ Functional ROM and strength
- ☐ Independent home exercise program
- ☐ Return to work and/or previous avocational and recreational activities

Transfer of Care- if applicable

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- Patients who are a fall risk, have transportation issues, or significant difficulty walking may benefit from home physical therapy until the patient is safely able to attend outpatient physical therapy.
 - Patient will be referred back to physician if worsening symptoms or symptoms do not change.

Patient's Discharge Instructions - continue home exercise program as directed. Contact clinic or physician if patient experiences increased symptoms or re-injury