



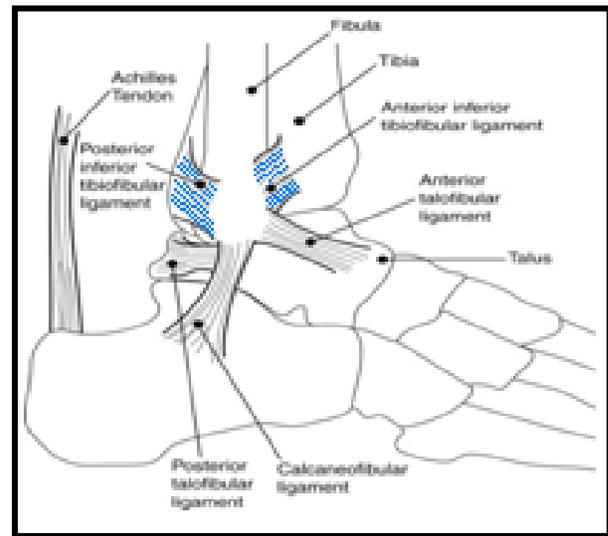
High Ankle Sprain (Syndesmosis Sprain)

Anatomy and Biomechanics

The ankle is a complex joint made up three bones: the tibia, the fibula and the talus. These three bones are connected by several ligaments that help stabilize the joint. When these ligaments are overstretched, it is referred to as an ankle sprain. A “high” ankle sprain involves the ligaments connecting the tibia and fibula just above the ankle joint, also known as the ankle mortise. The three major syndesmotic ligaments are the anterior inferior tibiofibular ligament (AITFL), the posterior inferior tibiofibular ligament (PITFL) and the interosseous ligament.

Mechanism of Injury

High ankle sprains are less common and account for approximately 15% of all ankle sprains. Injuries to the syndesmotic ligaments commonly occurs when the ankle is planted and rotated resulting in a shearing force between the tibia and fibula bones. Athletes who participate in sports that involve cutting and planting of the foot have the greatest risk for ankle syndesmotic sprains. Swelling is not always present with syndesmosis injuries but walking, flexing the foot upward and rotating the foot can be very painful.



National Institute of Arthritis and Musculoskeletal and Skin Diseases

Treatment Options

After your injury, your physician will work with you to determine a personalized course of treatment. Recovery is different in each case, but “high” ankle sprains generally take longer to resolve than lateral ankle sprains. Typically, high ankle sprains can be treated conservatively with physical therapy. Immediately after injury, you may be non-weight bearing for up to 1-2 weeks to prevent further injury and protect the ligaments. Your physician may decide to use a splint, brace or heel lift to help stabilize and facilitate healing. Rest, ice, compression and elevation will help reduce the pain and swelling of the ankle. Once the pain and swelling resolves, your physical therapist will advise you to begin bearing weight on your ankle and progress your rehabilitation program according to your individual goals.

Surgery

If the syndesmotic injury is severe or a fracture is also present with the injury, conservative measures are not the primary course of treatment and surgery is often indicated. Surgery can involve the use of syndesmotic fixation screws or suture fixation to stabilize the ankle mortise. Regardless of which procedure you undergo, weight bearing can be restricted for 6 to 8 weeks following surgery and patients gradually progress to a walking boot. A successive course of physical therapy is important to restore range of motion, strength and function. Full recovery can take up to one year.

Rehabilitation

****The following is an outlined progression for rehab. Advancement from phase to phase as well as specific exercises performed should be based on each individual patient's case and sound clinical judgment by the rehab professional. ****

Phase 1

Acute Phase

Goals

Control pain and swelling
Restore pain free ROM
Protect healing structures (splint, brace or heel lift)

Precautions

Often Non-Weight Bearing with Crutches with progression to CAM boot.
Avoid Painful Dorsiflexion and Eversion

Recommended Exercises

Range of Motion

Ankle pumps
Ankle circles
Toe curls

Strength

Ankle isometrics (neutral PF, DF, INV and EV)
Hip Abd/Ext/ER isotonic

Guidelines

ROM deficits should be mostly resolved and minimal swelling present before progressing to next phase. Avoid painful DF and eversion/ER of foot to limit shearing of ankle mortise and protect healing structures. Perform ROM exercises 2-3 sets of 20 repetitions, 3-5 times a day. Perform strengthening

exercises 2-3 sets of 10 repetitions, once a day. Ice for 15-20 minutes with ankle elevated 3-5 times a day.

Phase 2

Sub-Acute Phase

Goals

Maintain ROM and improve flexibility
Progressing WB'ing and normalize gait mechanics
Improve strength and initiate double-limb balance activities

Precautions

May continue to need CAM boot and or crutches for weight bearing.

Recommended Exercises

Range of Motion/Stretching

Gastroc/soleus towel stretch
Seated tilt board/wobble board ROM

Cardio

Bicycle without resistance 10-15 minutes

Strength

Seated heel raises
Seated toe raises (pain free ROM)
Ankle isotonic with Theraband (PF, DF, INV and EV)
Body weight squat
Standing hip isotonic

Proprioception

Double-limb standing activities (advance to foam, tilt board, etc.)

Guidelines

Achieve full pain free ROM but continue to be cautious with DF and eversion/ER. Perform ROM/stretching exercises 2-3 repetitions holding for 30 seconds, 2-3 times a day. Perform strengthening exercises 2-3 sets of 20 repetitions, once a day. Perform proprioception exercises 3 sets of 30-60 seconds, once a day. Continue to ice for 15-20 minutes with ankle elevated once a day.

Phase 3

Strengthening Phase

Goals

Maximize strength and initiate CKC exercises
Maximize neuromuscular control and initiate single-limb exercises
Initiate treadmill walking

Precautions

Full Weight Bearing: but may continue to use a heel lift or ankle brace for protection

Recommended Exercises

Range of Motion/Stretching

Gastroc/soleus wall stretch
Standing tilt board/wobble board ROM

Cardio

Bicycle/elliptical/treadmill 10-15 minutes

Strength

Advance ankle isotonics with Theraband (PF, DF, INV and EV)
Heel raises (progress double-limb to single-limb)
Forward lunges (monitor ankle DF ROM)
Lateral lunges
Hip Abduction side stepping
Plank and side plank
Single-limb bridge

Proprioception

Single-limb standing activities (advance to foam, tilt board, etc.)
Balance step ups (forward, lateral, crossover, etc.)

Guidelines

Achieve normal ankle strength and end range DF and eversion/ER without pain. Patient should be able to perform single-limb heel lift with good control. Perform ROM exercises once a day. Perform strengthening exercises 2-3 sets of 15-20 repetitions, every other day. Perform proprioception exercises every other day. Continue to ice for 15-20 minutes as needed.

Phase 4

Return to Activity/Sport Phase

Goals

Continue dynamic strengthening and proprioceptive exercises
Initiate jog-to-run progression
Initiate cutting, pivoting and sport specific drills

Precautions

Cleared to return to sport per physician

Recommended Exercises

Range of Motion

Gastroc/soleus wall stretch

Standing tilt board/wobble board ROM

Cardio

Continue cycle and elliptical progressions. Jogging at progressive speeds without heel lift 10-15 minutes

Strength

Continue progressing Phase 3 exercises

Single-limb squat

Single-limb dead lift

Proprioception

Single-limb balance with perturbations (progress eyes open to eyes closed, foam, BOSU, *sport specific if applicable)

Balance step ups on uneven surface (forward, lateral, crossover, *sports specific if applicable)

Plyometrics *emphasize eccentric control, avoiding increased trunk flexion, dynamic genu valgum, and femoral internal rotation *

Wall jumps- athlete stands by wall with arms up, hops vertically and lands softly on the balls of the feet. Emphasize soft landings, maintaining a slight bend in the knee.

Double-leg vertical jumps- athlete stands with hands at side, knees slightly bent and jumps straight up for maximum height. Emphasize soft landings, maintaining a slight bend in the knee. Hold each landing for 3-5 seconds.

Heiden/speed skater hop- athlete stands on one leg with knee slightly bent then jumps for maximum vertical height and lands on the opposite leg. Emphasize soft landings, controlled transitions and maintaining a slight bend in the knee.

Sport Specific Drills

Initiate sports specific drills

Begin speed/agility program

Guidelines

Perform stretching program daily. Cardio exercise is recommended 3-5 times a week for 15-20 minutes.

Perform strengthening/proprioception exercises 3 times a week. Perform plyometric/jumping exercises 2 times a week. Monitor increased swelling with plyometrics. Decrease intensity if swelling persists.

Clear to return to sport per physician.

Time	Weight Bearing and Gait	Focus	Recommended Exercises	Precautions
Phase 1 Acute Phase	*NWB with crutches	*Control pain and swelling *Restore pain free ROM *Protect healing structures (splint, brace or heel lift)	Modalities Ice, compression, ESTIM ROM Ankle pumps, ankle circles, toe curls Strengthening Ankle isometrics, hip AB/Ext/ER isotonics	*Minimize joint effusion and edema *Avoid forceful DF and rotation to protect healing structures
Phase 2 Sub-Acute Phase	*WBAT with crutches or CAM Boot	*Maintain ROM and flexibility *Progress WB and normalize gait mechanics *Improve strength and initiate double-limb balance exercises	ROM Gastroc/soleus towel stretch, tilt board/wobble board ROM Cardio Bicycle without resistance Strengthening Ankle isotonics with Theraband, seated heel raises, seated toe raises (pain free ROM), body weight squat Proprioception Double-limb standing activities on foam, standing hip isotonics	*Avoid forceful DF and rotation to protect healing structures
Phase 3 Strengthening Phase	*FWB but may continue to use heel lift or ankle brace for protection	*Maximize strength, initiate CKC exercises *Maximize neuromuscular control, initiate single-limb exercises *Initiate treadmill walking	ROM/Stretching Gastroc/soleus wall stretch, standing tilt board/wobble board ROM Cardio Bicycle/elliptical/treadmill Strengthening Advance ankle isotonics with Theraband (PF, DF, INV and EV), heel raises (progress double-limb to single-limb), forward lunges, lateral lunges, resisted hip AB walks, plank and side plank, single-limb bridge Proprioception Single-limb standing activities (advance to foam, tilt board, etc), balance step ups (forward, lateral, crossover, etc.)	*Avoid forceful DF and rotation to protect healing structures *Caution pivoting or lateral movements *Not cleared to return sports
Phase 4 Return to Activity/Sport	*Sport specific program per physician clearance	*Continue dynamic strengthening and proprioceptive exercises *Initiate jog-to-run progression *Initiate cutting, pivoting and sport specific drills	ROM/Stretching Gastroc/soleus wall stretch, standing tilt board/wobble board ROM Cardio Jogging at progressive speeds without heel lift 10-15 minutes Strengthening Continue progressing Phase 3 exercises, single-limb squat, single-limb dead lift Proprioception Single-limb balance with perturbations, balance step ups on uneven surface Plyometrics Wall jump, double-leg vertical jumps, heiden/speed skater hop Sport Specific Drills Initiate sports specific drills, begin speed/agility program	*Cleared for return to sport per physician

*Reviewed by Michael Geary, MD