Rehabilitation Protocol for Pediatric Lateral Ankle Sprain: non-operative management

This protocol is intended to guide clinicians through non-operative management of lateral ankle sprain. This protocol is time based (dependent on tissue healing) as well as criterion based. Specific intervention should be based on the needs of the individual and should consider exam findings and clinical decision making. The timeframes for expected outcomes contained within this guideline may vary based on referring physician preference, severity of ankle instability, number of involved ligaments, additional impairments, and/or complications.

Acute lateral ankle sprains are the most common injuries of all youth sports, accounting for 15% of all reported acute, non-severe injuries. Nearly 25% of pediatric patients that present to the emergency department with lower extremity injuries involve a fracture, with phalanx fractures representing the most common physeal injury. Tibial and fibular fractures account for 6% while ankle fractures account for 5% of the pediatric lower extremity trauma. Physeal fractures are common injuries in children and adolescents participating in contact sports, which may lead to growth disturbances and cause limb length discrepancy, stressing the importance of screening for these injuries on evaluation especially in a population with active epiphyseal plates.

Ankle sprains are typically classified as mild, moderate or severe.

Grade 1 Sprain (Mild)

- Slight stretching and microscopic tearing of the ligament fibers, commonly the anterior talofibular ligament.
- Mild tenderness and swelling around the ankle, typically recovers in 5-14 days.

Grade 2 Sprain (Moderate)

- Partial tearing of anterior talofibular ligament and some tearing of the calcaneofibular ligament.
- Moderate tenderness and swelling around the ankle, typically will take 2-3 weeks to recover.

Grade 3 Sprain (Severe)

- Complete tear of the anterior talofibular ligament, the calcaneofibular, and the posterior talofibular ligament.
- Significant tenderness and swelling around the ankle.
- May take 3-8 weeks or longer to recover.

The interventions included within this protocol are not intended to be an all-inclusive list of exercises. Therapeutic interventions should be included and modified based on the progress of the patient, and under the discretion of the clinician.

Diagnosis Considerations	• Mechanism of Injury • Degree of ecchymosis and edema • Tenderness to palpation over lateral ankle ligaments • Anterior drawer and reverse anterior drawer test • Ottawa ankle rule to rule out fracture	
Differential Diagnosis	• Foot and ankle fracture • Syndesmotic injury • Osteochondral lesion or avulsion • Talar bone contusion • Deltoid ligament sprain	• Peroneal tendon strain • Achilles tendon strain • Midfoot sprain • Epiphyseal plate injuries

PHASE I: ACUTE LOADING PHASE (0-2 WEEKS AFTER INJURY)

Rehabilitation Goals	• Decrease pain • Normalize gait pattern • Improve ankle ROM • Maintain or improve proximal muscle strength
Precautions	• Brace or protective tape should be worn during weight bearing activities • Immobilization is recommended for 10 days for severe ankle sprain
Interventions	*Range of motion/Mobility* • Foot and ankle PROM • Ankle pumps • Ankle circles • Ankle alphabet *Strengthening* • Seated heel raises • Seated toe raises • Towel crunches/toe curls • Gastroc/soleus complex stretching: Seated calf stretch, standing runners stretch *Joint mobilizations* • Grades I-II to distal tibiofibular, talocrural, subtalar joint, and midfoot for pain control *Gait Training* • Increase weight bearing and decrease need for assistive device as tolerated • Normalize heel toe pattern *Balance/proprioception* • Initiate Tandem or single leg balance on firm surface if non-painful • Ice, compression, elevation, NSAIDS (if appropriate) • BAPS board
Criteria to Progress	• Ability to fully weight bear on involved lower extremity • Decreased pain • Minimal swelling

PHASE II: INTERMEDIATE/SUB-ACUTE (2-4 WEEKS AFTER INJURY)

Rehabilitation Goals	• Improve muscular strength and endurance • Improve joint proprioception and motor control • Improved load bearing capacity by progressing ambulation (regain normal walking pattern)
Brace	• Continue to wear brace for weight bearing activities
Additional Interventions **Continue with Phase I interventions*	*Range of motion/Mobility* • Knee to wall closed chain dorsiflexion mobilization • Gastroc stretch, Soleus stretch *Manual Therapy* • Grades I-IV to talocrural, subtalar and midfoot for pain control and mobility *Strengthening* • Resisted dorsiflexion, resisted eversion, resisted plantar flexion, resisted inversion • Double leg heel raises • Single leg heel raises • Standing toe raises

	• Standing hip abduction, sidelying hip abduction, standing hip extension • Body weight squats • Pallof press • Lateral side stepping • Step ups: anterior step up, lateral step *Balance/Proprioception* • Tandem stance: firm and unstable surface, eyes open and eyes closed • Tandem walking • Single leg stance: firm and unstable surface, eyes open and eyes closed *Cardio* • Swimming, biking, walking
Criteria to Progress	• Non-antalgic gait pattern • Equal single leg stance time and quality bilaterally • Full ankle PROM and AROM • 5/5 ankle strength with MMT

PHASE III: LATE (4-6 WEEKS AFTER INJURY)

Rehabilitation Goals	• Improve ankle strength and proximal LE strength • Improve single leg balance • Initiate plyometric activities • Initiate return to running
Brace	• Utilize lace up brace for functional activities as needed
Additional Interventions **Continue with Phase I-II Interventions*	*Strengthening* • Closed chain strengthening and endurance for entire lower extremity *Progress established strengthening exercises with increasing resistance and repetitions *Motor control/Balance* • Single leg multidirectional reach: firm and unstable surface • Dual task balance exercises: ball toss with decreased base of support or unstable surface *Plyometrics/Agility* • Double leg hopping • Double leg pogo jumps progressing to jump rope • Lateral bounding • Initiate agility ladder drills *Interval Running Program* • Initiate Return to Running Program
Criteria to Progress	• ≥80% performance with heel rise test on involved lower extremity compared to uninvolved side • ≥80% performance with Star Excursion Balance Test on involved extremity compared to uninvolved side

PHASE IV: RETURN TO SPORT/FUNCTIONAL ACTIVITIES (6-8 WEEKS AFTER INJURY)

Rehabilitation Goals	• Improve LE strength • Improve motor control with higher level activities • Return to normal activities

Additional Interventions **Continue with Phase II-III interventions*	*Plyometrics/Agility* • Single leg hopping • Single leg lateral hopping • Single leg pogo jumps progressing to single leg jump rope • Dounble leg broad jump • Single leg anterior hop • Multi-plane sport specific plyometrics and agility program
Criteria to Progress	• ≥90% performance with heel rise test on involved lower extremity compared to uninvolved side • ≥90% performance with Star Excursion Balance on involved extremity compared to uninvolved side • ≥90% performance on single leg hop testing (e.g. single leg hop for distance, triple hop for distance, 6m timed hop, and/or cross over hop for distance) on involved extremity compared to uninvolved side • No increase in pain or swelling with plyometric and return to sports activities

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Contact	Please email MGHSportsPhysicalTherapy@partners.org with questions specific to this protocol

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