Demonstration of Manual Therapy for the Foot and Ankle

by

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What is Manual Therapy?

- Systematic approach to examine the way the joints of the body move
- Detailed biomechanical assessment to determine which tissue(s) of the body are causing dysfunction
- Specific hands-on techniques to promote tissue healing and restore normal movement patterns
• NAIOMT – North American Institute of Orthopedic Manual Therapy
  – Highly respected organization dedicated to providing continuing education to physical therapists in manual therapy
Each level of certification requires advance coursework and examination process

- CMPT – Certified Manual Physical Therapist
- COMT – Certified Orthopedic Manipulative Therapist
- FAAOMT – Fellow of the American Academy of Orthopedic Manual Therapy
- Advance certification through Performance Dynamics
- Therapists trained in Augmented Soft Tissue Mobilization
Manual Therapy Techniques

• Joint Mobilization
• Joint Manipulation
• Taping
• Friction Massage
• Soft Tissue Mobilization
• ASTYM
• Therapeutic Exercise
• Functional Activities
Indications for Manual Therapy

• Joint restrictions or dysfunction
• Soft tissue adhesions
• Tendonitis/Fasciitis
• Muscle Imbalance
Considerations for Manual Therapy

- Manual therapy appropriate for musculoskeletal issues only
- Must clear other systems for contraindications, including visceral, vascular, neurogenic, phychogenic & spondylogenic (fractures) issues.
- Must coordinate with surgeon for any precautions post-surgery
  - Post-op reports are helpful!
Demonstrations

- Talocrural Joint Mobilization & Manipulation for Dorsiflexion
- Subtalar Joint Mobilization & Manipulation for Eversion
- Calcaneocuboid Dorsal Manipulation
- Superior Tibiofibular Joint Manipulation (anterior)
- Metatarsal Cuneiform Joint Mobilization (dorsiflexion)
- Friction Massage for Peroneal Tendonitis
- Taping of Inferior Tib-Fib Joint
- ASTYM
Talocrural Joint

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Ankle (talocrural/mortise) joint

- Type: compound, synovial, uni-axial modified sellar (hinge)
- Motion: 1 degree of freedom: dorsiflexion/plantarflexion
- Joint mechanics: trochlear surface of talus is convex anterior/posterior, articulates with concave inferior tibial surface, tib & fib malleoli and inferior tib/fib ligament
  - Conjunct external rotation of talus with endrange DF
  - Ligaments include lateral collateral & medial collateral
  - Designed for stability
- Capsular Pattern: more limitation of plantarflexion than dorsiflexion
- Close Packed Position: weight bearing dorsiflexion
- Rest Position: 10 degrees plantar flexion
Posterior Talar Glide

- Indicated for patients with inadequate dorsiflexion range of motion
- Conjunct external rotation of the talus at endrange
Talocrural Manipulation

- Indicated for patients lacking full dorsiflexion
- High Velocity Low Amplitude Thurst (HVLAT) in inferior direction to traction the joint
Subtalar Joint

Sustentaculum Tali

Calcaneal Tuberosity

Anterior Tubericle

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Subtalar (talocalcaneal) joint

- **Type:** synovial, bicondylar compound
  - Structurally, 2 modified ovoid joints
  - Functions as modified sellar joint between superior surface of calcaneus & inferior surface of talus
- **Motion:** 1 degree of freedom: inversion/eversion
- **Joint Mechanics:**
  - Posterior joint acts more like a pivot
- **Capsular Pattern:** limitation of inversion. Joint eventually stiffens in full eversion
- **Close Packed Position:** weight bearing eversion (pronation/flat foot)
- **Rest Position:** mid position
Calcaneal Lateral Glide

- Indicated when patient lacks full eversion
- Anterior joint is mobilized medially while posterior joint is moved laterally
  - Plane or joint is about 30 degrees anteromedial/posterolateral
Subtalar Manipulation for Eversion

- Quick thrust (HVLAT) of the calcaneus laterally
- Indicated when subtalar joint lacks eversion
Calcaneocuboid Joint
Calcaneocuboid (transverse tarsal) joint - lateral foot

- **Type:** simple, synovial, modified sellar
- **Motion:** 1 degree of freedom: inversion/eversion
  - Eversion occurs with DF
  - Inversion occurs with PF
- **Joint Mechanics:**
  - Inferior, medial cuboid surface projects proximally to support calcaneous, provides concave surface
  - Superior cuboid surface convex, calcaneous concave
  - Cuboid bone grooved by peroneous longus tendon
  - Reinforced by calcaneocuboid part of bifurcate ligament, dorsal calcaneocuboid, long plantar and planter calcaneocuboid (short plantar) ligaments
- **Capsular Pattern:** ??? As talonavicular, loss of plantarflexion, adduction
- **Close Packed Position:** weight bearing pronation
- **Rest Position:** mid position
Cuboid Dorsal Manipulation

- Quick thrust (HVLAT) to move cuboid dorsally
- Indicated when cuboid subluxes in plantar direction
  - Patient may complain of feeling like they are “stepping on a rock”
Cuneometatarsal Joint
Tarsometatarsal 1,2,3 Joint (Cuneometatarsal) Medial Foot

- **Type**: simple, synovial, planar
- **Motion**:
  - 1st metatarsal/cuneiform more mobile with DF/PF and with passive ER/IR
  - As a group, fan (flatten (less arch) with DF) & fold (PF)
- **Joint Mechanics**
  - Medial cuneiform articulates with base of 1\(^{st}\) metatarsal
  - Intermediate cuneiform with base of 2\(^{nd}\) metatarsal
  - Lateral cuneiform with base of 3\(^{rd}\) metatarsal
  - Reinforced by dorsal, plantar and interosseous ligaments
- **Capsular Pattern**: ??? As talonavicular
- **Close Packed Position**: weight bearing pronation
- **Rest Position**: mid position
Plantar Manipulation of 1\textsuperscript{st} Metatarsal on Cuneiform

- Quick thrust (HVLAT) in plantar direction on metatarsal base
- Indicated when first ray lacks mobility
Superior Tib-Fib Joint
Proximal Tibiofibular Joint

- Type: plane synovial joint
- Joint mechanics: tibial facet is slightly convex and fibular facet is slightly concave so fibula glides in direction of movement
  - Small amount of inferior and superior sliding possible
  - Joint is more relevant to motion of the ankle than to the knee
  - Inferior joint acts as a pivot for superior joint
  - Weightbearing dorsiflexion causes fibula to move into abduction, glide upward and internally rotate = posterior glide due to strong posterior ligament as a hinge & limit of motion
- Capsular pattern: Pain with weightbearing dorsiflexion
- Close pack: Weightbearing knee extension with ankle dorsiflexion?
- Rest position: non-weightbearing?
Superior Tib-Fib Joint Manipulation Anterior

- Quick thrust (HVLAT) to move fibula anteriorly
  - Joint plane is about 30 degrees off of sagittal plane
- Indicated when fibula lacks normal internal rotation
- May restore normal splaying of inferior joint for full dorsiflexion
Inferior Tib-Fib Joint
Distal Tibiofibular Joint

- **Type:** fibrous syndesmosis (except at inferior of joint, 1 mm hyaline cartilage)
- **Motion:** 1 degree of freedom
  - Small motion: splaying rotation & glide
  - 1 – 2 mm spread of bones with DF of the ankle
- **Joint Mechanics:**
  - Talus is wider anteriorly and lateral aspect directed
  - Acts with superior tib/fib joint
  - Inferior joint acts as a pivot for superior joint
  - Weightbearing dorsiflexion causes fibula to move into abduction, glide upward and internally rotate = posterior glide due to strong posterior ligament as a hinge & limit of motion
- **Capsular Pattern:** pain on weight bearing dorsiflexion
- **Close Packed Position:** weight bearing dorsiflexion tenses ligaments
- **Rest Position:** ??? Plantar flexion non-weight-bearing
Taping of Inferior Tib-Fib Joint

- Support fibula from excessive lateral movement (splaying of Tib-Fib joint)
- Indicated to stabilize the joint following an ankle sprain.
Peroneal Tendon Friction Massage

- Direct pressure to tendon in perpendicular direction
- Increases blood flow to the tendon
- Increases activity of fibroblasts
- Decreases fibrosis/adhesions
- Most effective with stretching and functional exercise
• Advanced form of soft tissue mobilization
• Improve the status and function of soft tissue
• Treatments are performed with ergonomically designed instruments
  – help to identify adhesions and other restrictions in dysfunctional tissue, and then break down this tissue to allow for functional restoration to occur
• Effective for:
  – Chronic tendonitis and tendonosis
  – Carpal Tunnel Syndrome
  – Plantar Fascitis
  – Shin Splints
  – SI and Low Back Pain
  – Post Operative Scar Tissue
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