Implementing the NATA Position Statement: Conservative Management and Prevention of Ankle Sprains in Athletes

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NATA Position Statements
The purpose of a Position Statement is to declare the official NATA position on an approved topic based on current literature and practice.

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This Guy’s Pretty Experienced at What He Does!
He’s been plagued by ankle issues throughout his career!
Epidemiology

• Ankle sprains are extremely common in:
  – Sport and exercise
  – Military training
  – Occupational injuries
  – General population

• 1.6 million physician visits annually for ankle sprains in the US (AAOS, 1999)

• Annual aggregate medical costs of 2 billion dollars in US
  (Soboroff, Clin Orthop, 1984)

Epidemiology

• Recurrence rates >70% in basketball
  (Yeung et al, BJSM, 1994)

• 55-72% report residual symptoms 6 months post-injury
  (Braun, Arch Fam Med, 1999)

• 74% reported at least one residual symptoms at 2 years post-injury
  – 47% reported perceived instability and more than one symptom
  – Also rated lower general health quality of life (SF-36) compared to those with upper extremity injuries
  (Anandacoomarasamy & Barnsley, BJSM, 2005)

• Most common predisposition to an ankle sprain is the history of a previous sprain
  (Beynnon et al, J Athletic Training, 2002)

• 55% of ankle sprains are not treated by a health care professional
  (McKay et al, BJSM, 2001)

• Relationship between ankle sprain history and development of osteoarthritis
  (Valderrabano et al, AJSM, 2006)

Mechanism of an Acute Ankle Sprain

• Supination of the rearfoot coupled with external rotation of the lower leg
  – Plantar flexion
  – Inversion
  – Internal Rotation

• More plantar flexion increases likelihood of a sprain
  (Wright et al, J Biomech, 2000)

Consequences of an Acute Ankle Sprain

• Most commonly injured structures in 547 patients with soft tissue injuries due to an acutely twisted ankle
  – Present to emergency room or occupational medicine clinic

• “Injury” based on pain at site of structure
  – Anterior Talofibular Lig. (83%)
  – Calcaneofibular Lig. (67%)
  – Posterior Talofibular Lig. (34%)
  – Deltoid Lig. (32%)
  – Ankle joint capsule (32%)
  – Dorsum of foot (20%)
  – Sinus tarsi (16%)
  – Peroneals (15%)
  – Bifurcate Lig. (8%)
  – Syndesmosis (6%)

• Most common clinical presentations
  – ATFL + CFL = 34%
  – ATFL + CFL + PTFL = 31%
  – ATFL only = 14%
  – Other = 15%
  – PTFL only = 6%

• Most common primary diagnoses
  – Grade 1 sprain = 71%
  – Other = 15%
  – Grade 2 sprain = 10%
  – Grade 3 sprain = 3%
  – Syndesmotic sprain = 1%

Fallet et al, J Foot Ankle Surg, 1998
A Public Health Issue?

- Cost of initial treatment and follow-up rehabilitation
- Strong link with an increased risk for osteoarthritis and articular degeneration

The Impact of Osteoarthritis: Implications for Research.
Buckwalter, Joseph A MD; Saltzman, Charles MD; Brown, Thomas PHD

October 2004

Recommendations

The purpose of this position statement is to present recommendations for certified athletic trainers and other allied health professionals in the conservative management and prevention of ankle sprains in athletes. Our recommendations will be reinforced by relevant scholarly evidence currently available in peer-reviewed publications and graded according to the Evidence Category Taxonomy (SORT) Evidence Based Scale.

Recommendations from Five (5) Different Categories

- Diagnosis
- Treatment and Rehabilitation
- Return-to-Play Considerations
- Prevention
- Special Considerations

What is Evidence-Based Practice

Evidence
Clinical Expertise
Patients' Needs & Preferences
Current State of AT Practice

Best Research

Clinical Experience

Patient Values

Evidence Categories Made Simple

<table>
<thead>
<tr>
<th>Level of Evidence</th>
<th>SORT Grade</th>
<th>Clinical Practice Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Based on consistent and good evidence</td>
<td>No brainer! You should be doing this in clinical practice</td>
</tr>
<tr>
<td>B</td>
<td>Based on inconsistent or limited-quality evidence</td>
<td>Should probably include in our clinical practice!</td>
</tr>
<tr>
<td>C</td>
<td>Based on consensus or usual practice</td>
<td>Flip a coin --- it is up to you to decide!</td>
</tr>
</tbody>
</table>

Evidence Categories SORT Taxonomy

Strength of Recommendation Taxonomy (SORT)

In general, only key recommendations for readers require a grade of the “Strength of Recommendation.” Recommendations should be based on the highest-quality evidence available. For example, where II was found in some cohort studies (level II study quality) to have a benefit for cardiovascular protection, but a grade of randomized trials (level I) have not confirmed this effect. Therefore, it is preferable to base clinical recommendations in a manuscript on the level II studies.

<table>
<thead>
<tr>
<th>Strength of Recommendation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Recommendation based on consistent and good-quality patient-oriented evidence. *</td>
</tr>
<tr>
<td>B</td>
<td>Recommendation based on inconsistent or limited-quality patient-oriented evidence. *</td>
</tr>
<tr>
<td>C</td>
<td>Recommendation based on consensus, usual practice, opinion, feasibility studies, or expert opinion or case studies for studies of diagnosis, treatment, prevention, or screening</td>
</tr>
</tbody>
</table>

Implementing the Position Statement Recommendations

Easier said than done

Diagnosis

1. Patient history including mechanism of injury and past injuries, clinician observation, and palpation can provide important insights into the anatomical structures that may be injured, but not the severity of injury, in a patient suspected of having an ankle sprain.

   – Evidence Category: C

Diagnosis

2. Assessment of active, passive, and resistive range of motion about the ankle can provide insight into injury to ligaments, muscles, tendons, and nerves.

   – Evidence Category: C
Diagnosis

• 3. Special tests to assess for injury to the lateral ankle ligaments such as the anterior drawer and inversion talar tilt tests performed soon after injury and before joint effusion has accumulated may have better diagnostic accuracy than tests performed after effusion has occurred.
  – Evidence Category: C

• 4. Special tests such as the anterior drawer and inversion talar tilt test have more diagnostic accuracy 5 days after injury than they do at 2 days post injury.
  – Evidence Category: B

• 5. Clinicians must be vigilant in assessing for associated lesions, both local and distant to the talocrural joint that may accompany ankle sprains.
  – Evidence Category: C

• 6. Special tests for high ankle sprains, such as the Squeeze test, Cotzen test, external rotation test, and fibular translation tests, should be performed to assess for injury to the anterior inferior tibiofibular ligament.
  – Evidence Category: C

• 7. The Ottawa Ankle Rules are a valid clinical tool to determine the need for radiographs of the acutely injured ankle or midfoot.
  – Evidence Category: A

http://www.youtube.com/watch?v=2VrLItZGKNs

Clinical assessment of acute lateral ankle sprain injuries: consensus statement and recommendations of the International Ankle Consortium

Authors:
Delahunt E 1,2, Bleakley CM 3, Bossard DS 1,2, Caulfield BM 1,4, Docherty C 5, Doherty C 4, Fourchet F 6, Fong DT 7, Hertel J 8, Hiller CE 9, Kaminski TW 10, McKeeen PO 11, Refshauge KM 9, Remus A 4, Verhagen EA 12, Vicenzino BT 13, Wikstrom EA 14, Gribble PA 15

British Journal of Sports Medicine

Five (5) Important Considerations for Clinical Diagnostic Assessment during Acute Ankle Sprain

• Expert consensus via Delphi process (2017)
  – MOI
  – Hx of previous sprain
  – WB status
  – R/O Bony involvement
  – Ligamentous evaluation
Clinical Diagnostic Assessment

Mechanism of Injury
- Be aware of mechanisms characteristic of:
  - Lateral ankle sprain
  - Syndesmosis sprain

Why?
- Guide assessment of appropriate tissues

Establish the history of previous lateral ankle sprain

Why?
- Primary risk factor for recurrent injury
- May indicate that there are unresolved mechanical or proprioceptive impairments

Assessment of ligaments
- ATFL (Ankle drawer test, palpation & manual stress testing)
- CFL (Pseudo-Lachman & manual test)

Assessment of bones & weight-bearing status

Anterior Talofibular Ligament (ATF)

Calcaneofibular Ligament (CF)

Anterior Talofibular Ligament (ATF)

Anterior Talofibular Ligament (ATF) Schematic

Calcaneofibular Ligament (CF) Schematic

Talar Tilt Schematic
Ankle Syndesmosis

Clinical PEARL: Syndesmosis Palpation

- Anterior Inferior Tibiofibular Ligament
- Interosseous Membrane
- Posterior Inferior Tibiofibular Ligament

Diagnosis

- 8. Stress radiography is an unreliable tool to detect acute ligamentous disruption after ankle sprain.
  - Evidence Category: B

- 9. Magnetic resonance imaging is a reliable technique to detect acute tears of the anterior talofibular ligament and calcaneofibular ligament after acute injury.
  - Evidence Category: B

- 10. Osteochondral lesions of the talus can be accurately detected by both magnetic resonance imaging and computerized tomography.
  - Evidence Category: B

- 11. Ultrasound has a useful, but lower accuracy and sensitivity to detect acute lateral ankle ligamentous injury compared to magnetic resonance imaging.
  - Evidence Category: B
Diagnosis
12. Arthrogram and tenogram are less accurate than magnetic resonance imaging and computerized tomography especially when performed 48 hours after lateral ligamentous injury.
   - Evidence Category: B
13. Magnetic resonance imaging has a high sensitivity, specificity and accuracy to determine level of injury to the ankle syndesmotic ligaments after acute injury.
   - Evidence Category: B

Treatment and Rehabilitation
14. Cryotherapy should be applied to acute ankle sprains to reduce pain, diminish swelling formation and reduce secondary injury.
   - Evidence Category: C
15. Compression should be applied to acute ankle sprains to minimize swelling formation.
   - Evidence Category: C

Treatment and Rehabilitation
16. Acute ankle sprains should be elevated to curb swelling formation.
   - Evidence Category: C
17. Non-steroidal anti-inflammatory drugs, administered orally or topically reduce pain, swelling and improve short-term function following ankle sprains.
   - Evidence Category: A

The Evolution of RICE
What if RICE is wrong? Newer evidence is suggesting that both ICE and REST may actually delay recovery! Does this turn an ATC’s life into peril?

An Interesting Take on an Old Practice
POLICE = Protection, Optimal Loading, Ice, Compression, and Elevation

Did This 2012 JAT Article Make You Stop and Think About Current Ankle Sprain Management?
The Future of Acute Ankle Sprain Treatment Intervention?

https://www.youtube.com/watch?v=vADfbms8kJU

Footbeat in Action

Treatment and Rehabilitation

• 18. Early mobilization and functional rehabilitation is more effective over immobilization in the management of Grade I and II ankle sprains.
  – Evidence Category: A

• 19. Electrical stimulation can be used as an adjunct to diminish swelling formation during the acute phase of injury.
  – Evidence Category: C

Treatment and Rehabilitation

• 20. Clinicians should refrain from thermotherapy during the acute and sub-acute phase of injury due to lack of evidence and potential to exacerbate the injury.
  – Evidence Category: C

• 21. Cryokinetics can be used to reduce pain and thereby allow early rehabilitative exercises.
  – Evidence Category: C

Treatment and Rehabilitation

• 22. Rehabilitation should include comprehensive range-of-motion, flexibility, and strengthening of the surrounding musculature.
  – Evidence Category: B

• 23. Balance training should be included throughout rehabilitation, and follow-up management of ankle sprains to reduce re-injury rates.
  – Evidence Category: A

http://www.youtube.com/watch?v=ESqPhgXuVE4

http://www.youtube.com/watch?v=rmuSBXTu_WM

http://www.youtube.com/watch?v=fP9sXr5i1aU

http://www.youtube.com/watch?v=ESqPhgXuVE4
Treatment and Rehabilitation

- 24. Joint mobilizations should be utilized to increase ankle dorsiflexion and improve function.
  
  – Evidence Category: B

International Ankle Consortium Rehabilitation-Oriented ASsessmentT (ROAST)

- The International Ankle Consortium ROAST will help clinicians identify mechanical and/or sensorimotor impairments that are associated with chronic ankle instability (CAI).
  - 10 important considerations that clinicians should assess
- This consensus statement from the International Ankle Consortium aims to be a key resource for clinicians who regularly assess individuals with acute lateral ankle sprain injuries.

ROAST

Table 1: International Ankle Consortium ROAST

<table>
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<th>Test</th>
<th>Subcomponent</th>
<th>Outcome Measure</th>
<th>Evidence Category</th>
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<td>Impairment is an indicator of stability with CAI</td>
<td>Visual assessment of ankle gait</td>
<td>C</td>
</tr>
<tr>
<td>Physical capacity</td>
<td>Gait is an indicator of an individual's ability</td>
<td>Visual assessment of physical capacity</td>
<td>C</td>
</tr>
<tr>
<td>Dynamic postural balance</td>
<td>Impairment in dynamic postural balance is consistent with CAI</td>
<td>Visual assessment of balance</td>
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Return-to-Play Considerations

- 25. Patients' perception of function should be included in any return-to-play decision making. This information can be obtained through an array of self-report questionnaires that have been developed for patients with lateral ankle sprains.
  
  – Evidence Category: C

Return-to-Play Considerations

- 26. Functional performance testing should be a component of the return-to-play decision making. Specifically, during functional hopping tests, the injured limb should perform at the level of least 80% of the uninjured limb to return to sport specific tasks.
  
  – Evidence Category: B
Return-to-Play Considerations

27. Athletes with a history of previous ankle sprains should wear prophylactic ankle support in the form of ankle taping or bracing for all practices and games.

– Evidence Category: B

Prevention

28. Both lace-up and semi-rigid ankle braces and traditional ankle taping have been shown to be effective in both preventing ankle injuries and reducing the rate of reoccurrence in athletic populations.

– Evidence Category: A

Prevention

29. Clinicians working with athletes should perform a multi-intervention prevention program, lasting at least 3 months, focused on balance and neuromuscular control to reduce the risk of ankle injury. Athletes with a history of ankle injury may benefit more from this type of training.

– Evidence Category: A

Prevention

30. Leg muscle (evertor, invertor, dorsiflexor, and plantar flexor) and hip extensor and abductor strength may be considered as an ankle injury prevention strategy.

– Evidence Category: C

Special Considerations: Syndesmotic Ankle Sprains

32. Syndesmotic ankle sprains (aka “high ankle sprains”) are characterized by symptoms proximal to the talocural joint including prolonged pain, functional disability, and the deposition of heterotopic ossification. Evaluation should include notation of proximal tenderness, clinical testing, functional evaluation, and radiographic findings and/or evidence of injury on MRI.

– Evidence Category: C
Special Considerations: Syndesmotic Ankle Sprains

- 33. Syndesmotic ankle sprains should be treated more conservatively than lateral ankle sprains with acute management involving immobilization (non-weight bearing, walking boot, casting, or bracing) for a time period sufficient to allow healing and functional return.  
  – Evidence Category: C

- 34. Syndesmotic ankle sprains that exhibit widening of the ankle mortise greater than 2mm or joint incongruity on standard x-ray or stress radiograph should be considered for surgical fixation.  
  – Evidence Category: C

Special Considerations: Chronic Ankle Instability

- 35. Clinicians should be aware of characteristics that define chronic ankle instability. Several instruments (The Foot and Ankle Ability Measure (FAAM), Ankle Instability Instrument (AII), and Cumberland Ankle Instability Tool (CAIT)) may be utilized to help identify patients with CAI and quantify the severity of the condition.  
  – Evidence Category: C

- 36. Mechanical and functional deficits should be identified in patients with CAI. These deficits include, but are not limited to, increased laxity, impaired dorsiflexion range of motion (DFROM), deficient leg and hip strength, diminished postural control, and impaired movement strategies. Evidence Category: C

- 37. Intervention strategies should be utilized to address specific deficits in patients with CAI. Manual therapy techniques used to restore normal arthrokinematic motion may be beneficial to help restore DFROM. Strategies that focus on balance, strength, and dynamic movements with changes in direction may be effective in reducing the risk of recurrent ankle sprains in patients with functional deficits.  
  – Evidence Category: B

International Ankle Consortium Recommendations
Conclusions/Clinical Implications

• The recommendations contained in this emerging statement are designed to serve as “best practices”

• The position statement has been endorsed by the NATA and its’ Board of Directors

Helpful Resources

• Section I Risk and Risk Reduction of Ankle Sprains
• Section II Diagnosis
• Section III Treatment and Rehabilitation
• Section IV Surgical Considerations

Evidence-Based Medicine Glossary

• Here is a useful web site at the Centre for Evidence-Based Medicine (Toronto) that will help you to navigate through the plethora of terms associated with EBM!
• http://ktclearinghouse.ca/cebm/glossary/

Thank You!