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

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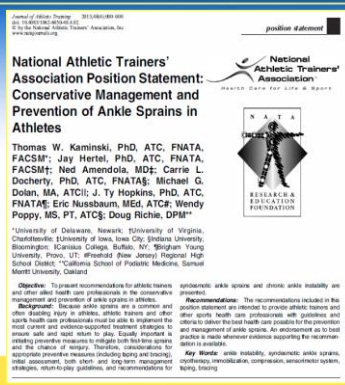
NATA Position Statements

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

http://www.nata.org/position-statements



position statement

National Athletic Trainers' Association Position Statement: Conservative Management and Prevention of Ankle Sprains in Athletes

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This Guy's Pretty Experienced at What He Does!

(but has 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)*

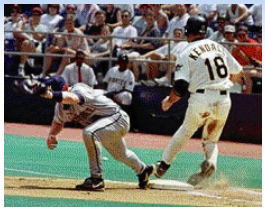
Epidemiology

- 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)

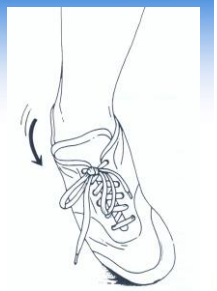
Epidemiology

- 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)*



Mechanism of Injury

Consequences of an Acute Ankle Sprain

- Most commonly injured structures in 547 patients with soft tissue injuries due to an acutely twisted ankle
  - Presented 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 = 16%
  - Other = 14%
  - PTFL only = 2%
  - CFL only = 1%
- 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?

CLINICAL ORTHOPAEDICS AND RELATED RESEARCH

The Impact of Osteoarthritis: Implications for Research.

Buckwalter, Joseph A MD; Saltzman, Charles MD; Brown, Thomas PHD

October 2004

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

2016 consensus statement of the International Ankle Consortium: prevalence, impact and long-term consequences of lateral ankle sprains

Phillip A Gribble,[1] Chris M Bleakley,[2] Brian M Caulfield,[3] Carrie L Docherty,[4] François Fourchet,[5] Daniel Tik-Pui Fong,[6] Jay Hertel,[7] Claire E Hiller,[8] Thomas W Kaminski,[9] Patrick O McKeon,[10] Kathryn M Refshauge,[8] Evert A Verhagen,[11] Bill T Vicenzino,[12] Erik A Wikstrom,[13] Eamonn Delahunt[14]

The concern in the AT community is the high prevalence of AI!

While the direct costs for treatment of an isolated lateral ankle sprain are relatively low, compounding these costs are the indirect costs from follow-up care and injury-associated time loss. With a large percentage of the population experiencing this injury, the societal costs are high. As these treatment costs for lateral ankle sprains are combined with the costs of managing the loss of physical activity, and treatments for onset and care for post-traumatic osteoarthritis of the ankle, it becomes apparent that the healthcare burden that emerges from a 'simple' lateral ankle sprain is substantial.

BJSM 2016

GUEST EDITORIAL

Tricia Hubbard Turner, PhD, ATC, FACSM, FNATA

Ankle Sprains Can Lead to Cancer? I Didn't Know That

Ankle sprains are a musculoskeletal injury and need to be treated as such; if not, they become a huge public health burden in the long term and, through decreased physical activity levels, may even lead to certain types of cancer.

Recommendations

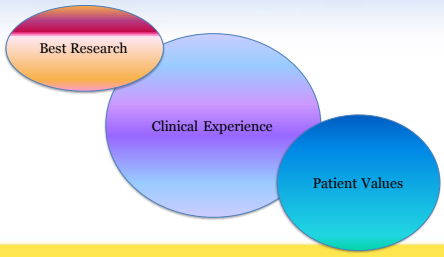
The purpose of this position statement is to present recommendations for certified athletic trainers and other allied health professionals in the conservative management and prevention of ankle sprains in athletes. Our recommendations will be reinforced by relevant scholarly evidence currently available 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

Current State of AT Practice



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, vitamin E was found in some cohort studies (level 2 study quality) to have a benefit for cardiovascular protection, but good-quality randomized trials (level 1) have not confirmed this effect. Therefore, it is preferable to base clinical recommendations in a manuscript on the level 1 studies.

Strength of recommendation	*Definition*
A	Recommendation based on consistent and good-quality patient-oriented evidence.*
B	Recommendation based on inconsistent or limited-quality patient-oriented evidence.*
C	Recommendation based on consensus, usual practice, opinion, disease-oriented evidence,* or case series for studies of diagnosis, treatment, prevention, or screening.

Evidence Categories Made Simple

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

Implementing the Position Statement Recommendations

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

Diagnosis

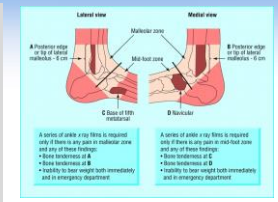
- 4. Special tests such as the anterior drawer and inversion talar tilt test have more diagnostic accuracy 5 days after injury than they do at 2 days post injury.
  - Evidence Category: B
- 5. Clinicians must be vigilant in assessing for associated lesions, both local and distant to the talocrural joint that may accompany ankle sprains.
  - Evidence Category: C

Diagnosis

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

Diagnosis

- 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 CL 5, Doherty C 4, Fourchet F 6, Fong DT 7, Hertel J 8, Hiller CE 9, Kaminski TW 10, McKeon 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 history of previous lateral ankle sprain

Why?
Primary risk factor for recurrent injury
May indicate that there are unresolved mechanical and/or sensorimotor impairments

Assessment of ligaments

ATFL (Anterior drawer test, palpation & manual stress testing)
CFL (Palpation & manual stress testing)
Syndesmosis (Palpation, squeeze test)

Assessment of bones & weight-bearing status

Why?
Establish the likelihood of ankle fracture (via use of Ottawa Ankle Rules)

BJSM

Eamonn Delahunt et al. Br J Sports Med
doi:10.1136/bjsports-2017-098885

Anterior Talofibular Ligament (ATF)

Anterior talofibular ligament palpation

Recommended position for palpating the anterior talofibular ligament (Figure 3):
With the ankle joint plantar flexed and the foot inverted and internally rotated the clinician can palpate the anterior talofibular ligament at its attachment to the distal tip of the lateral malleolus.

Clinical assessment:
The ligament is subcutaneous and can be palpated at its origin at the anterior margin of the distal tip of the lateral malleolus.

Clinical interpretation:
Replication of the patient's "known pain" upon palpation of the anterior talofibular ligament is indicative of injury to this ligament.

Figure 3. The left index finger of the clinician is positioned at the distal tip of the lateral malleolus and is palpating the fibular attachment of the anterior talofibular ligament. The ankle joint is positioned in plantar flexion whilst the foot is inverted and internally rotated.

Anterior Talofibular Ligament (ATF)

Figure 4. In this figure the clinician has passively plantar flexed the ankle joint and has also passively inverted and internally rotated the foot.

Anterior talofibular ligament stress test

Recommended position for "stressing" the anterior talofibular ligament (Figure 4):
The ankle joint is passively plantar flexed whilst the foot is passively inverted and internally rotated.

Clinical assessment:
The anterior talofibular stress test is performed by passively moving the ankle joint into plantar flexion combined with inversion and internal rotation of the foot.

Clinical interpretation:
Replication of the patient's "known pain" upon "stressing" of the anterior talofibular ligament is indicative of injury to this ligament.

Anterior Talofibular Ligament (ATF)

Anterior talofibular ligament anterior drawer test

Recommended position for performing the anterior talofibular ligament anterior drawer test (Figure 5 and 6):
Start position (Figure 5)
Presence of a "sulcus sign" (Figure 6)

Clinical interpretation: The anterior talofibular ligament anterior drawer test can be used to determine whether the anterior talofibular ligament is completely disrupted/ruptured. The presence of a "sulcus sign" is indicative of complete disruption/rupture.

Figure 5. Start position for performing the anterior drawer test.

Figure 6. Presence of a "sulcus sign". This figure illustrates the end position of an anterior drawer test. A clear "sulcus sign" is identified anterior to the lateral malleolus.

Calcaneofibular Ligament (CF)

Figure 7. The index finger of the clinician is positioned on a portion of the calcaneofibular ligament just distal to the peroneal tendons.

Calcaneofibular ligament palpation

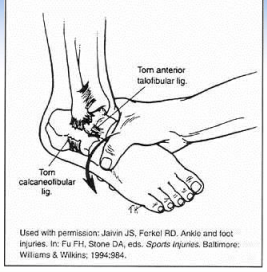
Recommended position for palpating the calcaneofibular ligament (Figure 7):
The patient is positioned in side-lying. The calcaneofibular ligament is palpated along a line directed at 135° oriented from the tip of the lateral malleolus to the posterior-lateral edge of the calcaneus.

Clinical assessment:
The distal portion of the ligament is subcutaneous and can be palpated distal to the peroneal tendons.

Clinical interpretation:
Replication of the patient's "known pain" upon palpation of the calcaneofibular ligament is indicative of injury to this ligament.

Talar Tilt Schematic

Figure 5. The Talar Tilt Test



Used with permission: Jaivin JS, Farkel RD. Ankle and foot injuries. In: Fu FH, Stone DA, eds. *Sports injuries.* Baltimore: Williams & Wilkins; 1994:984.

Inversion

Eversion

Ankle Syndesmosis

Syndesmosis ligament palpation

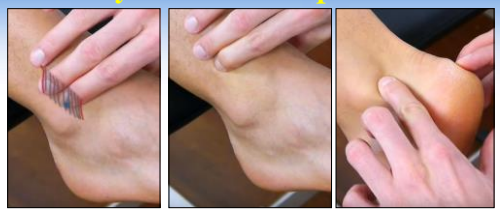
Recommended position for palpating the syndesmosis (Figure 8):
The anterior inferior tibiofibular ligament portion of the ankle joint syndesmosis ligament complex can be palpated at the anterior margin of the ankle joint.

Clinical assessment:
The syndesmosis ligament can be palpated at the anterior margin of the ankle joint.

Clinical interpretation:
Replication of the patient's "known pain" upon palpation of the syndesmosis ligament is indicative of injury to this ligament.

Figure 8. The clinician's thumb is positioned on a portion of the anterior tibiofibular ligament.

Clinical PEARL: Syndesmosis Palpation



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

Ankle Syndesmosis

Figure 9. The tibia is stabilized whilst the fibula is approximated ("squeezed") against the tibia.

Syndesmosis squeeze test

Recommended position for performing the syndesmosis squeeze test (Figure 9):
The syndesmosis squeeze test is performed with the patient in supine lying.

Clinical assessment:
The syndesmosis squeeze test is performed by stabilizing the tibia whilst simultaneous approximating (i.e. squeezing) the proximal fibula against the tibia.

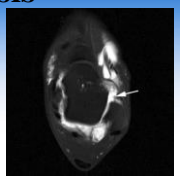
Clinical interpretation:
Replication of the patient's "known pain" is indicative of injury to this ligament.

Diagnosis

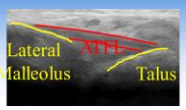
- 8. Stress radiography is an unreliable tool to detect acute ligamentous disruption after ankle sprain.
  - Evidence Category: B

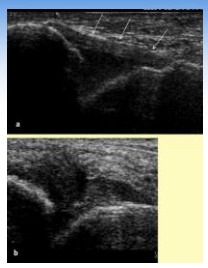
Diagnosis

- 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



Diagnosis





- 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

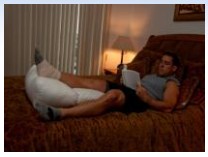
13. Magnetic resonance imaging has a high sensitivity, specificity and accuracy to determine level of injury to the ankle syndesmotic ligaments after acute injury.
    - Evidence Category: B

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 E CE

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ATC's life
eril?

An Interesting Take on an Old Practice

POLICE = Protection, Optimal Loading, Ice, Compression, and Elevation

Downloaded from http://bjsm.bmj.com/ on September 28, 2015 - Published by group.bmj.com

Editorial

PRICE needs updating, should we call the POLICE?

C M Bleakley,[1,3] P Glasgow,[2,3] D C MacAuley[4]

The acronym PRICE (protection, rest, ice, compression and elevation) has been central to acute soft tissue injury management for many years despite a paucity of high-quality, empirical evidence to support the various components or as a collective treatment package. Treatment paradigms in sports medicine must be updated based on contemporary research evidence. As a recent example, the widespread use of non-steroidal anti-inflammatory drugs in acute soft tissue injury management has been challenged, particularly with ligament and muscle injuries.[1]

Ice compression and elevation (ICE) is the basic principle of early treatment. Most research has focused on the analgesic effect of icing or the associated skin or intramuscular temperature changes; a recent randomised controlled trial by Prins and colleagues,[2] which examined the effectiveness of ice on recovery from acute muscle tear, is the first of its kind. Clinical studies into compression are also lacking, and much of its rationale is extrapolated from research relating to deep venous thrombosis prophylaxis and lymphoedema management; there is little clinical research on elevation.[3]

Protection and rest after injury are supported by assertions that stress shield, unload and/or prevent joint movement for various periods. Recent animal models[4-6] show that short periods of unloading are required after acute soft tissue injury and that aggressive ambulation or exercise should be avoided. But, rest should be of limited duration and restricted to immediately after trauma. Longer periods of unloading or bandaged and unloaded adverse changes to tissue biomechanics and morphology. Progressive mechanical loading is more likely to restore the strength and morphological characteristics of collagenous tissue.[4-7] Indeed, early mobilisation with accelerated rehabilitation is effective after acute ankle strain.[1] Functional rehabilitation of ankle sprain, which involves early weight-bearing usually with an external support, is superior to cast immobilisation for most types of sprain severity.[8 9]

Functional rehabilitation aligns well with the principles of mechanotherapy, whereby mechanical loading prompts cellular responses that promote tissue structural change.[10] There are consistent findings from animal models that demonstrate how mechanical loading upregulates mRNA expression for key proteins associated with soft tissue healing.[6-8] The difficult clinical challenge is finding the balance between loading and unloading during tissue healing. If tissues are stressed too aggressively after injury, the mechanical insult may cause re-bleeding or further damage. Protection of vulnerable tissues therefore remains an important principle. But, too much emphasis creates a default mindset that loading has no place in acute management. Rest may be harmful and inhibits recovery. The secret is to find the 'optimal loading'.

Optimal loading means replacing rest with a balanced and incremental rehabilitation programme where early activity encourages early recovery. Injuries vary so there is no single one size fits all strategy or dosage. A loading strategy should reflect the unique mechanical stresses placed upon the injured tissue during functional activities, which varies across time, tissue, loading in acute soft tissue injury management. Optimal loading is an umbrella term for any mechanotherapy intervention and includes a wide range of manual techniques currently available; indeed the term may include manual techniques such as massage related to maximise the mechano-effect. Functionally, crutches, braces and supports, traditionally associated with rest, may have a greater role in adjusting and regulating optimal loading in the early stages of rehabilitation.

POLICE should make us think more about research into designing rehabilitation strategies that are appropriate to the nature and severity of injury in different sports and activities. If the primary principle of treatment is to restore the histological and mechanical properties of injured soft tissue, optimal loading may indeed be sport specific. The challenge is in determining what is 'optimal' in terms of the dosage, nature and timing.

POLICE is not just an acronym to guide management but a stimulus to a new field of research. It is important that this research includes more rigorous examination of the role of ICE in acute injury management. Currently, cold-induced analgesia and the assurance and support provided by compression and elevation are enough to retain ICE within the acronym.

Competing interests None.

Provenance and peer review Not commissioned; externally peer reviewed.

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doi:10.1136/bjsports.2011.086287

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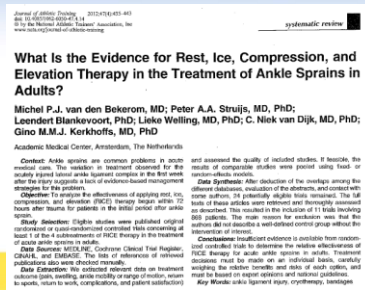
2. **Prins MR**, van der Wurff P, Bleakley CM, *et al*. Feasibility and preliminary effectiveness of ice therapy in patients with an acute tear in the gastrocnemius muscle: a pilot randomised controlled trial. *Clin Rehabil* 2011;**25**:423–41.
3. **Wakeling CM**, Glasgow PD, Phillips D *et al*. Ice the Association of National Physiotherapists in Sports

Did This 2012 JAT Article Make You Stop and Think About Current Ankle Sprain Management?



Journal of Athletic Training 2012;47(4):455–463
doi: 10.4085/1062-6050-47.4.14
© by the National Athletic Trainers' Association, Inc
www.nata.org/jat/ed-of-citation-ensuing

systematic review

What Is the Evidence for Rest, Ice, Compression, and Elevation Therapy in the Treatment of Ankle Sprains in Adults?

Michel P.J. van den Bekerom, MD; Peter A.A. Struijs, MD, PhD; Leendert Blankevoort, PhD; Lieke Welling, MD, PhD; C. Niek van Dijk, MD, PhD; Gino M.M.J. Kerkhoffs, MD, PhD

Academic Medical Center, Amsterdam, The Netherlands

Context: Ankle sprains are common problems in acute medical care. The variation in treatment observed for the acutely injured lateral ankle ligament complex in the first week after the injury suggests a lack of evidence-based management strategies for this problem.

Objective: To analyze the effectiveness of applying rest, ice, compression, and elevation (RICE) therapy begun within 72 hours after trauma for patients in the initial period after ankle sprain.

Study Selection: Eligible studies were published original randomized or quasi-randomized controlled trials concerning at least 1 of the 4 subtreatments of RICE therapy in the treatment of acute ankle sprains in adults.

Data Sources: MEDLINE, Cochrane Clinical Trial Register, CINAHL, and EMBASE. The lists of references of retrieved publications also were checked manually.

Data Extraction: We extracted relevant data on treatment outcome (pain, swelling, ankle mobility or range of motion, return to sports, return to work, complications, and patient satisfaction) and assessed the quality of included studies. If feasible, the results of comparable studies were pooled using fixed- or random-effects models.

Data Synthesis: After deduction of the overlaps among the different databases, evaluation of the abstracts, and contact with some authors, 34 potentially eligible trials remained. The full texts of these articles were retrieved and thoroughly assessed as described. This resulted in the inclusion of 11 trials involving 869 patients. The main reason for exclusion was that the authors did not describe a well-defined control group without the intervention of interest.

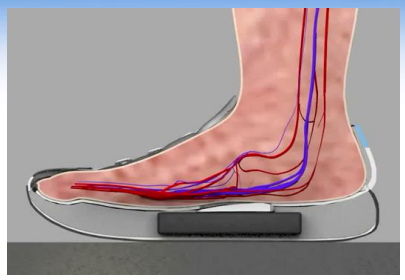
Conclusions: Insufficient evidence is available from randomized controlled trials to determine the relative effectiveness of RICE therapy for acute ankle sprains in adults. Treatment decisions must be made on an individual basis, carefully weighing the relative benefits and risks of each option, and must be based on expert opinions and national guidelines.

Key Words: ankle ligament injury, cryotherapy, bandages

The Future of Acute Ankle Sprain Treatment Intervention?

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

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

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

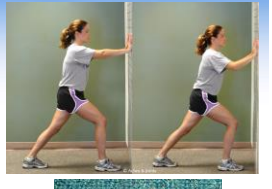
http://www.youtube.com/watch?v=fP9sXr5iiaU

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



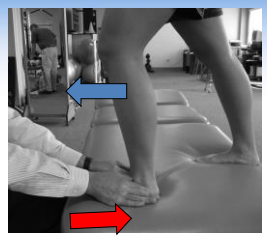
Treatment and Rehabilitation

- 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

Treatment and Rehabilitation

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



International Ankle Consortium Rehabilitation-Oriented ASsessmenT (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

What clinicians should assess following acute lateral ankle sprain injury	Why?	How?
Ankle joint pain	Guide progression of exercise-based rehabilitation. Assess the efficacy of treatments implemented.	Numeric rating scale for pain.[25] FADI.[26]
Ankle joint swelling	Swelling can cause arthrogenic muscle inhibition. Guide progression of exercise-based rehabilitation. Evaluate the efficacy of treatments implemented.	Figure-of-eight.[28,45]
Ankle joint range of motion	High propensity for the development of a dorsiflexion deficit. Impairments in ankle joint range of motion are consistently identified in individuals with CAI.	Weight-bearing lunge test.[44–46]
Ankle joint arthrokinematics	Disruption in ankle joint arthrokinematics can result in a dorsiflexion deficit. Impairments in ankle joint arthrokinematics are regularly identified in individuals with CAI.	Posterior talar glide test.[48]
Ankle joint muscle strength	Impairments in ankle joint strength compromise the functional integrity of the ankle joint. Impairments in ankle joint strength are regularly identified in individuals with CAI.	Hand-held dynamometry.[50]
Static postural balance	Impairments in static postural balance are consistently identified in individuals with CAI.	BESS.[56] FLT.[57]
Dynamic postural balance	Impairments in dynamic postural balance are consistently identified in individuals with CAI.	SEBT.[58]
Gait	Impairments in gait are consistently identified in individuals with CAI.	Visual assessment for antalgic gait.
Physical activity level	Guide the specificity of exercise-based rehabilitation.	Tegner activity-level scale.[65]
Ankle joint specific patient-reported outcome measures	Evaluate the efficacy of treatments implemented.	FADI.[26] FAAM.[63]

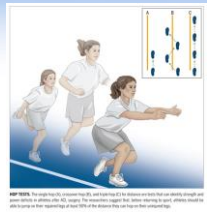
BESS, Balance Error Scoring System; CAI, chronic ankle instability; FAAM, Foot and Ankle Ability Measure; FADI, Foot and Ankle Disability Index; FLT, Foot Lift Test; ROAST, Rehabilitation-Oriented AS-sessmenT; SEBT, Star Excursion Balance Test.

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



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

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

http://www.youtube.com/watch?v=RvhPd7cv6Pc

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

Prevention

- 31. Clinicians should consider assessing dorsiflexion range of motion in at-risk athletes. If dorsiflexion range of motion is limited, clinicians should incorporate techniques to enhance arthrokinematic and osteokinematic motion for possible prevention of ankle injury.
  - Evidence Category: C

Special Considerations: Syndesmotic Ankle Sprains

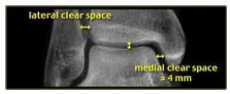
- 32. Syndesmotic ankle sprains (aka "high ankle sprains") are characterized by symptoms proximal to the talocrural joint including prolonged pain, functional disability, and the deposition of heterotopic ossification. Evaluation should include notation of proximal tenderness, clinical testing, functional 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

Special Considerations: Syndesmotic Ankle Sprains

- 34. Syndesmotic ankle sprains that exhibit widening of the ankle mortise greater then 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

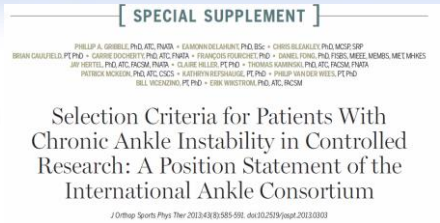
Special Considerations: Chronic Ankle Instability

- 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

Special Considerations: Chronic Ankle Instability

- 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


[SPECIAL SUPPLEMENT]

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Selection Criteria for Patients With Chronic Ankle Instability in Controlled Research: A Position Statement of the International Ankle Consortium

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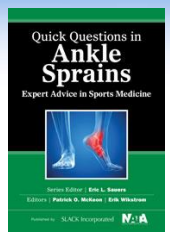
Conclusions/Clinical Implications

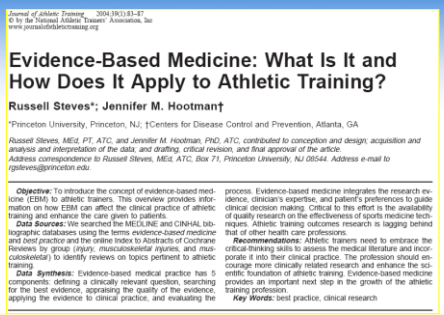
- The recommendations contained in this emerging statement are designed to serve as "best practices"
- The position statement has been endorsed by the NATA and its' Board of Directors

Helpful Resources



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

Helpful Resources



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Evidence-Based Medicine: What Is It and How Does It Apply to Athletic Training?

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Objective: To introduce the concept of evidence-based medicine (EBM) to athletic trainers. This overview provides information on how EBM can affect the clinical practice of athletic training and enhance the care given to patients.
Data Sources: We searched the MEDLINE and CINHAL bibliographic databases using the terms *evidence-based medicine* and *best practice* and the online Index to Abstracts of Cochrane Reviews by group (*injury, musculoskeletal injuries*, and *musculoskeletal*) to identify reviews on topics pertinent to athletic training.
Data Synthesis: Evidence-based medical practice has 5 components: defining a clinically relevant question, searching for the best evidence, appraising the quality of the evidence, applying the evidence to clinical practice, and evaluating the process. Evidence-based medicine integrates the research evidence, clinician's expertise, and patient's preferences to guide clinical decision making. Critical to this effort is the availability of quality research on the effectiveness of sports medicine techniques. Athletic training outcomes research is lagging behind that of other health care professions.
Recommendations: Athletic trainers need to embrace the critical-thinking skills to assess the medical literature and incorporate it into their clinical practice. The profession should encourage more clinically related research and enhance the scientific foundation of athletic training. Evidence-based medicine provides an important next step in the growth of the athletic training profession.
Key Words: best practice, clinical research

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/

Today's lecture can be viewed at the following URL address:

sites.udel.edu/chs-atep/lectures/

DELAWARE ATHLETIC TRAINING

Thank You!