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Implementing the NATA Position Statement Recommendations for Ankle Sprain Rehab: An Evidence-Based Approach

Thomas W. Kaminski, PhD, ATC, FNATA, FACSM, RFSAA
Professor/Director of Athletic Training Education
University of Delaware

Delaware Athletic Trainers' Association
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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>

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

Thomas W. Kaminski, PhD, ATC, FNATA, FACSM; Jay Hertel, PhD, ATC, FNATA, FACSM; Ned Amendola, MD; Carrie L. Docherty, PhD, ATC; Michael G. Dolan, MA, ATC; J. Ty Hopkins, PhD, ATC, FNATAE; Eric Nussbaum, MEd, ATC; Wendy Poppy, MS, PT, ATC; Doug Richie, DPM*

*University of Delaware; Newark; University of Virginia, Charlottesville; University of Iowa, Iowa City; Indiana University, Indianapolis; Canisius College, Buffalo, NY; Brigham Young University, Provo; Freehold Regional High School District; California School of Podiatric Medicine, Samuel Merritt University, Oakland

Objectives: To provide recommendations to athletes, trainers, and other allied health care professionals in the conservative management and prevention of ankle sprains in athletes.

Background: Because ankle sprains are a common and often recurrent injury in athletes, it is important that sports health care professionals need to be able to implement the most effective conservative management strategies to ensure safe and rapid return to play. Equally important is guiding athletes and coaches to prevent the occurrence of ankle sprains through the use of evidence-based prevention strategies.

Key Words: ankle instability, syndesmotic ankle sprains, conservative management, immobilization, compression, sensormotor system, taping, tincture

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The Writing Team

Co-Chairs

Jay Hertel, PhD, ATC – University of Virginia
Tom Kaminski, PhD, ATC – University of Delaware

Members

Ned Amendola, MD – University of Iowa
Carrie Docherty, PhD, ATC – Indiana University
Mike Dolan, MA, ATC – Canisius College
Ty Hopkins, PhD, ATC – Brigham Young University
Eric Nussbaum, MEd, ATC – Freehold Regional HS (NJ)
Wendy Poppy, MA, PT, ATC – Indiana University
Doug Richie, DPM – California School of Podiatric Medicine
@ Samuel Merritt University

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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)



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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 symptom 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 (Beymnon et al, *J Athletic Training*, 2002)
- 55% of ankle sprains are not treated by a health care professional (McKay et al, *BJSMS*, 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



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

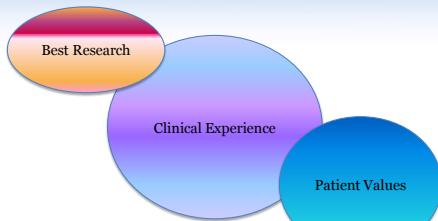
- Diagnosis
- Treatment and Rehabilitation
- Return-to-Play Considerations
- Prevention
- Special Considerations



What is Evidence-Based Practice



Current State of AT Practice



** EBP Quiz ?



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!

** EBP Quiz ?



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>

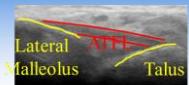


Diagnosis

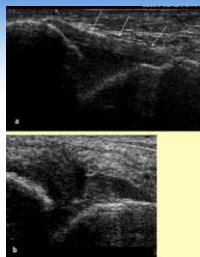
- 8. Stress radiography is an unreliable tool to detect acute ligamentous disruption after ankle sprain.
 - Evidence Category: B



Diagnosis

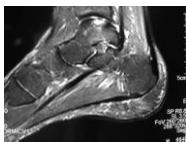
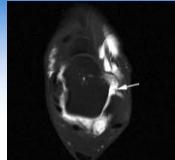


- 11. Ultrasound has a useful, but lower accuracy and sensitivity to detect acute lateral ankle ligamentous injury compared to magnetic resonance imaging.
 - Evidence Category: B



Diagnosis

- 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



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



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An Interesting Take on an Old Practice

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

Downloaded from <http://www.jbmj.com> on September 28, 2015 - Published by group.bmj.com

Editorial

PRICE needs updating, should we call it the POLICE?

C M Bleakley,^{1,3} P Glasgow,^{2,3} D C MacAuley⁴

The acronym PRICE (protection, rest, ice, compression, elevation) has been coined to advise management of acute sprains for many years despite a paucity of evidence to support the various components.^{1,2} Treatment guidelines to inform treatment decisions are based on sparse research evidence. As a more example, the evidence for the use of ice after soft tissue injury is poor, with no clear evidence for or against its use, particularly with ligament and muscle injuries.³

Ice, compression, and elevation (ICE) is a common treatment for acute sprains. Most research has focused on the use of ice, with little evidence to support the effectiveness of ice as an intervention for acute sprain. Clinical studies and comparisons of ice with other interventions such as heat and cold may show a benefit or further research remains an important priority. There is also evidence to support the use of functional rehabilitation along with mechanical loading compared with rest and no mechanical loading.^{4,5} The effects of mechanical loading are difficult to isolate, as loading is often included during time seating. If there is no evidence to support the use of mechanical loading, then it is reasonable to assume that loading has no place in acute ankle sprain management. The secret is to find the right balance between protection and prevention and to prevent joint movement by using a brace or tape. It is well known that short periods of unloading can be beneficial, but the evidence for prolonged immobilization is poor, and that aggressive immobilization is overused.⁶ Immobilization is often used for limited duration and removed to allow early active motion. Longer periods of immobilization have been shown to be associated with increased stiffness and reduced range of motion.⁷

Optimal loading, meaning applying just enough load to encourage functional rehabilitation programmes where early activity is encouraged, is a key component of the PRICE model. However, there is no single one size fits all strategy for optimal loading. The evidence for the unique mechanical stresses placed upon the injured tissue during functional

loading in acute soft tissue injury management. Optimal loading in an umbrella term for a range of different techniques that may include a wide range of manual therapy, functional exercises, and devices that may have a greater role in the early stages of rehabilitation.

PRICE has been widely adopted, and some research into designing rehabilitation programmes for acute sprain has focused on the nature and severity of injury in different populations and the best way to manage it. Of importance is to review the literature to determine what is optimal in terms of the use of ice, compression, and elevation.

PRICE is not just an acronym to guide treatment decisions; it is a useful framework to incorporate the available evidence for each component. To implement this, the search for evidence must be broad, and the evidence for each component must be assessed. The evidence for PRICE is poor, and the evidence for each component is even poorer.

Competing interests: None declared.

Source of support: None.

Conflict of interest: None declared.

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The Future of Acute Ankle Sprain Treatment Intervention?

FOOTBEAT MICRO-MOBILE COMPRESSION™

MECHANISM OF ACTION

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

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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

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

Journal of Orthopaedic Trauma 2012;26(4):401-403
DOI 10.1007/s00037-012-0001-4
© The Author(s) 2012. Published by Springer Science+Business Media, Inc.
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3413092/>

systematic review

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

Michel P.v.d. Bekkerom, MD; Peter A.A. Struijs, MD, PhD;
Leendert Blankvoort, PhD; Lieke Welling, MD, PhD; C. Niek van Dijk, MD, PhD;
Gert M.M.J. Kerkhoffs, MD, PhD

Academic Medical Center, Amsterdam, The Netherlands

Context: Ankle sprains are common problems in adults. The evidence for the use of rest, ice, compression, and elevation (PRICE) in the treatment of acutely injured lateral ankle ligament sprains in the first week after injury is poor.

Objectives: To evaluate the effectiveness of applying rest, ice, compression, and elevation (RIC) therapy before within 72 hours of an acute lateral ankle sprain.

Data Sources: Selected English studies were published original research or quasi-randomized controlled trials concerning at least one of the four components of RIC therapy in the treatment of acute ankle sprains in adults.

Study Selection: Two reviewers independently selected studies. Data Extraction: We extracted relevant data on treatment outcome, adverse events, and costs of RIC therapy compared to RICE therapy.

Data Synthesis: We extracted relevant data on treatment outcome, adverse events, and costs of RIC therapy compared to RICE therapy.

Conclusion: The available evidence is insufficient to support the use of RIC therapy to determine the relative effectiveness of RIC therapy for acute ankle sprains in adults.

Keywords: ankle ligament injury, cryotherapy, bandaging

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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=rmnSBXTu_WM

<http://www.youtube.com/watch?v=fPg8Xr5juU>

** EBP Quiz ?

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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



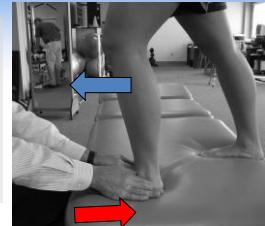
<http://www.youtube.com/watch?v=ESqPhgXuVE4>



Treatment and Rehabilitation

- 24. Joint mobilizations should be utilized to increase ankle dorsiflexion and improve function.

– Evidence Category: B



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=iNzGCeotOlo>



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



** EBP Quiz ?

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

** EBP Quiz ?

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 than 2mm or joint incongruity on standard x-ray or stress radiograph should be considered for surgical fixation.

– Evidence Category: C

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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



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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



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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

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International Ankle Consortium Recommendations

[SPECIAL SUPPLEMENT]

PUBLICATIONS COMMITTEE: PATRICK O. MCLEAN, PT, PhD • CHRISTIANELENE LUDWIG, PT, PhD • BRIAN CAULFIELD, PT, PhD • CLAUDIO COCCOPOLI, PT, PhD • FRANCIS COOPER, PT, PhD • DAVID COYLE, PT, PhD • RICHARD MATE, PT, PhD • MICHAEL METZ, PT, PhD • JEFFREY NEFF, PhD, ATC, CSCS • CLAUDIO HILLER, PT, PhD • THOMAS KARAKAZAKIS, PhD, ATC, PT, PhD • PATRICK MCKEEEN, PhD, ATC, CSCS • KATHRYN REHFUSGE, PT, PhD • PHILIP VAN DER WIEL, PT, PhD • BILAL YOUSSEFI, PT, PhD • ERIN WILKINSON, PhD, ATC, PT, PhD

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

J Orthop Sports Phys Ther 2013;43(8):585-591. doi:10.2519/jospt.2013.3033

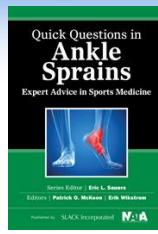
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Conclusions/Clinical Implications

- 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

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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

Journal of Athletic Training 2004;39(1):81-87
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www.journaledathletctraining.org

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

Russell Steves*; Jennifer M. Hootman

*Princeton University, Princeton, NJ; †Centers for Disease Control and Prevention, Atlanta, GA
Russell Steves, MS, PT, ATC, and Jennifer M. Hootman, PhD, ATC, contributed to conception and design, acquisition and analysis and interpretation of the data, and drafting, critical revision, and final approval of the article.
Address correspondence to Russell Steves, MS, ATC, Box 71, Princeton University, NJ 08544. Address e-mail to rsteves@princeton.edu.

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.

Data Sources: We searched the MEDLINE and CINAHL bibliographic databases using the terms evidence-based medicine and evidence-based practice. We also reviewed the Journal of Athletic Training and the American Journal of Physical Medicine & Rehabilitation by group (injury, musculoskeletal injuries, and musculoskeletal conditions). We also reviewed the Internet and training to stay current.

Data Synthesis: Evidence-based medical practice has 7 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 evidence-based resources such as the Clinical Evidence techniques. Athletic training outcomes research is lagging behind that of other health care professions.

Conclusion: Athlete care professionals need to embrace the critical-thinking skills to assess the medical literature and incorporate the findings into their clinical practice. This will encourage more clinically related research and enhance the skills 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:

<http://www.delata.org/>



Thank You!

