Improve Patient Care Through Clinical Research: Making EBP A Reality

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Goals

• Identify areas of EBP weakness in Athletic Training
• Demonstrate the value of clinical EBP and research
• Provide ideas to help Athletic Trainers (AT) become evidence-based clinicians and clinical researchers
Evidence Based Practice

“Without clinical expertise, practice risks becoming tyrannized by evidence, for even excellent external evidence may be inapplicable to or inappropriate for an individual patient. Without current best evidence, practice risks becoming rapidly out of data, to the detriment of patients.”

-David L. Sackett
EBP Review

**What is it?**

- A method of professional practice that is the result of the combination of three areas

**What is it not?**

- Redundant
- Laboratory or controlled environment based
- A ‘cookbook’ for treatment options
The 5 Step EBP Process

1. **ASK**: Formulate an answerable clinical question

2. **ACCESS**: Track down the best Evidence

3. **APPRAISE**: Appraise the evidence for its validity and usefulness

4. **APPLY**: Integrate the results with your clinical expertise and your patient values/local conditions

5. **ASSESS**: Evaluate the effectiveness of the process
Why do healthcare professionals struggle to incorporate EBP?\textsuperscript{2,3,4}

- A problem for all healthcare professionals despite their belief that it is a good idea
- Of ATs –
  - Over 97% believe EBP is \textit{important} to the profession
  - 92% believe that EBP improves the \textit{quality of patient care}
  - Less than 20% of clinical AT read \textit{professional literature} on a \textit{regular basis}
  - 84% believe that they \textit{need to increase} the use of evidence in their clinical practice
What seems to be the problem?²,³,⁴

- Lack of time
- Lack of confidence in implementing EBP
- Setting/environmental limitations
- Inability to interpret/appraise the literature
- Poor accessibility to literature
- Lack of support from coworkers or administration
- Inability to create answerable clinical questions
- Personal interest in EBP
My Perceived EBP Barriers

• Young professional
• New work environment
• Lack of confidence in implementing EBP
• Never attempt to form answerable clinical questions
Benefits from EBP Implementation$^{1,2,3}$

- Improves patient care and compliance
- Dissemination of knowledge
- Promotes professionalism among other healthcare providers
- Cost-effective healthcare
- Support for athletic training state licensure
- Third party reimbursement possibilities
- Continuing education for students, clinicians, researchers, and educators alike
Why I Decided to Change

• Improve my patient care
• Improve my patients’ experiences as student-athletes
• Break out of my young professional mindset
• Provide a learning platform for ATP students
Making EBP a Clinical Reality

How I overcame the barriers of EBP and helped my patients and clinical practice
Formulating my Clinical Question

• Injury reduction of my patient population

• High prevalence in injuries to the lower extremity

• Decided to focus on the ankle joint for various reasons:
  ○ Common injury to the team according to past data
  ○ Start of the kinetic chain
  ○ Personal interest

• How could improving ankle function help to reduce injuries to the lower extremity in female collegiate soccer players?
Searching for Evidence

• Accessed a variety of sources
  • Google scholar
  • PubMed
  • Peer-reviewed journal articles

• Searched for prevalence of ankle injuries in soccer players
• Searched for ankle injury prevention and rehabilitation tools
• Search for objective ways to measure
Prevalence of Ankle Injuries in Soccer Players

• Extremely common\textsuperscript{5-9}
  • 15-30\% of all injuries sustained in sports
  • Soccer has one of the highest incidence rates of 6.52 per 1000 person-hours

• Highly susceptible to re-injury\textsuperscript{10-13}
  • 80\% of patients who experience an ankle injury will sustain another one on the same side

• Variety of factors\textsuperscript{5,7,8,10,11,12,13,14,15,17}
  • Intrinsic: kinematics, range of motion (ROM), functional instability, leg dominance, postural control
  • Extrinsic: direct contact, artificial turf, shoe type, inadequate warm-up
  • Soccer specific: muscular imbalances, ROM, and neuromuscular imbalances due to leg-dominance
Ankle Injury Prevention and Treatment\textsuperscript{15,16,20,21,22,25}

Prevention Tools

- Very few recommendations due to a lack of evidence/research:
  - Exercise therapy
  - Taping or bracing
  - Preventative footwear

Rehabilitation Tools

- Numerous studies with strong evidence supported recommendations:
  - Exercise therapy
  - Joint mobilizations
  - Functional bracing
Objective Ways to Measure Function $^{10,11,12,18,27}$

- Star-Excursion Balance Test (SEBT)
- Y-Balance Test
- ROM
- Landing biomechanics
- Instrumented arthrometer
- Single-leg hop-stabilization task
- Radiographs
...Now What?

- Asked my clinical question
- Accessed information related to my clinical question
- Appraised the data I found
- How do I start to apply it?
Collaboration

• Sound design and methodology
• Excited to assist
• Research process through the institution
Improving Patient Care

To: Anna Kubiczki
From: NAU IRB Office
Date: August 31, 2016

Project: Measuring the Impact of Corrective Exercises on Ankle Function in Collegiate Female Soccer Players
Project Number: 938823-1
Submission: New Project
Review Level: Administrative Review
Action: RESEARCH - NOT HSR
Project Status: Research - Not HSR

The project listed above does not require oversight by the Northern Arizona University Institutional Review Board because the project does not meet the definition of 'research' and/or 'human subject'.

- **Not Research as defined by 45 CFR 46.102(d):** As presented, the activities described above do not meet the definition of research as cited in the regulations issued by the U.S. Department of Health and Human Services which state that "research means a systematic investigation, including research development, testing and evaluation, designed to contribute to generalizable knowledge".

- **Not Human Subjects Research as defined by 45 CFR 46.102(f):** As presented, the activities described above do not meet the definition of research involving human subjects as cited in the regulations issued by the U.S. Department of Health and Human Services which state that "human subject means a living individual about whom an investigator (whether professional or student) conducting research obtains data through intervention or interaction with the individual, or identifiable private information".
Disseminate to the Profession

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<th>Anna Kubiczki, MS</th>
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<td>Exempt Approval 45 CFR 46.101(4): Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.</td>
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This submission meets the criteria for exemption under 45 CFR 46.101(b). This project has been reviewed and approved by an IRB Chair or designee.

- Northern Arizona University maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00000357).
- All research procedures should be conducted in full accordance with all applicable sections of the guidance.
- Exempt projects do not have a continuing review component.
Hypothesis

- The implementation of corrective exercises specific to the ankle joint will improve ankle ROM and scores on the SEBT and thereby reduce the incidence of injury to the lower extremity in female collegiate soccer players
Justification

• Decided on corrective exercises because it was supported by evidence as both a preventative and rehabilitative technique
• Created 2 exercises designed to overcome deficits in ankle ROM, muscular strength, and dynamic neuromuscular control
• Progress was measured objectively with the SEBT and ROM due to the ease, speed, and cost of performing these tests
Corrective Exercises

- **Exercise 1: Heel-to-Toe Walks**
  - Performed 10 times/side

- **Exercise 2: 4-Touch Diamond**
  - Performed 4 times/side
Objective Measurements

Ankle ROM

Standard goniometric measurements
- Short-seated active plantarflexion and dorsiflexion

SEBT

Leg length-ASIS to ipsilateral medial malleolus
Directional diagram create with 1.5” athletic tape
- Anterior, posteromedial, and posterolateral\textsuperscript{23,24}
- Posteromedial and posterolateral were angled 135° off of the anterior

ALL MEASUREMENTS AND TESTING TOOK BETWEEN 4-7 MINUTE TO PERFORM
**Measurements Obtained**

<table>
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<th>Session</th>
<th>Baseline Data*</th>
<th>Leg Length</th>
<th>Ankle ROM</th>
<th>SEBT</th>
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<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
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*Baseline data obtained from Electronic Medical Records including height, weight, and age*
Ankle ROM

Active Range of Motion (degrees)

Right

PF

DF

Left

PF

DF

1 2 3
No difference in anterior reach
Posteromedial and posterolateral
Session 1 was significantly less than session 2 and session 3 for both limbs
Session 1 was significantly lower than session 2 and session 3 for both limbs.
Assessing the Results

• The 2 corrective exercises improved ankle ROM
  • Supports other findings that corrective exercises can restore normal ankle ROM

• The 2 corrective exercises improved the scores of the SEBT
  • Only direction of no improvement was the anterior direction
  • Improvement in the composite score demonstrates that the corrective exercises helped to reduce the risk of lower-extremity injury

• 50% of the participants experienced an injury to the lower-extremity
  • There are not enough data to support that the addition of corrective exercises reduced the incident of lower-extremity injury
My EBP Challenges

• Patient compliance
• The data collection process
• Re-learning about statistics
• Emotional reaction to injuries
Making EBP YOUR Clinical Reality

Helpful hints and tricks to find your way through the maze of EBP
The 5 Step EBP Process

1. **ASK**: Formulate an answerable clinical question

2. **ACCESS**: Track down the best Evidence

3. **APPRAISE**: Appraise the evidence for its validity and usefulness

4. **APPLY**: Integrate the results with your clinical expertise and your patient values/local conditions

5. **ASSESS**: Evaluate the effectiveness of the process
What do I need to **ASK**?

**• Who?**
- Who would benefit the most from my intervention?
- Who can help me accomplish my intervention?
- Who do I need permission from to perform my clinical research?

**• What?**
- What is a problem/area of concern in my patient population?
- What is my intervention?
- What do I need to perform my intervention?
What do I need to \textbf{ASK}? 

- Why?
  - Why do I believe an intervention is necessary?
  - Why do I believe my intervention will work?

- How?
  - How long do I want to perform my intervention?
  - How do I make my intervention patient-centered?
  - How can I determine if my intervention is working?
How can I ACCESS literature?

• Online search engines
  • MEDLINE
  • PubMed
• Professional literature or peer-reviewed journal articles
• Systematic reviews and meta-analyses
• NATA Position Statements
• Websites
• Textbooks
• Athletic Training Educators/Faculty
How do I **APPRAISE** the literature I find?

- Is the source reliable and valid?
  - Clinical prediction rules
  - Statistical analysis
- Does the source provide information to support or disprove my intervention?
- Do I need to gather more information about the source before deeming is valuable and useful information?
- Does the source help me implement my intervention?
- Does the source support or disprove my measurement tools?
- Do I need to ask for help?
How do I **APPLY** my intervention?

- Always should be patient-centered
- Several options:
  - Apply to a specific population (one team, males, females, etc...)
  - Apply to a specific season (competitive, off-season, pre-season, etc...)
  - Apply to a specific type of injury (AC joint sprain, ACL sprain, quadricpes strain, etc...)
How do I **APPLY** my intervention?

• Have both subjective and objective ways to measure how the intervention is working
  • Find tools that are **quick, easy, and inexpensive!**
  • Can measure at Pre-participation exams, end-of-season exams, following an injury, etc...

• All of your patients *do not* have to participate to collect meaningful data
  • Do not be discouraged by non-compliance or drop-outs
  • Allow the patients to provide feedback as to why they decided to not participate
Examples of Measurement Tools

**Subjective**\(^{26}\)
- Visual analog scale
- Numeric rating scale
- McGill Pain Questionnaire
- Short-form McGill Questionnaire
- Short Form-36 Bodily Pain Scale
- Measurement of Intermittent and Constant Osteoarthritis Pain
- [http://dx.doi.org/10.1002/acr.20543](http://dx.doi.org/10.1002/acr.20543)

**Objective**\(^{27,28}\)
- Square-hop test (Lower extremity injury)
- Drop vertical jump task (ACL sprain)
- Hamstring: Quadriceps strength ratio (Hamstring strains)
- Hip adduction: Hip Abduction strength ratio (Groin strains)
- Closed Kinetic Chain Upper Extremity Stability Test (General Shoulder)
- [https://doi.org/10.1007/BF03262295](https://doi.org/10.1007/BF03262295)
How do I **ASSESS** the results?

- Compare pre-intervention measurements to post-intervention
  - Did the patient(s) improve after receiving the intervention?
- Compare intervention data to non-intervention data
  - How do the patients who received the intervention compare to those who did not?
- Perform statistical analysis of the results
  - **DO NOT BE AFRAID TO ASK FOR HELP HERE!**
  - Helps to determine if your intervention improved patient care
- Clinical significance is also important!
  - Small sample sizes can be statistically insignificant but not clinically insignificant!
Thank you!

Any questions?
References


7. McKeon PO, Hertel J. Systematic review of postural control and lateral ankle instability, part 1: can deficits be detected with instrumented testing?. *Journal of Athletic Training*. 2008;43(3)293-304


References


