Injury Prevention is Job 1: Screening Tools to Identify High Risk Individuals

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A Moment of Introspection...

• The struggle of an athletic trainer...

http://www.bluezoneblog.net/mental-strength-perception-vs-reality/
An Identity Crisis...

What Should Our Focus Be?
NATA to the Public...

• ATs are in demand for their knowledge and skills in prevention...
• ATs specialize in patient education to prevent injury and re-injury...
• ATs are trained to treat, prevent and address health issues...
• Athletic training encompasses the prevention... of emergent, acute or chronic injuries and medical conditions.
  – [https://www.nata.org/about/athletic-training](https://www.nata.org/about/athletic-training)

NATA to Us...¹


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• **Preventing**, recognizing, diagnosing, referring, treating, and rehabilitating injuries
• Establishing criteria for safe return to practice and play and implementing the return-to-play process
  – Goal: PREVENT injuries
• Establishing a safe practice and playing environment by monitoring environmental risk factors such as meteorological conditions
  – Goal: PREVENT injuries
It’s Not You, It’s Me?

• “We err on the side of prevention, and I think that’s important – it’s better to prevent than to have multiple injuries and treat them after the fact,” she said.

• Elaine Winslow-Redmond, MS, ATC, EMT, head athletic trainer and director of athletic training and wellness for the Radio City Rockettes

What Does Reality Often Look Like?

For many of us, the “rest” of our jobs are to fit in here as well.

- Injury/Illness Prevention
- Professional development
- EBP integration
- Administrative duties
The Prevention Discussion

**Dynamic Testing**
- Pre-season
- Injury risk identification
- Concurrent training and participation

**FMS**
- Off-season
- Foundational movement training
- Progressive training towards improved movement quality

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Preparation
Planning
Assessment
Training
Prevention: Prepare For It

- EAP
  - Site specific
  - Annual review/practice/update
  - Collaborate w/ EMS
- Policies and Procedures
  - Environmental
  - Communication
- Professional
  - Continuing Education
  - EBP
- Learn from the past and others
  - Adapt/change as needed

http://inhabitat.com/world%E2%80%99s-highest-tennis-court-was-a-green-roof-atop-the-burj-al-arab-in-dubai/

Prevention: Plan For It

- Staff availability
- Venue safety
- PPEs
- Communicate w/ coaches
- Collaborate w/ team physician(s)

Prevention on the mind...
1. Health hx
2. Screening tools
   a. Physiological
   b. Psychological
   c. Functional
Prevention: Assessment Provides Clarity

- General health issues
  - BP, weight, health/family hx
- Cardiac issues
  - Physician exam, health/family hx
- Mental health issues
  - Survey tools
- Functional issues
  - Use established methods
  - Identify potential areas of higher risk

Prevention: Train For It

- Train Yourself
  - Make time
  - Ask questions
  - Find answers
  - Get comfortable
- Train Your Athletes
  - Explain why
  - Show them how
  - Keep them interested
  - Make it matter
Prevention: Be Realistic

- If your field has a tree in the middle of it...and you just try to play around it...

1. If we do nothing, or very little, we can expect to prevent no, or very few, injuries.
2. The frustrating thing about prevention is that you have no concrete evidence that it is working (at least not at first).
3. Two approaches:
   a. Prevention strategies
   b. Crossed fingers

[Image]

http://www.blablablarchitecture.com/2011/02/000off_what_football-box/

Why Assessment?

1. You can’t fix what you don’t know is broken
2. Goal: less triage and more prevention
3. Tailored training will be more effective
4. Is it... cost-effective, time-efficient, useful?
5. Document and follow up
   - Demonstrate progress to improve compliance

Don’t throw spaghetti at the wall and see what sticks.

http://www.slideshare.net/ttorres33/the-dos-and-donts-of-hypothesis-testing
Repeat Offenders

- Ankle sprain
- Groin pull
- Hamstring strain
- Shin splints
- Knee injury: ACL tear
- Knee injury: Patellofemoral syndrome
- Tennis elbow (epicondylitis)

What Are We Trying to Prevent/Correct?

- Overuse/excessive exposure
  - Dose/response
- Non-contact
- Poor mechanics
  - Sport-specific skills
  - Strength and conditioning
- Poor wellness habits
  - Sleep
  - Stress
  - Nutrition
A Quick Note…

Note: strong reliability and validity scores have been published for all tools discussed

<table>
<thead>
<tr>
<th>Test</th>
<th>Reliability</th>
<th>Validity</th>
<th>Author</th>
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<tr>
<td>SEBT</td>
<td>Strong (&gt; .8)</td>
<td>Face</td>
<td>Hewett et al²</td>
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<tr>
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<td>CKCUEST</td>
<td>Strong (&gt; .9)</td>
<td>High (&gt; .8)</td>
<td>Lee et al⁶</td>
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</table>

The Star Excursion Balance Test (Modified)²

- Dynamic stability and neuromuscular control
  - ACL injury risk
- Measure reach distance (3 directions)
- Hands on hips
- Weight on stance leg (heel)
- Normalize for leg length if comparing to others
  - (Reach distance/LL)*100 = % of LL
Star Excursion Balance Test (Modified)\textsuperscript{2}

![Image of Star Excursion Balance Test]

Weight-Bearing Lunge Test\textsuperscript{3}

- Reduced dorsiflexion $\rightarrow$ increased LE injury (i.e. ankle sprain)
- WB (functional) assessment of ankle dorsiflexion
- Restriction due to muscle or joint capsule
- Relates to ANT SEBT
- Bowling, not golf

Weight-Bearing Lunge Test\(^3\)

Single Leg Squat\(^4\)

- Glute med fx
- Record video and use mirror
- Precursor to jump landing
- Identify kinetic chain deficiencies
  - Trunk/pelvis/thigh/foot position
  - “cork screw”
The Landing Error Scoring System (LESS) Test

- Identify high-risk landing mechanics
- Record video
- Stratify by visual assessment or checklist
- Identify poor mechanics
  - Be wary of setting threshold

The LESS Test

![Scoring sheet for the Landing Error Scoring System-Real Time (LESS-RT) assessment tool.](https://www.dovepress.com/)

![Peer reviewed fulltext article OAJM](http://natajournals.org/doi/pdf/10.4085/1062-6050-50.1.10)
Closed Kinetic Chain Upper Extremity Test (CKCUET)\textsuperscript{8}

- Readiness for RTP/UE stability
- Push-up position
- Hands 36” apart
- Hand-to-hand touch
- # of touches in 15”
  – +/- 30 in healthy subjects\textsuperscript{6,8}

**Closed Kinetic Chain Upper Extremity Test (CKCUET)\textsuperscript{7,8}**
Closed Kinetic Chain Upper Extremity Test (CKCUET)\textsuperscript{7,8}

1. Muscular balance
   - Overactive/short vs. inhibited/lengthened

2. Neuromuscular control

\textsuperscript{7,8} http://womensrunning.competitor.com/2014/12/training-tips/6-plyometric-jump-exercises-help-run-faster_33298
3. Strength deficits
4. Movement pathology

Fitness and Injury/Recovery

- Within and between bouts
- Baseline fitness preparation
  - Heart-rate reserve?
  - Aerobic/anaerobic capacity?
  - Functional strength?
- Athlete preparation can lead to injury...
  - ...or it can prevent injury
Implementation Strategies

• Identify → Needs analysis
• Plan → implementation and training
• Communicate → coaches/athletes/(parents)
• Consider → time, cost, personnel needs
• Start → small, somewhere, soon

Take-Home Points

• “...if there is a chance some of these injuries can be decreased, we should take it. The good news is that while preventing all injuries is not possible, steps can be taken to decrease certain ones.” (Tim Koba, MS, ATC)
• Remember that we tell the world our primary role is to prevent injury.
Citations


Thank you!

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