Prevention of Recurrent Injuries: Opportunity Knocks!

What Characterizes an Effective Prevention Program?

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Greetings from Calgary, Canada

IOC Research Centres

- 4 International Centres
  - Melbourne, Oslo, Cape Town, Calgary

PREVENTION

Prevention

- Primary
  - Prevent occurrence of injury / illness
  - Intervention to change risk factors
- Secondary
  - Early detection and intervention
  - Presence of injury / illness – athlete factors?
- Tertiary
  - Complete recovery; prevention of re-injury
  - Definition of recovery?

Steps in Prevention

Find the risk factors (cause)

Measure effectiveness of prevention

Introduce preventive measure

Extent of injury problem?

Prevention: Targeting Risk Factors

The questions:
1. Which factors are associated with an increased rate of injury (risk factors)?
2. Are these factors the “cause” of injury?
3. Are these factors modifiable?

Risk vs Cause

Injury Correlation (with a risk factor) vs Causation

- is there an undetermined variable that the risk factor and injury have in common? (a confounder)

Confounding

• e.g. is the risk factor of irregular menses a causal factor in running injuries?

Amenorrhea ——— Running Injuries

Running Milage (distance)

Risk vs Cause

Why is this important?

- regardless of causal relationship, the risk factor is usually a valid predictor of injury

- however, removing the risk factor may not necessarily prevent injury if a causal relationship does not exist

Recurrence
Recurrence: Terminology

- First Injury = “index” injury
- 2nd, 3rd, 4th, etc.... = “Subsequent” or “recurrent”

Consensus definition of recurrence

- The consensus statements for injury surveillance studies in football and rugby union both define a recurrent injury as:

  An injury of the same type and at the same site as an index injury and which occurs after a player’s return to full participation from the index injury.

This is a pragmatic definition employed for the purposes of injury surveillance studies. The definition does not, for example, take into account the medical condition of the index injury at the time the second injury is sustained – only whether the player had returned to play.

What is meant by a ‘Recurrence’?

Injury Classifications?

- Acute:
  - Macro - traumatic
  - Discrete event
  - Identifiable mechanism of injury
  - Inability to continue participation

- Overuse:
  - Repetitive microtrauma
  - Gradual onset
  - Vague mechanism of injury over multiple exposures
  - Able to continue (intermittent) participation

2nd Injury = Recurrence

- previous injury can increase the risk of sustaining a similar injury at the same site by an order of magnitude.

- it is important to understand the nature and clinical status of the index injury at the time of the subsequent injury.

Original Research

Subsequent Injury Definition, Classification, and Consequence

Gavin M. Hamilton, MD, Willem H. Mees-antice, MD, PA,**, Carolyn A. Enery, BS/PT, PA,** and Ian Sherer, MD, PA)**

(Clin J Sport Med 2011;21:508-514)

Injury Classification

Index Injury

Subsequent Injury

New Injury

Recurrent Injury
Who Cares?

• Classification of 2nd injuries are important
• There may be a causality and a non-causality effect of past injury

Effective?

• Effectiveness vs Efficacy
  – Efficacy = Ideal conditions (controlled)
  – Effectiveness = Real-world circumstances
• Targets largest burden of injury
  – Frequent
  – Severe
  – Sport Specific

Effective Prevention of Recurrent Injuries

• Treat the cause!

A Dynamic, Recursive Model

Detection of Risk

• Pre participation evaluation
• Periodic health examination
  – Preseason
  – Exit medical
• Continuous evaluation
  – Medical monitoring and prevention
**Effective Injury Prevention**

- **Balance training reduces acute injuries:**

- **Comprehensive Warm-up protocols reduce acute injuries:**

- **Eccentric training reduces acute injuries:**

- **Rule & Equipment changes**

- **Education of people delivering the program is essential for prevention program effectiveness:**

**Effective Injury Prevention**

- **Compliance: a dose-response relationship**

- **Effectiveness across multiple demographics & sports**

**Effective Injury Prevention**

- **Monitoring Cycle**
  - Entry
  - Monitor
  - Exit
  - Monitor
  - Monitor
  - Monitor

**Effective Injury Prevention**

- **EVIDENCE?**
Prevention Programs

• More than applying research
• Multidisciplinary Team
  – Training
  – Competition
• Target “subclinical” function

Take Home Point

Subsequent Injury:
• The first question the team physician should ask is:

  WHY?

(Injuries are not accidents)

What Characterizes an Effective Prevention Program?

Thank You

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