Making Youth Sports Safe and Enjoyable

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Overuse Injuries: Preventing and Recognizing Them
Introduction

Overuse injuries are a growing concern for all involved in adolescent and young adults sports.

Some estimate that up to 50% of all injuries in growing athletes are overuse.


Important – These can be eliminated Hopefully …

Preventing rather than treating
Youth Sports Injuries

- Over 7.3 million high school students involved in sports programs
  - Up from 4 million in 1971-72

- Over four times that number involved in youth programs
  - 30-45 million in the 5-18 age group

- Sports Med 2003
Football historically has the highest injury rate
- 8-10 per 1000 exposures
- 30-35% of players sustain an injury

Soccer and basketball are the most injurious sports for girls
- 4-6 per 1000 exposures
- 20-25% of players sustain an injury
Injury Diagnosis

- Strain/Sprain: 41%
- Contusion: 16%
- Fracture: 19%
- Concussion: 10%
- Other: 14%

RIO Convenience Summary 2009-10
Most Common Injuries

Other – (in order)

- Knee other
- Shoulder other
- Hand/wrist fracture
- Shoulder strain/sprain
- Trunk strain/sprain
- Hand/wrist strain/sprain

Injury by joint or body part

- Ankle: 55%
- Head: 15%
- Hip: 15%
- Knee: 8%
- Other: 7%

[Diagram showing the distribution of injuries by joint or body part]
Types of Injuries

- 50% are strains or sprains
  - Most are minor
- Knees are the most commonly injured joint and the most common joint requiring surgery
- Re-injuries account for approximately 11-15% of injuries overall
Competition vs. Practice

- Competition is often what drives interest in sports
- Certainly wearing a uniform is exciting
- However, competition injury rates are 3-4x higher than those in practice
Over 9 million preventable sports injuries are estimated to occur per year.

Care and management of those injuries is estimated to be $1.8 billion.

– Does not include the long term effects

○ Hawkins and Methany – MSSE 2001
Nothing better than a couple hundred elementary aged kids on a soccer or football field on a fall Saturday morning.

Nothing worse than the same kids playing their 6th game on Sunday night at 6pm.
BUT ....

Perfect Storm

These long duration time commitments

Multiple games versus practices

Overuse Injury Factories
Sports do have an inherent risk of injury.

Injuries do occur and are ‘touchable’.

Need to know the difference between acute and chronic injuries.
Overuse Injuries

- Rotator cuff tendinitis
- Swimmer’s shoulder
- Little League Elbow
- Patellofemoral malalignment
- Shin Splints, Stress fracture
- Osgood-Schlatter’s disease
- Spondylolysis
What is an Overuse Injury?

Excessive use of muscle group(s) that are not conditioned for the intended action and pain and dysfunction result leading to poor performance

Too much!
Who suffers an Overuse Injury?

- Adults and weekend warriors
- Athletes who specialize in a particular sport or activity
- Adolescents
  - The existence of growth plates adds to the list of possible overuse injuries
Susceptibility

Physis and apophysis
– Growth plates are 2-5 times weaker than surrounding bone

Traction injuries
– Osgood-Schlatter’s
– Sever’s disease
– Little Leaguer’s shoulder
Age Differential

Younger athletes are ‘top heavy’

✓ Higher incidence of upper extremity injuries

✓ As athletes age and mature (become heavier) they are more apt to injury their knees, ankles, and legs in general
Buckle fractures

Avulsion fractures

Not seen in adults

But it is a difference in type of injury not in incidence of injury
Overuse Injuries

Paper clip analogy

Use it a few times and it takes on a different form

– Less able to hold a few sheets of paper firmly

Use it some more and it is non-useable

– Play with it during a presentation
Overuse Injury Etiology

Obviously no one cause

Risky behaviors include:
- Repetitive motion without rest or cross-training
- Year round single sports play
- Notion that ‘playing through the pain’ is appropriate or necessary
Concerning

As many as 50% of sports injuries in adolescent athletes are overuse injuries.

Estimate in 2003 was that there was over 3.5 million overuse injuries.
Mis-matched Participation

Energy and force of participation increases as coordination often becomes an issue.

Severity of injuries increase.

Kids need to be kids.

Lessen exposure.
Issues

Females
- Vertical growth peaks at 12
- Muscle growth peaks at 14-15

Males
- Vertical growth peaks at 13-14
- Muscle growth peaks at 13-14

Motor coordination comes with time

Inflexibility is a consequence of rapid growth
Injury Patterns

Specialization used to begin in high school or college

Earlier specialization is often when physical ability isn’t yet present
Specialization

Improves performance
- Therefore specialization works in the eyes of the coach/parent/spectator

Works best in untrained, out of shape athletes
- Improvements occur as quickly as 6 weeks, again worthwhile in eyes of others
Specialization

Therefore if 6 weeks shows an improvement, 12 weeks will show more, and 48 weeks will …..
Problem is ...

- Specialization works

- Starting from an untrained, out-of-shape condition – a six week training program will improve performance and ‘ability’ dramatically

- A learned behavior
But specialization is not a predictable or guaranteed path

Michael Jordan
Major League pitchers
Sports Specialization Training

Discouraged before adolescence

Adverse Effects

- overuse injuries
- over-training syndrome (physiologic burn out)
- delayed menarche, amenorrhea,
- disordered eating
- depression, anxiety, conversion reactions

Intensive Training and Sports Specialization in Young Athletes
Committee on Sports Medicine and Fitness
Pediatrics 2000;106;154-157
Signs and Symptoms

First signs of overuse problems that coaches/adults should be aware of:

– Poor performance
– Fatigue
– Vague pain
– Lack of enthusiasm
Overuse Injuries progress from:

- Pain after activity
- Pain with activity which affects performance
- Pain at rest
Overuse Injuries

As a physician, therapist, trainer, coach or a parent you can ‘feel’ the overuse injury before you ‘see’ it
Inability to find worst spot

“It’s usually here but yesterday it was here. And mom, do you remember when it ran down the back of my leg?”

“I don’t really feel like going to practice today”, “Is this game a friendly or league game?”
Concerning Signs and Symptoms

- Post-exercise pain that remains for > 24 hours
- Localizable pain
- Pain with effusion
- Repeated use of NSAID’s
Overuse Prevention

Provide rest during year
- Greater than 8 months of participation in a single sport will increase injury rates
  - 3600% in adolescent pitchers – Lyman et al - AJSM 2006
  - 42% in adolescent athletes overall – Cuff et al – CI Ped 2010

Assess tightness and address as needed
- Value of the pre-participation exam can not be overstated

Don’t encourage play-through-the-pain motto
No Pain – No Gain
Sports Preparation

“Don’t throw your athlete in the pool if he/she can’t swim”

Off-season training

Gradual increase in activity in season
- 1 to 2 days off per week
- Increase training by 10% each week
- 2 to 3 months away from a specific sport during the year
- Encourage participation on only 1 team during a season

— Brenner and Council on Sports Medicine
Preventing Injury

- Participate in athletics at a level that is commensurate with their skill and ability
- Adequate supervision
- Proper protective equipment
- Training programs
- Research
  - Equipment
  - Injury mechanisms

✓ Stephens and Beutler- Am Fam Phys 2007
Seatbelts

Car seats

Health screening steps
  – Caner
  – Hypertension
Sports Injury Prevention

Equipment
- Helmets
- Facemasks
- Mouth guards
Treatment for Overuse

- A long period of relative rest
  - Weeks to months
    - Collagen healing takes 42 days
    - Injury takes 5 weeks to heal and then ..
  - Rehabilitation and adjustments of modifiable factors
    - Training programs are based on a core 6 week program

Three months Total
Treatment for Overuse

Rest need to be active

- Pool activities
- Stationary biking

- Basketball if it is a pitching injury
- CORE exercises if it is a knee injury
Modifiable risk factors include

- improper technique
- training errors
- poorly fitting equipment including shoes
- muscle weakness and imbalance
Treatment for Overuse

Treatment and rehabilitation and return to play decisions should be guided by a team including the:

- Physical therapist or Athletic Trainer
- Sports medicine physician or PCP
- Parents
- Coach
- Athlete
Team Approach

- Smoother return to previous level
- Better performance often because of better ‘balance’
- Re-injury rates can be as high as 15%
Treating Overuse Injuries

- 1 to 2 days off per week
- Increase training by 10% each week
- 2 to 3 months away from a specific sport during the year.
- Encourage participation on only 1 team during a season.

- Brenner and Council on Sports Medicine
Thank you
