Tackling sport injuries in schools

Jason Gray
MSc, BSc(Hons), RMN, RGN, RN(Child), NMP, FFEN
Paediatric Emergency Nurse Consultant
Outline

- Introduction
- Musculoskeletal system
- Risk factors
- Injury severity
- Common injuries
- Initial treatment
Introduction

- Competitive sport established feature of childhood.
- 40% of all sport injuries present to A & E are 5-14 years old.
- 79% of children between 5 – 15 years participate in organised sport.
- 11% of these involved in intensive training.
- Approximately 3 – 11% of school children are injured each year during sport.
• Injuries involving contact and jumping have highest injury levels.

• Girls: soccer, basketball, field hockey, softball and volleyball

• Boys: Rugby (45%), Football (12.8%).

• Incidence of injuries increase with age.

• Boys : Girls 2: 1, Peak 14 years for boys, 12 years for girls.

• 70 – 80% are minor, 44% occur in legs, 35% occur in arms, others head

• Elite athletes lower risk of injury
Why Children?

- Less co-ordinated.
- Slower reaction times.
- Less accurate in performance of tasks.
- Unable to accurately assess risk.
- Still developing motor/cognitive skills
- Thermoregulation, nutrition, hydration.
Musculoskeletal system

• Tendons and ligaments relatively stronger than epiphyseal plate.
• Growth plate damage more common than ligamentous injury.
• Adolescents are vulnerable because of imbalance in strength and flexibility and changes to biomedical properties of bone.
• High intensity training inhibits bone growth.
• Limb length discrepancy, angular deformity and altered joint mechanics
Risk Factors

- Decrease in flexibility
- Inappropriate environment
- Incorrect footwear
- Players should ideally be matched
- Balanced nutrition
- High-resistance training
How do children get injured?

- **< 10 years**: usually occurs during first few weeks of individual activities e.g. bike riding, roller skating.
- **> 10 years**: tend to occur during organised team events e.g. rugby, football.
- With increasing age and weight:
  - Force and severity of collision increase
How are injuries classified

• **Direct**
  – Athlete directly hit by object or person

• **Indirect**
  – Acute
    • When muscle or bone overloaded by force.
    • Results in torn muscle or twisted ankle.
  – Chronic (repetitive overloading)
    • Body part subjected to repetitive force.
    • Common in growing children “apophysis”
Common sites of injuries
Is it Broken?

- Fracture or Soft Tissue Injury?
  - **Sprain:** Ligamentous injury
  - More frequent injury in children
  - **Fracture:** more common in collision and contact sports
  - Demeanour of injured child suggest fracture “guarding”
Fractures

• Mechanism of Injury
  – Violent: Swelling, bruising, disability
  – Diagnosis of exclusion
    • Hx of injury
    • Deformity, crepitus, abnormal / restricted movements, disability
  – Bony tenderness: X-ray indicated
  – Guidance: Ottawa ankle rules (over 8 years)
Soft Tissue Injuries

• **Grade I (Mild)**
  – Pain when part used/stretched
  – Some visible swelling/bruising
  – Not disabled, uncomplicated recovery

• **Grade II (Moderate)**
  – More severe mechanism
  – Abnormal laxity or painful loss of function

• **Grade III (Severe)**
  – Complete loss of function
  – Does not hurt to stress torn ligament
Type I Sprain
- ligaments stretched

Type II Sprain
- ligaments torn slightly

Type III Sprain
- ligaments torn completely
The Ottawa Ankle Rules

An ankle x-ray series is only required if:
- There is pain in **malleolar** zone and any of these findings:
  - Bone tenderness at A
  - Bone tenderness at B
  - Inability to bear weight both immediately and in the emergency department

A foot x-ray series is only required if:
- There is pain in **midfoot** zone and any of these findings:
  - Bone tenderness at C
  - Bone tenderness at D
  - Inability to bear weight both immediately and in the emergency department
Examination

LOOK!

MOVE

Feel!
Examination

• **Look for:**
  – Deformity (bending, rotation)
  – Swelling (compare with other limb)
  – Bruising
  – Abnormal posture or alignment

• **Feel for:**
  – Tenderness- try to localise
  – Deformity (compare with opposite side)
  – Distal pulse/capillary refill/sensation

• **Move:**
  – Think about your joint movements !
Common Injuries

• Elbow Dislocation
• Patella Dislocation
• Clavicle
• Humerus
• Forearm & Wrist
• Lower Limb
Common Injuries

• **Elbow Dislocation**
  – Common in gymnastics & football
  – Usually affects those over **11 years**
  – Prompt reduction is required at all ages
  – O/E deformity is obvious
    • Substantial swelling & severe pain
  – Assess for neurovascular deficit
Common Injuries

- **Patella Dislocation**
  - Dislocation occurs in 1 in 100 children
  - Aged between 9 - 15 years
  - Usually twisting injury

- **Management**
  - **P** = Protection
  - **R** = Rest
  - **I** = Ice
  - **C** = Compression
  - **E** = Elevation
Common Injuries

- **Clavicle Fracture**
  - Common in contact sports involving FOOSH or direct onto shoulder
  - Younger the child = less the deformity
  - If abduct beyond 90 degree fracture unlikely
  - Reduction generally not required
  - Sling to immobilise for 3 weeks
Common Injuries

- **Humeral Fracture**
  - Metaphyseal injury in older children
  - MOI usually indirect
  - Supracondylar: FOOSH
  - Damage to major vessels or nerves
Common Injuries

• Forearm & Wrist Fractures
  – Indirect trauma from FOOSH
  – Most distal 3rd of forearm

1. Torus Fracture: cortex buckles with no apparent break
2. Greenstick Fracture: one cortical surface breaks

3. Growth Plate injuries: weak part of bone
Common Injuries

• **Ankle Fracture**
  – Less common in children
  – Usually minimally displaced in children
  – Avulsion fracture more common than ligament tear or sprain
  – X-ray?
    • Child is/was unable to weight bear 2 steps on the effected side both at time of injury and now: “coaxing”
    • There is tenderness at the tip of the posterior half of the lateral or medial malleolus
Other injuries

- **Spinal Injury**
  - Cervical spine fractures less common in children
  - High risk: American football, diving, skiing, gymnastics, trampolining

- **Head Injury**
  - Most are not serious
    - Sleepy and unable to wake
    - 3 or more vomiting episodes
    - Persistent headache post analgesia
    - Convulsion, weakness in arms/legs, loss of balance
Apophysis (inflammation of growth area)

- **Osgood-Schlatter’s Disease**
  - Traction apophysitis of tibial tubercle.
  - Commonest cause of knee pain
  - Repetitive excessive force on weak growing area at top of shin bone – pain and swelling

- **Severs’ Disease**
  - Traction apophysitis of calcaneum (heal bone).
  - Common cause of heel pain in young athletes.
Osgood Schlatter’s Disease
Severs’ Disease

Achilles tendon  
Fibula  
Tibia  
Calcaneus  
Pain

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Conclusion

• Most school sport injuries are minor, causing limited physical and social disruption.

• Often limited to mild contusions, sprains and strains

• School and family disruption common.