FOOTBALL RELATED INJURIES

Background
1. General Information:
   - First collegiate game was played in 1869
   - Considered a high-velocity collision sport
   - Participants are both male and female (at high school level)
     - >1.1 million high school athletes
     - >75,000 collegiate athletes
   - The most popular sport in America based on participation numbers in high school

Pathophysiology
1. Mechanisms of injury
   - Acute and overuse
     - Majority are acute
2. Incidence, Prevalence
   - Most common injuries: knee, ankle, head injuries
3. Risk Factors
   - Football involves running, jumping, cutting, throwing, tackling and explosive movements
   - Acute injuries happen by one of 3 mechanisms:
     - Player contact, other contact, no contact
   - Factors affecting injuries
     - Athlete Specific:
       - Strength (both muscular and ligamentous)
       - Flexibility
       - Fitness/conditioning - can help prevent injuries during season
     - General:
       - Playing surface
       - Grass versus artificial turf
         - Injuries on grass are more common than artificial turf
       - Footwear
         - Length of cleats affects torsion forces on ankle leading to knee and ankle injuries
   - Protective Equipment:
     - Helmet, mouthguard, shoulder pads, hip pads, knee pads
     - Protective equipment does reduce injuries
     - Mouthguards help prevent orofacial injuries.
     - Insufficient evidence supports concussion reduction secondary to mouthguard use
     - Knee braces, no consensus recommendation exists from current evidence
4. Morbidity / Mortality
   - 7 fatalities directly related to high school football in 2008
• 13 indirectly related
  o Rate of direct fatality 0.39 per 100,000 participants

Specific Injuries
1. Lower Extremity
   o Accounts for > 50% of all football injuries
     ▪ Knee injuries
       • Internal Derangement
         o Most common injury in games (18%) and practice (12%)\textsuperscript{9}
         o ACL, PCL, menisci
         o Injury rate of 6.17 per 1000 athletes\textsuperscript{9}
       • Mechanism
         o Contact: blocking, being blocked, being tackled
         o Non-contact: Rotation about a planted foot

2. Patella/Patella Tendon Injury
   o Accounts for 1% of high school football injuries, and 9% of all knee injuries.\textsuperscript{10}
   o Usually subluxation injury.\textsuperscript{10}

3. Foot and Ankle Injuries
   o Ankle sprain
     ▪ Rates of injury
     ▪ Second most common football injury\textsuperscript{11}
     ▪ Injury rate of 5.39 per 1000 athletes\textsuperscript{9}
   o Ankle fracture
   o Patellar tendon rupture
   o Turf toe

4. Shin Splints-medial tibial stress syndrome

5. Head, Eyes, Ears, Nose, Throat (HEENT) Injuries
   o Concussion
     ▪ Rate
     ▪ 0.72 per 100,000 athletes\textsuperscript{9}
     ▪ Third most common game injury

6. Cervical spine injuries
   o Mechanism:
     ▪ Axial loading with neck in flexion as in “spear tackling”
     ▪ Usually from tucking chin at impact
     ▪ Encourage coaches to teach “heads up” tackling
   o Management of Head and Neck Injuries by the Sideline Physician:
     http://www.aafp.org/afp/2006/1015/p1357.html\textsuperscript{15}

7. Eye Trauma

8. Dental Trauma
   o Mouthguards protect against orofacial injuries\textsuperscript{7}

9. Upper Extremity
   o Shoulder injuries
     ▪ Rates of Injury
     ▪ 5th-8th most common game injuries
     ▪ Account for 10% of football injuries\textsuperscript{16}
       o Mechanism
       ▪ Thrusting shoulder into opponent while tackling
10. Skin Injuries
   o Abrasions/lacerations
     ▪ NCAA Sports Medicine Handbook: Blood-Borne Pathogens and Intercollegiate Athletics:
   o MRSA in athletes
     ▪ High transmission rates between players in practice and games\textsuperscript{17}
   o Athlete's foot
11. Medical Considerations
   o Exertional heat illness
     ▪ Most common during preseason, accounting for 6\% of preseason injuries\textsuperscript{9}
   o Asthma
     ▪ Exercise induced
   o Cardiac disorders in athletes
     ▪ Inter-Association Task Force Recommendations on Emergency Preparedness and Management of Sudden Cardiac Arrest in High School and Collegiate Athletic Programs: A Consensus Statement\textsuperscript{18}:
       http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1896083/
   o Sickle cell trait
     ▪ NCAA recommends screening of all student athletes before participation
   o Mononucleosis
   o Pre-Participation Evaluation (PPE)
     ▪ Recommendations for Preparticipation screen for cardiovascular abnormalities\textsuperscript{19}

\textbf{Patient Education}

1. NCAA Sports Medicine Handbook
   o Published annually:
2. National Federation of State High School Associations
   o http://www.nfhs.org/sportsmed.aspx
3. The Sports Medicine Patient Advisor by Pierre Rouzier

Disclaimer: “The views expressed in this article are those of the author and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, nor the U.S. Government.”

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