

Evaluation of the Injured Athlete

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A PA's Guide to the Musculoskeletal Galaxy
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Disclosures

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Goals

- Recognize common and life-threatening injuries and medical conditions in athletes
- Be able to discuss on-field evaluation and management of injured athletes
- Understand the role of the team provider in the overall care of team members



Athletic Team Coverage

- Preparticipation physicals
- Game/practice coverage
- Emergency evaluation and management
- Office consultations
- Referrals



Heart Abnormalities

- Sudden Cardiac Death
- Hypertrophic Cardiomyopathy
- Commotio Cordis
- Coronary Artery abnormalities



Sudden Cardiac Death

- Related to underlying cardiac condition
- Several causes
- Screening during preparticipation physical including EKG may identify risk
- Murmurs warrant further cardiac evaluation and usually referral

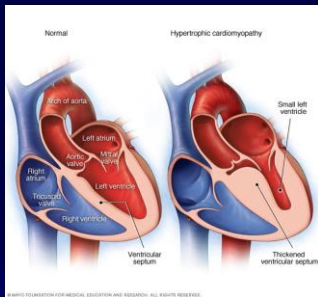


Hypertrophic Cardiomyopathy

- Hypertrophy of left ventricle below aortic root
- Autosomal dominant
- Can present as easy fatigue or dyspnea
- Asymptomatic
- Systolic murmur increases with valsalva maneuver and decreases standing → supine
- Second leading cause of sudden cardiac death
- Contraindication to sports participation



Hypertrophic Cardiomyopathy

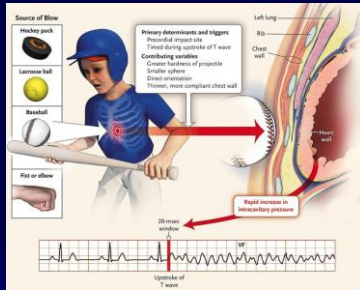


Commotio Cordis

- Precise cause and mechanism unknown
- Direct chest wall impact by object (ball, puck, kick)
- Timing of impact during heart cycle critical
- Ventricular fibrillation
- Third most common cause of sudden cardiac death in athletes
- 95% adolescent males
- Management is immediate CPR and defibrillation



Comotio Cordis

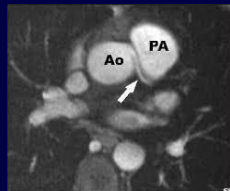


Defibrillators



Coronary Artery Abnormalities

- Second most common cause of sudden cardiac death in athletes
- Most frequent abnormality is anomalous origin of left main coronary artery
- Allows compression between great vessels
- Restricts circulation
- Ischemia
- CT or MR angiography



Concussion

- Definitions
- Symptoms
- Sideline Evaluation
- Management
- Imaging
- Complications
- Second Impact Syndrome



Concussion

- Traumatic brain injury due to external force directly transmitted to the head
- Impairment of normal brain function
- Usually involve no structural injury
- Symptoms are highly variable and may be very subtle
- 300K sports-related concussions in US annually
- 90% do not involve LOC



Concussion

- Sideline Evaluation
 - ❖ Must exclude cervical spine injury
 - ❖ Cannot do so if athlete is unconscious
 - ❖ Immobilize with board and c-collar



Concussion

- Evaluation should include:
 - ❖ Mental status exam
 - ❖ Glasgow Coma Scale
 - ❖ Balance/NM testing
 - ❖ Sport Concussion
 - ❖ Assessment Tool (SCAT3)
 - ❖ CT Scan



Concussion

- Any athlete diagnosed with a concussion should be closely monitored
- CANNOT return to play on same day



Concussion

- Cornerstone of management is physical and cognitive rest
- Neuropsychological testing useful adjunct
- 90% will recover within 10 days
- Graduated return to play protocol



Second Impact Syndrome

- May occur with second minor re-injury during the recovery period
- Brain is vulnerable
- Can lead to loss of autoregulation of blood supply and consequent herniation
- 50% mortality rate



Second Impact Syndrome

Kansas football player dies after collapsing at game

Chicago teen becomes seventh high school football player to die this year

High school football player dies after suffering head injuries during game

Another high school football player dies

High school football player Andre Smith dies in Illinois

NJ high school star quarterback dies after suffering injury during game

'Great kid, athlete' dies after high school football game



Female Athletic Triad

- Classic
 - ❖ Eating abnormalities
 - ❖ Amenorrhea
 - ❖ Osteoporosis
- Current definition
 - ❖ "Low energy availability"
 - ❖ Menstrual dysfunction
 - ❖ Altered BMD



Decreased Energy

- Anorexia and bulimia common eating disorders
- Fasting, purging, diet pills, laxatives, diuretics
- 7 million American women affected
- Highest mortality rate of any mental illness



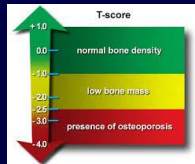
Menstrual Dysfunction

- Oligomenorrhea is extremely common in female athletes (prevalence 20-40%)
- Occurs when intake falls below 30 kcal/kg of lean body mass/day
- Most common in distance runners



Bone Mineral Density

- Female distance runners have lowest BMD vs. all other sports
- Low BMD due to hypo-estrogenic state which causes increased bone resorption
- Lack of suppressive effect of estrogen on osteoclasts
- Stress fractures common
- DEXA is study of choice



Female Athletic Triad

- Treatment requires a multidisciplinary approach
 - ❖ Medical evaluation
 - ❖ Nutritional counseling
 - ❖ Psychotherapy and group therapy
- Early recognition, intervention, and treatment result in better outcomes



Heat Illness

- Common during preseason conditioning, especially in warm, humid climates
- Heat Exhaustion
 - ❖ Profuse sweating
 - ❖ Dizziness
 - ❖ Tachycardia with weak pulse
 - ❖ Cool, clammy skin
 - ❖ Muscle cramping



Heat Stroke

- Symptoms
 - ❖ Tachycardia
 - ❖ Tachypnea
 - ❖ Hypotension
 - ❖ Temp > 104°F
 - ❖ Altered MS
- Treatment
 - ❖ Rapid cooling
 - ❖ Rehydration
- Second leading cause of death in football



Infectious Diseases

- Skin Infections
 - ❖ MRSA
 - ❖ Herpes Simplex
- HIV
- Mononucleosis



Skin Infections

- Most common infection in athletes
- More than 50% of ID outbreaks
- Person-person contact
- Disruption of skin integrity
- Staph Aureus and Herpes Simplex most common



Staph Aureus

- Methicillin Resistant Staph Aureus (MRSA) prevalence continues to increase
- Must consider possibility in any skin lesion
 - ❖ Erythematous base
 - ❖ Yellow or white central head
 - ❖ Fluctuant mass



Staph Aureus

- Simple abscesses
 - ❖ Topical antibiotics (Mupirocin)
 - ❖ Moist heat
 - ❖ Incision and drainage
- Severe or extensive lesions
 - ❖ Oral empiric Abx therapy
 - ❖ Septra or clindamycin



Staph Aureus

- Return to play
 - ❖ No new lesions for 48 hours
 - ❖ Oral Abx for 48-72 hours
 - ❖ No wet or weeping lesions
- Prevention
 - ❖ Encourage personal hygiene
 - ❖ Avoid sharing personal items (razors)
 - ❖ Infected athletes should avoid common areas



Herpes Simplex Virus

- Transmitted by skin-skin or bodily fluid contact
 - ❖ HSV-1 (lips)
 - ❖ HSV-2 (urogenital)
- Highly infectious
 - ❖ 33% likelihood of contracting HSV if sparring with infected opponent
 - ❖ Lips, head, extremities
 - ❖ Cluster of vesicles



Herpes Simplex Virus

- Treatment
 - ❖ Oral systemic antivirals x 5 days
 - ❖ Acyclovir
- Return to play
 - ❖ No systemic symptoms
 - ❖ No new lesions x 72 hrs
 - ❖ No wet or moist lesions



HIV

- Status is confidential
- Infection alone is not disqualifying
- Wound care is same for all athletes
- Universal precautions



Mononucleosis

- Epstein-Barr virus
- 3 million cases/yr in US
- Classic triad
 - ❖ High fever
 - ❖ Sore throat
 - ❖ Lymphadenopathy
- Splenomegaly occurs in 50%-100% of cases



Mononucleosis

- Potential complications in athletes
 - ❖ Chronic fatigue
 - May last over 3 months
 - ❖ Tonsillar enlargement
 - Respiratory and/or airway compromise
 - ❖ Splenic rupture
 - Rare
 - Lymphocyte infiltration
 - Usually occurs in first 3 weeks



Mononucleosis

- Treatment based on symptoms
- Return to play
 - ❖ Restricted x 3-5 weeks
 - ❖ Splenomegaly resolved

