

General Cardiology Potpourri

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Outline

- Chest Pain
- Syncope
- Murmurs
- Cyanosis



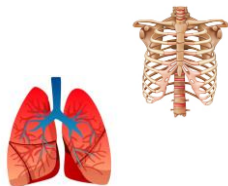
Chest Pain

- Cardiac causes of chest pain account for <5% of all cases
- Significant fear and anxiety associated with symptoms



Chest Pain

- Musculoskeletal:
 - Costochondritis
 - Idiopathic chest wall pain
 - Precordial catch syndrome
- Respiratory:
 - Asthma
 - Pneumonia/respiratory infection
- Gastrointestinal:
 - GERD
 - Esophagitis/Gastritis



Chest Pain

- Cardiac:
 - Pericarditis
 - Myocarditis
 - Severe aortic/pulmonary stenosis
 - Arrhythmias
 - Coronary artery disease



Chest Pain

- Evaluation:
 - History and physical examination are key
 - OPQRST for description of pain
 - Family history of CHD, arrhythmias/sudden death, premature coronary artery disease
 - Careful attention on exam for reproducible chest wall tenderness, work of breathing and posture, heart rate/rhythm, murmurs

Chest Pain

- Evaluation:
 - Ancillary testing:
 - Chest X-ray can assess for pulmonary etiologies and cardiomegaly
 - ECG may provide clues
 - If concern for cardiac etiology remains, further testing with echo, stress test, or advanced imaging may be required

Chest Pain



- Red Flags
 - Exertional
 - Non-reproducible
 - Associated with palpitations/syncope
 - Family history of sudden unexplained death (including drowning), cardiomyopathy, premature coronary artery disease <55 years of age

Cases

- A 15-year-old previously healthy male presents to urgent care with a 24-hour history of worsening chest pain. He has a feeling of a severe squeezing pain in his left chest and prefers sitting upright vs laying flat. He has had a recent URI in the last week. He is tachycardic to 120 bpm and has cap refill 3-4 seconds. His pain is not reproducible with palpation. Which of the following tests would most likely lead to a diagnosis?
 - A. Chest X-ray
 - B. CBC
 - C. Respiratory viral panel
 - D. ECG
 - E. Trial of antacids

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Cases

- A 15-year-old male with history of VSD closure as an infant presents to clinic with a two-day history of intermittent chest pain. It is located over the left chest and is worst when taking deep breaths. They have not tried any pain medications at home. Cannot recall a particular injury but has had a recent cold with a cough over the past week. He is afebrile, well-appearing. He has reproducible chest pain to palpation over his left chest and costal margin. Which of the following is the most likely cause of chest pain?
 - A. Pneumonia
 - B. Costochondritis
 - C. Myocardial ischemia
 - D. Pericarditis
 - E. Hypertrophic cardiomyopathy

Cases

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Syncope

- Definition: "temporary loss of consciousness resulting from a reversible disturbance of cerebral function"
- Estimated that up to 20% of children will experience at least one episode by the end of adolescence
- Neurocardiogenic in the vast majority of patients, but the greatest apprehension related to cardiac causes

Syncope

- Causes:
 - Neurally mediated syncope (neurocardiogenic/vasovagal syncope)
 - Noncardiovascular:
 - Seizures
 - Breath holding spells
 - Cardiovascular:
 - Structural
 - Arrhythmogenic

Syncope

- Evaluation:
 - History is key!
 - Prodrome/presyncopal symptoms are important to tease out
 - How it was induced
 - Previous history of similar episodes/symptoms
 - Family history of arrhythmias, cardiomyopathy, syncope
 - Did they actually lose consciousness?
 - Testing:
 - Orthostatic vital signs
 - ECG
 - Cardiac evaluation if red flags

Syncope



- Red Flags:
 - Under 6 years of age is unusual
 - Exertional
 - Ensure loss of consciousness
 - During exercise as opposed to following recovery
 - Associated with palpitations
 - Lack of pre-syncope symptoms (lightheadedness, blurry vision, etc)
 - Head trauma due to fall

Cases

- A 6-year old female with no significant past medical history presents to urgent care for evaluation of a syncopal episode. She has had a febrile URI over the past few days but has otherwise been well-appearing and drinking adequate fluids. When asking more closely, she does not recall feeling funny before the episode and her mother noticed her suddenly fall while playing in the house and hit her head. Her exam is unremarkable and she appears well-hydrated. What is the most appropriate next step?
 - A. Perform an ECG
 - B. Administer a fluid bolus
 - C. Reassure the family
 - D. Consult Neurology
 - E. Obtain orthostatic vital signs

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- D. Consult Neurology
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Cases

- A 15-year-old male presents to his pediatrician following an episode of syncope that occurred earlier today while at school. He was walking to his next class during passing period when he began seeing spots and getting lightheaded. Friends say they saw him begin to slump to the ground and briefly lose consciousness. Family history is unremarkable. Which of the following would you expect to be abnormal?

- A. Physical exam
- B. ECG
- C. Orthostatic vital signs
- D. Echocardiogram
- E. CBC

Cases

- A 15-year-old male presents to his pediatrician following an episode of syncope that occurred earlier today while at school. He was walking to his next class during passing period when he began seeing spots and getting lightheaded. Friends say they saw him begin to slump to the ground and briefly lose consciousness. Family history is unremarkable. Which of the following would you expect to be abnormal?

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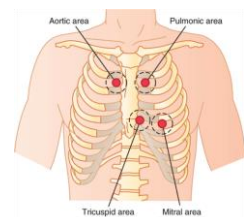


Murmurs

- Majority of children will have an audible murmur at some point in their lives
- Congenital heart disease incidence of <1%
- Most murmurs in children >6 months old are innocent
 - Most common murmur in infancy is peripheral pulmonary stenosis (PPS)

Murmurs

- Innocent murmurs:
 - Still's murmur
 - Pulmonary flow murmur
 - Systemic flow murmur
 - Venous hum
- Pathologic murmurs:
 - Harsh/turbulent quality
 - Loud
 - Diastolic (rarely innocent)



Murmurs

- Evaluation:
 - Growth chart
 - Oxygen saturation
 - Blood pressure (pre- and post-ductal)
 - ECG
- Exam:
 - Auscultation
 - Palpation
 - Femoral pulses
 - Hepatomegaly

Murmurs



- Red Flags:
 - Harsh/loud murmurs
 - Loudest when upright vs supine
 - Diastolic murmurs (rarely innocent)
 - Associated weight loss, chest pain (exertional), shortness of breath, activity intolerance, syncope
 - Age <6 months

Cases

- A previously healthy 8-year old female presents to clinic with a febrile URI. She has slight tachypnea but is in no acute distress. Her exam reveals coarse lung sounds and a 2/6 systolic murmur that is loudest at the LUSB when supine. Her oxygen saturation is 98%. An ECG is performed and is normal for age. Which of the following is the most likely diagnosis?
 - A. Atrial septal defect
 - B. Ventricular septal defect
 - C. Tetralogy of Fallot
 - D. Innocent flow murmur
 - E. Hypertrophic cardiomyopathy

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Cases

- A previously healthy 8-year old female presents to clinic for palpitations and chest pain with activity that have worsened over the past few weeks. She is comfortable in the office in no distress. Her mother's family has "heart problems" with a family member who had a heart transplant and another with a defibrillator. She has a harsh, 3/6 systolic ejection murmur loudest at the bilateral upper sternal borders that is loudest with standing and Valsalva maneuver. An ECG is performed with inverted T waves in V4-6. Which of the following is the most likely diagnosis?
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Cases

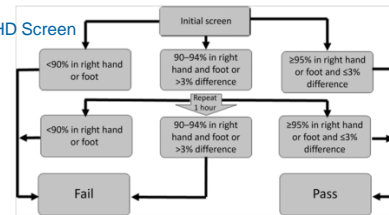
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Cyanosis

- Cyanotic congenital heart disease makes up about 1% of all CHD (~1/1000 births)
- Degree of cyanosis varies by the amount of pulmonary blood flow
 - D-TGA, HLHS with restrictive atrial septum can have severe desaturation
 - Truncus arteriosus, TAPVR can have saturations in the 90s once PVR decreases
- Commonly picked up in delivery room or at time of critical congenital heart disease (CCHD) screening

Cyanosis

• CCHD Screen



Cyanosis

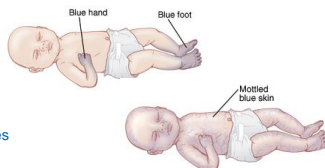
- Causes:
 - Respiratory:
 - Pneumonia
 - Breath holding spells in infants and toddlers
 - Apnea (obstructive/central)
 - Vascular:
 - Acrocyanosis
 - Raynaud's Phenomenon (pallor, cyanosis, and redness)
 - Neurologic
 - Seizures
 - Cardiac

Cyanosis

- Common forms of cyanotic CHD:
 - Tetralogy of Fallot (variable degrees of cyanosis)
 - D-TGA
 - Tricuspid atresia
 - Truncus arteriosus
 - Total anomalous pulmonary venous return
 - Hypoplastic left heart syndrome
 - Critical pulmonary stenosis/pulmonary atresia
 - Ebstein anomaly
- Other cardiovascular etiologies include persistent pulmonary hypertension of the newborn (PPHN), Eisenmenger syndrome, pulmonary arteriovenous malformations (AVMs)

Cyanosis

- Evaluation:
 - Central vs peripheral
 - 4-limb saturations
 - 4-limb blood pressures
 - Chest X-ray
 - Hyperoxia test
 - Echocardiogram if persistent concern for cardiac etiology



Cyanosis

- Management:
 - ABCs
 - Supplemental oxygen and respiratory support as indicated
 - Quickly assess differentials and rule out cardiac disease
 - If persistent concern for cardiac etiology or infant is unstable, would recommend prostaglandins
 - Be ready to treat the complications of prostaglandins (apnea, hypotension)

Cases

- A 24-hour old newborn male has been doing well with breastfeeding and is nearly ready for discharge. A CCHD screen was significant for a saturation of 85% in both the right arm and right leg. A new, harsh murmur is heard loudest at the RUSB. Supplemental oxygen with 100% FiO2 does not produce a significant change in oxygen saturation. What is the most likely diagnosis?
 - A. Pneumonia
 - B. Tetralogy of Fallot
 - C. Persistent pulmonary hypertension of the newborn
 - D. Large VSD
 - E. Obstructed TAPVR

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Cases

- A 10-year old previously healthy male was referred to the emergency department by his school due to painless cyanosis of his hands. He was anxious in appearance, but in no acute distress. His hands were a deep blue, but the exam was otherwise unremarkable. His oxygen saturation was recorded as 99% via pulse oximetry of his right upper extremity. What is the most likely etiology?
 - A. Tetralogy of Fallot
 - B. Eisenmenger syndrome from a long-standing VSD
 - C. Pulmonary hypertension
 - D. Raynaud's Phenomenon
 - E. Artificial blue staining of his hands from a blue gaming chair that he used all weekend

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References

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