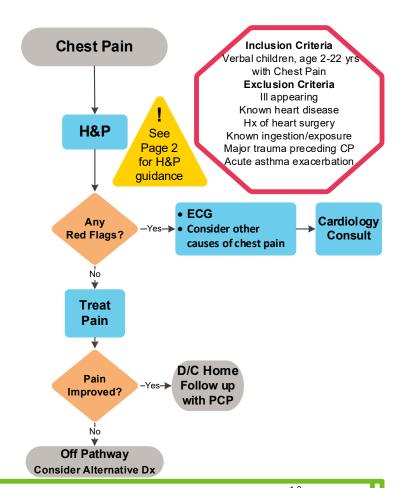


ED/UC CARDIAC CAUSES OF CHEST PAIN

ALGORITHM





Concerning ECG Findings in a ≥2yo patient with complaint of chest pain^{1,2} Anschutz: In-person Cardiology Consult

NOC: Phone Cardiology Consult to determine if transfer is needed

Concern of Ischemia, Myocarditis or Pericarditis:

- Pathologic ST Segment changes in 2 or more contiguous leads: More than 2mm above or below baseline
- Abnormal T wave inversion: >1mm in depth in two or more contiguous leads Excludes leads aVR, III, and V1
- Pathologic Q waves (more than 5mm deep and >40ms wide) in 2 or more contiguous leads Excludes leads III, aVR
- Low Voltage QRS amplitude (5mm or less in all six limb leads)

Right Ventricular Hypertrophy:

- Upright T wave between 4 days and Puberty in V1 and a qR pattern in V1
- Tall R V1 (>15 mm) and Deep S in V6 (>5mm)
- Right axis deviation for age

Left Ventricular Hypertrophy:

- Tall R V6 (>25 mm) and deep S V1(>25mm)
- Q in V6 > 4mm
- Left axis deviation for age

Findings that are <u>NOT</u> part of the chest pain pathway but should be reviewed <u>on all EKGs</u> (if any of the below are found – please call the cardiology fellow on call for a phone consultation)

- Evaluate the QTc (Seattle criteria that applies to athletes Prolonged QTc(calculated per Bazett's Formula= QT/√RR) greater than
 or equal to 450 msec ^{1, 4}. Note: Prolonged QTc in of itself rarely is an etiology for chest pain, these patients more often present
 with syncope.
- Abnormal: >470 msec in males, > 480 msec in females. And, Bazett's Formula was not designed for HR >100 bpm. In the
 absence of syncope or seizure, would argue more for a repeat EKG rather than consult.
- Abnormal P wave axis (outside of 0-90 degrees) in setting of tachycardia
- Wide QRS for age
- Delta waves, Wolff-Parkinson-White (WPW)
- First degree AV block
- Second degree AV block (Mobitz I, Wenckebach)
- Frequent PVCs on a 12 lead ECG or multiform PVCs

CLINICAL PATHWAY



TABLE OF CONTENTS

Algorithm

Target Population

Background | Definitions

Initial Evaluation

Clinical Management

Laboratory Studies | Imaging

Therapeutics

Parent | Caregiver Education

References

Clinical Improvement Team

TARGET POPULATION

Inclusion Criteria

Verbal children, age 2-22 years old, complaining of chest pain

Exclusion Criteria

- III appearing
- History of congenital heart disease
- History of heart surgery
- Known ingestion/exposure
- Major trauma preceding chest pain
- Acute asthma exacerbation

BACKGROUND | DEFINITIONS

- Cardiac causes of chest pain are rare among children^{3,4}
- This pathway focuses on identification of children at high risk for serious underlying pathology

INITIAL EVALUATION

*Concerning findings are in bold red below

History¹

- Pain: location, onset (acute), frequency, duration, quality (substernal, crushing), severity, radiation (shoulder, arm, neck, jaw, back)
- Triggers: exertional, post prandial, pleuritic
- · Alleviating factors: rest, position, medications

CLINICAL PATHWAY



- Associated symptoms: dizziness, near syncope/syncope, dyspnea, orthopnea, palpitations, fever, cough, sore throat, history of foreign body or caustic ingestions, rash, arthralgia, arthritis
- Social: anxiety, depression, substance abuse
- Medications: recent medications, including over the counter medications, supplements and caffeine intake

Physical Exam¹

- Complete set of vital signs including blood pressure (hypertension, hypotension) and pulse oximetry
- General: Perfusion, pulses (decreased femoral/peripheral), appearance (cyanosis), distress, anxiety, edema
- Chest: Heart rate and rhythm (bradycardia, tachycardia, dysrhythmia, murmur, S2, gallop, distant heart sounds, friction rub, etc.), Lung (wheezing, rales, crackles, air entry, respiratory distress, tachypnea, etc.), focal chest tenderness, crepitus, asymmetry of chest
- Abdomen: Hepatosplenomegaly (HSM), epigastric tenderness
- Other: fever, rash, arthritis, trauma, thrombophlebitis

CLINICAL MANAGEMENT

- Aims at identification of patients at high risk for serious underlying pathology
- See algorithm

LABORATORY STUDIES | IMAGING

- Most patients do not require any studies or imaging
- ECG is indicated for patients with Red Flags (see page 1)
 - ECG tutorial with examples: https://lifeinthefastlane.com/ecg-library/paediatric-ecg-interpretation/
- CXR and Laboratory evaluation maybe indicated in patients with Red Flags (see page 1)

THERAPEUTICS

Treat pain as indicated.

PARENT | CAREGIVER EDUCATION

Chest pain discharge Smart Set is available for use in appropriate patients.

CLINICAL PATHWAY



REFERENCES

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- 4. Saleeb SF, Li WY V, Warren SZ, et al. Effectiveness of screening for life-threatening chest pain in children. Pediatrics 2011;128: e1062–8.



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Clinical Pathways and Measures Committee – May 15, 2017 ED/UC Pathways and Policies Committee- August 1, 2017 Pharmacy & Therapeutics Committee – N/A

MANUAL/DEPARTMENT	Clinical Care Guidelines/Quality
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APPROVED BY	Medical Director, Clinical Effectiveness

REVIEW | REVISION SCHEDULE

Scheduled for full review on May 15, 2021.

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