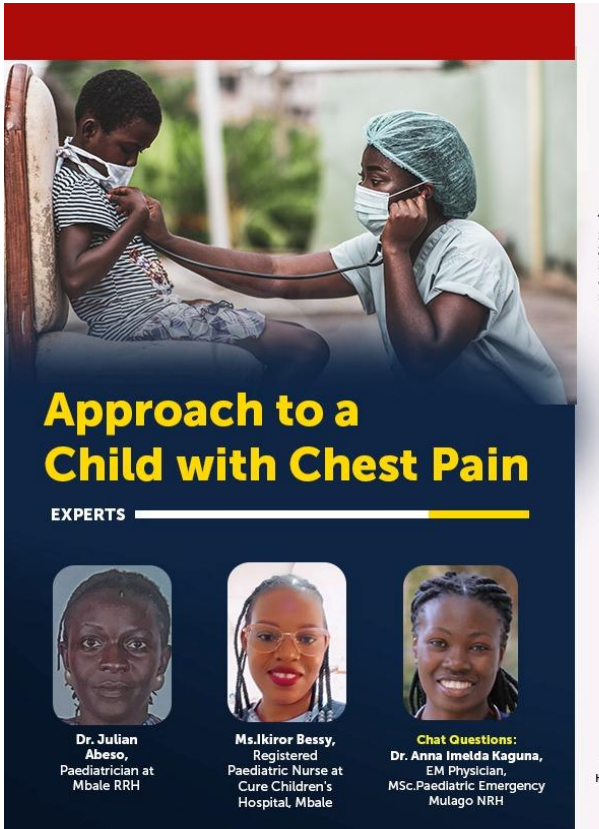
EMS ECHO Session 99



Brief History

M.R. 9yr/M, admitted on 21st/08/2025 at midnight at MNRH at ACU with h/o cough X2/7 associated with piercing chest pain radiating towards the back, generalised body pain, including long bones, and DIB. He has been fairly well for the last 9years without any admission.

Primary Survey (Emergency Assessment)

Airway	Patent
Breathing	In severe RD, RR= 46 b/m, SPO2=75-80% R/A, vesicular breath sounds, basal crepitations
Circulation	Warm peripheries, CRT<3s, HR= 116 bpm, strong & regular, normal HS I & II

Primary Survey (Emergency Assessment)

Disability	Alert with a GCS of 15/15, PEARL, a soft neck, normal tone and reflexes. There were no focal neurological deficits
Exposure	T= 36.6ºC, sick-looking, no rush, no wounds, no therapeutic scars

Poll 1

From the history and primary survey, what are the two most eminent emergencies in this patient?

What are BEDSIDE priorities?

THREATS	*PRIORITY*	*Findings*	*Associated Risk*
B	Severe Respiratory distress	SPO2 = 75 – 80% on RA	Respiratory failure Neuromuscular fatigue
	Hypoxia	Tachypnoea Respiratory distress	Hypoxic cardiac arrest

And always reassess to monitor response to treatments

Poll 2

Based on the above information, what are your

Management options for

this patient?

What are BEDSIDE priorities?

THREATS	*Findings*	*Associated Risk*	*Immediate Action Taken*
B	SPO2 = 75 – 80% on RA	Respiratory failure Neuromuscular fatigue	- Mechanical ventilation
	Tachypnoea Respiratory distress	Hypoxic cardiac arrest	Connect to Oxygen 15L via NRM, maintain SPO294%

And always reassess to monitor response to treatments

What happened in the ED to stabilize the patient

- Patient was put on O215L/min oxygen by NRM
- Oral morphine 15ml of 1mg/ml & IV PCM 450mg
- Transfused with 300ml of packed RBC (10ml/Kg)
- Patient was positioned supine in bed at 45ºto relieve the distress

This bought the team some time to find out more information

SAMPLE History

Signs & Symptoms	Generalized Body Pains 3/7 Cough 3/7 Chest Pain 2/7 Difficulty in Breathing 1/
Allergies	No Known Allergies
Medications	Oral PCM 500mg 8 hourly

SAMPLE History

Past Medical History	Newly diagnosed Sickle Cell Disease patient. This is the index admission
Last Oral Intake	21st before admission
Events Leading Up to Presentation	Had a cough for three days Was passing tea colored urine

Secondary Survey (Head-to-toe examination)

RELEVANT POSITIVES	RELEVANT NEGATIVES
G/E - Sick-looking, moderate pallor, tinge of jaundice Chest - Respiratory distress, hypoxia, bilateral air entry, vesicular breath sounds, basal crepitation CVS - Tachycardia MSK - Marked frontal and bi-parietal bossing, with long bone tenderness	- Cyanosis - fever - Cold extremities - Distended JVP - Hypotension - Abdomen nontender - Joint swellings

Now before we investigate this patient, what are our differentials?

What are all the possible differentials we need to look for?

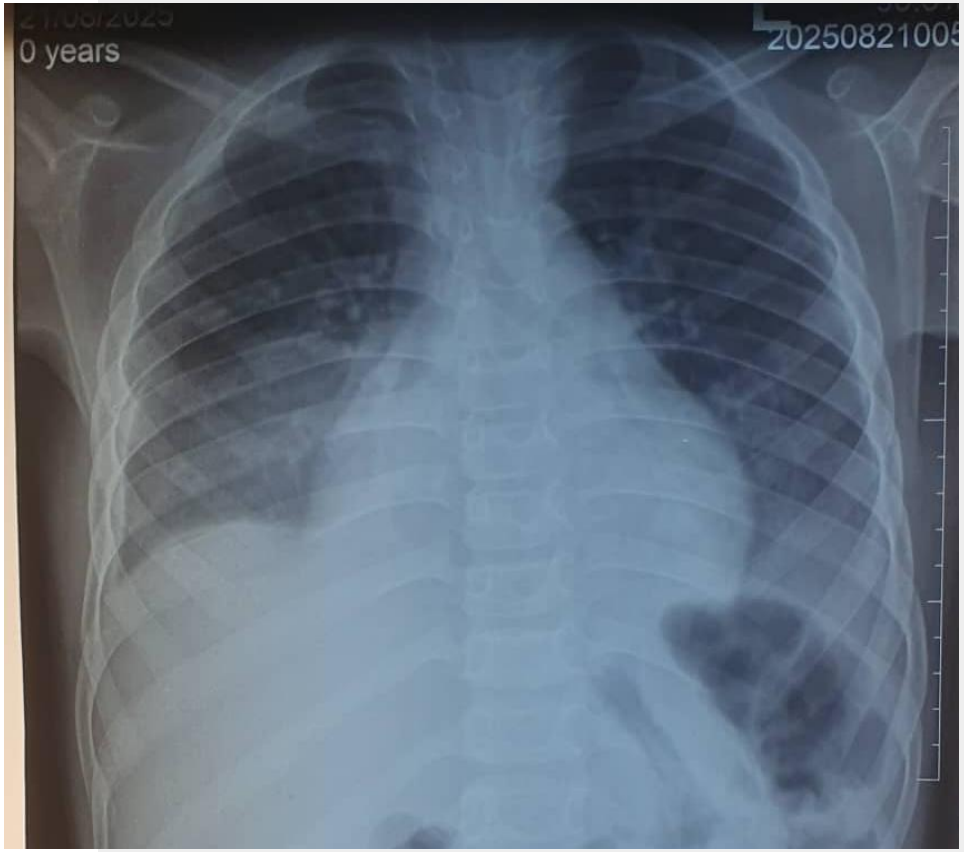
Category	Differential
Vascular	Anaemia, VOC, Acute Chest Syndrome
Infectious	Pneumonia, Malaria, sepsis
Trauma or Toxin	Blunt chest trauma with pneumo/hemothorax
Autoimmune	Juvenile idiopathic arthritis, systemic lupus erythematosus
Metabolic	Acid-base imbalances
Iatrogenic/Idiopathic	Idiopathic interstitial pneumonia
Neoplastic	Leukaemia, lymphoma, Osteosarcoma with lung metastases

Bloods

Investigation	Result
Full Blood Count	Hb 6.2, PLT 504, WBC 34.94 ANC 29.39, MCV 89.7
Malaria Blood Smear	(+) Malaria Parasites seen
Random Blood Sugar	*5 mmol/dL*
LFT	BILT 469, BILD 327, ALT 129,AST 15.9
Electrolytes, Creatinine	Creatinine 26, Urea 3.8, K 4.5, Na 138
Blood group	O Rhesus D positive

Poll 3

What is the interpretation of the chest radiograph shown?



Diagnoses

1. Acute Chest Syndrome
2. Vaso-occlusive crisis
3. Complicated malaria
4. Severe pneumonia

Poll 4

What are the 3 top priorities

Management options for

Acute chest syndrome?

Supportive Management

1. Put on 15L of oxygen Via NRM
2. I.V Fluids 250ml hourly
3. I.V Paracetamol 450 6hrly alternating with
4. Po Ibuprofen 200mg 6hrly
5. Po Morphine 15ml 4hrly

Specific Management

1. Transfusion Red Cell Concentrate 1 Unit (300ml PRBCs)
2. I.V Artesunate 86.4mg at 0 12 24
3. I.V Azithromycin 450mg O.D for 5days
4. I.V Ceftriaxone 2g O.D for 5days

Disposition & Follow-up plan

- Folic acid 5mg once a day for 2weeks
- Fansidar for malaria prevention monthly
- Initiate Hydroxyurea at 20mg/kg
- To enroll the child in routine care at the sickle cell clinic
- Screen for asthma and COPD
- Counsel parents to have a reproductive plan

Nursing team:

Is there anything else you would like to know now?

What are the **nursing priorities**
for this patient during their inpatient stay?

Introduction

- Chest pain is a common & could potentially be due to a life-threatening condition that requires immediate assessment and intervention
- It may indicate a range of conditions from myocardial infarction (heart attack) to musculoskeletal or gastrointestinal issues.
- Nurses play a critical role in the early identification, monitoring, and management of patients experiencing chest pain.

Purpose of the Presentation:

- To understand the causes, assessment techniques, and nursing interventions for chest pain.
- To highlight the importance of timely response and collaborative care in improving patient outcomes.

Assessment	Nursing Diagnosis	Goal/Desired Outcome	Intervention	Rationale	Evaluation
Chest pain Tachypnea Crackles cough	Impaired breathing pattern related to lung tissue disease .	* Patient will actively participate in actions, such as deep breathing exercises * Improve on the WOB	* Monitor and assess respiratory rate, depth, use of accessory muscles * O2 therapy * Demonstrate and assist with splinting the chest during coughing in an upright position. * Teach and assist the patient with proper deep-breathing exercises.	* minimizes discomfort, * Helps identify signs of respiratory compromise or muscle fatigue * Facilitates maximum lung expansion	Patient able to do deep breathing exercise with decreased oxygen needs

Assessment	Nursing Diagnosis	Goal/Desired Outcome	Intervention	Rationale	Evaluation
Body pain Tachypnea	Chronic pain related to vaso-occulisve crisis/ disease process	* Patient will be able to verbalize decreased pain using a pain scale * Patient will demonstrate the ability to sleep and rest without interruptions.	* Monitoring vital signs hourly * Pain assessment * Administering analgesics as prescribed * Comfort *Distructive measures	guides pain rating and management Pain relief in severe crisis encourages relaxation, distraction.	Patient verbalizes reduced pain with rating 5/10 Patient able to sleep without difficulty

Assessment	Nursing Diagnosis	Goal/Desired Outcome	Intervention	Rationale	Evaluation
Pallor Low Hb 6.5g/dl Body pain	Ineffective peripheral tissue perfusion related to vaso-occlusive crisis	* Patient will manifest hemoglobin levels at their baseline.	Transfuse * Administering supplemental oxygen * *together* Administering *and* intravenous *carry* fluids with *oxygenated* caution *blood to the*	*Enhance the quantity and quality of healthier, more flexible red blood cells* *clump* *RBCS* *cannot* *rest of the body.*	Patients Hb within normal 7.7g/dl

Assessment	Nursing Diagnosis	Goal/Desired Outcome	Intervention	Rationale	Evaluation
New diagnosis Adherence	Risk for Knowledge deficit related to new diagnosis	Paient and family able to verbalize follow up plan and adherence	* Assesing family knowledge and myths about sickle cell disease * Health educate family and patient about disese, routine medications, review dates * Health education about medication adherence	*Helps to know what to teach and not to teach * Prevents reobound severe crisis	Patient and family verbalize follow up plan and adherence

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Centers for Disease Control and Prevention. (2023, July 6). What is sickle cell disease? Retrieved July 2023, from https://www.cdc.gov/ncbddd/sicklecell/facts.html

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Now, let's dive into Acute & Critical Care Management of a child with chest pain

Emergency Treatment of a Child with Chest Pain

Dr. Julian Abeso,
Paediatrician at Mbale RRH

How should you approach this patient as an ED doctor?

THE REPUBLIC OF UGANDA MINISTRY OF HEALTH

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Project ECHO

Article on chest pain in children

Objective : This study aimed to assess and determine the presentation, risk factors, and outcomes of pediatric patients who were admitted for cardiac-related chest pain.
Background : Although chest pain is common in children, most cases are due to non-cardiac etiology. The risk of misdiagnosis and the pressure of potentially adverse outcomes can lead to unnecessary diagnostic testing and overall poorer patient experiences. Additionally, this can lead to a depletion of resources that could be better allocated towards patients who are truly suffering from cardiac-related pathology.
Methods : This review was conducted per PRISMA guidelines. This systematic review used several databases including MEDLINE, Embase, Scopus, and Web of Science to obtain its articles for review.
Results: A total of 6,520 articles were identified, and 11 articles were included in the study. 2.5% of our study population was found to have cardiac-related chest pain (prevalence = 0.025, 95% CI [0.013, 0.038]). The most commonly reported location of pain was retrosternal chest pain. 97.5% of the study population had a non-cardiac cause of chest pain, with musculoskeletal pain being identified as the most common cause (prevalence = 0.357, 95% CI [0.202, 0.512]), followed by idiopathic (prevalence = 0.352, 95% CI [0.258, 0.446]) and then gastrointestinal causes (prevalence = 0.053, 95% CI [0.039, 0.067]).
Conclusions: The overwhelming majority of pediatric chest pain cases stem from benign origins. This comprehensive analysis found musculoskeletal pain as the predominant culprit behind chest discomfort in children. Scrutinizing our study cohort revealed that retrosternal chest pain stands as the unequivocal epicenter of this affliction. Thorough evaluation of pediatric patients manifesting with chest pain is paramount for the delivery of unparalleled care, especially in the context of potential cardiac risks in the emergency department.

Introduction

- Chest pain in children is often **benign**, but may be a sign of serious illness
- Common causes: **Musculoskeletal**, **respiratory**, **cardiac**, **GI**, **psychogenic**
- Immediate goal: **Rule out life-threatening causes**

Initial Assessment

A– Airway: Clear or obstructed?

B – Breathing: Rate, effort, oxygen saturation

C – Circulation: Heart rate, perfusion, BP

D – Disability: Consciousness (AVPU scale), pupils

E – Exposure: Look for rashes, trauma, surgical scars

✅ **Start oxygen if needed**

✅ **Call for help if unstable**

Do Focused History (SAMPLE)

- **S**ymptoms: Onset, nature, radiation of pain
- **A**llergies
- **M**edications
- **P**ast history (asthma, cardiac issues, trauma)
- **L**ast meal
- **E**vents leading to the pain

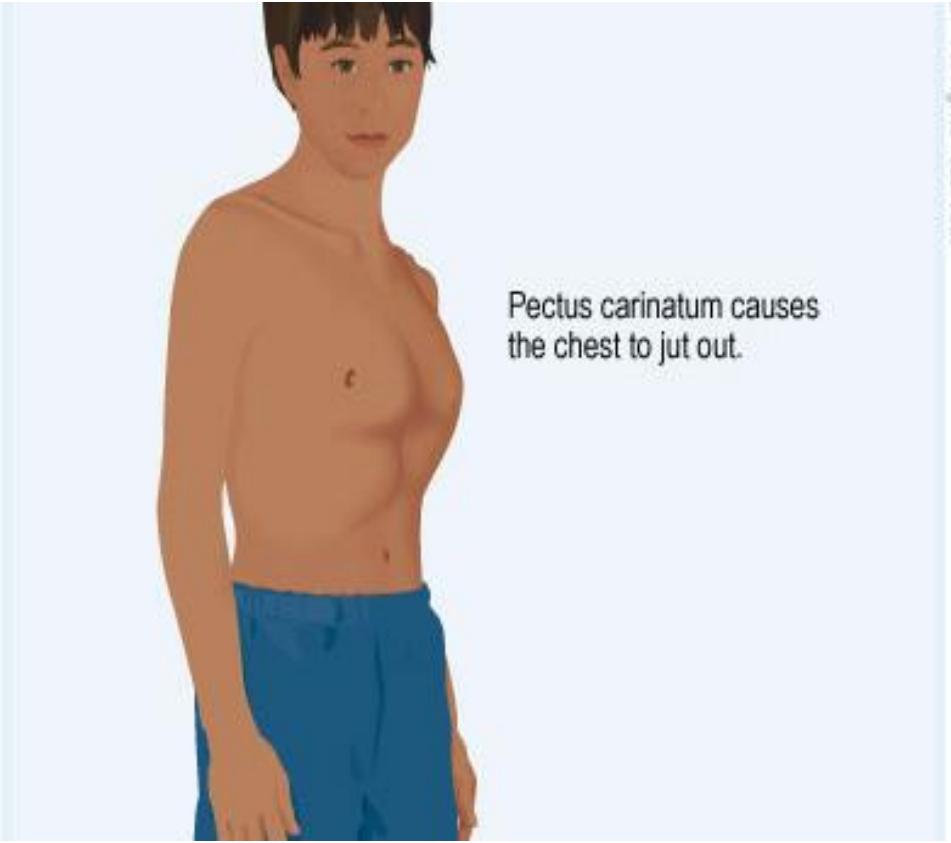
Physical Examination

- **Inspection**: Work of breathing, cyanosis, chest deformity
- **Palpation**: Tenderness (suggests musculoskeletal cause)
- **Auscultation**: Breath sounds, heart sounds, murmurs
- **Vital signs**: HR, RR, SpO_2, BP

Don’t forget to look out for chest wall deformities

- Pectus escavatum
- Scoliosis
- Bulging chest wall

etc



When to worry- Red flags

- Sudden, severe chest pain
- Pain with dyspnea or syncope
- Cyanosis
- Abnormal heart sounds or murmur
- Fever + chest pain
- History of cardiac disease or recent trauma
- Oxygen saturation < 94%

Common differentials

- Musculoskeletal (costochondritis)
- Asthma exacerbation
- Gastroesophageal reflux
- Anxiety/panic

Red flags-severe differentials

- Pneumothorax
- Pericarditis or myocarditis
- Congenital heart disease
- Pulmonary embolism (rare in children)

Investigations for stable patients

- Chest X-ray
- ECG
- Echocardiogram
- Blood tests: CBC, troponin, CRP
- COVID-19 test or viral panel (if febrile)

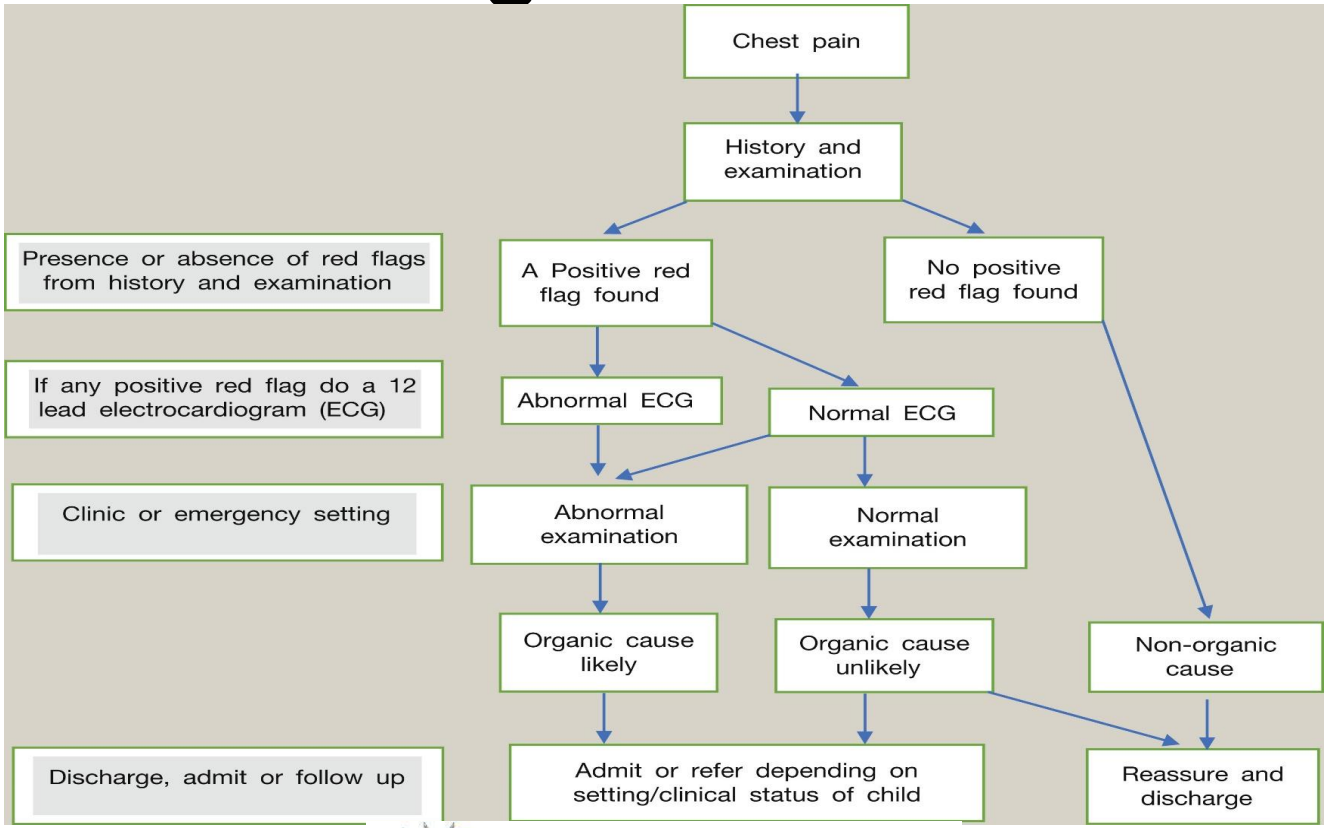
Emergency treatment-General Steps

- Ensure airway is open and breathing is adequate
- Administer oxygen if SpO_2 < 94%
- Position child upright (unless hypotensive)
- IV access + monitor vitals continuously
- Start fluids if signs of shock
- Administer specific treatments based on suspected cause

Specific emergency treatment

Condition	Emergency Management
Pneumothorax	Needle decompression, chest tube insertion
Asthma	Nebulized bronchodilators, steroids, O_2
Pericarditis	Analgesics, anti-inflammatory meds, O_2
Myocarditis	Supportive care, inotropes, ICU transfer
Trauma	CXR, stabilize fractures, eeding

A flow chart to guide with decisions



Way forward

- **Admit to hospital/ICU** if serious or unstable
- **Refer to pediatric cardiologist** if cardiac cause suspected
- **Discharge with follow-up** only if musculoskeletal or anxiety and stable

Scenario

- 10-year-old boy, with chest pain after soccer, mild tachypnea, normal SpO_2
- What's your differential diagnosis?
- What are your next steps?

Take Home

- Chest pain in children is usually benign but **can be life-threatening**
- Follow **ABCDE** for rapid assessment
- Treat based on **cause** and **stability**
- Always consider **cardiac and respiratory emergencies**

References

- Pediatric Advanced Life Support (PALS) Guidelines
- AHA Guidelines on Pediatric Chest Pain
- UpToDate, NICE, WHO resources

Thank you