



Royal London
Paediatric Courses

Chest Pain & Palpitation in Children

Dr Cheentan Singh
Consultant Paediatrician / Neonatologist
PEC (Sp. interest in Cardiology)
North Middlesex University Hospital



Chest Pain

Common Condition

Cause of concern :

Anxiety of being Cardiac (0.6 -2%)

Disruption to schooling & lifestyle is 40-44%
(feeling of 'heart attack')

Our Role:

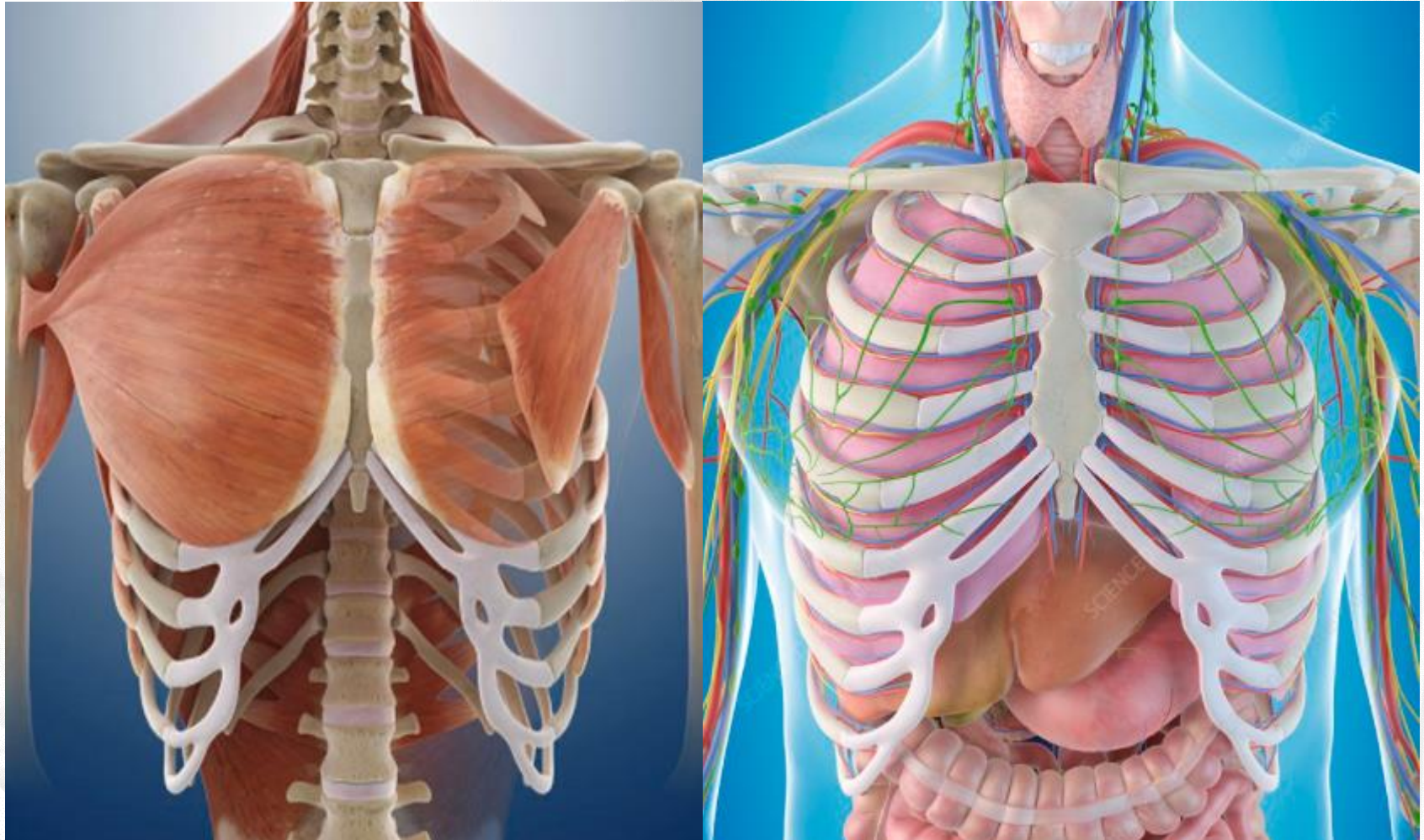
Listening to patients,

Limiting unnecessary investigations

Making the diagnosis,

Allaying anxieties, & reassuring carers.

Chest Pain: Anatomical approach





Chest Pain

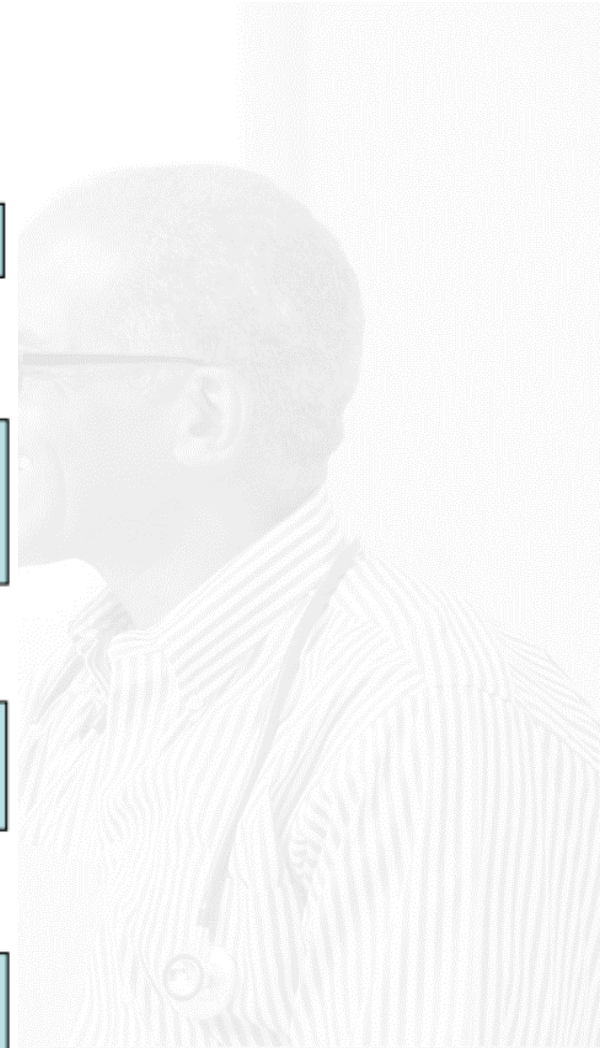
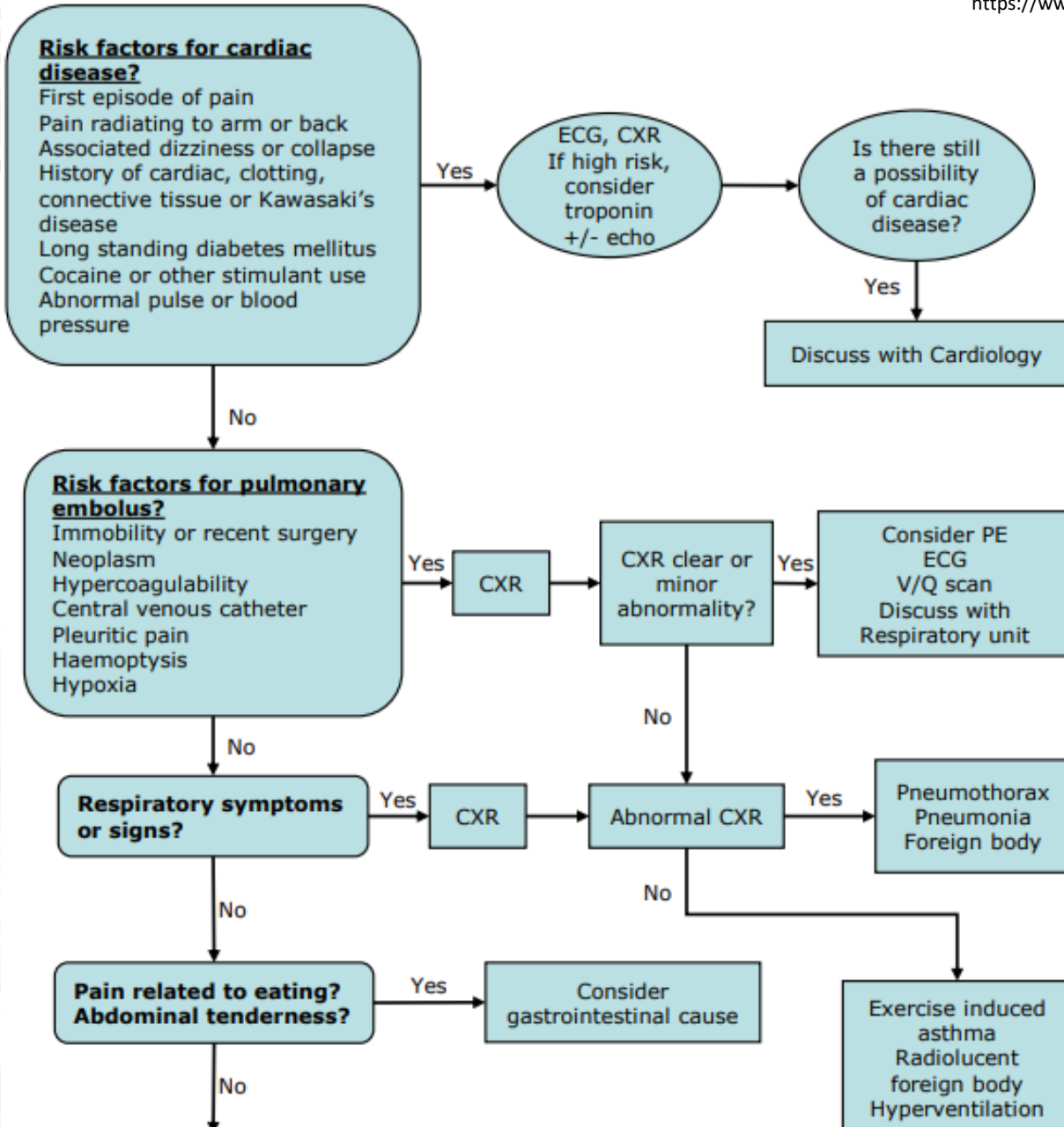
Causes of Chest Pain	Occurrence
Musculoskeletal <ul style="list-style-type: none"> • Costochondritis & Tietze’s • Precordial catch : Stitch 	25 – 50%
<ul style="list-style-type: none"> • Idiopathic 	12 – 50%
Respiratory <ul style="list-style-type: none"> • Pleural • Pneumothorax • Asthma • Pulmonary Embolus 	7 – 20 %
Gastrointestinal <ul style="list-style-type: none"> • Acid reflux • Oesophagitis 	3 – 6 %
Psychogenic <ul style="list-style-type: none"> • Panic Attack • Anxiety 	1 – 9 %
Cardiac <ul style="list-style-type: none"> • Pericarditis • Coronaries • Myocardial ischemia • MVP 	0.6 –1%
Others: neural, tumours, Aortic aneurysm	

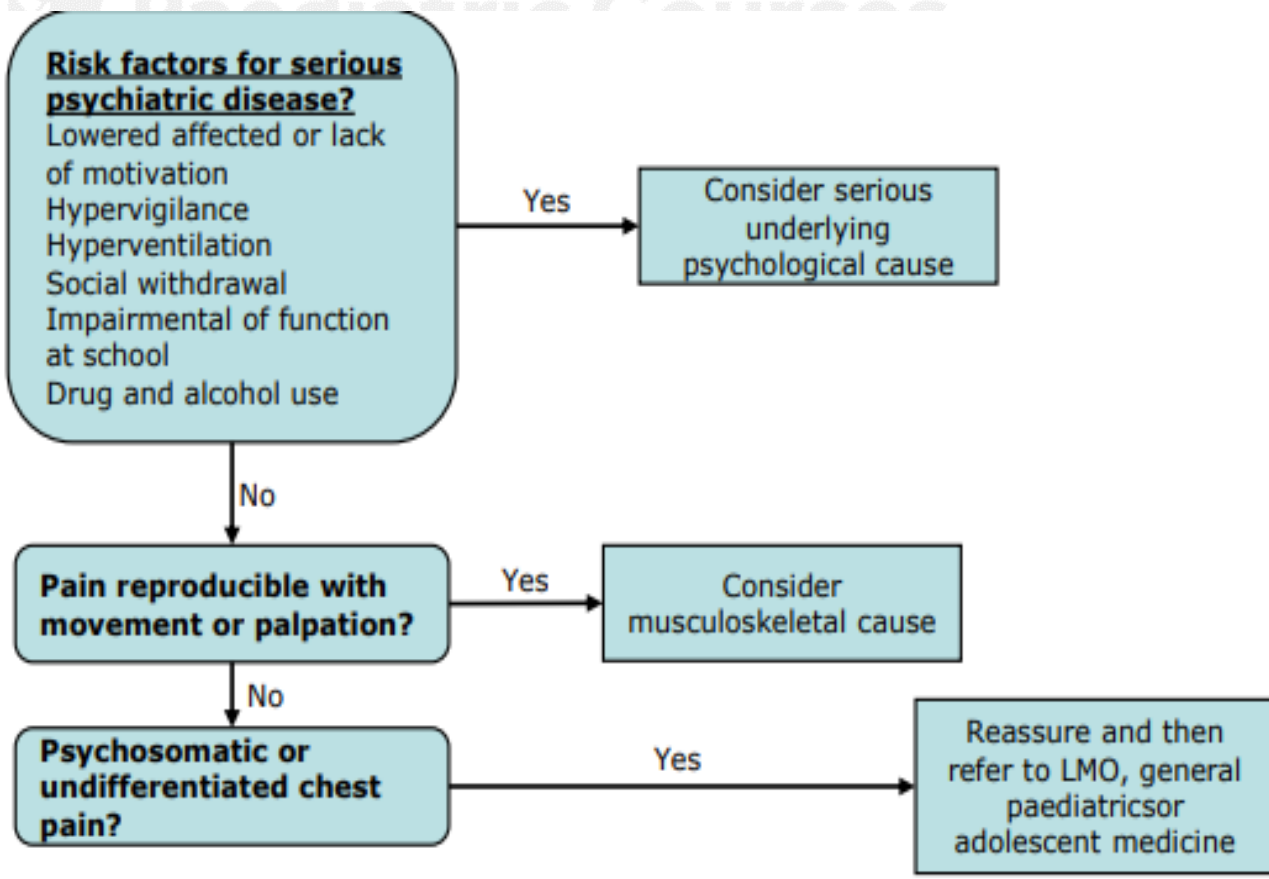
Risk factors	Condition
Major chest trauma	Pneumothorax, haemothorax, contusion
Prior cardiac disease or surgery	Myocardial ischaemia, arrhythmia, pericarditis, pericardial effusion.
Hypercoagulable states (primary clotting disorders, neoplasms, pregnancy, contraceptive pill use, prolonged immobility or post surgery, central venous catheters, connective tissue disease, past or family history of thromboembolic disease)	Pulmonary embolus
Sickle cell disease	Acute chest syndrome
Chronic respiratory disease	Pneumothorax
Kawasaki disease	Coronary aneurysm and myocardial ischaemia
Familial hyperlipidaemia syndromes	Myocardial ischaemia
Cocaine or stimulant use	Myocardial ischaemia
Connective tissue disease	Pericarditis and pericardial effusion, aortic dissection



Chest Pain

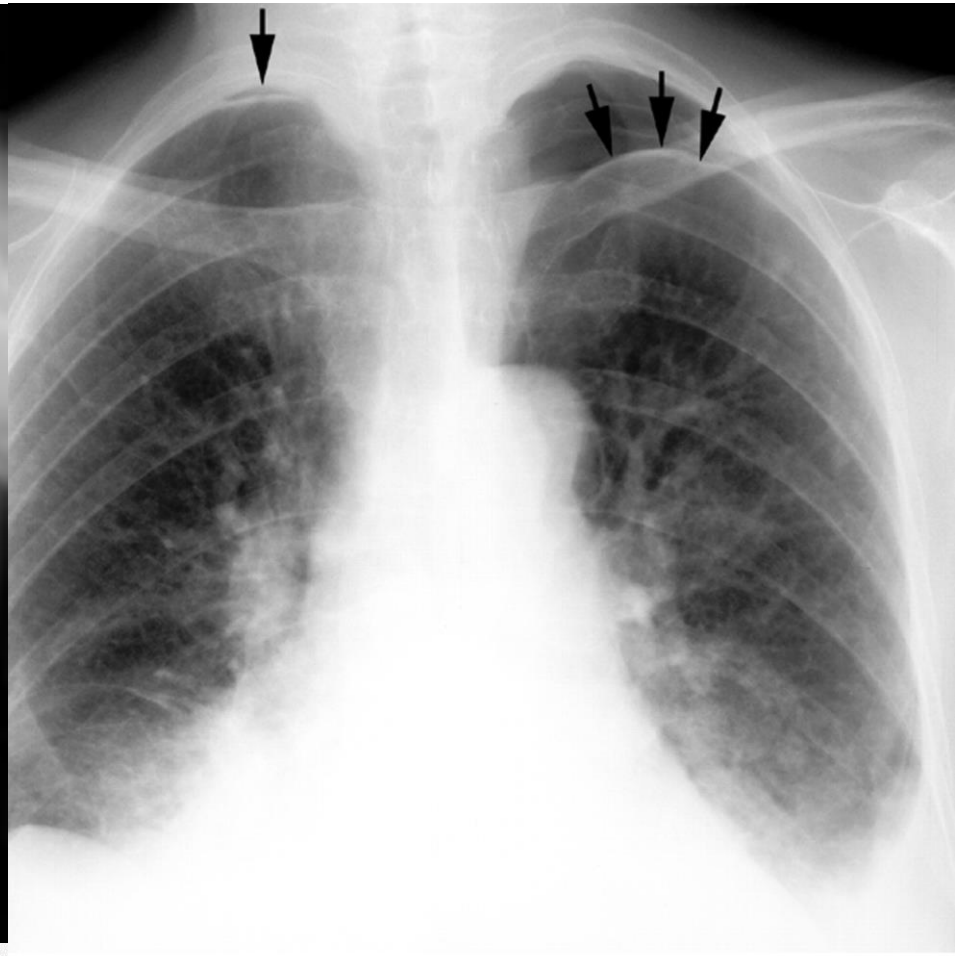
System	Indicators on History	
Musculoskeletal	Sharp, Anterior wall, Costochondral junction Muscular	Following exercise History of injury Variability with chest wall movement
Cardiac	Dull Retrosternal, Heavy weight on chest	Radiation to neck, left arm, jaws, back Associated fainting / syncope
Pericardial	Sharp / Fever	Palpitation Other cardiac signs
Respiratory	Unilateral, dull - sharp	Cough, pain on breathing Fever, DIB, Asthma / Wheeze
Psychogenic	Panic attack, hyperventilation	Triggers, school/family background



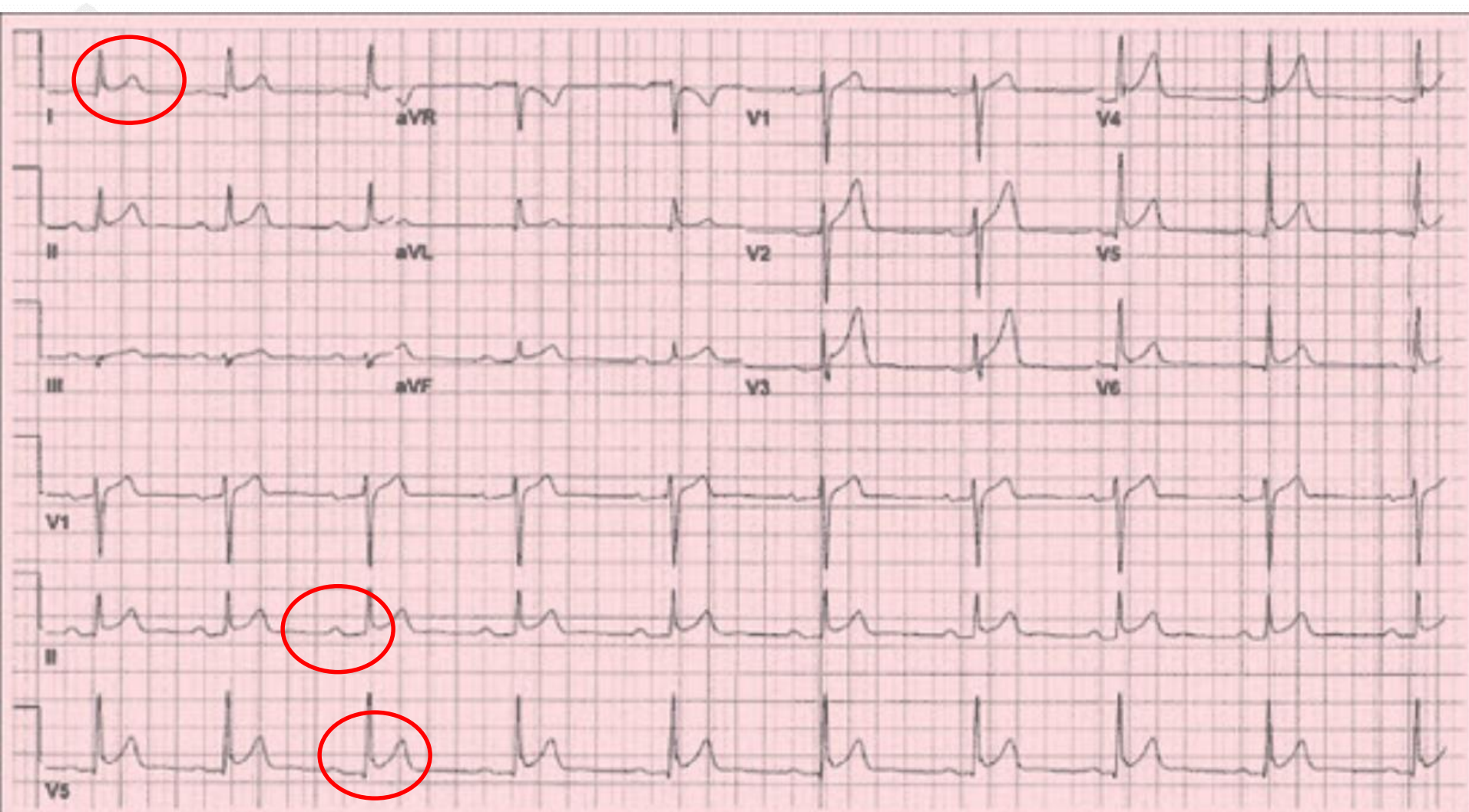




Pleurisy (Pneumonia)



Pneumothorax



PERICARDITIS

Diffuse ST elevation, Concave ST segment, low PR segment

Severe : T wave inversion (not in this ECG)



Ischemia: ALCAPA

Lead I, AVL, Lateral leads

ST elevation, T wave inversion, Deep Q waves

(in this ECG the changes are global in other leads too)

- Collins SA, et al. Arch Dis Child Educ Pract Ed 2014;99:122–126. doi:10.1136/archdischild-2013-303919
- https://www.rch.org.au/clinicalguide/guideline_index/Chest_pain
- <https://www.cincinnatichildrens.org/health/c/chest>



Palpitation

G165(P) PALPITATIONS – A CAUSE FOR CONCERN?

OC Stredder, J Fisher, F Damda. *Paediatric Department, Lewisham and Greenwich NHS Trust, London, UK*

10.1136/archdischild-2016-310863.156

Introduction Palpitations in children is a common presentation to the Emergency Department. Although usually benign and related to anxiety and stress, it is important to rule out the possibility of cardiac arrhythmia. Palpitations cause significant distress for child and parents. Appropriate initial management and onward referral can ensure accurate diagnosis and minimise the need for unnecessary further investigations whilst reducing anxiety in the family.

Methods A retrospective analysis of ED notes was undertaken. All children under 16 coded for a discharge diagnosis of arrhythmia or palpitations between October 2013 and October 2015 were included. Areas analysed included presentation, adequacy of history taking, physical examination, performance of an ECG and blood tests, advice prior to discharge and onward referral.

Results 84 patients were discharged from ED with a diagnosis of palpitations or arrhythmia. 15 did not meet inclusion criteria. Of the 69 patients analysed, 59% were not asked for family history of cardiac disease, 30% were not asked duration of their symptoms and 58% were not asked about possible triggers. ECG was performed in all but one case. Approximately half of new presentations had blood tests requested. Examination was adequately performed in almost all patients but pulses were documented in only half of patients. Appropriate advice was documented for half of the cases. Onward referral was made to the local cardiology clinic in 29% of patients, referral back to GP in 23% and 10% were in existing follow up at specialist tertiary clinics.

Conclusions Nearly 15% of patients presenting with palpitations had arrhythmia, commonly SVT. There was huge disparity in the management of palpitations in our ED. ECGs were routinely performed and most patients had an adequate examination. However, all patients should be asked about family history of cardiac disease, triggers for and duration of palpitations. Examination of pulses should be documented and appropriate advice given at discharge. Where clinically indicated, children presenting with palpitations should have FBC and TFTs. Children with recurrent palpitations will benefit from cardiology outpatient

59% : No family History was asked

58% : No triggers were asked

30% : Duration of symptoms were not asked

Lack of consistent approach

15% of all palpitations were arrhythmia mostly SVT



Palpitation is a Symptom

History holds the key to diagnosis

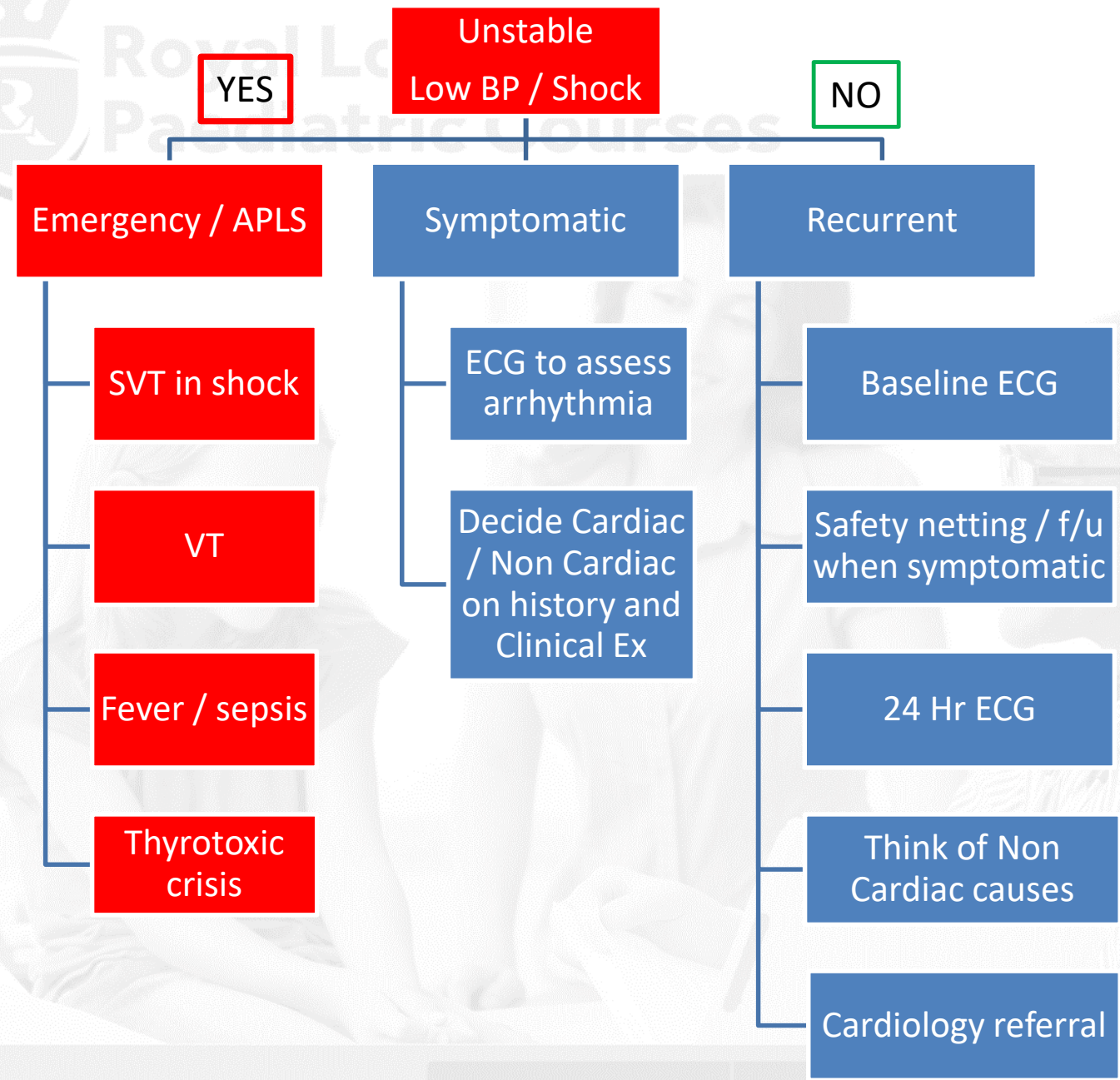
Cause	Aetiology	Associated features
Sinus Tachycardia	Fever, Anaemia, Hyperthyroidism Drugs: Salbutamol, Caffeine Panic attack Anxiety	Slow onset, sustained, related to illness. Weight loss, sweating Asthma, Drug intake
	Others: Pheochromocytoma	Hypertension, flushing
Infant / toddler	Non specific Irritability Inconsolable cry	Poor perfusion High lactate / acidosis on Gas



Palpitation is a Symptom

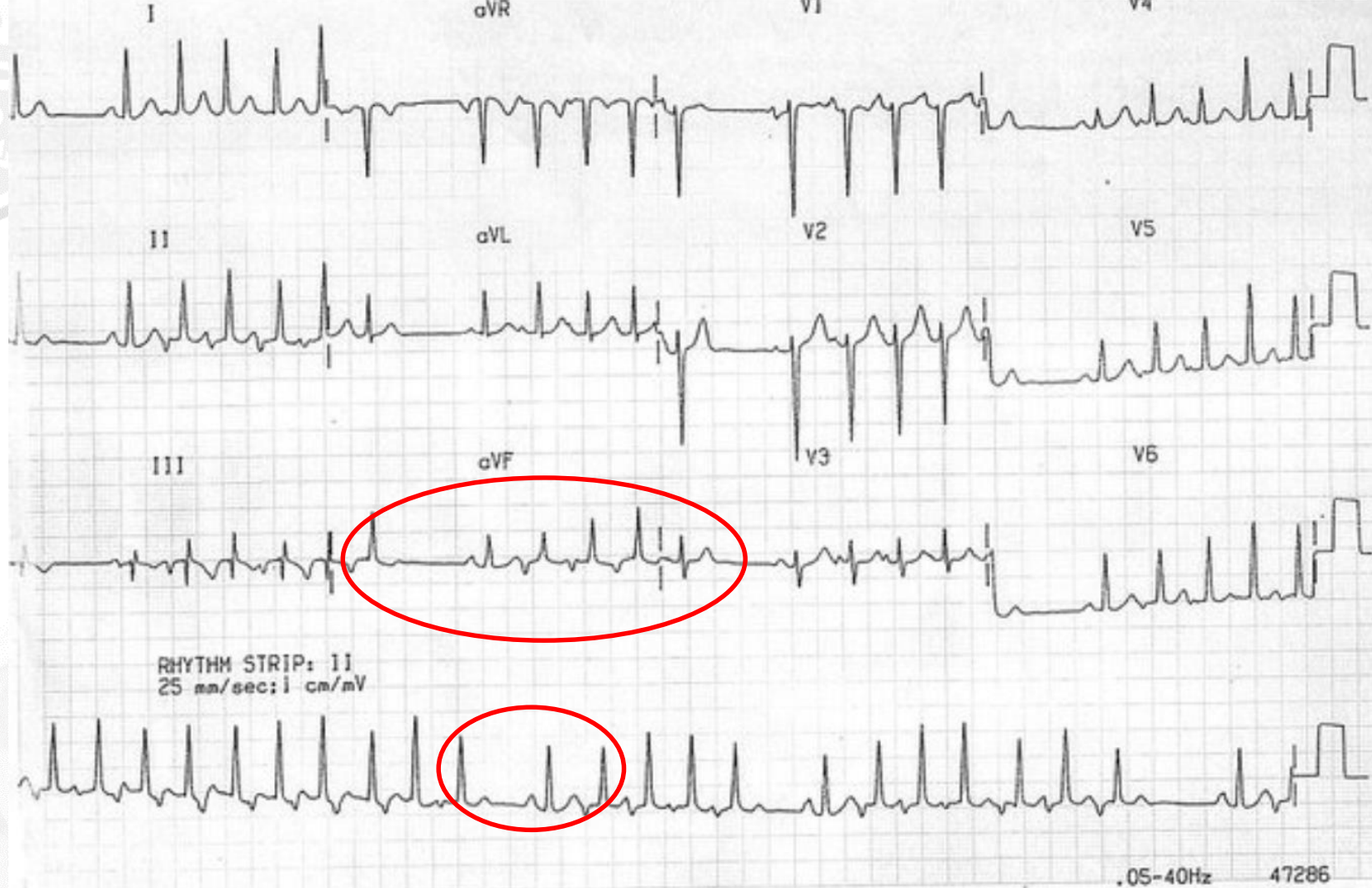
History holds the key to diagnosis

Cause	Aetiology	Associated features
Cardiac	Supra Ventricular Tachycardia (SVT)	Sudden onset, Recurrent Most 'bigger' patient shave worked out ways to terminate Family history
	Prolonger SVT	Fainting, chest pain, poor perfusion
	Ventricular VT Long QT syndromes	Exercise / Drug induced Family history Baseline bradycardia
	Ectopic beats	Sudden jerk/jolt Caused with stimulants
	Heart muscle D/s Myocarditis/ Cardiomyopathy	Gradual worsening, pericarditis Murmurs, gallop, Pulmonary oedema, raised RA pressure

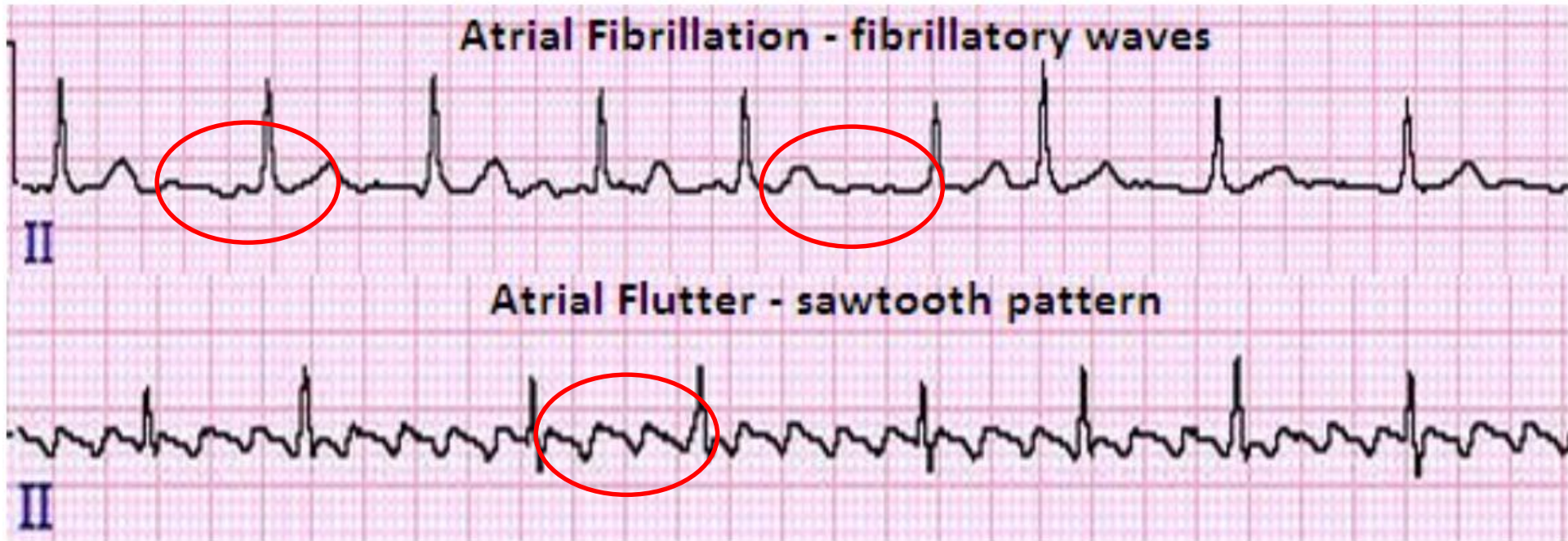


Palpitation (points to remember)

- Perform baseline ECG in all
- Consider both Cardiac / non cardiac causes
- High index of suspicion
- Detailed history
- If any clinic signs: then thoroughly investigate
- Detailed safety netting
- Follow up plans

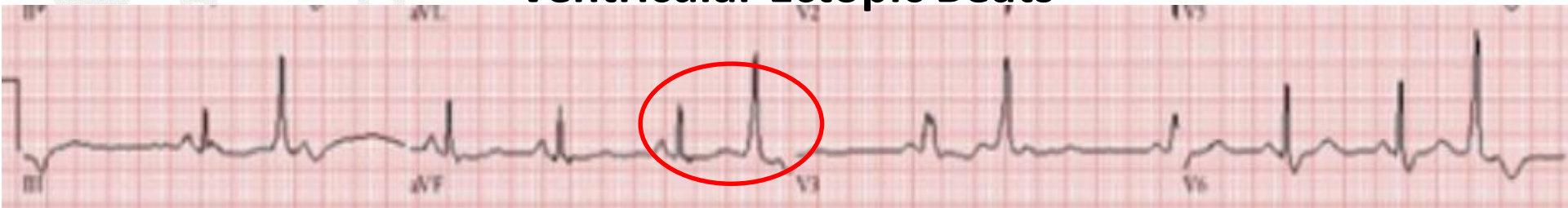


SVT: Sudden onset / Sudden termination



**Atrial flutter/Fibrillation: Uncommon
(feels like butterflies in chest)**

Ventricular Ectopic Beats



Ventricular Bigeminy



Ventricular Couplets



Non sustained VTs





Important references:

- NICE. Revised May 2015. Clinical Knowledge Summaries - Palpitations. <https://cks.nice.org.uk/palpitations>
- UpToDate. <https://www.uptodate.com/contents/approach-to-the-child-with-palpitations>
- American Heart Association. Children and Arrhythmia. [https://www.heart.org/HEARTORG/Conditions/Arrhythmia/UnderstandYourRiskforArrhythmia/Children-and-Arrhythmia UCM 301982 Article.jsp](https://www.heart.org/HEARTORG/Conditions/Arrhythmia/UnderstandYourRiskforArrhythmia/Children-and-Arrhythmia_UCM_301982_Article.jsp)





Royal London Paediatric Courses

Chest Pain and Palpitation

Many Thanks for listening

Dr Cheentan Singh
cheentan.singh@nhs.net