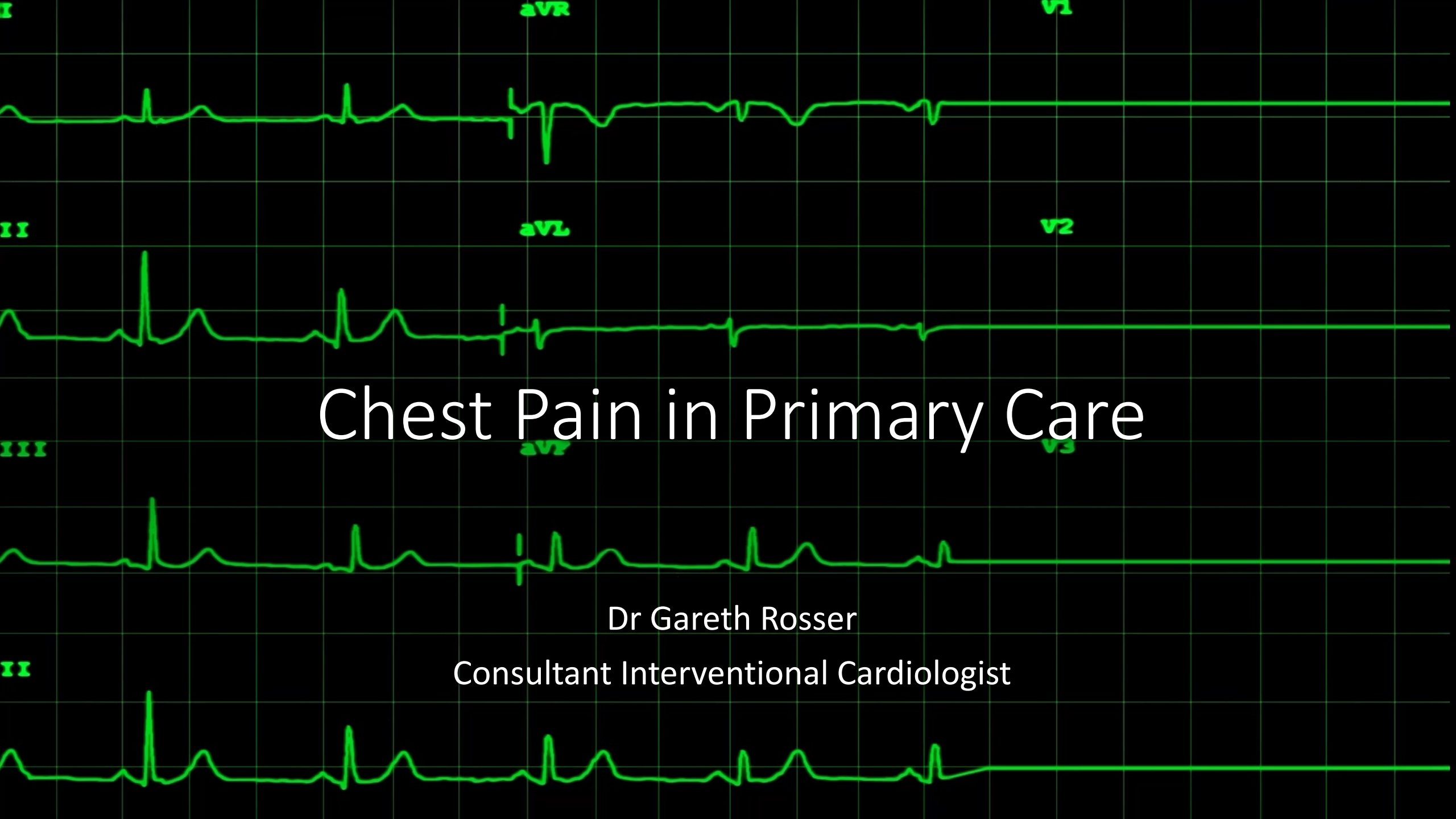


Chest Pain in Primary Care

Dr Gareth Rosser

Consultant Interventional Cardiologist

The extent of the problem

- Chest pain is in the top 10 presentations to your practices
- Large number of potential causes
- Anxiety provoking for patients and doctors

But…….

- 14 out of 15 referrals to our RACPC are for patients who ultimately do not have obstructive CAD and the vast majority leave with no cause of their symptoms identified

Stress reliever

- Revascularisation with PCI only has prognostic benefit in patients presenting with acute coronary syndromes

- Revascularisation with PCI may be of no benefit at all over optimal medical therapy*

So what does NICE suggest?
Chest pain of recent onset

Take a detailed clinical history documenting:

- the age and sex of the person
- the characteristics of the pain, including its location, radiation, severity, duration and frequency, and factors that provoke and relieve the pain
- any associated symptoms, such as breathlessness
- any history of angina, MI, coronary revascularisation or other cardiovascular disease **and**
- any cardiovascular risk factors. **[2010]**

Carry out a physical examination to:

- identify risk factors for cardiovascular disease
- identify signs of other cardiovascular disease
- identify non-coronary causes of angina (for example, severe aortic stenosis, cardiomyopathy) **and**
- exclude other causes of chest pain. **[2010]**

Typical angina

Assess the typicality of chest pain as follows:

- Presence of three of the features below is defined as typical angina.
- Presence of two of the three features below is defined as atypical angina.
- Presence of one or none of the features below is defined as non-anginal chest pain.

Anginal pain is:

- constricting discomfort in the front of the chest, or in the neck, shoulders, jaw or arms
- precipitated by physical exertion
- relieved by rest or GTN within about 5 minutes. **[2010, amended 2016]**

Following referral of patients with chest pain – 90%+ triaged to RACPC

- RACPC team consists of a Physician's Associate and Senior Clinical Fellow under Consultant supervision
- Patients will undergo an ECG, thorough history and clinical examination

- Audit 19/20:
  - 40% non-cardiac chest pain and discharged without further investigation
  - 55% investigated with CTCA
  - 5% direct for invasive angiography

But…….

- 30% of events happen in patients in who were classified as suffering with non-cardiac symptoms

- Why?
  - Understand the cohort of patients referred – often with highly atypical CP but with risk factors “please see this patient with atypical CP but who is high risk”
  - Understand the pathophysiology of CAD
  - Non-cardiac chest pain is a reassurance to all concerned
  - Cardiac risk factors not optimised

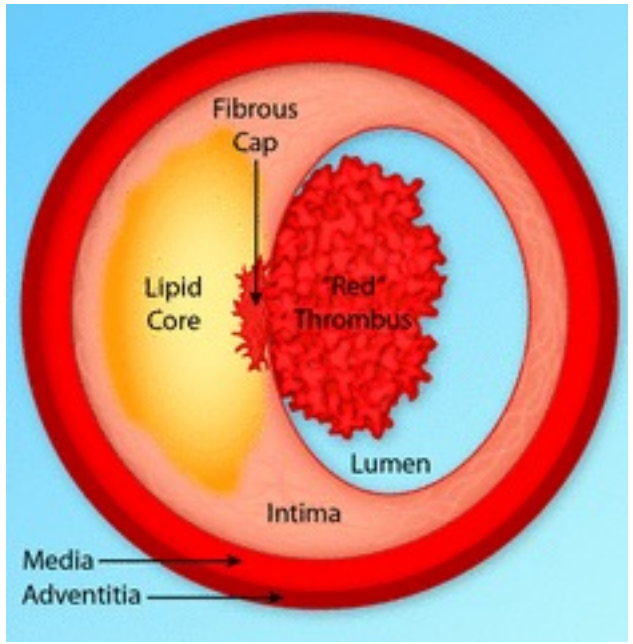
Coronary artery disease

Grading:

<50% mild

50-70% moderate

>70% severe

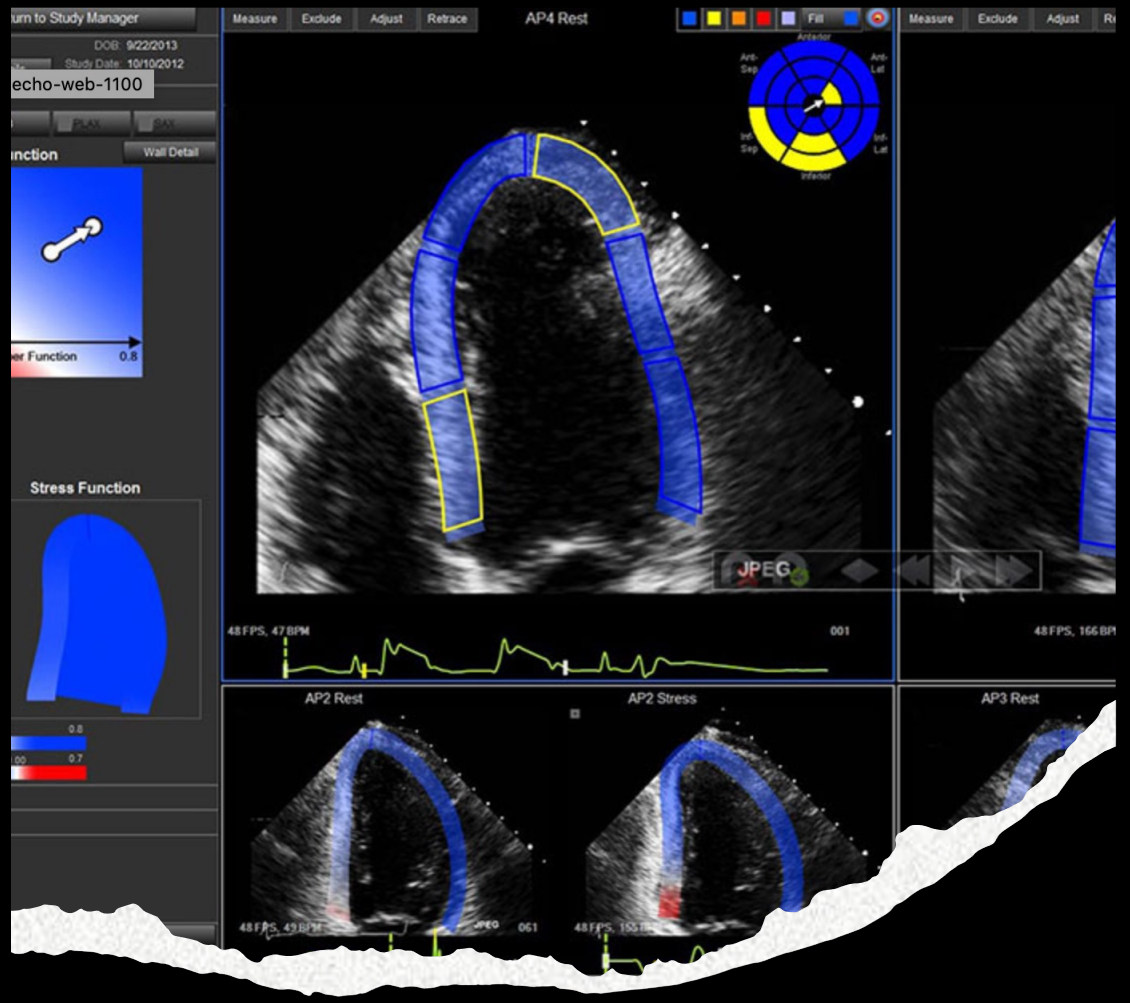


Investigations – non invasive anatomical

- CT coronary angiography
- Excellent first line investigation. Particularly useful in patients with ’virgin’ coronaries
- Can be limited by calcium, stents and arrhythmia

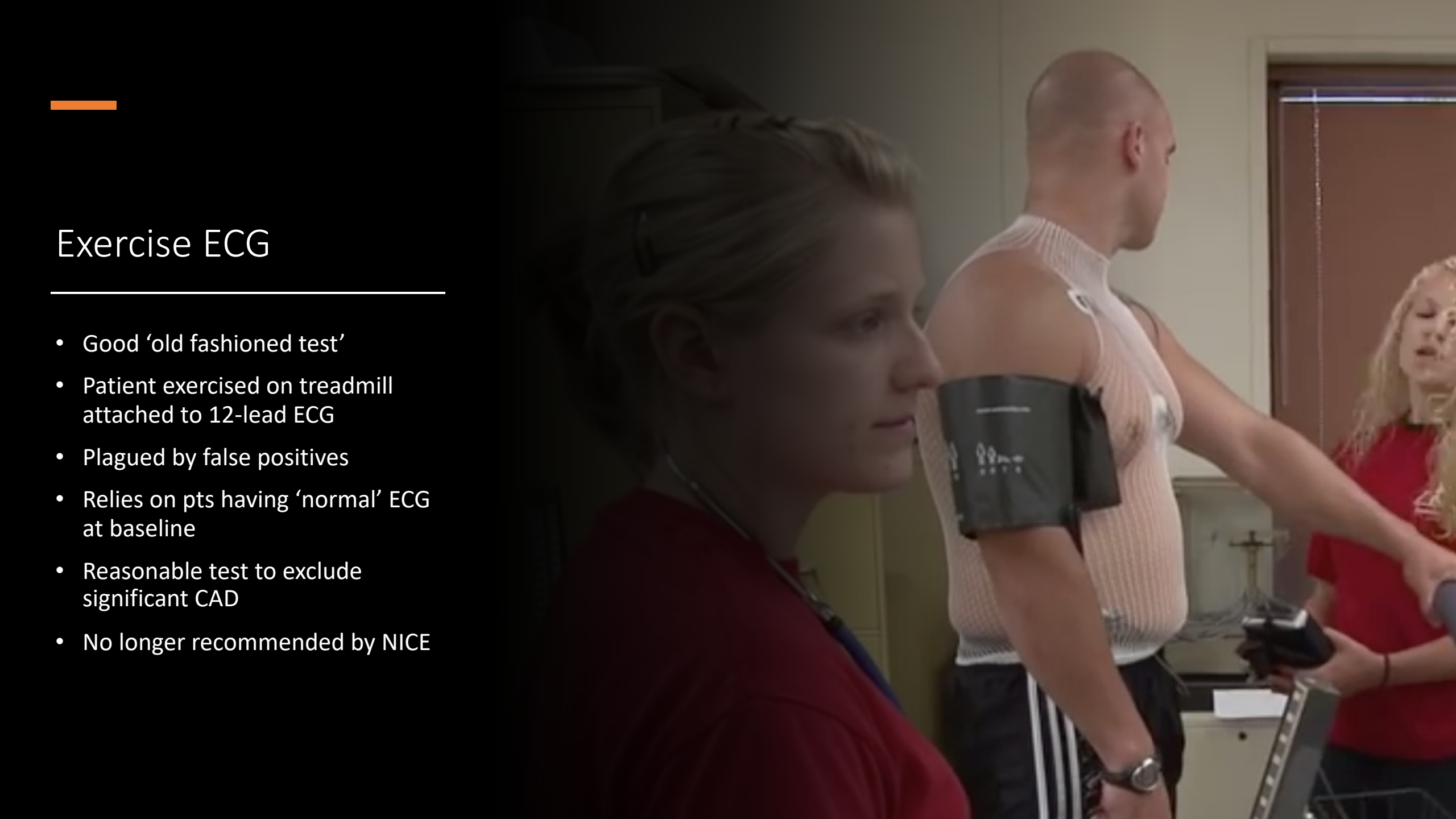
Functional assessments

- Stress echocardiography
- Assesses the presence of RWMA after physical stress or drug-induced stress (dobutamine - DSE)
- Provides quantifications (segments of ischaemia)



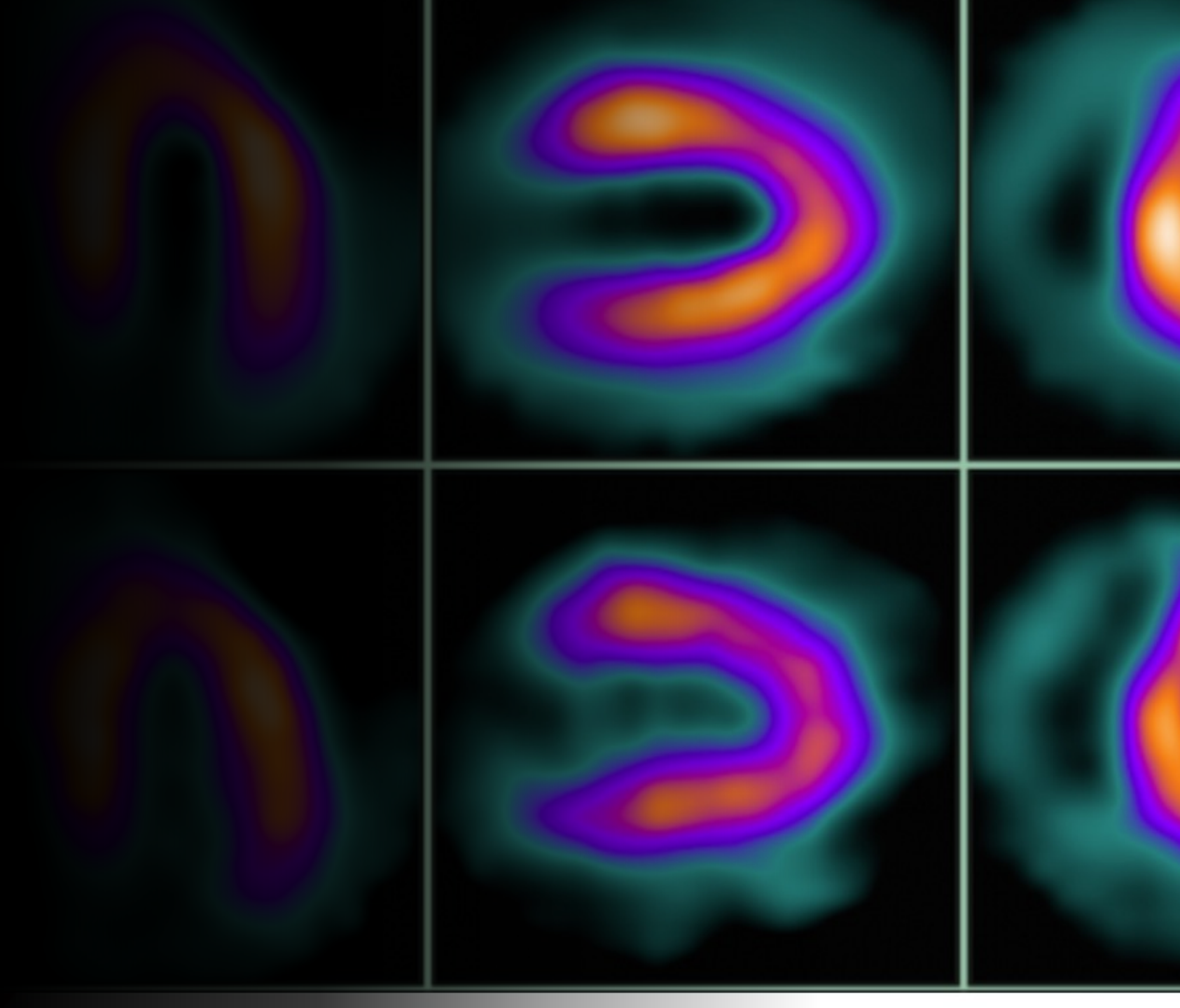
Exercise ECG

- Good ‘old fashioned test’
- Patient exercised on treadmill attached to 12-lead ECG
- Plagued by false positives
- Relies on pts having ‘normal’ ECG at baseline
- Reasonable test to exclude significant CAD
- No longer recommended by NICE



Myocardial perfusion scan (nuclear/thallium)

- Injection of radioactive material
- Generally heart scanned twice
  - Once during stress
  - Then again after ‘cooling off’ period
- Scans compared
- Provides useful information on quantification.



cMRI with perfusion

- Provides a comprehensive assessment of heart function including stress
- According to studies at least as accurate as DSE and MPS in assessment of ischaemia

Invasive assessment

- Coronary angiography
- Allows us to assess coronary artery disease most accurately
- Can perform further invasive function assessment
  - FFR/iFR
- Invasive anatomical assessment
  - IVUS/OCT
- PCI performed at the same time

Coronary revascularisation

- Should now be reserved for acute coronary syndromes and those with resistant chest pain (optimised on antianginal therapy)

- Putting a stent into a coronary artery is the start of the treatment not the end

- DAPT, long-term DAPT, antiplatelet / anticoagulant therapy combinations – always clarify with the person who has performed the angiogram/PCI

The biggest predictor of future events is prior events

- Medical optimization
  - Referral to cardiac rehabilitation (often done within Hospital)
  - Stop smoking
  - Strict cholesterol control (TC<4mmol/L; LDL<1.4mmol/L)
  - Aggressive control of diabetes and hypertension

Personal opinion

- We perform too much PCI globally
- Almost none of the patients are ‘optimised’ prior to the angiogram
- PCI remains the best treatment for symptomatic severe CAD despite what recent trials suggest

The RACPC problem

- Expanded 400% over the space of 10 years
- ‘Hit rate’ of 1 in 15 referrals
- Resource heavy
- Large numbers of patients radiated with CTs – stochastic injuries

- Is it worth it?

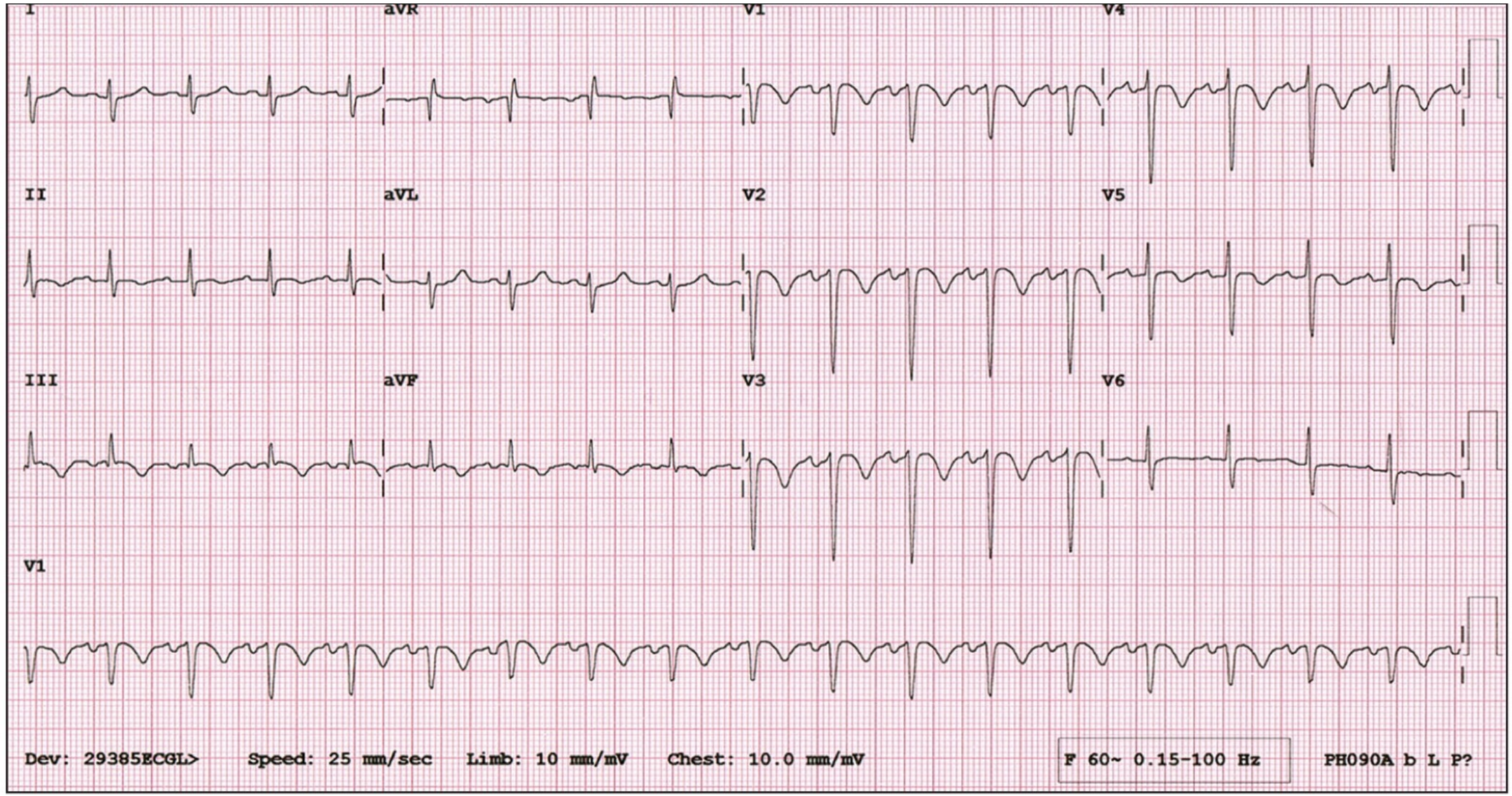
How do we break the cycle?
The primary care algorithm

- Risk stratify:
  - Take a thorough history and examination
  - Send a full blood screen including HbA1c and fasting cholesterol
  - Send the patient for an ECG +/- CXR if appropriate
  - Direct access echocardiography for those suspect of non-coronary causes

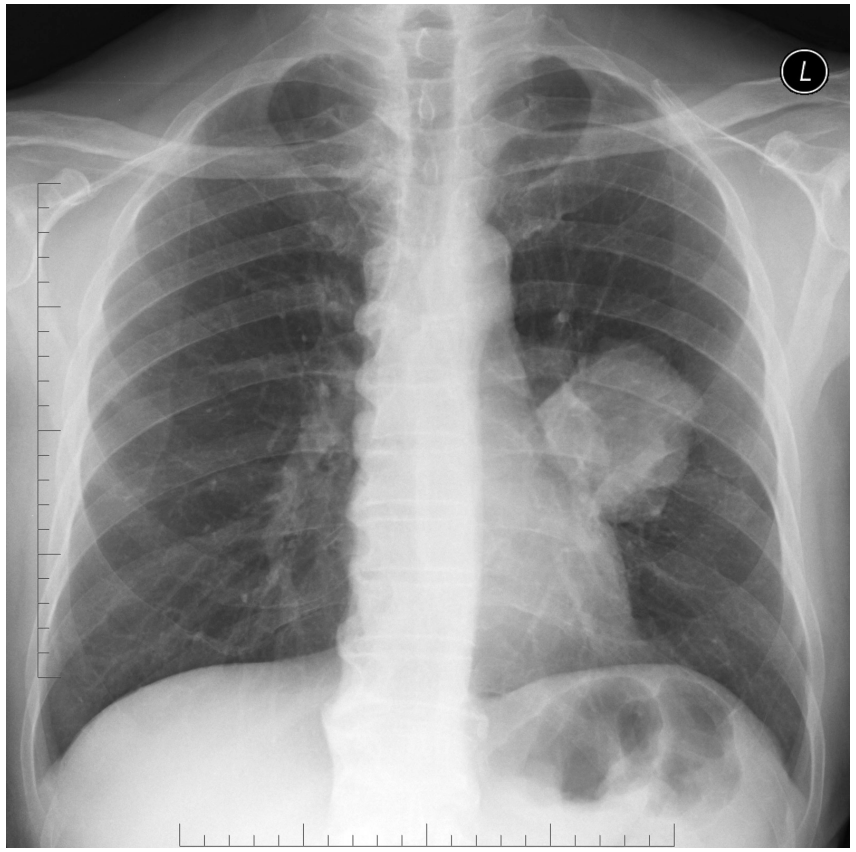
- Make a record on the characteristics of the pain
  - Typical
  - Atypical
  - Non-cardiac

- If you don't think it cardiac chest pain it very likely isn't and referrals to RACPC should be resisted
  - Optimise risk factors

- If you are concerned that the chest pain is cardiac mediated then start antiplatelet, statin, 2 antianginals (B blocker and DHP CCB are first line) and refer


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
Dev: 29385ECGL>
Speed: 25 mm/sec
Limb: 10 mm/mV
Chest: 10.0 mm/mV
F 60~ 0.15-100 Hz
PH090A b L P?

CXR can be useful – particularly in the young and old



Take away messages

- The vast majority of patients even with cardiac mediated chest pain are not in ‘danger’
- You have time to optimise medications
- At the time of referral to Hospital, start antiplatelet, statin and 2 antianginals
- QRISK scores are under-utilised and should routinely be used to risk stratify patients
- Any form of coronary revascularistion is just the start of the journey

Top tips

- Men < 30 and Women < 40 don't have chronic obstructive coronary artery disease*
- All interventions have a placebo effect but it is temporary
- The patients whose symptoms improve most predictably are those with classical symptoms to begin with
- "Angina equivalent" is over-played
- Normal CT coronary angiograms or invasive angiograms are good for 10 years
- Those patients with a normal MPS have a low rate of events in the following 10 years
- There is no evidence for investigations in the absence of symptoms – QRISK is the way forward
- The role for aspirin for primary prevention is not clear. Case by case basis

ECGs in primary care

Aims

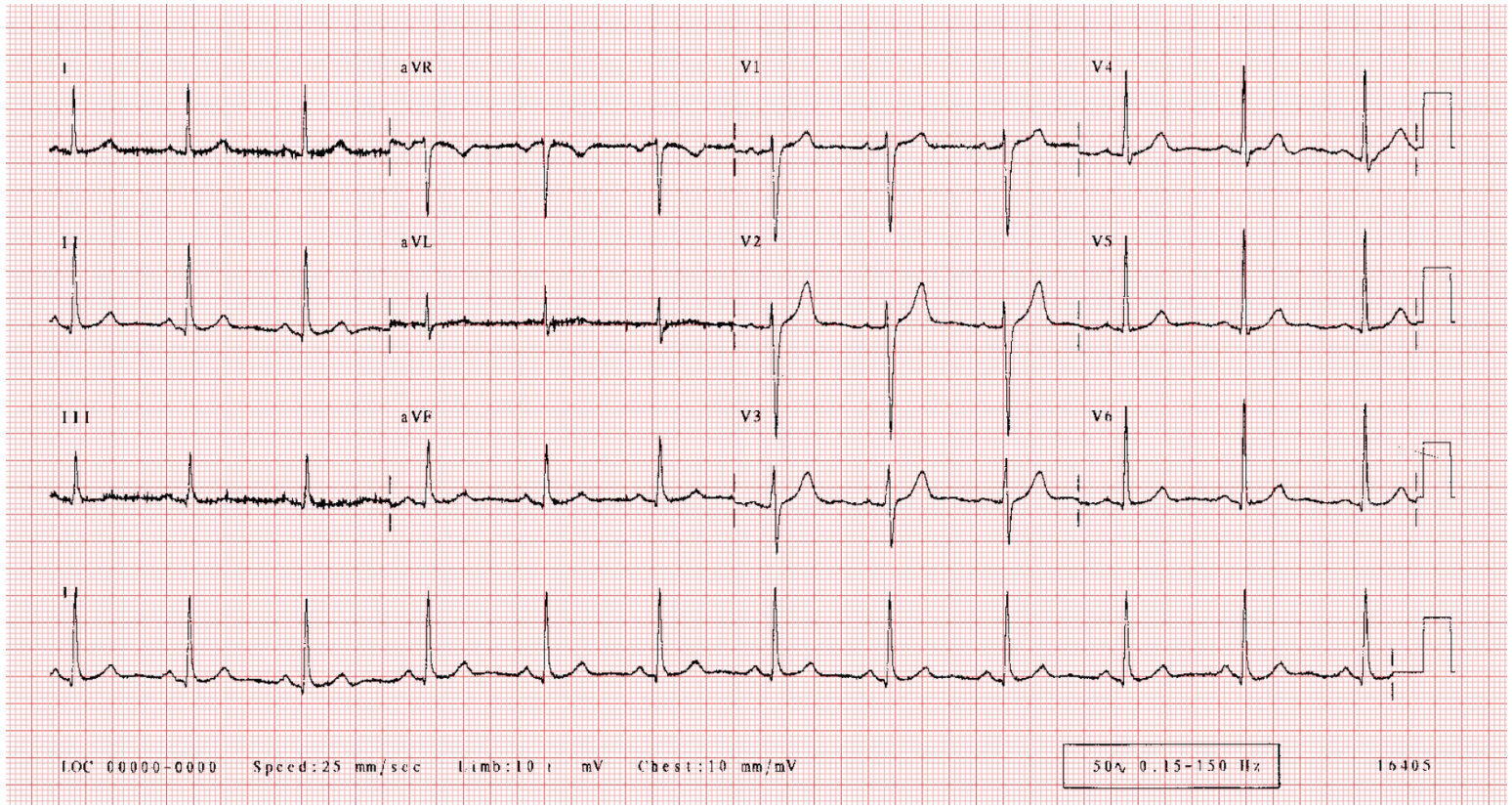
- To familiarise GPs with ECG patterns and abnormalities
  - Normal from abnormal
  - Common, benign variants
  - Abnormalities that require urgent intervention
  - What can be managed in primary care?

Prologue

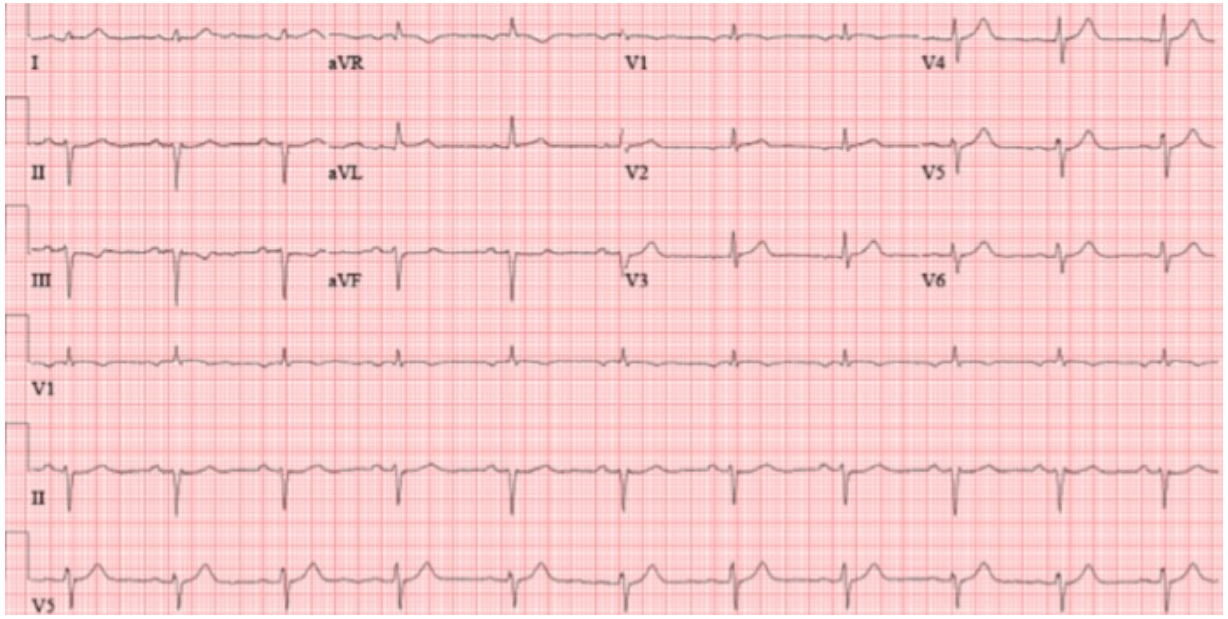
The ECG must always be interpreted in the context of the clinical presentation

Only very rarely do we act upon an ECG finding alone, the clinical presentation dictates how we apply the ECG findings in 99% of cases

Normal ECG

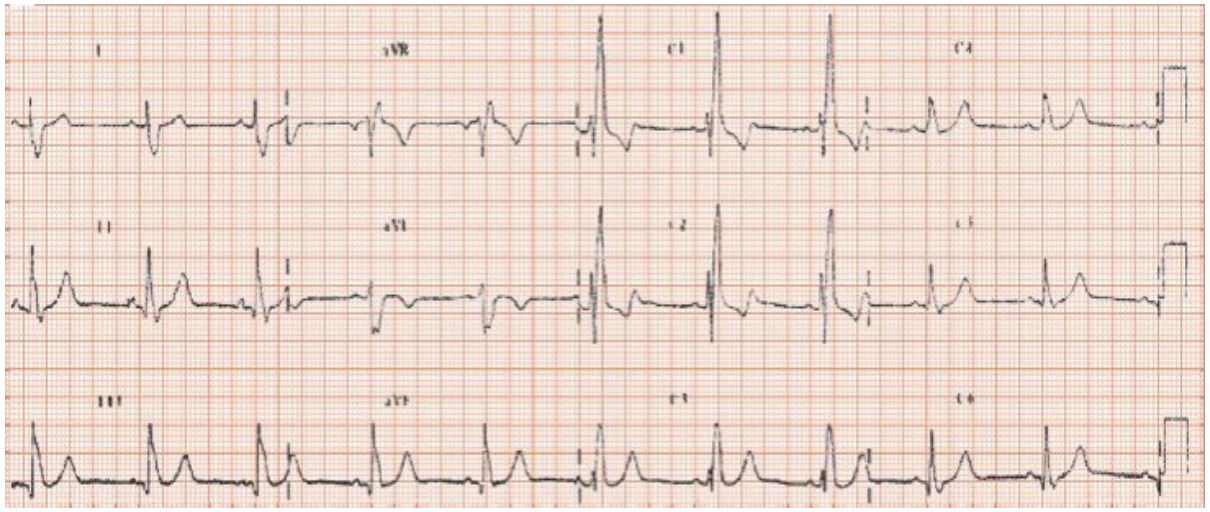

I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II
LOC 00000-0000
Speed:25 mm/sec
Limb:10 mV
Chest:10 mm/mV
50Hz 0.15-150 Hz
16405

Axis deviation
Left



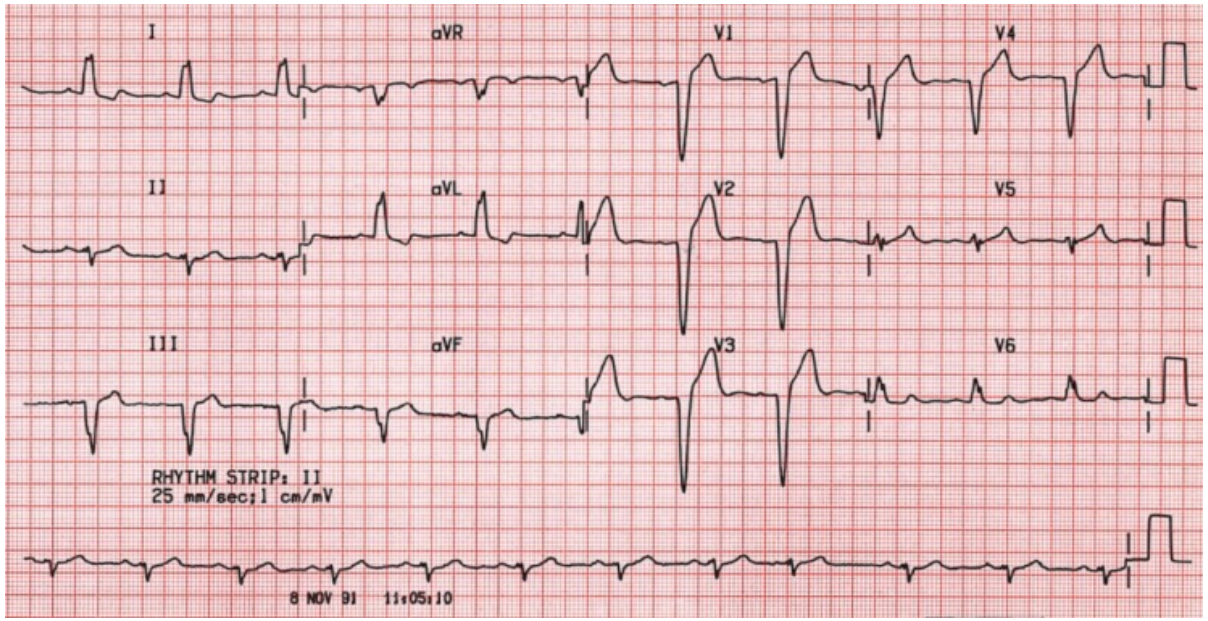
- Common
- Typically entirely benign
- Associated most commonly with HTN
- Would only perform further investigation if concomitant concerning symptoms

Right



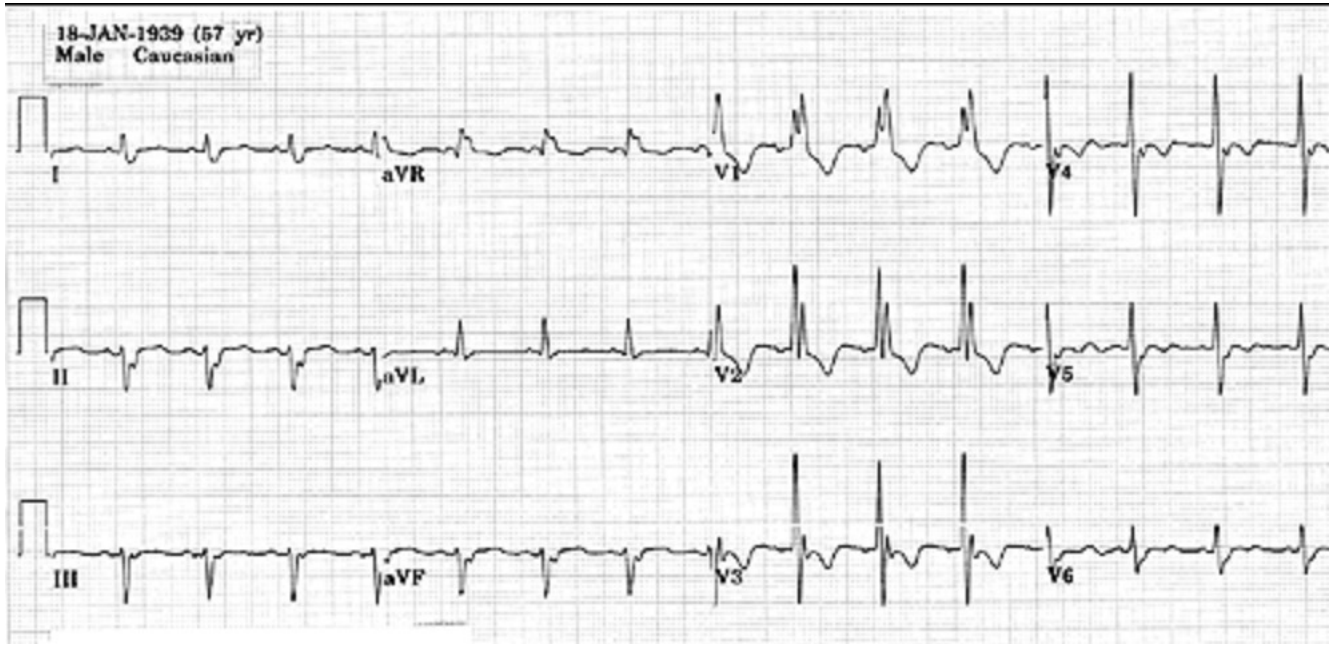
- Typically entirely benign
- Can be associated with lung disease resulting in strain on the right heart
- Would only perform further investigation if concomitant concerning symptoms

Bundle branch block
Left



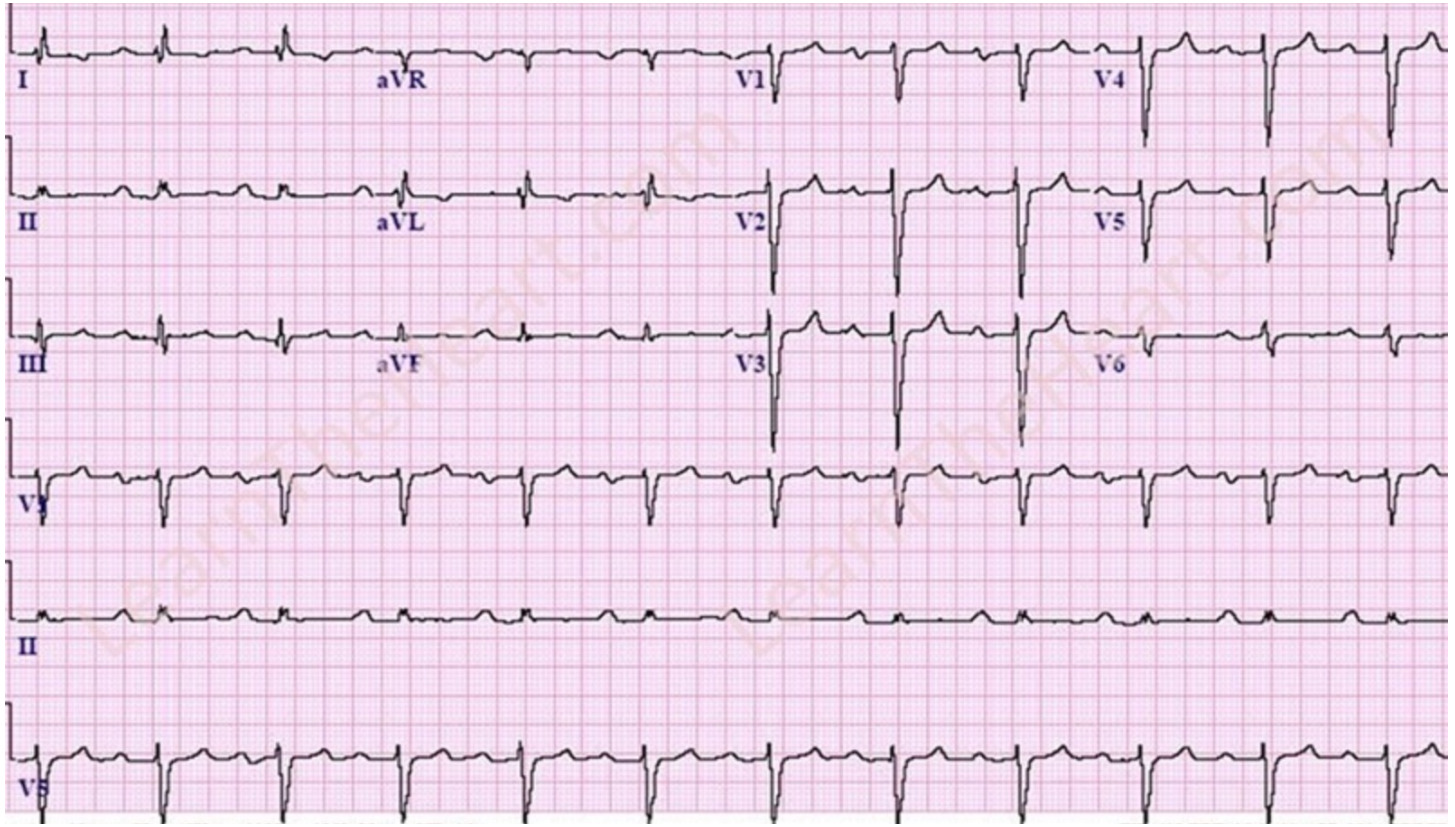
- QRS >120ms
- Dominant S wave in V1/2
- Often coincides with left axis deviation
- Most commonly associated with structural changes within the left ventricle
  - HTN
  - Cardiomyopathy
  - AV disease
- Can also be a sign of intrinsic conduction disease within the heart outside of the context of the above
- RARELY implies acute ischaemia
- Would typically recommend echocardiography to rule out structural heart issues

Bundle branch block
Right



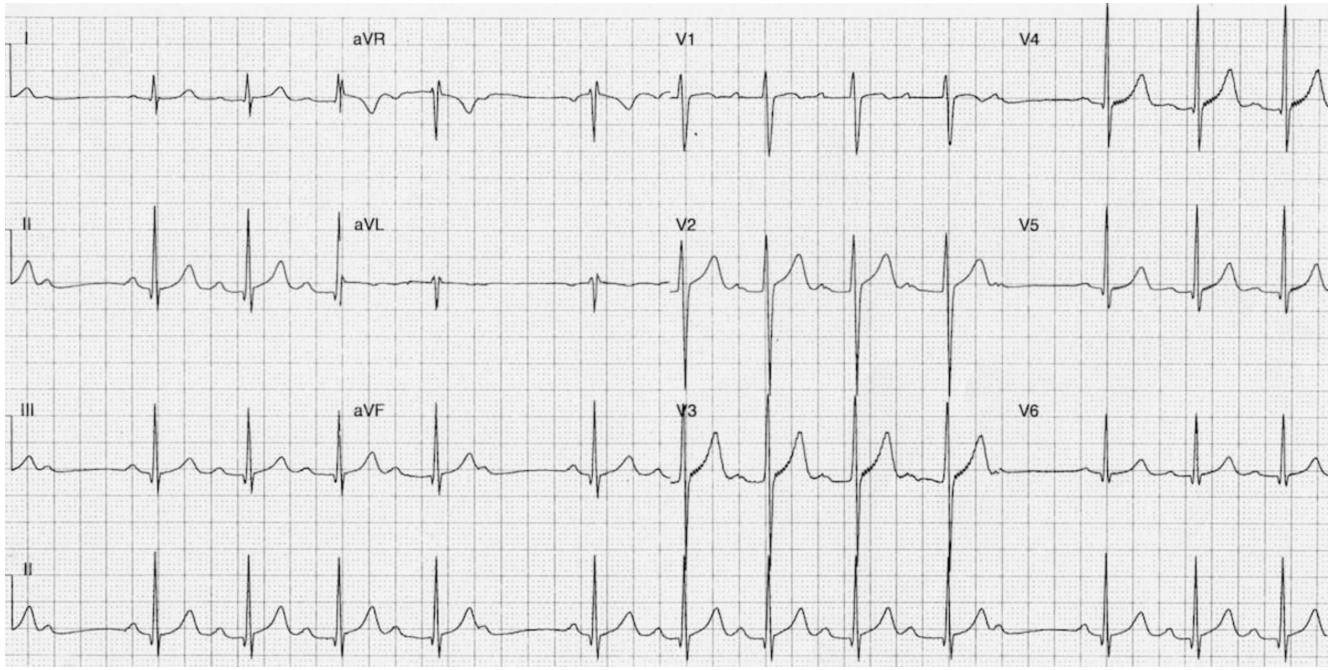
- QRS >120ms
- Dominant R wave in V1/2, with associated T wave abnormalities
- Most commonly an entirely benign finding with no structural heart issues
- Can be associated with right heart strain
- If coupled with evidence of further conduction disease, can mean significant intrinsic conduction disturbance and a low threshold for PPM if symptomatic (typically elderly patients)
- If present, would only look to perform investigation if other symptoms present

1st degree AV block



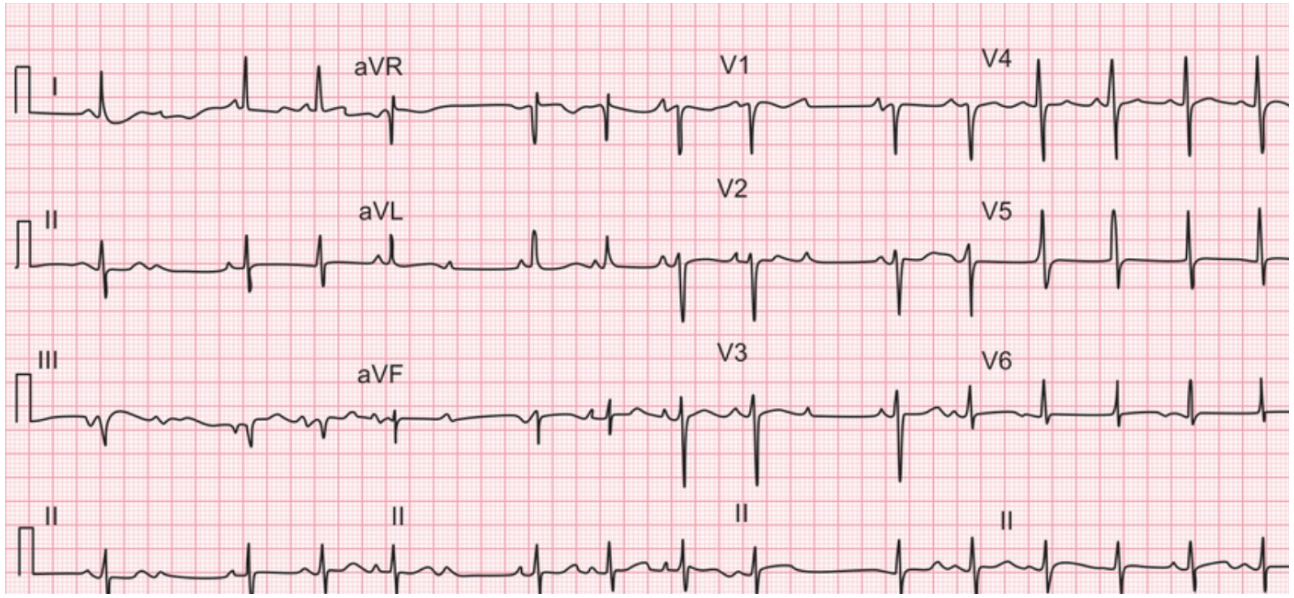
- PR interval >200ms
- Common
- Young (high vagal tone)
- Old (intrinsic conduction disease)
- By itself requires no further investigation unless there are other concomitant symptoms

2nd degree AV block
Mobitz 1
Wenckebach



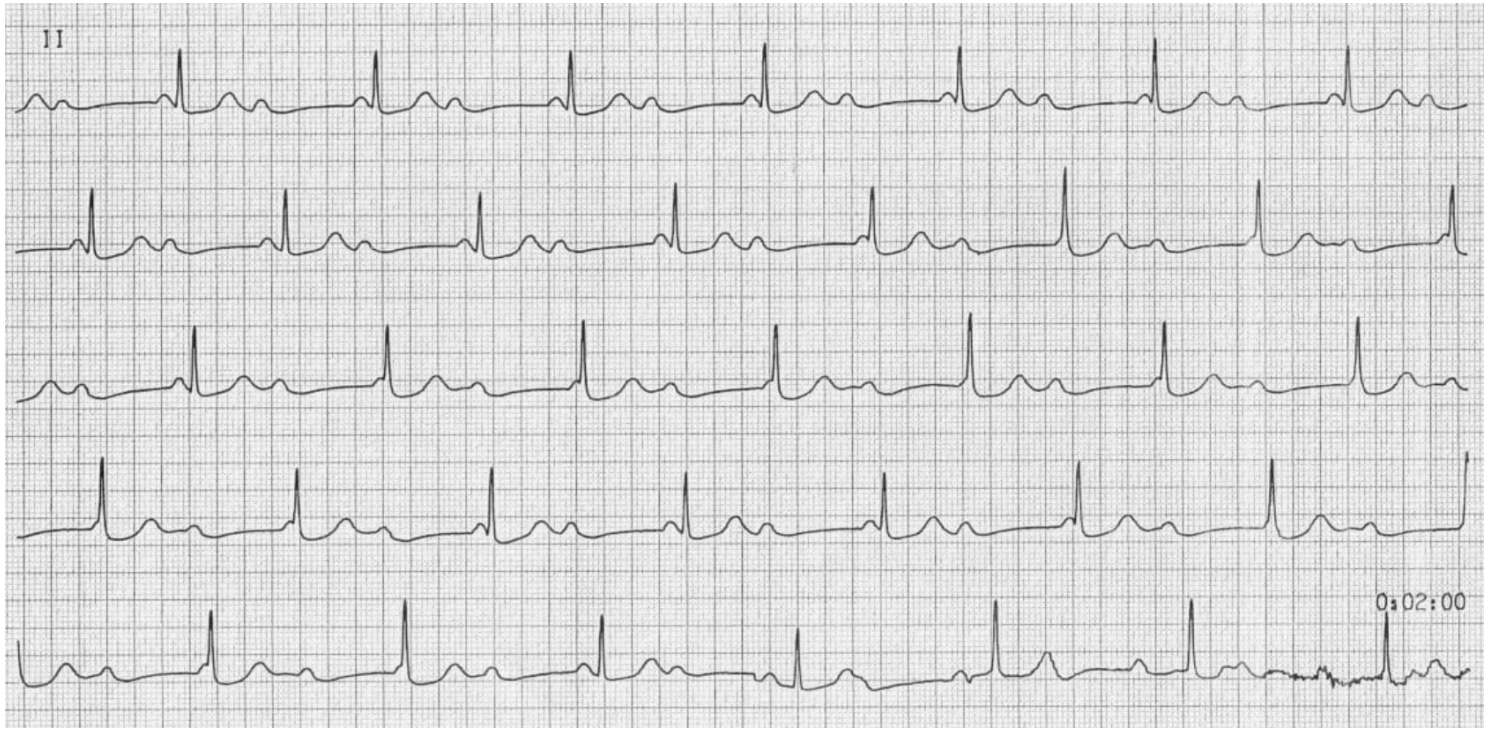
- Young (high vagal tone), especially overnight
- Old (intrinsic conduction disease), more common overnight
- Stop offending rate limiting medication
- If overnight only and no symptoms of bradycardia then typically no intervention required
- Daytime Wenckebach more unusual and may require PPM insertion. Should be referred for assessment. If syncopal then to refer to ED

2nd degree AV block
Mobitz 2



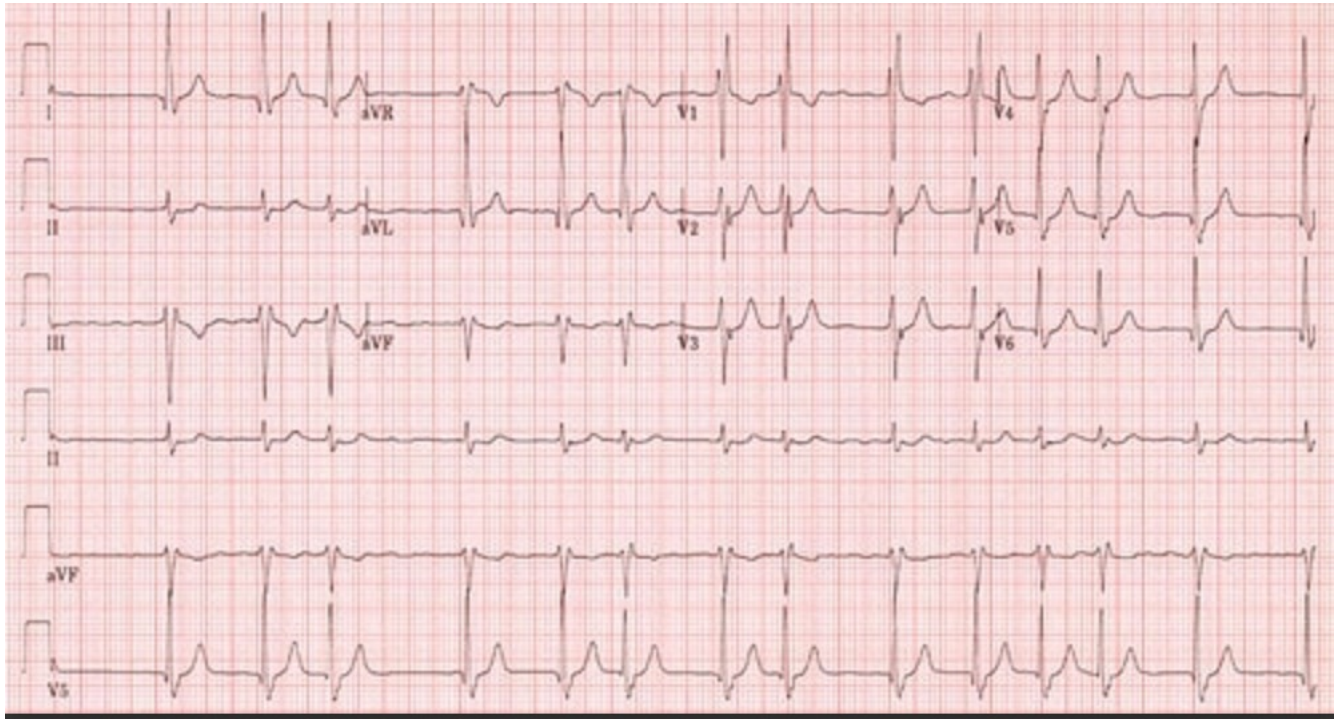
- Typically in older patients (intrinsic conduction disease)
- Stop offending rate limiting medication
- Refer urgently to ED

3rd degree AV block
Complete heart block



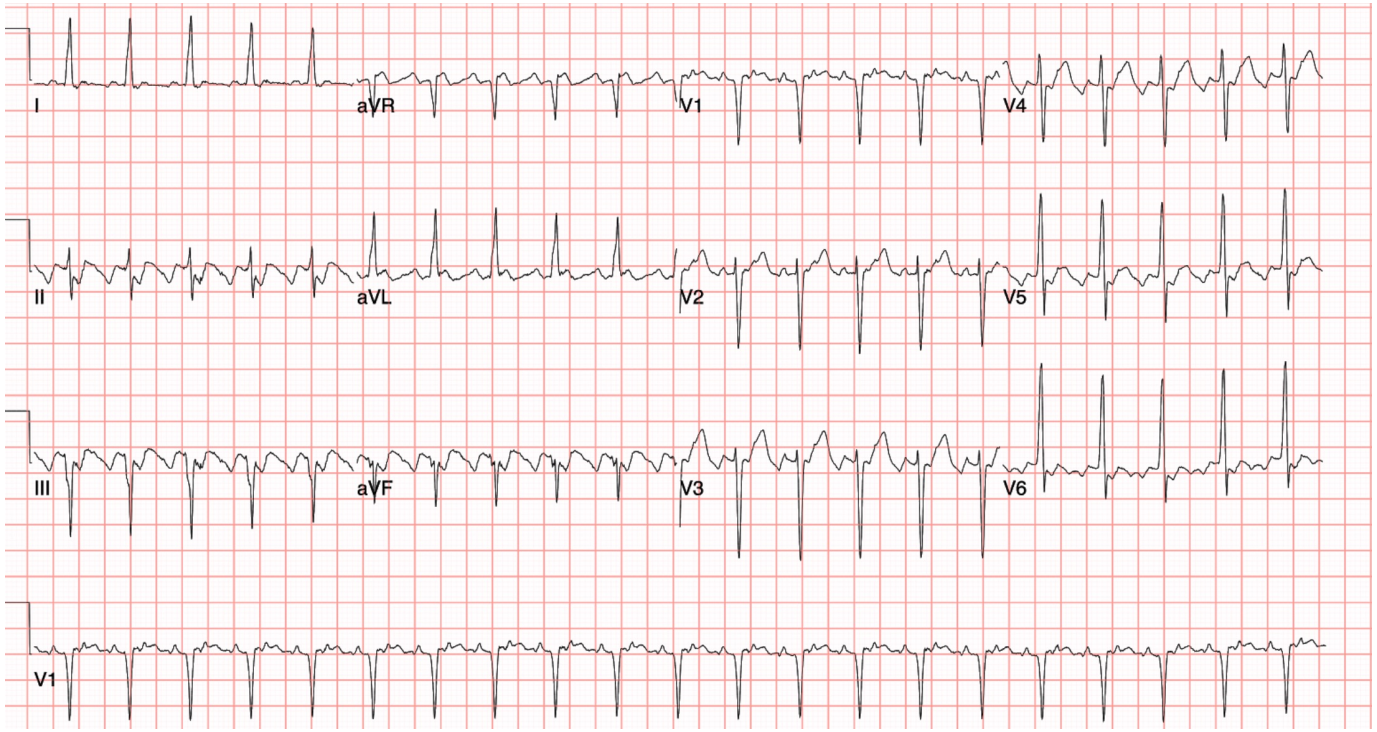
- Typically in older patients (intrinsic conduction disease)
- Very common in the context of acute right coronary ischaemia (STEMI)
- Stop offending rate limiting medication
- Refer urgently to ED

Atrial fibrillation



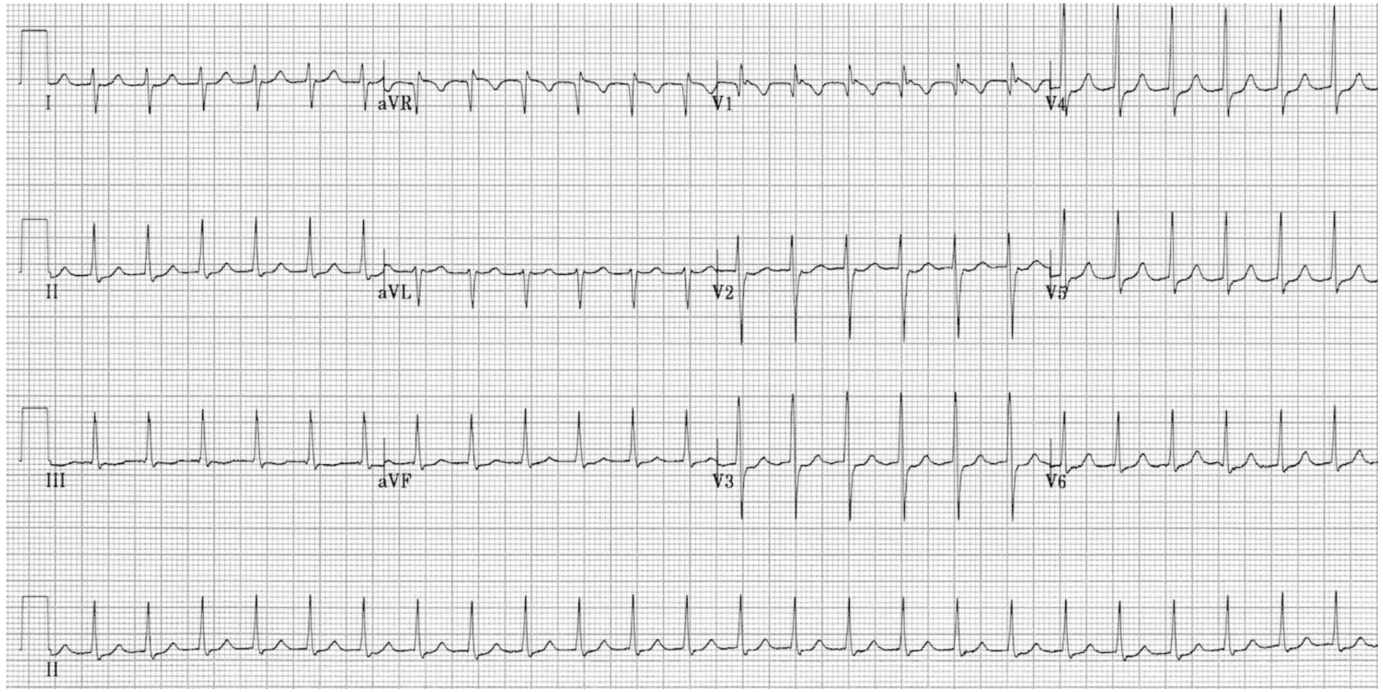
- Incidence increases with age
- Structural heart changes promote Afib so an echo mandatory
- Most patients require anticoagulation, most will meet criteria for a DOAC
- The management initially is with a DOAC and rate limiting medication. Don’t wait to start the DOAC, you could prevent a stroke
- Long-term management dependent upon symptoms.

Atrial flutter



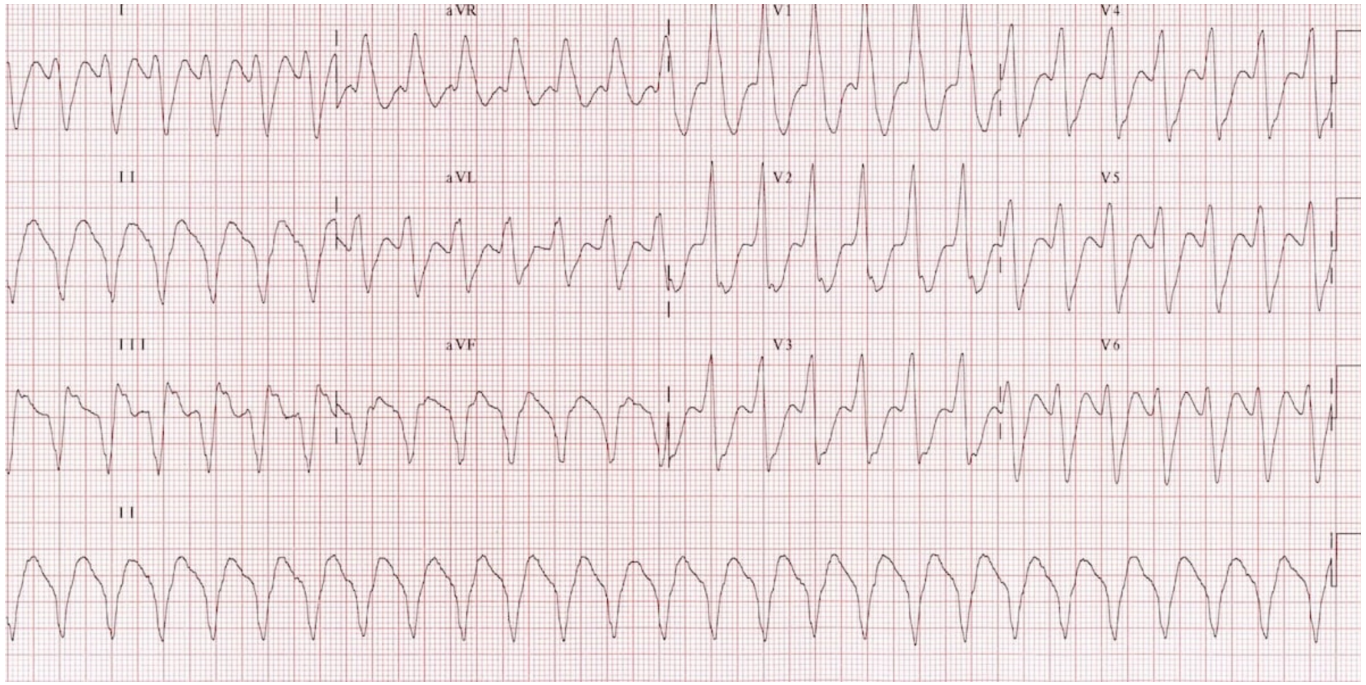
- Managed as per atrial fibrillation
- Can be more difficult to achieve tight heart rate control with flutter
- Perhaps an earlier role therefore for cardioversion and ablative therapy

SVT



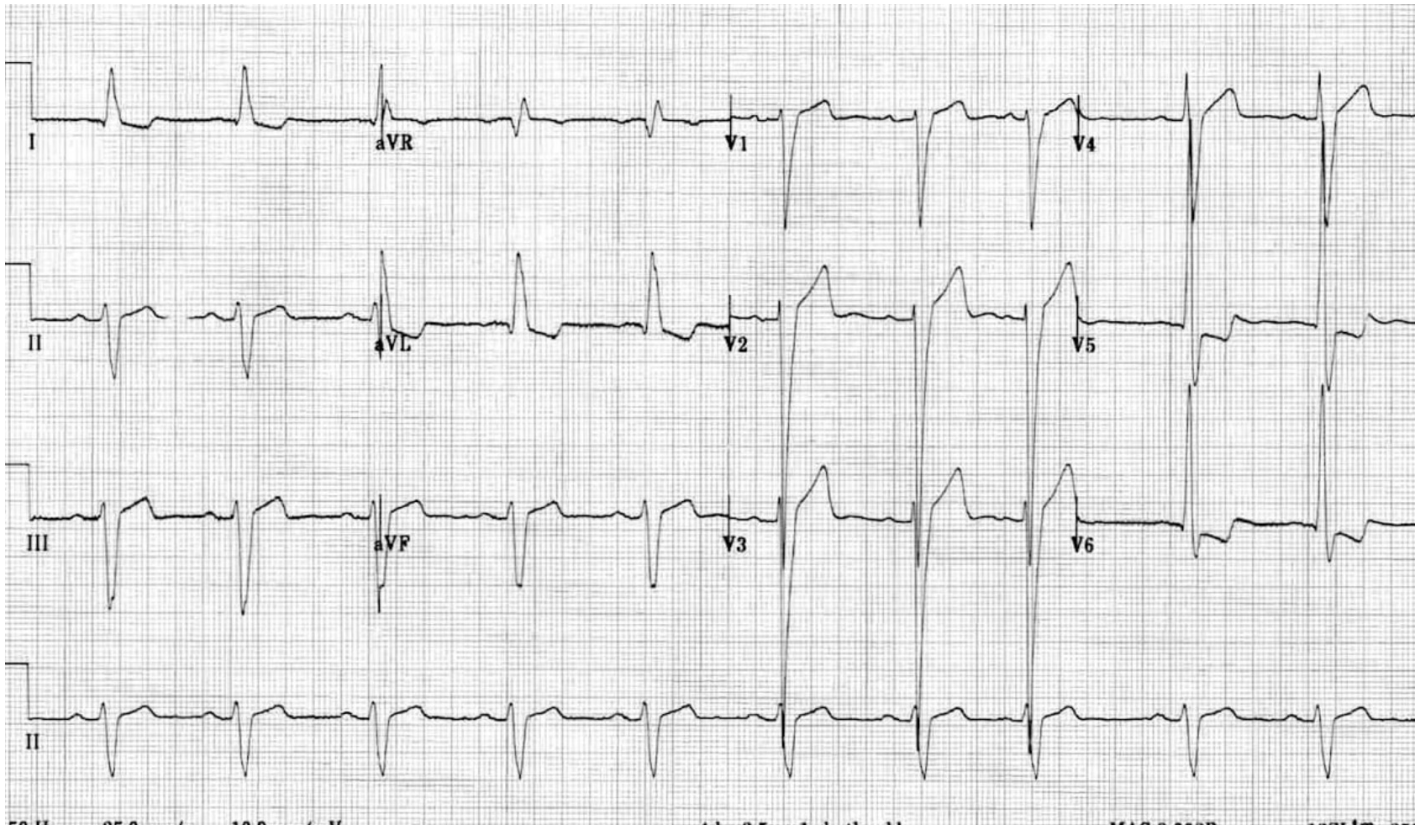
- Regular tachycardia
- Patients often describe burts of fast palpitations
- Any age but perhaps more common in younger patients
- Can provide rate limiting medications or flecainide but ablative therapy almost always curative so please refer

VT



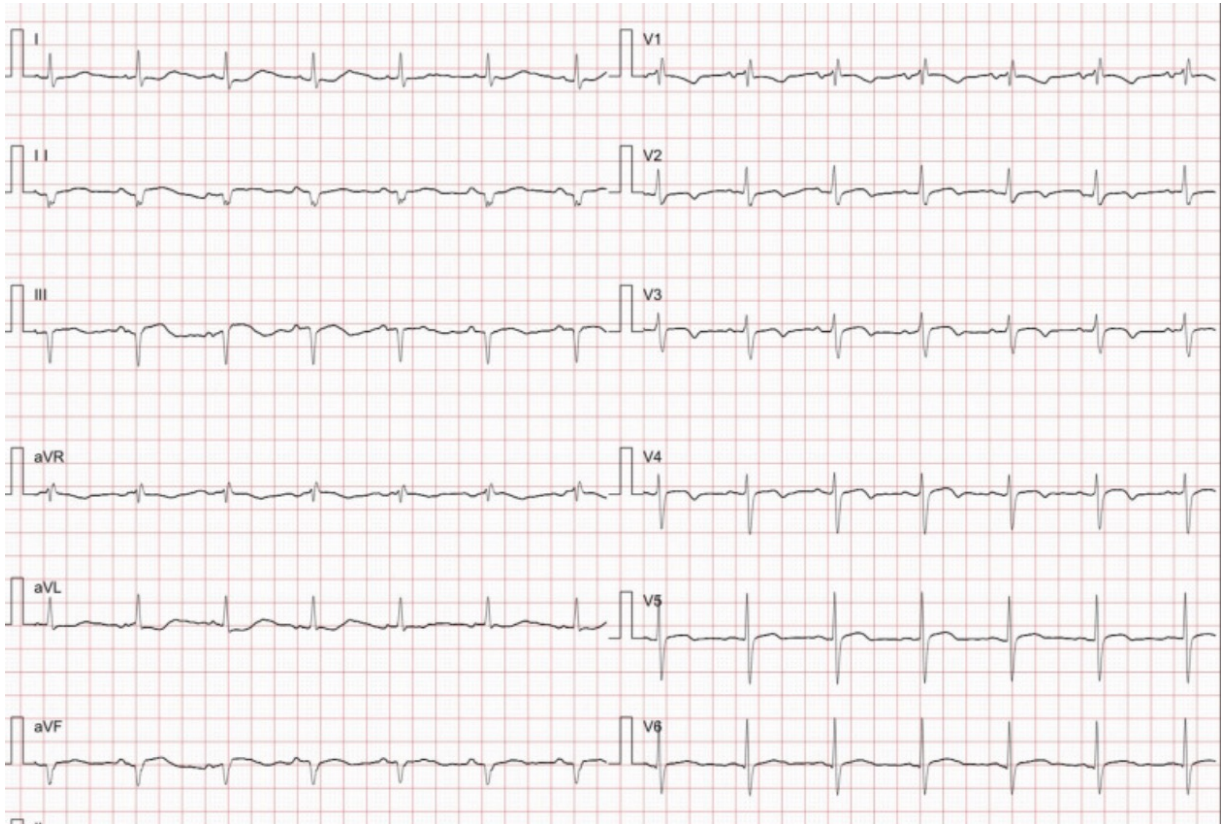
- Regular tachycardia
- Commonly associated with syncope/presyncope
- Typically generated from scar within the heart not ischaemia
  - Common in patients with established heart disease
- Call 999

ST segment abnormalities



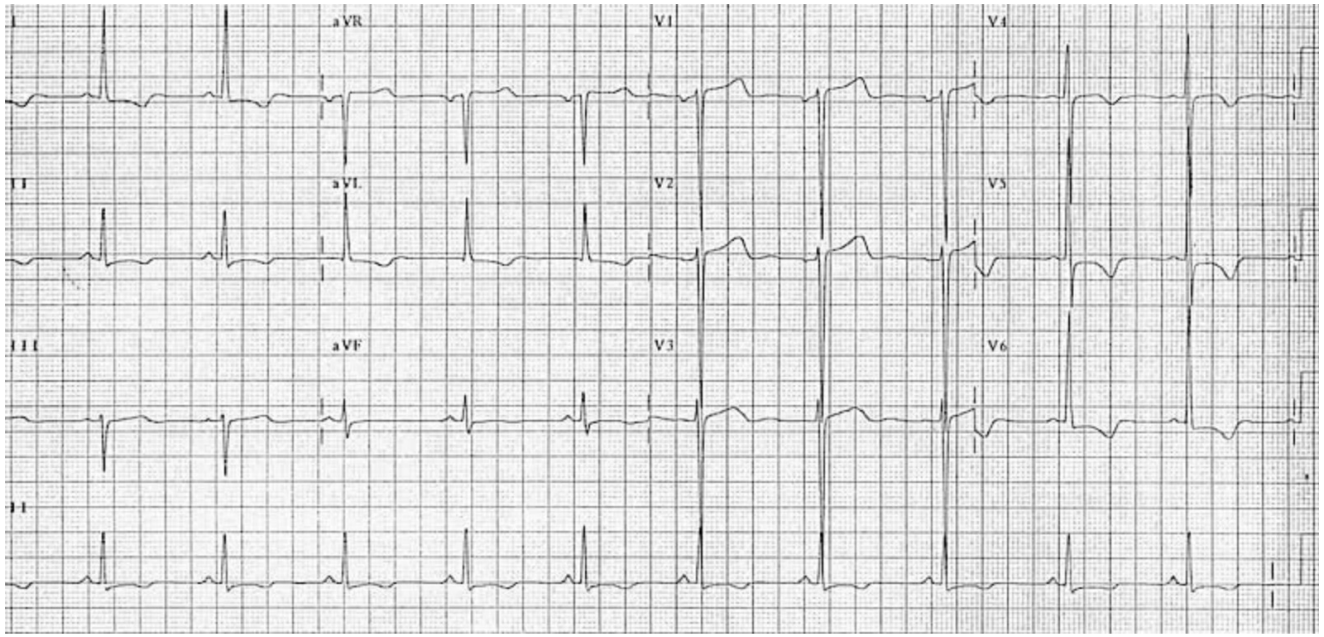
- Lots of variety of ST segment change
- Commonest by far we see on 12 lead resting ECG is this pattern
- This is as a result of LVH (strain)
  - HTN
  - AV disease
- Rarely ischaemia

T wave abnormalities
Post CABG



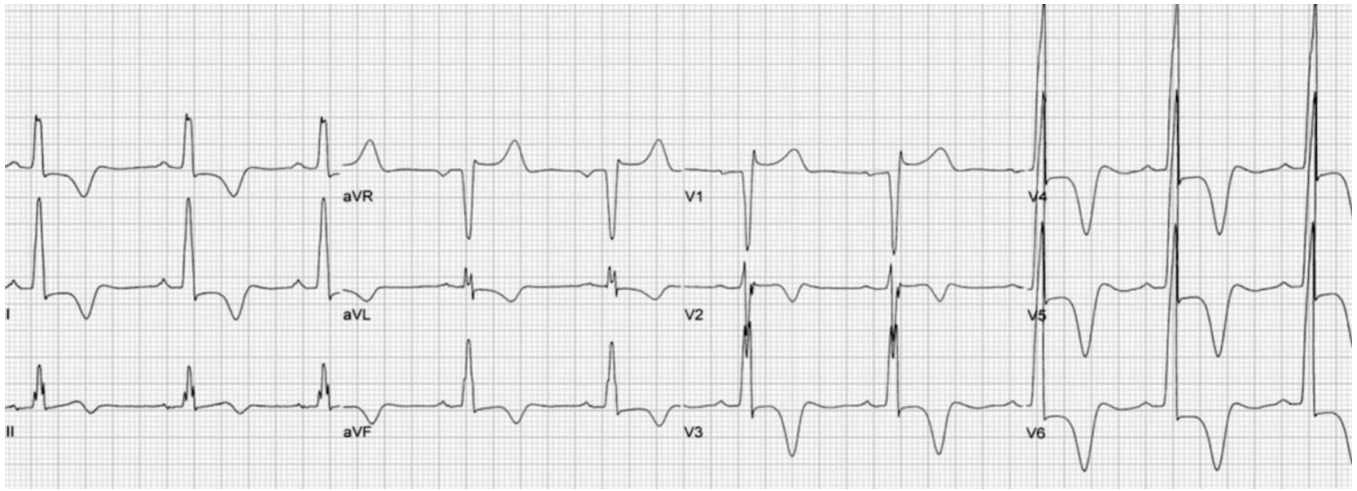
- Wide variety of abnormalities common and entirely benign post CABG
- Try to obtain ECGs performed post operatively for comparison
- Echo to exclude structural heart abnormalities

T wave abnormalities
Lateral TWI - LVH



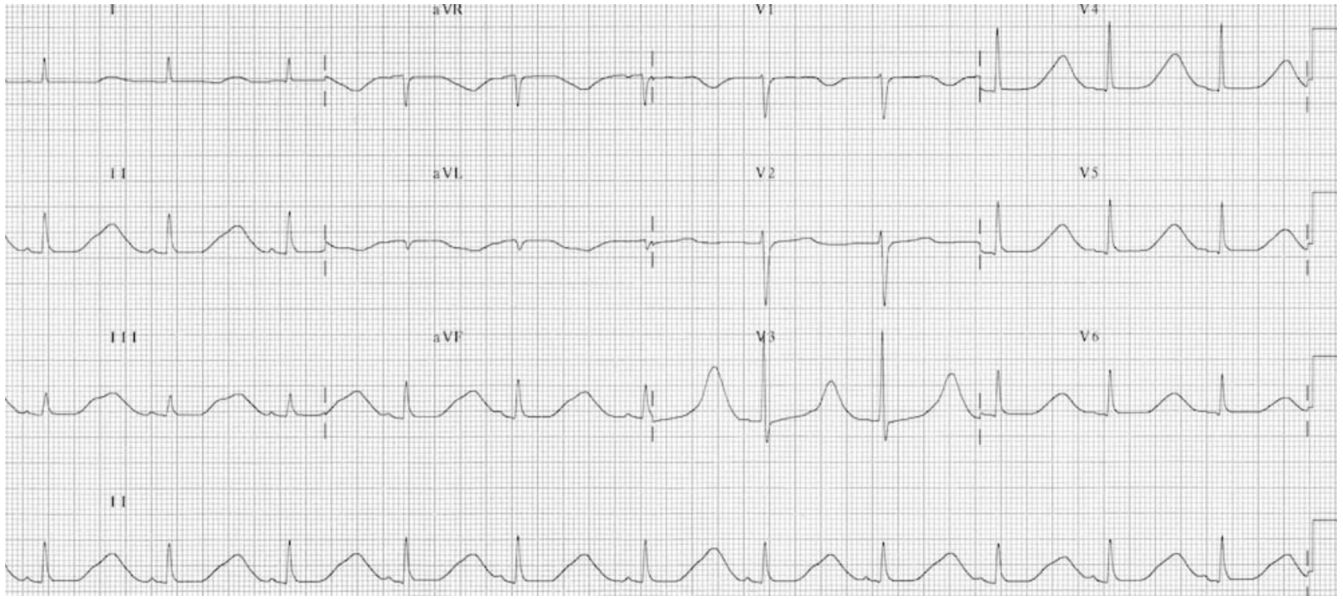
- HTN
- AV disease
- Echo to confirm

T wave abnormalities
Anterolateral deep TWI - cardiomyopathy



- Echo to confirm

Prolonged QT syndrome



- Check that its actually prolonged
  - BBB or u waves confusing computer calculation
- Eyeball guide is >50% R-R interval (this rules out prolonged QT v often
- <500ms unlikely to be clinically important
- Clinical context, check electrolytes
- Stop offending meds
- Refer via A&G if concerns

Summary

- Hopefully now more confident in interpreting and managing common ECG abnormalities
- Most ECG abnormalities can be dealt with in primary care with direct access diagnostics if required
- Any concerns with ECGs to contact secondary care via A&G (typically respond within 24hrs)

Questions?

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www.garethrossercardiology.com