Palpitations

Disclaimer

See also Heart Conditions and Pregnancy.

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Red Flags

- Shortness of breath
- Chest pain
- Heart failure
- Syncope, presyncope, or loss of consciousness
- Persisting tachyarrhythmia on electocardiogram (ECG)

Background – About Palpitations

Palpitations are the patient's awareness of their heartbeat, which may feel rapid, heavy, slow, regular, or irregular.

- Most episodes seen in primary care are not associated with cardiac pathology and only a minority of cases require advanced investigation or specialist assessment.
- A diagnosis can usually be made from a detailed history, examination, and basic investigations.

Assessment

1. History – Note any ***diagnostic clues:***

Sinus tachycardia:
- *Gradual onset and offset*
- *Basically regular although rate may vary slightly*
- *Able to count rate (less than 160 beats per minute)*
- *No significant haemodynamic compromise*

Ectopic beats:
- *Often described as missed, skipped, or strong beats, or weak extra beats*
- *Particularly noticed at rest*

Atrial fibrillation:
- *Irregularly irregular*
- *Usually faster than normal sinus rate*
- *May start or stop suddenly (paroxysmal atrial fibrillation (PAF))*
- *May be associated with symptoms of haemodynamic instability*

Supraventricular or ventricular tachycardia:
- *Sudden onset and offset*
- *General very rapid, and can be described as "too fast to count"*
- *Often associated with symptoms of haemodynamic instability*

➢ *Encourage patients to fully describe their symptoms.*

➢ *Ask specifically about* **episodes, symptoms, triggers,** *and any previous cardiovascular disease.*

Episodes, symptoms, and triggers
- *Frequency and duration of episodes*
- *Triggers, especially any association with exercise*
- *Awareness of symptoms starting and stopping, e.g. sudden, gradual*
- *Estimated heart rate*
- *Whether beats are regular or irregular*
- *Associated symptoms, e.g. breathlessness, chest pain, syncope, or presyncope*

- ***Ask about medications with arrhythmic potential***.
  - *Tricyclic antidepressants*
  - *Phenothiazines*
  - *Digoxin*
  - *Anti-arrhythmic drugs*
  - *Decongestant preparations*
  - *Beta-2 agonists, e.g. salbutamol*
  - *Theophylline*

- Check family history, especially of ***sudden unexplained death.***

  When there is a history of sudden death or arrest aged less than 30 years, consider the possibility of inheritable conditions causing arrhythmias or cardiomyopathy. If suspected, investigate further in patients with palpitations, and all their first–degree relatives.

- Ask about ***caffeine intake*** (including energy drinks), alcohol and drug use, and smoking status.

  There is a widespread belief that caffeine causes palpitations. However, evidence suggests caffeine is unlikely to be a major factor in people with or without heart disease.[1]

- Consider any possible ***underlying conditions.***
  - *Anxiety*
  - *Infection*
  - *Anaemia*
  - *Thyroid disease*
  - *Pregnancy*
  - *Electrolyte imbalances*

2. Examination:
- Perform cardiac and respiratory examination, including blood pressure and temperature.
- Look for signs suggesting anaemia, or thyroid disease.
- Assess for ***red flags*** where immediate cardiology assessment is required.

  Red flags
  - *Shortness of breath*
  - *Chest pain*
  - *Heart failure*
  - *Syncope, presyncope, or loss of consciousness*
  - *Persisting tachyarrhythmia on electocardiogram (ECG)*

3. Investigations:
- Arrange a 12-lead ECG, looking for any findings associated with:
  - ***WPW (Wolff-Parkinson-White syndrome)***

    For example, short PR interval and delta wave.

    See also ECG Images.
  - ***Long QT syndrome***
  - ***Paroxysmal atrial fibrillation***
    - *Defined as an episode of atrial fibrillation (AF) that stops spontaneously or< 7 days of intervention.*
    - *Often asymptomatic.*
    - *Symptoms (if any) are as for AF. May notice irregular palpitations.*
    - *Can progress to AF. This is more likely with increasing age, and if:*
      - *hypertension*

    - *heart failure*
    - *underlying heart condition.*
  - *See ECG Images.*

- ***Brugada syndrome***
  Brugada syndrome is an ECG abnormality:
  - *characterised by incomplete right bundle-branch block and ST-segment elevations in the anterior precordial leads.*
  - *associated with a high incidence of sudden death in patients with structurally normal hearts.*
    See ECG Images.

- ***Right bundle branch block (RBBB)***
  RBBB is a common ECG abnormality:
  - *Characterized by:*
    - *broad QRS > 120 ms in duration.*
    - *RSR' pattern in V1 to 3 ('M-shaped' QRS complex)*
    - *wide, slurred S wave in the lateral leads (I, aVL, V5 to 6).*
  - *Associated features of ST depression and T wave inversion in the right precordial leads (V1 to 3).*
  - *Usually an incidental finding on an ECG.*
  - *If seen in elderly individuals without heart problem, this could be due to the degenerative changes of the right bundle as a part of normal ageing process.*
  - *If symptomatic with chest pain, shortness of breath, or syncope, causes may include:*
    - *right ventricular hypertrophy or cor pulmonale.*
    - *pulmonary embolus.*
    - *ischaemic heart disease.*
    - *rheumatic heart disease.*
    - *myocarditis or cardiomyopathy.*
    - *degenerative disease of the conduction system.*
    - *congenital heart disease e.g., atrial septal defect.*

  See ECG Images

- ***Left bundle branch block (LBBB)***
  LBBB is an ECG abnormality:
  - *Characterized by:*
    - *broad QRS complex > 120 ms in duration.*
    - *upright monomorphic R waves in V5, V6, aVL and lead I without Q waves.*
    - *no secondary R wave in V1.*
  - *Incomplete LBBB is diagnosed when a patient has the ECG criteria for LBBB but the QRS duration is less than 120 ms.*
  - *It is unusual for LBBB to exist in the absence of organic disease.*
  - *Causes of LBBB include:*
    - *aortic stenosis.*
    - *ischaemic heart disease.*
    - *hypertension.*
    - *dilated cardiomyopathy.*
    - *anterior myocardial infarction.*
    - *primary degenerative disease (fibrosis) of the conducting system (Lenegre disease).*
    - *hyperkalaemia.*

    - *digoxin toxicity.*
  - *Differential Diagnosis – left ventricular hypertrophy may produce a similar appearance to LBBB, with QRS widening and ST depression or T-wave inversion in the lateral leads.*
  - *It is difficult to be definite of an acute myocardial infarction in the presence of an LBBB without a rise in the serum troponin level or classic symptoms and signs.*
  - *Patients with incomplete or complete LBBB require full investigation, including a cardiac echocardiography, assessment of cardiovascular risk factors, consideration of functional stress testing and a cardiology consultation.*
  - *Patients with no impairment of exercise tolerance and no evidence of cardiac failure do not require any treatment other than reducing their cardiovascular risk factors as appropriate.*
  - *Pacemaker cardiac resynchronisation therapy is required for patients with LBBB who have a reduced ejection fraction, are symptomatic with exertion, and have cardiomyopathy.*

  See ECG Images

- If uncertain about ECG findings, seek cardiology advice and ***transmit the ECG image.***
  An image received via smartphone is preferable to a faxed image, which provides the poorest quality.
  To transmit an ECG image:
  1. *Arrange with the registrar or consultant an agreed transmitting mechanism (e.g., smartphone) and a contact number for sending the ECG image.*
  2. *Mutually agree on a follow-up mechanism to ensure ECG is received, read, and reported back to the general practitioner, so that the result is not lost to follow-up.*

  If the ECG is unhelpful, advise the patient to re-present during a symptomatic episode to their general practice, the nearest after-hours centre, or emergency department. Alternatively, smartphone ECG apps e.g., AliveCor, and devices such as the Apple watch are becoming less costly and are more frequently used to screen for abnormalities.

  ECG diagnosis
  The gold standard for diagnosis is correlation of symptoms with ECG rhythm. However, this may not be possible and ECG diagnosis is not necessary to exclude red flags or concerning features.

- ***Blood tests***, if indicated.
  - FBE
  - *Ferritin*
  - *Creatinine, sodium, potassium*
  - *CRP*
  - *Thyroid function*
  - *LFTs*

- ***Holter monitoring,*** if there are significant clinical concerns and the diagnosis is unclear, or patient anxiety is very high. If Holter is negative and symptoms are frequent, consider an ***event monitor.***

  Holter monitoring
  - *Only consider in patients with concerning features that occur at least 3 times per week for > 1 month.*
  - *Provides limited clinical value. Diagnosis is found in only 2 to 15 % of tests. It may be useful to rule out serious arrhythmias when sinus rhythm is correlated to the timing of the patient's symptoms.*

Order through most pathology providers *and* cardiology investigation providers. *An out-of-pocket cost may apply.*

Event monitor

- *Portable event monitor for 1 week.*
  Implantable loop monitor – indicated if loss of consciousness episodes of unknown cause occurring ≥ 2 times per year.

- Further investigations may include:
  - *Chest X-ray – to exclude respiratory causes.*
  - *Echocardiography – to assess cardiac structure.*
  - *Tilt Test – different body positions may trigger the arrhythmia – specialist referral necessary. Rarely used in the investigation of syncope in the general practice setting.*

Management

1. Arrange immediate cardiology assessment if red flags.

2. If there are any ***concerning features,*** refer for urgent or routine cardiology assessment or consider seeking cardiology advice.

   Concerning features

   - *Palpitations with any of:*
     - *abnormal electrocardiogram (ECG)*
     - *abnormal echocardiogram*
     - *other cardiac disease*
     - *functional impact of symptoms on daily activities including impact on work, study or carer role*
   - *Family history of sudden cardiac death or structural heart disease.*

3. For most patients, determine management either by the ECG findings or the most likely clinical diagnosis:

   - ***Sinus tachycardia***
     - *Manage any underlying cause.*
     - *If persisting, unexplained sinus tachycardia, request* urgent or routine cardiology referral *or seek cardiology advice.*

   - ***Ectopic beats***
     - *Manage underlying causes e.g., alcohol, anxiety.*
     - *If isolated and no other cardiac symptoms, reassure the patient.*
     - *If frequent and bothersome, consider trialling a beta blocker.*

   - Atrial fibrillation or flutter – see Atrial Fibrillation.

   - ***Supraventricular tachycardia***
     If currently symptomatic:
     - *Once carotid bruit excluded, try Valsalva manoeuvre, carotid sinus massage, or dip face in iced water. Take care in the elderly because of the risk of stroke and asystole.*
     - *If severe symptoms continue, request immediate cardiology referral or admission. The duration of the episode is less important than the severity of symptoms.*

- *If acute cardiology review is not available, and you are competent, confident, and equipped to administer intravenous medications for paroxysmal supraventricular tachycardia:*
  - *Start cardiac monitoring, intravenous access, and follow local protocols.*
  - *Consider acute cardiology advice.*
  - *Initially, give intravenous adenosine 6 mg rapidly (over 1 to 2 seconds) via peripheral line. Reduce to 3 mg if the patient is currently on carbamazepine or dipyridamole, has had a heart transplant, or if administering via a central line. Warn the patient that they may experience chest pain or a feeling of impending doom.*
  - *If not effective within 1 to 2 minutes, give 12 mg (maximum single dose). Repeat if necessary.*
  - *Follow each dose with 20 mL normal saline flush.*
  - *If no response, second-line drugs are not recommended unless staff are familiar with their use and the patient is in a monitored environment where electrical cardioversion is available.*

- Ventricular arrhythmias – arrange immediate cardiology assesment.

4. If well and without concerning features reassure and monitor. Advanced investigation or specialist assessment is not necessary.

5. Only consider ***medications*** for benign palpitations if symptoms are distressing and reassurance is ineffective.

Medications

Consider low-dose beta blocker e.g., metoprolol or atenolol, or a calcium-channel blocker as second line e.g., verapamil. This may not suppress the arrhythmia, but usually eliminates the associated symptoms.

Referral

- Request immediate cardiology assessment if palpitations and any of:
  - Shortness of breath
  - Chest pain
  - Heart failure
  - Syncope, pre-syncope, or loss of consciousness
  - Persisting tachyarrhythmia on electrocardiogram (ECG).

- If specialist review of the ECG is necessary, seek cardiology advice and transmit the image.
- If any concerning features, refer for urgent or routine cardiology assessment (include a detailed history and investigations with resting ECG), or seek cardiology advice.

Information

For health professionals

Further information

- Heart Foundation – Arrhythmias
- Patient:
  - ECG Identification of Arrhythmias
  - Supraventricular Tachycardia in Adults

For patients

- Doctors Australia – What Are Palpitations?
- Heart Foundation – Arrhythmias
- Patient:
  - Arrhythmias
  - Supraventricular Tachycardia

References

1. Zuchinali P, Souza GC, Pimentel M, Chemello D, Zimerman A, Giaretta V, et al. Short-term effects of high-dose caffeine on cardiac arrhythmias in patients with heart failure: A randomized clinical trial. JAMA internal medicine. 2016 Oct;176(as):1752-9.

Disclaimer

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