Tachyarrythmia

- An abnormality of the cardiac rhythm is called a cardiac arrhythmia.

- Arrhythmias may cause sudden death, syncope, heart failure, chest pain, dizziness, palpitations or no symptoms at all.

There are two main types of arrhythmia:

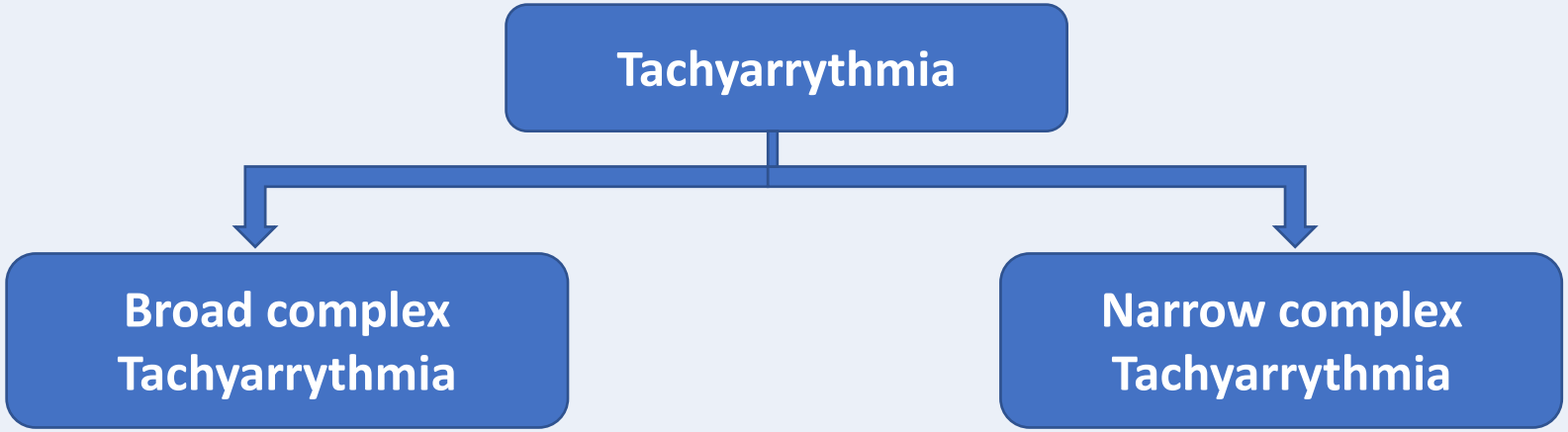
- ***Bradycardia***: the heart rate is slow (<60b.p.m. during the day or <50b.p.m. at night).
- ***Tachycardia***: the heart rate is fast (>100b.p.m.).

- Tachycardias are more symptomatic when the arrhythmia is fast and sustained.

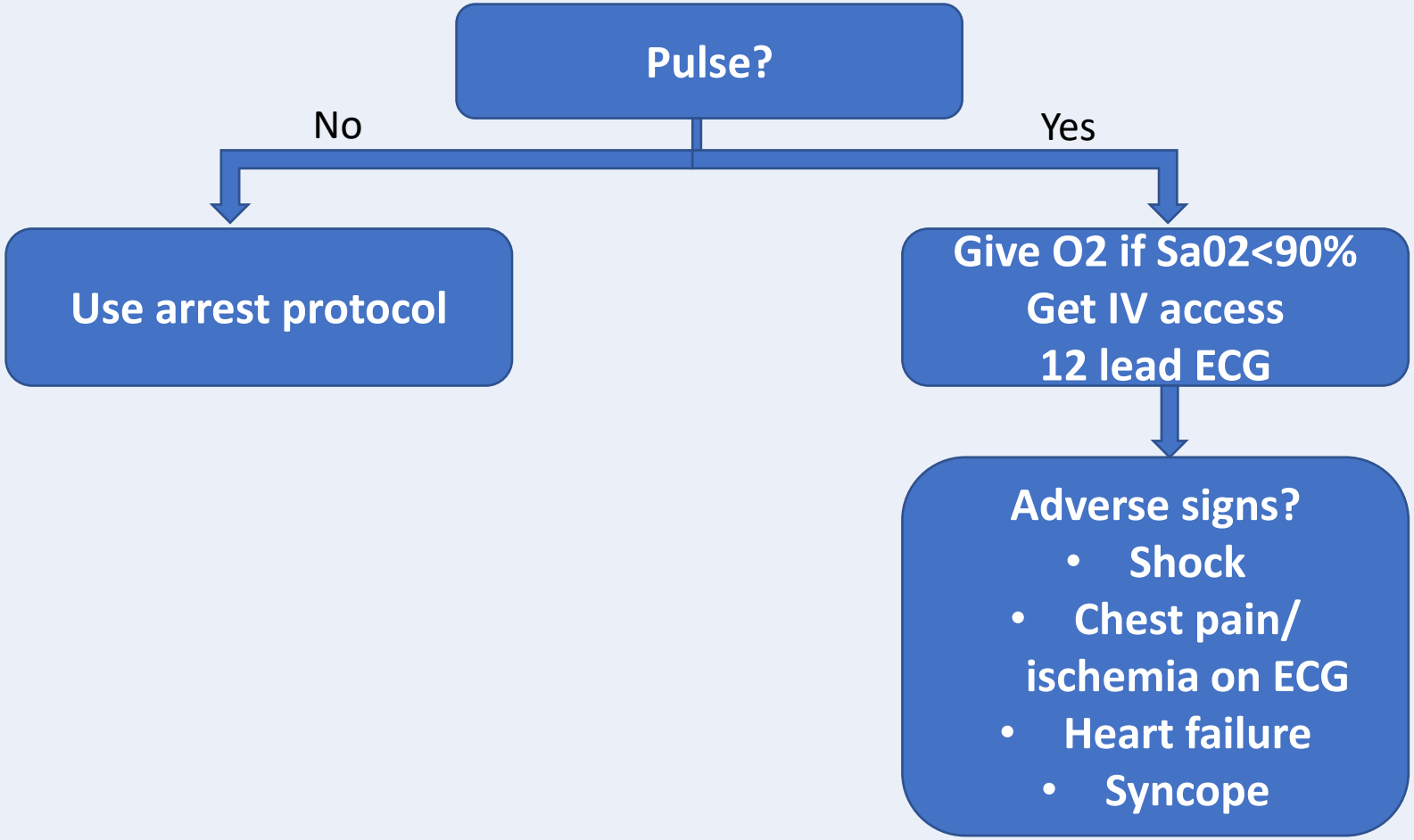
- Tachycardias are subdivided into ***supraventricular tachycardias***, which arise from the atrium or the AV junction, and ***ventricular tachycardias***, which arise from the ventricles.

- Some arrhythmias occur in patients with apparently normal hearts; in others, arrhythmias originate from diseased tissue, such as scar, as a result of underlying structural heart disease.

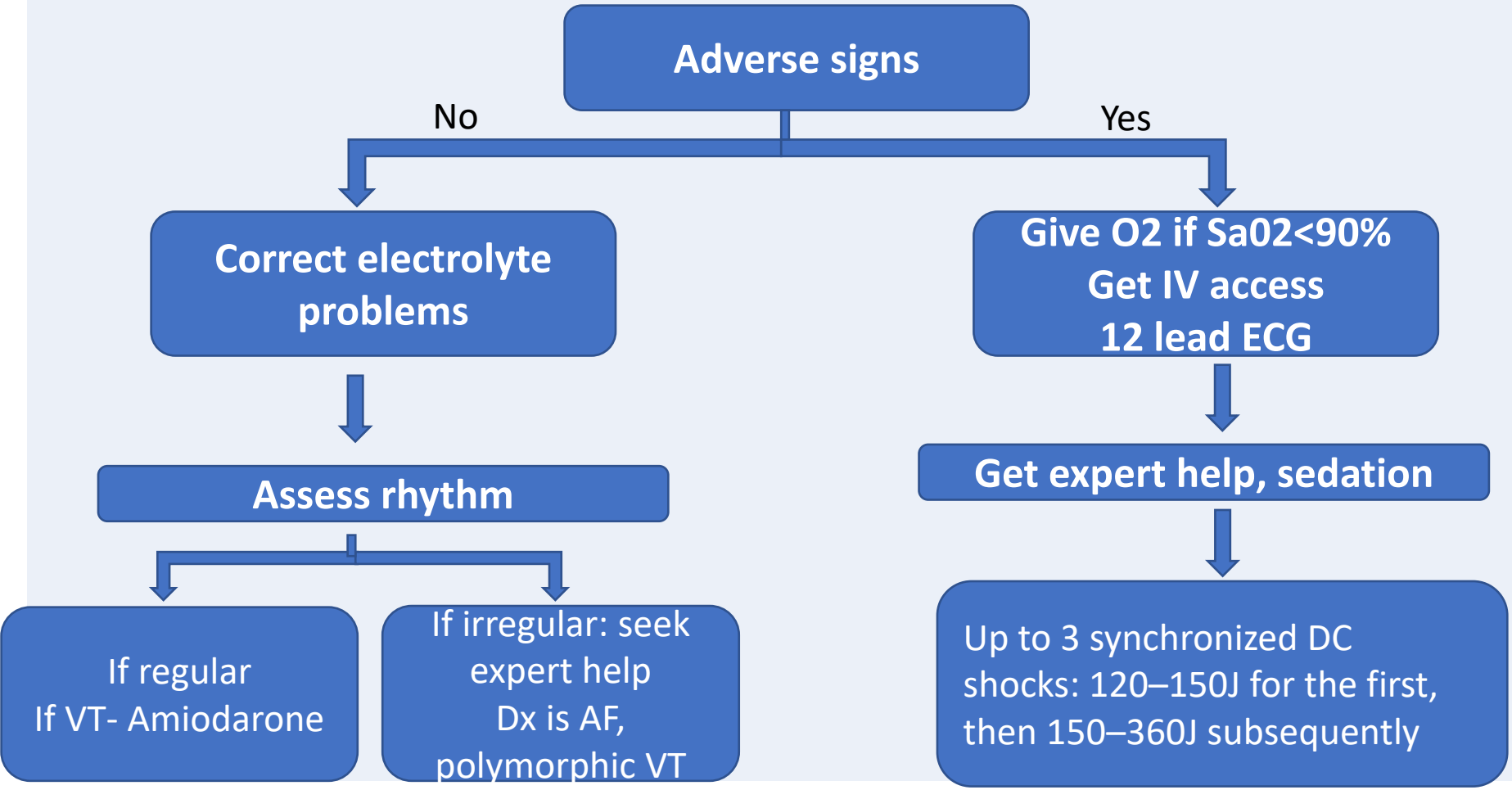
Tachycardia



Management of broad complex tachycardia



Management of broad complex tachycardia



Narrow complex tachycardia

ECG shows rate of >100bpm and QRS complex duration of <120ms.

- **Differential diagnosis**
- *Sinus tachycardia:* Normal P wave followed by normal QRS—not an arrhythmia! Do not attempt to cardiovert; if necessary (ie not a physiological response to fever/ hypovolaemia) rate control with beta-blockers.

Narrow complex tachycardia

- *Atrial tachyarrhythmias:* Rhythm arises in atria, AV node is a bystander.

  - Atrial fibrillation (AF): absent P wave, irregular QRS complexes.
  - Atrial flutter: atrial rate ~260–340bpm. Sawtooth baseline, due to a re-entrant circuit usually in the right atrium. Ventricular rate often 150bpm (2:1 block).
  - Atrial tachycardia: abnormally shaped P waves, may outnumber QRS.
  - Multifocal atrial tachycardia: ≥3 P-wave morphologies, irregular QRS complexes.

Narrow complex tachycardia

- *Junctional tachycardia:* AV node is part of the pathway. P wave either buried in QRS complex or occurring after QRS complex.
  - AV nodal re-entry tachycardia.
  - AV re-entry tachycardia, includes an accessory pathway, eg WPW

Management of narrow complex tachycardia

Be guide

- If the patient is compromised, use DC cardioversion.

- Otherwise, identify the underlying rhythm and treat accordingly. The most important thing is to decide whether the rhythm is regular or not (irregular is likely AF).

Management of narrow complex tachycardia

- Vagal manoeuvres (carotid sinus massage, Valsalva manoeuvre) transiently increase AV block, and may unmask an underlying atrial rhythm.
- If unsuccessful, give adenosine, which causes transient AV block. It has a short halflife (10–15s) and works by: **1** transiently slowing ventricles to show the underlying atrial rhythm; **2** cardioverting a junctional tachycardia to sinus rhythm.

Management of narrow complex tachycardia

Specifics:

- *Sinus tachycardia:* Identify and treat underlying cause.
- *Supraventricular tachycardia:* If adenosine fails, use verapamil 2.5–5mg IV over 2min. NB: NOT if on a beta-blocker. If no response, a further 5mg IV over 3min (if age <60yrs). Alternatives: atenolol 2.5mg IV repeated at 5min intervals until 10mg given; or amiodarone. If unsuccessful, use DC cardioversion.
- *Atrial fibrillation/flutter:* Manage with rate control; seek help if resistant.
- *Atrial tachycardia:* Rare; may be due to digoxin toxicity: withdraw digoxin, consider digoxin-specific antibody fragments. Maintain K+ at 4–5mmol/L.

Management of narrow complex tachycardia

- *Multifocal atrial tachycardia:* Most commonly occurs in COPD. Correct hypoxia and hypercapnia. Consider verapamil if rate remains >110bpm.

- *Junctional tachycardia:* Where anterograde conduction through the AV node occurs, vagal manoeuvres are worth trying. Adenosine will usually cardiovert a junctional rhythm to sinus rhythm. If it fails or recurs, □-blockers (or verapamil—*not* with beta-blockers, digoxin, or class I agents such as quinidine). If this does not control symptoms, consider radiofrequency ablation.

Wolff-Parkinson-White (WPW) syndrome

- Caused by congenital accessory conduction pathway between atria and ventricles. Resting ECG shows short PR interval and widened QRS complex due to slurred upstroke or 'delta wave'.
- Two types: WPW type A (+ve delta wave in V1), WPW type B (–ve delta wave in V1). Present with SVT which may be due to an AVRT, pre-excited AF, or pre-excited atrial flutter.
- Risk of degeneration to VF and sudden death.

- ***Treatment:*** Flecainide, propafenone, sotalol, or amiodarone. Refer to cardiologist for electrophysiology and ablation of the accessory pathway