2.3 Cardiac arrhythmias

ALS guidelines adapted Jan 2002

Author Taj Hassan Amjid Mohammed

Background :

- Dysrhythmias are common in the A&E department. Some patients tolerate them well and others become acutely unwell due to a poor cardiac output.
- It is important to differentiate those that need emergent treatment from those in whom treatment can be delayed until expert advice is sought.
- Call for senior help early , particularly if your patient is hypotensive or has chest pain.

Key Points

- Always assess the patient first. Treat the patient and NOT the monitor.
- A patient who is talking is usually tolerating their rhythm.
- Perform simple manoeuvres first (give oxygen, get an IV line and perform vagal interventions if you suspect SVT)
- Analyse the ECG methodically.
- Get a SENIOR early if your patient is compromised. Do not try to treat it yourself.

2.3.1 Bradycardia

Note:Sinus bradycardia may be physiological in hypothermia or in very fit athletes

1.Heart block

Management depends on the underlying cause.

a) Acute myocardial infarction

Inferiors:- heart block rarely needs to be treated with an inferior AMI. Complete heart block may be symptomatic and should initially be treated with Atropine and then by an isoprenaline infusion or transcutaneous pacing.

Anterior:- temporary pacing is indicated for complete heart block with anterior AMI as this is associated with ventricular standstill. Again initial management should be with Atropine, temporary pacing or an Isoprenaline infusion, but always transfer the patient with the external pacer available.

b)Chronic conduction diseases

Complete heart block and high grade second degree block usually require permanent pacing.Atropine and isoprenaline can be used as a temporising manovre

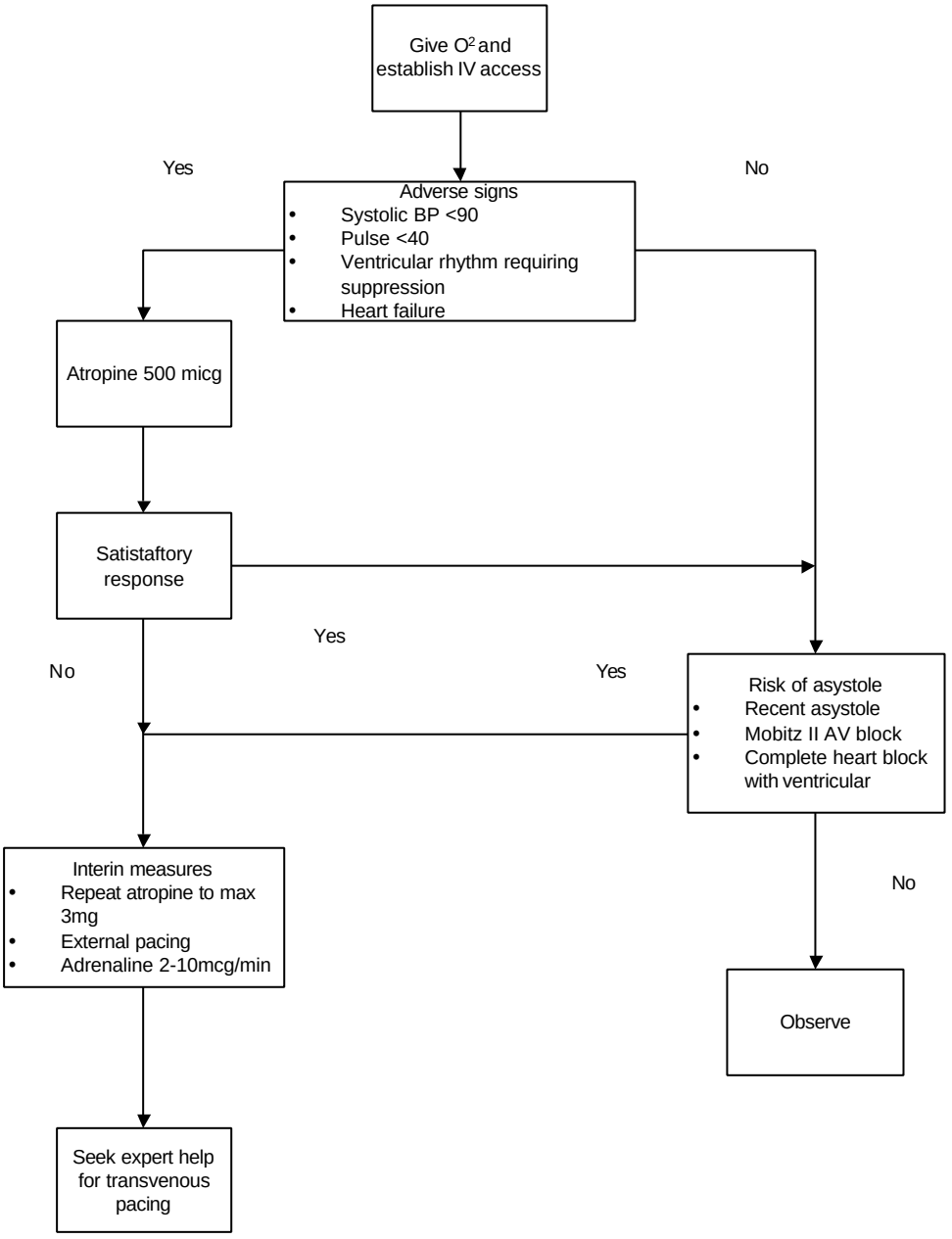
Syncopal patients should be treated as soon as possible which in A & E means transcutaneous pacing or Isoprenaline infusion.

How to set up an Isoprenaline infusion:- 2 mg of Isoprenaline in 500 mls of 5% Dextrose. Start SLOWLY (eg:at a rate of 15 mls per hour) and titre against cardiac rate - this is ideally suited if pacing is not immediately available and if the patient has not been responsive to Atropine.

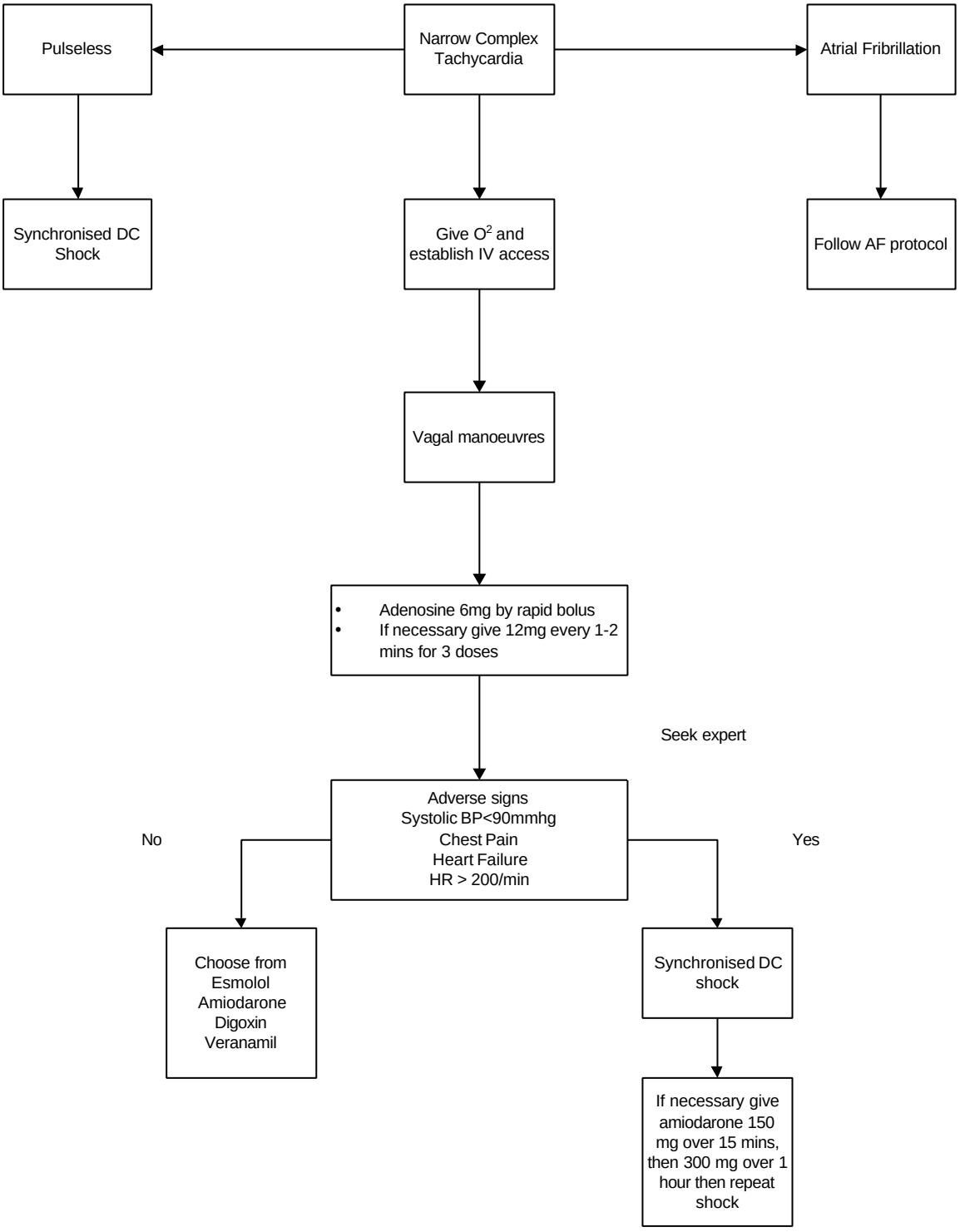
Key Points

- Treat only if the patient is symptomatic.
- Do not forget it may be physiological in hypothermia or in very fit athletes.
- First line drug is IV atropine using small aliquots of it at a time to maintain an adequate pulse rate and blood pressure.
- Follow the ALS guideline for Bradycardias if further treatment is required

ALS algorithm for Bradycardia

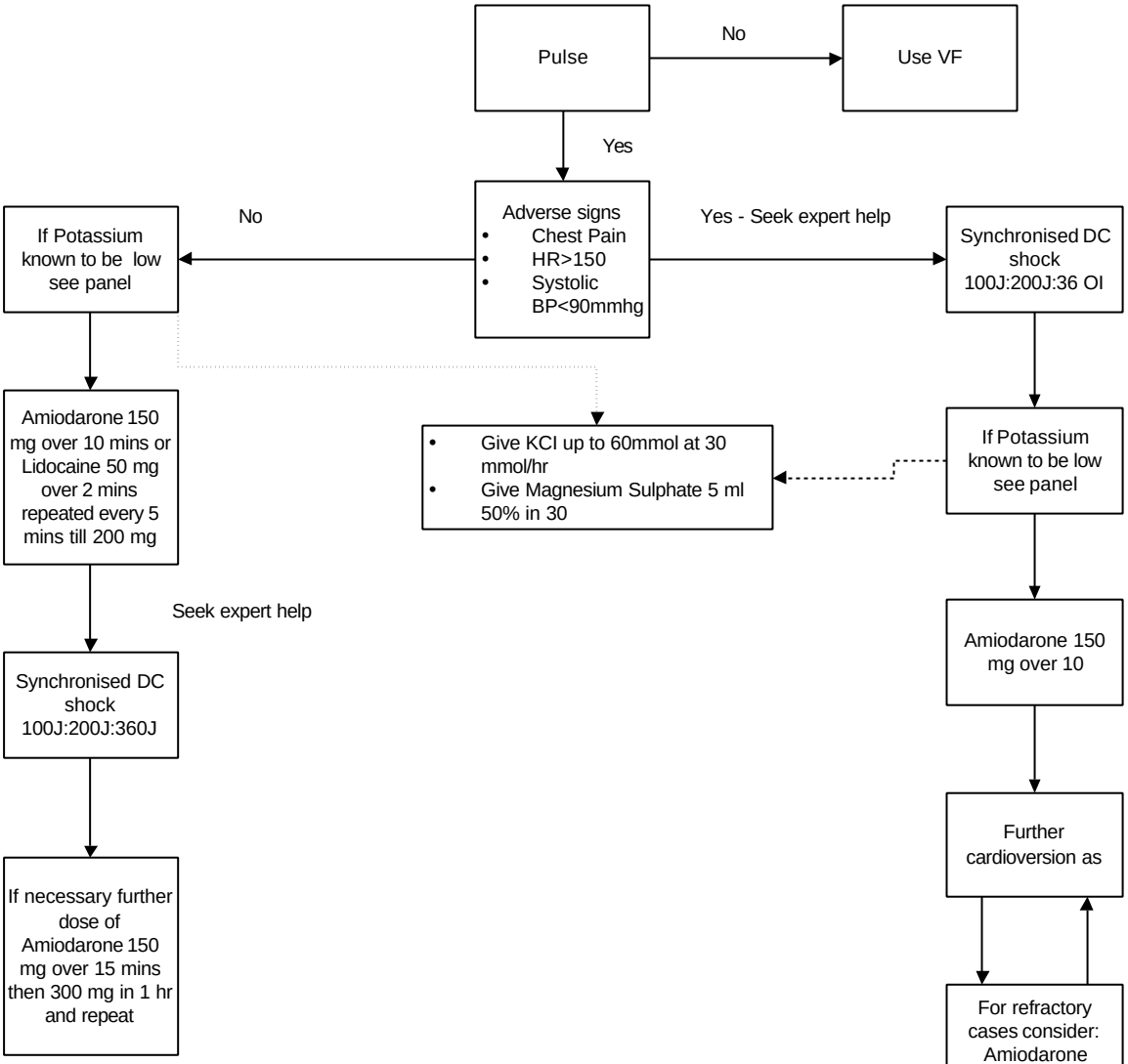


ALS Algorhythm for Narrow Complex



Broad Complex Tachycardia

Give O^2 and establish IV access



Note DC cardioversion is always given under sedation or GA

2.3.2 Broad complex tachycardia:

- This may be due to Ventricular Tachycardia or a Supraventricular Tachycardia with aberrant conduction (which is quite rare).
- VT is characterised by AV dissociation, concordance, capture and fusions beats on the 12 lead ECG.
- It is a malignant rhythm usually occurring in patients with coexisting ischaemic heart disease and there is usually systemic upset secondary to a poor cardiac output.
- SVT can be tolerated much better unless the rate is such that myocardial perfusion is impaired.
- Adenosine can be used to distinguish SVT with aberrant conduction from VT if the patient is stable in many cases .

Always treat the patient not the monitor; if in doubt its safer to treat as VT.

Key points

- **Get senior help early**
- **Use the ALS guidelines for the management of Broad Complex Tachycardias**
- **Patients with signs of cardiovascular compromise require cardioversion**
- **Check Potassium on the blood gas analyser**

2.3.3 Supraventricular Arrhythmias

The Supraventricular tachycardias

a. Sinus tachycardia is usually not of abrupt in onset and has a rate of <150, always check for underlying problem, eg hypoxia, pyrexia etc. Treatment is that of the underlying cause .

b.Paroxysmal atrial tachycardia (SVT) is usually abrupt in onset and rate >150. These patients may have chest pain and be hypotensive if the rate impairs myocardial perfusion. The rate may be slowed by vagal manoeuvrers eg valsalva against a closed glottis or CSM, always check for a bruit before trying this.

If the patient is compromised then cardiovert with a DC shock starting at 100J.

The best drug to use for chemical cardioversion is adenosine, start with 3mg iv, wait 2 min then repeat with 6 mg, followed by 12 mg. Don't forget to warn the patient that they may experience a heavy feeling in the arms and chest pain. If adenosine doesn't work then it probably isn't a SVT!

c Atrial flutter (not associated with MS and thyrotoxicosis as is like AF). The atrium always flutters at 300 bpm, the ventricles can't respond to this and there is always an element of block, so suspect it in rates that are approx 150 bpm(2:1 block).

Again if the patient is compromised then DC cardiovert.

Treat as for AF (Atrial fibrillation), digoxin is still the mainstay of treatment but it doesn't cardiovert back to sinus rhythm (it only slows the ventricular response) and so some cardiologists use other drugs like Amiodarone.

d.Atrial fibrillation. This is very common affecting >10% in the over 70s. It may be a response to an underlying illness such as pneumonia, sepsis, neoplasm or ischeamic heart disease. It is important to ascertain how long the rhythm has been established for as this influences treatment. The decision is whether the patient requires rate control with digoxin or cardoversion chemically with amiodarone. At present this depends on individual clinical judgement. Guidelines are being developed to help in this process.As usual if the patient is hypotensive and unwell they should be considered for cardioversion.

Acute cardioversion whether chemical or electrical carries a risk of embolic

phenomenon particularly if AF has been established for at least 48 hrs.
*How to digitalise someon*e....0.5 mg of digoxin in 100 ml of normal saline over 30 mins, this can be repeated every 6 hrs to a total dose of 1.5-2.0 mg. Try and get a potassium before digitalisation, a low K potentiates dig induced arrhythmias.

Key points

- Correct biochemical abnormality
- If there is serious cardiovascular compromise then cardiovert
- Use the ALS guidelines for the management of Narrow Complex Tachycardias

ALS algorhythm for Narrow Complex