

PERI-ARREST ARRHYTHMIAS

Peri-arrest arrhythmias

To understand:

- The importance of arrhythmias that occur in the peri-arrest period
- The principles of management of these arrhythmias

Peri-arrest arrhythmias

Principles of treatment

- How is the patient?
- What is the arrhythmia?

Adverse signs (1)

- **Low cardiac output**
 - Chest pain, pallor, cool peripheries, hypotension, reduced level of consciousness
- **Excessive tachycardia**
 - Narrow complex >200 beats min^{-1}
 - Broad complex >150 beats min^{-1}

Adverse signs (2)

- **Excessive bradycardia**
 - $< 40 \text{ beats min}^{-1}$ or $< 60 \text{ beats min}^{-1}$ if poor cardiac reserve
- **Heart failure**
 - Pulmonary oedema, raised JVP, hepatic enlargement

Treatment options

Bradycardias

- Cardiac pacing

Tachycardias

- Cardioversion

All Arrhythmias

- Antiarrhythmic and other drugs

Cardiac pacing

- Reliable method of treating bradycardias
- Requires expert help to insert transvenous pacing system
- Used in presence of adverse signs or when drugs have failed

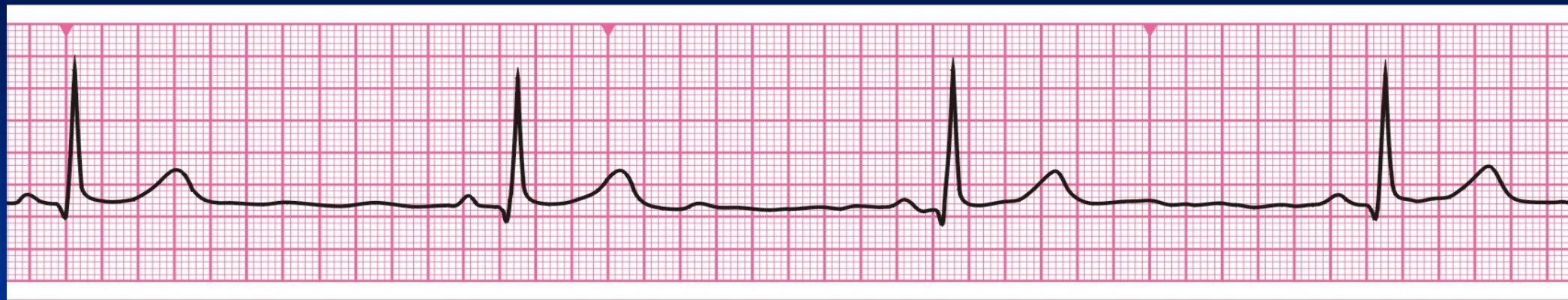
Cardioversion

- Effective at converting tachyarrhythmias to sinus rhythm
- Used when adverse signs
 - Drugs are relatively ineffective
- May cause VF !
 - Must use a synchronised shock
 - Need for sedation / anaesthesia

Antiarrhythmic and other drugs

- May convert a tachyarrhythmia to sinus rhythm
 - Less reliable than cardioversion
 - Use when no adverse signs
- Used to treat bradycardias initially
 - Less effective if cardiac output reduced

All drugs that are used to treat arrhythmias can cause arrhythmias !



K10

Bradycardia

- Are there any adverse signs?
 - Systolic blood pressure < 90 mmHg
 - Heart rate < 40 beats min⁻¹
 - Ventricular arrhythmias requiring suppression
 - Heart failure
- If YES – give atropine 500 µg i.v. and assess response

Bradycardia

- If there is a satisfactory response to atropine, and -
- There are NO adverse signs

Determine the risk of asystole:

- Recent episode of asystole?
- Mobitz type II heart block?
- Complete heart block with wide QRS?
- Ventricular pause > 3 seconds?

Bradycardia

- There is a risk of asystole, or
- If there is NO response to atropine
 1. Further doses of atropine, 3 mg maximum
 2. External pacing
 3. Epinephrine infusion, $2\text{-}10 \mu\text{g min}^{-1}$
 4. Arrange transvenous pacing

SEEK EXPERT HELP !

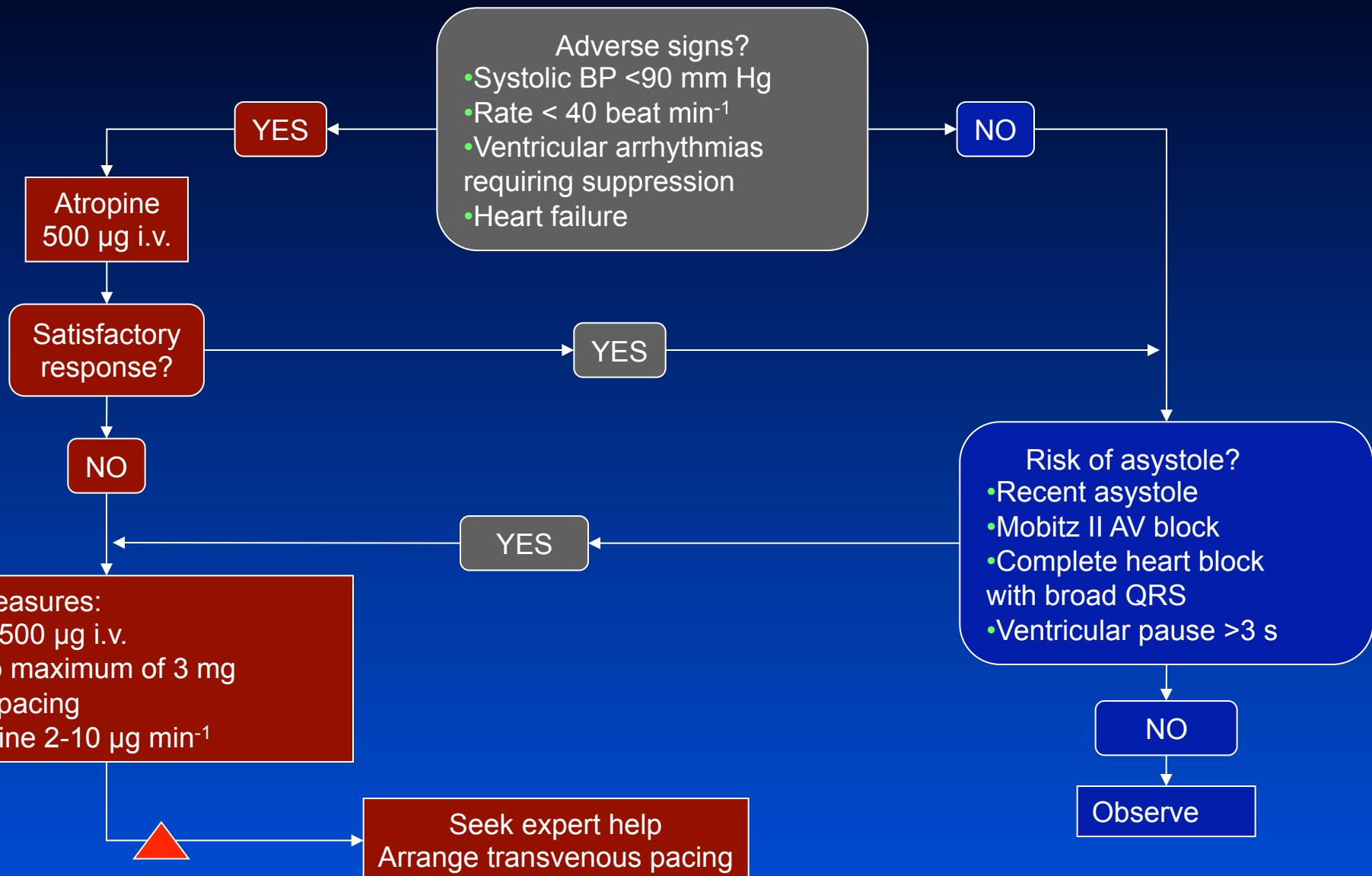
Bradycardia

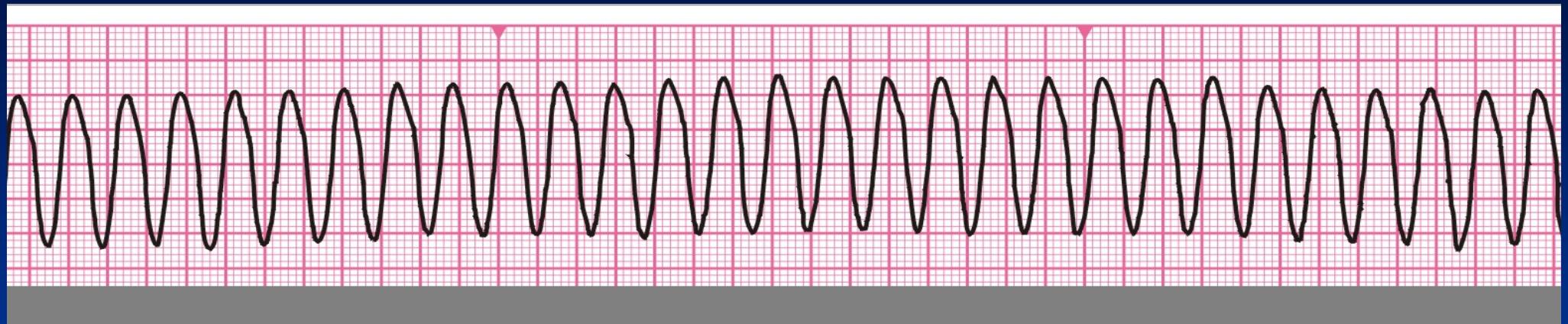
- If there is a response to atropine, and:
- There is NO risk of asystole

Observe the patient

BRADYCARDIA

(Rate <40 beat min⁻¹ or inappropriate slow for haemodynamic state)





K16

Broad complex tachycardia

- Does the patient have a pulse?

NO! – follow the VF protocol

YES – are there any adverse signs?

Broad complex tachycardia

- **Adverse signs**

- Systolic blood pressure < 90 mmHg
- Chest pain
- Heart failure
- Rate > 150 beats min⁻¹

NO

- Antiarrhythmics
- Seek expert help
- Cardioversion

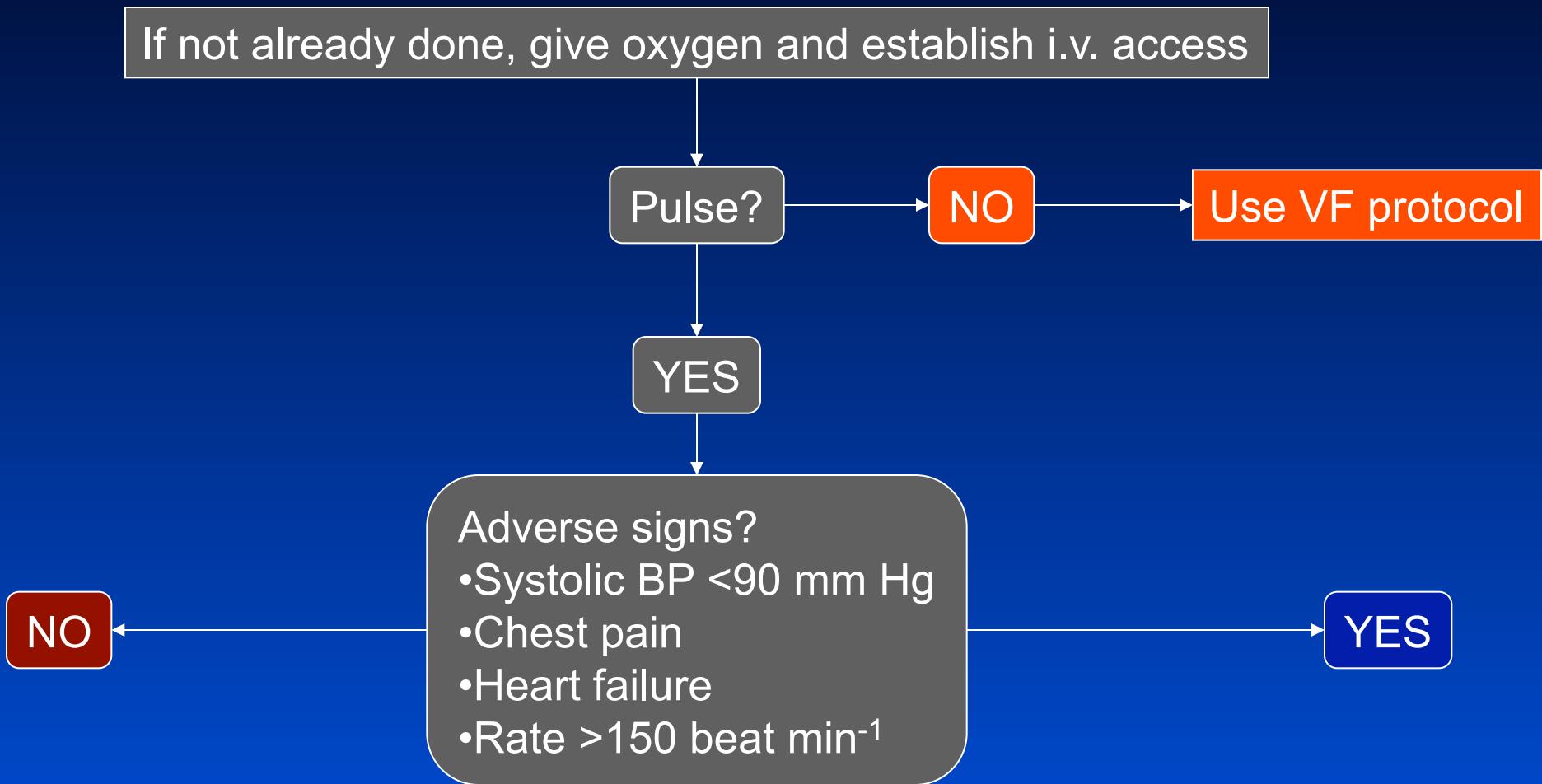
YES

- Seek expert help
- Cardioversion
- Antiarrhythmics

Correct hypokalaemia, give magnesium

Broad complex tachycardia

(Treat as sustained ventricular tachycardia)



NO

Adverse signs?

- Systolic BP <90 mm Hg
- Chest pain
- Heart failure
- Rate >150 beat min⁻¹

If potassium known to be low see panel

- Amiodarone 150 mg i.v. over 10 mins
or
Lidocaine i.v. 50 mg over 2 mins
repeated every 5 mins to maximum
dose of 200mg;

Seek expert help

Synchronised DC shock 100 J: 200 J: 360 J
or equivalent biphasic energy

If necessary, further amiodarone 150 mg i.v. over 10 mins,
then 300 mg over 1 hour

- Give potassium chloride up
to 60 mmol, max rate
30mmol h⁻¹
- Give magnesium sulphate
i.v. 5ml 50% in 30min

Adverse signs?

- Systolic BP <90 mm Hg
- Chest pain
- Heart failure
- Rate >150 beat min⁻¹

YES

Seek expert help

Synchronised DC shock 100 J:200J: 360 J
or equivalent biphasic energy

If potassium known to be low, *see panel*

Amiodarone 150 mg i.v. over 10 mins

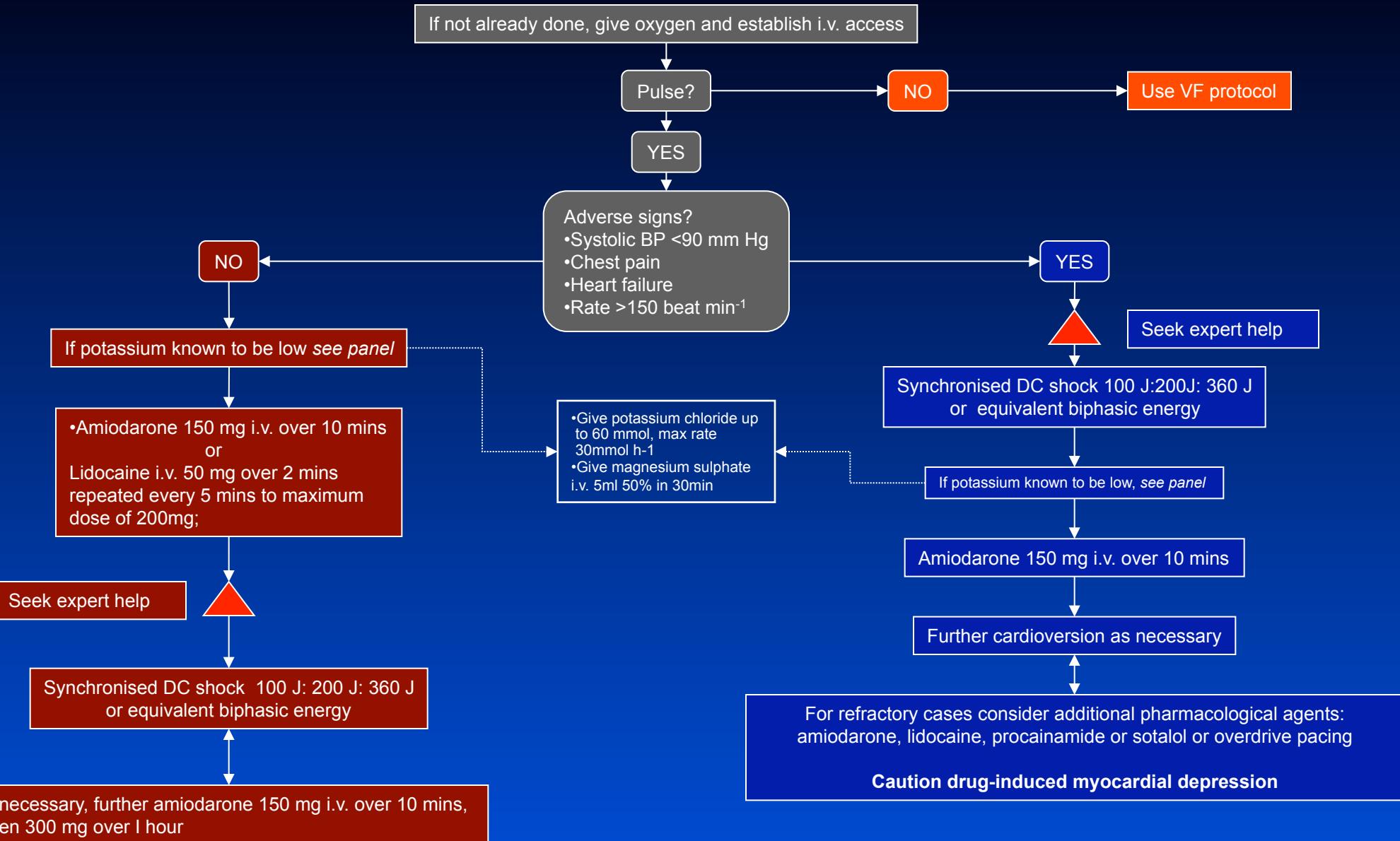
Further cardioversion as necessary

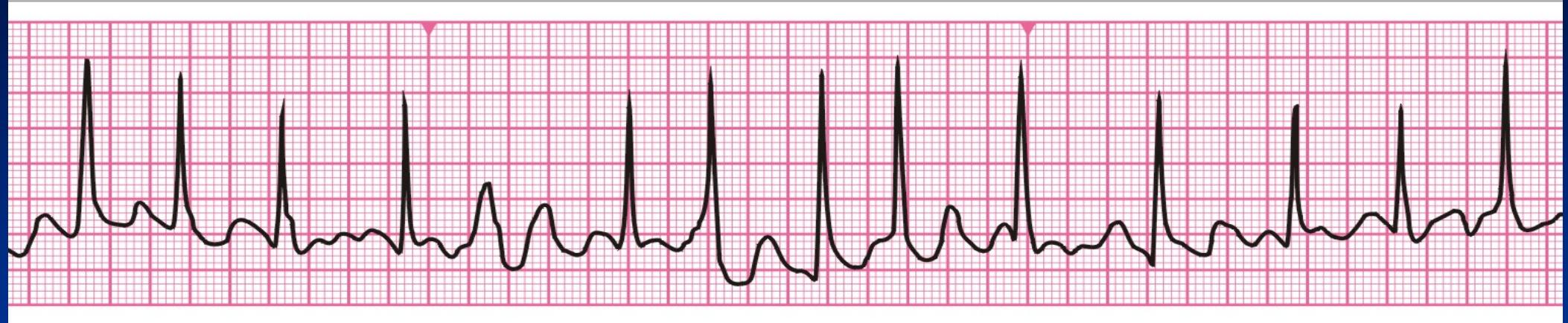
For refractory cases consider additional pharmacological agents:
amiodarone, lidocaine, procainamide or sotalol
or overdrive pacing

Caution drug-induced myocardial depression

BROAD COMPLEX TACHYCARDIA

(Treat as sustained ventricular tachycardia)





Atrial fibrillation

Treatment based on risk to patient from the arrhythmia

- High risk
 - Rate > 150 beats min^{-1}
 - Chest pain
 - Critical perfusion
- Low risk
 - Rate < 100 beats min^{-1}
 - Mild or no symptoms
 - Good perfusion
- Intermediate risk
 - Rate 100-150 beats min^{-1}
 - Breathlessness
 - Poor perfusion

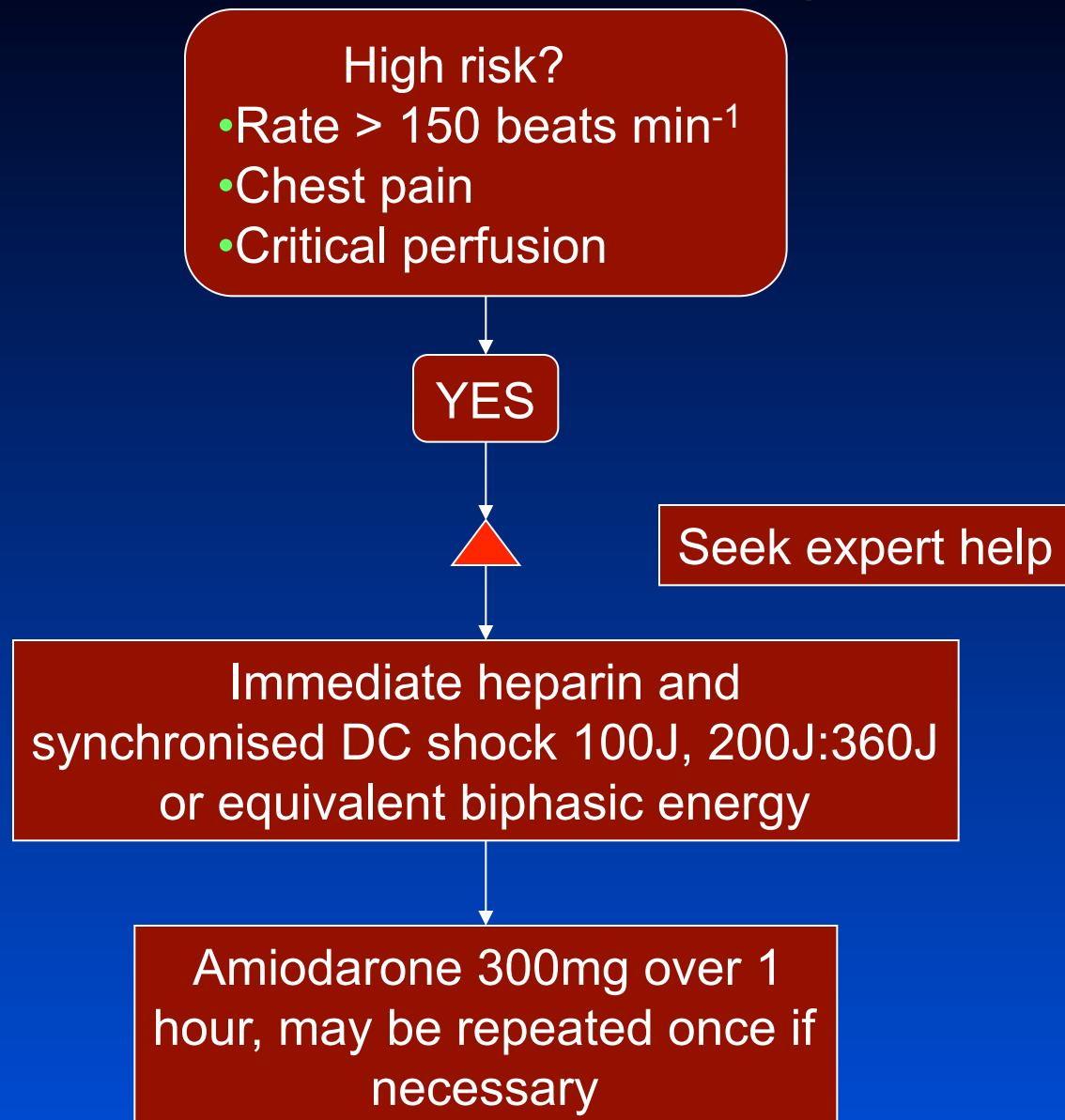
Atrial fibrillation

- **High risk**
 - Rate > 150 beats min^{-1}
 - Chest pain
 - Critical perfusion

SEEK EXPERT HELP !

1. Heparinisation
2. Synchronised shock 100J, 200J, 360J (or biphasic equivalent)
3. Amiodarone 300mg over 1 hour (may repeat once)

Atrial Fibrillation: high risk



Atrial fibrillation

- Intermediate risk
 - Rate 100-150 beats min⁻¹
 - Breathlessness
 - Poor perfusion

SEEK EXPERT HELP !

1. Impaired haemodynamics or structural heart disease?
2. Onset within 24 hours?

Atrial fibrillation

Intermediate risk

NO impaired haemodynamics / structural heart disease

Onset > 24 hours ago:

- Control rate with drugs
- OR
- Anticoagulation
- Later synchronised DC shock

Onset < 24 hours ago:

- Heparinisation
- Antiarrhythmics
- Synchronised DC shock if indicated

Atrial fibrillation

Intermediate risk

Impaired haemodynamics / structural heart disease

Onset > 24 hours ago:

- Control rate with amiodarone
- Anticoagulation
- Later synchronised DC shock if indicated

Onset < 24 hours ago:

- Heparinisation
- Synchronised DC shock if indicated
- Amiodarone

Atrial fibrillation

- **Low risk**
 - Rate < 100 beats min⁻¹
 - Mild or no symptoms
 - Good perfusion

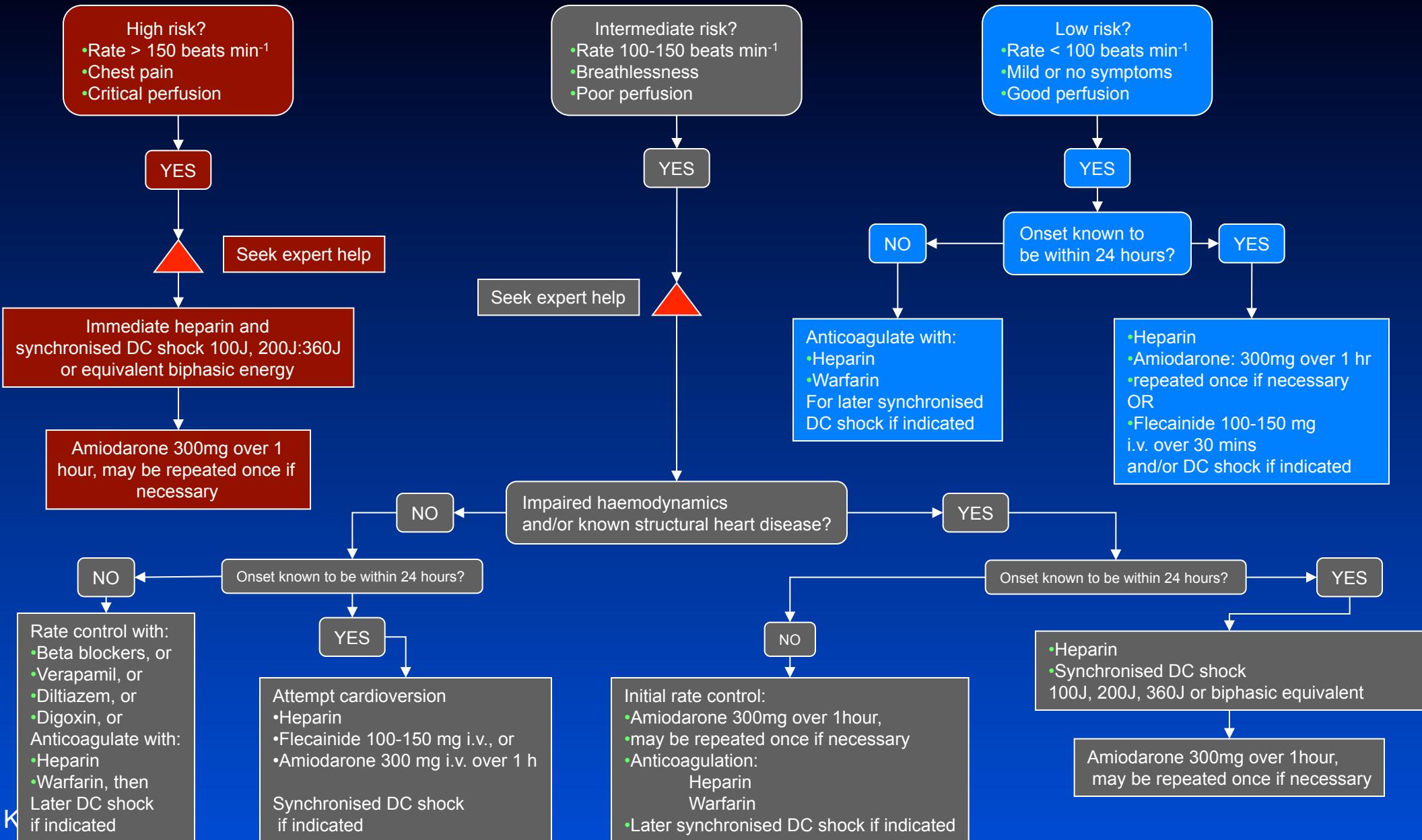
Onset > 24 hours ago:

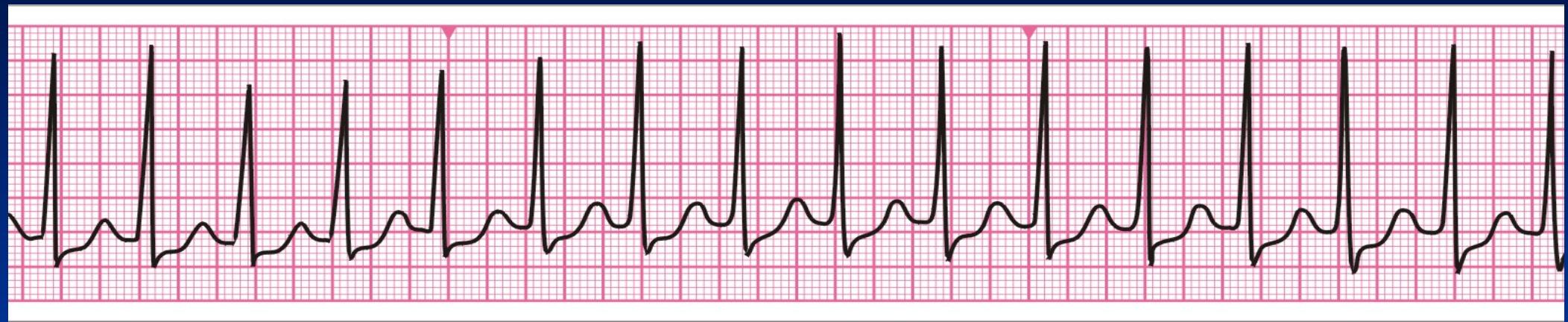
- Consider anticoagulation
- Later DC shock if indicated

Onset < 24 hours ago:

- Heparinisation
- Antiarrhythmics
- DC shock if indicated

Atrial Fibrillation





Narrow complex tachycardia

(Presumed supraventricular tachycardia)

1. Rate > 250 beats min⁻¹, pulseless
 1. synchronised DC shock
2. Rapid AF
 1. follow AF algorithm
3. Narrow complex, with pulse
→ follow SVT algorithm

Narrow complex tachycardia

(Presumed supraventricular tachycardia)

1. Vagal manoeuvres

- Valsalva
- Carotid sinus massage

2. Adenosine i.v.

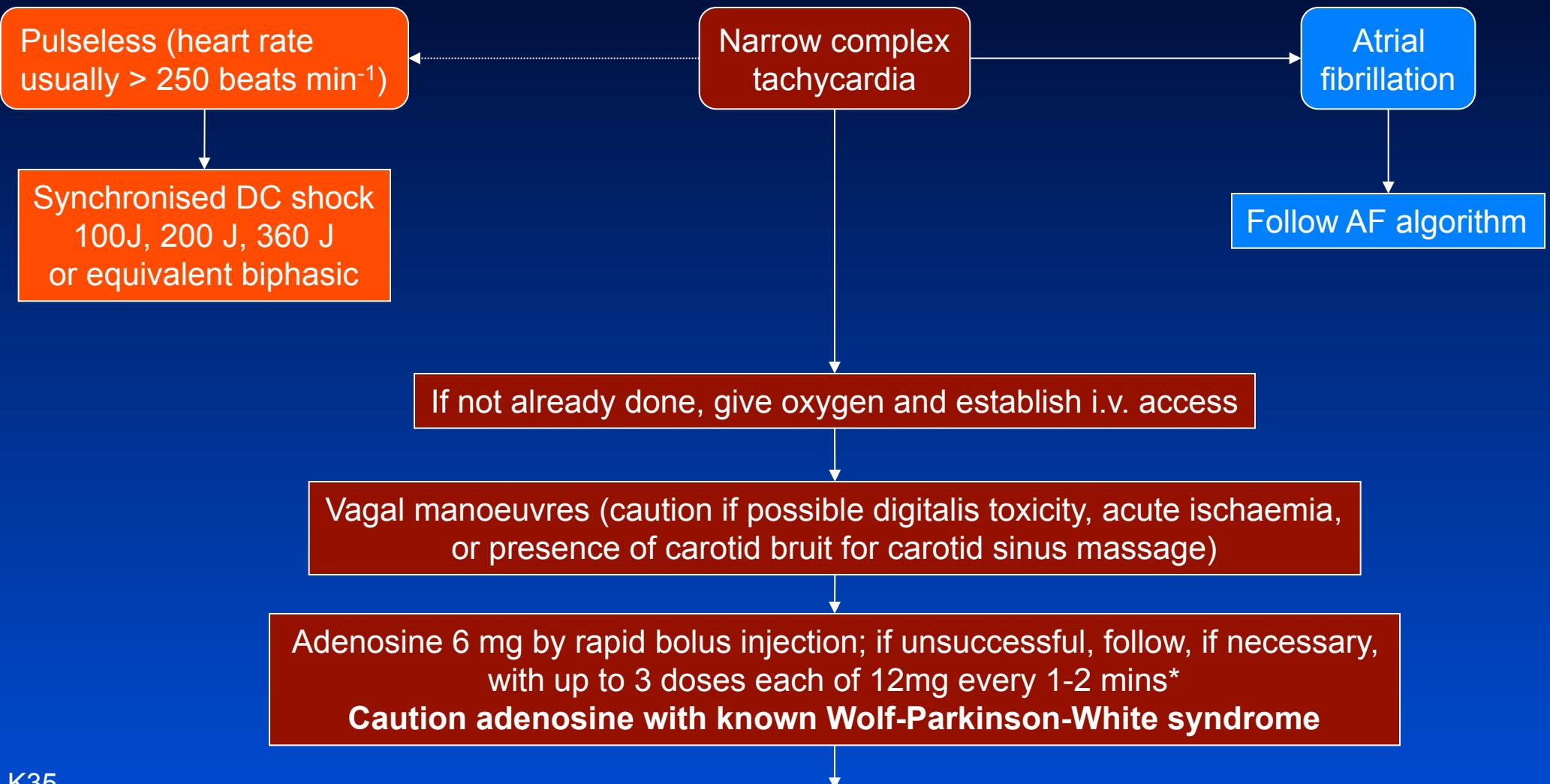
- 6mg, rapid bolus
- 12mg, every 1-2 minutes, (max 3 doses)

If no effect:

SEEK EXPERT HELP!

NARROW COMPLEX TACHYCARDIA

(Presumed supraventricular tachycardia)



Narrow complex tachycardia

(Presumed supraventricular tachycardia)

Adverse signs

- Systolic BP < 90 mmHg
- Chest pain
- Heart failure
- Rate > 200 beats min⁻¹

NO

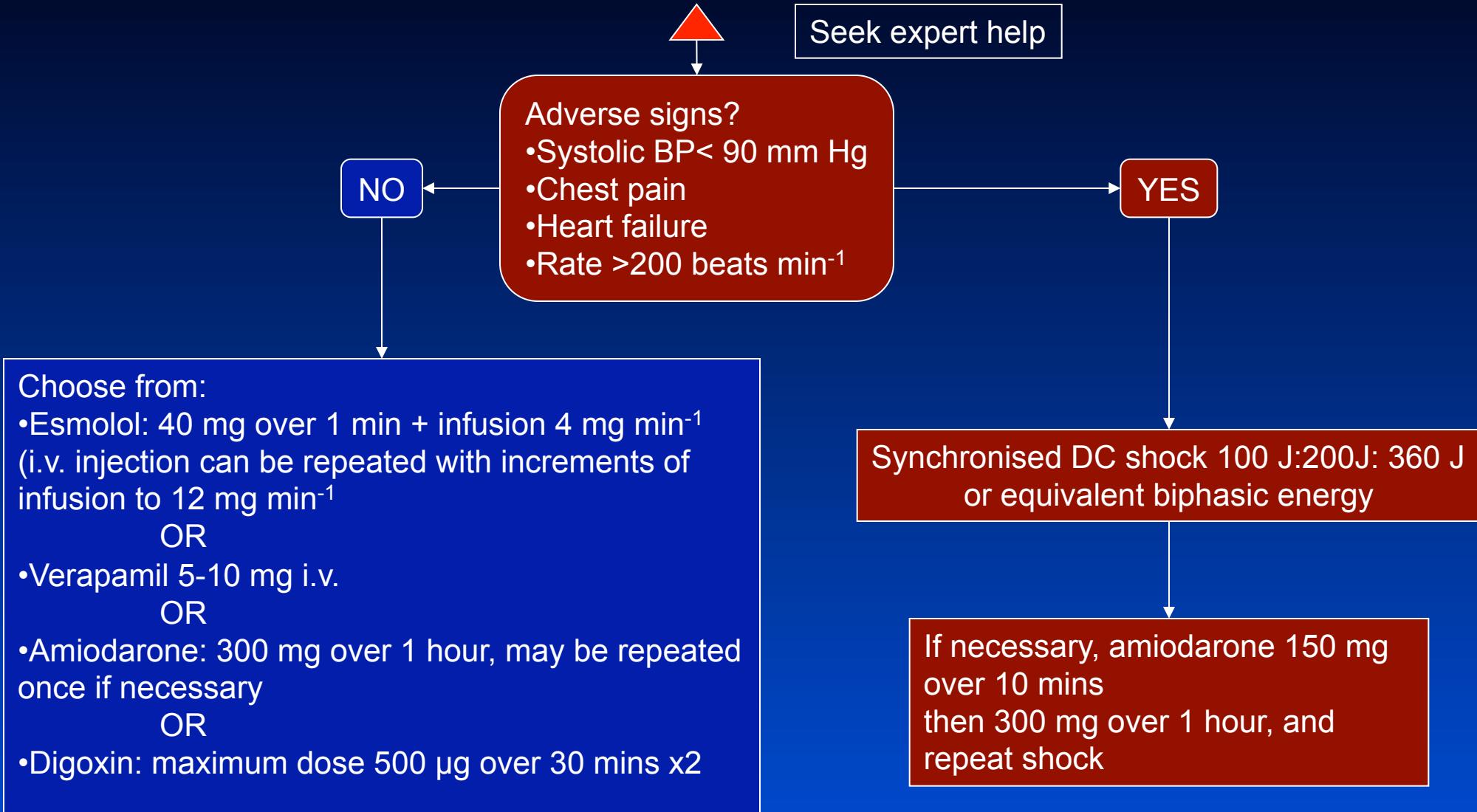
- Antiarrhythmics
- (caution drug interactions)

YES

- Synchronised DC shock
- Amiodarone if necessary

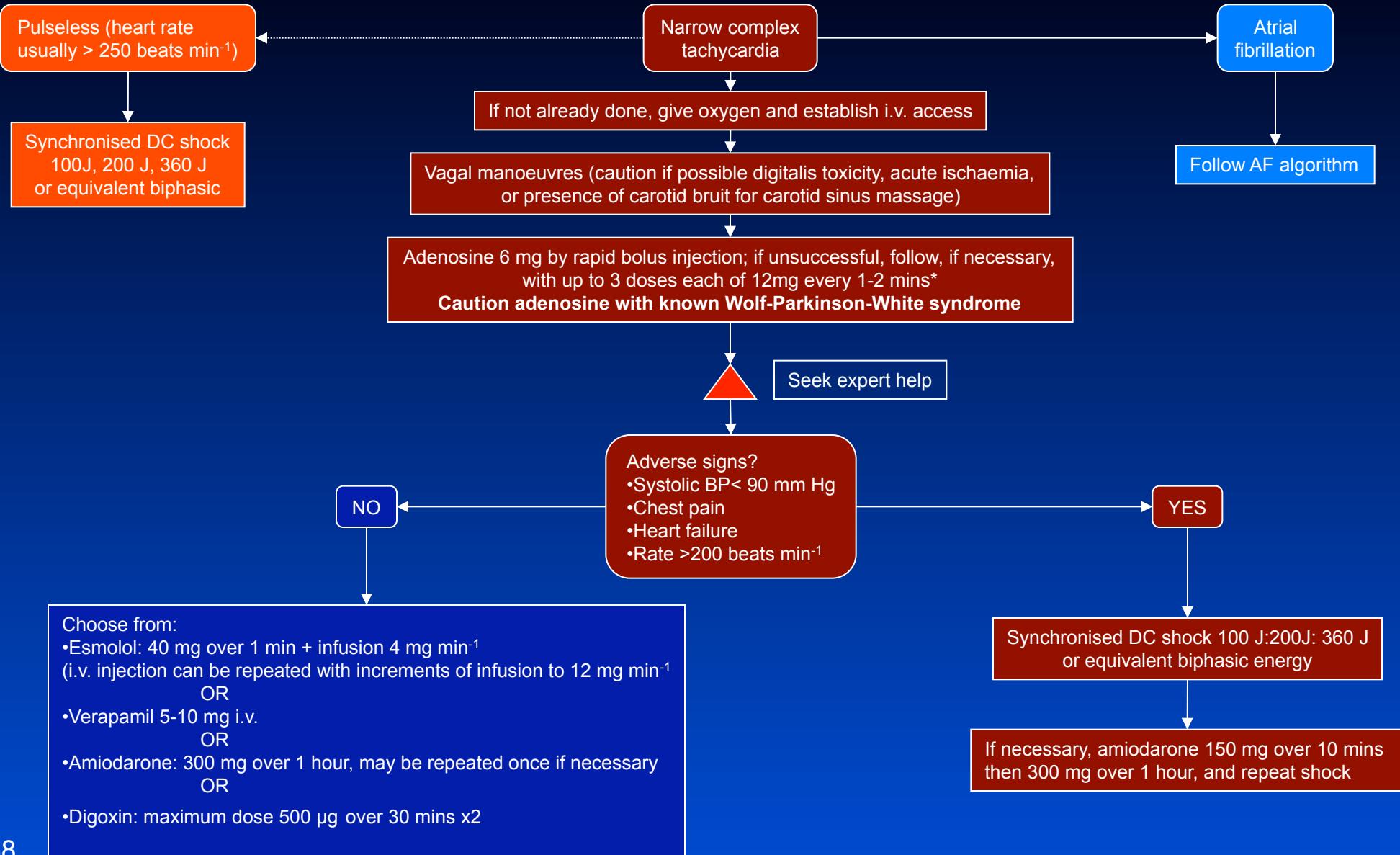
NARROW COMPLEX TACHYCARDIA

(Presumed supraventricular tachycardia)



NARROW COMPLEX TACHYCARDIA

(Presumed supraventricular tachycardia)



Any Questions?