### Causes & Triggers
- Acute illness: infection, hyperthyroidism, PE, hypovolaemia
- Cardiac: abnormalities of conduction system, ischaemic heart disease, pericarditis / myocarditis, alcohol, mitral valve disease, post cardiac surgery
- Drugs: β2 agonists, antiarrhythmics, digoxin toxicity, tricyclics, lithium, cocaine, MDMA, amphetamines – see toxbase
- Metabolic: high or low K or Ca, hypoxia, high CO2, acidosis, high or low temp

### Anti-arrhythmics – cautions & contra-indications:
- B-blockers and Ca channel blockers should not be used together
- Adenosine: acute bronchospasm, dypiridamole, carbamazepine
- Amiodarone: sino-atrial block and conduction disturbances, severe hypotension, thyroid disease, CCF, pregnancy & breast-feeding
- Ca channel blockers: heart failure, hypotension, sick sinus syndrome, heart block, AF with WPW, VT, pregnancy & breast-feeding

### Classification of SVT
- SVT usually produces a regular narrow complex tachycardia. P waves may not be visible, but it may seen may give a clue as to the origin of the SVT:
  - AVNRT (AV nodal reentry tachycardia): Accessory pathway within AV node. May see pseudo R in V1, or pseudo S in II, III, aVF. RP shorter than PR
  - AVRT (AV reentry tachycardia): Accessory pathway outside AV node (WPW). May see delta wave on resting ECG.
  - Junctional tachycardia: Retrograde P waves before, during or after QRS. P usually inverted in II, III, aVF and upright in aVR, V1
  - Atrial tachycardia: Trigger within the atria but outside SA node, AV node or accessory pathway. P waves abnormal morphology. Isoelectric baseline seen between P waves (cf atrial flutter). P waves often inverted in II, III, aVF. RP longer than PR (cf AVRT, AVNRT)

### Summary of Treatment Response
**Cardioversion achieved by vagal manoeuvres, adenosine or DC shock. Rate control achieved by B blockers or verapamil**

- AVNRT and AVRT may cardiovert with vagal manoeuvres, adenosine, verapamil or DC shock. B blockers will slow rate
- Junctional and atrial tachycardia will not cardiovert with vagal or adenosine, but usually respond to DC shock. Atrial tachycardias respond better to B blockers than Ca blockers

### Investigations: FBC & VBG (all), HCG, TFT (if first presentation) & CXR (only if clinically indicated); additional tests if condition requires

### Are there signs of shock or acute pulmonary oedema?
**Caution:** compromise due to SVT is rare if structurally normal heart. Consider underlying cause and treat as appropriate eg sepsis

- No
- Yes

#### Vagal Manoeuvres
- Valsalva eg blow into syringe
- Carotid sinus massage

#### Arrhythmia terminated?
- No
- Yes

#### Adenosine
- 6 mg iv rapid bolus followed by 20 mL rapid 0.9% saline flush
- If unsuccessful, repeat with 12 mg then 18 mg

#### Arrhythmia terminated?
- No
- Yes

#### Discuss with ED Senior / Cardiologist
Consider:
1. Metoprolol 5 – 10 mg iv or Esmolol 5 – 10 mg iv
2. Verapamil 5 mg iv (do not use both)
   - Giving with iv calcium chloride 300 mg (3 mL of 10%) or calcium gluconate 1 g (10 mL of 10%) slow iv
   - push 2 minutes before verapamil can offset hypotension in patients with borderline BP
3. Amiodarone 300 mg over 1 hour (only if patient has intercurrent critical illness – interferes with subsequent electrophysiological studies)
4. Consider DC Cardioversion

#### Discharge Criteria:
- No signs ACS or LVF, full recovery post sedation
- Follow up: Refer to Rapid Access Heart Rhythm Clinic at Barts Hospital:
  - fax referral form and a copy of the ECGs and discharge summary to 0203 465 5769
  - Barts Hospital is located in West Smithfield, EC1A 7BE. Nearest tube is St Pauls or Barbican.
  - Enquiries 0203 465 6767

#### Discuss with Cardiologist
- Electrophysiology SpR at Barts: 07810 878 2395
- Cardiology SpR NUH in hours: bleep 148

Consider:
- Adenosine
- Overdrive pacing
- Chemical cardioversion

If broad complex – exit pathway, follow ALS protocol

**CAUTION**
WPW with AF
Do not use AV node blocking drugs

**SENIOR ADVICE**
Consider: DC shock (first line)
Amiodarone
Flecainide

**Synchronised DC Cardioversion**
- Senior Dr to review
- Procedural sedation (RSI not essential)
- Synchronised DC shock:
  - 150J biphasic
  - (consider 100J eg frail, elderly)

**Arrhythmia terminated?**
- Yes
- No
Use of calcium with verapamil in the management of supraventricular tachyarrhythmias; Weiss et al; International Journal of Cardiology; October 1983
Treatment of atrial arrhythmias: effectiveness of verapamil when preceded by calcium infusion; Jacob et al; Archives Internal Medicine; 1986
Administration of intravenous calcium before verapamil to prevent hypotension in elderly patients with paroxysmal supraventricular tachycardia; Miyagawi et al; Journal of Cardiovascular Pharmacology; August 1993
ALS 2010 Resuscitation Guidelines