

Synchronised DC Cardioversion

Routine indications: AF/atrial flutter after 4 weeks anticoagulation

Emergency indications: tachyarrhythmia with adverse signs (shock, syncope, myocardial ischaemia, heart failure)

Synchronised DC cardioversion is used for patients with a pulse (shock synchronises with R wave to avoid inducing VF)

Unsynchronised DC cardioversion (defibrillation) is used for patients without a pulse (cardiac arrest) – see [ALS](#)

Pre-procedure

Skip this section if it is being performed as an emergency

- Read referral letter
- Check potassium >4mmol/L
- Check ECG still shows AF/flutter
- Consent patient
 - Risks: stroke (<1%), pain or burns from pads, failure (1/3), ventricular arrhythmias (may require further shocks/CPR), bradycardia or asystole (may require external pacing)
- Check anticoagulation has been taken for >4 weeks
 - NOAC – check no missed doses
 - Warfarin – check INRs in last 3 weeks are >2
- Check patient is clinically well and fit for anaesthetic

Procedure

- Anaesthetist must be present to sedate patient
- Apply 3-lead cardiac monitoring (clockwise from right arm **Ride Your Green Bicycle**) and connect lead to external cardiac monitor or defibrillator machine
 - **R**ed: anterior aspect of right shoulder
 - **Y**ellow: anterior aspect of right shoulder
 - **G**reen: left anterior superior iliac spine
 - **B**lack: not present on defibrillation machine
- Apply defibrillator pads (in AP position) after shaving chest if required
 - 'Right' pad: place longitudinally on left sternal edge
 - 'Left' pad: place longitudinally on left paraspinal muscles (in line with anterior pad)
- Connect pads lead to defibrillator machine
- Set defibrillator machine monitoring trace to 'pads'
- Set defibrillator to synchronised mode (synchronises shock with R wave to avoid inducing VF)
- Set energy level (increase as shown if unsuccessful)
 - Broad-complex tachycardia or AF: **150J → 200J → 200J** (biphasic)
 - Narrow complex tachycardia or atrial flutter: **70J → 120J → 200J** (biphasic)
- Ask anaesthetist to sedate patient and wait until they are happy to proceed
- Ask everybody to move away from the patient and ask for the oxygen to be moved away
- Press charge (then move hand away from button)
- Re-check everybody and oxygen is away from the patient, announce you are about to shock and press and hold the shock until shock is delivered (it will wait for the R wave)
- Re-assess the rhythm
- If unsuccessful, repeat at next energy (maximum 3 attempts)

Dealing with complications

- Asystole or bradycardia with haemodynamic compromise (SBP<90) → if sustained, proceed to transcutaneous pacing
 - Set defibrillator to pacing mode
 - Set onscreen pacing rate (default usually ~70bpm) and energy (default starting energy usually ~30mA)
 - Click onscreen start pacing button
 - Observe the monitor to see if QRS complexes follow every pacing spike – if not, increase the energy until they do – 'electrical capture' (usually occurs at 50-100mA)
 - Next check the patients pulse corresponds to the induced QRS complexes – 'mechanical capture'
 - Seek senior help if does not resolve
 - *Note you can touch the patient during pacing*
- Bradycardia without haemodynamic compromise → monitor, reduce β -blockers
- Ventricular tachycardia with pulse → repeat synchronised DC shock as above
- Pulseless arrhythmia → unsynchronised DC shock if shockable rhythm (VT/VF); if ongoing or not shockable rhythm, start chest compressions and manage as cardiac arrest (see [ALS](#))

Post-procedure

- Document procedure
- Complete discharge letter
 - Continue all medications (except digoxin if taking and successfully cardioverted)
 - Continue anticoagulation until patient has been reviewed at least 4 weeks post-cardioversion
- Book for clinic follow up
- Re-check ECG and observations
- Advise patient not to drive for 24 hours and stay with someone overnight

