QUESTION ONE

A 45 year old man presents with 6/24 history of palpitations, sweating, dyspnoea and chest pain. His BP is 90/60 mmHg. His ECG is shown below:

![ECG Image]

The most appropriate treatment of his arrhythmia is:
A. IV amiodarone  
B. IV digoxin  
C. IV sotalol  
D. Cardioversion  
E. Overdrive cardiac pacing

Answer: D

**Sustained, monomorphic ventricular tachycardia:**
- Wide, regular QRS complexes (> 120ms)

**Ddx**
1) SVT with aberrances (may be revealed with vagal manoeuvres)  
2) Pacemaker or ICD  
3) ECG artefact

If unsure, treat as VT because:
- 80% of wide complex tachycardias are caused by VT (up to 95% in those with previous AMI)  
- VT treatment can terminate other arrhythmias  
- SVT treatment (eg adenosine) may precipitate VF

VT is classified and managed according to:
1) Duration: sustained vs non-sustained (3-15 beats)  
2) Morphology: monomorphic vs polymorphic  
3) Symptoms: palpitations, dyspnoea, chest pain, syncope  
4) Haemodynamic stability  
5) ?Caused by AMI- if yes, treat as unstable because can deteriorate quickly and worsen ischaemia

**Unstable patient**
- conscious but pulse and BP still present
  - **Synchronised cardioversion**  
  - If not possible because cannot differentiate between QRS and T, defibrillate as per VF  
  - Treat low K (commonest cause) and Mg
- unconscious/ pulseless
  - Defibrillate as per VF
  - CPR +/- adrenalin
  - Treat low K and Mg

**Stable patient**
- Urgent synchronised cardioversion
- If refractory or prolonged, anti-arrhythmics (class 1 or 3)
  - IV Lignocaine (especially effective if known cardiac ischaemia)
  - IV amiodarone
  - Or if EF >40%, IV sotalol or IV procainamide
- Treat low K and Mg, heart failure, ischaemia
- If known VT syndrome with no structural abnormalities, consider using previous calcium channel blocker or beta-blocker

**A. and C.**
IV amiodarone and sotalol is appropriate and can be used, but is 2\textsuperscript{nd} line to cardioversion (some studies suggest it is less useful in reversion compared to procainamide and sotalol (Marill KA et al. Amiodarone is poorly effective for the acute termination of ventricular tachycardia. *Ann Emerg Med* 2006 Mar)

**B.**
Digoxin suppresses the AV node by increasing vagal tone, thus it precipitates ventricular arrhythmias, not suppress it.

**E.**
Overdrive cardiac pacing will not change the ventricular response.
Cardiac pacing eg in pacemakers work by providing electrical stimuli when they sense intrinsic cardiac potentials being too low or absent (eg in heart block).
For ventricular tachycardias, an ICD is required to cardiovert/defibrillate when it senses that ventricular rate exceeds a programmed cut-off rate.

**Monomorphic VT**
- usually from heart disease (IHD)
- or “idiopathic” (named after sites of origin, usually exercise induced)

**Polymorphic VT**
- malignant form of VT that degenerates into VF
- usually from QT prolongation (drugs or congenital) or electrolyte imbalance
- classically Torsades de pointes

![Heart Rate: 124]