

## Cardiac Dysrhythmias

General warnings – if a rhythm looks odd, think about artefact.

- Is the paper speed correct? ( $25 \text{ mms}^{-1}$ )
- Is the patient moving/shivering?
- Is there any equipment nearby that could interfere?
- Are the electrodes secure and correctly placed?

Always check the patient – any rhythm can represent cardiac arrest, so always ensure patient has adequate output (i.e. pulse) before worrying about fine points of diagnosis.

### Normal sinus rhythm

Rate between 60 and 100

P waves present

QRS present and  $<0.12\text{s}$  wide (3 small squares)

One P wave for each QRS

PR interval (start of P to start of QRS) constant and between  $0.12\text{s}$  and  $0.2\text{s}$  (3 and five small squares)

### Sinus bradycardia

As above, but rate  $<60$

May be physiological

Consider atropine and/or pacing if symptomatic (usually  $<40$ )

### Supraventricular tachycardia (SVT)

Rate  $>100$ , narrow QRS complexes

May be sinus (usually rate  $<220$ , P waves present but may not be visible)

Treat by vagal manoeuvres, if unsuccessful then adenosine to cardiovert

### Wolff-Parkinson-White

Apparent narrow complex tachycardia, but with delta wave (slurred upstroke of QRS complex)

### Ventricular tachycardia

Rate  $>100$ , broad QRS complexes

Often bizarre morphology

Shockable rhythm! Check patient and treat

### Torsade de Pointes

VT with twisting axis

Complexes progressively get larger and smaller when viewed in any one lead

Treat with  $\text{Mg}^{2+}$  infusion

### Ventricular fibrillation

Random, disorganised electrical activity

Subdivided into coarse or fine

Shockable rhythm! Check patient and treat

### **Atrial fibrillation**

Chaotic atrial activity seen as fluctuating baseline (may not be visible)  
Irregularly irregular QRS complexes  
Can often be detected clinically  
New onset – attempt cardioversion  
Old – warfarinise then attempt cardioversion  
If refractory, rate control may provide satisfactory outcome

### **Atrial flutter**

Sawtooth atrial activity at rate of 300 (may not be visible)  
Narrow QRS complexes, rate depends on degree of AV block (if any)

- Typically 300, 150, 100

Vagal manoeuvres to slow heart may reveal atrial activity

### **1<sup>st</sup> degree AV block**

Prolonged PR interval ( $>0.2s$ )  
One P wave for every QRS  
Not usually a problem

### **2<sup>nd</sup> degree AV block (Mobitz I or Wenckebach)**

Gradual prolongation of PR interval until QRS missed  
Pattern repeats  
Often benign, but may need monitoring in case it develops

### **2<sup>nd</sup> degree AV block (Mobitz II)**

Constant PR interval  
Not every P wave followed by QRS  
May be regular pattern (classified as X:1 where X is number of P waves per QRS)  
May be variable  
Often requires treatment

### **3<sup>rd</sup> degree AV block**

No association between P waves and QRS  
P wave rate usually faster than QRS rate  
Caution – some P waves may be hidden in QRS complex or T wave  
Often symptomatic  
Consider atropine as temporary measure, usually requires pacing

### **Ectopic**

Any complex arising from a focus other than the SA node  
May be seen as complex with abnormal morphology  
Unifocal – from a single ectopic focus  
Multifocal – from multiple foci, seen as multiple morphologies  
May be atrial or ventricular

### **Escape rhythm**

Three or more consecutive ectopic beats

Indicates alternative pacemaker is taking over from SA node

- Atrial – may have atrial activity, narrow QRS, usually rate >60
- Junctional – narrow QRS, may have inverted P wave (retrograde)
- Ventricular – broad QRS, usually slow

### **Asystole**

Flat line on ECG

Usually some baseline drift seen

Check leads (most monitors now indicate if they are disconnected) and gain

### **Ventricular standstill**

P waves present

No QRS complexes

Sometimes responds to pacing

### **Agonal**

Slow, random patterns of electrical activity

Precedes asystole

Usually terminal sign

NB Bundle branch block, MI, etc are diagnosed on 12 lead ECG, not rhythm strip.

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