

Cardiac Series Teach Session 3 (Arrhythmia) – June Low

Bradyarrhythmias

Type	Aetiology	Signs/Symptoms	ECG findings	Treatment
Sinus Bradycardia	Normal response to cardiovascular conditioning Sinus node dysfunction Beta-blocker (BB)/calcium channel blocker (CCB) toxicity	May be asymptomatic May also present with lightheadedness, syncope, chest pain (CP) or hypotension	Sinus rhythm Ventricular rate <60 bpm	None if asymptomatic Atropine may be used to increase heart rate Pacemaker placement is definitive treatment if severe
First degree AV block	Can occur in normal individuals Associated with increased vagal tone and with BB and CCB	Asymptomatic	Constant prolonged PR int. >0.21s	Not necessary
Second-degree AV block - Mobitz I (Wenckebach phenomenon)	Drug effects (digoxin, BB, CCB) Increased vagal tone Right coronary ischemia/infarction	Usually asymptomatic	Progressive PR lengthening until a dropped beat occurs, then PR int. then resets	Stop offending drug Atropine as clinically indicated
Second-degree AV block - Mobitz II	Results from fibrotic disease of the conduction system or from acute, subacute, or prior MI	Ocasionally syncope; frequent progression to third-deg AV bock	Unexpected dropped beat(s) without a change in PR int.	Pacemaker
Third-degree AV block (complete)	No electrical communication between the atria and ventricle	Syncope, dizziness, acute heart failure, hypotension	No relationship between p waves and QRS complex	Pacemaker
Sick Sinus Syndrome / tachycardia-bradycardia syndrome	A heterogenous disorder that leads to intermittent supraventricular tachy and bradyarrhythmias	Secondary to tachycardia or bradycardia May include syncope, palpitations, dyspnoea, CP, TIA and stroke	Moments of bradycardia and tachycardia	The most common indication for pacemaker

Supraventricular/Atrial Tachyarrhythmias

Type	Aetiology	Signs/Symptoms	ECG findings	Treatment
Sinus Tachycardia	<p>Normal physiologic response to fear, pain and exercise</p> <p>Can be secondary to hyperthyroidism, volume contraction, infection or pulmonary embolism (PE)</p>	Palpitations, SOB	<p>Sinus rhythm</p> <p>Ventricular rate >100 bpm</p>	Treat underlying cause
Atrial Fibrillation (AF)	<p>Acute AF: PIRATES</p> <p>Pulmonary disease Ischaemia Rheumatic heart disease Anaemia/Atrial myxoma Thyrotoxicosis Ethanol Sepsis</p> <p>Chronic AF- Hypertension, CHF</p>	<p>Often symptomatic</p> <p>May present with SOB, CP or palpitations.</p> <p>Physical examination reveals an irregularly irregular pulse</p>	No discernible p waves, with variable and irregular QRS response	<p>Estimate risk of stroke using CHA2DS2-VASc score Anticoagulate if ≥ 2</p> <p>Rate control: BB CCB Digoxin</p> <p>Rhythm control: Sotalol Amiodarone Flecainide</p> <p>Favour rate control: >65Y History of IHD</p> <p>Favour rhythm control: <65Y Symptomatic 1st presentation Lone AF AF secondary to corrected precipitant CCF</p>
Atrial flutter	Circular movement of electrical activity around the atrium at rate of approximately 300/min	<p>Usually asymptomatic</p> <p>Can present with palpitations, syncope, and lightheadedness</p>	<p>Regular rhythm;</p> <p>“sawtooth” appearance of pwaves can be seen.</p> <p>Atrial rate is usually 240-320bpm and the ventricular rate around 150 bpm</p>	Anticoagulation, rate control and cardioversion guidelines as in AF above

Ventricular Tachyarrhythmias

Type	Aetiology	Signs/Symptoms	ECG findings	Treatment
Premature Ventricular complex (Ectopics)	Ectopic beats arise from ventricular foci Associates with hypoxia, electrolyte abnormalities, hyperthyroidism	Usually asymptomatic May lead to palpitations	Early, wide QRS not preceded by a P wave. Ectopics usually followed by a compensatory pause	Treat underlying cause If symptomatic, give BB or occasionally other anti-arrhythmics
Ventricular Tachycardia (VT)	Can be associated with CAD, MI and structural heart disease	Nonsustained VT is often asymptomatic; Sustained VT can lead to palpitations, hypotension, angina and syncope. Can progressed to VF and death	Three or more consecutive ectopics Wide QRS complexes in a regular rapid rhythm	Shockable rhythm (ALS)
Ventricular Fibrillation (VF)	Associated with CAD and structural heart disease. Associated with cardiac arrest	Syncope, absence of BP, pulselessness.	Totally erratic wide-complex tracing	Shockable Rhythm (ALS)
Torsades de pointes	Associated with long QT syndrome, proarrhythmic response to medications, hypokalaemia, congenital deafness and alcoholism	Can present with sudden cardiac death Typically associated with palpitations, dizziness and syncope	Polymorphous QRS VT with rates between 150 and 250bpm	Magnesium sulphate initially and cardiovert if unstable Correct hypokalaemia Withdraw offending drugs

Glossary

ALS - advanced life support

BB - beta blockers

bpm - beats per minute

CAD - coronary artery disease

CCB - calcium channel blocker

CCF - congestive cardiac failure

CP - chest pain

IHD - ischaemic heart disease

MI - myocardial infarction

SOB - shortness of breath

TIA - transient ischaemic attack