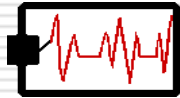


HTEC 91

Medical Office Diagnostic Tests

Week 4



Topic for Today: Atrial Rhythms

- ❑ PACs: Premature Atrial Contractions
- ❑ PAT: Paroxysmal Atrial Tachycardia
- ❑ AF: Atrial Fibrillation
- ❑ Atrial Flutter

Premature Atrial Contractions (PACs)

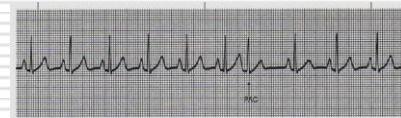
- ❑ Premature atrial contractions (PACs) are atrial beats that arise earlier than expected.



This one: P wave similar to others (ectopic focus close to SA node)

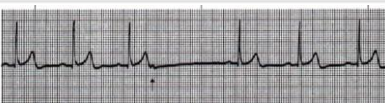
NSR with PAC

- ❑ This one: p wave hidden in previous t wave



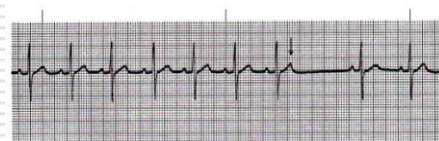
Nonconducted PAC

- ❑ No QRS follows p wave.
- ❑ Impulse comes so early that AV node is refractory.
- ❑ Impulse not conducted to ventricles.



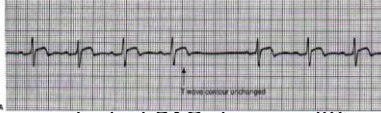
Nonconducted PAC

- ❑ This one: p wave hidden in the t wave



Nonconducted PAC vs Sinus Arrest

- ❑ Sinus arrest: t wave same as others



- ❑ Nonconducted PAC: t wave different



PACs: 8 Steps...

1. P wave: premature (early)
 - Abnormally shaped / appears different from other p waves
 - May be lost in the previous t wave
2. Atrial rhythm: irregular as a result of the PAC; underlying rhythm may be regular.
3. Atrial rate: varies according to the underlying rhythm.
4. PR interval: usually within normal limits (0.12 to 0.20 sec), but may be short or prolonged depending on where in atria the ectopic focus originates.

PACs: 8 Steps...

5. Ventricular rhythm: irregular as a result of the PAC; underlying rhythm may be regular.
6. Ventricular rate: varies according to the underlying rhythm.
7. QRS complex: usually within normal limits (0.06 to 0.10 sec)
8. QT interval: usually within normal limits (0.36 to 0.44 sec)

PACs: Significance

- ❑ PACs occur both in normal and diseased hearts.
- ❑ Significance of PACs depends on the cause and any hemodynamic changes.

Causes of PACs

- ❑ Stress, fatigue
- ❑ Alcohol, caffeine, nicotine
- ❑ Hyperthyroidism
- ❑ Acute MI: pain, apprehension
- ❑ Heart or lung disease
- ❑ Electrolyte imbalance
- ❑ Hypoxia
- ❑ Digitalis toxicity

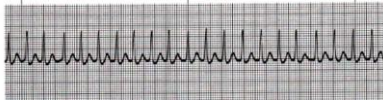
PACs: Interventions

- ❑ Most patients do not require treatment.
- ❑ Eliminate the offending cause; treat the underlying cause.
- ❑ If frequent, may give medications:
 - Procainamide
 - Digitalis
 - Verapamil
 - Beta blocking agents



Paroxysmal Atrial Tachycardia (PAT)

- Also known as SVT.
- An ectopic rhythm that starts and stops suddenly.
- Very rapid firing of an atrial ectopic focus.
- Usually preceded by frequent PACs.



PAT (continued)

- Usually preceded by frequent PACs



PAT: 8 Steps...

1. P wave: usually upright, rounded
 - May not be visible ("lost" in previous t wave)
 - If visible, a p wave exists for every QRS complex
2. Atrial rhythm: regular
3. Atrial rate: 150 to 250 beats per minute
4. PR interval: variable; may not be measurable if difficult to distinguish from preceding t wave
5. Ventricular rhythm: regular
6. Ventricular rate: depends on AV conduction ratio
7. QRS complex: usually within normal limits
8. QT interval: usually within normal limits; difficult to measure; may be shortened due to fast rate

PAT: Significance

- PAT shortens diastole → reduced myocardial blood flow.
- Episodes may be brief, or may last for hours.

Causes of PAT

- Digitalis toxicity
- Coronary artery disease
- Hyperthyroidism
- Wolff-Parkinson-White syndrome
- Hypoxia
- Hypertension
- Stress
- Caffeine / stimulants



PAT: Interventions

- Treatment depends on patient S/Sx
- Vagal maneuvers
 - Carotid sinus massage
 - Valsalva's maneuver
- Cardioversion
- Overdrive pacing
- Medications:
 - Digitalis (unless due to dig toxicity)
 - Beta blocking agents
 - Verapamil
 - Adenosine
 - Phenylephrine



Atrial Fibrillation (AF)

- ❑ Atrial rhythm characterized by disorganized atrial activity.
- ❑ No visible p waves.



Uncontrolled AF

- ❑ Rate > 100 beats per minute

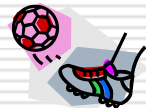


AF: 8 Steps...

1. P wave: N/A. Appear as erratic, fibrillatory waves.
2. Atrial rhythm: grossly irregular
3. Atrial rate: indiscernible. If measurable, 400-600 beats per minute.
4. PR interval: N/A
5. Ventricular rhythm: grossly irregular
6. Ventricular rate: usually 100 to 150 beats per minute
7. QRS complex: usually within normal limits, normal configuration.
8. QT interval: not measurable.

AF: Significance

- ❑ Atria "quiver" rather than contract.
- ❑ Loss of "atrial kick."
- ❑ Fibrillating atria tend to develop thrombi.



Causes of AF

- ❑ Rheumatic heart disease
- ❑ Cardiac valve disorders
- ❑ Hypertension
- ❑ Cardiomyopathy
- ❑ CAD
- ❑ Thyrotoxicosis
- ❑ Chronic obstructive pulmonary disease
- ❑ CHF



AF: Interventions

- ❑ Control ventricular response
- ❑ Attempt conversion to NSR
- ❑ Vagal maneuvers
- ❑ Medications:
 - Amiodarone
 - Flecanide
 - Digitalis
 - Verapamil
 - Beta blocking agents
 - Quinidine
 - Procainamide

Atrial Flutter

- ☐ Atrial rhythm characterized by a rapid atrial rate.
- ☐ Circus movement pathway ("reentry").
- ☐ Enhanced automaticity.



Atrial Flutter

- ☐ Variable conduction



- ☐ 4:1 conduction



Atrial Flutter: 8 Steps...

1. P wave: saw-toothed "flutter" F waves
2. Atrial rhythm: regular
3. Atrial rate: 250 to 350 beats per minute
4. PR interval: not measurable
5. Ventricular rhythm: usually regular
6. Ventricular rate: depends on degree of AV block. Can be 2:1, 4:1, etc.
7. QRS complex: usually within normal limits
8. QT interval: not measurable (no identifiable t waves)

Atrial Flutter: Significance

- ☐ Depends on the ventricular rate: if too slow or too fast, can → decreased cardiac output.

Causes of Atrial Flutter

- ☐ Cardiac disease (acute or chronic)
- ☐ Valve disease
- ☐ Cor pulmonale
- ☐ Sick sinus syndrome
- ☐ Hyperthyroidism
- ☐ Hypoxia
- ☐ Pericarditis

Atrial Flutter: Interventions

- ☐ Synchronized cardioversion
- ☐ Atrial overdrive pacing
- ☐ Remove the cause (if possible)
- ☐ Medications
 - Verapamil
 - Digitalis
 - Beta blocking agents
 - Amiodarone