MEDAVIE HealthEd ÉduSanté

Rhythm Interpretation

Part C: Lethal Arrhythmias

Primary Care Paramedicine

Module: 12

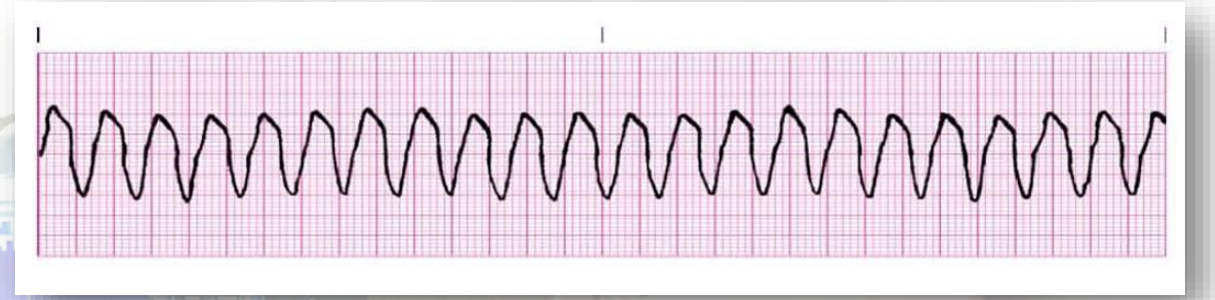
Section: 04c

Lethal Arrhythmias

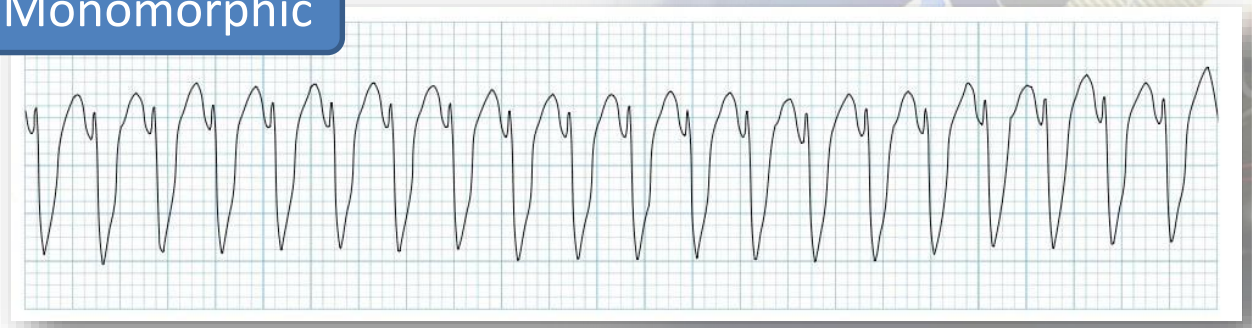
- Ventricular Tachycardia
- Ventricular Fibrillation
- Asystole

Ventricular Tachycardia

Rate	> 100 bpm
Rhythm	Regular
P Waves	None
PRI	None
QRS	> 0.12 s (> 120 ms), wide



Monomorphic



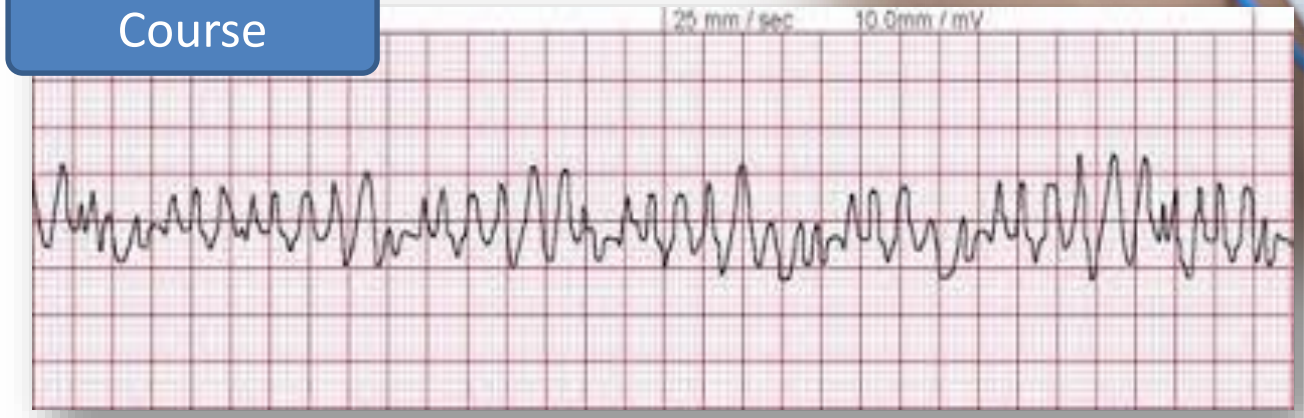
Polymorphic

Torsade de Pointes

Ventricular Fibrillation

Rate	No organized rhythm
Rhythm	No organized rhythm
P Waves	None
PRI	None
QRS	None

Course



Fine

Ventricular Fibrillation

Etiology

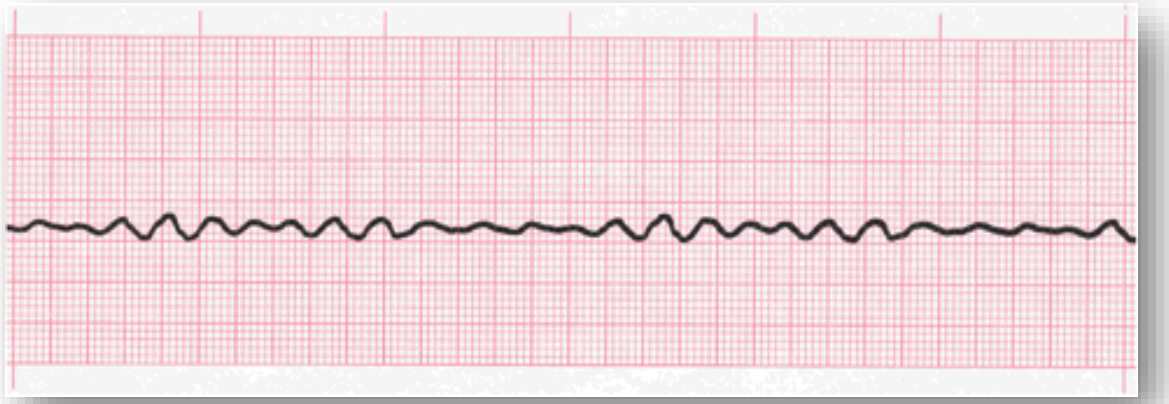
- Rhythm in which the entire heart is no longer contracting
- Quivering without organized contraction
- Random depolarization of many cells

Clinical Significance

- Lethal dysrhythmia with no organized electrical pattern, therefore no mechanical squeeze and no cardiac output and

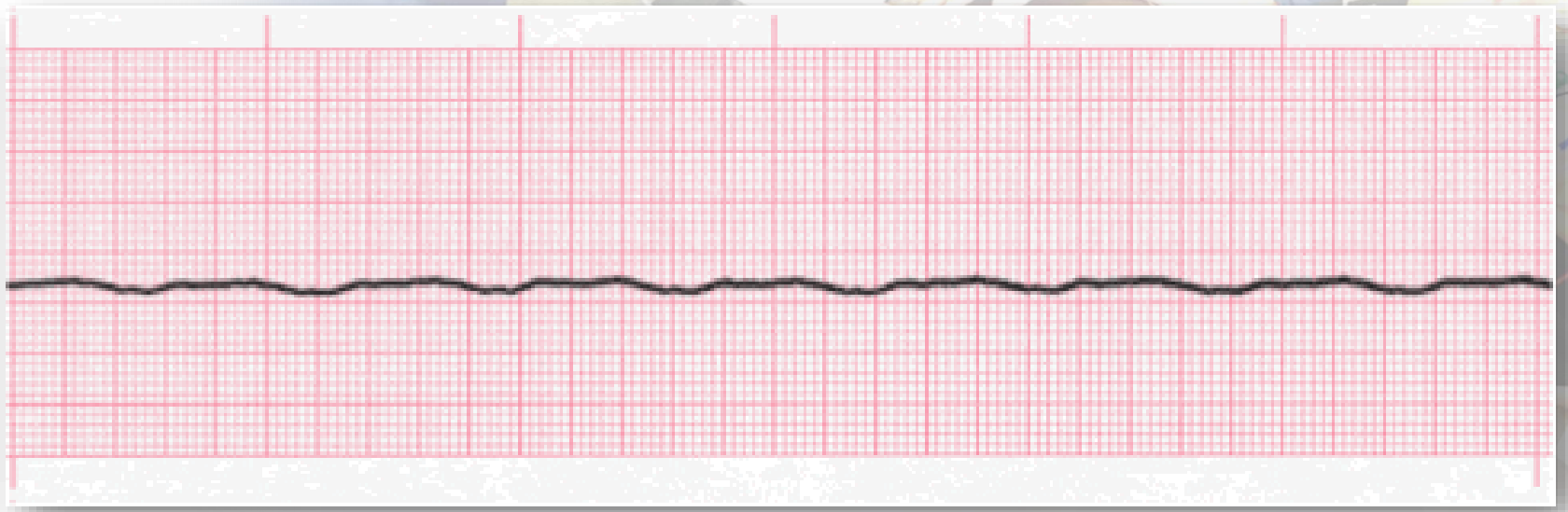
Treatment

- Follow cardiac arrest guidelines



Asystole

Rate	No electrical activity
Rhythm	No electrical activity
P Waves	Absent
PRI	Absent
QRS	Absent



Asystole

Etiology

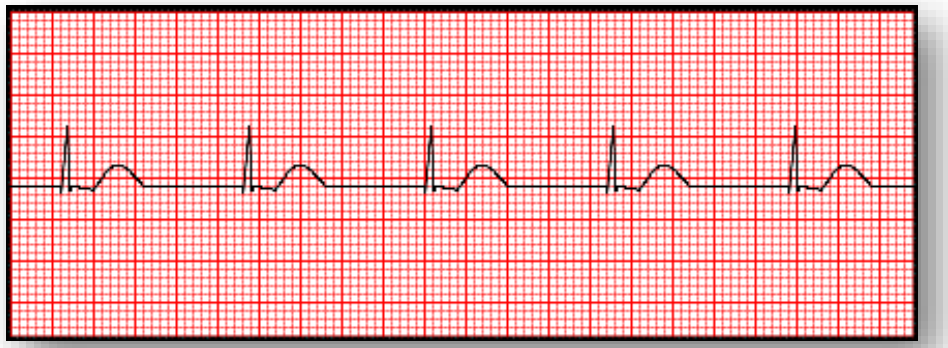
- Flatline
- Entire heart is no longer contracting.
- Many cells have no energy for contraction.
- Generally a confirmation of death

Clinical Significance

- Asystole = cardiac arrest
- Poor prognosis for resuscitation

Treatment

- Follow cardiac arrest guidelines



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Agonal

Pulseless Electrical Activity

- This is more a protocol or treatment plan than it is an actual rhythm
- Characteristics
  - Electrical impulses are present, but with no accompanying mechanical contractions of the heart
  - Treat the patient, not the monitor
  - If pulseless initiate cardiac arrest protocols

PEA/Asystole

- When attempting to determine underling cause of cardiac arrest remember the H's and T's

H's

- Hypovolemia
- Hypoxia
- Hydrogen Ion (Acidosis)
- Hypo/hyperkalemia
- Hypoglycemia
- Hypothermia

T's

- Toxins
- Tamponade (cardiac)
- Tension Pneumothorax
- Thrombosis (coronary or pulmonary)
- Trauma

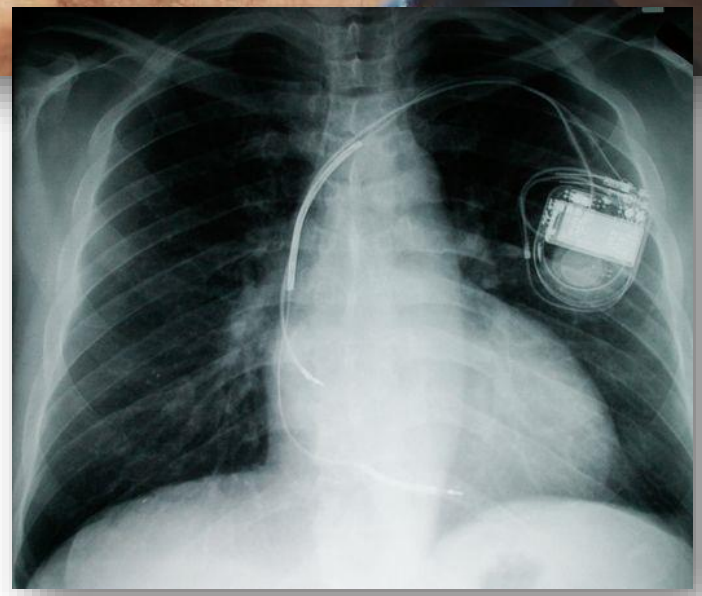
ECG

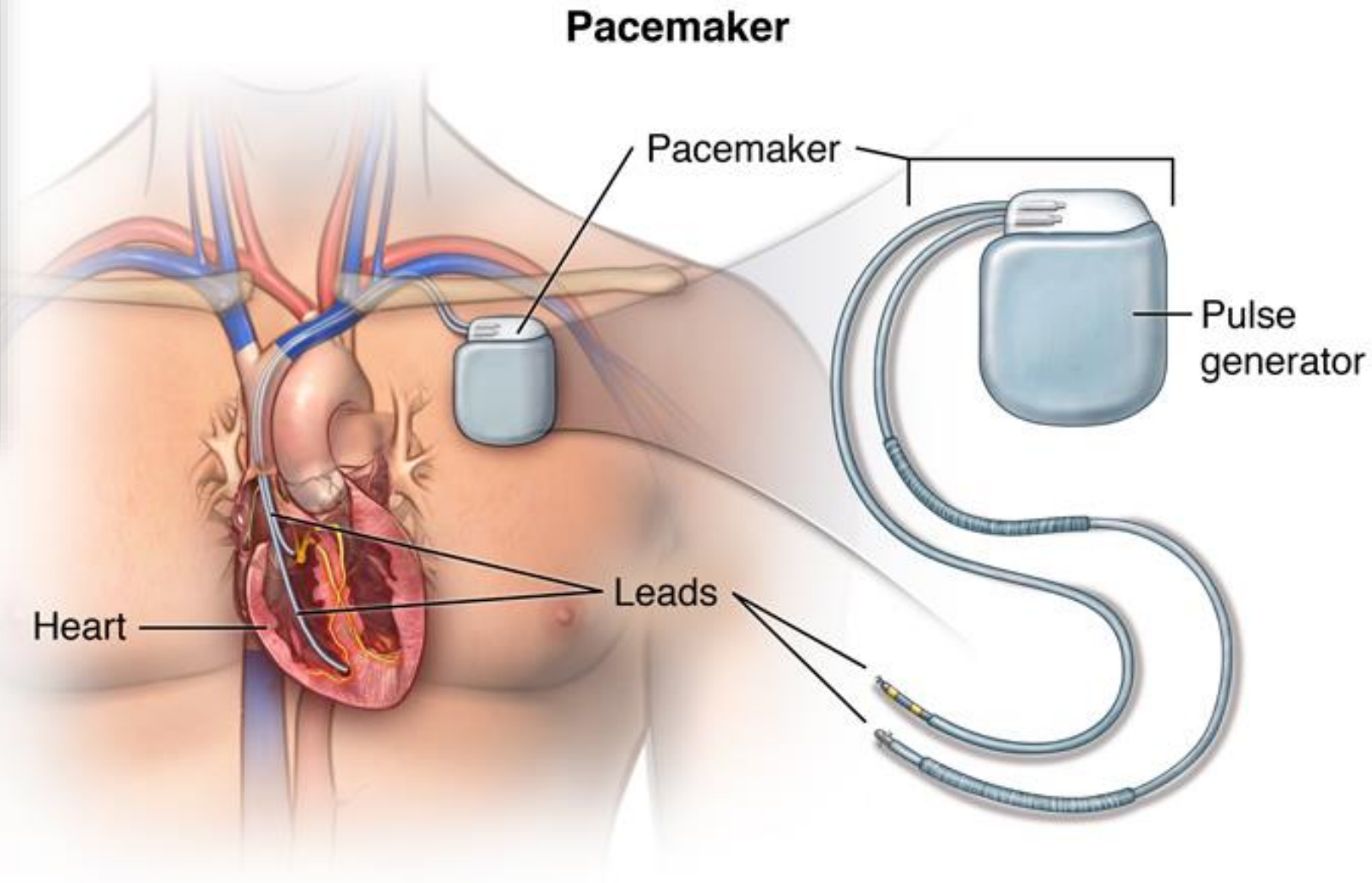
OTHER RHYTHMS

Pacemaker Rhythm

- As a result of underlying dysrhythmias, some patients have a surgically implanted cardiac pacemaker
- Two main types:
  - Single chamber: only one pacing lead is placed in the R atrium or R ventricle
  - Dual chamber: two pacing leads, one in the R atrium and R ventricle
- For both types, the device can either:
  - monitor the patient's underlying rhythm and take over pacing when needed = demand pacemaker
  - or automatically pace the patient at a set rate = fixed pacemaker

Pacemaker Rhythm



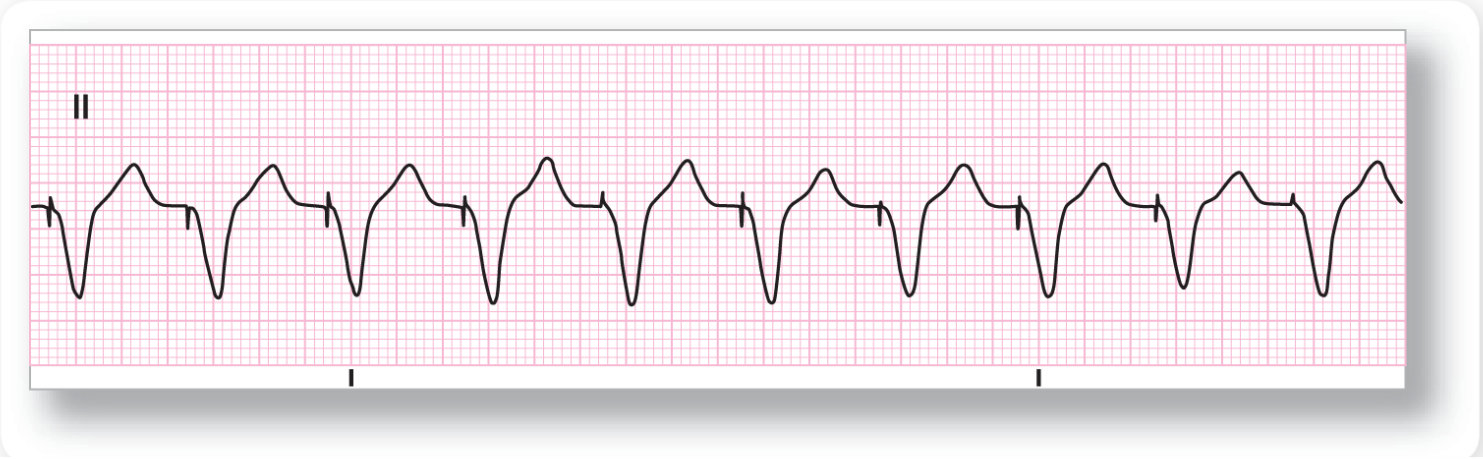


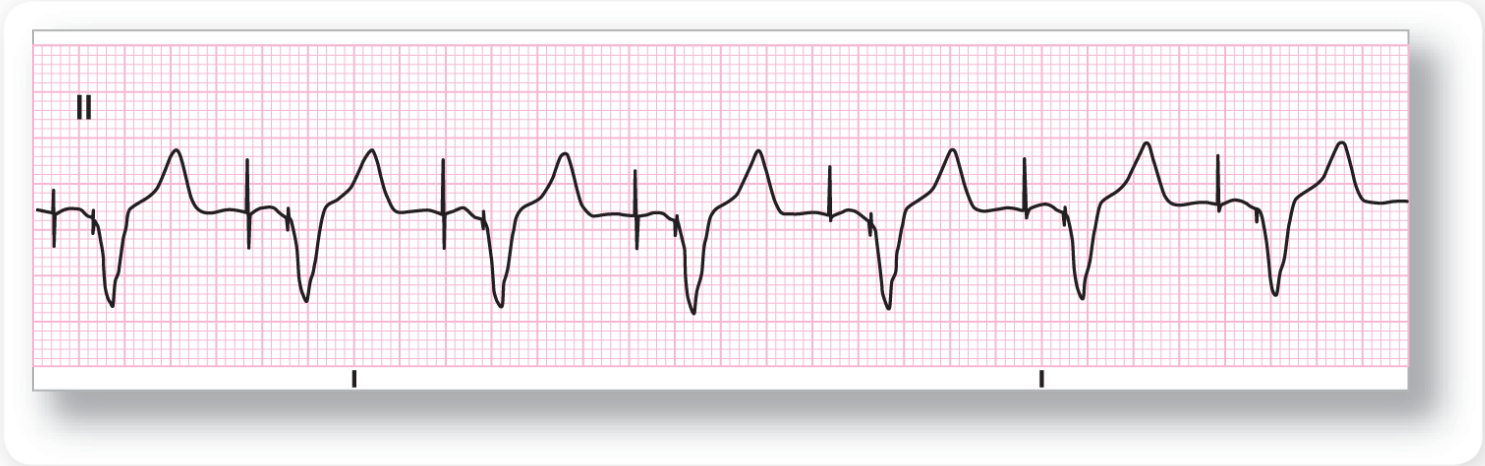
Artificial Pacemaker Rhythms

- Obvious on the heart monitor
- Many types exist.
  - Ventricular pacemakers are attached to the ventricles only.
  - Demand pacemakers

Artificial Pacemaker Rhythms

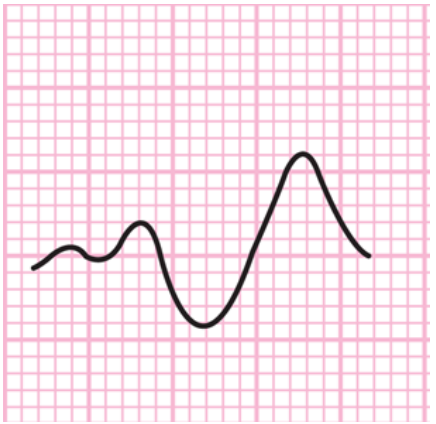
- Artificial pacemaker rhythms





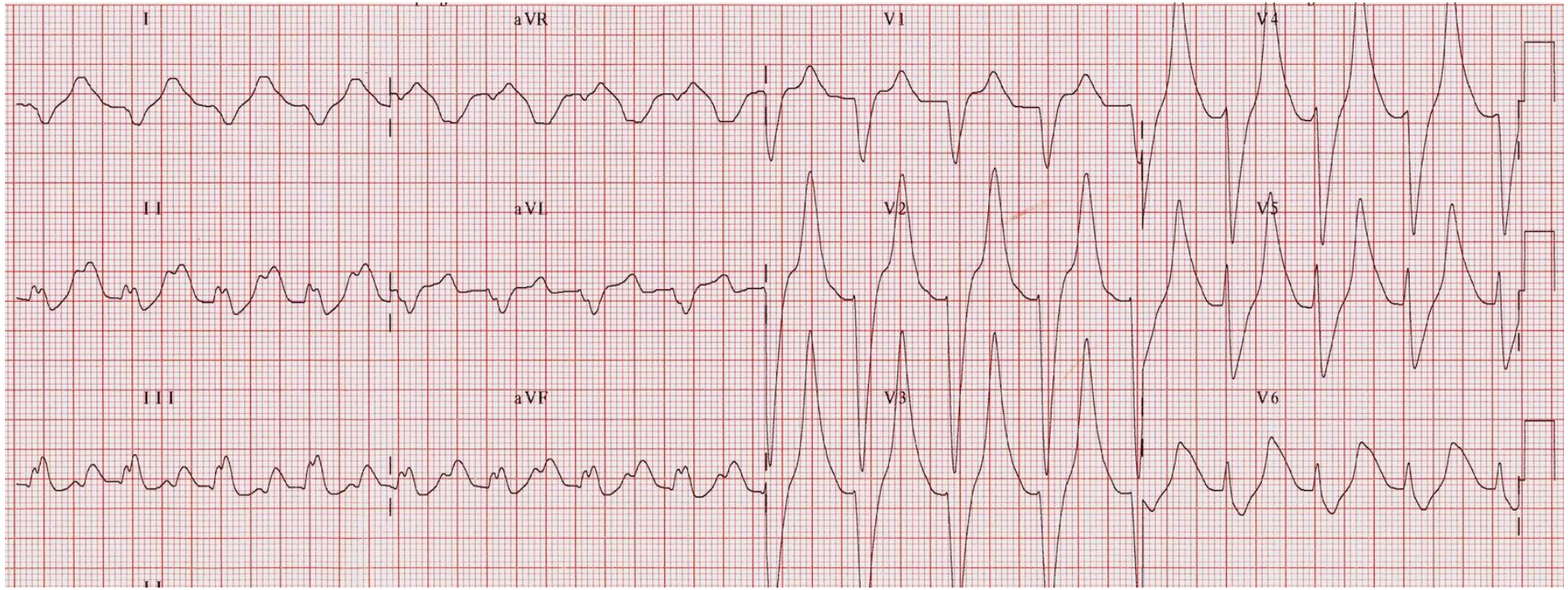
Other ECG Findings

- Hyperkalemia
  - Can produce tall ("peaked") T waves
    - Suspect in patients with a history of renal failure
  - Differentiate from Hyperacute T waves
    - Hyperacute should only be in leads affected by hypoxia whereas Hyperkalemic, peaked T waves would be global
  - Best seen in precordial leads



Profound, severe hyperkalemia has the appearance of a sine wave

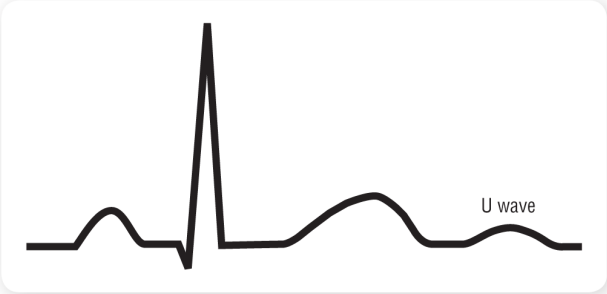
Other ECG Findings

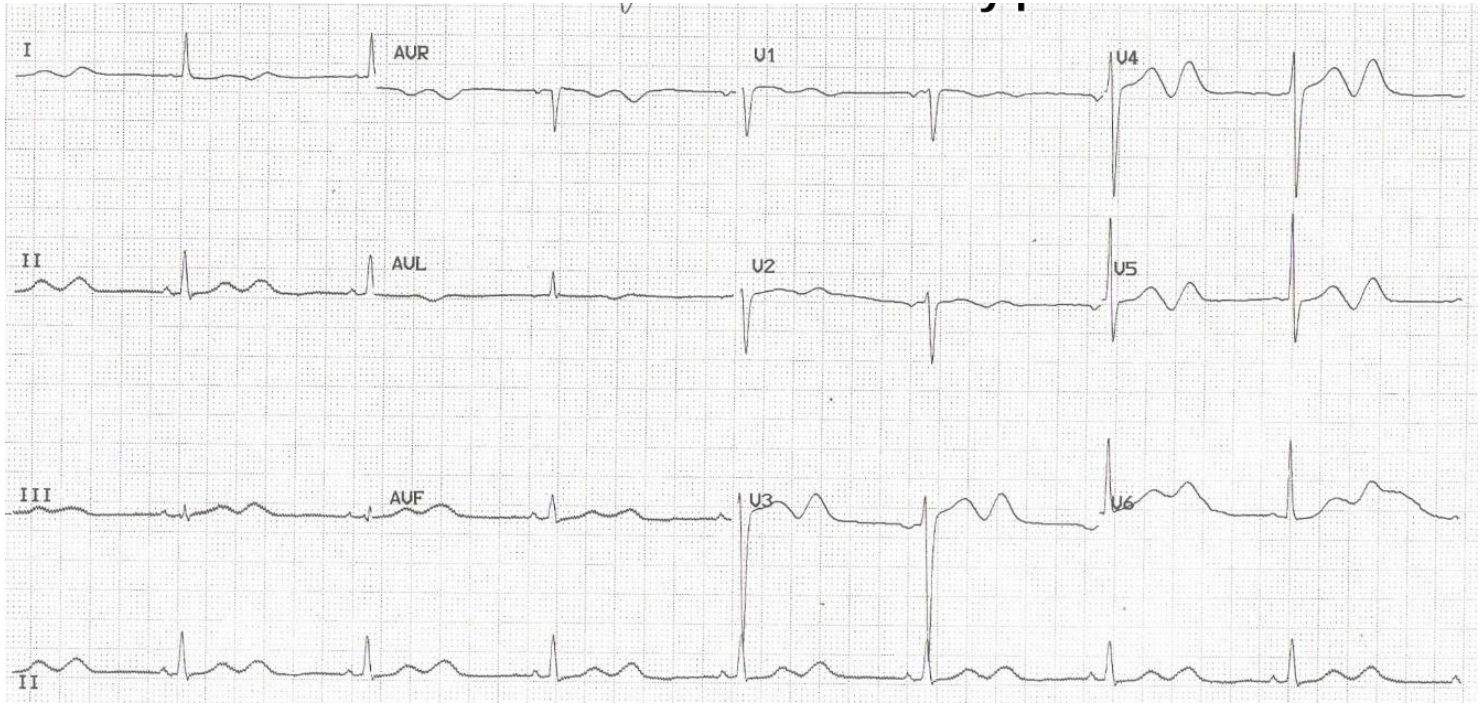


Serum K^+ = 9.2 mEq/L

Other ECG Findings

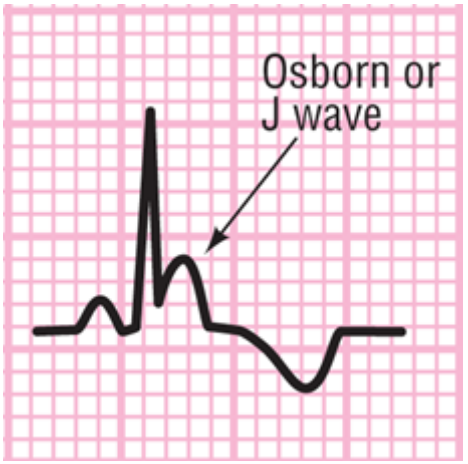
- Hypokalemia
  - Can produce ECG changes that include:
    - P waves with decreased amplitude
    - Increase PRI
    - Flattened or inverted T waves
    - U waves (best observed in precordial leads)

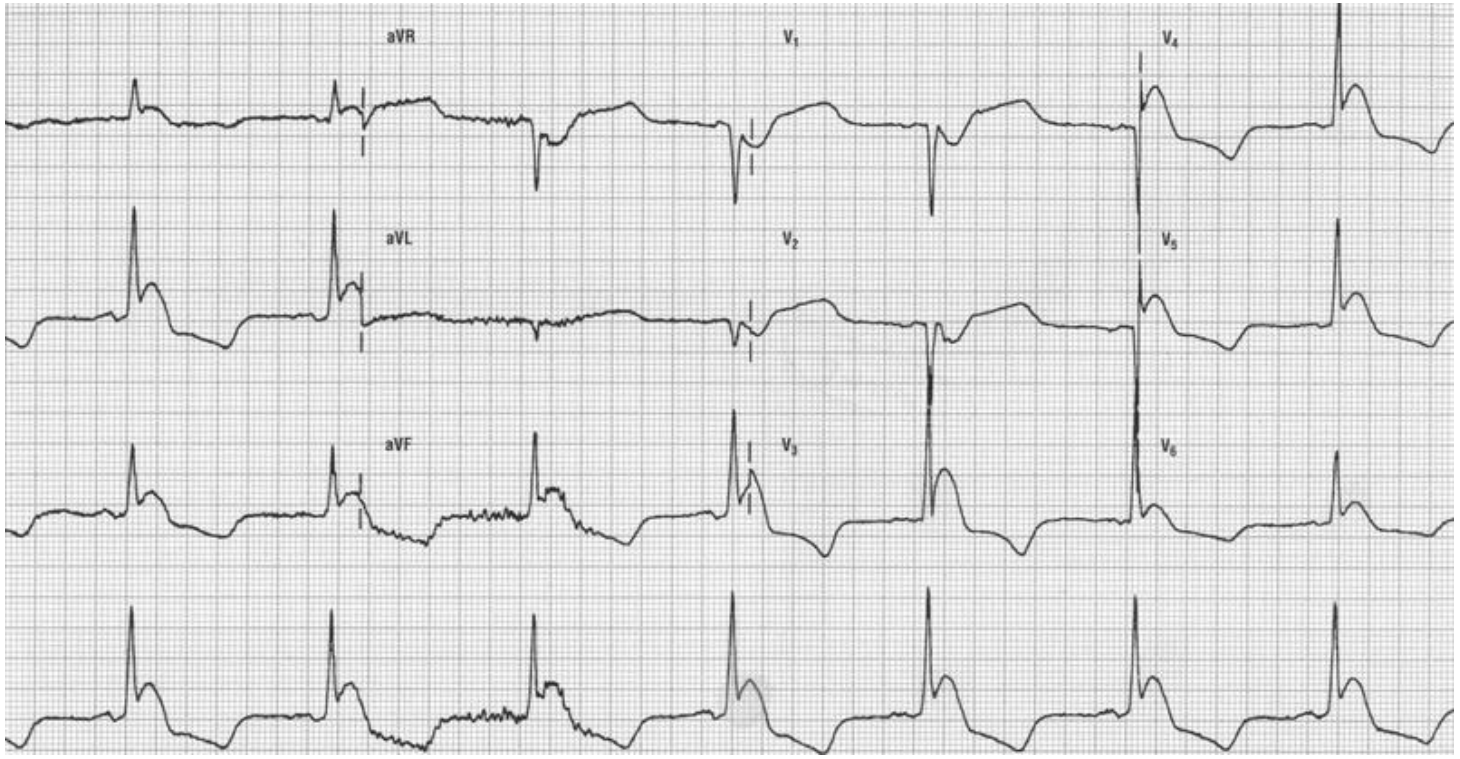




Other ECG Findings

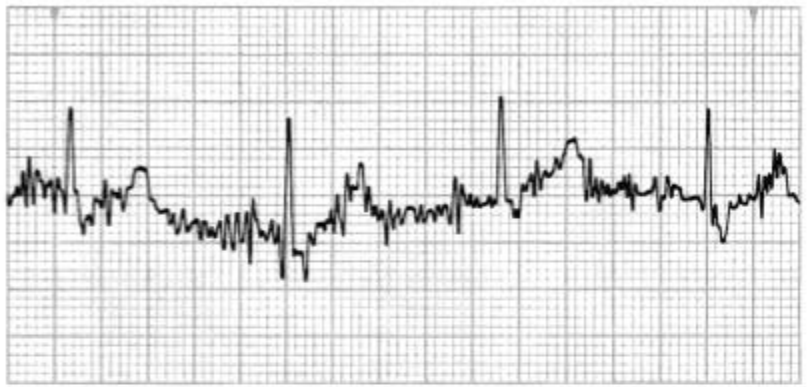
- Hypothermia
  - Can produce ECG changes that include:
    - Osborn wave (“J” wave)
    - T wave inversion
    - Prolonged PRI and QRS



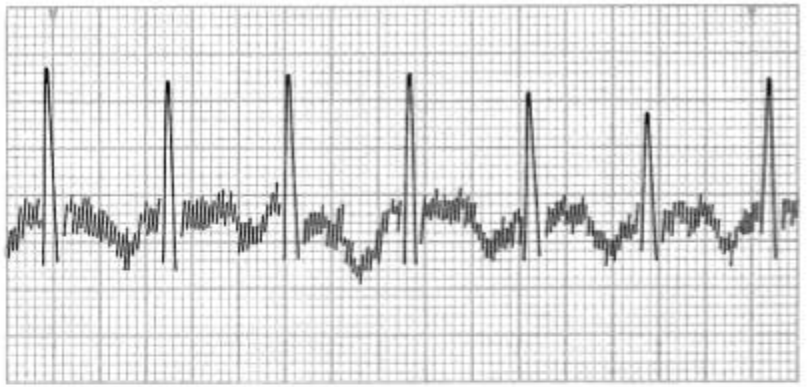


Artifact

Muscle Tremors



AC (60-cycle) interference



Lose electrodes

Biotelemetry

(Poor reception of signal)

Artifact

- Minimize possible artifact by:
  - Stop patient movement
  - Have patient stop talking
  - Stop ambulance is necessary to capture accurate tracing
  - Support limbs
  - Cover with blankets to reduce shivering
  - Move electrode to another location on limb to avoid interference by muscle tissue
  - Replace electrodes if not adhering to patient
  - Shave patient's hair if not allowing skin contact
  - Troubleshoot worn out/damage cables