EKG(s) in Primary Care Practice

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Cardiac action potential

- **Phase 0**: Rapid Na+ influx
- **Phase 1**: K+ Cl efflux
- **Phase 2**: Ca2 influx and K+ efflux
- **Phase 3**: K+ efflux
- **Phase 4**: K+ ions enter cell and Na+ exchange via Na+K pump

**200 M/S**
Electrical system of the Heart
Quick but **SYSTEMATIC** approach

1. Rhythm
2. Rate
86 year old man admitted to the ICU

Multi-focal atrial tachycardia
Irregular narrow complex tachycardia

1. Atrial fibrillation

2. Multifocal atrial tachycardia

3. Paroxysmal atrial tachycardia with variable AV block

4. Atrial flutter with variable AV block
76 year old woman with chronic renal failure

Prolonged QTc – Hypocalcemia
Prolonged QTc

- Meds, meds, meds
- Bradycardia
- Hypokalemia
- Hypomagnesemia
- Hypocalcemia
- Hypothyroidism
- Hypothermia
- Long QT syndrome
42 year old woman with acute shortness of breath

Acute RV strain - Acute pulmonary embolism
Right axis deviation

- Limb lead reversal
- Lateral MI
- RV strain (PE, lung disease)
- RVH
- Vertical heart
- Dextrocardia
- Secundum ASD
- Left posterior fascicular
62 year old woman with breast cancer and weakness

Atrial flutter – Pericardial effusion
Typical and atypical Atrial Flutter

Atypical

Typical
Microvoltagen

1. Pericardial effusion
2. Obesity
3. Pleural effusion
4. Pneumothorax
5. Emphysema
6. Large MI
7. Infiltrative cardiomyopathy
78 year old unconscious man

Hyperkalemia
EKG signs of hyperkalemia

1. Tall peaked T waves
2. Short QTc
3. 1st degree AVB
4. Flat P wave
5. LAFB or LPFB
6. IVCD or LBBB or RBBB
7. Sign wave - VT – VF
8. Asystole
52 year old woman with cold intolerance, weight gain and constipation

**Hypothyroidism**
72 year old woman with fatigue and dyspnea

**Digoxin toxicity**
75 year old man with congestive heart failure

Digoxin toxicity
Digoxin toxicity

- PAT with block
- SVT with alternating BBB
- Afib with complete AVB
- 2nd of 3rd degree AVB
- Accelerated Junctional rhythm
- AIVR
59 year old man with chest pain

Acute pericarditis
63 year old asymptomatic man presenting for a physical

Limb lead reversal
23 year old woman with an abnormal chest x-ray

Dextrocardia
85 year old woman with chest pain

**Acute Anterior STEMI – 2\textsuperscript{nd} Degree AVB Mobitz 2**
71 year old man with dizziness

2\textsuperscript{nd} Degree AVB Mobitz 1
62 year old woman with chest pain for the last 2 days

Acute lateral STEMI
47 year old unconscious man in the ER

Hypothermia
EKG signs of hypothermia

- Osborne wave
- Sinus bradycardia
- AV block
- IVCD
- Long QTc
- T wave inversion
- A fib
- VF
- Asystole
"Hey, Lori! Take a look at Mr. Geckler's EKG!"
Thank You
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