Outline for Friday November 1, 2002

- ECG
- Cardiac Cycle

**Conduction System**

- Autorhythmic cells = self-excitable specialized cardiac muscle fibers
- Myogenic contractions 80-100 times/minute
- SA node = pacemaker
- Atrioventricular (AV) node
- AV bundle = bundle of His
- Purkinje fibers

**Dysrhythmia**

- Bradycardia = less than 50 beats/min
  - Artificial pacemaker
- Tachycardia = over 100 beats/min

**Cardiac muscle contraction**

- Similar to skeletal muscle
- BUT refractory period is longer than contraction
- NO TETANUS

**Electrocardiogram (ECG)**

- P wave = atrial depolarization
- QRS wave = ventricular depolarization
- T wave = ventricular repolarization

- P-R interval = conduction time from start of atrial stimulation to beginning of ventricular stimulation

- Q-T interval = complete cycle of ventricular depolarization and repolarization
• Atrial repolarization is masked by QRS wave

**Cardiac cycle**
= all the events associated with ONE heart beat: at rest = 0.8 sec

• SYSTOLE = Contraction
• DIASTOLE = Relaxation

**Cardiac Cycle**
• Heart is innervated/regulated by ANS - BUT only to increase or decrease heart rate
• NO neural or hormonal control over INITIATION of cardiac muscle contraction

**Heart contraction**
1. Blood moves from HIGH PRESSURE to LOW PRESSURE
2. Conduction system
3. Automaticity of cardiac muscle

**Atrial diastole (&Ventricular diastole)**
• Blood returns to L & R atrium and flows passively into L & R ventricles (70%)
• AV valves are open - SL valves are closed

**Atrial systole (&ventricular diastole)**
• SA node fires impulse, atria contract forcing remaining 30% of blood into ventricles
• Pressure in ventricles increases above atria
• AV valves close
• End-diastolic-volume (EDV)

**Ventricular Systole**
• Impulses from AV node travel down bundle of His & Purkinje
• AV valves are closed SL valves are closed
• Pressure increases in the ventricles above aorta
• SL valves open
• Blood rushes into arteries
**Ventricular diastole**
- Blood fills arteries
- Pressure in arteries increases over that in ventricles
- SL valves close
- (AV valves are closed)
- End-systolic-volume (ESV)
- Pressure in ventricles drops below atria
- AV valves open
- Blood flows passively from atria into ventricles

**Heart Sounds**
- S1 = AV valves close = lubb
- S2 = Semilunar valve close = dupp

**Heart murmurs**
- Indicate abnormal flow of blood