Extra Notes from HEART Chapter

All of these notes pertain to Control of Heart Rate (near end of notes):

Cardioinhibitory center stimulates vagus nerves

-secretes ACH (acetylcholine) which binds to muscarinic receptors

*nodal cells hyperpolarized, HR slows

*vagal tone: background firing rate holds HR to sinus rhythm of 70 to 80 bpm

-severed vagus nerves (intrinsic rate-100bpm)

-maximum vagal stimulation
↓ HR as low as 20 bpm

Inputs to Cardiac Center

1. Higher brain centers affect HR
   - -cerebral cortex, limbic system, hypothalamus
     - *sensory or emotional stimuli (rollercoaster, IRS audit)
2. Proprioceptors
   - -inform cardiac center about changes in activity, HR ↑ before metabolic demands arise
3. Baroreceptors signal cardiac center
   - -aorta and internal carotid arteries
     - *pressure ↓, signal rate drops, cardiac center ↑ HR
     - if pressure ↑, signal rate rises, cardiac center ↓ HR

Exercise and Cardiac Output

Proprioceptors
HR ↑ at beginning of exercise due to signals from joints, muscles

Venous return
muscular activity ↑ venous return causes ↑ SV

↑ HR and ↑ SV cause ↑CO

Exercise produces ventricular hypertrophy
↑ SV allows heart to beat more slowly at rest
↑ cardiac reserve