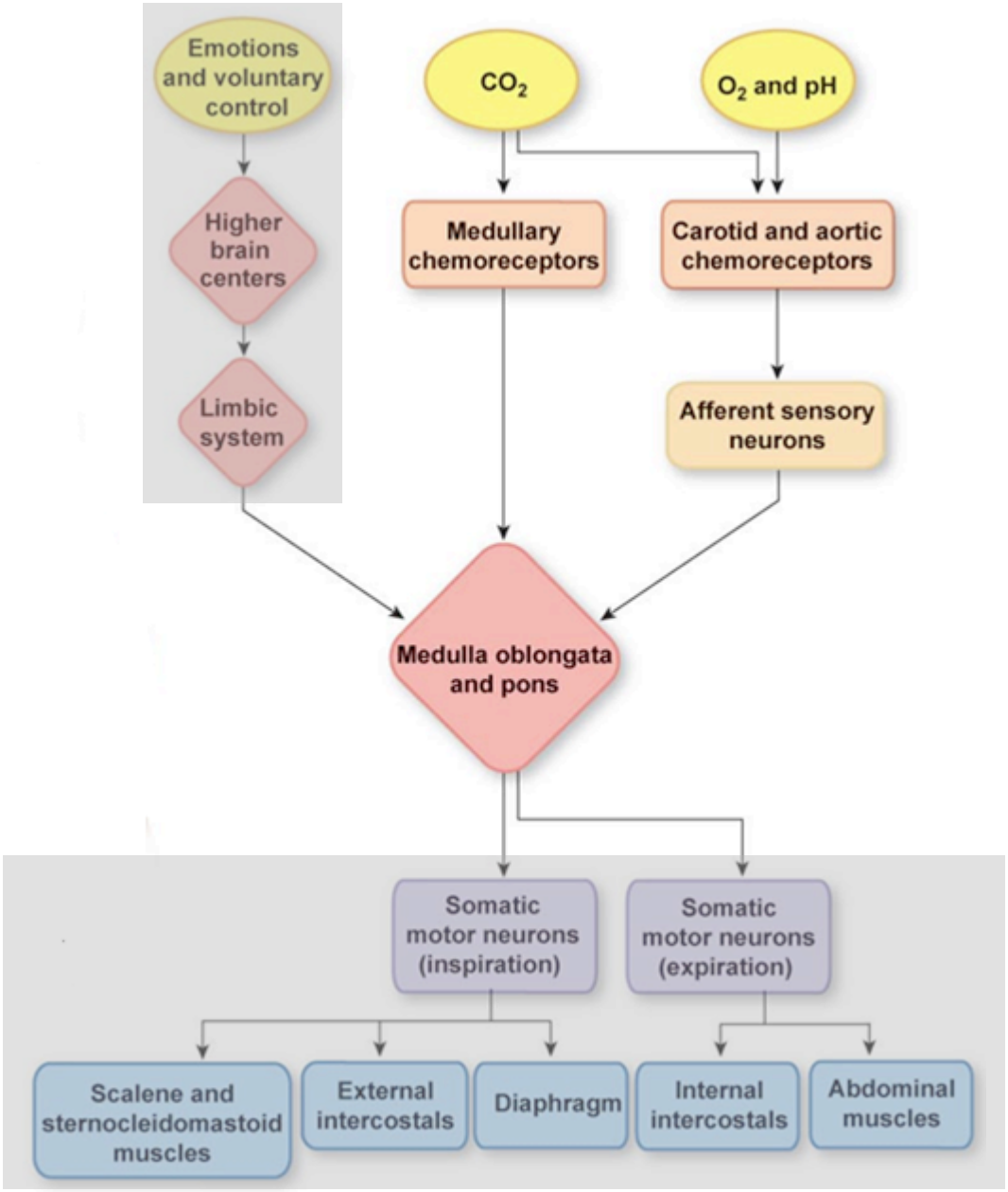


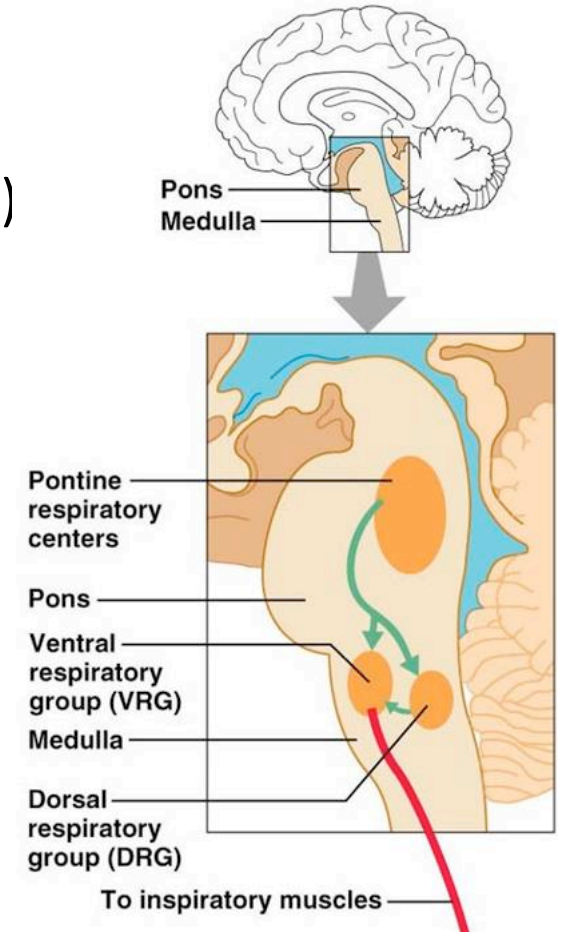
http://4.bp.blogspot.com/-hLxzb9OE-dQ/UNTasss06gI/AAAAAAAAAPE/tHEw39WrUxU/s640/respiratory%20system20.png

Control Scheme

- Central controller/pattern generator
- Sensors
  - Central
    - Chemical
  - Peripheral
    - Chemical
    - Mechanical

Respiratory Pattern Generator

- Located in brainstem (medulla)
  - Dorsal respiratory group
    - Dorsomedial (back/upper, middle/central)
      - Nucleus tractus solitarius
  - Ventral respiratory group
    - Ventrolateral (bottom/abdominal, side)
      - Rostral nucleus retrofacialis
        - » Exhalation
      - Caudal nucleus retroambiguus
        - » Exhalation
      - Nucleus paraambiguus
        - » Inspiration



http://apbrwww5.apsu.edu/thompsonj/Anatomy%20&%20Physiology/2020/2020%20Exam%20Reviews/Exam%203/CH22%20ANS%20Control%20of%20Breathing.htm

Sensors

- Central chemoreceptors
  - Ventrolateral medulla (botton/abdominal, side)
    - Near surface
- Peripheral chemoreceptors
  - Aortic arch
    - Aortic bodies
  - Carotid bifurcation
    - Carotid bodies
- Pulmonary mechanoreceptors

Current hypothesis: the central chemoreceptors are located in the retrotrapezoid nucleus (RTN) in caudal pons/rostral medulla

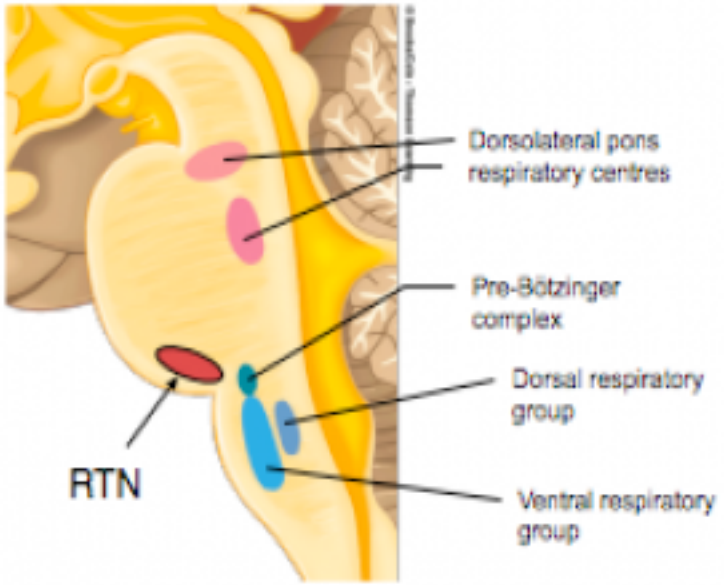


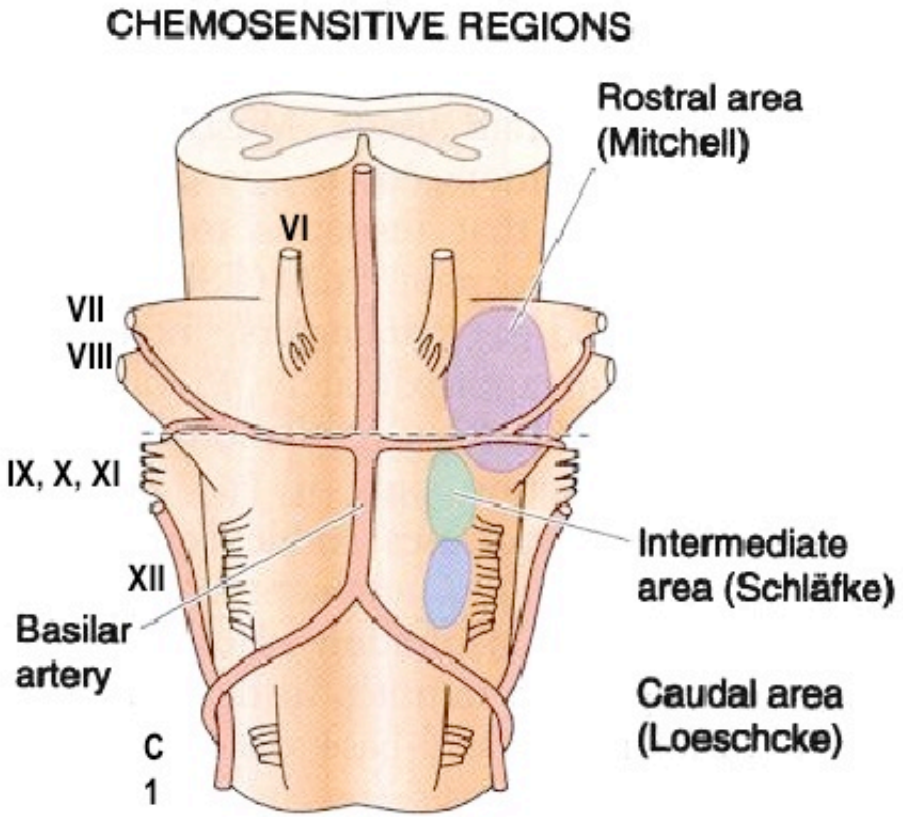
Fig. 13-32 in Sherwood L *Human Physiology* 6th ed., Brooks-Cole, 2007

← Ventral

Dorsal →

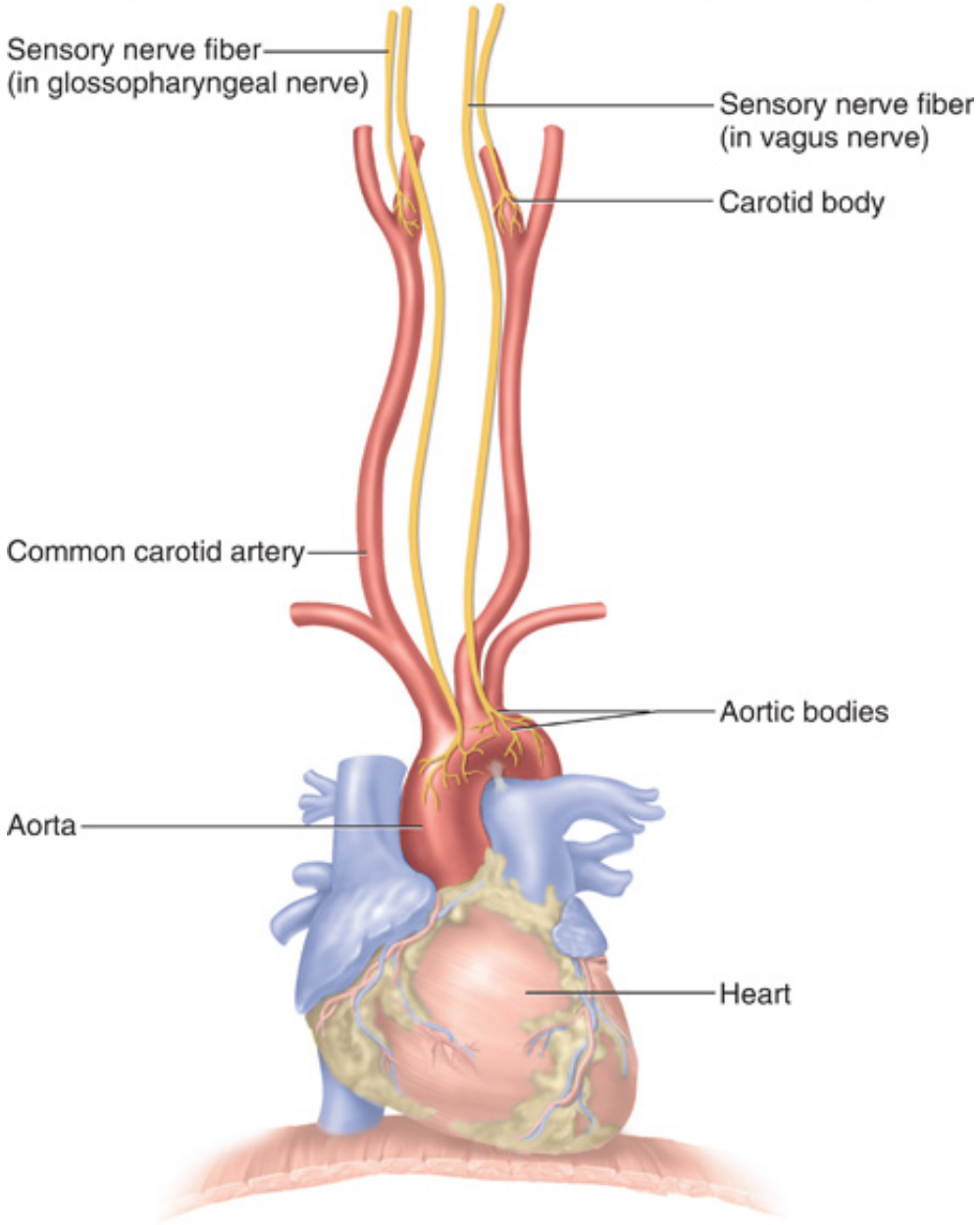
http://www.proprofs.com/flashcards/upload-images/large/mnea4422/17433.png

Chemical Control of Respiration
Central Chemoreceptors

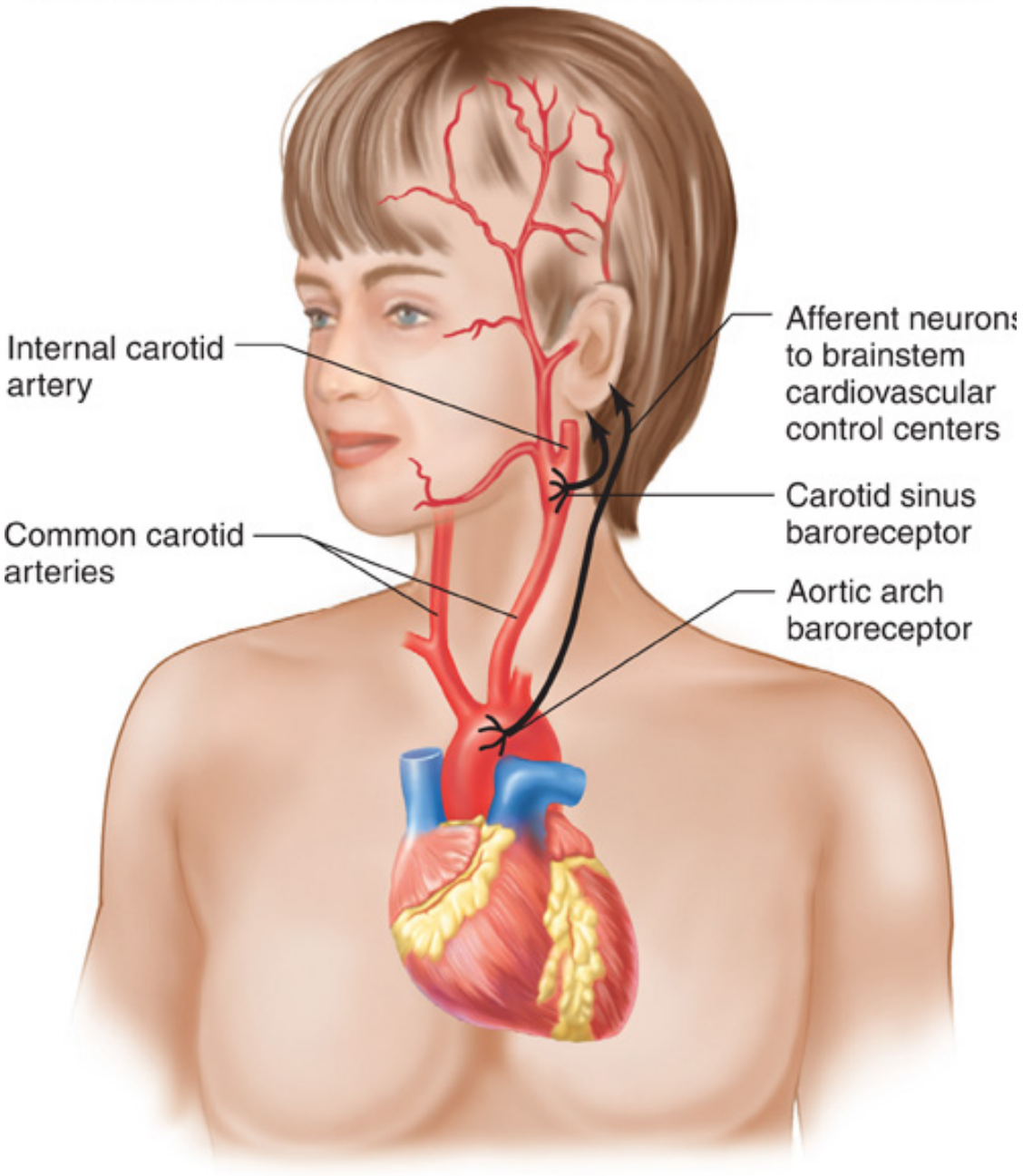


- few μm beneath the ventral surface of the medulla
- close to entry of VIII & XI cranial nerves
- bilateral pairs: eponyms
- stimulated by application of acidic or high P_{CO_2} solution on the surface: increase in ventilation
- reversibly depressed by application cold / anesthetic solution on the surface: decrease in ventilation

http://image.slidesharecdn.com/control20of20breathing-100407101137-phpapp01/95/control20of20-breathing-6-728.jpg?cb=1270653174



VSL[10] 13-33



VSL[10] 12-53

Pulmonary Mechanoreceptors

- Upper airway
  - Nasopharynx, pharynx
- Lung parenchyma
  - Diffuse
- Somatic
  - Skeletal muscle
    - Intercostals, etc.
  - Tendons

END

Video 1, Module 14