

Lecture 13: Respiration (Part 2)

0. Review

1. Absolute Lung Volume

2. Whole-Body Plethysmography

3. Helium Dilution

4. Nitrogen Washout

5. MiniLab

★ Student presentations (Mar 10+12)

→ Teams of 2-3 students (3 is preferable)

→ 15 min powerpoint

(see course website for guidelines)

• Today: HW 5 due ← Quiz next Tue

• Fri: Lab 4 report due

• Next Mon (2/24): Email Buma
(team + topic)

• PreLab 6 due next lab session

• HW 6 due next Thu (2/27)

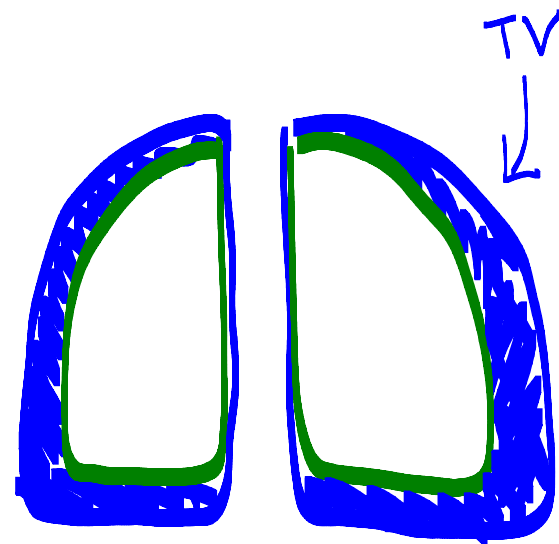
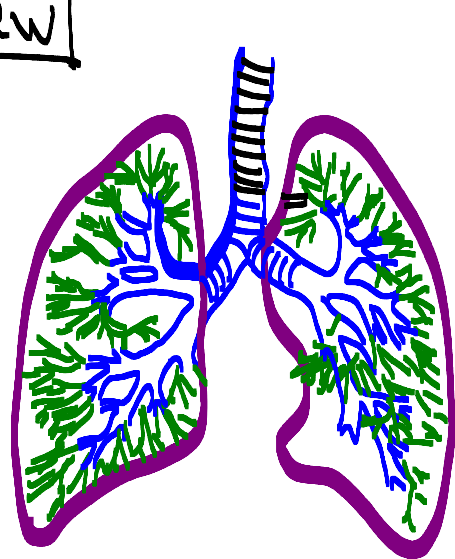
• Lab 5 report due next Fri (2/28)

★ Ellis Hospital Tour Mar 10 (Tue)

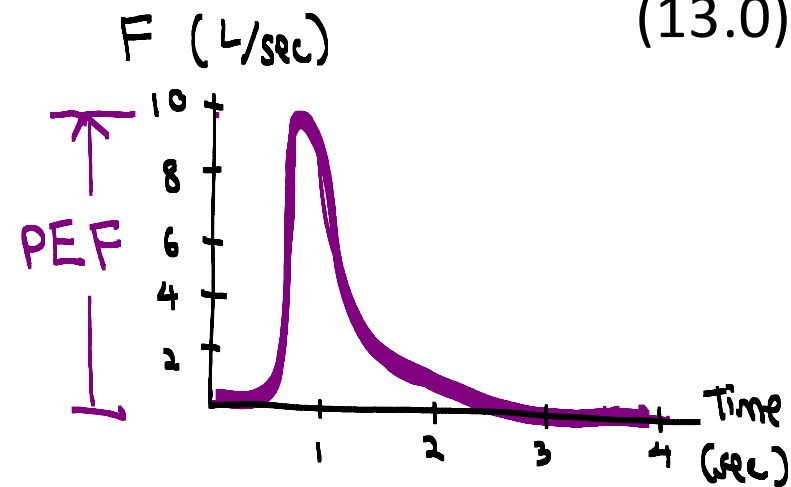
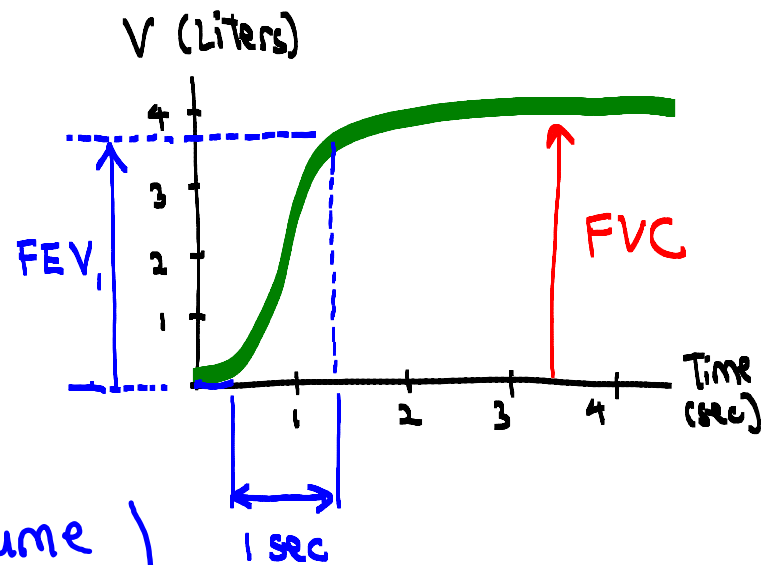
Group 1: Depart 12:45 PM

Group 2: Depart 2:45 PM

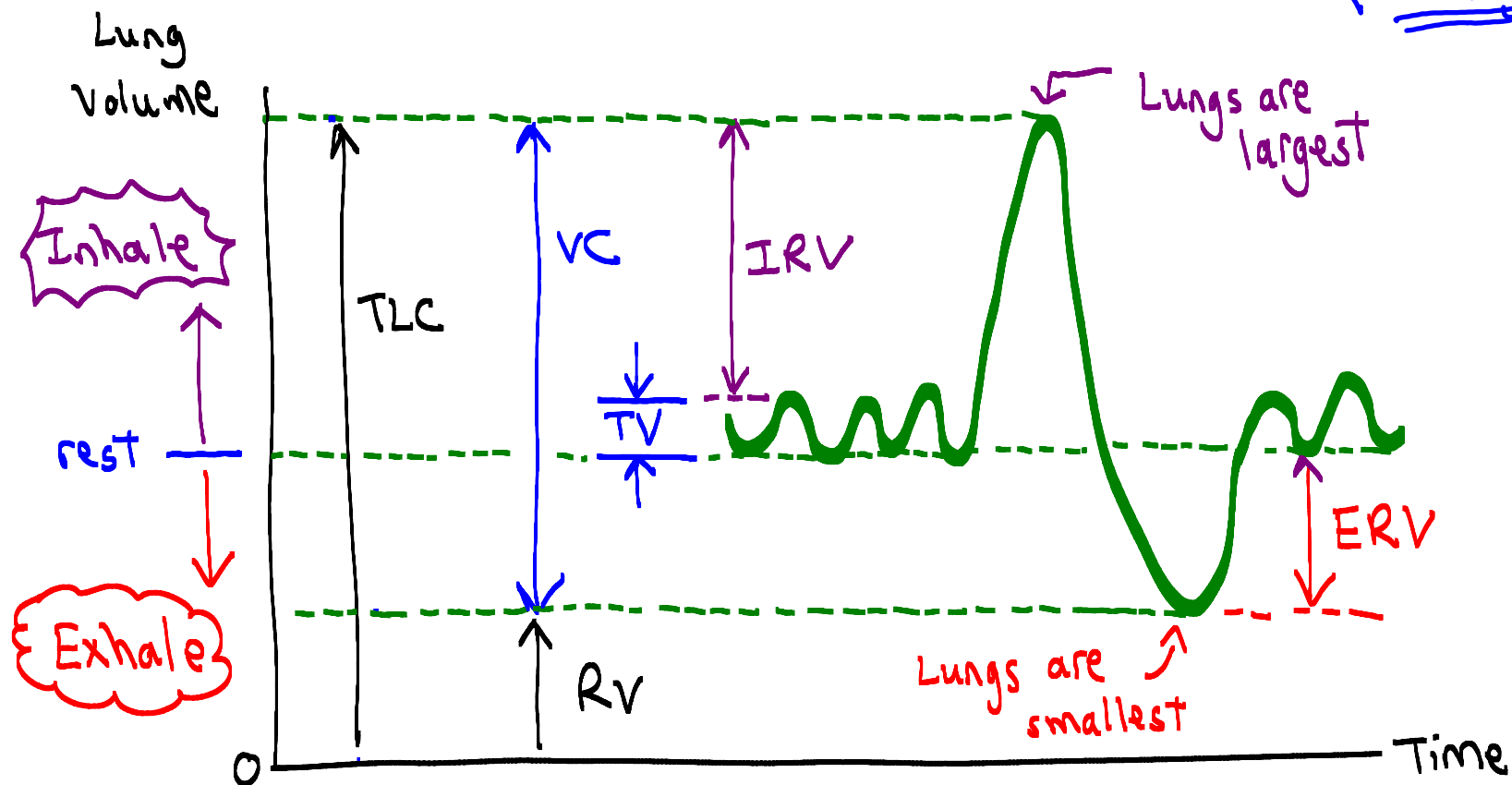
0. Review



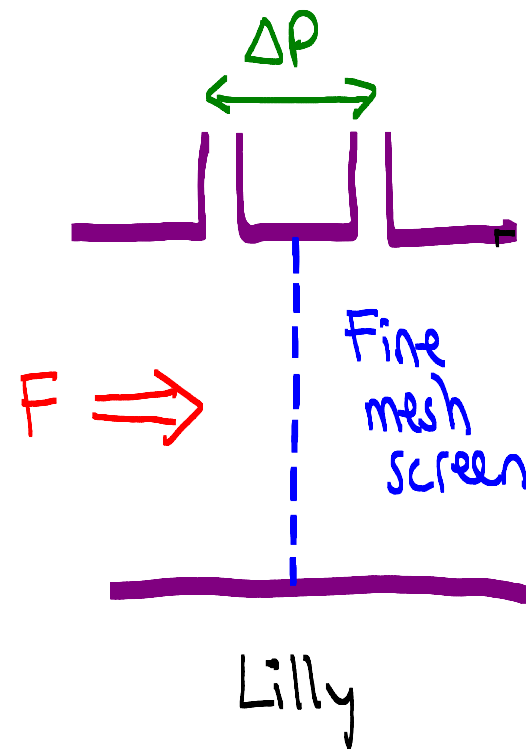
(Volume change)



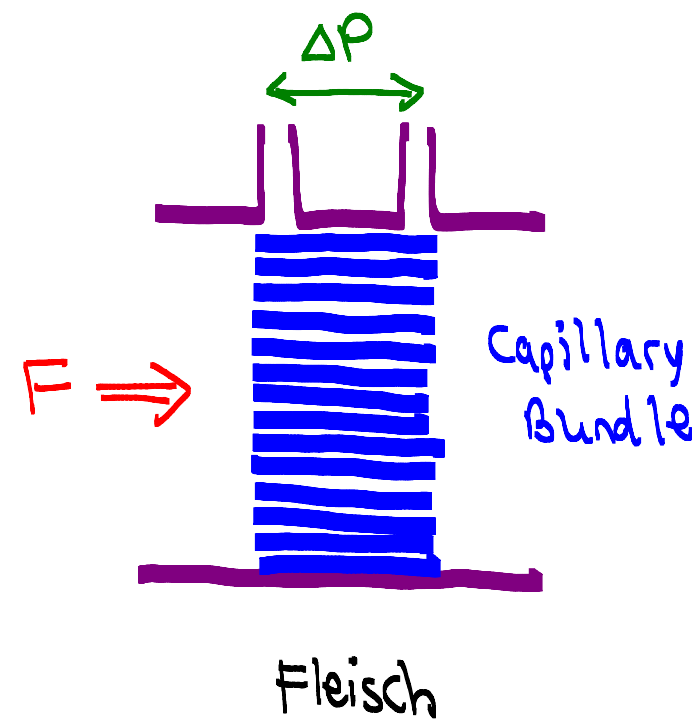
(13.0)



Pneumotachometer

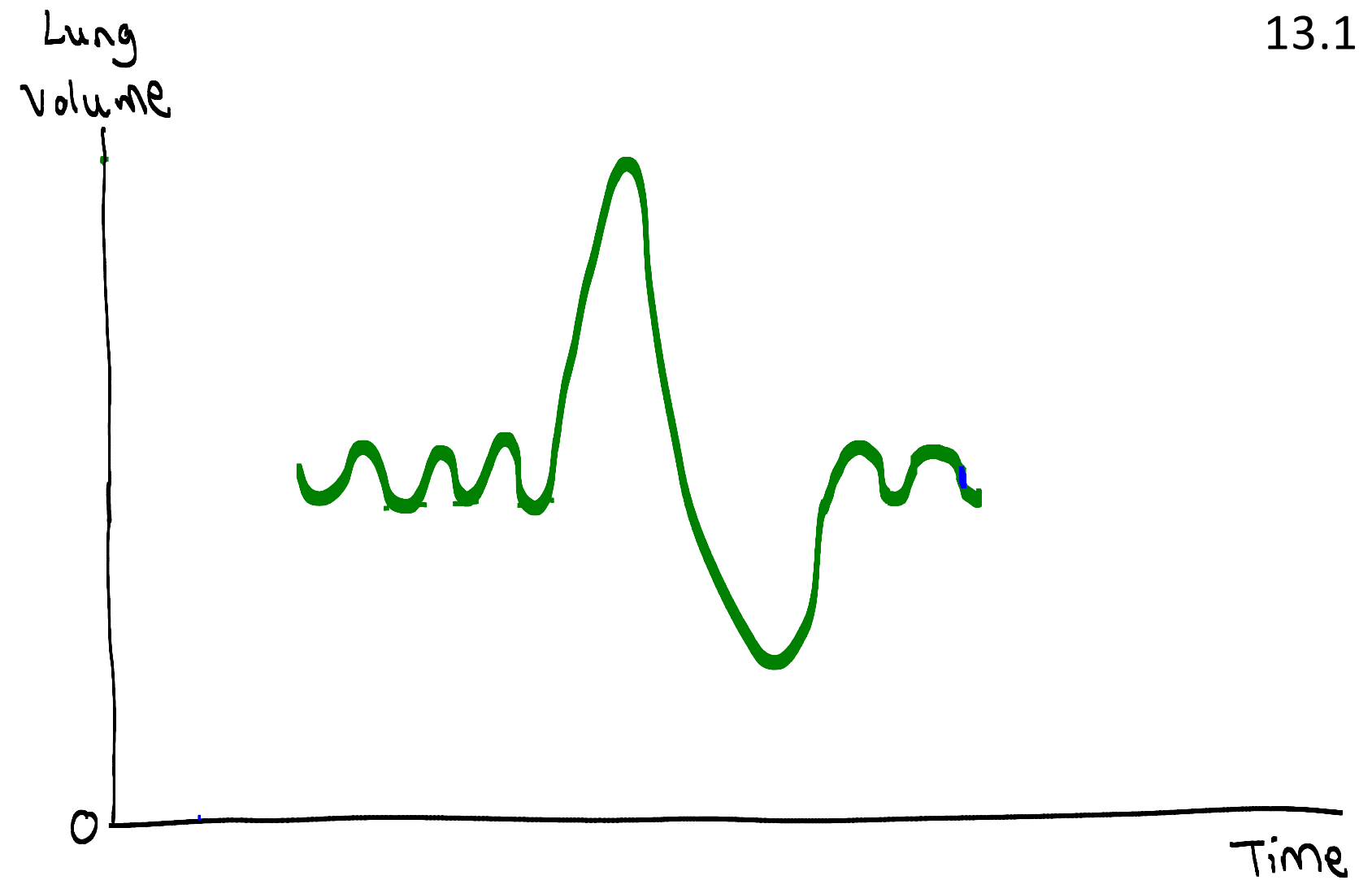


Linear flow: $\Delta P = F \times R$



1. Absolute Lung Volume

- Spirometers measure



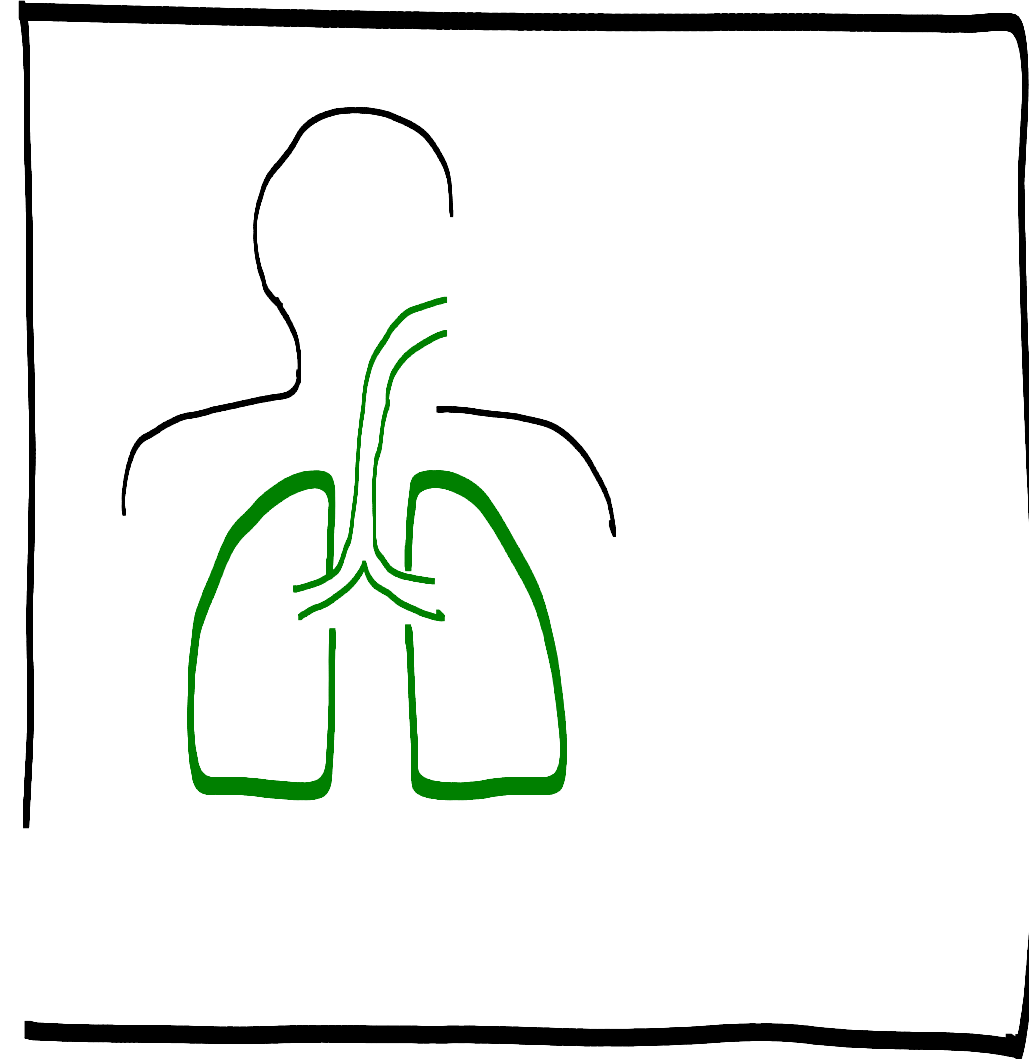
2. Whole Body Plethysmography

- BASIC IDEA:

① Patient

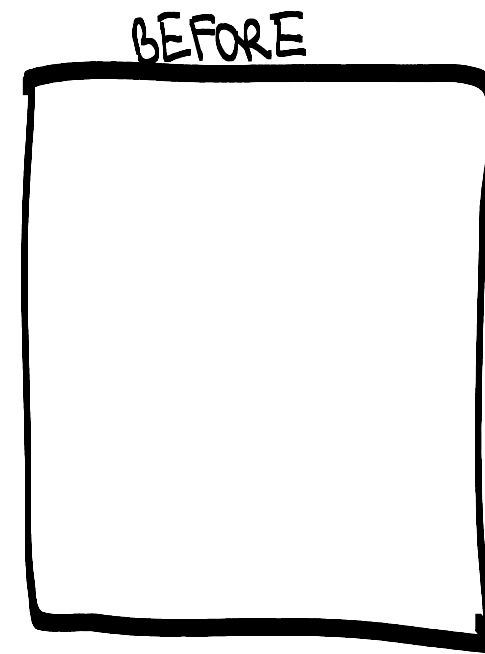
②

③

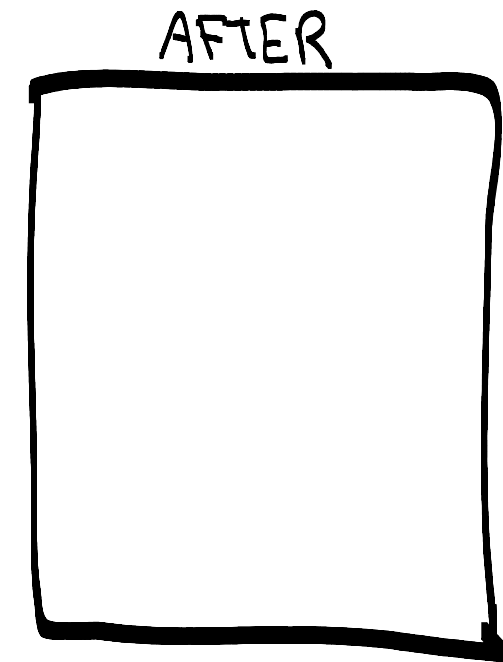


Q: How to compute FRC?

A: Recall Boyle's Law for
an ideal gas (constant temp)



VS



13.3

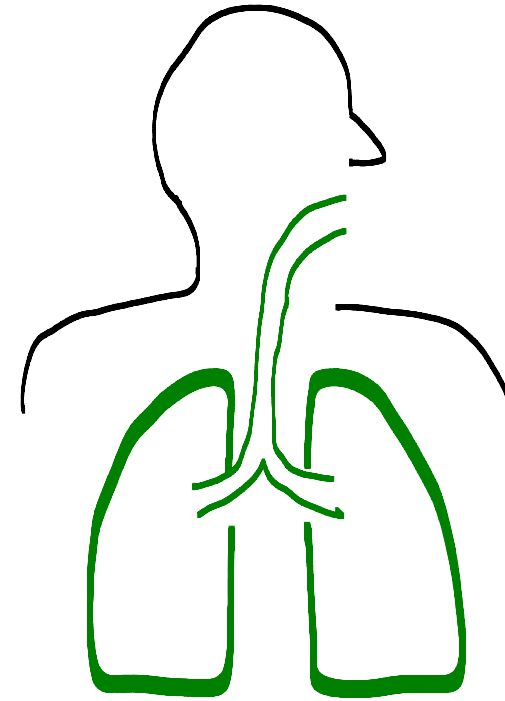
3. Helium Dilution

- BASIC IDEA

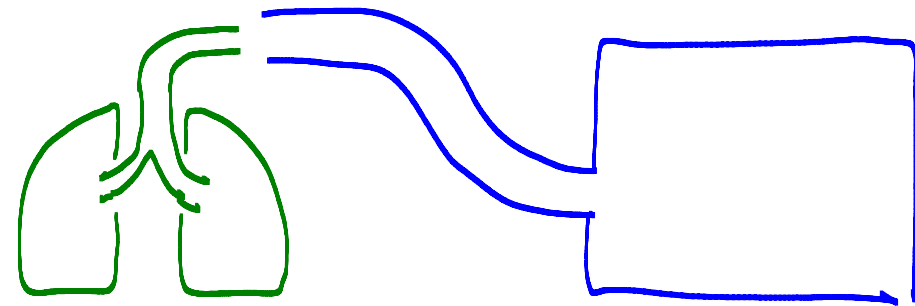
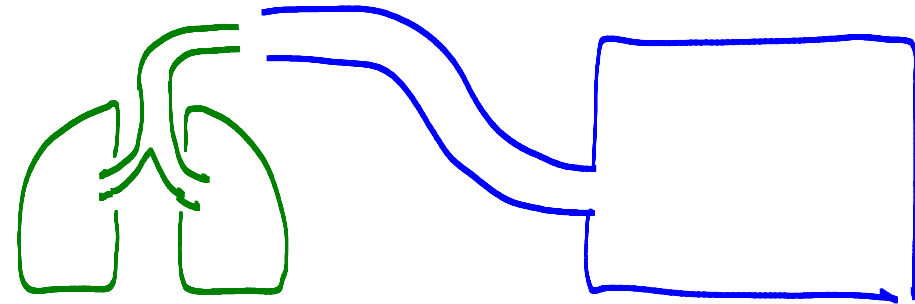
① Patient

②

③



Q: How to compute FRC?



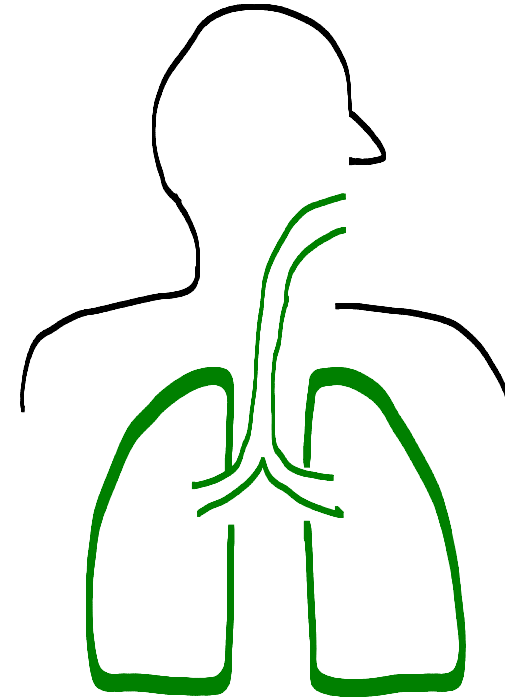
4. Nitrogen Washout

- BASIC IDEA

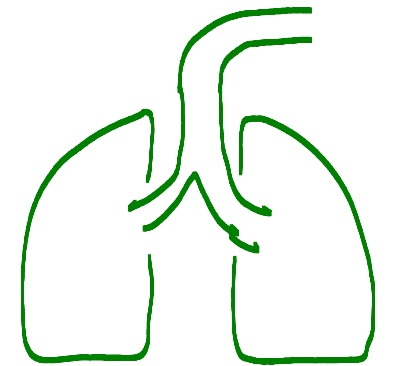
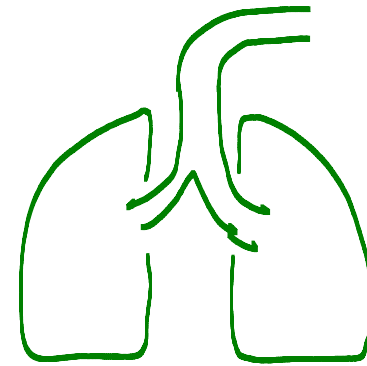
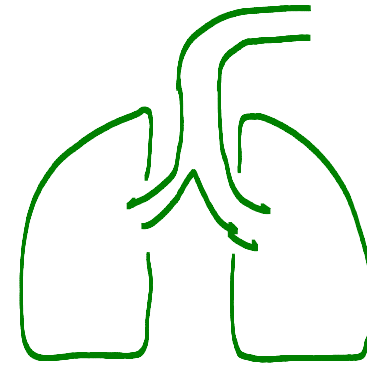
① Patient

②

③



Q: How to compute FRC?



S. MiniLab

(13.8)

Spirometer



Scope

