

BI 121, Lab 6 Pulmonary Function Testing (PFT)



I. Attendance

II. Pulmonary Function Test/PFT

- A. What? Measure of static & dynamic lung function
- B. Why? Picture of lung health; absence, presence, progression of disease (eg asthma, emphysema); effectiveness of drugs
- C. How? Complete PFT with computer or dinosaur spirometer

III. Crucial Clinical Measures

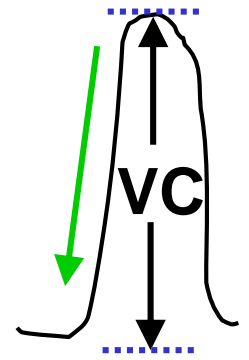
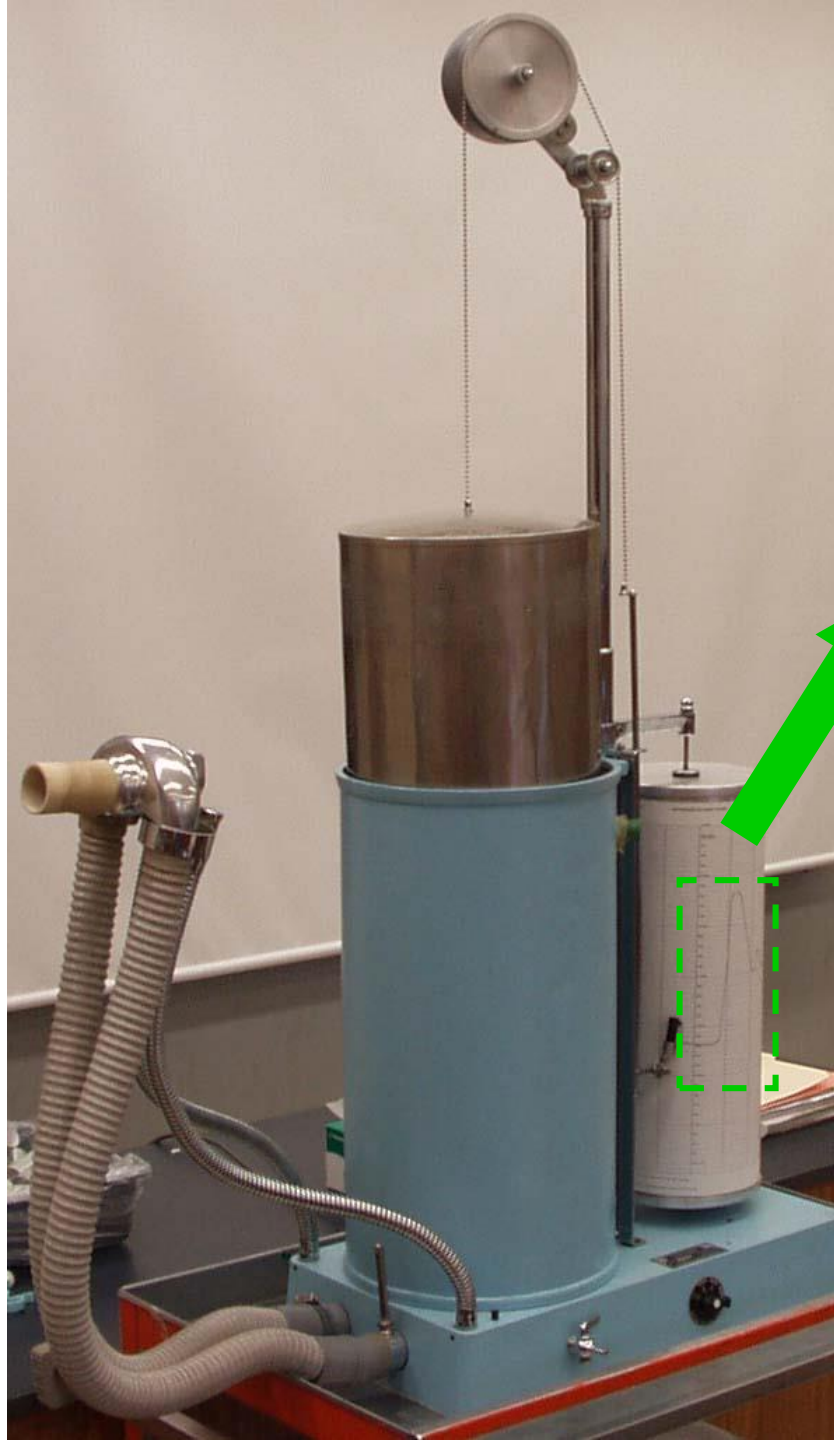
- A. VC vital capacity = FVC forced vital capacity amount of air exhaled after maximal inhalation
- B. $FEV_{1.0}$ = How much of VC in 1 second? $[FEV_{1.0}/FVC] \times 100$
 - If $\geq 75-80\%$ (0.75-0.80) \rightarrow clinically normal
 - If $\leq 40-50\%$ \rightarrow obstructive disease (eg, asthma)

IV. Your Goals

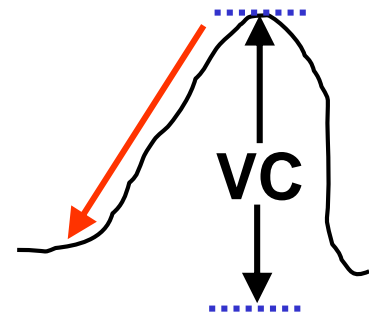
- A. Estimate your VC & $FEV_{1.0}$ from Nomogram pp 6-5 or 6-6 LLM
- B. Measure these values accurately w/computer PFT LabChart
- C. Compare estimated with actually assessed values to determine whether you're within a healthy range.

**Respirometer →
measures complete
Pulmonary Function
Test or PFT!**

**NB: Should be able to
blow out $\geq 75 - 85\%$ of
VC/FVC in 1 second!
That's $FEV_{1.0}/FVC \geq$
 $0.75 - 0.85$. If less,
may indicate asthma
or other lung disease.**

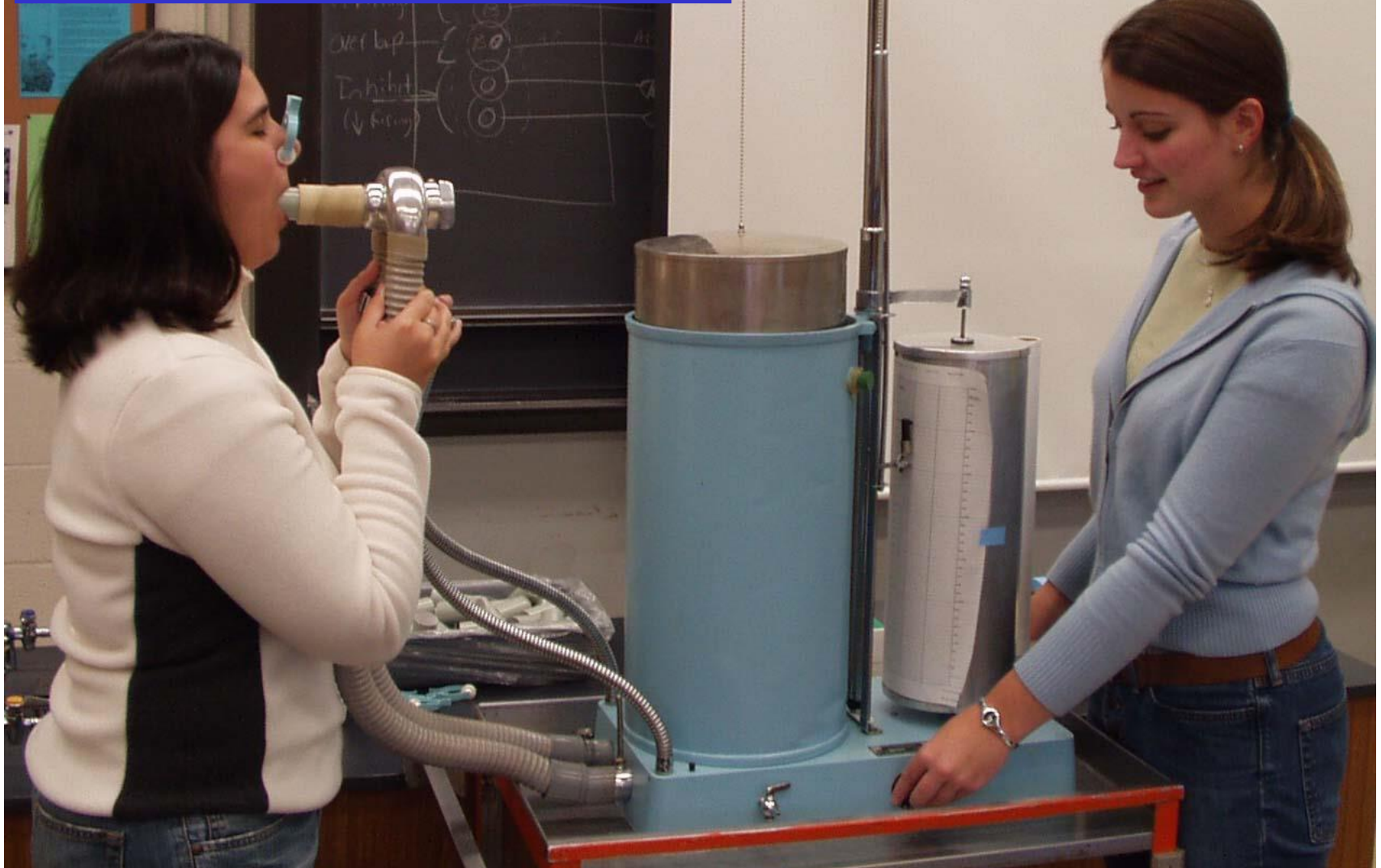


**Normal =
Steep**

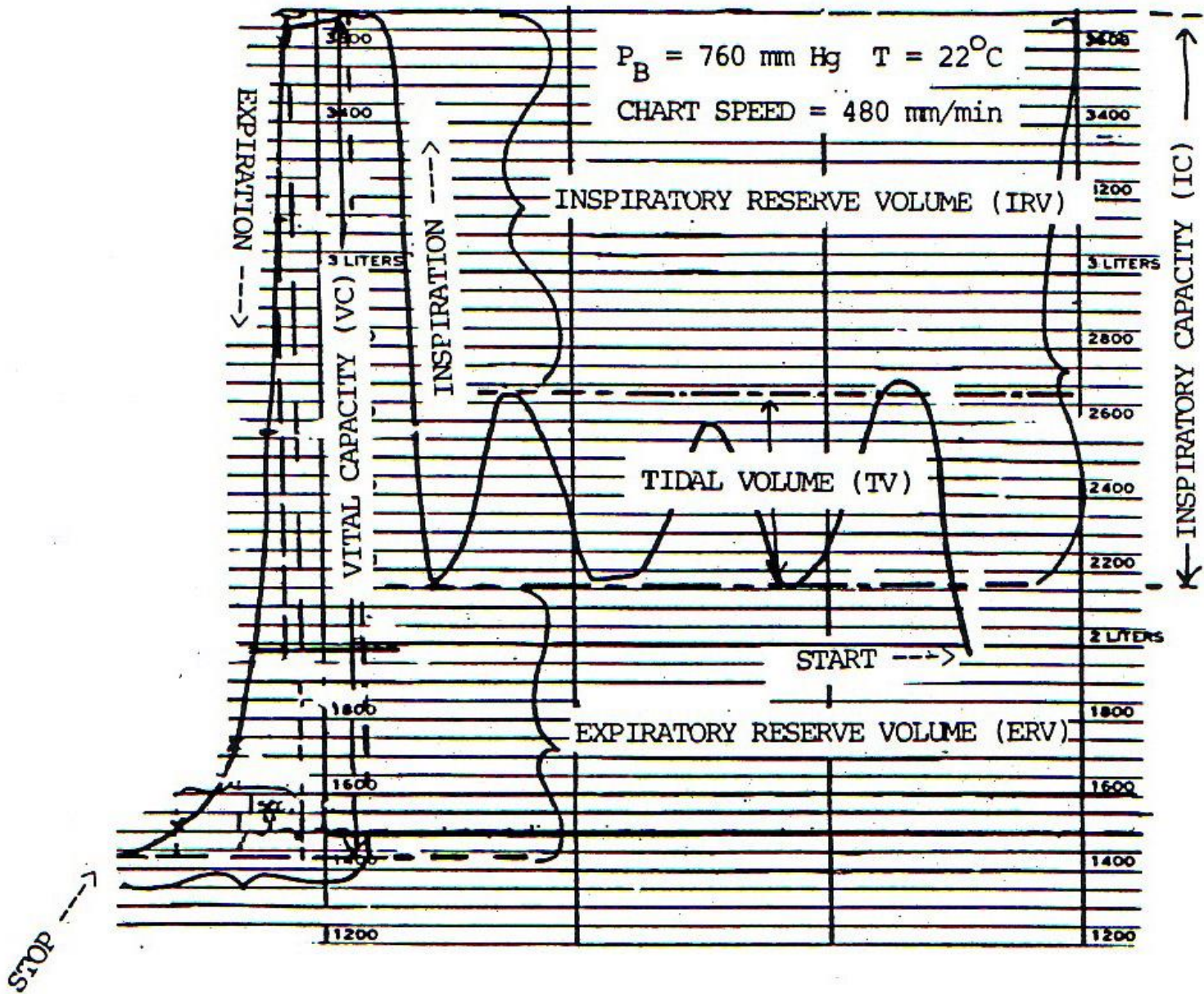


**Abnormal =
Flatter
Downslope
(eg, Asthma)**

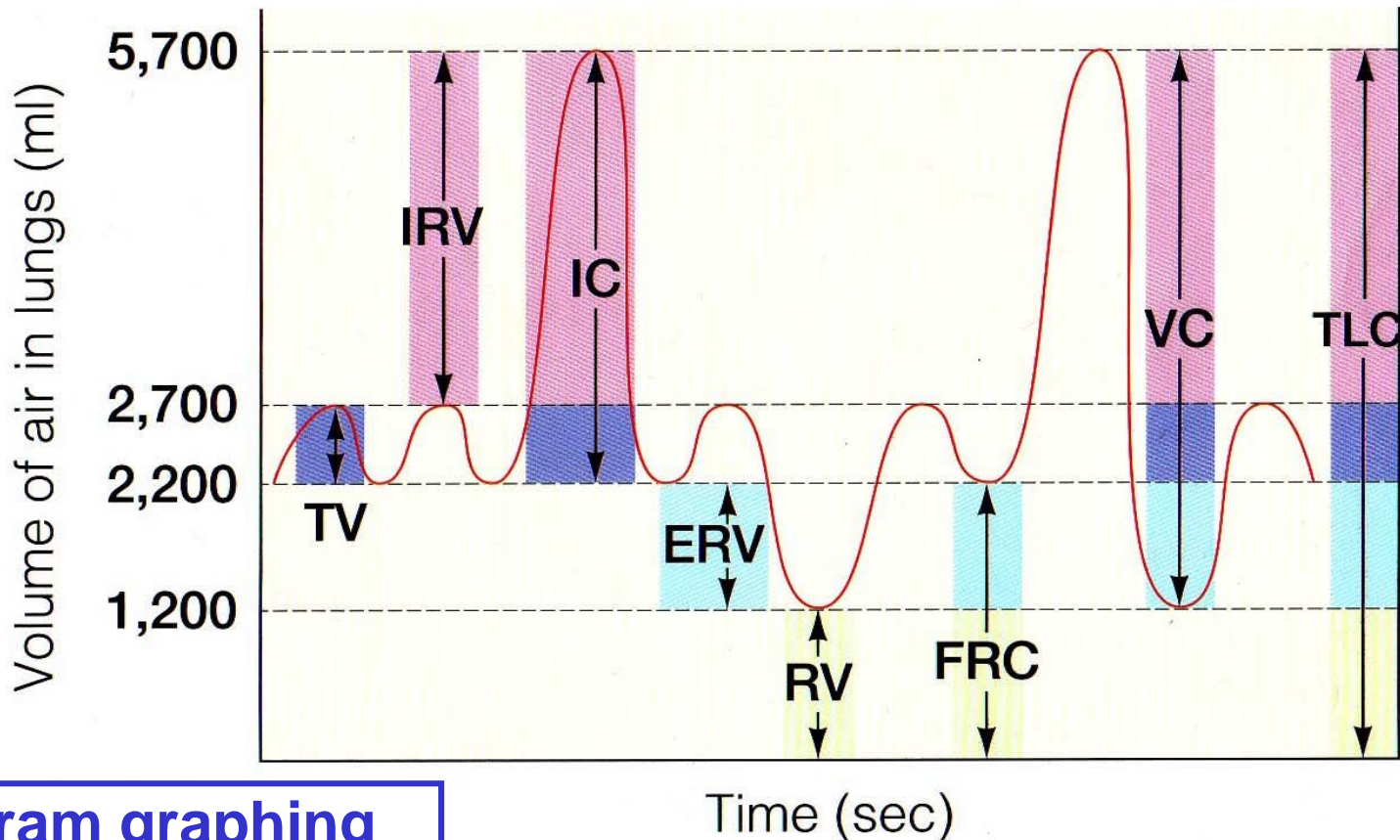
***PFT* → measures all lung volumes & capacities (sum of ≥ 2 volumes). Subject relaxes & breathes normally into and out of tank.**



Sample PFT from Collins 13.5 L Respirometer



Normal Spirogram of Healthy Young Adult Male

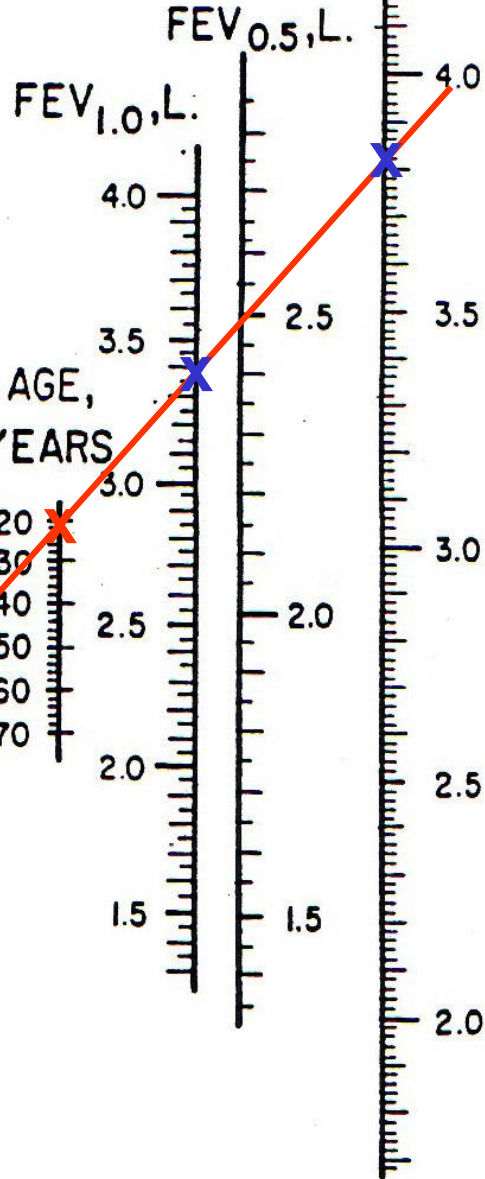
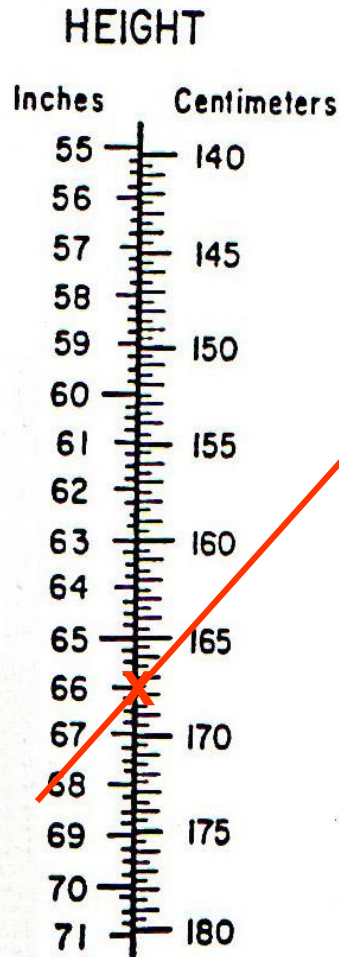


**Spirogram graphing
complete *PFT* from
computer simulation.**

- TV = Tidal volume (500 ml)
- IRV = Inspiratory reserve volume (3,000 ml)
- IC = Inspiratory capacity (3,500 ml)
- ERV = Expiratory reserve volume (1,000 ml)
- RV = Residual volume (1,200 ml)
- FRC = Functional residual capacity (2,200 ml)
- VC = Vital capacity (4,500 ml)
- TLC = Total lung capacity (5,700 ml)

SPIROMETRY IN NORMAL FEMALES PREDICTION NOMOGRAMS

**e.g., Monica height = 5'6"
= 66", age = 21 yr**

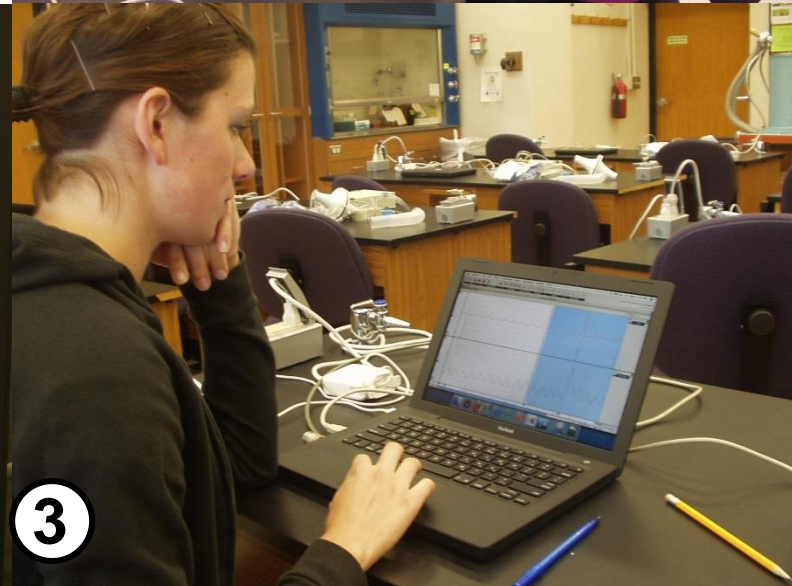
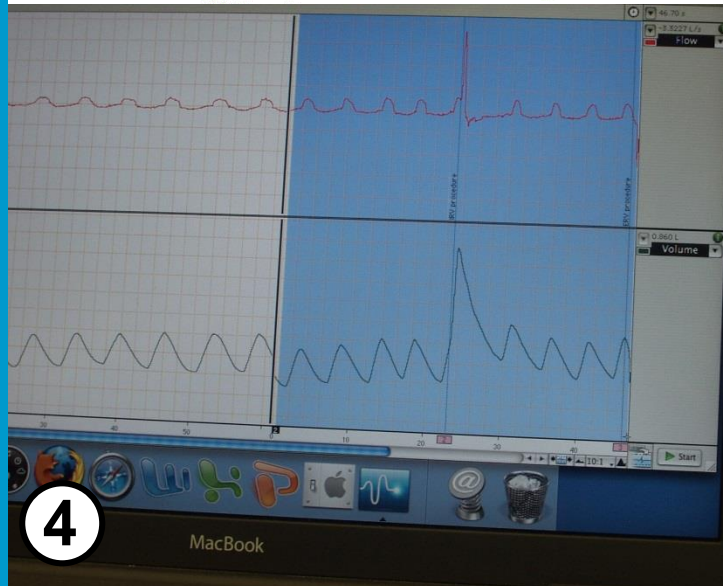
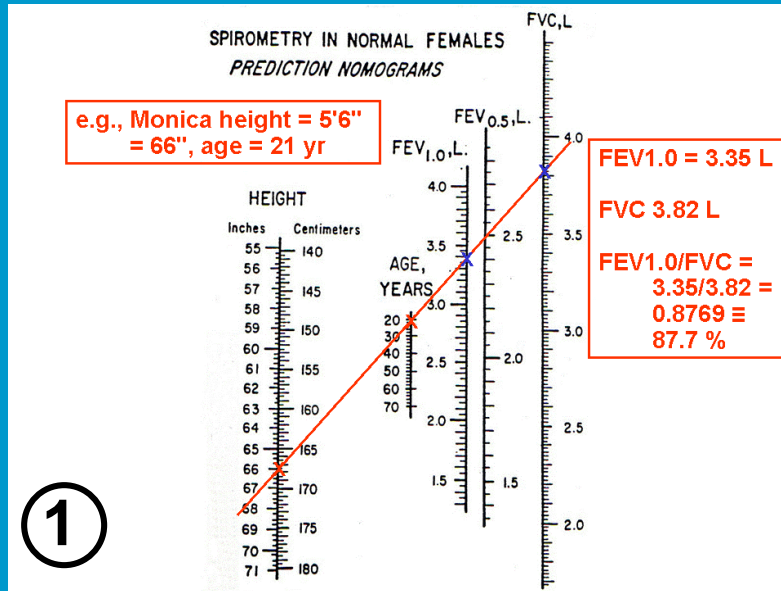


FEV_{1.0} = 3.35 L

FVC 3.82 L

**FEV_{1.0}/FVC =
3.35/3.82 =
0.8769 ≡
87.7 %**

① Estimate, ② Setup, ③ Assess, ④ Compare



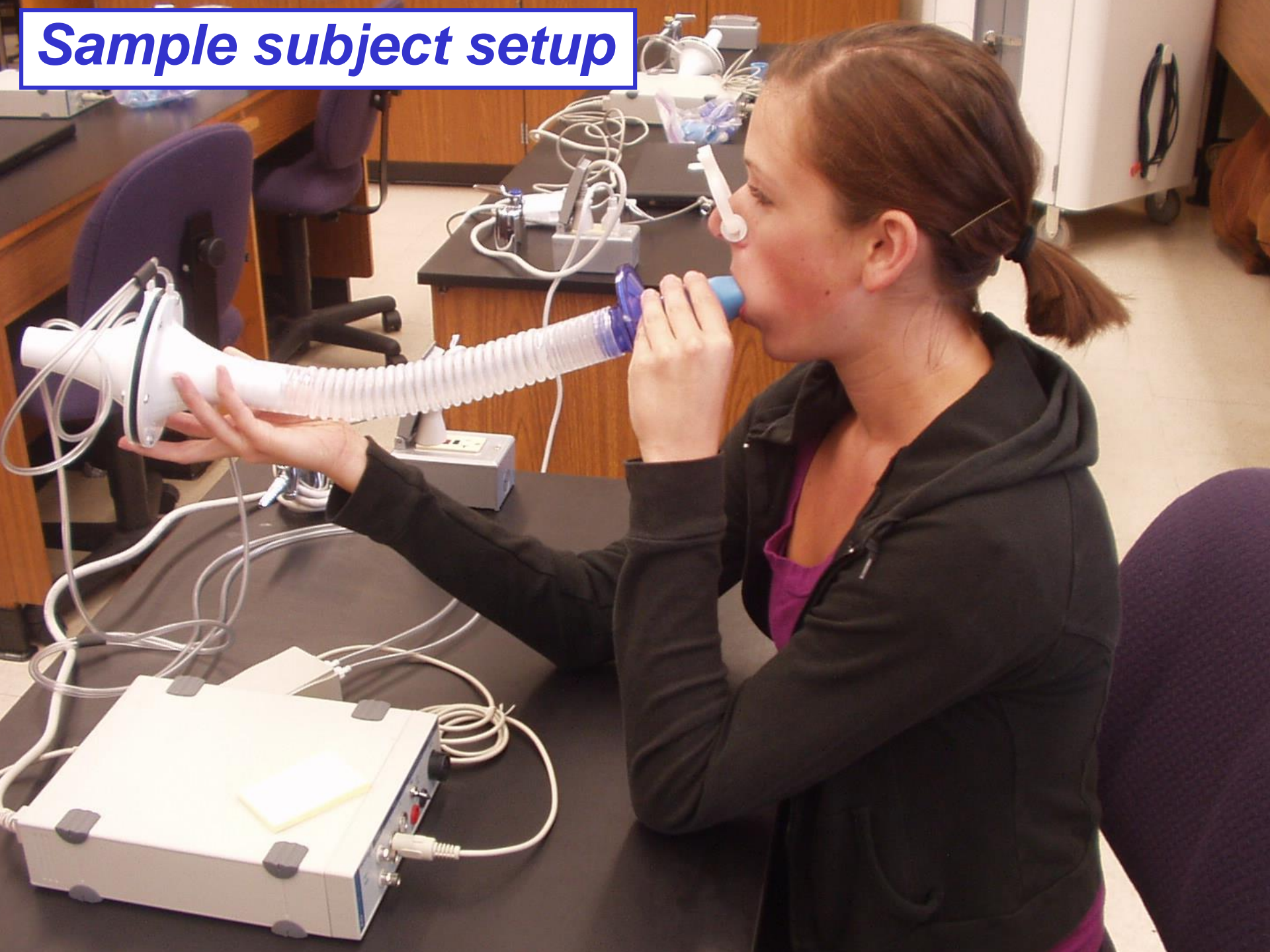


**How to put
together?**

Viola!!

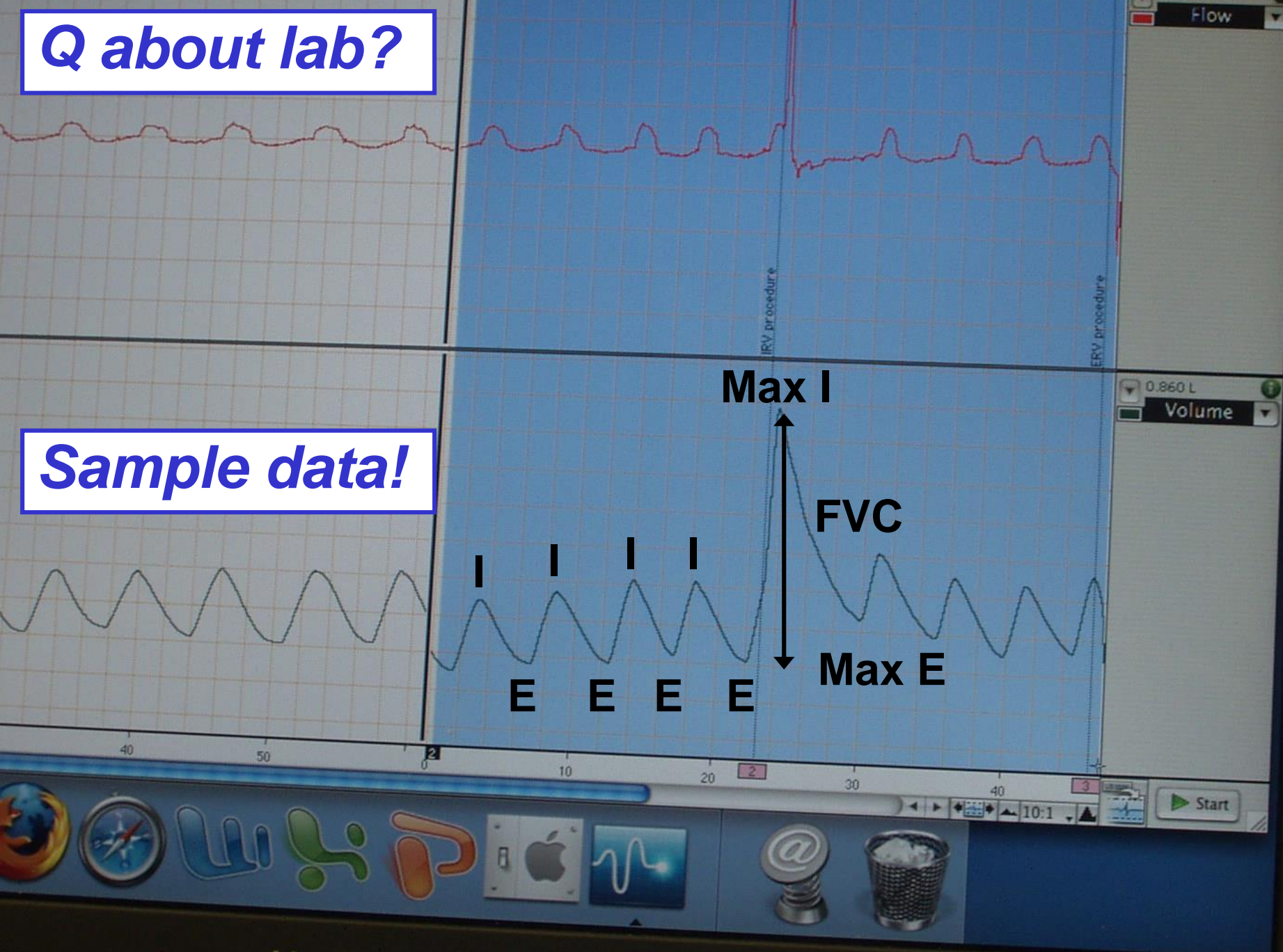


Sample subject setup



Q about lab?

Sample data!



MacBook