

Official PFT Guides

Official Guides
ATS Rapid Interpretation Guide
2010 GOLD Spirometry Guide
2022 ERS/ATS Interpretive Strategies for PFTs

Interpretation Position

At UMMC, PFTs do report LLN and reference value (pop mean?) but not percentiles or z scores.

One can back-calculate the SD using $\sigma = \frac{\{LLN - ref\}}{-1.65}$ (this assumed LLN on our reports corresponds to 5th percentile).

Once σ is known for the each value (e.g., $\sigma_{FVC} \neq \sigma_{FEV1} \neq \sigma_{RV}$), you could then use $z = \frac{\{PT_{value} - ref\}}{\sigma}$ and refer to the tables below to grade severity.

Given the complexity of this, using ERS/ATS for diagnosing and grading abnormalities is not possible.

Therefore, I use GOLD criteria.

Step-by-Step to Interpreting PFTs

Assess Flow-Volume Loops

1. Are the loops similar between attempts?
 1. YES: Skip to next
 2. NO: See first page's comment if ATS reproducibility criteria was met
2. Roughly speaking, do the loops appear obstructive or restrictive?

Assess Spirometry

Spirometric Severity

ATS Criteria

[Source](#)

Grade	FEV1 z score	Severity
NA	-1.65 to -2.5	Mild

Grade	FEV1 z score	Severity
NA	-2.51 to -4.0	Moderate
NA	<-4.1	Severe

GOLD Criteria

Grade	FEV1 Percent Predicted	Severity
1	≥80%	Mild
2	50% – 79%	Moderate
3	30% – 49%	Severe
4	<30%	Very Severe

Bronchodilator Response

ERS/ATS Definition

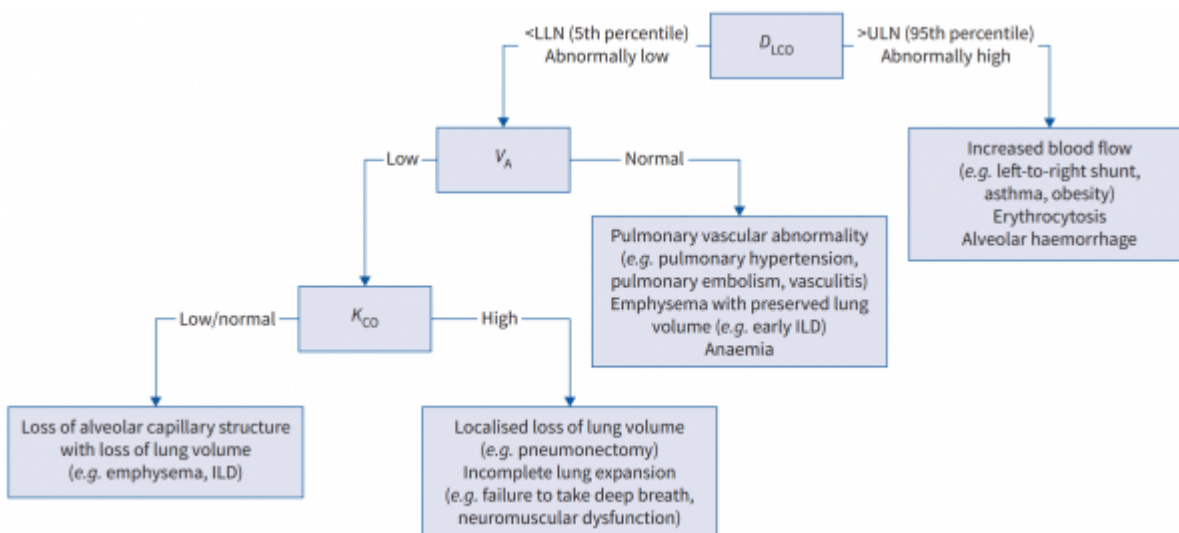
1. Required:
 1. BDR >10%
1. Calculation
 1. $BDR = \frac{FEV1_{\text{postBD}} - FEV1_{\text{preBD}}}{FEV1_{\text{predicted}}}$

Important NOTE:

1. Calculation is not
 1. $BDR = \frac{FEV1_{\text{postBD}} - FEV1_{\text{preBD}}}{FEV1_{\text{preBD}}}$
2. Does NOT require
 1. $\Delta FEV1_{\text{volume}} > 200 \text{ mL}$

DLCO Severity

ERS / ATS Definition



Source

Grade	FEV1 z score	Severity
NA	-1.65 to -2.5	Mild
NA	-2.51 to -4.0	Moderate
NA	<-4.1	Severe

Gold Definition

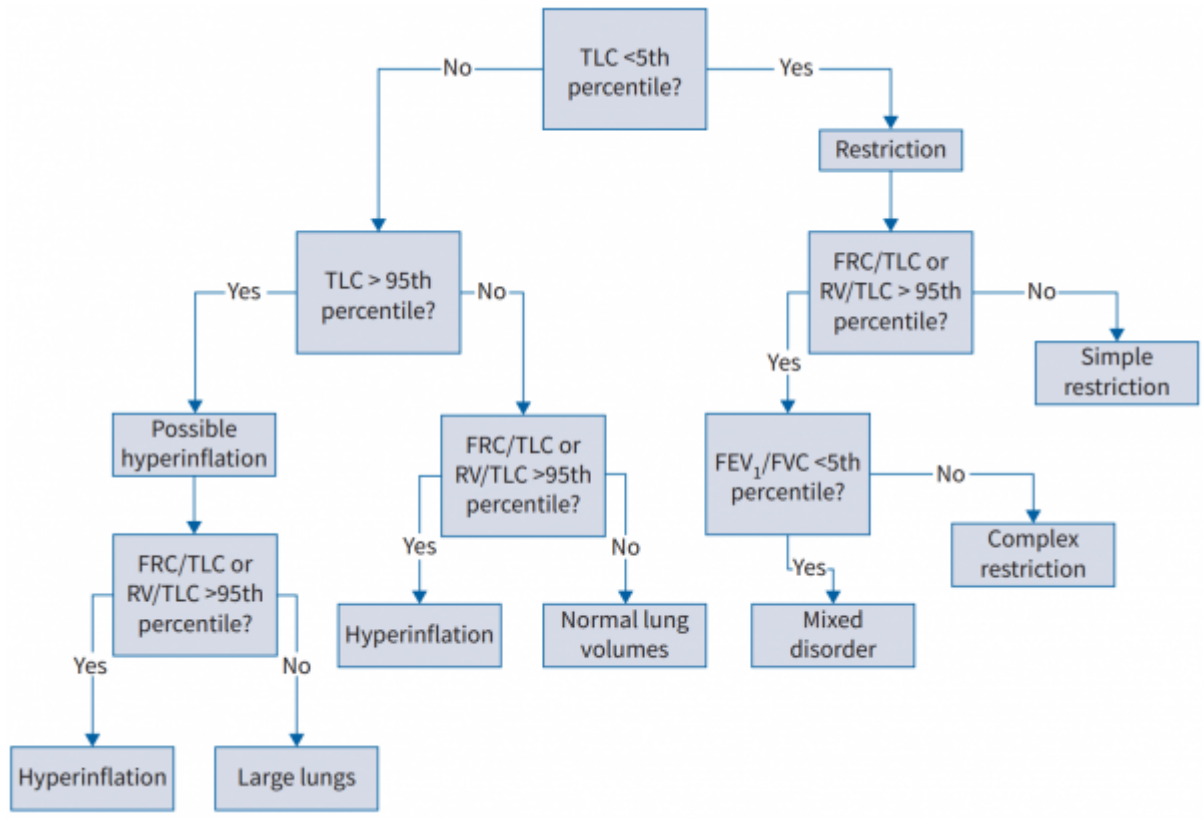
DLCO Percent Predicted	Severity
>140%	Abnormally High
76%-140%	Normal
61-75%	Mild
41-60%	Moderate
<40%	Severe

Assessing Restriction

ATS Criteria

Source, pg 17

1. Check spiro
 1. Is $FVC \cdot z_{\text{score}} \leq -1.65$ (e.g. < 5th percentile)?
 1. Yes: get lung volumes
 2. No: no restriction
2. Check lung volumes
 1. Is $TLC \cdot z_{\text{score}} \leq -1.65$ (e.g. < 5th percentile)?



Source

Grade	FEV1 z score	Severity
NA	-1.65 to -2.5	Mild
NA	-2.51 to -4.0	Moderate
NA	<-4.1	

GOLD Definition

TLC Percent Predicted	Severity
>70%	Mild
50%-69%	Moderate
<50%	Severe

Other Lung Volumes

VC: ↓ in restriction, ↓ in air trapping
 RV & FRC: ↑ with air trapping
 RV & FRC: ↓ with restriction
 ERV: ↓ in obesity

Lung Volume

FRC is the primary thing calculated in lung volume calculations.

Other

Plethysmography

Boyle's Law

- $P_1V_1 = P_2V_2$
- $\implies V_{tg} = 970 \frac{\Delta V}{\Delta P}$

$$FRC = ERV + RV$$

$$TLC = VC + RV$$

Helium

- Helium is used because He doesn't cross the alveolar-capillary membrane
 - $C_1V_1 = C_2(V_1+V_2)$
 - $\implies V_2 = V_1 \left(\frac{C_1}{C_2} - 1 \right)$
 - **limitations** since inhalation done only for a few minutes, would get into poorly ventilated lungs, so will underestimate FRC

Nitrogen

Method for calculation is similar to [Helium](#) method.

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