

Classes of Respiratory Impairment

Overview: The impairment to a person caused by a respiratory disorder can be assessed from pulmonary function tests. Both the American Medical Association (AMA) and American Thoracic Society (ATS) have developed schemes for rating impairment to the whole person.

Parameters studied:

- (1) FVC
- (2) FEV1
- (3) FEV1/FVC
- (4) diffusing capacity of carbon monoxide
- (5) exercise capacity in mL of oxygen per kg per min or as METs

NOTE: The division based on measured oxygen capacity is similar to that used for impairment in ischemic heart disease (above).

AMA Rating Scheme

Class 1: No impairment of the whole person (0%)

- FVC: $\geq 80\%$ of predicted AND
- FEV1: $\geq 80\%$ of predicted AND
- FEV1/FVC: ≥ 0.70 AND
- diffusing capacity D(CO): $\geq 70\%$ of predicted

OR

- VO₂ max (measured exercise capacity): > 25 (mL O₂)/kg/min; > 7.1 METs

Class 2: Mild impairment of the whole person (10-25%)

- FVC: 60-79% of predicted OR
- FEV1: 60-79% of predicted OR
- diffusing capacity D(CO): 60-69% of predicted

OR

- VO₂ max (measured exercise capacity): 20 - 25 (mL O₂)/kg/min; 5.7 - 7.1 METs

Class 3: Moderate impairment of the whole person (26-50%)

- FVC: 51-59% of predicted OR
- FEV1: 41-59% of predicted OR

- diffusing capacity D(CO): 41-59% of predicted

OR

- VO₂ max (measured exercise capacity): 15 - 20 (mL O₂)/kg/min; 4.3 - 5.69 METs

Class 4: Severe impairment of the whole person (51-100%)

- FVC: $\leq 50\%$ of predicted OR
- FEV₁: $\leq 40\%$ of predicted OR
- diffusing capacity D(CO): $\leq 40\%$ of predicted

OR

- VO₂ max (measured exercise capacity): < 15 (mL O₂)/kg/min; < 4.3 METs

where:

- The FEV₁/FVC is expressed as an absolute number and not as a percentage of the predicted value.
- Equations to predict expected values: These are described in Crapo. A more complete overview is available in the chapter on Respiratory and Acid-Base Disorders.
- The resting maximum oxygen consumption in mL per minute per kilogram is defined as 1 MET = 3.5 (mL O₂)/kg/min.

ATS Rating Scheme

This is similar to the AMA rating scheme.

Additions

- Class 2 FEV₁/FVC: 0.60 to 0.74
- Class 3 FEV₁/FVC: 0.41 to 0.59
- Class 4 FEV₁/FVC: ≤ 0.40

Differences

- Class 1 FEV₁/FVC: ≥ 0.75
- Class 1 diffusing capacity D(CO): $\geq 80\%$ of predicted
- Class 2 diffusing capacity D(CO): 60-79% of predicted
- measured exercise capacity not utilized

References:

American Medical Association. Guides to the Evaluation of Permanent Impairment Fourth Edition. 1995. Chapter 5: The respiratory system. pages 154-167; Table 8 page 162.

Crapo RO Morris AH Gardner RM. Reference spirometric values using techniques and equipment that meet ATS recommendations. Am Rev Respir Dis. 1981; 123: 659-664.

Crapo RO Morris AH. Standardized single breath normal values for carbon monoxide diffusing capacity. Am Rev Respir Dis. 1981; 123: 185-189.

Harber P Chan-Yeung M. Chapter 29: Assessment of respiratory impairment and disability. pages 338-354. IN: Demeter SL Andersson GBJ Smith GM. Disability Evaluation. American Medical Association. Mosby. 1996.