INTERPRETATION AND REPORTING LUNG FUNCTION

This chapter focuses on the common or *routine* tests (spirometry, lung volumes and CO gas transfer). Additional tests, which may be requested, such as exercise, blood gas estimations, oximetry, muscle pressures, and sleep studies are considered in the appropriate specialist chapters.

15.1 Computerised pulmonary function test reporting

Computerised interpretation of pulmonary function tests has two defects:

- computer–generated reports cannot take the comments on the referral form into account
- computer reports tend to state the obvious and lack insight

Reporting Pulmonary Function has great educational value for the junior doctors and healthcare scientists who undertake it. All staff should be encouraged to write pulmonary function reports, at first under supervision.

15.4 The interpretative diagram

The algorithm in Figure 15.2 starts with the FEV_1/FVC ratio (normal or low), and divides sequentially on the basis of a normal or low FVC and TLC (see *Figure 15.1*), a low or normal TLCO and a low, normal or high KCO.

Additional tests may be helpful. For example, a high KCO should prompt a measurement of minimum and maximum mouth pressures (PImax, PEmax). Other causes of a high KCO (loss of units, pleural or chest wall disease) will generally have an abnormality on the chest radiograph. Upper (extrathoracic) airway obstruction (*Chapter 1.4.1, p.16*) is not included in the schema, and could easily be missed unless maximal *inspiratory* flow–volume curves were carried out. Thus, Laboratory staff rely on getting some relevant clinical information on the Pulmonary Function Request Form (e.g. thyroid disease, previous tracheostomy, laryngeal disease, acromegaly) or a specific request (e.g. upper airflow obstruction?).

DIAGNOSTIC AND INTERPRETATIVE ALGORITHM

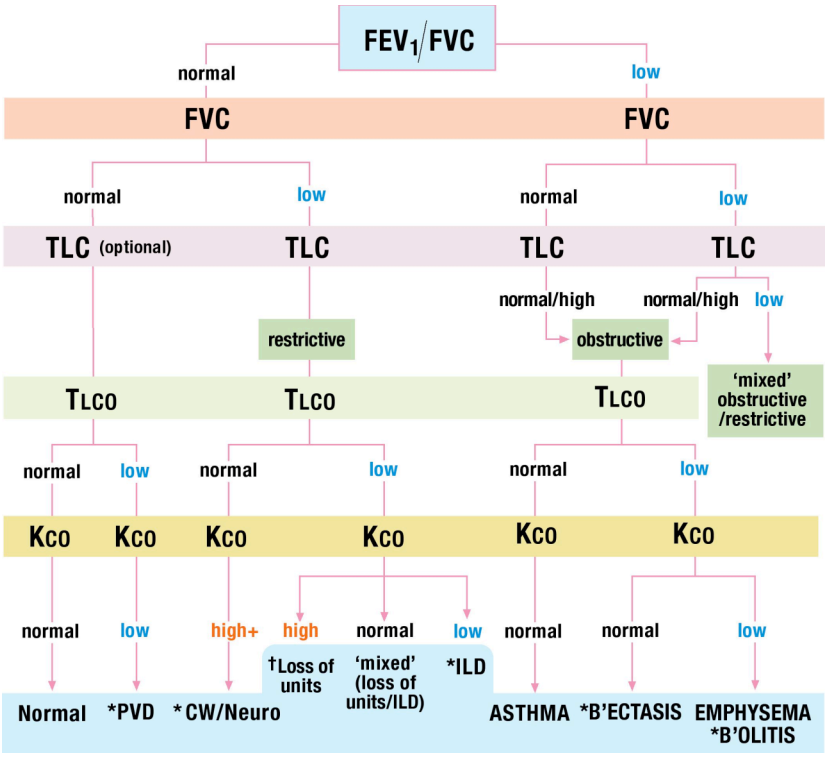

Figure 15.2 Usual spirometric, lung volume and transfer factor (TLCO and KCO) patterns for common pulmonary disorders. PVD = pulmonary vascular disease: CW/Neuro = chest wall/ neuromuscular disease: ILD = interstitial lung disease: *B = bronchi…

15.6 What should be said in the Pulmonary Function report?

The most rigorous way to write a report is to decide, on the basis of the algorithms (Figures 15.1-2), what clinico-physiological pattern best fits the data for spirometry, TLC and TLCO and KCO; and then, to look at the clinical data provided on the Request Form and say whether the pulmonary function data is compatible or not with the clinical picture. In patients with systemic disease, it is useful to comment on whether the data suggests pulmonary involvement by the underlying condition.

15.7 Learning Points

- Computerised interpretation of PFTs is not recommended
- The laboratory needs a properly completed PFT request form
- The routine test performed at initial and follow–up visits should follow agreed protocols
- Presentation of results will include the actual value, the percent predicted value (or range, ± 1.645 SD) and standardised residual (SR)
- Interpretation considers in turn the FEV_1/FVC ratio, FVC, TLC, TLCO and KCO, as summarized in the algorithm (Figure 15.2)
- The most specific indices are the FEV_1/FVC ratio and the KCO

Further Reading

General

Pellegrino R, Viegi G, Brusasco V, et al. Interpretive strategies for lung function tests (ATS/ ERS Task Force: Standardisation of Lung Function Testing).. Eur Respir J 2005; 26: 948-68.

Specific points

1. ***Quanjer PH, Tammeling GJ, Cotes JE, Pedersen OF, Peslin R, Yernault J-C.*** Lung volumes and forced ventilatory flows. Report of the Working Party Standardization of Lung Function Tests, European Community for Steel and Coal (ECSC). Eur Respir J 1993; 6: Suppl 16, 5-40.
2. ***Enright PL, Kronmal RA, Higgins M, et al***. Spirometric reference values for women and men aged 65–85: cardiovascular health study. Am Rev Respir Dis 1993; 147: 125-133.
3. **Vandevoorde S, Verbanck S, Schuermans D, et al.** Forced vital capacity and forced expired volume in six seconds as predictors of reduced total lung capacity. Eur Respir J 2008; 31: 391-5.