



ARTP **SPIROMETRY** **HANDBOOK**

SECOND EDITION

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ARTP Spirometry Handbook

FOREWORD

Respiratory disorders can cause changes within the lungs and airways of a subject. The most important effects are on airways calibre and lung elastic recoil. Simple tests, such as dynamic lung volumes (commonly called spirometry), where volumes and flows are measured during forced expiratory and inspiratory manoeuvres, are valuable in the detection of some of these abnormalities associated with respiratory disorders.

The measurement of lung function parameters has been available for clinical use for approximately the last 40 years but research into the subject started many years prior to this. The volume of air that a man can inhale during a single deep breath was first measured by Borelli in 1679. It was not until 1846 that it was put on a quantitative basis by Hutchinson who defined the Vital Capacity as 'the greatest voluntary expiration following the deepest inspiration' and who designed a spirometer for its estimation (Hutchinson J, 1846). In 1915 Rohrer was examining the relationship between the force exerted by the respiratory muscles and the rate of airflow and in the same year Peabody looked at the relationship of the vital capacity to breathlessness. The FEV₁ (Forced Expiratory Volume in one second) was described independently by Tiffeneau and Pinelli in Paris (1947) and Gaensler in the USA (1951). Gaensler demonstrated that the FEV₁ correlated better than 2 second and 3 second capacities or the total vital capacity. From that time the FEV₁ became a regular measurement obtained along with the Forced Vital Capacity (Gibson 2005).

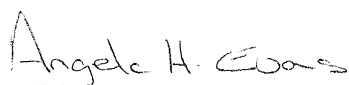
The most common tests that we perform today in respiratory medicine are based on these early works.

The following tests are the most commonly used:

- a) Peak Expiratory Flow
- b) Vital Capacity
- c) Forced Vital Capacity and Forced Expiratory Volume in 1 Second
- d) Maximum Flow-Volume Curves

These tests will only supply meaningful results where uniformity and quality of practice exist. Without a thorough understanding of the principles involved, the procedure, the effects of disease on lung function and the interpretation of results, it is impossible for individuals to be competent and confident in practice.

Guidelines for the measurement of respiratory function have been produced to help in standardising the way we work. Guidelines have been produced by the Association For Respiratory Technology and Physiology (ARTP)/British Thoracic Society (BTS) 1994, European Respiratory Society (ERS) (Sterk et al.1993), and the American Thoracic Society (ATS) 1994. The procedures and working practices in this handbook are all based on the ARTP/BTS document.



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