

## Pediatric Pulmonology

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Pulmonology is considered a branch of internal medicine, and is related to intensive care medicine. Pulmonology often involves managing patients who need life support and mechanical ventilation. Pulmonologists are specially trained in diseases and conditions of the chest, particularly pneumonia, asthma, tuberculosis, emphysema, and complicated chest infections.

One of the first major discoveries relevant to the field of pulmonology was the discovery of pulmonary circulation. Originally, it was thought that blood reaching the right side of the heart passed through small 'pores' in the septum into the left side to be oxygenated, as theorized by Galen; however, the discovery of pulmonary circulation disproves this theory, which had previously been accepted since the 2nd century. Thirteenth-century anatomist and physiologist Ibn Al-Nafis accurately theorized that there was no 'direct' passage between the two sides (ventricles) of the heart. He believed that the blood must have passed through the pulmonary artery, through the lungs, and back into the heart to be pumped around the body. This is believed by many to be the first scientific description of pulmonary circulation.

Although pulmonary medicine only began to evolve as a medical specialty in the 1950s, William Welch and William Osler founded the 'parent' organization of the American Thoracic Society, the National Association for the Study and Prevention of Tuberculosis. The care, treatment, and study of tuberculosis of the lung is recognised as a discipline in its own right, phthisiology. When the specialty did begin to evolve, several discoveries were being made linking the respiratory system and the measurement of arterial blood gases, attracting more and more physicians and researchers to the developing field.

Surgery of the respiratory tract is generally performed by specialists in cardiothoracic surgery (or thoracic surgery) though minor procedures may be performed by pulmonologists. Pulmonology is closely related to critical care medicine when dealing with patients who require mechanical ventilation. As a result, many pulmonologists are certified to practice critical care medicine in addition to pulmonary medicine. There are fellowship programs that allow physicians to become board certified in pulmonary and critical care medicine simultaneously. Interventional pulmonology is a relatively new field within pulmonary medicine that deals with the use of procedures such as bronchoscopy and pleuroscopy to treat several pulmonary diseases. Interventional pulmonology is increasingly recognized as a specific medical specialty.

Medication is the most important treatment of most diseases of pulmonology, either by inhalation (bronchodilators and steroids) or in oral form (antibiotics, leukotriene antagonists). A common example being the usage of inhalers in the treatment of inflammatory lung conditions such as asthma or chronic obstructive pulmonary disease. Oxygen therapy is often necessary in severe respiratory disease (emphysema and pulmonary fibrosis). When this is insufficient, the patient

might require mechanical ventilation.

Pulmonary rehabilitation has been defined as a multidimensional continuum of services directed to persons with pulmonary disease and their families, usually by an interdisciplinary team of specialists, with the goal of achieving and maintaining the individual's maximum level of independence and functioning in the community. Pulmonary rehabilitation is intended to educate the patient, the family, and improve the overall quality of life and prognosis for the patient. Interventions can include exercise, education, emotional support, oxygen, noninvasive mechanical ventilation, optimization of airway secretion clearance, promoting compliance with medical care to reduce numbers of exacerbations and hospitalizations, and returning to work and/or a more active and emotionally satisfying life. These goals are appropriate for any patients with diminished respiratory reserve whether due to obstructive or intrinsic pulmonary diseases (oxygenation impairment) or neuromuscular weakness (ventilatory impairment). A pulmonary rehabilitation team may include a rehabilitation physician, a pulmonary medicine specialist, physician assistant and allied health professionals including a rehabilitation nurse, a respiratory therapist, a physical therapist, an occupational therapist, a psychologist, and a social worker among others. Additionally, breathing games are used to motivate children to perform pulmonary rehabilitation.