

## SPECIAL ARTICLES

### *A HISTORY OF PEDIATRIC SPECIALTIES*

*These two articles describe the development of Pediatric Pulmonology within and outside of North America. Drs. Chernick and Mellins document the remarkable evolution of the field as it grew out of Pediatrics into a sub-specialty studying diseases of children with asthma, neonatal lung diseases, cystic fibrosis and other pulmonary disorders. They describe the advances in technology and pulmonary physiology that provided the foundation for the clinical programs and the specialized services necessary for the care of these patients. Drs. Godfrey, Carlsen and Landau provide a colorful account of similar developments and specific advances in Europe and Australia.*

## **Pediatric Pulmonology: A Developmental History in North America**

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### ABSTRACT

We describe the development of pediatric pulmonology in North America, from its rudimentary beginning in the early part of the 20th century. Milestones in the history of lung diseases affecting children, such as tuberculosis, cystic fibrosis, asthma, and neonatal lung disease, are discussed. Finally, maturation into a subspecialty recognized by the American Board of Pediatrics is described. (*Pediatr Res* 55: 514–520, 2004)

#### Abbreviations

**AAP**, American Academy of Pediatrics  
**ABP**, American Board of Pediatrics  
**ALA**, American Lung Association  
**APS**, American Pediatric Society  
**ATS**, American Thoracic Society  
**CF**, cystic fibrosis  
**RDS**, respiratory distress syndrome  
**TB**, tuberculosis

An understanding of the function of the respiratory system and descriptions of disorders that affect the lung date back to antiquity. This historical perspective of the discipline of pediatric pulmonology begins in the 1800s. At the end of the 19th century, when the American Pediatric Society (APS) was formed, the main scourges of children were infectious diseases, including diarrhea, diphtheria, tuberculosis, scarlet fever, pneumonia and empyema, typhoid fever, influenza, and “heredi-

tary” syphilis (1). Concepts of public hygiene, proper diet, and fluid replacement therapy were rudimentary or absent. The only laboratory tools available were pathologic histology and morphologic bacteriology. Notably, only two of the 43 founding members of the APS limited their practice to pediatrics: L. Emmett Holt (New York) and Isaac Love (St. Louis) (2).

The following is a very truncated view of some of the APS meetings and the topics discussed that pertained to pulmonology. The first meeting of the APS was held in 1889 in Washington, DC, and was attended by 25 members who read 27 papers (1). Many of the papers were devoted to infant feeding, but there were presentations on pneumothorax and lung expansion, tuberculosis, meningitis, scarlet fever, neona-

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tal asphyxia, and diphtheria. The revolutionary invention of an endotracheal tube by Joseph O'Dwyer of New York was the subject of his presidential address to the APS (read in absentia) held in Montreal in 1896. It was used to treat patients with laryngeal diphtheria to afford relief of the obstruction but in reality did not prevent death. At the same meeting, a major report on the use of antitoxin for the treatment of diphtheria was presented and its use ultimately made intubation decline in importance. Eighteen years later, meetings were still small, with 39 attendees and 26 papers read at the 1914 meeting. Pediatrics was entering the biochemical era. Papers were presented on respiratory gas exchange in infants, and a new respiration incubator for the study of energy metabolism in infants was described. By 1927, membership had almost doubled and presentation at the annual meeting included a paper on the use of gastric lavage for the diagnosis of tuberculosis in infants that was probably the original study. The frequent shift of the heart to the affected side in lobar pneumonia also was discussed.

Cystic fibrosis (CF) was not recognized as a distinct clinical entity until 1938, and Dorothy Anderson's paper on CF and its relation to celiac disease was presented at the 50th meeting of the APS in Great Barrington, MA, U.S.A. (2). There had been an autopsy report of two cases of congenital steatorrhea with associated pancreatic and pulmonary pathology presented by A.H. Parmelee of Chicago at the 1935 meeting of the APS. Four similar cases had been reported in the literature, but it was Anderson who was the first to clearly separate CF of the pancreas from celiac disease. In 1941, Anderson presented data on pancreatic enzyme deficiency, particularly trypsin, and how this could be used to verify a suspected case of CF (2, 3). At that time, all patients with CF died in early infancy of malnutrition and staphylococcal pulmonary infection. Anderson's work set the stage for pancreatic enzyme replacement therapy.

One of the first reports of recovery of infants <3 mo of age with pneumonia and empyema secondary to *Staphylococcus aureus* infection was presented at the 1944 meeting. Four of five infants recovered with total doses of penicillin ranging from 70,000 to 640,000 units! At the 1946 meeting, it was pointed out that histoplasmosis could also cause a calcified lesion in the x-ray study of the chest resembling tuberculosis. A similar paper had been presented in 1939 on coccidioidomycosis. Diphtheria was shown to be treatable by penicillin. Of interest is that in the history of the APS, which reflected American pediatrics from 1887–1965, there is no mention of asthma, asthmatic bronchitis, or bronchiolitis (2)!

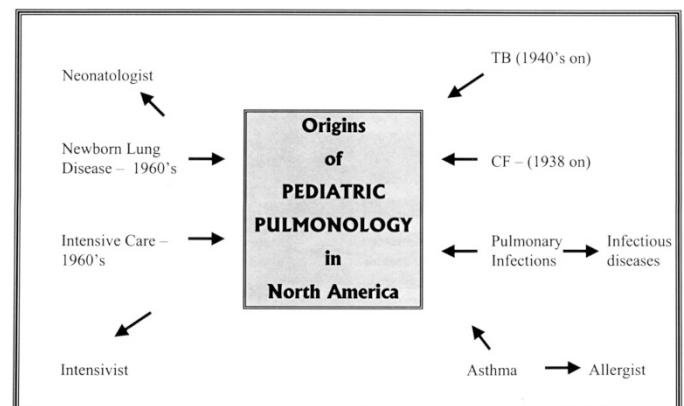
Medical sciences rapidly developed after World War II as did pediatrics as a discipline. There also was a boom in pediatric research in the post-war years. In the years from 1944 to 1960, there was an increasing knowledge of biochemistry and physiology as it related to childhood diseases, and in particular the complexity of the prematurely born newborn infant was appreciated. Treatment and prevention of childhood infectious diseases was now being accomplished. Although the American Academy of Pediatrics (AAP) was founded in 1930 with a membership of a few thousand pediatricians, by 1965, there were >8000 members, and now there are 55,000 members. The American Board of Pediatrics (ABP) was founded in

1933 to assess pediatric training programs and trainees. The Society for Pediatrics Research ("Young Turks") was formed in 1931 by 25 pediatricians who were interested in a more open forum than was provided by the APS and who limited their membership to 100. By 1964, there were 248 members and currently there are 1000 active members. However, over the past 30 y, the American Thoracic Society (ATS) has evolved as a major forum for pediatric pulmonary clinical and basic research, and this is discussed in more detail later.

### EARLY DEVELOPMENT OF PEDIATRIC PULMONOLOGY

The following is an attempt to emphasize important advances in pediatric lung disease, which is not possible to do without reference to some of the pioneering physicians who created the subspecialty of pediatric pulmonology. As pointed out previously, "The birth, early growth and development of pediatric pulmonology in North America are difficult to describe precisely. Indeed, the paternity is somewhat in question" (4) (Fig. 1). It is too late for DNA testing, but there is no doubt that the training of early pediatric respirologists in the 1950s and 1960s was spawned by strong adult programs with their major emphasis on basic pulmonary physiology and the influence of disease on pulmonary function and gas exchange. The adult program leaders who were particularly influential included D. Bates and R. Christie (Montreal), R.M. Chermiack (Winnipeg), J.H. Comroe, Jr. (San Francisco), A. Fishman (New York), R.E. Forster (Philadelphia), R.L. Riley and S. Permutt (Baltimore) and J. Whittenberger and J. Mead (Boston). Various groups of pediatricians with a strong interest in disorders that had a major effect on the lung helped to shape the current subspecialty (5).

**Tuberculosis.** Many of the early pediatric pulmonary specialists became interested in tuberculosis (TB) and its prevention, diagnosis, and treatment. At least two of the pioneers in the field, Edwin L. Kendig (Richmond, VA, U.S.A.) and Mary Ellen Avery (Baltimore, MD, U.S.A.) had pulmonary TB early in their careers. In the mid-1940s, the study of TB was the



**Figure 1.** A "primordial soup" of various interests in pediatric lung disease coalesced to form the subspecialty of pediatric pulmonology. A major dehiscence was the formation of neonatology as a separate discipline. Intensive care of older children also evolved as a subspecialty, but many pediatric pulmonologists now are also intensivists.

rudimentary beginning of one branch of pediatric pulmonology. Especially noteworthy are the contributions of Edith Lincoln and Edward Sewell at Bellvue Hospital in New York City (6). Some milestones in the recognition and treatment of childhood TB are listed in Table 1 (7). The reader is referred to a wonderful book by Comroe for further details on the discovery of anti-TB drugs and other important medical discoveries (13).

It is illuminating to look at textbooks of pediatrics published over the past 100 y or so to help assess what was important in childhood disease at the time and the attention paid to childhood TB. In Holt's (single authored!) textbook published in 1899, diseases of the newly born, primarily asphyxia and atelectasis neonatorum, were covered in 8 pages of the 54 pages devoted to the newborn infant (14). Nutrition and feeding occupied 125 pages, whereas diseases of the respiratory system (largely infection) were discussed in 130 pages. Tuberculosis was a separate section occupying 135 pages under Specific Infectious Diseases.

In a five-volume textbook of pediatrics translated from the German by M.G. Peterman and 21 American pediatricians in 1935 (15), diseases of the respiratory apparatus (146 pages) were covered along with diseases of the digestive tract (425 pages) in volume 4. X-ray studies of the chest and bronchograms were included. TB and scrofula (125 pages) were a separate section in volume 3 and also contained x-ray studies of the chest.

Some 15 y later, the Mitchell-Nelson textbook of pediatrics was published (16). Disorders of the respiratory tract in newborn children were discussed in 5 pages! There was no mention of hyaline membrane disease, but atelectasis, aspiration pneumonia, pneumonia, pneumothorax, and pneumomediastinum were discussed. No specific treatment was recommended for these respiratory diseases except for the supportive use of oxygen supplementation or a combination of oxygen (40–50%) and carbon dioxide (concentrations not specified!). Only 8 pages were devoted to the premature infant. The section on the respiratory system, including the ears and larynx, occupied 102 pages. The use of a respirator for paralysis of respiratory muscles was only briefly discussed, and the reader was referred to a pamphlet issued by the National Foundation for Infantile Paralysis (the forerunner of the March of Dimes Foundation) entitled "The Use of the Respirator in Poliomyelitis" by James L. Wilson. TB was discussed in 33 pages, and recommended therapies including rest, fresh air, heliotherapy, streptomycin, sulfonamides, para-amino salicylic acid were evaluated. Isoniazid would not be available until 1952. Mortality rates were

extremely high in the early part of the 20th century. In 1900, 200 per 100,000 population (adults and children) died from TB in the United States. The use of hygienic techniques, better nutrition, and organized public health control measures decreased the mortality rate to 46/100,000 in 1940. By 1963, the use of anti-TB drugs had a major effect and TB mortality was then 5/100,000.

**CF.** Some of the major milestones in CF are listed in Table 2. CF is a relatively young disease having first been described as a pathologic entity in 1936 by Fanconi *et al.* (17) and clearly elucidated as a clinical entity distinct from celiac disease by Anderson in 1938 (3) (Table 2). Di Sant'Agnese described the high sweat chloride in 1953 after a heat wave in New York City that led to prostration and death of infants with CF (18). The pilocarpine iontophoresis method for collecting sweat for analysis was described some 6 y later (19). It became clear in the 1950s and 1960s, as pioneered by Harry Schwachman (Boston) and Leroy Matthews (Cleveland), that care of the patient with CF required a dedicated team effort with special attention to nutrition and to treating pulmonary infections. The establishment of the Pediatric Metabolism Branch, National Institute of Arthritis, Metabolism, and Digestive Diseases, National Institutes of Health in 1960 with Paul Di Sant'Agnese as chief emphasized research on CF and provided a fertile training ground for future leaders in pediatric pulmonology [see (4)].

**Neonatal lung disease.** Table 3 lists some of the important milestones in neonatal lung disease. In the 1950s, it became increasingly clear that to influence favorably neonatal lung disease, it would be necessary to understand pathophysiology. Dr. Robert Usher (Montreal) made some of the earliest measurements of electrolyte and glucose abnormalities in infants with respiratory distress syndrome (RDS), and the "Usher Regime" of treatment was widely advocated (22). At the same time, Dr. C.A. Smith in Boston and his fellows, including C.D. Cook, Sam Prudhomme, and Mary Ellen Avery, began to make fundamental measurements in premature infants with RDS (23). In 1959, Avery and Mead described high surface tension in the lung of infants dying with hyaline membrane disease (24). The early and mid-1960s saw the beginnings of the current pediatric intensive care units and artificial ventilation of the sick newborn (25). Measurements of acid-base balance were still cumbersome and required a large volume of blood. A short-lived breakthrough was the development of a rebreathing method for estimating arterial  $P_{CO_2}$  that could be used in newborn infants (26). A major breakthrough was the develop-

**Table 1.** Some milestones in pediatric TB (7)

1882	Robert Koch isolates the tubercle bacillus and proves it to be the causative agent in TB (Nobel Laureate 1905).
1906	Tuberculin skin test developed.
1924	BCG vaccine developed.
1944	Streptomycin isolated from fungus <i>Streptomyces lavendula</i> .
1946–1948	Single and combined use of streptomycin and thiazolsulfone for treatment of TB meningitis and miliary TB (8–10).
1952	INH introduced.
1956	Early diagnosis of TB in children strongly urged (11).
1957	INH shown to be effective in reducing complications of primary TB (12).
1963	Comprehensive textbook on TB in children published (6).
1966	Rifampin introduced.

INH, isoniazid.

**Table 2.** *Some milestones in CF*

1936	Fanconi's description of a clinical entity (17).
1937	Dorothy Anderson's classic description separating CF from celiac disease appears (3).
1953	High sweat chloride described (di Sant' Agnese) (18).
1959	Pilocarpine iontophoresis (Gibson and Cooke) (19).
1960	CF centers established by Cystic Fibrosis Foundation.
1960	Establishment of Pediatric Metabolism Branch, NIAMDD, NIH with emphasis on CF research.
1960–1970s	Better antibiotics; increasing attention to nutrition.
Mid–1980s	Lung transplantation for CF begun (20).
1987	North American CF Conference replaces old "CF Club," which met at APS/SPR meetings. Since then has grown into a major international meeting.
1989	CF gene described (CFTR) (21).

**Table 3.** *Some milestones in neonatal lung disease*

1950s	Measurements made in sick newborn infants (22).
1959	Surfactant deficiency in HMD described (Avery & Mead) (24).
1960s	Mechanical ventilation began and neonatal intensive care units established (25) Astrup technique for blood acid–base measurements introduced (27).
1964	Mary Ellen Avery publishes <i>The Lung and Its Disorders in the Newborn Infant</i> (29).
1970	Continuous positive airway pressure for HMD reported by George Gregory (30).
1971	Continuous negative pressure introduced by Vidyasagar and Chernick (31).
Mid-1980s	Surfactant replacement therapy (32).

HMD, hyaline membrane disease

ment of the Astrup technique for estimating pH,  $P_{CO_2}$ , and  $HCO_3$  on an arterialized capillary sample of blood (27). The Astrup technique was based on pH measurements at known  $P_{CO_2}$  and required only three capillary tubes of blood. This was supplanted when the Severinghaus  $P_{CO_2}$  electrode was developed to the point of measurement on microsamples of blood. The Clark oxygen electrode was developed in the early 1950s, but it took almost 15 y to develop the electrode to the point at which oxygen tension could be measured on small quantities of blood (28).

Mary Ellen Avery's pioneering text on the lung and its disorders in the newborn infant was published in 1964 (29). Mortality rates for RDS (hyaline membrane disease) remained high until the concept of distending pressure (continuous positive airway pressure) was introduced by George Gregory in 1970, quickly followed by an adaptation to avoid intubation, continuous negative chest wall pressure in 1971 (30, 31). In the 1970s, the care of the preterm infant became increasingly complex and successful, and neonatology split from pediatric pulmonology because the former now required the devotion of full-time specialists. Undoubtedly, a more complete history of neonatology will be included in this series, which will update a long account published in 1983 (33). The rediscovery of pulmonary surfactant and its composition and the eventual use of surfactant replacement therapy in preterm infants are integral to the subspecialty of neonatology.

**Advent of pediatric intensive care.** It was pointed out earlier that Stahlman at Vanderbilt University was one of the earliest pioneers of artificial ventilation in the newborn infant (25). One of the limitations at that time was the lack of ventilators specifically made for children, and artificial ventilation was accomplished by adapting ventilators made for adults for use in pediatric patients. An excellent, succinct history of the development of mechanical ventilation has been published (34). In the 1970s, ventilators that were specifically modified for the needs of infants and children began to appear, and there was

the advent of respiratory therapists who specialized in pediatric ventilatory care (35). As in neonatology, intensive care of older children became increasingly complex and evolved into a separate subspecialty, although many pediatricians in North America now have sub-boards in both subspecialties of pulmonology and intensive care.

**Asthma.** As pointed out earlier, asthma was not a prominent disease entity in the annals of the APS (1, 2), although the disease has been known since antiquity (36). Indeed, it was not until 1948 in the "new" sixth edition of the International Classification of Diseases that asthma was given a specific category but in association with "bronchitis." It was not until the seventh revision of the International Classification of Diseases in 1955 that the asthma category corresponded more to a single disease entity [see (37)]. The treatment of childhood asthma was largely by inhaled adrenergic agents, and patients who visited the emergency room were treated with inhaled isoprenaline and injections of a long-acting adrenalin. The first clinical trial of albuterol was reported in 1969 (38). It was not until the mid-1970s that "safe" inhaled steroid preparations began to become available (39). Highly atopic children were treated by pediatric allergists, but children with asthma by and large continued to be treated by family practitioners and pediatricians rather than allergists or pulmonologists. The realization in the 1990s that there was a major worldwide increase in the prevalence of childhood asthma and that it was a chronic disorder led to the production of various asthma treatment guidelines for adults and children and an increase in referrals, particularly of recalcitrant patients, to the pediatric pulmonologist. This was also the impetus for the emphasis on the immunology, genetics, and possible environmental causes of the disease, including air pollution, which are still areas of intense investigation.

**Pulmonary function testing in children.** The use of the spirometer for measuring lung volumes was described >150 y ago by Hutchinson (40). Measurement of lung function in



adults became increasingly popular, and its importance was recognized after World War II in the 1940s as a result of a major effort during the war to understand gas exchange in the lung. After a lag period, the importance of measuring pulmonary function in children was appreciated and the classical text on pulmonary function testing in children was published by George Polgar and his fellow Varuni Promadhat (41). (Incidentally, Promadhat later left Philadelphia to return to her native Bangkok, where she practiced general pediatrics for many years.) The major contribution of this text was the compilation of standard values for lung volumes in children based on height and sex and the assessment of the effects on lung function of such diseases as asthma and CF and other disorders, including neonatal lung disease. Pulmonary function laboratories specifically for testing children have increased in number throughout the world and play an integral part in diagnosing diseases such as asthma and providing long-term follow-up of lung function for disorders such as CF, bronchopulmonary dysplasia, and asthma. A variety of bronchial provocation tests such as histamine, methacholine, or exercise challenge are in common use now but evolved during the past 25 y. Pulmonary function testing in infants and children under the age of 5–6 y is now feasible but is largely limited to research laboratories (42, 43).

**Maturation of the subspecialty.** As pointed out earlier, a number of physicians with primary interest in lung disease in newborn infants and children spawned pediatric pulmonology (Fig. 1). The field now relates to intensive care and acute and chronic pulmonary diseases, including TB, CF, respiratory viral and bacterial infections, asthma, bronchopulmonary dysplasia, infantile apnea, and sleep-disordered breathing in children. Many ventilator-dependent children with chronic pulmonary disease are now cared for in the home setting, and, again, a team approach is necessary. Many pediatric pulmonologists are also trained in fiberoptic bronchoscopy and provide this service at their institutions.

A number of books that are devoted to clinical pediatric lung disease have now been published since the early publications already referred to previously (6, 29). Edwin Kendig was the first to edit a book that was entirely devoted to pediatric pulmonology in 1967 (44). This first edition contained 854 pages by 29 contributors. The sixth edition, published in 1998, had 96 contributors and 1213 large pages (45)! Several other textbooks in pediatric respiratory disease have also been published recently (46–48). Polgar's landmark text on pulmonary function testing in children has already been mentioned (41).

Because of rapid advances in the basic sciences related to pediatric lung disease, a book devoted to this topic was first published in 1991 and revised in 2002 (49, 50).

The rapid growth and productivity in pediatric lung disease resulted in the founding of the new journal of *Pediatric Pulmonology* in 1985 with George Polgar as editor-in-chief. In 1995, this function was taken over by Gerd Cropp, and in 2002 Victor Chernick assumed the editorship. The journal was small in the beginning (eight issues per year) but is now a monthly publication and serves as an important forum for scientific and clinical pediatric pulmonology.

## ORGANIZATIONS AND PEDIATRIC PULMONOLOGY

The importance of pediatric lung disease has been appreciated by a number of organization over the past 45 y (Table 4). Because the ATS was so focused on adult lung disease, primarily TB, the AAP was urged to establish a Diseases of the Chest section and did so in 1957 with Edith Lincoln as its first chair and Edwin Kendig as the second chair. Funding for pediatric pulmonary centers was begun in 1968 under the Chronic Disease Division of Maternal and Child Health of the Bureau of Community Health Services, Health Services Administration, Public Health Service. These centers are currently under the Maternal and Child Health Resources Services Administration, Public Health Service, and focus on the interdisciplinary training of pediatric pulmonologists at tertiary care centers.

In 1970, the scientific assembly on Pediatrics of the ATS was established under the chairmanship of Victor Chernick (Winnipeg), who together with Carl Doershuk (Cleveland; named past chairman) and Will Waring (New Orleans; Secretary) were the organizing committee. Twenty-five members were required to establish an assembly, and the initial pediatric assembly had 50 members. By 1999, this had grown to 1543 members, approximately a 30-fold growth. In 1970, the American Review of Respiratory Disease published the first listing of pediatric pulmonary training programs and listed the requirements for training; this listing has been an annual feature of the journal since that time. The American Lung Association (ALA) and its medical arm, the ATS, formed the Pediatric Lung Committee in 1974 under the chairmanship of Daniel Shannon in recognition of the increasing burden of pediatric lung disease in society. The ALA/ATS began funding fellowship grants in pediatric pulmonology in 1972.

**Table 4.** Organizations and pediatric lung disease: important milestones

1957	Chest section of the AAP established.
1968	Pediatric pulmonary centers established (U.S. Public Health Service).
1970	Scientific Assembly on Pediatrics established in the ATS.
1970	First listing of pediatric pulmonary training programs in <i>Am Rev Respir Dis</i> .
1972	National Heart, Lung, and Blood Institute, Division of Lung Diseases begins support of pediatric pulmonology as district program area.
1974	Pediatric Lung Committee of the ALA formed.
1982	Pediatric pulmonologist elected president of the ATS (R.B. Mellins).
1983	Pediatric pulmonologist elected president of the ALA (E. Sewell).
1985	ATS establishes long-range planning committee for pediatric pulmonology.
1985	DLD-NHLBI report on "Evaluation of Pediatric Respiratory Disease" completed.

Pediatric pulmonology became an increasingly important area in the ATS/ALA, and in 1982, R.B. Mellins was the first pediatric pulmonologist to serve as president of the ATS. E. Sewell became the first pediatric pulmonologist to serve as the president of the ALA in 1983. A long-range planning committee for pediatric pulmonology was established by the ATS in 1985.

The Division of Lung Diseases of the National, Heart, Lung and Blood Institute began to support pediatric pulmonology as a distinct program area in 1972 and in 1985 prepared a comprehensive report on pediatric respiratory disease that clearly indicated the magnitude and serious nature of childhood respiratory disorders (51). Many of the highlights in the development of pediatric pulmonology were reviewed in a landmark publication in 1986 (4). The role of the National Institutes of Health in the support of pediatric and adult pulmonary biology and medicine over the past 50 years has recently been reviewed (52).

The increasing importance of pediatric lung disease as a special discipline of study was recognized early on by Edwin Kendig, who first suggested a sub-board in 1973 (Fig. 2, Table 5). As early as 1978, guidelines for the training of pediatric pulmonologists were published by a task force of the Section of Diseases of the Chest of the AAP (53). These guidelines emphasized research training and also suggested a course in

statistics. In 1980, a formal application was submitted to the ABP by a committee chaired by Lynn Taussig and included R. Lemen, R.B. Mellins, C. Doershuk, and A Platzker. The application was refused on several grounds, including the small number of potential candidates for such an examination; the overlap with other disciplines such as cardiology, neonatology, anesthesia, allergy, and critical care medicine; and the limited number of acceptable training programs. This ruling was hotly contested, and a joint committee of the ATS and the AAP was formed to further pursue the matter. ATS members of this committee were H. Eigen, R. Mellins, D. Shannon, and L. Taussig; the AAP was represented by J. Brooks, R. Lemen, D. Seileimer, and W. Waring. They pointed out the increasing importance and growth of the subspecialty. In 1972, fewer than 40% of academic pediatric departments in the United States had a trained pulmonologist on staff, and there were fewer than 12 training programs in pediatric lung disease. By 1982, >75% of academic departments had established pulmonary sections or divisions, and there were >50 pediatric pulmonary training programs listed in the American Review of Respiratory Disease. By 1985, the sub-board in pediatric pulmonology was approved and was the first to incorporate research as an important and integral component of training, largely as a result of urging by R.B. Mellins.

The first subspecialty of pediatric pulmonology meeting of the ABP was held on November 10, 1984, in Philadelphia. It was chaired by John Brooks, and the other committee members were Thomas Boat, Howard Eigen, Robert Mellins, Darrell Miller (ABP liaison), Daniel Shannon, Lynn Taussig (unable to attend), and Will Waring. An examination was to be given on July 1, 1986, and required the rapid development of a bank of questions and the hiring of a medical editor. V. Chernick, a Canadian, was the first medical editor (1986–1999); he was succeeded by John McBride on January 1, 2000. The initial examination certified 158 pediatric pulmonologists, and in 2000 there were an additional 65 certified. Since 1986, 661 pediatricians have been certified in pediatric pulmonology by the ABP.

January 15, 1973

F. Howell Wright, M.D.  
American Board of Pediatrics  
Museum of Science and Industry  
57th Street & South Lake Shore Drive  
Chicago, Illinois 60637

Dear Howell:

Some of us are interested in establishing a sub-Board for certification in pulmonary disease in children. How shall we go about it?

Many thanks for your help.

Sincerely yours,

Edwin L. Kendig, Jr., M.D.

ELK:jg

Figure 2. Letter from E.L. Kendig to F. Howell Wright.

## PEDIATRIC PULMONOLOGY AND THE BURDEN OF CHILDHOOD LUNG DISEASE

Although the foregoing focused on the development of pediatric pulmonology in North America and principally the United States, the global burden of pediatric lung disease has been accompanied by strong research and clinical programs in this subspecialty in many other areas of the world, including Great Britain, Europe, Australia, Israel, South America, and

Table 5. Establishment of sub-board of pediatric pulmonology

1973	Letter from E.L. Kendig to F. Howell Wright, President, ABP.
1978	Guidelines for pediatric pulmonology training published.
1980	Formal application to ABP to establish sub-board of pediatric pulmonology—refused.
1981	Joint committee of ATS and AAP formed to continue effort.
1984	ABP applies to American Board of Medical Specialties to subcertify pediatric pulmonology.
1984	First meeting of subcommittee of pediatric pulmonology of ABP.
1985	Pediatric pulmonology sub-board approved; first sub-board of ABP to incorporate research as an integral part of training.
1986–1999	Examination medical editor—Victor Chernick
1986	First examination.
2000	Examination medical editor—John McBride

the Philippines, to name a few. There continues to be a huge burden of pediatric lung disease worldwide. As pointed out in 1984, preventable acute respiratory infections in children represented a problem of enormous magnitude and accounted at that time for some 2.2 million deaths per year in children under the age of 1 y (54). Indeed, it is estimated that nearly 4 million children die each year from acute respiratory illness, most of them in developing countries. Poverty, with its accompanying nutritional deficiency, particularly vitamin A and zinc, plays a major role in the prevalence and mortality from acute respiratory illnesses in children (54). It is estimated that 250 million people worldwide have asthma, which is now the most prevalent chronic disease in childhood (55). There are 8 million new cases of active TB annually, with the worst annual increase in TB in Africa because of HIV infection. Because of this global epidemic of respiratory disease burden, a Forum of International Respiratory Societies has recently been formed (56). Pediatric pulmonologists will need to play a prominent role in this international effort in the future.

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