

HISTORY OF MEDICAL EDUCATION

Joel D. Howell, MD, PhD, Associate Editor

Academic medical education in the late twentieth century is divided into many specialties. The invention of these specialties may seem inevitable—does it not seem obvious that physicians need to focus their training on specific sets of knowledge and abilities? And, even though there may be some debate at the margins, the essence of the “core” specialties may also appear to be natural. Surgery, childbirth, diseases of children—how could one choose *not* to divide medical practice into such categories? Yet, if one examines the history of how specialties came into existence, their cur-

rent status appears anything but natural and inevitable.

Rather, specialties were formed when people living in specific social, cultural, and political conditions elected to create them. In this essay, Howard Markel analyzes the early formation of pediatrics in the United States by focusing on three key individuals who helped effect a transition between the less specialized world of the nineteenth century and the highly specialized world of the late twentieth century. They did so, as Dr. Markel describes, in a world very different from today's. Although times have changed,

medicine—and its system of specialties—is today, and will remain, firmly embedded within not only a biological sphere, but also a specific social and cultural sphere.

Joel D. Howell, MD, PhD

Dr. Howell is codirector, Robert Wood Johnson Clinical Scholars Program, associate professor, Department of Internal Medicine and Department of History, and director, Program in Society and Medicine, University of Michigan, Ann Arbor. He may be reached by mail at U-M Clinical Scholars Program, 6312 Medical Science Building 1, 1150 W. Medical Center Drive, Ann Arbor, MI 48109-0604, or by e-mail at JHOWELL@umich.edu

Academic Pediatrics: The View from New York City a Century Ago

Howard Markel, MD, PhD

Abstract: Pediatrics arose as an academic and medical specialty in the United States during the late nineteenth century. This paper documents the first three stages of academic pediatrics in the United States between 1850 and 1950: (1) 1850–1880, a period that focused on sanitary reform as a means of reducing infant mortality; (2) 1880–1900, the era where discoveries being made in bacteriology, physiology, and nutrition began to be applied to

improving the health of children; and (3) 1900–1930, when the field was characterized by an active health reform movement directed at parents and health care professionals. Three prominent pioneer pediatricians, Drs. Abraham Jacobi, Henry Koplík, and L. Emmett Holt, are profiled as representative practitioners of these eras. *Acad. Med.* 1996;71:146–151.

Today, most children in the United States enjoy excellent health and access to health care, in large part because of children's health care specialists, who have both enabled more children to gain access to care and developed important new therapeutic options for childhood diseases. As an academic endeavor, the study of pediatrics plays a pivotal role in the education of medical students and house officers. However, the respected position of pediatrics in American medicine is a relatively

recent historical phenomenon. In 1927, the eminent medical historian Fielding H. Garrison described American pediatrics of the late nineteenth and early twentieth centuries as the “dependent dwarf of ordinary medical practice.”¹

Scholars who agree with this interpretation have tended to focus on the strikingly small number of physicians who devoted their careers to children's health issues during this period.² To be sure, finding a well-trained and experienced pediatrician in the United States between 1880 and 1920

was no small task. There were relatively few established departments of pediatrics at American medical schools during this era; more often than not, "Diseases of Children" was wedded to established departments of internal medicine or to departments of obstetrics and gynecology—widely referred to as "Departments of the Diseases of Women."

Beginning in the mid-1800s, a handful of the largest American cities established free-standing hospitals devoted largely to childhood surgical problems and the disastrous consequences of growing up poor in nineteenth-century urban America.³ Although the American Medical Association established a "Section on the Diseases of Children" as early as 1880 and the independent American Pediatric Society was founded in 1888, there were probably fewer than 50 children's health care professionals practicing in the United States during the 1880s, and none of these physicians practiced pediatrics to the exclusion of other branches of general medicine.^{4,5} As Dr. Abraham Jacobi admitted in an 1880 address to the American Medical Association, if he restricted his practice solely to the diseases of infancy and childhood he "would make himself ridiculous."⁶ Indeed, Abraham Jacobi, like many a pediatrician of this era, continued to see adult patients throughout his long and successful career. By the first decade of the twentieth century, approximately 500 physicians in the United States either practiced pediatrics exclusively or devoted 50 percent or more of their professional practices to caring for children.⁷

People who thought about children's health care at this time probably concluded that these 500 physicians were enough. In an age before "experts" began to play a role in the daily lives of Americans, children, unless they were acutely ill, were rarely taken to consulting pediatricians or even to general practitioners. There were no "well-child examinations" or vaccination schedules to keep a pediatrics practice economically sustainable. Nor could clinicians offer the array of now-familiar therapeutic options to ameliorate some of the most common and dangerous diseases of childhood.

But long before the advent of the 1900s, a number of physicians were devoting significant attention and talent to the alarming problems of infant mortality and childhood diseases. Social historian Richard Meckel has proposed that American pediatrics underwent three stages of development between 1850 and 1930. The first stage (1850–1880) was directed at ameliorating infant mortality and was tied to the broader movement of sanitary reform. Throughout the last half of the nineteenth century, 200 of every 1,000 children born in the United States died *before* their first birthday.⁸ Sanitarians reasoned that cleaning up the environments in which children (and adults) lived could improve health and reduce mortality.

During the next stage, 1880–1900, physicians and public health workers dedicated to improving the health of children

began to apply the exciting discoveries concurrently being made in bacteriology, gastroenterology, physiology, and nutrition. Many infant deaths were associated with complications of infant feeding and with epidemics of "summer diarrhea" (cholera infantum) and resultant dehydration. Thus, it is hardly surprising that infant nutrition and the elaboration of complex concoctions of infant "formulae" became the intellectual focus of many a nascent pediatrician at this time.⁹

The final stage of this transformation of pediatrics from "dependent dwarf" to full-fledged medical specialty, which occurred between 1900 and 1930, was characterized by an active health reform movement directed at parents (most typically mothers) and health care professionals. Two of this era's greatest successes were the widespread transmission of baby- and child-care advice to the lay public and the development of the now commonplace well-child examination schedule. Both of these endeavors continue to contribute to the health of our nation's youth.

In spite of the small number of practitioners and the slow growth (in retrospect) of pediatrics as a field prior to 1900, it is historically inaccurate to state that American pediatrics "did not exist" before the advent of the twentieth century.² If we restrict our attention to the last half of the nineteenth century, we find that many dedicated, productive Americans practiced pediatrics and advanced our knowledge of the diseases of childhood and infancy. Perhaps more important, these professionals were using their experiences to teach medical students, nurses, and parents. The accouterments of a profession, such as specialized journals, titles, specialty boards, and so on, were not yet, or were only beginning to be, developed at this time, but the path towards a medical specialty devoted to children's health was already on track during the closing decades of the nineteenth century. Three of the most successful representatives of the vanguard of American pediatrics in the late nineteenth century were the New York City pediatricians Dr. Abraham Jacobi, Dr. Henry Koplik, and Dr. L. Emmett Holt. Gifted teachers, practitioners, and medical investigators, their careers spanned the last decades of the nineteenth century and the early decades of the twentieth century. If we apply Richard Meckel's timeline for the initial development of nineteenth-century American pediatrics, we find that each of these prototypical pediatricians was educated during the first stage, 1850–1880; came of intellectual and professional age during the second period, 1880–1900; and enjoyed senior statesmen-like status in the field of pediatrics when it was more consciously developing itself as a medical specialty between 1900 and 1930.

NEW YORK CITY AT THE TURN OF THE CENTURY

During the last decades of the nineteenth century and the opening decades of the twentieth century, New York City

was the largest and most crowded city in the United States. Overburdened by the social problems resulting from massive industrialism and immigration, this city was for many Americans a sprawling symbol of corruption, vice, danger, and disease. Inadequate handling of sewage and waste, overcrowding, poor living conditions, and contaminated food and water chains led to several serious epidemics of cholera, typhus fever, and smallpox. Children forced to reside in this atmosphere of disease and poverty suffered disproportionately in terms of mortality and morbidity.¹⁰

Several institutions attempted to aid homeless and orphaned children, including the Orphan Asylum Society (founded 1806), the Children's Aid Society (1853), the New York Infant Asylum (1865), the New York Foundling Hospital (1869), and the New York Society for the Prevention of Cruelty to Children (1875).¹¹ The city's wide resources, in terms of hospitals and medical schools, and the large number of children requiring medical care also attracted talented young physicians who wanted to devote as much intellectual and clinical attention as was economically feasible to the practice of pediatrics.

Abraham Jacobi: The Nestor of American Pediatrics

Abraham Jacobi is credited with being "the first Professor of diseases of children in America."¹² Born in Westphalia, Prussia, in 1830, and educated at the University of Bonn (MD, 1851), Jacobi became involved with the German social revolution of 1848 and emigrated to the United States in 1853. After settling in New York City, Jacobi opened his first practice in the Bowery on Howard Street. There, he focused his attention on diseases of infancy and childhood. His ebullient personality, wide command of the medical literature, and ready pen that produced an enormous amount of scientific monographs and papers soon elevated the young immigrant practitioner to great respect and prominence in the New York medical community and beyond. Although Jacobi served academic appointments at several now-defunct institutions during the 1850s and 1860s, his appointment in 1870 as Professor of the Diseases of Children at Columbia University College of Physicians and Surgeons made him the first professor of pediatrics at a U.S. medical school. (Interestingly, this appointment did not initially give Jacobi the right to a full vote on the Columbia faculty.)

During his long career that spanned from the years before the Civil War to those following World War I, Jacobi applied his skills, talents, and pragmatism to teaching and advancing the discipline of pediatrics. He wrote several textbooks and numerous papers on such topics as diphtheria, the intestinal diseases of infancy, and infant nutrition.^{13,14} His collected papers and addresses comprise eight volumes.¹⁵ Ja-

cobi worked avidly with the philanthropist Nathan Straus to advocate the distribution of clean milk to impoverished infants. He played important roles in many medical bodies such as the New York Academy of Medicine, the American Medical Association, and the American Pediatric Society. A forceful speaker for children's rights, Jacobi advocated considering children's medical problems as distinctly different from those of adults.

In his role as attending pediatrician of the Mount Sinai Hospital, the Roosevelt Hospital, the Lennox Hill Hospital, and the German Dispensary in New York, Jacobi demonstrated his pediatric diagnostic skills and inspired several generations of New York City physicians to practice the art and science of pediatrics. He maintained an active private practice and was frequently called upon to be a consultant for patients as well as for public health organizations such as the New York City and the New York State health departments. For example, during the 1892 cholera epidemic in New York City, Jacobi was a member of the influential New York State Chamber of Commerce Quarantine Committee. The group, consisting of some of the nation's finest physicians and bacteriologists, including Hermann Biggs and T. Mitchell Prudden, condemned the quarantine station in New York Harbor as inadequate and deadly for those unfortunates isolated there.¹⁶

Jacobi's career illustrates all of the major features of the typical late-nineteenth-century American (and almost exclusively male) pediatrician: in his practice he treated both adults and children in order to make ends meet; he was the author of many pediatrics treatises and papers; he was active in the cause of needy children; he focused on preventing disease using the scientific discoveries of the day; and he was devoted to teaching the art of pediatrics. Jacobi continued to serve as a revered pediatrician, mentor, role model, and physician-statesman until his death in 1919.

Henry Koplik and Dispensary Practice of Pediatrics

Henry Koplik was born in New York City on October 2, 1859. Koplik received his bachelor of arts degree from the City College of New York in 1878 and his medical degree from the Columbia University College of Physicians and Surgeons in 1882. He completed an internship at Bellevue Hospital in 1882. Influenced by his professor, Abraham Jacobi, young Koplik traveled to Europe in order to complement his American medical education by studying and working at some of the finest pediatrics clinics, laboratories, and hospitals in Vienna, Munich, Prague, and Berlin. Like many of America's finest young physicians of that era who were eager to better their careers and professional standing,¹⁷ Koplik spent the years 1883 to 1887 studying under such medical luminaries as the public health expert Max von Pet-

tenkoffer, the developer of the "germ theory," Robert Koch, and the pediatrician Alois Epstein.

Upon his return to New York City in 1888, Koplik successfully competed for a position as attending pediatrician at the Good Samaritan Dispensary. Dispensaries were free-standing, neighborhood outpatient clinics where medical examinations and minor operations were performed and medicines were dispensed. New York City's competitive medical marketplace during the late 1880s and early 1890s offered few paying positions for specialists such as pediatricians, and thus dispensary positions were avidly sought after by young ambitious doctors hoping for prominent careers in urban medicine.¹⁸ There, many hoped to obtain more clinical experience, meet senior physicians (and others) who might advance their careers, and, with hard work, luck, social connections, and diagnostic acumen, secure more financially advantageous appointments as attending physicians at prestigious hospitals. Such hospital positions brought not only honor and prestige but also a steady stream of paying patients.

Located on the corner of Essex and Broome Streets in New York's Lower East Side, Koplik's clinical practice at the Good Samaritan Dispensary consisted almost entirely of impoverished East European Jewish and southern Italian immigrant children; his practice served these children's mothers, too, until pediatrics became wholly separate from obstetrics and gynecology at the dispensary. Dr. Koplik saw between 40 and 60 children a day during his busy clinic sessions on Essex Street and at his private practice on East 62nd Street. In the early 1890s, Koplik set up a small bacteriology laboratory, at his own expense, in the back room of the dispensary. One of his best known observations and contributions to clinical pediatrics was his 1896 description of the pathognomonic signs of measles—a sign still referred to as Koplik's spots.¹⁹

Koplik published prodigiously his research into the bacteriologic aspects of disease and his case reports on interesting pediatric problems. His magnum opus, *The Diseases of Infancy and Childhood*, first published in 1902, went through four editions.²⁰ Koplik also maintained active associations with Columbia's Department of Pathology and Bacteriology, the Mount Sinai Hospital, and the Medical Department of the University of the City of New York. In 1900, Koplik assumed the coveted position of attending pediatrician at Mt. Sinai Hospital, where he continued to practice and to teach and train residents for the next 25 years. Koplik also developed an ingenious plan that combined the provision of clean milk for the poorest infants on the Lower East Side with a schedule of well-child examinations. During these regularly scheduled examinations, doctors assessed children's growth and development; identified high-risk situations or conditions that required counseling; provided appropriate treat-

ment or preventive care; and offered treatment, prevention, and advice for acute or chronic medical problems. In addition, Koplik was an active lecturer to mothers' groups and nursing schools. Between 1888 and 1925, Henry Koplik devoted the major portion of his waking hours to teaching and practicing pediatrics.

Koplik, in contrast to Jacobi, represented the newer, "homegrown" generation of American pediatricians. He was born and primarily educated in the United States, but he traveled to Europe to enhance his training. He was well versed in both diagnostic and experimental bacteriology. Like Jacobi, he spent a great deal of time teaching and writing about pediatrics as well as being an activist in causes on the behalf of his young patients. Koplik died in 1927, an internationally known specialist in the diseases of children.

Luther Emmett Holt and the Babies Hospital

Born in 1855 in upstate New York, Luther Emmett Holt studied at Rochester University, the Medical College of Buffalo University, and the Columbia University College of Physicians and Surgeons. Some of Holt's most formative clinical rotations were taken at the New York Ruptured and Crippled Hospital under the venerable orthopedic surgeon Virgil Gibney. When Holt received his MD in 1880, he took his internship at Bellevue, where he served under Drs. William Henry Welch, Alfred L. Loomis, E. G. Janeway, William Halsted, and Edward Trudeau. After first considering a career in surgery, Holt turned his clinical attention to medicine, and, once in practice, to pediatrics.¹² Like Jacobi and Koplik, however, Holt spent many of his early years in practice seeing both adult and pediatric patients.

In 1889, Holt was appointed director of the financially unstable Babies Hospital in New York. In the middle of a severe nursing shortage, he hired, with a minimum of expense, young girls to serve in the capacity of "nursery maids." For these nurses, Holt designed a four-month course on the proper care, bathing, and feeding of infants. He even wrote a booklet for them entitled *A Catechism for Nurses*. Using what he learned from this successful teaching program, Holt expanded the booklet into *The Care and Feeding of Children*, which became one of the best-selling primers for parenting in the twentieth century. The book went through 12 editions, 75 printings, and numerous translations. In 1946, the Grolier Club voted it one of the most important 100 books that had "influenced the life and culture of American people."^{21,22}

L. Emmett Holt accomplished more, of course, than writing a best-selling baby book—although this was not an insignificant achievement. Holt's textbook, *The Diseases of Infancy and Childhood*, became a standard resource for generations of American medical students and pediatricians

and was referred to by many a medical student as the "Osler of Pediatrics," linking it to another classic medical textbook of the same era by Sir William Osler.^{23,24} Holt was known for his investigations on infant nutrition and the development of artificial formulas using a now-forgotten system (the "percentage method") of modifying cow's milk with specific amounts of fats, carbohydrates, and proteins. In 1897, he was named president of the American Pediatric Society. In 1901, he succeeded Abraham Jacobi as professor of pediatrics at the College of Physicians and Surgeons.

During the last two decades of his life, Holt devoted all of his time to pediatrics. Holt continued teaching at the College of Physicians and Surgeons and the Babies Hospital as well as attending his private practice on West 55th Street. He served on several charitable boards dedicated to the poor, including the Henry Street Settlement, the National Child Labor Committee, and the American Child Health Association. Holt influenced several generations of medical students and pediatricians with his gentle wit, his clear presentations, and his insistence on the need to understand the unique physiology, pathology, and psychology of infants and children. As his former interns, who became prominent pediatricians themselves, Edwards A. Park and Howard H. Mason, concluded: "More than any other single person in this country he laid the groundwork for 'the age of the child.' American Pediatrics is his monument."¹²

Unlike Jacobi and Koplik, Holt was a completely American product in terms of his intellectual development, education, and training. Like Jacobi and Koplik, he needed to supplement his early career by seeing adults as well as children. He applied the science of the day concerning the measurement of fats, carbohydrates, and proteins to the development of safer infant formula. Moreover, he used his role as teacher and professor to train new young pediatricians. Finally, he developed into a popular author on child care issues, bringing important information to literally millions of parents over a 40-year period. Holt died in New York City in 1924.

EPILOGUE

The rich and varied history of children's health care reaches as far back as the first children. How adults understand the problems or dangers of childhood rests largely upon the social constructs of their particular eras. Medicine and the attention it pays to children's health in many ways reflects its complex and interdependent relationship with society. One can learn a great deal about a given society in a particular time and place by considering how that society treats and respects its children.

I have discussed three prototypical "modern American pediatricians" whose careers spanned the mid-nineteenth to early twentieth centuries. Jacobi (a German immigrant), and

the American-born Koplik and Holt were pioneers in a field that was not yet economically or professionally secure. All three of these pediatricians saw adult patients through most or all of their professional careers. They were educated in the era before the germ theory of disease and reached the peaks of their careers *after* germ theory became the new prism through which clinical medicine was viewed. They received important hospital and teaching posts from which they further expanded the field of academic pediatrics. They were most active in practice and research between the years 1880 and 1900. They were successful in adapting to new explanations of disease, elaborated several of their own, and worked long hours both to meet the economic realities of daily life and to chart careers in academic pediatrics. Their writings, clinical acumen, and professional attainments accorded them most or all of the highest accolades of the international medical profession.

Unlike other specialties, such as ophthalmology, which centers on particular instruments and access to a particular organ, pediatrics has a broader focus. Its missions are to study children's growth and development, to understand the inherent differences between children and adults, and to ensure the good health of all children. Together, these missions have become a vital part of academic medicine.

Dr. Markel is assistant professor of pediatrics and communicable diseases at the University of Michigan Medical School, Ann Arbor.

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