## Committee Report: American Pediatrics: Milestones at the Millennium

The quantum advances of American pediatrics of the last century have been built on the solid foundation constructed by our professional ancestors in pediatrics and other fields. To understand where we are today, it is useful to know where we came from. The Historical Archives Advisory Committee of the American Academy of Pediatrics has prepared this timetable of the evolution of our discipline. The list of signal events and important people is extensive, but to a degree is subjective and not all-inclusive. We apologize for any flagrant omissions.

### THE WORLD AND NATION

1492: Columbus’s first voyage.

1587: The Virginia Colony on Roanoke Island was founded.

1607: The Jamestown, Virginia colony was founded.

1620: The Plymouth, Massachusetts colony was founded.


1650: Governor John Winthrop, Jr, practiced pediatrics and prescribed through the colonial mails, New Haven and Hartford, Connecticut.

1677: Thomas Thatcher published a broadside on smallpox, the first American medical publication. Boston, Massachusetts.

1721: Reverend Cotton Mather and Dr Zabdiel Boylston introduced variolization for smallpox. Boylston’s 6-year-old son, Thomas, was the first person inoculated in the American Colonies. Boston, Massachusetts.

1721–1740. New England diphtheria epidemic killed 5000 people, most of them children.

1747: Dr James Lind demonstrated that fresh citrus juice could prevent and treat scurvy in English sailors. London, England.

1765: The founding of University of Pennsylvania Medical College, Philadelphia, Pennsylvania, the first American medical school.

1769: The founding of King’s College of Medicine, New York, New York, which became Columbia University College of Physicians and Surgeons in 1813.

1776: The Declaration of Independence was signed.

1783: The founding of Harvard Medical School, Boston, Massachusetts.

1788: Dr Hezekiah Beardsley described hypertrophic pyloric stenosis of infancy, New Haven, Connecticut. His paper was rediscovered and republished in 1903 by Sir William Osler.


### AMERICAN PEDIATRICS

1482


1650: Governor John Winthrop, Jr, practiced pediatrics and prescribed through the colonial mails, New Haven and Hartford, Connecticut.

1735–1740. New England diphtheria epidemic killed 5000 people, most of them children.

1789: Dr Benjamin Rush gave lectures on the diseases of children and coined the term “cholera infantum” for summer diarrheal disease. University of Pennsylvania Medical College, Philadelphia, Pennsylvania.
1798: The founding of Dartmouth Medical School, Hanover, New Hampshire, by Dr Nathan Smith, who was its 1-man faculty.

1800: Dr Benjamin Waterhouse introduced vaccination for smallpox using Jenner’s cowpox vaccine. His son Daniel, age 5, was the first person in the American states to be vaccinated. Boston, Massachusetts.

1813: The founding of Medical Institution of Yale College, New Haven, Connecticut.

1813: Dr Nathan Smith successfully treated the osteomyelitis of 8-year-old Joseph Smith (no relation) avoiding amputation of his leg, Lebanon, New Hampshire. Joseph Smith later founded the Church of Jesus Christ of Latter-day Saints (Mormons).

1813: Dr Eli Ives was appointed Professor of the Diseases of Children and conducted the first formal American courses in pediatrics for 40 years at the Medical Institution of Yale College, New Haven, Connecticut.

1818: Dr William Potts Dewees published *Treatise on Physical and Mental Treatment of Children*, Philadelphia, Pennsylvania. Dr John Logan published *Practical Observations on Diseases of Children*, Charleston, South Carolina. These were the first American pediatric textbooks.

1820: Dr Eli Ives was appointed Professor of the Diseases of Children and conducted the first formal American courses in pediatrics for 40 years at the Medical Institution of Yale College, New Haven, Connecticut.

1825: Dr William Potts Dewees published *Treatise on Physical and Mental Treatment of Children*, Philadelphia, Pennsylvania. Dr John Logan published *Practical Observations on Diseases of Children*, Charleston, South Carolina. These were the first American pediatric textbooks.

1846: Dr William Morton demonstrated ether anesthesia at the Massachusetts General Hospital, Boston, Massachusetts.

1847: The founding of the American Medical Association (AMA).


1861–1865: The American Civil War, the War between the States.

1865: Gregor Mendel published *Principles of Heredity*, Brühnn, Austria.

1866: The New York State Health Department was established, the first in the United States.


1868: Publication by the AMA of the *American Journal of Obstetrics and Diseases of Women and Children*. The first number included an article on croup by Dr Abraham Jacobi.

1869: The founding of Boston, Massachusetts Children’s Hospital.

1876: Dr Job Lewis Smith was appointed Clinical Professor of Diseases of Children, Bellevue Medical School, New York, New York.

1880: Dr H. H. Robert Koch (1843–1910) discovered the causative organism of tuberculosis for which he received the Nobel Prize in Medicine in 1905. His many contributions over 40 years included formulation of *Koch’s Postulates*. Berlin, Germany.
1883: Discovery of diphtheria toxin and antitoxin by Emil von Behring for which he was awarded the first Nobel Prize in Medicine in 1901. Berlin, Germany.

1884–1962: The publication of the Archives of Pediatrics, the first American journal dedicated totally to pediatrics.

1885: Louis Pasteur (1822–1895) successfully tested his rabies vaccine on Joseph Meister, who had been bitten by a rabid dog. In 1864, he saved the French wine industry by showing that heating wine (pasteurization) prevented bacterial spoilage, Paris, France. His brilliant investigations over 40 years led to the modern science of bacteriology.

1886: Franz von Soxhlet described “pasteurization” of milk to prevent spoilage and transmission of diseases. Munich, Germany.

1888: The American Pediatric Society (APS) was founded by Dr Job Lewis Smith and 43 founding members. The APS published the Transactions of the American Pediatric Society for 50 years.

1893: Dr Thomas Morgan Rotch was appointed Professor of Pediatrics with a chair on the faculty, Harvard Medical School, Boston, Massachusetts.

1893: Pasteurization plants and milk stations providing safe milk for poor infants were established by philanthropist Nathan Strauss, in collaboration with Dr Abraham Jacobi, New York, New York.

1894: Dr L. Emmett Holt, Sr, wrote The Care and Feeding of Children that became an influential and widely disseminated child-rearing manual for parents. Holt also published his classic textbook, The Diseases of Infancy and Childhood. New York, New York. This text had 11 editions before becoming in turn, Holt’s Pediatrics, edited by Dr Rustin McIntosh, and then Pediatrics, edited by Dr Abraham M. Rudolph.

1894: Dr C. W. Townsend described “the hemorrhagic disease of the newborn.” Boston, MA. In 1936 H. Dam discovered “Koagulations Vitamin”, for which he received the Nobel Prize in Medicine in 1943. Copenhagen, Denmark. In 1937, Dr W. W. Waddell showed that coagulation abnormalities of the newborn could be prevented and treated by vitamin K.

1895: The discovery of the radiograph (X-ray) by Wilhelm C. Roentgen, for which he received the first Nobel Prize in Physics in 1901. Wurtzburg, Germany.

1898: Dr Joseph B. DeLee established the first premature infant incubator station in the United States. Chicago, Illinois.

1900: Dr Karl Landsteiner discovered the ABO blood groups, for which he received the 1930 Nobel Prize in medicine. Vienna, Austria.


1905–1910: Drs Walter Reed in Havana, Cuba and William Gorgas in Panama eradicated yellow fever and malaria by mosquito control, enabling the construction of the Panama Canal.

1902: Dr L. Emmett Holt, Sr, succeeded Abraham Jacobi as Professor of Pediatrics, College of Physicians and Surgeons and Director, Infants Hospital, New York, New York.

1908: The establishment of New York City Division of Child Health under Dr Josephine Baker. Her system of child health supervision was widely adopted.

1908: Chicago, Illinois mandated pasteurization of milk. This was followed by many cities throughout the United States.

1909: The first White House Conference on the Care of Dependent Children was convened by President Theodore Roosevelt.

1910: Dr James Herrick described sickle cell anemia, Chicago, Illinois.

1910: Dr Thomas Morgan Rotch published The Roentgen Ray in Pediatrics, the first American textbook of pediatric radiology. Boston, Massachusetts. This was the only one until John Caffey’s Pediatric Radiograph Diagnosis was published in 1965. New York, New York.

1910: Abraham Flexner published Medical Education in the United States and Canada recommending undergraduate college requirements for medical students and full-time basic science faculty and hospital affiliations for medical schools.

1911: Publication of the American Journal of Diseases of Children by the AMA. In 1994, this became The Archives of Pediatric & Adolescent Medicine.

1912: Dr John Howland was appointed full-time Professor of Pediatrics at Johns Hopkins School of Medicine and the Harriet Lane Home, Baltimore, Maryland.

1912: The United States Children’s Bureau was established by Congress in response to recommendations of the 1909 White House Conference.

1913: Dr Bela Schick described an intradermal test (Schick test) for immunity to diphtheria. Vienna, Austria.

1916: The first large American epidemic of paralytic poliomyelitis, which primarily attacked children in New York City.

1919: Dr J. P. Crozier published The Disease of Infants and Children, which in turn became Griffith and Mitchell’s Pediatrics, then Mitchell and Nelson’s Pediatrics; Waldo E. Nelson’s Pediatrics in 1954, and in 1984 Nelson’s Pediatrics, edited by Dr Richard Behrman.

1921: Congress enacted the Sheppard-Towner Bill, which provided federal matching funds for health care of poor mothers and infants and extended health supervision beyond infancy to include preschool children.

1921: Dr Thomas B. Cooley described thalassemia major (Cooley’s anemia), Detroit, Michigan.

1922: Drs Frederick G. Banting and Charles H. Best isolated insulin and demonstrated its antihyperglycemic activity. Banting received the 1923 Nobel Prize in Medicine. Toronto, Canada.

1922: Drs H. Steenbock and A. Black showed that irradiation of ergosterol resulted in concentrated vitamin D preparations. Madison, Wisconsin.

1919: Drs Frederick G. Banting and Charles H. Best isolated insulin and demonstrated its antihyperglycemic activity. Banting received the 1923 Nobel Prize in Medicine. Toronto, Canada.
1922: Drs E. V. McCollum, Edwards Park, Benjamin Kramer, John Howland, and their research team at Johns Hopkins described blood chemistry changes in rickets and the beneficial effects of sunlight and cod liver oil, Baltimore, Maryland.


1928: Dr Ethel Dunham was the first woman to be elected to the APS, Washington, DC.

1930: The founding of the American Academy of Pediatrics (AAP) with 304 charter members.

1931: Dr Alvin F. Coburn, a medical resident at Presbyterian Hospital, suggested a causal relationship between hemolytic streptococcal infections and rheumatic fever, New York, New York.

1931: The founding of the Society for Pediatric Research (SPR) for younger members of the academic community.

1932: Drs W. A. Waugh and C. G. King isolated the antiscorbutic factor (vitamin C) from lemon juice and showed that it was hexuronic acid, Pittsburgh, Pennsylvania.

1932: Drs Louis K. Diamond, Kenneth Blackfan, and James M. Batty unified hydrops fetalis, icterus gravis, and anemia of the newborn as manifestations of “erythroblastosis fetalis,” Boston, Massachusetts.

1932: Publication of the *Journal of Pediatrics*.

1933: The founding of the American Board of Pediatrics (ABP). The ABP established criteria for certification of clinical competence, including the required length of postgraduate training and the passing of a cognitive examination.

1933: Dr Louis W. Sauer used pertussis vaccine for the first time in the United States.

1935: Gerhard Domagk discovered Prontosil, the first sulfa drug, for which he was awarded the 1939 Nobel Prize in Medicine but was forced to decline it by the Nazi government, Germany.


1936: Dr Edwards A. Park established specialty clinics for tuberculosis, psychiatry, cardiology, and endocrinology at Johns Hopkins. This became the prototype of modern departments of pediatrics, Baltimore, Maryland.
1936: Dr Philip C. Jeans persuaded the AMA Committee on Foods to recommend fortification of milk with vitamin D. The incidence of rickets fell precipitously in the United States, Iowa City, Iowa.

1936: Dr Maud E. Adams published the *Atlas of Congenital Heart Disease*, the first North American textbook on pediatric cardiology, Montreal, Canada. This was followed in 1947 by Dr Helen B. Taussig’s *Congenital Malformations of the Heart*, Baltimore, Maryland.

1938: Dr Charles Chapple designed a modern infant incubator—prototype of the Isolette, Philadelphia, Pennsylvania. These incubators permitted high levels of oxygen therapy that led to an epidemic of retinopathy of prematurity in the 1940s and 1950s.

1938: Dr Dorothy Anderson described pathologic features of cystic fibrosis of the pancreas, New York, New York.

1938: Dr Robert Gross surgically ligated a patent ductus arteriosus, Boston, Massachusetts.

1938: Drs A. Cournand and D. Richard used the cardiac catheterization technique of W. Forssman to diagnose congenital heart disease, for which they received the Nobel Prize in Medicine in 1956, New York.


1941–1945: World War II: The US Emergency Maternity and Infant Care (MIC) program was enacted by Congress to provide medical care for the families of American servicemen.


1941: First clinical use of penicillin by Dr Howard Florey in Oxford, England. In 1945, Florey and Fleming received the Nobel Prize in Medicine.

1942: First use of penicillin in an American child by Dr Wesley W. Spink, Minneapolis, Minnesota.

1943: Dr Selman A. Waksman discovered streptomycin, for which he was awarded the 1952 Nobel Prize in Medicine, Rutgers University, New Jersey. This was followed in the next 55 years by the discovery of many natural and synthetic antibiotics including the tetracyclines, chloramphenicol, synthetic penicillins, aminoglycocides, cephalosporins, macrolides, and others.

1943: Drs Alfred Blalock and Helen Taussig described a palliative surgical treatment for Tetralogy of Fallot, Baltimore, Maryland.

1946: Dr Louis K. Diamond described exchange transfusion through the umbilical vein as treatment for erythroblastosis fetalis, Boston, Massachusetts.

1946: Dr Clement A. Smith published *The Physiology of the Newborn Infant*. The first American textbook on neonatology, Boston, Massachusetts.
1946: Dr Benjamin Spock published The Common Sense Book of Infant and Child Care. This extraordinarily popular, multiply republished handbook for parents advocated a child-centered, parent empowerment approach to child rearing. New York, New York.

1946: Alfred Gilman and Frederick Philips showed that nitrogen mustard caused regression of lymphomas, the first cancer chemotherapeutic agent. New Haven, Connecticut.

1947 and 1950: Drs Benedict Massell, Floyd Denny, and Lewis Wannamaker reported the effectiveness of penicillin treatment of β-hemolytic streptococcal pharyngitis in preventing acute rheumatic fever. Minneapolis, Minnesota.

1948: The World Health Organization (WHO) was founded.

1948: Alfred Gilman and Frederick Philips showed that nitrogen mustard caused regression of lymphomas, the first cancer chemotherapeutic agent. New Haven, Connecticut.

1948: Publication of Pediatrics by the AAP.

1948: Dr John Enders and his research fellows, Drs Thomas H. Weller and Frederick C. Robbins, successfully grew polio virus in tissue culture, for which they received the 1954 Nobel Prize in Medicine, Boston, Massachusetts. This technique enabled commercial production of viral vaccines.

1948: Dr Sidney Farber and associates induced remissions of acute leukemia by the use of a folic acid antagonist (aminopterin), the first chemotherapeutic agent for childhood cancer. Boston, Massachusetts.

1949: Drs Linus Pauling and Harvey Itano described sickle cell anemia as a “molecular disease.” caused by an abnormal hemoglobin molecule. Palo Alto, California.

1949: The last case of smallpox in the United States was reported.

1949: Drs W. L. Bradford, Elizabeth Day, and F. C. Morton showed that infants respond to a triple vaccine against diphtheria, tetanus, and pertussis (DTP). Rochester, New York.

1950: Dr Lawson Wilkins published The Diagnosis and Treatment of Endocrine Disorders in Childhood and Adolescence, the first American textbook of pediatric endocrinology. Baltimore, Maryland.

1951: Dr Ogden Bruton described agammaglobulinemia. Washington, DC.

1952: Dr Roland Scott was the first black pediatrician elected to the APS. Washington, DC.

1952: Dr. Virginia Apgar described the “Apgar Score” for evaluation of the condition of the newborn. New York, New York.

1952: Drs Dorothy Anderson and William Kessler described hypochloremia in cystic fibrosis patients with heat stroke. A year later, Paul Di Sant’ Agnese demonstrated marked increases in sweat chloride levels which became the diagnostic test for CF. New York, New York.


1953: Dr Grover F. Powers received the second Howland Award of the APS in recognition of his long time emphasis of the importance of humanistic, psychosocial, and emotional issues and mental retardation in pediatric practice. New Haven, Connecticut.
1954: A national randomized trial of Dr Jonas Salk's inactivated polio vaccine involving nearly 2 million American children demonstrated the vaccine's effectiveness in preventing paralytic polio.

1955: Last major American epidemic of poliomyelitis, especially prevalent in the Northeast.

1956: Albert Levan established that the normal diploid chromosome number in man was 46, not 48. Stockholm, Sweden.

1957: Dr Albert Sabin developed a live, attenuated polio vaccine, which was approved for general use in 1963. By the mid-1970s the Sabin live vaccine became nearly universally used in the United States. Cincinnati, Ohio.


1959: Dr Jerome Lejeune in Paris, France described trisomy of chromosome 21 in Down Syndrome, Paris, France. This was followed by extensive investigations of chromosomal syndromes in man, further advanced by techniques for banding and identifying deletions and translocations.

1959: Drs Mary Ellen Avery and Jere Mead described a deficiency of surface-active material (surfactant) in lungs of infants dying of respiratory distress syndrome, Baltimore, Maryland.

1959: Drs Mary Ellen Avery and Jere Mead described a deficiency of surface-active material (surfactant) in lungs of infants dying of respiratory distress syndrome, Baltimore, Maryland.

1960: The establishment of the National Institute of Child Health and Human Development (NICHD) with Dr Robert Aldrich as first director.


1960: Live, attenuated rubella (measles) vaccine introduced by Drs John Enders, Samuel Katz, and associates. Dr Katz’s children were among the first to receive this vaccine. Boston, Massachusetts.

1960: Founding of the Ambulatory Pediatric Association (APA).

1961: The ABP conducted examinations for sub-board certification in Pediatric Cardiology, followed in 1974 by Pediatric Hematology/Oncology, Pediatric Nephrology, and Pediatric Infectious Disease, in 1975 by Neonatology and Perinatal Medicine, and in 1978 by Pediatric Endocrinology. Specialty sub-boards in Pediatric Pulmonology, Critical Care Medicine, Rheumatology, and others were established subsequently.

1962: The “battered child syndrome” was described by Dr Henry Kempe. Denver, Colorado.

1963: Dr R. D. K. Reye described a syndrome of encephalopathy, fatty degeneration of the liver following a prodromal viral infection, which was given the eponym Reye’s Syndrome. Australia.

1963: Dr Robert Guthrie described a test for detecting phenylketonuria in the newborn period. This was followed by methods for detecting other metabolic, genetic, and endocrinologic diseases by mass neonatal screening, now carried on in all of the United States. Albany, New York.
1965: The first American newborn intensive care unit (NICU), designed by Dr Louis Gluck, was opened in New Haven, Connecticut. After the 1976 report *Toward Improving the Outcome of Pregnancy* by the AAP, American College of Obstetrics & Gynecology, and the National Foundation, premature care became increasingly centralized in regional NICUs with dramatic improvements in survival.

1966: Live, attenuated rubella vaccine was developed by Drs Harry M. Meyer, Paul D. Parkman, and Theodore C. Panos. Pearl River, New York.

1966: Dr Victor Freda and associates described prevention of maternal Rh sensitization by anti-Rh antibody. Rh erythroblastosis became a rare disease in the United States. New York, New York.

1967: The founding of the Association of Medical School Pediatric Departmental Chairmen (AMSPDC).

1968: Dr Robert Good performed a successful bone marrow transplant for severe combined immunodeficiency syndrome. Good also introduced the concept of T- and B-lymphocyte subsets. Minneapolis, Minnesota.

1968: Dr Edwin L. Kendig, Jr, published *Pulmonary Disorders*, the first American textbook on pediatric pulmonary medicine. Charlottesville, Virginia.


1972: Congress enacted the National Supplemental Feeding Program for Women and Children (WIC).

1972: The United States ended requirements for routine smallpox immunization.


1976: Dr D. Carleton Gajdusek, a pediatrician, received the Nobel Prize in Medicine for his studies of kuru and slow virus infections.

1977: The WHO reported that smallpox was eliminated from the world.

1979: Drs Godfrey N. Hounsfield and Allan M. Cormack received the Nobel Prize for the development of computed axial tomography (CAT) scans. This was followed by major advances in diagnostic imaging, including magnetic resonance imaging (MRI) and ultrasonography.

1980: Dr Joseph E. Murray performed a kidney transplantation, Boston, Massachusetts. This ushered in the modern era of transplantation of kidney, liver, heart, and other organs. Dr E. Donnell Thomas performed and studied bone marrow transplantation for a variety of blood diseases. Murray and Thomas received the Nobel Prize in Medicine in 1990.

1980: Dr K. M. Starko reported an association between aspirin ingestion and Reye’s Syndrome. In 1987, Dr J. D. Arrowsmith documented a sharp decrease in the incidence of Reye’s syndrome paralleling a marked decrease in aspirin use in American children. Chamblee, Georgia.

1985: The National Cooperative Study of Sickle Cell Diseases showed that the use of prophylactic penicillin greatly reduced the high early infectious mortality of infants with sickle cell anemia. This provided a rationale for neonatal screening for hemoglobinopathies, now conducted in 40 states.

1985: Drs David Smith and Porter Anderson developed polysaccharide vaccine for Haemophilus influenzae type B, Rochester, New York. This and the subsequent development of a protein-conjugated vaccine, resulted in the virtual disappearance of invasive HiB disease (meningitis and epiglotitis) in the United States.

1985: Dr Antoinette P. Eaton was the first woman to be elected president of the AAP, Columbus, Ohio.

1990: The AAP published a statement advocating supine instead of prone sleeping position for infants. This was followed by a 30% to 40% reduction in the incidence of sudden infant death syndrome (SIDS) in the United States.

1994: The WHO reported the elimination of poliomyelitis from the Western Hemisphere.

1994: Treatment of HIV infected mothers with zidovudine was shown to reduce perinatal transmission to their infants. Testing of blood products for HIV markedly reduced transfusion-related HIV infections. New retroviral drugs markedly improved length of survival and quality of life.

2000: Completion of the analysis (mapping) of the human genome by Drs Francis S. Collins and J. Craig Venter.

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