



# Mary Ellen Avery



Dr. Mary Ellen Avery died on December 4, 2011 at the age of 84. She was best known to the world for her ground breaking research on the cause of hyaline membrane disease (later called Respiratory Distress Syndrome), an illness that claimed the lives of an estimated 10,000 infants in the United States each year. That discovery catapulted her to leadership positions in the United States and Canada and to the highest honors offered by national societies.

Following her residency in pediatrics at Johns Hopkins Hospital in Baltimore, she came to Boston in 1957 as a research fellow in neonatology with Dr. Clement Smith, Professor of Pediatrics at Harvard Medical School and with Dr. Jere Mead, a professor of physiology at the Harvard School of Public Health. While carrying out a literature search she had come upon an article by Dr. John Clements who was studying the effect of war gases on the lung. He had developed an instrument that measured surface tension in the lung. When he suggested that surface tension is inversely correlated with surface area, she noted that the lungs of the sick premature infants she

was caring for were collapsed and unable to retain air. Returning to Boston from a visit with Clements in Maryland, she built a similar device to measure surface tension. She found that aspirates from the lungs of these premature infants who died with hyaline membrane disease lacked the ability to lower surface tension and inferred the relevance of this observation to the clinical disease. Contrasting the lungs of these infants with healthy animals, she discerned that the former lacked the critical foamy substance, surfactant, that maintained the lungs in an expanded state. Thus she determined that hyaline membrane disease was caused, in large measure, by a deficiency in surfactant due to immaturity of the lungs at birth. This work was published in a landmark paper in the American Journal of Diseases of Childhood in 1959. She continued to work in the area and with others defined the timecourse of surfactant appearance during late gestation and the factors that could slow or accelerate its appearance in the fetal lung. Building upon the observation that glucocorticoids administration in premature sheep led to normal respiration, she and

Liggins in New Zealand established prenatal steroid administration as the standard of obstetric care when mothers risked delivering a baby at high risk of Hyaline Membrane Disease. Avery's surfactant work was finally translated into clinical practice by a Japanese pediatrician, Dr. Tetsuro Fujiwara, who developed a surfactant replacement made from the lungs of cows. Avery encouraged Ross Laboratories to produce a clinically available surfactant modeled on the Japanese product. Following the advent of the widespread use of surfactant therapy, by the year 2000 fewer than 1,000 prematures were dying yearly from this dreaded disease.

Dr. Avery was born in Camden and raised in Moorestown, New Jersey. She attended the Moorestown Friends School where an intense curiosity about biology and the human body were first evident. But it was at Wheaton College in Norton, Massachusetts, majoring in Chemistry under her professor, friend and ultimately biographer, Bojan Jennings, that the fires were ignited and her great talent recognized. Johns Hopkins Medical School admitted women and Harvard did not and she thus joined three other women in a class of 90. Graduation was followed by an internship and residency at Johns Hopkins Hospital, only to be interrupted by tuberculosis, convalescence at the Trudeau Sanitarium in Saranac, New York, and an awakening of a lifelong interest in the lung. She then came to Boston as a research fellow and her remarkable discovery at the very young age of 32.

On returning to Johns Hopkins Hospital she became Pediatrician-in-Charge of the Newborn Nurseries and rose rapidly becoming the Eudowood Associate Professor of Pulmonary Disease of Children. In 1969 she was called to be Professor and Chair of Pediatrics at McGill University and Physician-in-Chief at Montreal Children's Hospital. In Montreal, she initiated new programs in developmental pharmacology and neonatal circulatory physiology and developed an outstanding neonatology research group. While at McGill, she also observed the new Canadian programs in health care. Noting an opportunity to initiate new initiatives, she helped introduce genetics on a universal basis into health care in the form of the Quebec Network of Genetic Medicine. Finally, she developed a strong medical interest in the Inuit Eskimo children in the Arctic Circle and travelled to the north on many occasions over her five years in Montreal.

Harvard had tried to entice Dr. Avery to come to Boston to develop the program in neonatology, but after careful reflection she decided not to accept the invitation. Harvard succeeded shortly thereafter when she became a candidate to replace Dr. Charles A. Janeway. When she was selected in September 1973 by the search committee, she became the 7th Thomas Morgan Rotch Professor of Pediatrics and the first woman to lead a major clinical department at Harvard Medical School. As Physician-in-Chief at Children's Hospital, she was also the first woman to lead that department.

Dr. Avery served as chairwoman from 1974 to 1985. During that time she greatly strengthened the hospital's capabilities in neonatology by establishing the Joint Program in Neonatology, led by Dr. William Taeusch, uniting the neonatal services at the Children's, the Brigham and Women's and the Beth Israel Hospitals. She fostered the rapid growth of the Divisions of General Pediatrics, Pulmonary Medicine and Genetics and greatly augmented the department's research and financial base.

Over her ten years of leadership, the Department underwent spectacular growth reaching in 1984, 200 full time faculty, 100 part time faculty, 120 fellows and 68 pediatric house-officers. The research budget increased three fold over the same period of time, from four million in 1974 to thirteen million in 1984, remarkably funding 2/3rds of all faculty salaries. Patient care volume showed a concomitant though less spectacular growth with admissions increasing from 7,800 in 1977 to 8,800 in 1984 and outpatient department visits increasing from 45,000 each year in 1975 to 67,000 in 1984. The emergency department saw a steady growth as well from 31,000 in 1975 to 43,000 in 1984.

In the area of undergraduate and graduate education Dr. Avery left a significant legacy. Pediatrics became a much sought after specialty for Harvard Medical students with 8 to 10 students or 1/3 of a given class filling the internship positions at the Children's Hospital. The residency grew in size and in academic orientation. Dr. Avery strongly encouraged residents with scientific interests to pursue the American Board of Pediatrics Special Alternative Research Pathway in pediatrics. Eighty to 85% of a given senior class pursued fellowship training in pediatrics each year with her subspecialty of neonatology leading the list. The number of women in the residency increased from 20% in 1974 to 40% in 1985. A remarkably large number of national leaders in pediatrics came out of her residency classes including fourteen departmental chairs, two medical school deans, and two hospital presidents as well as a number of national leaders at the NIH, NICHD and the CDC.

Mary Ellen Avery was an avid investigator. She loved science and research. She talked about science whenever there was an audience to listen. She was fearless in asking questions for the sake of learning. Her work with hyaline membrane disease, neonatology and neonatal intensive care defined her. She was also at her core a pediatrician and neonatologist. She loved clinical medicine and her patients and she set an example of dedicated and compassionate care. Her innate exuberance, humor and zest for discovery was the basis of her greatness as a teacher. She was fun to be around and attracted hordes of students, residents and fellows. She also attracted untold numbers of women into pediatrics. She took great pride in their achievements and strove to help them break their own glass ceilings, but insisted on all being part of a meritocracy. Her trainees today fill positions of leadership throughout the U.S. and internationally. Once asked what was most important in her professional life she answered: "the most important event, the discovery of surfactant deficiency; the most important thing, the people with whom I have worked."

Her awards were many including the E. Mead Johnson Award from the Academy of Pediatrics in 1969, the Chadwick Medal from the Massachusetts Thoracic Society in 1982, The Trudeau Medal from the American Lung Association in 1984, the Virginia Apgar Award from the Academy of Pediatrics in 1991, the National Medal of Science in 1991, the Philipson Prize in Pediatric Medicine from the Nobel Committee in 1998 and the most prestigious award in academic pediatrics, the Howland Medal, from the American Pediatric Society in 2005. She was the recipient of 14 honorary degrees including degrees from her alma maters, Wheaton College and Johns Hopkins University as well as Radcliffe College. Hers was a life of firsts: the first woman to be selected as President of the Society for Pediatric Research, among a very few women to be President of the American Pediatric Society and the first pediatrician to lead the American Association for the Advancement of Science.

Most, however, will remember Dr. Avery as an immensely human, human being. Images of her ability to connect abound – residents at their final senior dinner surrounding her as she explored with each their future careers or probing or critiquing a research presentation by a fellow or showing as much interest in the janitor who cleaned her office as those in the highest positions of authority. People loved and enjoyed her company whether the conversation was professional or social. Finally her loves ran deep, love of her institutions, Wheaton, Johns Hopkins and Harvard, affection and respect for her lifelong mentor, Clement Smith and love of her sister Jane, her brother-in-law Carl, and her nieces Sue and Jennifer and her nephew Bill. The human qualities shown through like a clarion and galvanized her success: strongly held beliefs, the highest professional standards, remarkable courage and a profound passion for her work.

Over the library at Wheaton College is the inscription, "That they may have life and have it abundantly."

Dr. Avery lived out her college motto to its fullest; most assuredly her life was abundantly lived.

Respectfully Submitted,

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