

Virginia Apgar, M.D.: At the Forefront of Obstetric Anesthesia

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Every baby born in a modern hospital throughout the world receives an Apgar Score, developed by anesthesiologist Virginia Apgar, M.D. (1909-1974). So, her name is probably the most remembered of any anesthesiologist. She is remembered also by those who knew her personally for her warm, dynamic personality and energetic lifestyle filled with many interests such as baseball (the Brooklyn Dodgers was her team), deep-sea fishing, stamp collecting and, most of all, music.

Setting the Stage for Women Physicians

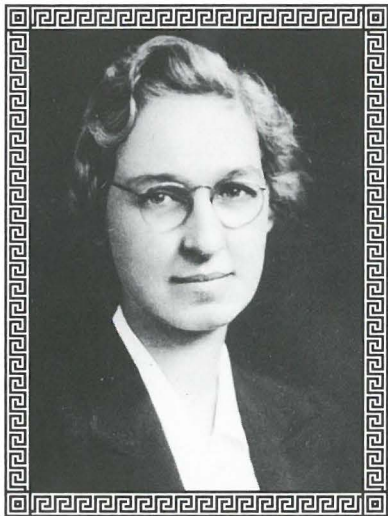
First, some background: The first American woman received a medical degree in 1849. Seventeen women's medical schools and nine women's hospitals were founded between 1848 and 1895 to improve training opportunities, and the number and percent of women physicians increased, peaking at 6 percent of the physician population between 1900 and 1910. There was then a marked decrease as the women's medical institutions closed after 1910, unable financially to support teaching of the newly important, and increasingly expensive, scientific medicine. After 1910 and until the end of World War II, there were few women physicians, and they had limited practice opportunities.

Anesthesiology, meanwhile, was not a specialty yet, and many anesthetics were given by nonmedical personnel. The need for medical anesthesia was becoming clear to academic surgeons, who realized surgery could not advance unless anesthesia improved. Because of low prestige and low pay, it was difficult to interest male physicians in this area. Many surgeons, accustomed to female nurses, accepted women physicians as the ideal physician anesthetist. For example, the 1918 edition of Alton J. Ochsner's *Textbook of Surgery* stated the choice of the anesthetist to be: "1. A woman — a. Nurse, b. Physician; 2. An assistant (male); 3. Very rarely a physician specializing in anesthesia."

The result was a surprising number of women physician anesthetists between 1900 and 1948. From 1920 to 1948, women comprised 11-13 percent of professional anesthesia organizations, but they were only 3-4 percent of the physician population. In some areas (San Francisco), they were the majority of



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A medical student made a chance remark about the need to evaluate newborn babies. Dr. Apgar said, "That's easy, you'd do it like this." She grabbed the nearest piece of paper, jotted down the five points of the Apgar Score and then rushed off to O.B. to try it out.

practitioners until the late 1930s. There were even three women presidents of national anesthesia societies between 1922 and 1930. The first woman to devote her practice completely to anesthesia was Mary Elizabeth Botsford, M.D. of San Francisco, who began practice in 1897.

Dr. Apgar's choice of anesthesia becomes understandable in this historical setting. She was born in Westfield, New Jersey to an unusual family. Her father's scientific and inventive interests kept him in his basement laboratory or at his handmade telescope, and economic support of his family was difficult. Her older brother was chronically ill. The atmosphere of scientific curiosity and chronic illness led to her interest in medicine. She decided to become a doctor by 1925, the year she graduated from high school.

She went to Mt. Holyoke College, South Hadley, Massachusetts, supported by scholarships and an amazing number of jobs such as catching cats for zoology lab. She began medical school at New York's Columbia College of Physicians and Surgeons in September, 1929. In October, the stock market crashed. America's Great Depression began, and her financial problems became much worse. She was able to borrow money from a family friend whose assets had survived the Crash, but when she graduated in 1933 (fourth in her class), she was \$4,000 in debt. This was an enormous amount of money for the time, especially for a single woman who now wanted to become a surgeon.

Facing New Challenges and Challengers

She began a surgery internship at Columbia in October, 1933. By August, 1934, she was searching for anesthesia training. She had excelled in surgery; what made her change? The first reason was probably economic. It was difficult for women surgeons to be financially successful, and she *had* to support herself. Next, Alan Whipple, M.D., head of surgery at Columbia, wanted medical anesthesia there and probably thought Dr. Apgar could initiate it. Although this is not documented for Dr. Apgar, anesthesia was thought then to be a field suited to women physicians.

Dr. Apgar's anesthesia training was typical for that time. She spent nearly a year with the nurse anesthetists at Columbia, then six months with Ralph M. Waters, M.D. at the University of Wisconsin and six months with Emery A. Rovenstine, M.D. at Bellevue Hospital in New York. Her diary from Wisconsin records events most would remember from their training days: "*Did first case. Not bad, but wouldn't wake up . . . Another frightful mess today. Patient almost died.*" It also records great difficulty getting housing and frustration at being unable to attend the dinners that followed anesthesia meetings ("*Good meeting. Stag dinner — MAD!*") because they were held in all-male social clubs.

She returned to Columbia in 1938 as Director of the Division of Anesthesia under the surgery department. Her plan followed exactly Waters' plan for his own department: first educate medical students (to attract excellent physicians) and second, provide patient care. Research would follow as a byproduct of the first two. Enormous problems began quickly. Recruitment was very difficult, and there was an overwhelming workload, especially after World

War II began. The surgeons did not want to accept anesthesiologists as equals in the operating room, and compensation was inadequate. While there was gradual improvement in most of these problems, research became the critical problem. By 1946, it was clear that research was not following naturally as a byproduct of medical student teaching and patient care. There was intense activity between 1946 and 1948 to recruit the few available anesthesia researchers. In 1949, E. M. Papper, M.D. came from Bellevue Hospital to be chief at Columbia, and the division became a department.

Apgar Score Sets New Standards

Dr. Apgar then moved into obstetric anesthesia, which was a neglected area. Anesthesia residents were now required to rotate on O.B., and she expanded the agents and techniques available. The Apgar Score was also developed at this time. The idea came in 1949 at breakfast in the hospital cafeteria. A medical student made a chance remark about the need to evaluate newborn babies. Dr. Apgar said, "That's easy, you'd do it like this." She grabbed the nearest piece of paper, jotted down the five points of the Apgar Score and then rushed off to O.B. to try it out. The Score was published in 1953.

The Apgar Score could be used as a standard evaluation, and it was now possible to compare different methods of infant resuscitation. With the help of pediatrician Stanley James, M.D. and anesthesiologist-researcher Duncan Holaday, M.D., a scientific basis for the Score was developed, in spite of many difficulties due to technology of the time. They demonstrated that hypoxia and acidosis were not normal at birth; low Apgar Scores meant hypoxia and acidosis, and treatment should be given promptly. Cyclopropane was also shown to be excessively depressant to babies, and its use in obstetrics declined markedly after publication of their study on this.

In 1959, Dr. Apgar went to the Johns Hopkins School of Public Health to get a master's degree in public health. She hoped to learn more about statistics to help with evaluations of studies with Drs. James and Holaday. While there, she was offered the position as Director of the National Foundation's (previously March of Dimes) new division of congenital defects. There was no conflict about accepting; she wrote, "Who wants to retire? This entirely new



Virginia Apgar (approximately 3 years old) with her brother, Larry.

Author's collection, courtesy of Margaret and Larry Apgar



career intrigues me.” She spent the last 15 years of her life with the National Foundation and was extremely successful.

Dr. Apgar’s life was profoundly shaped by history. When she could not be a surgeon, she entered anesthesiology, which needed physicians. The neglected area of obstetric anesthesia offered opportunities when she was no longer in charge at Columbia. When polio was eliminated, the National Foundation’s new program of birth defects offered another opportunity. Dr. Apgar’s many talents and unique personality allowed her to take advantage of these opportunities and become a well-remembered anesthesiologist.

Further Reading:

1. Calmes SH. The women physician anesthetists of San Francisco, 1897-1940: The legacy of Dr. Mary Botsford (1865-1939). In: Atkinson RS, Boulton TB. eds. *The History of Anaesthesia*. London: The Royal Society of Medicine Services; 1989:547-550.
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3. Calmes SH. Virginia Apgar: A woman physician’s career in a developing specialty. *JA Med Wom Assoc* 1984; 39:184-188.

