

## Dr. Virginia Apgar: A Light House of Neonatology

Sunil Mhaske\*, Vishnu Kadam\*\*, Gaurav Machale\*\*\*, Makrand Dharma\*\*\*

\*Professor & Head, \*\*Professor, \*\*\*Assistant Professor, Dept. of Paediatrics, Padamsharee Dr. Vikhepatil Medical College, Ahmednagar 414111, Maharashtra (India).

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### Abstract

Virginia Apgar (7 June 1909– 7 August 1974) was an American physician who specialized in anesthesia. She was a leader in the fields of anesthesiology and effectively founded the field of neonatology. She is best known as the developer of the Apgar test, a method of assessing the health of newborn babies that has drastically reduced infant mortality over the world.

**Keywords:** Virginia apgar; Neonatology; Apgar score; Light house.

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### Introduction

Virginia Apgar was born in 07 June 1909 in Westfield, New Jersey. Coming from a family of amateur musicians, Apgar played violin and other instruments and became a skilled musician, performing with the Teaneck *Symphony*.

In 1929, Virginia Apgar graduated from Mount Holyoke College, where she studied zoology and a premed curriculum. During her college years, she supported herself by working as a librarian and waitress. She also played in the orchestra, earned an athletic letter, and wrote for the school paper.

By the time she graduated from high school, Virginia Apgar was determined to be a doctor. She may have been inspired by her father's scientific hobbies, or by her eldest brother's early death from tuberculosis, and another brother's chronic childhood illness. With the help of several scholarships, she attended Mt.



Holyoke College, performing in the college orchestra as a gifted violinist and cellist and graduating with a major in zoology in 1929. [1]

Apgar entered the College of Physicians and Surgeons at Columbia University just before the Wall Street crash of October 1929, the beginning of the Great Depression. Despite financial problems, she graduated fourth in her class in 1933. Determined to become a surgeon,

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**Corresponding Author:** Dr. Sunil Mhaske, Professor & Head, Dept. of Paediatrics, Padamsharee Dr. Vikhepatil Medical College, Ahmednagar 414111, Maharashtra (India). E-mail: sunilmhaske@rocketmail.com

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she won a surgical internship at Columbia and performed brilliantly. Nevertheless, the chair of surgery, Dr. Alan Whipple, discouraged her from continuing because other women he had trained in surgery failed to establish successful careers in the specialty. Whipple also believed that innovations and improvements were needed in anesthesia (at that time handled mostly by nurses) if surgery was to advance, and he saw in Apgar “the energy, intelligence, and ability needed to make significant contributions in this area.” Because anesthesiology was not generally recognized as a specialty until the mid-1940s, Apgar struggled to find a training program when she completed her surgical residency in 1937. She spent six months training with Dr. Ralph Waters’ department of anesthesia, the first in the United States, at the University of Wisconsin-Madison. She then spent six months with Dr. Ernest Rovenstine at Bellevue Hospital in New York.

So Apgar transferred to the relatively new medical field of anesthesiology, and spent 1935-37 as a resident in anesthesiology at Columbia University, the University of Wisconsin, and Bellevue Hospital, New York. In 1937, Virginia Apgar became the fiftieth physician in the US certified in anesthesiology.

In 1938, Dr. Apgar returned to Columbia University as the director of the division of anesthesia and as an attending anesthesiologist. Despite her title, she had trouble recruiting physicians to work for her. Surgeons did not accept anesthesiologists as equals, and the pay for the less well-respected specialty was low.

Apgar was the only staff member until the mid-1940s. By 1946, anesthesia began to become an acknowledged medical specialty with required residency training, and in 1949, when anesthesia research became an academic department, Dr. Apgar was appointed the first woman full professor at the Columbia University College of Physicians and Surgeons.[2]

In 1949, Virginia Apgar developed the Apgar Score System (presented in 1952 and published in 1953), a simple five-category observation-based assessment of newborn health in the delivery room. This was the first standardized method for evaluating the newborn’s transition to life outside the womb. “Five points—heart rate, respiratory effort, muscle tone, reflex response, and color—are observed and given 0, 1, or 2 points. The points are then totaled to arrive at the baby’s score.” The score was presented in 1952 at a scientific meeting, and first published in 1953. Despite initial resistance, the score was eventually accepted and is now used throughout the world. Apgar first planned the score to be taken one minute after birth, as a guide to the need for resuscitation. Others began to take measurements at longer intervals, to evaluate how the baby had responded to any necessary resuscitation. Eventually, the one- and five-minute Apgar Score became standard.

Apgar went on to relate the score more closely to the effects of labor, delivery, and maternal anesthetics on the baby’s condition. [3]

### The Five Criteria of the Apgar score

SCORE	0	1	2
1.Skin color/Complexion	blue or pale all over	blue at extremities body pink (acrocyanosis)	no cyanosis body and extremities pink
2.Pulse rate	Absent	<100	=100
3.Reflex irritability	no response to stimulation	grimace/feeble cry when stimulated	cry or pull away when stimulated
4.Muscle tone	none	some flexion	flexed arms and legs that resist extension
5.Breathing	absent	weak, irregular, gasping	strong, lusty cry

## Summary for the Apgar score

The test is generally done at one and five minutes after birth, and may be repeated later if the score is and remains low. Scores 3 and below are generally regarded as critically low, 4 to 6 fairly low, and 7 to 10 generally normal.

A low score on the one-minute test may show that the neonate requires medical attention but is not necessarily an indication that there will be long-term problems, particularly if there is an improvement by the stage of the five-minute test. If the Apgar score remains below 3 at later times such as 10, 15, or 30 minutes, there is a risk that the child will suffer longer-term neurological damage. There is also a small but significant increase of the risk of cerebral palsy. However, the purpose of the Apgar test is to determine quickly whether a newborn needs immediate medical care; it was not designed to make long-term predictions on a child's health. A score of 10 is uncommon due to the prevalence of transient cyanosis, and is not substantially different from a score of 9.

Ten years after the initial publication, the acronym APGAR was coined in the US as a mnemonic learning aid: Appearance (skin color), Pulse (heart rate), Grimace (reflex irritability), Activity (muscle tone), and Respiration. The same acronym is used in German (Atmung, Puls, Grundtonus, Aussehen, Reflexe), Spanish (Apariencia, Pulso, Gesticulación, Actividad, Respiración) and French (Apparence, Pouls, Grimace, Activité, Respiration) although the letters have different meanings. Another such backformation attempting to make Apgar an acronym is American Pediatric Gross Assessment Record. The test, however, is named for Dr. Apgar, making Apgar an eponymous backronym.[4]

### *Post Hold*

- Honorary doctorate, Women's Medical College of Pennsylvania (1964)
- Honorary doctorate, Mount Holyoke

### College (1965)

- Distinguished Service Award from the American Society of Anesthesiologists (1966)
- Elizabeth Blackwell Award, from the American Women's Medical Association (1966)
- Honorary doctorate, New Jersey College of Medicine and Dentistry (1967)
- Alumni Gold Medal for Distinguished Achievement, Columbia University College of Physicians and Surgeons (1973)
- Ralph M. Waters Award, American Society of Anesthesiologists (1973)
- Woman of the Year in Science, Ladies Home Journal (1973)

### *Virginia Apgar's awards*

- Four honorary degrees (1964-1967)
- Ralph Walders Medal, American Society of Anesthesiologists
- Gold Medal of Columbia University
- American Academy of Pediatrics prize named for her
- Mount Holyoke College created an academic chair in her name[5]
- To honor her, the U.S. Postal Service issued a 20¢ commemorative stamp on October 24th, 1994. The woman who broke new ground in medicine would be pleased. Stamp collecting was one of her favorite hobbies.



In November of 1995 she was inducted into the National Women's Hall of Fame in Seneca Falls, NY. Eric Apgar attended the ceremony and gave an acceptance speech on her behalf.

Dr. Apgar died in August 7, 1974 at age 65 in New York City.[6]

*It has been said that babies born in modern hospitals anywhere in the world are looked at first through the eyes of Virginia Apgar.*

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