

REVIEW ARTICLE

Pioneers of Paediatric Medicine: A Compendium of Scientific and Clinical Achievements a Research Paper on Dr. Virginia Apgar

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ABSTRACT

Dr. Virginia Apgar was a pioneering anaesthesiologist whose creation of the Apgar Score transformed the immediate assessment of newborns worldwide. Developed spontaneously on the back of an envelope, the score offered a clear, rapid method to evaluate heart rate, respiration, reflexes, tone, and colour quickly becoming an indispensable tool in delivery rooms. Despite facing gender bias and working in an era when anaesthesiology was undervalued, Apgar excelled as the first woman to head a division at Presbyterian Hospital and later as a senior leader at the March of Dimes. Her humour, curiosity, and relentless dedication made her deeply admired by colleagues and students. She championed scientific research, maternal-infant health, and the advancement of women in medicine. Today, the Apgar Score is recommended by WHO and ACOG and remains one of the most widely used neonatal assessments globally. Apgar's legacy continues to save lives, reflecting her brilliance and enduring impact on modern medicine.

Key Messages:

- Dr. Virginia Apgar revolutionised neonatal care with the creation of the Apgar Score in 1952.
- The score provides a rapid, standardised assessment of a newborn's condition, saving millions of lives worldwide.
- Apgar overcame gender bias and the undervaluation of anaesthesiology to become a pioneering leader in medicine.

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- Her humour, intellect, and dedication made her a beloved and influential figure.
- As a researcher and later Vice President of Medical Affairs at the March of Dimes, she advanced the prevention of birth defects and maternal-infant health.
- The Apgar Score remains globally recommended by WHO and ACOG, reflecting her lasting legacy.

KEYWORDS

- Virginia Apgar • Apgar Score • Newborn assessment • Anaesthesiology
- Women in medicine • Neonatal health • March of Dimes • Medical innovation
- Birth outcomes • Global health

INTRODUCTION

Early assessment of a newborn's condition is crucial for prompt resuscitation and prevention of neonatal morbidity and mortality. Before the mid-twentieth century, neonatal evaluation was largely subjective and inconsistent, limiting timely intervention and standardisation of care.

In 1952, Dr. Virginia Apgar introduced the Apgar Score a simple, rapid, and objective method to assess neonatal wellbeing based on five clinical parameters: heart rate, respiratory effort, reflex irritability, muscle tone, and skin colour. Its ease of use and reproducibility led to its rapid global adoption and incorporation into routine obstetric and neonatal practice.

The Apgar Score not only standardised neonatal assessment but also strengthened the foundation of modern perinatal medicine by promoting early detection of distress and improving newborn outcomes. Dr. Apgar's contributions, both through this scoring system and her leadership in maternal-infant health initiatives at the March of Dimes, established a lasting legacy in paediatrics and neonatology.

VIRGINIA APGAR

The Woman behind the World Famous APGAR Score.



"Nobody, but nobody, is going to stop breathing on me!"

Dr. Virginia Apgar, 1950s, explaining why she kept basic resuscitation equipment with her at all times.



Kathryn Crosby, registered nurse and actress, handed the award of *Woman of the Year in Science and Research* to Dr. Virginia Apgar at the Kennedy Centre in Washington, D.C. in 1973

Crosby said, **"Infants have found the world a better and less painful place to live because of Dr. Virginia Apgar."** (March of Dimes, n.d.). It has been said that *every baby born in a modern hospital, anywhere in the world, is first looked at through the eyes of Dr. Virginia Apgar.*

In the noisy chaos of a delivery room, where seconds decide the fate of a newborn, a young anaesthesiologist once asked: "How do you assess the health of a baby right after birth?" Dr. Apgar, with calmly picked up an envelope and scribbled five criteria heart rate, respiration, reflexes, muscle tone, and skin colour. Thus, the Apgar Score was born, a tool that would save millions of babies across the world!

Why I Chose This Scientist

As a medical student, the *first thing you learn in paediatrics is the Apgar Score*. When searching for scientists online, I realised the score we all know so well was actually named after a

scientist. The score is so incredibly famous and the fact that it was developed by a woman made it even more inspiring. I became curious to know more about her and reading into her story, found it even more interesting than I thought!

Background, Early Life, Education and Personal Experiences

Virginia Apgar was born on June 7, 1909 in Westfield, New Jersey, into a family she often described as one that never sat down. Growing in a home with music and creativity, she played the violin from an early age, a passion she nurtured throughout her life. Her father, Charles Apgar, was an amateur inventor and astronomer, and sparked her early interest in science and discovery.



National Library of Congress, National Woman's Hall of Fame

By the time she was in high school, Virginia had already decided that she wanted to pursue a career in medicine. She excelled in the sciences, though ironically struggled with home economics and admitted she never learned how to cook! Despite her many extracurricular commitments, her academic performance remained exceptional.

Her zoology professor at Mount Holyoke College once remarked, **"It is seldom that one finds a student so thoroughly immersed in a subject and with such a wide knowledge of it"** (National Library of Medicine, n.d.).

Education & Career

- Graduated Westfield High School (1925) → Mount Holyoke College
- Columbia P&S (MD, 1933).
- Trained at Bellevue, University of Wisconsin.
- Faculty at Columbia, later joined March of Dimes as Director of Basic Medical Research, then VP for Medical Affairs
- Earned MPH at Johns Hopkins (1959).

Professional Milestones

- Professor of Anaesthesiology at Columbia University's College of Physicians and Surgeons.
- First woman to head a division at Presbyterian Hospital.
- Made anaesthesiology more physician-led.
- As Vice President for Medical Affairs for March of Dimes, she oversaw grants of \$5 million a year for research, medical services and in the cause and prevention of birth defects.

Personal Experiences & Legacy

On receiving the Woman of the Year in Science and Research Award, Virginia Apgar:

"There is plenty of room in medicine and science for women, I hope. It is just waiting for them. There are only two reasons why I'm here. One is there's seven-eight of us having names in the first half of the alphabet, that's statistically significant. I'm quite sure the two million and a half volunteers from the March of Dimes have all been ordered to vote for me! I'd just like to mention five people, my teachers, who continue to inspire me every day. I thank them and thank you."

This shows the wicked sense of humour she had!

Dr. Selma H. Calmes, M.D., anaesthesiologist and co-founder of the Anaesthesia History Association, reflects on archival material of Dr. Apgar: "We have many of what are called her *genie gram*. Dr. Apgar had an excellent sense of humour, which made her dearly loved. She would typically sign something 'V.A.' with a smiley face. It was her notable signature, and it exemplifies her spirit of fun, craziness. She was really quite a character!"



"Another archival item that we have is a clipboard designed by Dr. Luis Colon Morales from Puerto Rico, which simplifies the doing of the Apgar score, **first at one minute after birth**, the purpose was to sort out which babies needed resuscitation.

Other people started doing it at five minutes after birth to see how the baby had responded to resuscitation if needed, but there was the problem of timing with all the activity that goes on in the delivery room. Dr. Morales developed this with two timers for one and five minutes, on your clipboard, with the five items for the score, and this improved the accuracy."

(Image/source: Wood Library-Museum of Anaesthesiology; Scientific Contributions

"The legend is that a medical student asked her how she would assess the health of a newborn. And she said, *well, that should be easy*. And she, on the back of an envelope, wrote, *we'll look at the heart rate and the breathing and other components of health*. She came up with the score at that moment".

Challenges and Breakthroughs

- Discouraged from pursuing surgery by her mentor, Dr. Alan Whipple, due to gender bias
- Lack of recognition for anaesthesiology at the time
- Difficulty recruiting staff due to the undervalued status of anaesthesiology
- Exclusion from male-only professional social clubs
- Initial resistance to the Apgar Score for being too simple and unconventional (National Library of Medicine, n.d.)

Dr. Apgar was asked if she had encountered sexual discrimination in medical school, she said, "Never! You just have to be twice as smart as the men in your class!"

Apgar never retired and remained active until shortly before her death, though she was down by progressive liver disease during her final years.

Reflection:

Virginia Apgar came up with something as impactful as the score so quickly, she didn't sit down to plan out. It just came to her automatically, which showed the type of observation, level of skill, thorough training, knowledge, and instinct that she had.

Even with the disadvantages she faced, especially as a woman in an extremely male dominated field, she rose above them and earned a lasting place in medical history.

CONCLUSION

Throughout her career, she maintained with her characteristic optimism that women are liberated from the time they leave the womb. Her contributions to medicine continue to echo through delivery rooms across the world, decades after her passing. Despite the challenges, she carved a place through brilliant grit and relentless dedication.

The Apgar score continues to be used globally and is recommended by WHO and ACOG.

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