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Charles Drew: An extraordinary life



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Charles Richard Drew (1904–1950), surgeon and researcher, made fundamental contributions to blood preservation and the practice of plasma infusion. He led the first effort at large-scale blood donation and collection, first in New York with the Blood for Britain program of 1940–1941, then on a nationwide scale with the National Research Council and the American Red Cross. As chair of the department of surgery at Howard University, and chief of surgery at the Freedmen’s Hospital in Washington, DC, he educated a generation of African American surgeons. The tragic circumstances of his death at age 46 years adds poignancy to his legacy as one of foremost figures in American surgery in the 20th century.



Early life and education

Drew was born on June 3, 1904, in Washington, DC, the oldest of five children of an African-American carpet layer and a mother with a teaching degree. Of modest circumstances, his family was well respected in their racially mixed neighborhood. With a mature sense of responsibility at an early age, young Drew, “Charley” to his friends, was only 12 when he managed a crew of six newspaper delivery boys.¹

While his academic achievements in Washington’s Dunbar High School were modest, he lettered all four years in football and track. He was named the school’s top athlete in his final two years. He went to Amherst College in 1922, where he lettered as a freshman in football and scored all four years in the New England intercollegiate championships. By his junior year he was the top athlete in football and track, a distinction that by tradition would confer the captaincy for both teams. He was not selected captain of the football team, a decision that was unfortunately no surprise, because top candidates in both sports the previous year, both African Americans, had been denied the honor. The track team, however, elected Drew its captain unanimously.¹

Two events inspired a career in medicine: His sister died in 1920, two years before he entered Amherst, from tuberculosis brought on by complications of influenza; and he was hospitalized for an infected football injury, which brought him in contact with his future occupation. Otto Glazer, chair of biology at Amherst, sparked an interest in science.²

After he graduated from Amherst in 1926, he taught biology and chemistry and coached football and track at Morgan College in Baltimore, MD, for two years to earn money for medical school. He had six hours of English at Amherst, two short of entrance requirements for medical school at Howard. He had an opportunity to attend Harvard Medical School, but they wanted to defer his admission for a year. Not wanting to wait, Drew chose McGill University in Quebec instead, a decision that led to speculation that one factor in his choice may have been the reputation of Canadian schools as an environment more supportive of people of color.¹

An honor student at McGill, he was elected to Alpha Omega Alpha. After a five-year curriculum, Drew was awarded MD and CM (master of surgery) degrees in 1933, second in a class of 137. He took a one-year residency in medicine at Montreal General Hospital, where he worked with John Beattie studying shock and resuscitation.²

He wanted further training in surgery in the U.S., but because of his race his options were restricted to the Freedman Hospital in Washington, DC, and Meharry Medical College in Nashville, TN, the only postgraduate training programs open to African-American physicians. A one-year position at the former facility kept him close to home, a fortunate circumstance, because his father died in 1935. The loss left Drew as his family's primary support. He applied for a position in the department of surgery at the Howard University College of Medicine. Its dean, Numa P.G. Adams, already had his eye on the young trainee. In 1935 Adams gave him an entry position as instructor of pathology. The next year, Drew served both as an assistant in surgery and resident at Freedmen's, followed by an appointment as assistant surgeon at the hospital in 1937 and 1938.¹

In 1935 Adams hired a white surgeon from Yale, Edward Lee Howes, to act as chief of surgery for five years and modernize the department at Howard. Adams' and Howes' goal was to mentor a young African-American surgeon to eventually take over as chair. Drew was the obvious candidate for the position. Funds from the Rockefeller Foundation allowed the protégé to get further training in surgery and do research at New York's Presbyterian Hospital under Allen Whipple in 1938.¹

Blood and plasma

Drew had a background in fluid resuscitation and shock in Montreal, QC, so he welcomed an opportunity to work with John Scudder to set up an experimental blood bank at Presbyterian in 1939. They researched all aspects of blood preservation and transfusion therapy. Drew's doctoral research, published in 1940, focused on every aspect that affected blood storage: anticoagulants, preservatives, storage conditions, shapes of containers, and ranges of temperatures.

He found that plasma, unlike whole blood, could be stored without refrigeration and without deterioration during transport. It could substitute for whole blood during resuscitation in any recipient without regard to blood type.³ Scudder described Drew's dissertation as "a masterpiece," and "one of the most distinguished essays ever written, both in form and content."³

The relevance of Drew's research became manifest with World War II. Britain's need for medical supplies, including blood and plasma for transfusion, became desperate when the Battle of Britain began in July 1940. Despite America's resolve not to become militarily involved in the early years of the war, in June the Blood Transfusion Betterment Association (BTBA), a cooperative group of New York hospitals, anticipated the need to supply the Allies with plasma and began to organize a relief program, "Blood for Britain" (a better-known, pithier slogan than the original "Blood Plasma for Great Britain").⁴

Each hospital had its own system to collect blood and used serum and plasma as it was needed at each facility. Now they wanted to cooperate in a large-scale effort to send serum and plasma overseas. A myriad of questions had to be addressed: the age and blood pressure of donors; should donors be fasting; whether to collect serum or plasma; blood collection by gravity or suction; the concentration of citrate in collection bottles; the shape of collection bottles; how much merthiolate to add as an antiseptic; the temperature of storage; and the all-important issues of bacteriological and toxicological control.⁴

The call for volunteers went out on August 15, and 20 of 22 donors were accepted at Presbyterian Hospital. By October, nearly 10,000 appointments for donors were made at eight hospitals. Shipment to England was due to begin in November.

In September, just weeks into the program, the need for a fulltime medical director became obvious. "The mounting difficulties which we encountered forced us to take a radical step," wrote Stetten. The board was unanimous in their choice for fulltime director: Charles Drew. "Since Drew, who is a recognized authority on the subject of blood preservation and blood substitutes, and, at the same time, an excellent organizer, has been in charge, our major troubles have vanished."⁴ By January 1941, in its five months of operation nearly 14,556 persons donated more than 6,151 liters of plasma to Britain.⁵

It became increasingly apparent that the U.S. would become involved in the fighting, and blood would be needed. With a national organization and local chapters, the American Red Cross was the ideal association to expand the blood collection program throughout the country despite its prior lack of involvement in blood donation activities. In February, Drew was named director of the first American Red Cross blood bank at Presbyterian Hospital. The National Research Council (NRC) named him assistant director for blood procurement. Among his innovations was the “blood mobile,” a van roomy enough to allow blood collection and refrigerated storage.⁶



The country might have been united against foreign enemies, but it remained divided by race. A national program of blood donation inevitably highlighted the question of the racial identity of the donor, even though the science of blood typing was long established. The Blood for Britain program labelled its units of plasma by race before delivery overseas.⁴ The original blood bank in Chicago, IL, continued to label its units by race, as certainly banks did in the Deep South.⁵ The War Department issued a directive that gave lip service to science but only served prejudice.

For reasons which are not biologically convincing but which are commonly recognized as psychologically important in America, it is not deemed advisable to collect and mix Caucasian and Negro blood indiscriminately for later administration to members of the military forces.⁵

Procurement policies had to be made on a national scale, including the question of racial segregation of blood. When the Red Cross decided to adopt the policy of the War Department in April 1941, Drew resigned his positions both with the Red Cross and NRC.⁷

Drew's silence about the circumstances of his resignation surprised some African-American leaders at the time. “[It] seems strange that his country could find no further use for the services of a citizen who had been of such vital expert assistance in the critical hour,” wrote W. Montague Cobb of Howard University. “One hears that it was thought that a Negro would not be acceptable in a high place in a national program.”⁸

Given Drew's thorough knowledge of blood donation and transfusion and his dedication to racial advancement, it is doubtless that official donor policies contributed to his decision to leave the program. Edward Cornwell III, current chair of surgery at Howard, wrote, “He was not an activist by nature, and he was cautious about publically criticizing a policy of the Armed Forces during wartime.”⁹ In 1944, Drew later wrote a letter to the director of the federal Labor Standards Association on the issue.

I think the Army made a grievous mistake, a stupid error in first issuing an order to the effect that blood for the Army should not be received from Negroes. It was a bad mistake for 3 reasons: (1) No official department of the Federal Government should willfully humiliate its citizens; (2) There is no scientific basis for the order; and (3) They need the blood.⁹

Howard

True to Adams and Howes' agreement to have an African American surgeon trained at Howard succeed the latter, Drew was named professor and head of the department of surgery at Howard University and chief surgeon of Freedmen's Hospital. His profile in the National Library of Medicine website summarizes his educational mission at Howard.

Drew could at last pursue his larger ambition: training young African American surgeons who would meet the most rigorous standards in any surgical specialty and to place them in strategic positions throughout the country where they could, in turn, nurture the tradition of excellence. This, Drew believed, would be his greatest and most lasting contribution to medicine.³

In 1948 Drew's first class of surgical residents passed the certification examination of the American Board of Surgery, two receiving top marks. To promote the wide acceptance of African Americans as surgeons, Drew was an advocate of his graduates to hospitals and communities throughout the country. He often paid their expenses to attend national meetings to present their work and searched for training opportunities for his best residents.

Despite his achievements he faced discrimination at the professional level. The District of Columbia chapter of the American Medical Association (AMA) excluded him from membership, which made him ineligible for the national organization. At the time, membership in the AMA was often a requirement for privileges at many hospitals and placement in training programs in medical and surgical specialties. Exclusion from the AMA was therefore a *de facto* barrier against racial minorities.³ He became a Fellow of the American College of Surgeons (ACS), but posthumously, a year and a half after he died. One of his profiles notes he refused to join the ACS because the organization did not accept other well-qualified African-American surgeons.⁷

He was recognized in other quarters for his accomplishments. He served as consultant to the Surgeon General on the status of surgical facilities in the European theater after the war. The National Association for the Advancement of Colored People gave him its highest award, the Spingarn Medal, in 1944 for his work on blood preservation and plasma infusion. He was awarded honorary degrees from the Virginia State College (1945) and Amherst College (1947). He was an ABS examiner in 1948.

Death

In the wee hours of April 1, 1950, Drew and three other physicians started a long drive to Tuskegee, AL, to attend the annual meeting of the John A. Andrew Clinical Society. He had a full schedule the day before, with 6:30 am morning rounds with residents, a mastectomy at Freedmen's Hospital, a two-hour lecture, department business the entire afternoon, and two student functions on campus after dinner with his family. He still had evening rounds to make, so it was not until 11:00 pm when he got back home to pack.⁹

They had made it to Haw River, a small town on state route 49 just east of Burlington, NC, Drew at his turn at the wheel. When he apparently fell asleep, the car drifted onto the shoulder of the road and overturned several times. None of the occupants were restrained. Two were unharmed; another suffered fractures of the humerus and scapula and an injury to the knee. Drew, however, suffered crush injuries to the head, chest, and leg.

An ambulance took Drew to Alamance General Hospital in Burlington. Three local surgeons, including brothers Harold (an orthopaedic surgeon) and Charles Kernodle (a general surgeon trained in thoracic surgery), met Drew and began intravenous infusions. The hospital had no blood bank, so he never received a transfusion. Decades later in an interview with Patrick Craft, a family medicine physician in Oxford, NC, Charles Kernodle said he could not remember whether he was given plasma. Drew died two hours after his arrival at the hospital.¹⁰

A myth arose about Drew's death: He had been turned away from a white-only segregated hospital, a story perpetuated in *Time* magazine (March 29, 1968) and the hit TV show *M*A*S*H* (season 2, episode 9). The fable had its roots in a 1959 play by Edward Albee, *The Death of Bessie Smith*, where the famous blues singer dies upon being turned away from an all-white segregated hospital in the South. While it was true that Smith died after a car crash, she was taken directly to an all-black hospital where she died.

Kernodle and his colleagues recognized the severity of Drew's wounds and tried to send him to Duke University Hospital in Durham, NC, 35 miles away. "He was too critical to go to Duke," said Kernodle in his conversation with Craft. "They recommended supporting as best we could.... I treat patients to the best of my ability, black or white, rich or poor."¹⁰

C. Mason Quick, then an intern at the Kate Bitting Reynolds Hospital in Winston-Salem, NC, a segregated facility for African Americans, confirmed the severity of Drew's wounds and the appropriateness of the treatment. Summoned to check on Drew by Samuel Bullock, one of Drew's friends in the car, he was able to get there before Drew died. "[Drew] got fluids and was treated aggressively," Quick said to Craft. "The chest was just torn up, practically opened up." John Ford, another Drew colleague in the car, was the one who had suffered the orthopaedic injuries. In a letter to Quick, Ford wrote:

*We were taken to Alamance General Hospital... where we received excellent care. I informed the physicians on duty as to who Dr. Drew was. They went to him immediately, and of course, there was nothing to be done because of the extensive injuries. His face was blown up like a balloon indicating a superior vena cava syndrome... I have nothing but praise for the excellent care provided me while at that hospital.*¹⁰

Cornwell notes that a number of later articles by prominent African-American surgeons have subsequently been written to set the record straight, including an article written by him. In 1989, the attendees of the inaugural meeting of the Society of Black Academic Surgeons met in Durham, NC, and made the 30-mile trip to Haw River on state route 49 to the memorial marking the site of Drew's car crash. Joining them were Harold and Charles Kernodle.¹¹

Legacy

Drew made fundamental contributions in the biochemistry of blood preservation and plasma processing that provided a scientific basis for large scale plasma donation in the months before America's involvement in World War II. His administrative leadership helped assure the success of the Blood for Britain program, which became the framework for the blood donor program of the American Red Cross. These achievements place Drew in the first rank of academic surgery of his generation.

Today we see many circumstances that only add to the poignancy of his death: a car crash before modern lifesaving restraint systems, trauma center care, and especially the one area where he is indelibly identified, the ready availability of blood products in the care of the injured. His lasting gift is the tradition of clinical service and surgical education at the department of surgery at Howard University. Graduates of the Howard University School of Medicine and its residency in general surgery are Drew's enduring legacy.



References

- 1 Cobb WM. Charles Richard Drew, MD, 1904–1950. *J Natl Med Assoc.* July 1950;42(4):238-246.
- 2 The Charles R. Drew Papers: Biographical Information. Available at: <https://profiles.nlm.nih.gov/ps/retrieve/Narrative/BG/p-nid/336>. Accessed November 20, 2017.
- 3 The Charles R. Drew Papers: “My chief interest was and is surgery,” Howard University, 1941–1950. Available at: <https://profiles.nlm.nih.gov/ps/retrieve/Narrative/BG/p-nid/339>. Accessed November 21, 2017.
- 4 Stetten D. The blood plasma for Great Britain project. *Bull NY Acad Med.* 1941;17(1):27-38.
- 5 Schneider WH. Blood transfusion between the wars. *J Hist Med.* 2003;58(2):187-224.
- 6 The Charles R. Drew Papers: Becoming “the Father of the Blood Bank,” 1938–1941. Available at: <https://profiles.nlm.nih.gov/ps/retrieve/Narrative/BG/p-nid/338>. Accessed November 22, 2017.
- 7 Rutkow IM. Moments in surgical history: Charles Richard Drew. *Arch Surg.* 2000;135(10):1233.
- 8 Cobb WM. Charles Richard Drew, MD, 1904–1950. *J Natl Med Assoc.* 1950;42(4):238-246.
- 9 Cornwell EE III, Chang DC, Lefall LD Jr. The Southern Surgical Association history of medicine scholarship presentation. Dr. Charles Drew, a surgical pioneer. *Ann Surg.* 2006;243(5):612-618.
- 10 Craft PP. Charles Drew: Dispelling the myth. *South Med J.* 1992;85(12):1236-1240.
- 11 Hoover EL. Dr Charles R. Drew: Facts, fiction and legend. *J Natl Med Assoc.* 2005;97(6):837-838.

Legends

- 1 Charles Richard Drew, by Betsy Graves Reyneau (1888–1964). National Portrait Gallery.

National Portrait Gallery, Smithsonian Institution; gift of the Harmon Foundation.
- 2 Charles Drew teaching interns and residents during rounds at Freedmen’s Hospital. Scurlock Studio Records, Archives Center, National Museum of American History, Smithsonian Institution.
- 3 Charles Richard Drew. National Library of Medicine.
- 4 Historical marker, state route 49, Haw River, NC. Photo by Patrick Jordan, Burlington, NC, Historical Marker Database, *HMdb.org*.