In Memoriam

Joeann Guthrey Taylor Fraser: Trailblazing Nurse in a New Profession

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Abstract: This historical vignette describes the career of Joeann Guthrey Taylor Fraser. Her story begins as she cleans animal cages and sweeps floors in the research labs at Jefferson Medical College. As a nursing student at Jefferson she is fascinated by cardiac surgery and accepts the opportunity to learn to operate the heart-lung machine. Esteemed cardiac surgeons, Dr. John H. Gibbon, Jr. and Dr. John Y. Templeton III guide her to become one of the first perfusionists in the United States. Keywords: perfusion, surgery, cardiopulmonary bypass, history.

In 1955, a 16-year-old Joeann “Jodi” Guthrey expressed an interest in a career in medicine to a family friend and neighbor, Dr. Anthony F. DePalma, then Chair of the Department of Orthopedics at Jefferson Medical College in Philadelphia, PA. He soon secured a position for her working in the research labs at Jefferson cleaning cages and sweeping floors. This position landed her in the academic and clinical epicenter for groundbreaking science in cardiothoracic surgery. Only 2 years prior, on May 6, 1953, Dr. John H. Gibbon, Jr., Chief of Cardiothoracic Surgery at Thomas Jefferson University Hospital (Figure 1), had performed the first successful open heart surgery procedure using the heart–lung machine to close an atrial septal defect on an 18-year-old Wilkes-Barre, Pennsylvanian woman, Cecelia Bavolek (1). Dr. Gibbon had successfully used the machine for cardiopulmonary bypass that he had developed through decades of study and research, some of it in the very labs where Jodi swept floors and cleaned animal cages.

Dr. Gibbon and his wife, Mary Hopkinson Gibbon, had worked together in the early 1930s, first in Boston, then in Philadelphia, to develop the first iteration of a heart–lung machine, which exhibited limited success in dogs. After becoming a full professor of surgery and the director of surgical research at the Jefferson Medical College, he continued his research (2). With the help of International Business Machines president Thomas Watson, Dr. Gibbon was able to advance his designs using rotating screen oxygenators, vertical screen oxygenators, and DeBakey roller pumps. The second iteration of those cardiopulmonary bypass pumps was used in 1952 and 1953. The young Miss Bovalek was the only survivor in 1953 (2).

After graduating from the Quaker school, Friends Central, in Wynnewood, PA, Jodi left Philadelphia to attend Hood College, a liberal arts college in Frederick, MD. She completed two semesters at Hood College, applied and was accepted at the Jefferson School of Nursing, graduating in the Class of 1960 (Figure 2). She was back on familiar ground in Philadelphia to begin what would be her journey into groundbreaking cardiac surgery technology and bear witness to the birth of a new profession.

During Jodi’s nursing school training from 1957 to 1960, she met Sylvia Shopp, RN, who was head of the cardiac operating room at Jefferson and was involved in the research being conducted by Dr. John H. Gibbon and Dr. John Y. Templeton, III (Figure 3). Jodi was approached by Dr. Gibbon who inquired as to her interest in learning to operate his heart–lung machine. Fascinated by the technology and the opportunity to be in on the ground level of a new technology, she eagerly accepted the challenge. On graduating from nursing school in 1960, she started her nursing
career in the cardiac operating room as a cardiac surgical nurse and as a trainee on the heart–lung machine (3).

In 1960, Dr. Templeton had attained the rank of professor at Jefferson and was continuing the research begun by Dr. Gibbon in cardiac surgery and the development of the heart–lung machine (4). The decade after Gibbon’s limited success at Jefferson was followed by revisions and refinement of surgical techniques, advancements in hardware and materials in the heart–lung machine, and new techniques for oxygen transfer in blood (5). After joining the surgical team and beginning a dual role as a surgical nurse and as a “pumpist,” an early title designation given to the role at Jefferson, Jodi became an integral part of the burgeoning clinical world of cardiac surgery.

By the late 1960s and early 1970s, the world had witnessed the birth of mechanical heart valves and the development of myocardial (coronary artery) revascularization, both important innovations and both dependent on surgical acumen and impossible without the heart–lung machine (5). During this time, Jodi had honed her craft under Dr. Templeton’s training as a surgical nurse and pumpist. When Nurse Shopp left her position at Jefferson to get married, Jodi became the lead cardiac nurse and the solo practitioner of what the world would come to know as a perfusionist.

In 1964, Dr. Templeton became the Chief of Surgery at Pennsylvania Hospital in Philadelphia only to return 3 years later to Jefferson as the Samuel D. Gross Professor and Chair of the Department of Surgery. During those years, Jodi practiced as an RN and as a perfusionist for Dr. Templeton exclusively. Cardiac cases requiring the heart–lung machine were infrequent during those early years, but the specialized training required to operate the equipment had become essential. While on vacation visiting her family in rural Missouri, Jodi received a phone call asking her to return to Philadelphia right away to prepare for an urgent case. “Returning urgently” required a flight in a two-seater crop duster piloted by a local farmer to the nearest large commercial airport, which
was in St. Louis, MO, and then finding a return flight to Philadelphia. Setting up and priming the heart–lung machine required days of careful preparation including a prime of heparinized whole blood. All medical students at Jefferson were blood typed and provided the main pool of donors. Jodi served as phlebotomist as well as perfusionist and collected the blood from the donors on the morning of the surgery (3).

The American Society of Extracorporeal Technology was founded in 1964 and early leaders in the field set about to formulate guidelines for education in the field, which would lead to certification examinations. Jodi participated in these early examinations and received certification as a Clinical Perfusionist in 1972, 12 years after beginning her amazing journey under the tutelage of Drs. Gibbon and Templeton.

In the mid-1970s, Dr. Templeton was recruited to begin the cardiac surgery program at Our Lady of Lourdes Hospital in Camden, NJ. Jodi relocated to Camden to be the perfusionist in the new program and there she continued her commitment to the profession. After launching the program, Dr. Templeton soon returned to Jefferson and Jodi remained in New Jersey without her beloved “Temp.” In 1976, Joanne Formicola (coauthor of this vignette) joined the Lourdes cardiac surgical team as a cardiac RN. New cardiac surgeons were recruited and the Lourdes program grew and expanded.

The opportunity to pass along the art and science of the relatively new field of extracorporeal technology was important to Jodi. When Joanne Formicola expressed an interest in learning to become a perfusionist, Jodi passed along considerable knowledge gained from some of the giants in the field of cardiac surgery. The two RN perfusionists continued to practice together until the mid-1980s.

Dr. Templeton continued to practice at Jefferson until his retirement in 1987 (Figure 4). Both authors (CAR and JPF) of this vignette were assigned positions as perfusionists in the operating room at Jefferson in the final months of Dr. Templeton’s career. Jodi visited Jefferson and Dr. Templeton’s operating room during those last months to reconnect with her former colleague and mentor. Jodi had decided to retire as well after 27 years in the field. Jodi enjoyed her retirement in Florida with her husband, Ian Fraser, and became very active in her community. In May of 2003, Jefferson celebrated the 50th anniversary of Dr. Gibbon’s successful surgery on Cecelia Bavolek with a symposium, Gibbon and His Heart–Lung Machine, 50 Years and Beyond. Jodi was invited to speak and share her memories of those early years in Gibbon’s laboratory, her training under Gibbon and Templeton’s mentorship, and the evolution of the heart–lung machine over 50 years. She spoke eloquently and told fascinating stories of those early years.

Joeann Guthrey Taylor Fraser died suddenly on January 2, 2018, at her home in Florida. The field of extracorporeal technology owes a debt of gratitude to the pioneering perfusionist, Jodi, who assumed the mantle of a profession and science in its infancy and led the way for subsequent generations of professionals who provide advanced technology in
perfusion services to thousands of patients every year throughout the world.

REFERENCES


