



IMAGINING IN TIME

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Betty Lank: A Kind and Gentle Anesthetist Devoted to Children

Many noted clinicians and educators led the development of nurse anesthesia as a profession during the first half of the 20th century. Betty E. Lank, CRNA, a nurse anesthetist at Children’s Hospital Boston, Massachusetts, for 34 years, devoted her professional life to the delivery and advancement of pediatric anesthesia. She is credited with many contributions including the first use of cyclopropane for infant anesthesia, developing pediatric-sized anesthesia masks and ventilation bags, and instituting standards

for specialized postanesthesia recovery areas.

Lank recorded her anesthesia experiences in various nursing publications and shared her knowledge with colleagues at professional meetings. Her accomplishments make her a notable figure in the early history of pediatric anesthesia, and her dedication helped forge the foundation for anesthesia at Children’s Hospital Boston.

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Recently, the *British Medical Journal* described the use of anesthesia for surgery as one of the greatest medical discoveries of the last 160 years.¹ Since the first public demonstration of ether anesthesia in Boston, Massachusetts, in 1846, the anesthetist has become an essential part of the surgical team. Initially, the person in the operating room with the least amount of experience would often assume the role of anesthetist. Soon administering anesthesia in the United States was known as “women’s work” because some surgeons would designate one of their surgical nurses for this task.² Now nurses have many years of experience as anesthetists, and they had an important role in the history and development of anesthesia.

Betty Lank and the Specialty of Pediatric Anesthesia

Although the early history of the nurse anesthesia profession has been well described, the contribution of

nurse anesthetists to the specialty practice of pediatric anesthesia has not been extensively recognized. Nurses and physicians working in pediatric facilities began to make the care of children a priority during the 1930s. These early anesthetists shaped their careers by successfully administering anesthesia for many of the patients being treated by the first surgeons in the United States to specialize in pediatric surgery. Nurse anesthetist Betty Lank (Figure 1) was one of these early pioneers. She spent most of her career at Children’s Hospital Boston and was a remarkable presence there for more than 30 years.

Betty E. Lank was born on January 9, 1904, on Campobello Island off the coast of New Brunswick, Canada. Campobello Island became famous for being the place where the Roosevelt family would summer and where Franklin Delano Roosevelt contracted polio. Coincidentally, it was Lank’s uncle

who taught young FDR how to sail a boat. Lank was 1 of 9 children and became passionate about a career in nursing at the end of World War I. In 1999, coauthor Mark A. Rockoff, MD, conducted an oral interview



Figure 1. Betty Lank, circa 1949 (Courtesy of AANA Archives.)



Figure 2. Betty Lank at her home in Campobello Island, New Brunswick, Canada, in 1999
(Courtesy of Mark A. Rockoff, MD.)

with Lank (Figure 2) at her home on Campobello Island.³ At the time of the interview Lank was an amazingly spry 95 years of age and enthusiastically recalled her anesthesia career.

Lank first came to Boston in 1923 and entered the School of Nursing at Newton (now Newton-Wellesley) Hospital. During her training, Lank opted to concentrate on anesthesia practice instead of public health. In her interview she remembered being terrified while delivering anesthesia alone as a student. After graduating, she worked for a short time as a private duty nurse in the Boston area. Soon she returned to Newton Hospital for a 3-month postgraduate training program in anesthesia. Upon graduation she was considered a nurse anesthetist. This was during the Great Depression and jobs were scarce. Despite her specialty training, Lank could only find work as a relief nurse in New York City while other nurses took their summer vacations. She eventually returned to Boston to work as a relief nurse at the Children's Hospital, and in December 1935, she was hired full time as an anesthetist. Lank continued her notable career there until retiring in 1969.³

In the beginning of the 20th century, Children's Hospital Boston recorded few details about its anesthetists. Freeman Allen is listed as



Figure 3. Yankauer mask
(Courtesy of AANA Archives.)

the hospital's first official anesthetist in 1903; before this, no one was mentioned as being responsible for delivering anesthesia.⁴ Lank was first acknowledged as the anesthetist for the hospital in 1936.⁵ Before 1945, the Division of Anesthesia was officially supervised by the surgeon-in-chief.⁵

Soon after Lank began working at Children's Hospital, she was appointed chief nurse anesthetist.⁵ At that time, there was only 1 anesthesia machine in the facility because most anesthesia was delivered via open drop technique using a cloth-covered, metal face mask. Initially she presided over an anesthesia division that consisted of 5 nurse anesthetists. They were the main anesthesia providers in the hospital until after World War II, although occasionally general practice physicians came to the hospital to provide anesthesia for their own patients. In her interview, Lank described anesthesia equipment for pediatrics in the early days as consisting of either a large or small Yankauer mask (Figure 3), 1 simple gas machine, and a Richardson bottle. During patient use, the underside of the mask was pinned with layers of gauze and adjusted to fit the child. The mask was gently placed against the patient's face as anesthesia was induced. Lank

recalled the commonly used drugs as rectal avertin (tribromethanol) for sedation alone or in combination with morphine, nitrous oxide, and ether for most procedures.

During Lank's early practice endotracheal tubes were not commonly used. Volatile anesthetic agents, such as ether, were flammable and proved a challenge to deliver without endangering everyone in the operating room suite. Expert airway skills were vital. Lank recalled the use of mask anesthesia for children in supine, prone, and sitting positions. She recalled 1 prone craniotomy with an extremely difficult airway. Seated under the drapes with the patient, there was significant mucous production and the patient occasionally vomited while she tried to maintain a "tight" mask seal. With a stethoscope and blood pressure cuff as the only monitors, skill in responding to barely perceptible changes in heart tones was crucial for a safe anesthetic.

Colleagues fondly recalled Lank as a kind and gentle person. She acquired nicknames including Bessie, Bess, and Bet. She enjoyed singing in her church choir and was blessed with a soothing voice that would comfort her patients during induction and emergence. She often remained with her young patients as they recovered in the operating

room and she would sing lullabies as they awakened from anesthesia. She was meticulous in her technique and always attentive to patients' needs. "Some children were so frightened," Lank recalled, in part because parents were only allowed to visit briefly on weekend afternoons.³

Advancing Pediatric Anesthesia

Lank was a leader in introducing new techniques that could benefit her patients. In 1938, she attended a course at Yale-New Haven Medical Center, New Haven, Connecticut, to learn how to administer cyclopropane.⁶ Up until then, cyclopropane was only being used with adult surgical patients. Lank was determined to integrate its use into pediatric anesthesia. Upon returning to Boston, she demonstrated the first successful use of cyclopropane with children. This was a significant contribution to pediatric anesthesia. After witnessing this, colleagues of Robert E. Gross, MD, a renowned surgeon at Children's Hospital Boston, deemed Lank's use of cyclopropane with infants as "remarkable."⁶ Interestingly, she recalled the explosive gas as "a beautiful anesthetic, quiet, with no mucous." She described her patients' emerging from anesthesia "quickly and easily, with no nausea," and she went on to publish an article titled "Cyclopropane Anesthesia: A Series of 150 Cases" in which she described a low-flow technique that minimized leaking of the gas using a well-fitted mask with head straps.⁷ In this publication, she also discussed the benefits of using cyclopropane instead of ether.

Lank worked closely with many other renowned surgeons providing anesthesia for several notable procedures first performed at Children's Hospital Boston. She administered a successful anesthetic using a mask while Gross, who later became the hospital's surgeon-in-chief, divided the first patent ductus arteriosus in

1938, an event that marked the beginning of pediatric cardiac surgery. She also recalled her struggles with another patent ductus ligation performed on a 200-pound adolescent. Using a mask cyclopropane technique for a large adolescent patient with a difficult airway and an open chest in the lateral position seems almost impossible to imagine today.^{6,8} Subsequently she provided anesthesia for many additional, innovative pediatric cardiac procedures performed by Gross. In 1939, William Ladd, MD, regarded as the Father of Pediatric Surgery in North America and then the chief of surgery at Children's Hospital Boston, performed the first successful esophageal atresia repair while Lank administered the anesthetic.^{6,8} During her humble career, Lank provided anesthesia for more than 16,000 surgeries.

Lank was an innovator who always looked to improve the technical aspects of patient care. She worked closely with Geoffrey Dykes, an engineer at Children's Hospital Boston, to design and construct a variety of different sized pediatric masks and blood pressure cuffs. The mask design was produced per Lank's request, and its development represented a simple but critical innovation that significantly improved the delivery of inhaled anesthetics for small patients. With the success of the new masks, the design was soon taken to the public market by the Foregger Company.^{6,7} Lank also called on the Foregger Company to make small rebreathing bags that enhanced the ease and precision of anesthetic delivery.⁶

Contributions Beyond the Operating Room

As surgery and anesthesia evolved, advances in postanesthesia care also emerged, and Lank's contributions to pediatric anesthesia extended beyond the operating room. She participated in the design and creation of the Children's Hospital's first

recovery rooms. Before these were established, Lank recalled staying with patients in the operating room; alternatively, a team would bring the children to the wards where nurses would recover them one to one. Charlotte E. Webber, RN, was one of these nurses who recalled Lank's practice. In a conversation with one of the authors (S. Galvin, oral communication, June 2006), Webber recalled her nursing career in Boston: "Children's Hospital was, and still is, a well respected pediatric institution and each nurse took pride in the care she delivered." She described the critical importance of sterile technique with dressing changes and wound cleansing for postoperative patients. This nursing care was especially meticulous since it was before antibiotics were available or routinely used. Surgeons would make their daily rounds at each bedside where the child's nurse would take an active role in advocating for her patients, much like today.

Physician Anesthesiologists' Emerging Role

World War II greatly influenced American society in many areas including healthcare. Following the war, physicians discharged from the armed services sought civilian employment. Those recruited to administer anesthesia to troops overseas began to assume positions of leadership in anesthesia departments around the United States. Nurse anesthetists, who had been providing the bulk of the anesthetics in the United States, often remained on to work with these physicians. This cooperative arrangement fortified the development of academic anesthesia centers nationwide where research and teaching assumed greater prominence along with excellence and innovation in critical care and anesthesia practice.

With early guidance from Lank, Robert Smith, MD, succeeded Lank as the head of the anesthesia department at Children's Hospital Boston.⁶



Figure 4. Betty Lank with a patient, date unknown

This photograph was used on the plaque that was dedicated in her honor at Children's Hospital Boston, Massachusetts.

(Courtesy of the Archives of Children's Hospital Boston.)

Necessity had transformed him during the war from a general practitioner into an anesthesiologist. Upon his return home, this Dartmouth College and Harvard Medical School graduate went on to develop the specialty area of pediatric anesthesia using a team of nurses and physicians. Smith is now widely regarded as the Father of Pediatric Anesthesia.⁶ He became anesthesiologist-in-chief at Children's Hospital in 1946 and published his renowned book, *Anesthesia for Infants and Children*, in 1957.⁶ It is currently in its seventh edition. During her 1999 interview, Lank fondly recalled Smith as a "nice, obliging, patient, young man." They worked together for more than 20 years and magnificently demonstrated the heritage of nurse anesthetists and physician anesthesiologists working cooperatively for the benefit of patients and the field of anesthesiology.

Professional Contributions

As Lank became established as a clinical nurse leader of the discipline of pediatric anesthesia, she contributed to more than just patient care. She was an active participant in professional societies for nurse anes-

thetists that were becoming established in the United States. As an early member of the AANA, she was elected a trustee from 1949 to 1951.⁹ She was instrumental in organizing the first meeting of the Massachusetts Association of Nurse Anesthetists (MANA) in May 1940 that was held in the Ether Dome at Massachusetts General Hospital, the site of the first public demonstration of ether anesthesia. Lank served as secretary-treasurer and president of MANA.¹⁰ The New England Assembly of Nurse Anesthetists honored Lank in 1968 by naming her Woman of the Year; she also served as secretary-treasurer and president of the New England Assembly.¹¹

Pediatric Anesthetist Recognized

Lank's contributions did not go unrecognized by leaders in the fields of pediatric surgery and anesthesia. In 1991, an article in *Paediatric Anaesthesia* by Robert M. Smith, MD, called Lank an "enterprising" nurse anesthetist when he described the development of child-specific materials for anesthesia.¹² In 1998, W. Hardy Hendren, MD, then chief of pediatric surgery at Children's

Hospital Boston and the Robert Gross professor of surgery at Harvard Medical School, wrote an article in *Pediatrics* that recounted the history of pediatric surgery. In the text, he referred to Lank as "superb" and cited her historic contribution as the anesthetist for the first patent ductus repair.¹³

Lank was an important contributor to impressive strides in pediatric anesthesia and pediatric surgery during her career at Children's Hospital Boston. She closed her 1999 interview with words of wisdom for future anesthetists: "Be diligent and please do not be impersonal."³ Her inspiring career resonated just that. At the 2002 memorial ceremony for Lank, she was noted as having been "long on the child's side and more than 16,000 children knew it!" She is remembered for her contributions to anesthetic and surgical advances for children. Her name is in articles written by some of the most notable medical pioneers of pediatric anesthesia and surgery.

Lank died at her home on Campobello Island on March 10, 2001, at the age of 97. In 2002, a plaque (Figure 4) was dedicated in Lank's memory in the Department of Anesthesiology, Perioperative and Pain Medicine, that she helped to establish. It is inscribed with the words "a kind and gentle anesthetist." Among the attendees at the dedication ceremony were Drs Smith and Hendren. At its dedication, one of the authors (M.A.R.) spoke about Lank to a room filled with several of her surviving colleagues and relatives. He recalled the advice Lank gave today's pediatric anesthesia providers. She had stated "how vital it is to be a caring, kind individual to deal especially warmly with children who are ill."⁵ The ceremony was concluded with Rockoff's remarks that it was hoped future clinicians would be inspired to emulate the "wonderful qualities of this kind and gentle anesthetist."

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