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Surgical Leaders

William Edwards Ladd, M.D. (1880–1967): The Description of His Bands

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IN THE EARLY 20th century, an established surgical specialty catering to pediatric surgery did not exist, and pediatric surgical ailments were operated on by general surgeons. With his devotion to childhood diseases and his unique thinking in surgical development, William E. Ladd would become a leading figure in America by pioneering the field of pediatric surgery.

William Edwards Ladd was born on September 8, 1880, to William Jones Ladd and his wife, Anna Russell Watson, in Milton, Massachusetts, and he was the sixth of seven children. Following in his father's footsteps, he attended Harvard University, graduating with a B.A. at the age of 22 years in 1902, and subsequently an M.D. in 1906 from Harvard Medical School.¹ After medical school he trained in general surgery at Massachusetts General Hospital. After training he was appointed assistant professor in surgery at Harvard. He rose to full professor (Fig. 1) not just as a result of wisdom and love for children, but because he was an academic, talented, well-known surgeon. In 1940, the William E. Ladd Professor of Child Surgery Chair at Harvard Medical School was established in his honor.¹

Many believed that the most powerful nonnuclear explosion in the history of mankind to that date occurred in Halifax, Nova Scotia, Canada, on December 6, 1917, and had a major impact on Ladd and his life as a pediatric surgeon. Approximately 4 per cent of Halifax's population died from a catastrophe involving two ships, the S.S. Mont Blanc, a French munitions ship, and the S.S. Imo, a Norwegian relief steamship, when they collided in the Halifax harbor. More than 500 children and infants were killed, and approximately 300 children were left without one or both parents alive.² Relief efforts were initiated immediately from the United States, dispatching trains of medical supplies, trained doctors, and nurses. Dr. William E. Ladd led a team of physicians and nurses to Nova Scotia and participated in the

care of the injured.² That catastrophic experience moved Ladd tremendously, particularly the plight of burned and injured children, and inspired him to devote his time, skills, and energy to the surgical care of children.

Ladd had established an interest in pediatric surgery even before the Halifax incident. He, together with many other prominent surgeons, founded pediatric surgery at Boston Children's Hospital in 1910.¹ In 1937,

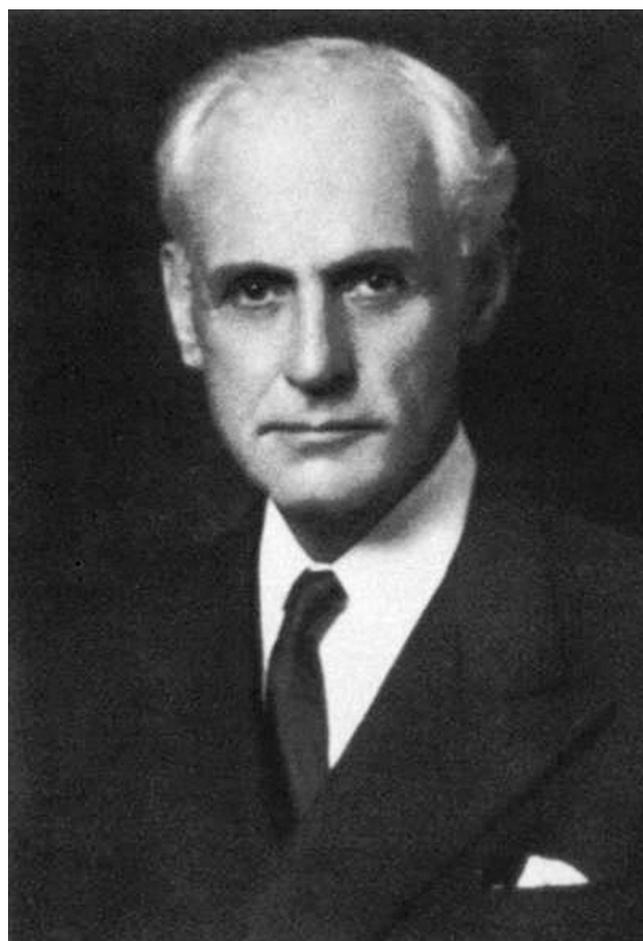


FIG. 1. Father of pediatric surgery, William E. Ladd, M.D. Reprinted from *European Journal of Pediatrics*. Available at: www.springerlink.com/content/m641772466k4j4n4/. Accessed September 26, 2011.

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FIG. 2. Department of Surgery Boston Children's Hospital in 1940 when Ladd was Chief. Standing left to right: Charles Ferguson, Donald Mac Collum, Henry Hudson, Thomas Lanman, William Ladd, George Cutler, Augustus Thorndike, Jr., and Robert Gross. Seated left to right: Dean Tanner, James Campbell, Harold Hoover, Donald Matson, Marion Connerley, Chilton Crane, Orvar Swenson, James Blodgett, Eben Alexander, Jr., and one not identified. Reprinted from Department of Surgery, Children's Hospital, 1940. Pediatrics. Available at: http://pediatrics.aappublications.org/content/102/Supplement_2/275/F1.expansion.html. Accessed September 26, 2011.

Ladd gave up his surgical practice in adult medicine in downtown Boston to fully contribute to the field of pediatric surgery (Fig. 2).

Ladd's consistent contributions to clinical research in children's diseases led him to publish his first article entitled "Treatment of Intussusception in Children" in 1911. He also focused on pyloric stenosis, a common condition that he believed warranted early intervention. In February of 1932, Ladd published an article in the *New England Journal of Medicine* entitled "Congenital Obstruction of the Duodenum in Children."³ Although such cases had been described previously, this condition was often overlooked by doctors. In his article, Ladd described the embryological cause of the disease, attributing it to the incomplete rotation of the intestines, leading to the attachment of the cecum to the posterior abdominal wall by the "mesenteric attachments," resulting in duodenal obstruction. These attachments were later referred to as "Ladd bands." Because timely and appropriate surgical intervention offers the only chance for cure in these patients, Ladd emphasized that early suspicion for the disease is crucial. In October of 1936, Ladd followed with another article entitled "Surgical Diseases of the Alimentary Tract in Infants" introducing his method of surgically correcting malrotation that proved successful during his time at Boston Children's Hospital.⁴ Before the introduction of his procedure, there were only 15 operative recoveries out of 349 articles in the literature, and mortality rates of non-operative patients were 100 per cent. Ladd successfully

saved the lives of 16 of 21 patients with the use of his operative procedure. The "Ladd procedure," named in honor of William E. Ladd, M.D., today involves surgical division of Ladd's bands, widening of the small intestine's mesentery, performing an appendectomy, and placement of the cecum and colon to the left, restoring an earlier state of embryologic development.

Ladd pioneered the repair of cleft palates, bladder exstrophy, and the abdominal approach for removal of Wilms' tumor. He also left his mark on the surgical repair of tracheoesophageal fistulas, biliary atresia, anorectal abnormalities, and esophageal atresia. In 1941, Ladd together with Robert E. Gross published the first textbook in pediatric surgery, "Abdominal Surgery of Infancy and Childhood," defining for the first time this new field of learning and practice.¹ Not just recognized and respected at Harvard, he also garnered acclaim throughout North America. He was a founding member of the American Board of Surgery, the American Academy of Pediatrics, and the American Association of Plastic Surgeons. He was honored by memberships in the highest surgical groups, including the New England Surgical Society, the American College of Surgeons, and the American Surgical Association. Ladd was a skillful practitioner and, most importantly, a superb teacher at all levels, from medical students to residents. His greatest successor, Robert E. Gross, followed in Ladd's footsteps as an innovator of surgery. Ladd was a major force as role model, educator, and leader, reflected by the success of many of his pupils all across the world.

Ladd married his wife, Helen Katherine Barton, on August 18, 1910. Together, they had three children. Ladd particularly enjoyed crew and was a member of the crew team for Harvard. He continued to row into his later years. On June 30, 1945, Ladd retired as the William E. Ladd Professor of Children's Surgery. Ladd died on April 19, 1967, at the age of 86 years after an illustrious and highly productive career.¹

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