

OPERATIVE NOTES

American Academy of Pediatrics - Section on Surgery Newsletter

Table of Contents

Page 1-3:

Dr. Jay M Wilson
2024 Ladd Medal Winner

Page 4:

AAP Advocacy Conference
2024 - Saleem Islam, MD,
FAAP, SOSu Chair

Page 5

The World Federation of
Associations of Pediatric
Surgeons (WOFAPS)

Page 6-9:

The Development of Parenteral
Nutrition
Key Figures: Dudrick, Ravdin,
Rhoads, Vars, Wilmore, Groff

Page 10:

Passages:
Daniel Alexander Gillis
(1928-2024)
Dale G Johnson
(1930-2024)



AAP Section on Surgery
Together, We Heal Children



Dr. Jay M. Wilson, 2024 Ladd Medal Award Recipient

The Ladd Medal is the highest honor the AAP Section on Surgery can bestow on a Pediatric Surgeon and is given to recognize accomplishment of outstanding merit in Pediatric Surgery. The 2024 recipient, **Dr. Jay M. Wilson**, is recognized for revolutionizing the care of infants born with **Congenital Diaphragmatic Hernia** over the course of his career.

Dr. Wilson was born in Landstuhl, Germany to parents who met while in the Air Force. After his parents left the military, they settled in Boston. Young Dr. Wilson was quite adept with his hands and worked as a plumber’s apprentice, stonemason’s apprentice, and electrician’s apprentice. He matriculated to UMass Amherst and majored in Biochemistry. He was not successful with his first applications to medical school and decided to pursue a career in the burgeoning field of “Recombinant Genetics.” He entered the Biochemistry graduate program at MIT where he was mentored, among others, by **Dr.**

Dr. Jay M. Wilson, 2024 Ladd Medal Award Recipient / cont'd

David Baltimore, who had won the Nobel Prize in Medicine in 1975 for his work in discovering reverse transcriptase. Dr. Wilson had extensive experience with tissue culture at this time, which was much in demand in the medical research world in the 1970s. Consequently, Dr. Wilson was “loaned out” to **Dr. Judah Folkman**, then Chief of Surgery at Boston Children’s Hospital, to help his lab establish a tissue culture program for endothelial cells, as Dr. Folkman progressed in his understanding of tumor angiogenesis. There, Dr. Wilson encountered future Ladd Medal winners **Drs. Joseph Vacanti** and **Michael Klein** who were surgical residents working with Dr. Folkman.



Judah Folkman

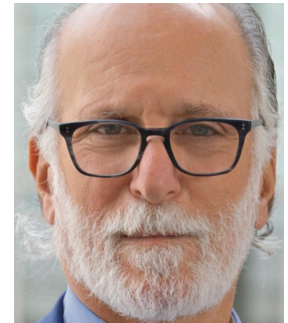
Dr. Folkman often visited the research area after he had completed his clinical work, therefore he and Wilson interacted frequently in the late hours. During those meetings, Dr. Folkman frequently commented that, given Wilson’s late night work ethic and his observed technical ability in the lab, that he should consider a career in surgery. One night Dr. Folkman asked Wilson what he intended to accomplish in his research career. Wilson responded that he wanted to find a way to hopefully cure cancer. Dr. Folkman then asked, “*What is cancer?*” and Wilson proceeded to explain the concept of cells gone awry in a petri dish. Dr. Folkman responded “*No, you are wrong, come with me!*” He then took Wilson to the bedside of a girl who was dying of Stage IV neuroblastoma. Folkman introduced Wilson to the patient’s mother as “*Mr. Wilson, the man who will try to cure cancer so that other children may not need to die.*” That girl made Wilson realize he didn’t really know what cancer was. As they walked back towards the lab, Dr. Folkman said, “*That’s cancer, and that’s why you have to go to Medical School if you ever hope to make a difference.*”

This critical experience prompted Wilson to reapply to medical school. He received multiple acceptances, and asked Dr. Folkman where he should go. Dr. Folkman’s response was, “*War is only good for one thing: training surgeons. But there is no war right now, but the Bronx is the next closest thing.*” So, Wilson attended **Albert Einstein School of Medicine** in the Bronx, where he discovered that, once again, Dr. Folkman had been right! He was now finally Dr. Wilson and returned to Boston for his surgical residency at the Brigham and Women’s Hospital, where his fellow interns included noted pediatric surgeons **Drs. Gail Besner** and **Robert Sawin**. Dr. Wilson matched at Boston Children’s Hospital for his Pediatric Surgery Fellowship, and subsequently spent the majority of his surgical career there.

As a junior faculty member, Dr. Wilson became the **ECMO Surgical Director**. He was intimately involved in the management and expansion of the ECMO program at Boston Children’s, which had been established by Dr. Vacanti. At the time, infants with Congenital Diaphragmatic Hernia were operated on emergently. However, a study from Toronto showed that survival wasn’t worsened - or improved - by delaying the operation. Dr. Wilson thought that preoperative stabilization, including ECMO, might lead to an improved outcome. Initially, it did not, possibly due to the aggressive ventilatory protocol that was common then. However, with changes in the timing of surgery and in ventilator management, which

Dr. Jay M. Wilson, 2024 Ladd Medal Award Recipient / cont'd

evolved over the following decade, survival did improve for repair on or off ECMO. Dr. Wilson helped popularized the concept of “gentle ventilation” which was first introduced by **Drs. Charles Stolar** and JT Wung. Adoption of a gentle ventilation strategy increased CDH patients’ survival by 25% when compared to the historic hyperventilation strategy that was ubiquitous at the time. This was also accompanied by a recognition of the critical importance of managing pulmonary hypertension and the heart to stabilize patients prior to semi-elective operative repair of the diaphragmatic defect. Dr. Wilson also embraced the concept of using medications such as aminocaproic acid to minimize bleeding and to facilitate repair of CDH while on ECMO. Delayed repair and preoperative stabilization is now standard and CDH is seen as a physiological, not surgical, emergency.



Charles Stolar

As part of his research effort, Dr Wilson reviewed literature related to pulmonary hypoplasia to better understand lung growth. One day he was making photocopies in the basement stacks of the Countway Library from the Journal of Pediatric Pathology when he saw a report about infants who were born without kidneys and died of pulmonary hypoplasia. They had Potter Syndrome. The report included 2 infants who also had laryngeal atresia, and these infants had large and overdistended lungs that were histologically normal. Dr. Wilson recognized that this normalization of the lungs, in an otherwise fatal

condition that always caused pulmonary hypoplasia, might be exploited to increase the lung development in infants with CDH. This led to the concept, and first demonstration, in fetal lambs, of tracheal occlusion leading to accelerated lung growth and maturation. Subsequent refinements of this technique are currently employed as fetal tracheal occlusion (FETO) to facilitate in utero lung development in human infants with congenital diaphragmatic hernia. Given his dedication to this disease, it is no surprise that Dr. Wilson was instrumental, along with **Dr Kevin Lally**, in starting the **Congenital Diaphragmatic Hernia Study Group**. He has also been a key figure in ECMO and the Extracorporeal Life Support Organization (ELSO).



Kevin Lally

Dr. Wilson was on faculty at Boston Children’s Hospital for 29 years and remains on faculty at UT Houston. He has held leadership roles in many national organizations including serving as the Chair of the AAP Section on Surgery Publications Committee in 2000. He has given talks on CDH and ECMO worldwide and, along with **Dr. Dennis Lund**, established the first multidisciplinary clinic for long-term follow up of infants with CDH in North America. He has published over 80 original manuscripts and over 25 book chapters and reviews on CDH, and holds two patents, both related to critical care management of CDH infants.

Advocacy is in our Lane

Saleem Islam, MD, FAAP, SOSu Chair

The **AAP Advocacy Conference** in April 21-23, 2024 was an outstanding example of the AAP showing where its power lies – and perhaps reflecting the major reason it came into existence all those years ago. That was (and is) to make sure that children’s issues remain front and center and to simply ask “*what about the kids?*”



This year, there were three bills that we fought for – two on children’s safety online (known as COSA and COPPA 2.0) and one to reauthorize emergency services for children (EMSC – in place for 40 years now!). These are critical issues that affect us all in our practices as well as for our own loved ones! I learnt a lot about the bills myself and how they were crafted and modified and evolved. While the issues may be straightforward, we all learnt that nothing can ever be taken for granted and we needed to push for the right thing to happen. The other lesson was that we must be at the table at every turn: federal legislation, state governance, and local grassroots application. We can’t just walk away after ‘winning’ in one area, otherwise things can unravel fast. The AAP’s strong presence in each arena (they have a council for Federal Government affairs, and a separate one for State – COFGA and COSGA!) is very well suited to fight the good fight at each level.

It was clear that this group of pediatricians and subspecialists share that vision and were super excited to be able to contribute. The passion was palpable and the AAP’s commitment was visible: 117 trainees attended, proving that the AAP is in this for the long haul! This was a obvious example of developing future leaders in advocacy and a recognition that this is indeed an ‘infinite’ game that will continue long after the current leadership is done.

The staff there was switched on from the start. They knew exactly what to say and how to say it. Yet, they left the glory to the physicians and the trainees because that is what demonstrates true advocacy. Their professionalism spoke volumes and also showcased the incredible history and experience that the AAP has in true political advocacy.



Saleem Islam (SOSu Chair) on Capital Hill with his Florida AAP Advocates

Ultimately, this conference demonstrated what makes this organization so special when it comes to advocacy: with the power of 67,000 members, the AAP can make things truly happen. As Surgical specialists, we simply must align ourselves with our pediatric medical colleagues and make sure that we ‘advocate’ for our own issues and stay consistent with our seat at the table. In fact, we need to expand our role here – for surgeons are ‘doers’ by nature and of course – Together, we heal children!

The World Federation of Associations of Pediatric Surgeons (WOFAPS)

In 1963 at the Paris Congress of the French Association, **Denys Pellerin** from Paris proposed the creation of the **International Union of Pediatric Surgeons (IUPS)** to provide support for pediatric surgeons in developing countries and to provide an international unifying voice to bridge gaps in training and care. The three aims included i) keep each national society fully independent, ii) improve the relationship between all pediatric surgeons, iii) provide information on the activities of its members at a world congress every 4 years.



Denys Pellerin



Jesus Lozoya Solis

In 1968, this idea gained support from **Jesus Lozoya Solis** (AAP SOSu Executive Committee Member and charter member of the AAP SOSu), and **Virgilio Carvalho Pinto** from the Brazilian Society of Pediatric Surgeons. Lozoya and Pinto decided to link a World Symposium in Pediatric Surgery (WSPS) with the already established International Pediatric Symposium (IPA) as it would create an opportunity to present the proposal to IPA attendees. What followed was the first World Symposium of Pediatric Surgery (WSPS) held in 1968 in Mexico.

Lozoya and Pellerin made plans for the second WSPS 1971. The WSPS was held in Paris. Step were taken for the transition of the symposium into a proper organization representing Pediatric Surgeons from around the world. This effort was led by **Jimmy Lister** (1923-2004; Alder hey Hospital, Liverpool). He contacted other pediatric surgeons from around the world. He, along with **Harvey Beardmore** (1921-2007; AAP SOSu Chair 69-70), **Keijiro Suruga** (1920-2023; father of pediatric surgery in Japan), spent the most time drafting the constitution and by-laws in 1973 in anticipation of review by the first WOFAPS Council at the next WSPS congress.



Jimmy Lister



Harvey Beardmore



Keijiro Suruga

WOFAPS was founded on **15th October 1974** in Sao Paulo, Brazil with 27 different national associations in attendance. While he Presidency role was offered to Jesus Lozoya Solis, he declined due to his age. Ultimately, Harvey Beardmore, who was president of APSA, was elected as WOFAPS President and Jimmy Lister was selected as General Secretary.

WOFAPS has grown to include over 100 member countries today. It is a representation of Pediatric Surgical Associations and it does not represent any political ideas nor does it make any racial or religious distinction. WOFAPS is governed by its Constitution and its official office is in Bern, Switzerland.



The Development of Parenteral Nutrition

The concept of feeding patients intravenously was considered and attempted long before the successful practical development of total parenteral nutrition (TPN) five decades ago. Dating back all the way to 1658, **Sir Christopher Wren** was the first to predict that fluids could be injected into the bloodstream. During the years that followed, Wren and others administered a long list of fluids intravenously. But it would take 175 years until **Thomas Latta**, a Scottish physician, pioneered the development of modern IV therapy.

The modern era of parenteral nutrition (PN) began in 1900 when a diluted solution of glucose was developed as an IV source of calories. **Robert Elman** in the 1930s and 40s demonstrated that a protein hydrolysate could be safely infused intravenously. While TPN seemed like a natural next step, the prevailing dogma in the 1960's was that feeding entirely by vein was impossible. Even if it were possible, it would be impractical. Even if it were practical, it would be unaffordable.

It was **Dr. Stanley Dudrick** who deserves much of the credit for solving the riddles of TPN. His interest in TPN was first piqued as a medical student and then as an intern in 1961 when **Dr. IS Ravdin**, Chair of Surgery at the University of Pennsylvania, asked him to administer IV Lipids into a patient. Later that year, Dudrick had three patients die from malnutrition and not anything related to their surgical care. His mentor, **Dr. Jonathan Rhoads** explained to him that the state of medicine at the time was insufficient to feed starving patients intravenously. Rhoads himself was interested in this science because of Ravdin. Rhoads, sensing interest from Dudrick, challenged him to spend time in the laboratory to overcome this problem.

Dudrick spent 2 years compiling and reading over 600 nutrition and metabolism articles. Many of these were recommend by **Harry M Vars, PhD**, the Department's biochemist with whom he had weekly meetings. During a subsequent 1-year surgery residency research experience in the Harrison Department of Surgical (1965-66), Dudrick, Rhoads, and 3rd-year resident **Douglas Wilmore** solved the problems that stymied the development of safe and effective TPN:

1. Determine the subjects' complete nutrient requirements
2. Concentrate nutrient substrates within physiochemical limitations
3. Create an IV catheter for safe and practical venous access
4. Demonstrate the ability to practically and safely infuse PN over prolonged periods of time
5. Maintain sterility throughout the process
6. Manage nutritional derangements

Dudrick successfully fed the dogs for 72-256 days and analyzed the metabolic and nutrition problems that developed so that he could treat them and keep the dogs healthy. Dudrick and his team published their work in Surgery in 1968 entitled, "*Long-term total parenteral nutrition with growth, development and positive nitrogen balance*".



Stanley Dudrick and one of his beagles who received TPN

Parenteral Nutrition / cont'd

Less than one year later, he was asked to apply his nutrition to a child admitted to the Children's Hospital of Philadelphia in 1967. The infant was a baby girl from Vineland, NJ named Kelleen who had a Type 3b intestinal atresia. As the bowel twisted around the single vessel, it became strangulated, and Kelleen was left with her duodenum and only 3 cm of terminal ileum. The child was on **Dr. Harry C Bishop's** service at CHOP and was being looked after by the Pediatric Surgery Fellow, **Dr. Diller B Groff**. Groff and Dudrick had been interns together at U Penn and the two remained friends. Groff had heard about Dudrick's work with the puppies while he watched his own patient losing >20% of her birth weight due to malnutrition. Groff called his friend and asked him to come to CHOP to present his work. The idea of trying TPN in this child arose. At first, CHOP and medical school administration refused to allow the use of Dudrick's untested therapy, threatening investigations by the Federal Bureau of Investigation and even the US Food and Drug Administration. However, Dudrick suggested that the media would have a field day if they found out that a child could have been saved but that treatments were withheld. This opened the door to the use of TPN in human patients. Dudrick approached the parents and sensing no other alternatives, they agreed.

Along with Wilmore, Dudrick prepped Kelleen's neck with an ointment impregnated with an antibiotic and placed a catheter through the infant's external jugular vein into her SVC. Knowing that the child's movement might dislodge the catheter, they tunneled the catheter so that it emerged from her scalp behind the ear. They provided meticulous skin care to try to minimize infection, changed the dressing every three days, and scrubbed the site with an iodine solution. Wilmore lived close to CHOP and checked on the baby frequently. For the TPN, the hospital pharmacist prepared the day's solution under strict sterile procedures. The research team carefully analyzed every aspect of growth, weight, head circumference, and length. Very quickly, the child began responding to the TPN and by the end of two months, she had gained 3 lbs. Of course, there were other notable figures who were a part of the clinical care team including a CHOP Pediatric Surgeon named **Dale G Johnson** (see Passages in this issue) who helped deal with some of the complications



Before and after 44 days of TPN

of this new approach for nutrition. News quickly spread about this success, especially after Wilmore and Dudrick published this case in JAMA in 1968. The child lived for a total of 22 months receiving all her nutrition from PN. As a result of these landmark reports, intravenous hyperalimentation was rapidly accepted and employed around the world. Like Jonas Salk, Dudrick never patented his technique or sought to make money from it. Instead, he said he wanted simply, *"to leave something better behind when I go, rather than just practice medicine the way it has always been done."* It has been said that parenteral nutrition was the most important scientific contribution ever made by a surgeon.

Parenteral Nutrition - Key Figures

Stanley J. Dudrick (1935-2020)



Born in Nanticoke, PA, Dudrick was raised in a Pennsylvania coal-mining family. He turned toward medicine at the age of 7 after a doctor cured his mother during a serious illness. He received a bachelor's degree in biology from Franklin & Marshall College in 1957 and graduated from the University of Pennsylvania Medical School in 1961. He remained there for his surgical residency. He would later join the faculty at the University of Pennsylvania and become a full professor after only 5 years. He left in 1972 to Houston to become the founding chairman of the Department of Surgery at the University of Texas Health Science Center. He followed this by becoming Chairman of Surgery at the University of Pennsylvania, and then with professorships at Yale University, the Geisinger Commonwealth School of Medicine in Pennsylvania and Misericordia, a Catholic University in Dallas, PA. He co-founded the American Society for Parenteral and Enteral Nutrition (ASPEN) in 1975 and served as its first president. He received awards from the American Surgical Association, American College of Surgeons, and the AAP Ladd Medal in 1988.

Isadore Schwaner (I S) Ravdin (1894-1972)



Born in Evansville, Indiana on October 10, 1894, Ravdin attended Indiana University and graduated in 1916 in science, and medical school (1918) and surgical residency (1922) at the University of Pennsylvania Medical School, graduating in 1918. After a brief stint in Edinburg, he returned to the University of Pennsylvania where he began his academic ascent as the new chair of surgical research in 1928. He was the first chair of the Harrison Department of Surgical Research. In 1945, he was appointed the Surgeon in Chief.

Jonathan Evan Rhoads (1907-2002)



Born on May 9, 1907, the son of a physician, Rhoads attended Quaker schools including Haverford College. He was in medical school at Johns Hopkins (1932). He interned at the University of Pennsylvania and then completed his surgical training from 1934-39. During World War II, after the director went to Burma to command a hospital unit, he was left in charge of an undermanned surgical service, which included a young C Everett Koop. Rhoads' mentor was I S Ravdin, with whom he wrote his first research paper reviewing the importance of a knowledge of biochemistry by the surgeon. He remained at Penn for his entire career. In 1959, when

Ravdin gave up the chair of surgery to become VP for Medical Affairs, Rhoads succeeded him as Professor and Chairman. The next 12 years were the busiest and most productive of his career including the development of TPN. This was the culmination of his research in surgical nutrition which he had begun in the 1930s.

Parenteral Nutrition - Key Figures

Harold Morton Vars (1903-1983)



Vars was born in Edelstein, IL and moved to Colorado in high school. He attended the University of Colorado at Boulder, studied Chemistry, and graduated in 1924. He then spent 6 years in the Yale Chemistry Department as a student and instructor. In 1931, he accepted a position at Princeton which lasted three years. He was then recruited by IS Ravdin to the University of Pennsylvania where he would spend his remaining years. From 1954 until his retirement, he served as Professor of Biochemistry in Surgical Research. When Vars was made a member of the Harrison Department of Surgical Research at Pennsylvania, he had medical graduates assigned to work with him for guidance in doing the laboratory studies needed for their work. He is best remembered for his work on parenteral feeding. Vars had been interested in this topic as early as 1939. A decade later, he wrote a report on a "Method for Continuous Administration of Nutritive Solutions Suitable for Prolonged Metabolic Studies in Dogs." But Vars attributes the success of TPN to Dudrick who, "dedicated his time, energy and ingenuity to making the project a success." Vars and Dudrick would publish 27 papers together.

Douglas Wayne Wilmore (b 1938)



Born on July 22, 1938 in Newton, KS, Wilmore completed his MD in Kansas University and internship at the University of Pennsylvania from 1965-1971. He was the Chief clinical research and staff surgeon at US Army Institute Surgical Research, Fort Sam Houston, from 1971-79. Wilmore worked with Dudrick on the first papers demonstrating the use of TPN in patients in the late 1960's. In 1979, Wilmore joined the faculty at Peter Bent Brigham Hospital to continue the work of Dr. Moore in the area of surgical metabolism. He established the Laboratory for Surgical Metabolism and Nutrition and his team developed modern techniques to measure glutamine. This pioneering work led to multiple patents and FDA approval for the use of glutamine in patients with short bowel syndrome. He became the Frank Sawyer Professor of Surgery at Harvard Medical School in 1989 until his retirement in 2003.

Diller Baer Groff (b 1935)



Born on June 21, 1935 in Washington, DC, Groff completed his Bachelors at Haverford College (1957), and his MD at Duke University (1961). He was an Instructor in surgery at George Washington University (1962-67), and then a Pediatric Surgery Fellow at Children's Hospital of Philadelphia under C Everett Koop (1967-68). He served as Chief of Pediatric Surgery, Catholic Medical Center Brooklyn and Queens Inc., Jamaica, NY, 1969-70, Pediatric Surgeon at New Jersey Medical School, Newark, 1970-78, and Surgeon-in-chief, Kosair Children's Hospital, Louisville, KY (1978-2004). Groff served as AAP SOSu Chair of the Publications Committee, 1992-93.

Passages

Daniel Alexander Gillis (1928-2024)



Daniel Gillis grew up in Port Hawkesbury, Cape Breton. He earned his undergraduate degree from St. Francis Xavier University and received his medical degree from Dalhousie University. He trained with Potts and Swenson in Chicago and trained as a pediatric cardiac surgeon at the Mayo Clinic in Rochester, Minnesota. In 1961, he was the first pediatric surgeon in Halifax, Nova Scotia. Gillis and his team of Dalhousie grads established a heart-lung facility at the Izaak Walton Killam Children's Hospital and later at the Victoria General Hospital. The first open-heart operation took place at the Children's on November 24, 1964. Dr. Gillis served as the chief of surgery at the IWK Health Centre from 1965 to 1994 and was instrumental in developing a pediatric surgical service in the Maritimes. He started the training program there in 1988. He took on the role of vice president of professional and academic affairs and has served as interim president and CEO in 2002 and 2004. In 1997, he was awarded the Order of Canada for the introduction and development of techniques of open-heart surgery in children which earned him international acclaim.

Dale Gedge Johnson (1930-2024)



Dale Johnson completed his undergraduate studies and medical school at the University of Utah in 1956. He then moved to Massachusetts General Hospital in Boston for his surgical residency from 1956-60. Following military service research, he accepted a position at Children's Hospital of Philadelphia from 1964-1966. He stayed on and served as Professor of Surgery and Professor of Pediatrics at the University of Pennsylvania. While there, C Everett Koop and Johnson were responsible for establishing pediatric surgery as a new area of surgical specialization. He moved back to Salt Lake City and served as Surgeon-in-Chief at Primary Children's Medical Center and Chief of the Division of the Division of Pediatric Surgery from 1971-2001.

Johnson was a founding member of the American Pediatric Surgery Association (APSA) (1970), APSA president in 1985, Pacific Association of Pediatric Surgery president in 1990, and the AAP SOSu Arnold M Salzberg Mentorship Awardee 2002.

Operative Notes Staff

Senior Editor and Contributor: Kenneth W. Gow, MD, FAAP

Editor and Contributor: Minna Minsing Wieck, MD, FAAP

A product of the AAP Section on Surgery Communications Committee; Publication date: May 2024

If you have questions or suggestions please email: sosu@aap.org