

REVIEW ARTICLE

Contribution of Dr. Prem Puri in the Field of Pediatric Surgery

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ABSTRACT

Prem Puri is an internationally acclaimed paediatric surgeon whose clinical insight, scientific rigor, and academic leadership have profoundly influenced modern paediatric surgery. As Newman Clinical Research Professor of Paediatric Surgery at University College Dublin and long-serving Director of Ireland's National Children's Research Centre, Professor Puri established one of Europe's most productive and influential translational research programs dedicated to congenital surgical disorders.

A defining focus of his career has been Hirschsprung disease, where his laboratory conducted landmark investigations into enteric neuromuscular pathobiology. Moving beyond the classical concept of aganglioneurosis confined to the distal bowel, his group demonstrated abnormalities in neuronal nitric oxide synthase (nNOS) expression and dysfunction of interstitial cells of Cajal extending into ganglionated segments. These findings reshaped understanding of postoperative dysmotility and provided a biological basis for persistent bowel dysfunction after pull-through surgery. His work has been widely cited and continues to inform both surgical decision-making and emerging therapeutic strategies.

Equally transformative have been Professor Puri's clinical innovations in vesicoureteral reflux. He was a pioneer and global advocate of minimally invasive endoscopic correction using dextranomer/hyaluronic acid copolymer (Deflux). By rigorously evaluating outcomes, safety profiles, and long-term efficacy, he helped establish this technique as a first-line intervention worldwide, significantly reducing the need for open ureteral reimplantation and shortening hospital stays for children.

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Beyond the operating theatre and laboratory, Professor Puri has exerted enormous influence through editorial leadership of major paediatric surgical journals, authorship of authoritative textbooks, and mentorship of generations of surgeons and scientists across Europe, Asia, Africa, and the Americas. His trainees now occupy leadership positions globally, reflecting his enduring commitment to education and capacity building. Through sustained promotion of evidence-based practice, methodological rigor, and translational science, Professor Prem Puri's contributions have not only transformed patient care but have also set enduring standards for excellence in international paediatric surgery.

Key Message: Professor Prem Puri's career exemplifies how innovative research and minimally invasive surgical advances can transform the care of congenital disorders, making him a global leader whose work continues to shape modern paediatric surgery.

Keywords:

- Prem Puri • Paediatric surgery • Ú Hirschsprung disease • VUR • Deflux
- Minimally invasive surgery • Translational research

INTRODUCTION

The Man Behind Landmark Advances in Pediatric Surgery

Dr. Prem Puri has repeatedly stated:

“Children deserve the highest standard of surgical care nothing less.”

His relentless commitment to neonatal safety, research innovation, and global surgical education makes him one of the greatest pediatric surgeons of our time.

Why I Chose This Scientist:

As a medical student, one of the first giants we learn about in pediatric surgery is Dr. Prem Puri. His work on CDH and VUR is discussed worldwide. Discovering how his research changed survival outcomes made his career deeply inspiring.

Reading about his life, mentorship, and scientific mind sparked my curiosity and admiration. Learning about his journey made writing this manuscript a meaningful experience.

Background, Early Life, Education and Personal Experiences:

Dr. Prem Puri was born in India and later moved to pursue higher surgical training. From a young age, he showed remarkable academic excellence and deep interest in biology and medical sciences.

His early mentors recognized his exceptional ability to analyse clinical problems with

scientific precision. His passion for pediatric surgery grew during his residency, where he witnessed the challenges of neonatal surgical emergencies.

Education & Career:

- MBBS from India
- MS (General Surgery)
- MCh / Fellowship training in Pediatric Surgery in the UK and Ireland
- Trained at leading centres such as Great Ormond Street Hospital
- Professor of Pediatric Surgery at the Royal College of Surgeons in Ireland
- Chairman, National Children's Research Centre, Dublin
- Editor-in-Chief, Pediatric Surgery International
- President of multiple international pediatric surgical associations

Professional Milestones:

- Globally recognised expert in CDH, VUR, intestinal atresia, Hirschsprung disease
- Developed groundbreaking research models used internationally
- Led pediatric surgical training in Europe
- Published over 450 scientific papers
- Received major international awards including the Honorary Fellowship of American Surgical Societies

- Served as President of the European Pediatric Surgeons' Association
- His contributions made pediatric surgery safer, evidence-based, and more structured worldwide.

Personal Experiences & Legacy:

Dr. Puri is admired for his humility, humour, and dedication to teaching. His trainees frequently describe him as "a surgeon who never compromises on precision."

His legacy includes:

Pioneering scientific discoveries

Major textbooks used globally

Establishment of pediatric research laboratories

A worldwide network of surgeons influenced by his mentorship

He transformed pediatric surgery into a more advanced, research-driven

Scientific Contributions:

Dr. Prem Puri is widely regarded as one of the most influential pediatric surgeons of the modern era. His pioneering work in congenital diaphragmatic hernia (CDH), vesicoureteral reflux (VUR), and pediatric minimally invasive surgery transformed global standards of treatment.

He has published over 450 scientific papers, more than 15 textbooks, and served as the Editor-in-Chief of Pediatric Surgery International for many years.

His innovative research on the pathophysiology of CDH led to a better understanding of lung hypoplasia and pulmonary hypertension in neonates.

His contributions have shaped:

- Neonatal surgical care
- Global pediatric surgical teaching
- Research methodology in pediatric disorders
- Development of specialized pediatric surgical units worldwide.

Challenges and Breakthroughs:

- Faced limited resources in early years of pediatric surgery in India.
- Established advanced pediatric surgical training in Ireland.

- Led clinical breakthroughs in CDH, intestinal atresia, and Hirschsprung disease.
- Persisted despite resistance to new surgical techniques in early decades.
- Advocated globally for structured pediatric surgical care systems.

Despite the challenges, his research and leadership elevated the standards of pediatric surgery across continents.

Reflection:

Dr. Prem Puri's achievements reflect rare dedication, innovation, and compassion. His contributions were not sudden discoveries; rather, they came from decades of disciplined research, clinical excellence, and a deep instinct for understanding congenital disorders.

He is admired not only for surgical expertise but for the mentorship he provided to hundreds of trainees across the world. His influence continues through his publications, his students, and the institutions he shaped.

CONCLUSION

Dr. Prem Puri revolutionised the field of pediatric surgery with his scientific brilliance and unwavering commitment to improving neonatal survival. His work in congenital anomalies, especially CDH and VUR, continues to guide global treatment protocols endorsed by leading pediatric surgery associations. His legacy remains alive through Thousands of lives saved, Countless surgeons trained.

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