



ANNUAL REPORT

DIAGNOSTIC, ANESTHESIA AND SURGICAL HEALTH REPORT
ISSUE 2

Innovation Advancing
Children's Health



Children's
Wisconsin

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DASH Issue 1 Highlights

Innovation to Improve the Health of Kids

Our vision at Children's Wisconsin is for children in our communities to be the healthiest in the nation. To be successful, we must excel in our mission of CARE: care, advocacy, research and education. In this issue of the Diagnostic, Anesthesia and Surgical Health (DASH) report, we showcase how we are using innovation to improve the health of kids — one of our guiding values.

Children's Wisconsin is a verified Level I Children's Surgery Center by the American College of Surgeons (ACS) and an ACS Surgical Quality Partner. Recently, we have focused our attention on improving postprocedural pain control and enhancing postoperative recovery to improve surgical care excellence. This is a concerted effort, driven by science and data, that involves our nurses, surgeons, pediatricians and anesthesiologists. In this issue, discover how our Cleft Program and Orthopedic Surgery Program demonstrate how we use team-based care to expedite recovery and minimize postoperative complications.

We are also proud to share that we are among the few centers in the world using the novel plaque brachytherapy technique to treat retinoblastoma. This custom-made radiation disc is designed specifically for each child's eye and tumor, delivering highly targeted treatment while minimizing harm to surrounding structures and reducing the risk of secondary cancers. Our commitment to innovation doesn't end there. Our Urology Program implemented a Hypospadias Data Registry of more than 1,000 patients that guides ongoing refinement of surgical techniques to achieve the best possible outcomes.

Together, these efforts reflect our unwavering dedication to advancing surgical care and improving the lives of children and families we serve.



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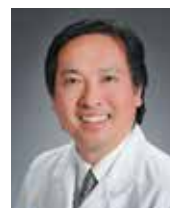


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Expanding ERAS Pathways in Pediatric Cleft and Craniofacial Surgery

Enhanced Recovery After Surgery (ERAS) protocols are evidence-based perioperative care pathways designed to optimize recovery by addressing factors across the preoperative, intraoperative and postoperative continuum. In adult surgical populations, ERAS pathways have demonstrated improvements in outcomes, reductions in morbidity and lower health care costs. In pediatric surgery, however, published data remain limited, particularly for children undergoing cleft and craniofacial procedures.

Building on prior quality improvement work, we expanded ERAS principles to pediatric cleft and craniofacial surgery at Children's Wisconsin. Our earlier initiative focused on cranial vault remodeling and demonstrated meaningful benefits, including improved pain control, reduced opioid use and decreased need for blood transfusions. Encouraged by these results, we extended ERAS pathways to primary cleft lip and palate repair as well as alveolar bone grafting.

APPLYING ERAS PRINCIPLES TO CLEFT CARE

Cleft lip and cleft palate represent some of the most common congenital anomalies, occurring in approximately 1 in 600 to 700 births. At Children's Wisconsin, we perform more than 60 primary cleft lip and palate procedures and over 30 alveolar bone grafts each year. Given this volume, even incremental improvements in recovery can have a meaningful impact on patient experience and outcomes.

A central focus of our ERAS protocol is minimizing opioid exposure. Opioid-related side effects such as nausea, vomiting, ileus, pruritus, urinary retention and respiratory depression can delay recovery and complicate postoperative care. Reducing reliance on narcotics supports earlier feeding, improved comfort and shorter hospital stays.

EARLY IMPACT AND FUTURE DIRECTION

Key components of our pathway include the use of regional nerve blocks in combination with scheduled nonopioid medications. Early initiation of acetaminophen and ibuprofen has become a cornerstone of postoperative pain management. Together, these strategies provide effective analgesia while limiting opioid requirements. We have observed lower FLACC pain scores and improved tolerance of the first oral feeding in patients managed with this approach.

Since implementing the expanded ERAS protocol, we have maintained opioid prescription rates at discharge well below the national average and continue to pursue further reductions. By standardizing perioperative care and emphasizing multimodal analgesia, we have improved recovery for children undergoing cleft procedures while maintaining safety and comfort.

Our strategies have helped to standardize care, emphasize analgesia and limit opioid requirements.



Kristen Klement, MD
Division Chief, Pediatric Plastic Surgeon,
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Scan to learn more about
our Plastic Surgery Program.



**Dr. Klement examines a patient
at the multidisciplinary cleft clinic**

When Surgery Meets Complexity: How Team-Based Care Supports Medically Fragile Children

For children with complex medical conditions, even routine hospital stays can pose challenges. When major orthopedic procedures such as spinal fusion or hip reconstruction are added, risk increases substantially. Many of these children live with multiple chronic conditions, depend on feeding tubes or wheelchairs and receive care from numerous subspecialists. Recovery after major surgery requires careful coordination across teams and close attention to maintaining medical stability.

Recognizing the elevated risk in this population, we formed a multidisciplinary group that included clinicians from Complex Care, Pediatric Hospital Medicine and Orthopedic Surgery. Our goal was to evaluate how different models of perioperative care influence outcomes for medically complex children undergoing major orthopedic surgery. Specifically, we examined whether orthopedic-only management differed from partial or full multidisciplinary

co-management during the postoperative period.

EVALUATING REAL-WORLD OUTCOMES

We reviewed five years of data from 177 medically complex children who underwent major orthopedic procedures between 2016 and 2020. Most underwent spinal surgery, while others had complex hip reconstructions. We grouped patients based on the level of perioperative co-management they received:

ORTHOPEDIC CARE ALONE

Partial co-management, involving orthopedics plus either hospital medicine or complex care.

FULL CO-MANAGEMENT, INVOLVING ALL THREE TEAMS

We evaluated hospital length of stay and tracked postoperative outcomes, including infections, unplanned ICU transfers, readmissions and prolonged hypoxia.

UNDERSTANDING THE FINDINGS

Children who received full co-management had longer hospital stays, averaging approximately six days, compared to about four days for those managed by orthopedics alone. At first glance, this difference could appear unfavorable. However, the children receiving full co-management were significantly more medically fragile at baseline.

Most children in the study underwent spinal surgery, while others had complex hip reconstructions.

Multidisciplinary co-management helped bring outcomes for the most fragile children in line with those of their healthier peers.

Primary and Secondary Outcomes

Primary and Secondary Outcomes	Overall						
	Control	Partial		Full			Control
	n=72	n=61		n=44			n=64
	Mean ± SD* / Percent (n)	Mean ± SD* / Percent (n)	P-value (compared to control)	Mean ± SD/ Percent (n)	P-value (to control)	P-value (to partial)	Mean ± SD*/ Percent (n)
CCC** = 2	73.6% (53)	41% (25)		25			73.4% (47)
CCC > 2	26.4% (19)	59% (36)	<0.001	75	<0.001	0.09	26.6% (17)
Hospital LOS‡ (Median [IQR])	101.2 [79-109]	123 [81.5-152.9]	0.003	140.2 [106.7-176.7]	<0.001	0.04	102.7 [80.2-109.2]
ICU‡‡ LOS (Median [IQR])	26.1 [25.3-43.8]	40.7 [26.3-51.8]	0.18	46.4 [106.7-176.7]	0.18	0.44	26.1 [23.1-28.1]
ICU Admission	18.1% (13)	68.9% (42)	<0.001	72.7	<0.001	0.67	17.2% (11)
Number of Consults¹	1.3 ± 0.6	2 ± 1.1	<0.001	2.5 ± 2	<0.001	0.44	1.3 ± 0.6
					P-value (between all group)§		
Highest BPEW Score on Acute Care Floor	3.9 ± 1.9	4.5 ± 2	0.037	5.6 ± 2.7	0.001		3.8 ± 2
Postop Hypoxia	20.8% (15)	41% (25)	0.021	50	0.003		23.4% (15)
> 48 Hours w/o BM	40.3% (29)	54.1% (33)	--	40.9	0.225		39.1% (25)
Antibiotics within 30 days	9.7% (7)	14.8% (9)	--	15.9	0.554		10.9% (7)
Other Postop Complications	2 (2.8%)	6.6% (4)	0.412	18.2	0.014		3.1% (2)
Mean Pain Score 1st 24 hours	3.4 ± 2	2.5 ± 2.1	0.009	2 ± 1.6	<0.001		3.5 ± 2
Mean Pain Score 2nd 24 hours	3.4 ± 2	2.4 ± 1.9	0.005	1.8 ± 1.4	<0.001		3.6 ± 2
Time to Enteral Nutrition (hrs, Median [IQR])	2.6 [1.5-6.6]	8.9 [4.5-21.3]	<0.001	6.9 [4.7-20.6]	<0.001		2.4 [1.5-5]
Non-Planned Postop Visits	18.1% (13)	14.8% (9)	--	15.9	0.873		20.3% (13)
RRT/Code/Mortality/PICU Transfer	1.4% (1)	0 (0)	--	4.6	0.258		1.6% (1)
Readmission within 30 days	4.2% (3)	9.8% (6)	--	9.1	0.433		4.7% (3)
Repeat Surgery within 30 days	1.4% (1)	6.6% (4)	--	0	0.140		1.6% (1)

* SD — standard deviation
** CCC — Complex Chronic Conditions
‡ LOS — Length of Stay
‡‡ Intensive Care Unit (ICU)

† PHM — Pediatric Hospital Medicine,
CCP — Complex Care Program
§ P-values by Chi-square or Fisher's Exact test
as appropriate

1. Average number of consults other than PHM
or CCP

Spine					
	Partial		Full		
	n=47		n=39		
	Mean ± SD/ Percent	P-value (compared to control)	Mean ± SD/ Percent (n)	P-value (to control)	P-value (to partial)
	44.7% (21)		25.6% (10)		
	55.3% (26)		74.4% (29)		
	127.8 [105.3-172.5]	<0.001	149.9 [106.8-177.5]	<0.001	0.29
	43.8 [26.5-51.8]	0.08	45.9 [26.5-69.6]	0.08	0.75
	78.7% (37)	<0.001	71.8% (28)	<0.001	0.46
	1.2 ± 2	<0.001	2.1 ± 2.6	<0.001	0.22
				P-value (between all group)§	
	4.6 ± 1.8	0.022	5.6 ± 2.8	0.001	
	48.9% (23)	0.015	48.7% (19)	0.007	
	63.8% (30)	0.03	41% (16)	0.023	
	14.9% (7)	--	15.4% (6)	0.756	
	8.5% (4)	0.4	20.5% (8)	0.014	
	2.8 ± 2.3	0.035	2.1 ± 1.6	0.001	
	2.7 ± 1.9	0.04	1.9 ± 1.7	<0.001	
	18.2 [4.9-23.9]	<0.001	5.7 [4.6-20.6]	<0.001	
	19.2% (9)	--	18% (7)	0.957	
	0% (0)	--	5.1% (2)	0.347	
	8.5% (4)	--	7.7% (3)	0.705	
	6.4% (3)	--	0% (0)	0.216	

They were less likely to ambulate independently, more likely to rely on enteral feeding and carried a higher burden of chronic conditions and medications.

Despite this increased complexity, children in the fully co-managed group experienced similar rates of serious postoperative complications, readmissions and emergency department visits compared to less medically complex patients. In effect, multidisciplinary co-management helped bring outcomes for the most fragile children in line with those of their healthier peers.

REDEFINING SUCCESS FOR COMPLEX PATIENTS

Rather than functioning as a mechanism to shorten hospitalization, co-management appears to serve as a safety framework. The involvement of multiple teams supports early identification of evolving medical issues and proactive management before complications escalate. For children with significant medical complexity, success is not defined solely by speed of discharge but by safe, stable recovery.

Our findings reinforce the importance of close collaboration between surgical and medical teams. Multidisciplinary co-management does not simply add layers of care; it creates alignment, shared accountability and a more resilient system for supporting complex patients through major surgery.



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The Bridge-Enhanced ACL Restoration Procedure Offers Advantages Over Traditional Reconstruction Surgery

Bridge-Enhanced ACL Restoration (BEAR) is a surgical treatment option for patients who have sustained an ACL tear in their knee. Each year, nearly 250,000 ACL ruptures occur in the United States alone. The majority of these injuries are treated with surgery, most commonly, an ACL reconstruction by utilizing a graft. Graft options include allograft and autograft sources. Each option includes its own risk/reward profile. Autograft options typically include patellar tendon, quadriceps tendon and patellar tendon donor sites. These have all demonstrated positive clinical outcomes; they all also involve some form of donor site morbidity. Allograft ACL reconstructions do not include donor site morbidity, but re-injury rates have been shown to be nearly double those after autograft reconstructions. Healing rates and outcomes have been rather inconsistent. This is likely due to the intra-articular environment of the knee, which has been shown to inhibit fibrin clot formation, resulting in inconsistent and incomplete ACL healing.

The BEAR procedure utilizes a proprietary resorbable implant derived from bovine sources, primarily extracellular matrix and collagen (Figure 1). The implant is surgically placed into the patient's knee, along with suturing of the injured ACL tissue back to its original anatomic location. The BEAR implant acts as a bridge, allowing a clot to form between the torn ends of the ACL, thus allowing ligament healing and restoration of knee stability and proprioception (Figure 2). All of this is accomplished

without the use of a graft to replace the injured ligament while demonstrating re-injury rates and patient outcomes that are comparable or non-inferior to ACL reconstruction.

BENEFITS OF THE BEAR PROCEDURE

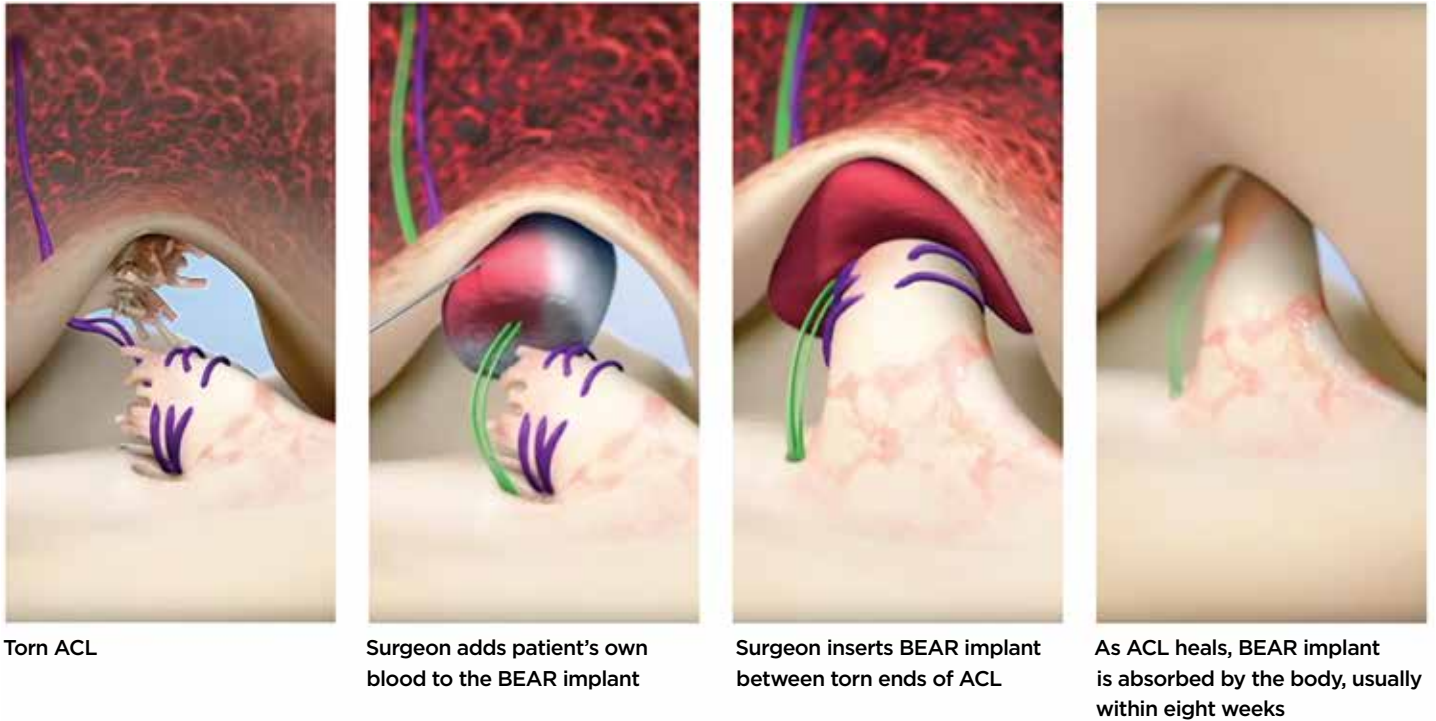
A number of potential benefits of this procedure are offered when compared to traditional ACL reconstruction. Given the BEAR procedure does not require a graft to replace the patient's native ACL, there is no graft site morbidity associated with the procedure. This has been shown to result in significantly improved patient-reported postoperative pain scores in BEAR patients compared to ACL reconstruction patients. Early studies have also demonstrated superior hamstring-to-quadriceps strength ratios in BEAR patients compared to ACL reconstruction. This has the added benefit of decreased rates of contralateral knee ACL tears, which can be found in ACL reconstruction patients. One potential long-term benefit of the BEAR procedure may be a lower rate of long-term osteoarthritis progression. Most studies suggest at least 50% of patients with a history of ACL injury go on to develop radiographic evidence of arthritis. In pre-clinical porcine testing, the BEAR procedure demonstrated a significant reduction in knee osteoarthritis at 12 months post-procedure compared to both ACL transection and ACL reconstruction. If confirmed in long-term human studies, this may indeed be the greatest advantage of the BEAR procedure.

Figure 1

The BEAR procedure utilizes a proprietary resorbable implant derived from bovine sources, primarily extra-cellular matrix and collagen.



Figure 2



CANDIDATE CONSIDERATIONS

This procedure is indicated for the treatment of complete ACL tears in most patients. Current FDA approval includes patients 14 years and older with closed growth plates. However, the BEAR procedure can and has been used to safely treat ACL injuries in younger patients. In these cases, a growth plate sparing technique should be utilized. The timing of the patient's injury and treatment is also important, as it is recommended to perform the BEAR procedure within 50 days from the initial ACL injury. Additional consideration should also be given to the type of ACL tear, as well as the patient's activities and personal goals. As with any injury and proposed surgery, a robust discussion of the options and shared decision-making allows for the highest likelihood of success and patient/family satisfaction.

SURGERY AND RECOVERY

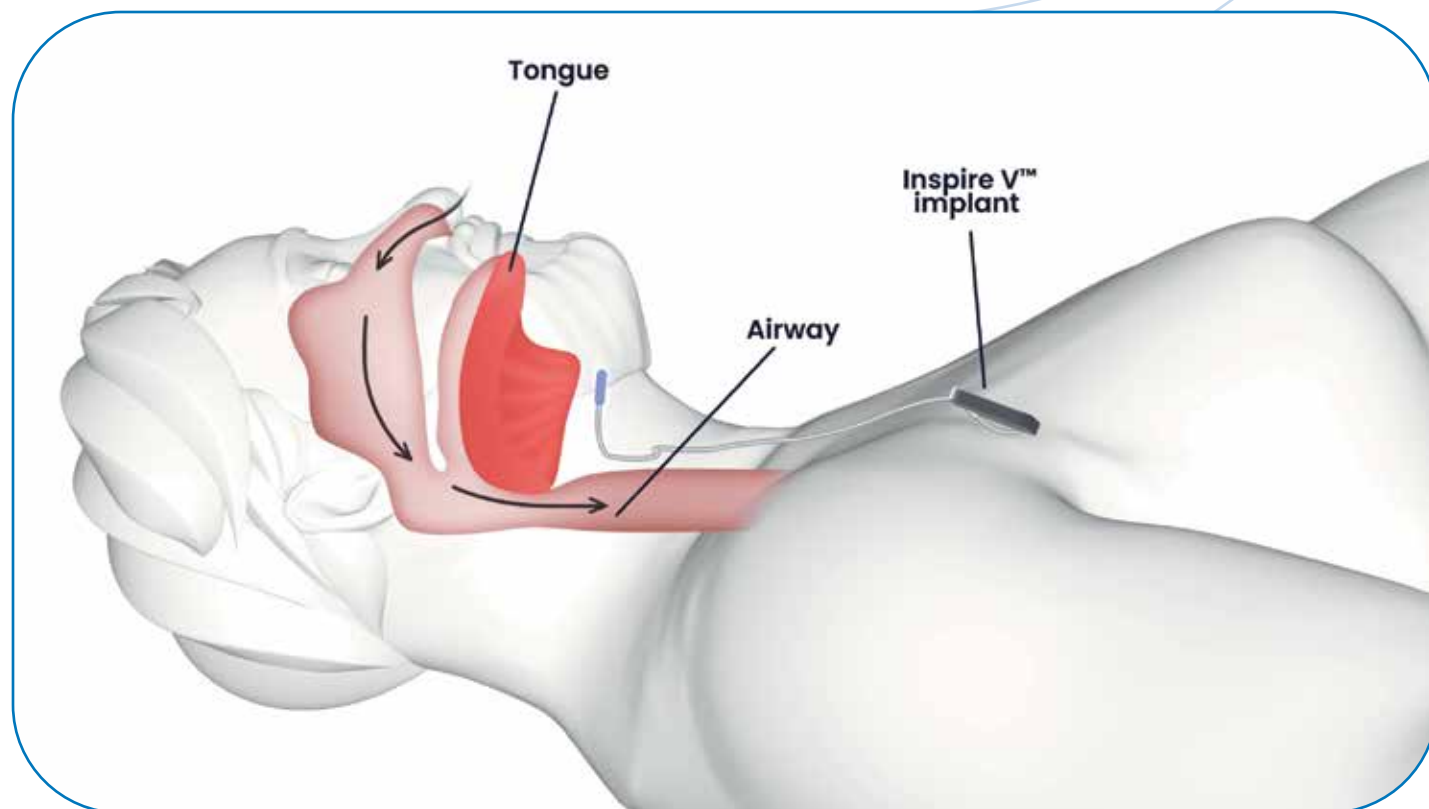
The BEAR procedure is arthroscopically assisted and typically occurs in an outpatient (day surgery) setting. Postoperatively, patients are protected in a knee brace and crutches and

referred to physical therapy to work on their range of motion and strengthening. Running and sport-specific training activities are typically initiated at the four- and six-month postoperative marks, respectively. Return to sport clearance/progression occurs no sooner than nine months after surgery, with most patients returning to their usual sports and activities between nine and 12 months after surgery.

In summary, while it may not be the best fit for every patient, the BEAR procedure offers a novel treatment option for patients with an ACL tear. Ligament preservation offers significant potential advantages over ACL reconstruction. However, much remains to be learned regarding long-term benefits and outcomes.



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Expanding Alternatives to CPAP: Hypoglossal Nerve Stimulation for Sleep-Disordered Breathing in Children With Down Syndrome

Obstructive sleep apnea (OSA) is common in children with Down syndrome and often proves difficult to treat. Many patients continue to experience clinically significant disease even after adenotonsillectomy. Continuous positive airway pressure (CPAP) can improve breathing, but many families struggle with long-term tolerance. When standard treatment options fail, clinicians have limited alternatives.

To address this gap, our team at Children's Wisconsin developed the Alternatives to CPAP Program, which emphasizes careful evaluation and individualized treatment planning. Our team assesses children with persistent sleep apnea through a multidisciplinary process, which may include drug-induced sleep endoscopy. By directly evaluating airway collapse during sleep, we can identify anatomic contributors and match patients with the most appropriate surgical or non-surgical options.

The Alternatives to CPAP Program recently introduced hypoglossal nerve stimulation using the Inspire system for a small, carefully selected group of adolescents with Down syndrome. The FDA has approved the device for patients age 13 and older with severe OSA who cannot tolerate CPAP and meet defined anatomic and physiologic criteria. During sleep, the system stimulates the hypoglossal nerve to support airway patency without relying on external airway pressure.

Children's Wisconsin became the first center in the Midwest to implant the latest Inspire V system in a pediatric patient with Down syndrome. The first patient our team treated with Inspire V showed meaningful improvement in nighttime breathing without reliance on CPAP. These early results are promising and highlight the potential role of hypoglossal nerve stimulation for patients with few remaining treatment options.

From left to right: Michael Gorelik, MD;
Cecille Sulman, MD, Jennifer Schmid;
Axel Shum, MD



Our team applies this technology deliberately. Rather than positioning Inspire as a replacement for other therapies, we incorporate it as one option within a broader Alternatives to CPAP framework. A multidisciplinary team guides patient selection, and structured follow-up includes device adjustment and ongoing monitoring to support safety and effectiveness.

As our team gains more experience, we will continue to evaluate which patients benefit most from hypoglossal nerve stimulation and learn how to most effectively integrate the technology into long-term care. For families who have struggled with existing therapies, the availability of an additional, carefully applied option marks an important step toward improving sleep health and quality of life.



Cecille Sulman, MD
Medical Director of
Otolaryngology, Children's
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Professor and Chief of
Pediatric Otolaryngology,
Medical College of
Wisconsin

Qualifications for Inspire Therapy

Children with Down syndrome who meet the following criteria may be candidates for Inspire.

- Age 13 or older
- Diagnosed with severe obstructive sleep apnea (between 10 and 50 events per hour)
- Not effectively treated by adenotonsillectomy
- Inability to tolerate or failed CPAP use



Scan to learn
more about our
ENT Program.



Endoscopic Ultrasound and Endoscopic Retrograde Cholangiopancreatography Procedures

Advanced endoscopy plays an important role in the diagnosis and management of complex gastrointestinal disease in children. Yet nationwide, there is limited access to pediatric-trained physicians with expertise in interventional procedures such as endoscopic retrograde cholangiopancreatography (ERCP) and endoscopic ultrasound (EUS). ERCP is used to diagnose and treat disorders of the bile ducts and pancreas. EUS combines endoscopy with ultrasound imaging to evaluate gastrointestinal, pancreatic and other abdominal structures. Until recently, many children

in Wisconsin who required these procedures had to seek care at an adult hospital or leave the state, often facing delays and added strain on families.

In October 2024, our team at Children's Wisconsin launched the Advanced and Interventional Endoscopy Program to bring this level of care closer to home. The program grew out of specialized interventional training completed by Diana Lerner, MD, at the University of Colorado Anschutz Medical Center. Fewer than 20 pediatric gastroenterologists nationally have formal training in both ERCP and EUS, a reality that has long

constrained access to these procedures in pediatric settings. By establishing our Advanced and Interventional Endoscopy Program, we expanded our clinical reach and strengthened continuity for patients and referring providers.

For many pediatric gastroenterology teams, advanced endoscopy has reshaped how we manage a wide range of complex gastrointestinal conditions. Through ERCP, we now treat biliary and pancreatic disorders such as choledocholithiasis, biliary strictures and select causes of pancreatitis without defaulting to surgical intervention. Meanwhile, EUS offers high-resolution imaging of the pancreas, biliary tree and surrounding structures and is helpful in targeted tissue sampling when clinical questions demand greater precision. Together, these tools shift decision-making earlier in the care pathway and reduce reliance on more invasive approaches.

Keeping advanced endoscopy within our pediatric system has also changed the experience for patients and families. Rather than navigating transfers to adult-focused or out-of-state centers, children now receive evaluation, intervention and follow-up care in a familiar and pediatric-focused environment. Referring physicians can also benefit from tighter communication loops and more predictable care timelines, particularly when managing children with evolving or complex gastrointestinal disease.

DEEPENING COLLABORATION ACROSS CHILDREN'S WISCONSIN

Advanced endoscopy frequently sits at the intersection of diagnosis and definitive treatment, fostering shared planning discussions involving experts in numerous specialties, including:

- Anesthesia
- Pathology
- Hepatology
- Radiology
- Oncology
- Surgery
- Pancreatology
- Transplant

We now design care plans collaboratively, aligning imaging, endoscopic intervention and surgical decision-making to reduce fragmentation and improve efficiency.

In many cases, this coordination supports combining procedures under a single anesthetic. For children with medical complexity or those who require multiple interventions, minimizing repeated anesthetic exposures matters. Achieving this

By establishing our Advanced and Interventional Endoscopy Program, we expanded our clinical reach and strengthened continuity for patients and referring providers.

coordination requires deliberate scheduling, early communication and shared ownership across teams. This reduces procedural and financial burdens for families and reinforces a system-wide commitment to coordinated care.

Although the program remains in the early stages of development, we have already seen a tangible operational impact. Timely access to advanced diagnostic and therapeutic options has reduced delays and improved efficiency. Families frequently express relief at staying within our system for care that previously required travel. Referring physicians describe stronger collaboration and clearer pathways for escalation when advanced intervention becomes necessary. And as procedural volume grows, we plan to track outcomes, utilization and downstream effects on surgical care to better understand long-term impact.

It's important to understand that pediatric anatomy and disease presentation differ fundamentally from adult practice, and procedural risk requires thoughtful case selection and technical expertise. By investing in formal interventional training and building a dedicated program, we created a structure that provides the institutional support needed to enhance safety and effectiveness.

Looking ahead, we plan to continue expanding our Advanced and Interventional Endoscopy Program while strengthening regional collaboration. As experience grows, we see opportunities to develop clearer care pathways, intervene earlier in disease progression and further reduce the need for invasive surgery.

By building interventional endoscopy capability within pediatric gastroenterology, we have expanded what is possible for children with complex gastrointestinal disease at Children's Wisconsin.



Diana Lerner, MD
Pediatric Gastroenterologist,
Children's Wisconsin

Professor, Medical
College of Wisconsin



**Scan to read how
our team used ERCP
to help a family find
answers and provide
them with lifesaving
care closer to home.**

Radiation Plaque for Retinoblastoma

Retinoblastoma is a rare and aggressive eye cancer that affects young children, most often before the age of 5. Treating the disease requires urgency, technical precision and close coordination across specialties. For clinicians and families alike, the goal is to preserve vision and to avoid both metastasis and eye removal.

At Children's Wisconsin, we serve as a referral center for retinoblastoma, providing comprehensive, multidisciplinary care for children across the region. Our team brings together Ophthalmology, Oncology, Radiation Oncology, Anesthesia and specialized nursing to manage a disease that demands seamless collaboration. As treatment options have evolved, so has our program.

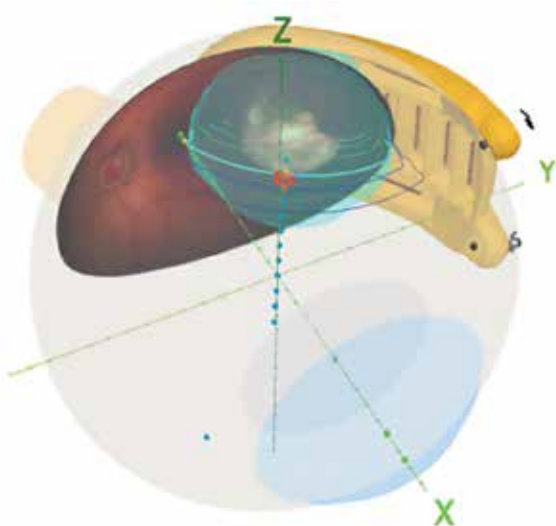
In September 2025, we performed the first plaque brachytherapy procedure for retinoblastoma in the state of Wisconsin. This milestone marked a significant expansion of our ability to offer eye-sparing therapy for carefully selected patients. The procedure was completed for a child referred from out-of-state and required coordination across institutions, teams and clinical environments.

Plaque brachytherapy delivers targeted radiation directly to the tumor while minimizing exposure to surrounding tissue. Each radiation plaque is custom-designed for the individual child, sized and shaped to match the eye and precisely target the tumor. The plaque contains lead pellets that emit a controlled dose of radiation over three to four days. After careful localization in the operating room, surgeons suture the plaque directly to the surface of the eye. Once the planned treatment duration is complete, the team removes the plaque, limiting radiation exposure to surrounding structures.

The precision of plaque brachytherapy distinguishes it from other radiation approaches. The radiation dose drops off rapidly with distance, concentrating treatment at the tumor while sparing critical structures such as the optic nerve and macula. This distinction carries particular importance for children with retinoblastoma. These patients face an elevated lifetime risk of second cancers, a risk that broader radiation exposure can increase. Because plaque brachytherapy delivers radiation focally, it does not raise the risk of secondary malignancies. Reported tumor control rates range from 80–90%,

**Our team
brings together
Ophthalmology,
Oncology, Radiation
Oncology, Anesthesia
and specialized
nursing to manage
a disease that
demands seamless
collaboration.**

**Custom radiation plaque designed
for the tumor and the individual eye**



and successful treatment often preserves the eye, avoiding enucleation.

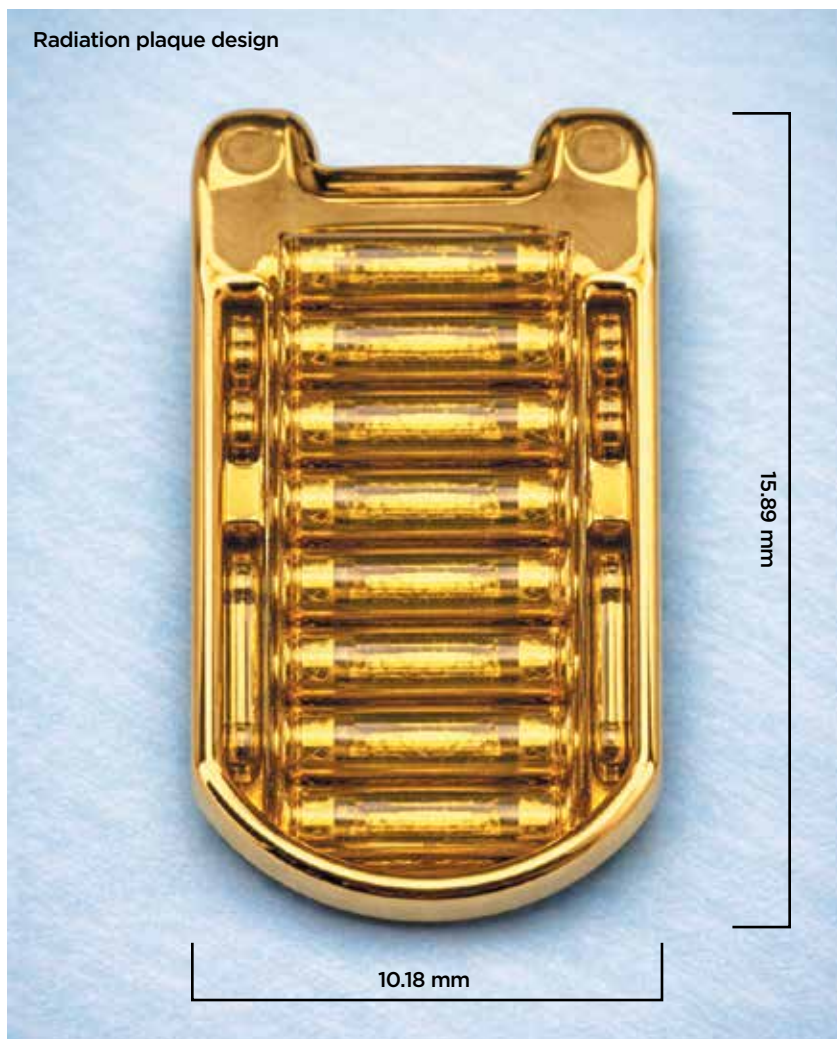
Bringing plaque brachytherapy to Children's Wisconsin required coordination beyond our standard operating environment. Radiation privileges necessitated a shared-care model across institutions. Our ophthalmology and anesthesia teams worked with our colleagues in radiation oncology from the Medical College of Wisconsin. Together, we performed the procedure in the Froedtert Hospital Interventional Radiology Suite, aligning safety protocols, staffing and workflow across systems. This level of coordination reflects both the complexity of the therapy and the commitment shared by all involved.

The addition of plaque brachytherapy strengthens an already robust Retinoblastoma Program. Our multidisciplinary model allows us to tailor treatment plans to each child, balancing tumor control with long-term visual outcomes. For families, access to this therapy within a coordinated pediatric care system reduces the need for distant referrals and fragmented care.

This first case represents a foundation rather than a finish line. We plan to continue growing the Retinoblastoma Program and establish Children's Wisconsin as a regional center of excellence in the Midwest. Our team is actively engaged in research aimed at improving outcomes, including the exploration of chemotherapy-based plaque therapy as an alternative to radiation. In parallel, we are collaborating with radiation oncology partners to evaluate additional targeted approaches that may further reduce treatment burden.

For children with retinoblastoma, the difference between eye salvage and enucleation can shape quality of life for decades. By adding plaque brachytherapy to our treatment options, we have expanded our ability to individualize care and preserve vision without compromising oncologic control. This milestone reflects not only technical capability, but also the multidisciplinary culture that defines how we care for children with complex, high-risk disease at Children's Wisconsin.

Radiation plaque design



Aparna Ramasubramanian, MD

Medical Director of Ophthalmology,
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of Wisconsin



Scan to read how two families impacted by retinoblastoma formed a lifelong bond while receiving care from Dr. Ramasubramanian at Children's Wisconsin.

Quality Improvement Infrastructure for Hypospadias Surgery: Using Data to Refine Technique and Improve Outcomes



Hypospadias repair is among the most technically demanding procedures in pediatric urology. Success depends on meticulous surgical technique, thoughtful patient selection and experience gained over time. Even with fellowship training, outcomes can vary, and mastery requires ongoing refinement. Recognizing these challenges, our team of pediatric urologists at Children's Wisconsin developed a structured quality improvement approach designed to support continuous learning and improve surgical outcomes.

In 2015, the Urology Program team established a quality improvement database to systematically track outcomes for patients undergoing hypospadias repair. Our goal was not to simply document success rates, but to create a tool that would allow surgeons to evaluate their own results, understand complications and adjust techniques in real time. Today, the database includes data on more than 1,000 unique patients and captures outcomes across all types of hypospadias repairs performed at Children's Wisconsin.

Hypospadias repair presents a unique challenge, because there is no single surgical technique that fits every patient. Variations in anatomy, severity and associated conditions require surgeons to choose from multiple approaches, each with its own learning curve. Published research suggests that achieving consistent, acceptable outcomes may require more than 100 cases, underscoring the importance of experience and feedback. Without structured data, however, identifying patterns or areas for improvement can be difficult.

The database at Children's Wisconsin was designed to address this gap. All of our pediatric urologists contribute to the initiative, ensuring comprehensive and consistent data collection. Outcomes are reviewed on an ongoing basis, with formal evaluation incorporated into larger, team-wide discussions where we collectively examine trends, complications and technique selection. This structure allows insights from individual cases to inform shared learning and practice refinement across the group.

The database tracks surgical techniques, complications and the need for secondary procedures, allowing outcomes to be evaluated at both

the individual and program level. Surgeons receive individualized performance summaries — often described as “report cards” — that provide insight into their results over time. This feedback is used to promote self-reflection, technical adjustment and informed decision-making.

In practice, the database has enabled surgeons to identify specific factors associated with postoperative outcomes. For example, patterns in complication timing and postoperative utilization have informed changes in follow-up protocols and perioperative counseling. The analysis of technique-specific outcomes has helped guide more tailored surgical decision-making for patients with distinct anatomic characteristics.

Early outcomes suggest meaningful progress. Among patients undergoing distal hypospadias repair from 2017 to 2022, the rate of secondary surgeries decreased from 9.5% to 4%, using a two-year complication review period. While multiple factors likely contribute to this improvement, the ability to systematically track outcomes and refine technique over time has been a central component of our team's quality improvement efforts.

Beyond individual outcomes, the database reinforces the value of subspecialty training and experience in pediatric urology. Hypospadias repair is a procedure that often distinguishes pediatric urologists from general urologists, requiring a depth of expertise that develops

over years of focused practice. By pairing that expertise with data-driven feedback, we have created an environment that supports accountability, learning and surgical excellence.

Looking ahead, our team will continue using the database to monitor individual outcomes and further define which surgical techniques are most effective for specific patient populations. As the dataset continues to grow, it may also support broader research initiatives and inform best practices beyond the institution. For now, the focus remains on embedding quality improvement directly into clinical practice.

For pediatric urologists, hypospadias repair represents both a technical challenge and an opportunity for continuous growth. By investing in durable quality improvement infrastructure, Children's Wisconsin has built a model that supports surgeons as they refine their skills, improves outcomes for patients and reinforces a long-term commitment to delivering the highest standard of care.

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2017 secondary
surgery rate
9.5%

**From 2017 to
2022, the rate
of secondary
surgeries
decreased from
9.5% to 4%,
using a two-year
complication
review period.**

2022 secondary
surgery rate **4%**



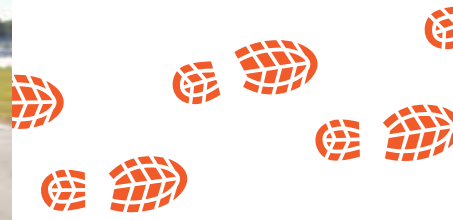
Scan to learn
more about our
Urology Program.



Children's Wisconsin patients, families and local community of all ages come together to celebrate at the "festival of fun" in Milwaukee

Rally Round

For 45 years, the Children's Wisconsin community has laced up their sneakers and gathered with loved ones to participate in Al's Run & Walk for Children's Wisconsin. We shared stories, celebrated triumphs and remembered those children who inspired us every step of the way. Rally Round represents a renewed promise. A promise to continue the legacy of Al's Run & Walk and create an experience that resonates with a new generation of supporters. Rally Round was a party, a pep rally and a new way to come together as a community. This family-centered event featured live entertainment, interactive games and activities, local food



Rally Round is a powerful testament to the love and support the community has for the kids of Wisconsin, bringing people together across the state.



vendors and running and walking activities — something for participants of all ages. Thousands of community members joined Children's Wisconsin in demonstrating their commitment to supporting the health and wellness of kids throughout the state. Every dollar raised directly advances Children's Wisconsin efforts statewide in research, advocacy, patient care and educational programs, helping build healthier futures for children and families statewide. Support from Rally Round helps Children's Wisconsin:

- **Provide exceptional care:** From routine checkups to complex surgeries, this support ensures that every child receives the highest quality care, regardless of their family's ability to pay.
- **Advance groundbreaking research:** Donations help fund critical research that leads to new treatments and cures for childhood illnesses, giving kids a healthier tomorrow.
- **Expand vital programs and services:** Support allows Children's Wisconsin to reach more families with essential programs like mental and behavioral health services, child advocacy and community outreach initiatives.



Interested in learning more about Rally Round? Scan here.





40 Under 40

Children's Wisconsin is proud to share that Caroline Maloney, MD, PhD, Pediatric Surgeon at Children's Wisconsin and Assistant Professor of Surgery at the Medical College of Wisconsin, has been named one of Milwaukee's 2026 40 Under 40.

"In my 15 years of training pediatric surgeons, Dr. Maloney is the best of the best."

Amy Wagner, MD

The Milwaukee Business Journal's annual 40 Under 40 Award spotlights young professionals who are going above and beyond to shape their organizations and communities.

Dr. Maloney joined Children's Wisconsin as a Pediatric Surgery Fellow in 2023. She has played an instrumental role in developing the Thoracic Robotic Surgery Program at Children's Wisconsin and is responsible for the growth of minimally invasive surgery at Children's Wisconsin and improved outcomes for countless children. Dr. Maloney's surgical practice and laboratory at Children's Wisconsin has already been successful, as a leader in the field of surgical oncology and in the competitive world of grant applications.

"In my 15 years of training pediatric surgeons, Dr. Maloney is the best of the best," said Amy Wagner, MD, Pediatric General Surgeon. "I have no doubt that she will not only continue in her career to personally help and save the lives of thousands of children in the Milwaukee area, but to also make an impact and improve the way we treat pediatric cancer to save the lives of pediatric cancer patients all over the world."

Her dedication to innovation, compassionate patient care and advancement of surgical techniques elevate the standard of pediatric treatment. Her success will undoubtedly allow us at Children's Wisconsin, and the Medical College of Wisconsin (MCW), to recruit additional promising surgeon scientists. She hosted an undergraduate student this past summer allowing them to gain experience in her lab, which she plans to continue. She also mentors young physician scientists and medical students at MCW, specifically as an active participant in AMWA, the American Medical Women's Association.

What's most impressive about Dr. Maloney is not just what she has accomplished, but how she has accomplished her achievements — with kindness, humility and grace.



Milwaukee Business Journal

New Providers

Anesthesiology



Joseph Robey, CAA

Anesthesia Assistant, Children's Wisconsin and Medical College of Wisconsin



Nhan Pham, CAA

Anesthesia Assistant, Children's Wisconsin and Medical College of Wisconsin

Otolaryngology



Maria Park, PA-C

Physician Assistant, Children's Wisconsin and Medical College of Wisconsin

Urology



Susan Jarosz, DO

Pediatric Urologist, Children's Wisconsin
Assistant Professor, Medical College of Wisconsin

Neurosurgery



Ros Whelan, MD

Pediatric Neurosurgeon, Children's Wisconsin
Assistant Professor, Medical College of Wisconsin

Ophthalmology



Carleigh Bruce, MD

Pediatric Ophthalmologist, Children's Wisconsin
Assistant Professor, Medical College of Wisconsin



The DASH Annual Report, Issue 1 showcases how Children's Wisconsin is advancing pediatric care through multidisciplinary collaboration, data-driven innovation and standardized clinical pathways. These initiatives improve safety, outcomes and access while shaping more coordinated, efficient models of care. Explore the full articles online to learn more about each program and its impact.



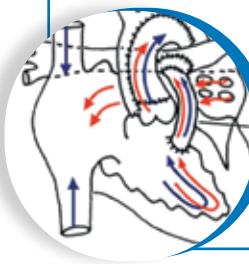
ELEVATING TRAUMA AND BURN CARE THROUGH MULTIDISCIPLINARY PRACTICE

Care for critically ill pediatric patients has been enhanced through standardized guidelines for inhalational burn injuries and targeted efforts to reduce cervical collar-related pressure injuries. These coordinated, data-driven interventions improved consistency, prevention and overall patient safety.



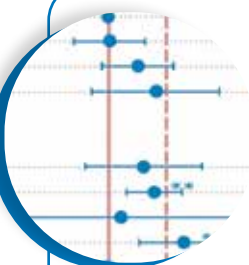
RAISING THE BAR IN AIRWAY SAFETY: TRACHEAL INTUBATION EXCELLENCE IN THE PICU AND CICU

A standardized Airway Bundle improved pediatric intubation safety by strengthening team coordination, planning and communication. Ongoing quality improvement and data-driven practices significantly reduced complication rates and reinforced a culture of high reliability in critical care.



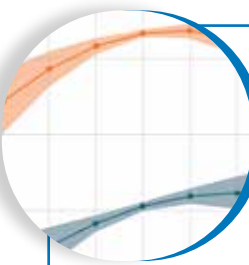
THE NORWOOD PATHWAY: STANDARDIZING CARE TO IMPROVE OUTCOMES

A multidisciplinary Norwood Pathway standardized communication and care for infants undergoing this high-risk heart surgery. The approach improved survival rates and reduced ICU and hospital length of stay, highlighting the impact of coordinated, data-driven care.



MULTIPLE PROCEDURES UNDER ONE ANESTHETIC: GUIDANCE FOR CARE

Analysis of more than 200,000 anesthetic cases showed that prolonged anesthesia time, not multiple exposures, is the primary driver of increased risk. With careful planning and coordination, combined procedures can be performed safely while improving efficiency and reducing family burden.



PERSONALIZING PERFUSION: HEMODYNAMIC MANAGEMENT IN PEDIATRIC ANESTHESIA

Near-infrared spectroscopy (NIRS) enables real-time monitoring of organ-specific perfusion, supporting more precise and individualized anesthesia management. This approach detects critical changes not captured by traditional metrics, allowing for earlier intervention and improved outcomes in high-risk patients.

VISION SCREENINGS: PROTECTING SIGHT THROUGH EARLY DETECTION

A collaborative, data-driven vision screening program improves early detection of amblyopia by integrating primary care and specialized eye services. Expanded access and advanced screening technology support earlier diagnosis, timely treatment and better long-term outcomes.



CHILDREN'S WISCONSIN OPENS NEW MULTIDISCIPLINARY PEDIATRIC KIDNEY STONE CLINIC

A multidisciplinary kidney stone clinic delivers connected, preventive and personalized care for children with a growing risk of recurrent disease. Integrated specialties and a focus on long-term outcomes enhance care delivery while advancing research and future treatment strategies.



ADVANCING PEDIATRIC SURGICAL IMAGING THROUGH INTERVENTIONAL COLLABORATION

An advanced imaging suite integrates interventional radiology into the surgical platform, improving precision, safety and efficiency across specialties. The hybrid model enables innovative treatments while expanding access to complex, minimally invasive care.



CLOSING THE LOOP: ADVANCING THE "ACT" PHASE IN CARDIAC SURGICAL QUALITY IMPROVEMENT

Cardiac surgical quality improvement often stalls at data analysis, underscoring the need to fully execute the "Act" phase of the PDSA cycle. Models like the "Flight Plan" and Clinical Case Review translate insights into real-time improvements, strengthening collaboration and outcomes.



PUSHING BOUNDARIES IN PEDIATRIC SURGERY: LAUNCHING ONE OF THE NATION'S FIRST PEDIATRIC ROBOTIC THORACIC PROGRAMS

In partnership with Froedtert Hospital, a pediatric robotic thoracic surgery program expands minimally invasive options for complex conditions. Multidisciplinary collaboration and specialized training are advancing surgical precision, safety and innovation in pediatric care.



ONE TEAM, ONE GOAL: IMPROVING FIRST CASE ON-TIME STARTS AT CHILDREN'S WISCONSIN

The DASH team's "One Team" approach drives first case on-time starts in the operating room, improving efficiency, coordination and patient care. Timely starts enhance the patient and family experience while reflecting strong teamwork and shared accountability.



IMPROVING THE TRANSITION FROM PEDIATRIC TO ADULT TRANSPLANT NEPHROLOGY CARE

A structured, multidisciplinary transition program supports adolescents with kidney transplants as they move to adult care, addressing risks of graft failure and nonadherence. Emphasis on early education, skills-based readiness and coordinated care improves continuity and long-term outcomes.



FORWARD PEDIATRIC ALLIANCE

Forward Pediatric Alliance unites Children's Wisconsin and UW Health Kids in a "one program, two campuses" model, bringing together more than 80 specialists to advance pediatric cardiac care. This expands access, strengthens outcomes and fosters innovation across the region.





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Keeping you informed

CONNECT WITH PHYSICIAN LIAISONS IN PERSON OR VIRTUALLY

The Children's Wisconsin physician liaison team is here for referring physicians whenever and wherever you need us.

In addition to serving as a link between Children's Wisconsin and referring physicians, your liaisons can:

- Provide information about services and programs offered by Children's Wisconsin
- Direct you to continuing education opportunities
- Facilitate solutions to referral issues

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