Physicians:  
Patrick Dillon, MD, pediatric surgeon,  
St. Louis Children’s Hospital (SLCH)  
Shawn Larson, MD, pediatric surgery fellow, SLCH

Background: During a routine ultrasound at 19 weeks' gestation, Sarah and Jason Hanebrink of Brighton, Illinois, learned their baby had an omphalocele. Occurring in approximately one in 5,000 births, an omphalocele is a type of hernia in which the intestine and/or other abdominal organs protrude through a defect in the abdominal wall at the umbilicus. A thin layer of tissue usually covers the defect. According to the National Institutes of Health, approximately 25 to 40 percent of infants with an omphalocele have other birth defects, including sometimes-severe cardiac defects and chromosomal abnormalities.

"Once the omphalocele was discovered, our obstetrician immediately referred us to The Fetal Care Center," says Sarah Hanebrink. "Physicians there recommended we have a fetal heart echocardiogram and an amniocentesis done. Fortunately, those didn't indicate any other birth defects."

Baby Ike was delivered at Barnes-Jewish Hospital on August 27, 2010. He immediately was transported to SLCH's newborn intensive care unit (NICU), where Dr. Dillon examined him.

The surgical challenge: According to Dr. Dillon, the decision about when and how to correct omphaloceles depends on the defect's size and whether the baby has associated anomalies. "In babies with cardiac defects, treatment of those takes priority," he says. "For babies in good health with relatively small omphaloceles, their defects can be closed within the first days of life as long as there is enough room in the abdominal cavity to hold the organs."

Some infants need a silastic sheet of material sewn around their omphaloceles, creating a silo. The intestine and liver rest in the silo, and daily pressure is placed on the organs to reposition them inside the body. Usually within a week or so the abdominal cavity has stretched enough to allow for closure of the defect.

In Ike's case, a different approach was needed. "Although Ike was in good health, his omphalocele was large, with both his intestine and liver outside..."
of his abdomen. Whenever we tried to compress his organs, he developed apnea and couldn’t tolerate his feedings because of reflux,” says Dr. Dillon.

To alleviate Ike’s complications, Dr. Dillon chose to apply a topical treatment that promotes epithelialization and then wrapped Ike’s omphalocele with an elastic bandage.

“Applying this gentler type of pressure alleviated Ike’s bradycardia, apnea and reflux. Since his omphalocele was covered, I felt there was no urgency to operate on him,” says Dr. Dillon. “A better course of action was to wait several months while the intestine and liver gradually compressed. This approach also would give Ike time to nearly double his birth weight.”

After Ike’s parents received instruction and practice on how to wrap the bandage, Ike went home after spending two months in SLCH’s NICU.

The surgical approach: By January 2011, Ike was ready for surgery. Dr. Dillon chose to perform a component separation procedure, which is described primarily in adult surgical literature for closing abdominal defects such as large ventral hernias.

“The premise for using this technique is that you can gain extra length and mobility by separating the fascia and muscles along certain lines of dissection,” he explains. “By separating some of the muscle layers, there was more room within the abdomen to work, with the result that we didn’t need to use a patch in order to gain closure.”

Dr. Dillon believes that the more conservative approach of gentle compression through wrapping, waiting to perform surgery, and then using the component separation surgical technique helped Ike avoid complications.

“The main worry in closing omphalocoeles is that a hernia or defect will develop where you did the repair,” he says. “If we had closed Ike’s omphalocele earlier, we may have had to use a patch or there may have been too much tension, both of which can result in a recurrence.”

The outcome: Ike was doing well at his checkup in late February. “Ike should continue to heal and grow normally without the need for further surgery,” says Dr. Dillon. “And his intestine and liver should be normal and healthy. As he grows, there shouldn’t be any restriction on his activity level. When he gets older and goes to school, he can play on the playground with all the rest of the kids.”

Dr. Dillon believes that access to advanced surgical techniques is not the only advantage for parents of babies with omphalocoeles who come to St. Louis Children’s Hospital and the Fetal Care Center. “Basically, we have the whole package that’s needed for these patients, from obstetricians specializing in high-risk pregnancies and maternal-fetal medicine specialists, to newborn medicine physicians familiar with these problems,” he says. “Fortunately, Ike didn’t have any other birth defects, but many of these babies need the specialized cardiac care and genetic testing available at Children’s Hospital.”

For more information about omphalocele or to speak with a pediatric surgeon, call Children’s Direct at 800.678.HELP (4357).
Interventional Radiology Services at SLCH

is a subspecialty of radiology using image-guided, minimally invasive procedures that often are alternatives to conventional surgery. X-rays, ultrasound and other medical images are used to guide small instruments such as catheters through the blood vessels or other pathways to treat or diagnose disease. Among the conditions treated are:

**Angiography and vascular interventions**
- GI bleeding
- Bronchial bleeding
- Trauma
- Vascular malformation
- Renovascular HTN
- Venography, venous PTA/stenting
- Angioplasty, stenting, thrombolysis
  - Venous access
- Placement of PICCs
- Placement and maintenance of pheresis, dialysis and infusion catheters
- Temporary central venous catheters

**Gastrointestinal**
- Placement of gastrostomy and gastrojejunostomy feeding tubes
- Placement of cecostomy tubes

**Drainages**
- Paracentesis
- Thoracentesis
- Percutaneous drainage of abscesses and fluid collections
- Placement of chest tubes

**Obstructive uropathy**
- Nephrostomy, nephroureterostomy and urteronephrostomy
- Ureteral stents
- Percutaneous access for stone retrieval
- Suprapubic drainage

**Biliary intervention**
- Biliary drainage (native & transplant liver)
- Cholecystostomy
- Biliary percutaneous stone retrieval

**Image-guided biopsies**
- Thyroid
- Liver (percutaneous and transjugular)
- Kidney
- Lung
- Lymphatic

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**SLCH News | Interventional Radiology Hits Milestone of 1,000 Patients Treated**

St. Louis Children’s Hospital’s (SLCH) interventional radiology suite, opened in October 2008, reached a milestone of 1,000 patients in December 2010. That number outpaced projections for the service, which grew 40 percent between its first and second years. “It’s been gratifying for all the interventional radiologists and team members to see the acceptance of our capabilities by other Children’s Hospital services, as well as the acknowledgement of the added value we bring to the care of pediatric patients,” says Jim Duncan, MD, PhD, interventional radiologist with the Mallinckrodt Institute of Radiology.

A factor contributing to the success of interventional radiology at SLCH is the ability to offer more routine procedures like peripherally inserted central catheters (PICCs) placement and abscess drainage along with new, more complex procedures. “Among the new procedures we’ve adopted are image-guided biopsies and treatment of venous blood clots,” says Dr. Duncan. “We also can treat children with appendicitis, draining the infection through an incision rather than having patients on long-term antibiotics or undergoing major surgery. Patients can quickly turn around with this type of treatment.”

Integral to the SLCH’s interventional radiology suite is a recording system that allows physicians to document procedures from start to finish. The capability provides valuable insight for physicians into how they may improve their techniques and approaches to procedures. A recent improvement to the system is the ability to track the amount of radiation being used midway through procedures. It allows physicians to pinpoint at what points during their procedures they were able to reduce radiation usage and hopefully duplicate those actions in the future. “The recording system also acts as a safety check for us,” says Dr. Duncan. “We regularly monitor whether we are taking time to complete our safety checklist prior to beginning our procedures. If we are not, then we know what areas to work on.”

Another major advantage of the interventional radiology service at SLCH is its accessibility, says Melissa Fitzpatrick, RT(R). “We are available 24 hours a day and on weekends, which is an important convenience for our referring physicians,” she says. “And this is a suite dedicated to children, which means pediatric anesthesiologists, nurses and technicians—even the appropriate supplies—are all close at hand.”

Interventional radiology accepts referrals from both in-house and community physicians. For additional information, contact Children’s Direct at 800.678.4357.
On behalf of the children whose families have traveled the farthest for care and the tiniest babies whose journeys have just begun, this year’s Advocacy Awards spotlight the St. Louis area’s newest arrivals.

St. Louis Children’s Hospital presented the 2010 Advocacy Awards to Anna Crosslin, President and CEO of the International Institute, and Illinois State Representative Tom Holbrook. Established in 1994, the awards recognize local and state leaders who leverage their positions, resources and influence to do what’s right for kids. Lee Fetter, SLCH president, presented the awards on Friday, March 11.

Anna Crosslin, The International Institute Community Advocate of the Year

From the time she arrived at the International Institute in 1978, Anna Crosslin has made meeting the medical needs of the immigrant and refugee population a priority. One of her most vivid memories is the arrival of a mother and daughter from Cambodia. “That mother had lost everything,” Crosslin says. “Her husband and six children were killed in Cambodia. She arrived with the only child she had left.”

That child had a large and life-threatening facial tumor. A Children’s Hospital surgeon agreed to operate.

Months later, a woman approached Crosslin in the grocery store and pointed to a little girl not far away. Crosslin took a moment to make the connection. “The little girl was beautiful. She survived the operation and had a life.”

That story is one of many instances of cooperation Crosslin has helped facilitate as President and CEO of the International Institute, a nonprofit agency and member of the United Way. The organization provides essential aid to refugees and immigrants, advancing their independence by eliminating language and cultural barriers.

“That’s almost a given that children and adults will have some kind of health issues when they arrive. It becomes a very important part of what we do to help integrate them into the community,” Crosslin says.

The International Institute partners with SLCH to meet the most critical medical needs of the youngest new Americans. The hospital’s mobile health van, Healthy Kids Express, provides immigrant and refugee children with immunizations required for school.

Crosslin is excited her honor will spotlight the work of the International Institute. “From the point of accepting it on behalf of my staff, I’m honored.”

Representative Tom Holbrook State Advocate of the Year

In his 16 years serving in the Illinois House of Representatives, Tom Holbrook has advocated on behalf of countless metro east families receiving care at SLCH.

“The ones I remember are the preemies,” he says. “On visits to the hospital, I have seen those babies who can fit in the palm of my hand and wonder how in the world these children would have a chance without this kind of care. Even though we have good hospitals on the Illinois side of the river, we don’t have that kind of advanced care.”

Rep. Holbrook has made the health of his youngest constituents a top priority. He consistently advocates the importance of SLCH in his home state, supporting legislative issues central to pediatric health care and encouraging his fellow legislators to recognize the critical role the hospital plays in providing essential medical services to children in Southern Illinois.

“It’s one of the most rewarding aspects of being a legislator, knowing I can help ensure that this type of service can be provided to a child in a life-or-death situation. It’s not available anywhere else within 300 miles.”
Neuroscientists at Washington University School of Medicine in St. Louis are using sophisticated imaging, neuropsychological testing and clinical evaluations to study children who may be at risk for Tourette Syndrome (TS) due to the onset of motor and/or vocal tics. “As many as 20 to 30 percent of children develop tics at some time in their life, and typically, these tics disappear in a few months,” says Kevin J. Black, MD, professor of psychiatry, of neurology, of neurobiology and of radiology. “But for about 3 percent of children, those new tics represent the beginnings of either Tourette Syndrome or a condition known as Chronic Tic Disorder.”

Movies, television shows and other popular media presentations tend to portray people with TS as whooping, shuddering or cursing uncontrollably, but the syndrome often is much more subtle, according to Dr. Black. More common tics include head shaking, excessive blinking and repeated sniffing.

When a child develops tics, doctors typically advise parents not to worry since the tics likely will go away, according to Dr. Black. But why most tics disappear while others remain is not well understood, so Dr. Black and postdoctoral research associate Deanna Greene, PhD, are studying children who recently have developed tics. They will use MRI scans to measure brain volumes and brain function in these children. The children will be followed for one year. Those who still have tics after a year may be diagnosed with TS, which requires both movement and vocal tics for at least a year. If tics are still present after a year but no vocal tics have developed, it is called Chronic Motor Tic Disorder.

The researchers then will be able to compare function and anatomy in the brains of those children to brain function and brain anatomy in children whose tics go away after a few months.

“By comparing what we find in those whose tics persist with those whose tics remit, we hope to identify biomarkers that help predict whether recent-onset tics are likely to go away or to persist and develop into Tourette’s,” Dr. Black says.

To enroll in the study, children cannot have had tics for more than three months. Because other studies have suggested that certain clinical measures can predict poor long-term outcomes in children with tics, the research team will do clinical testing, IQ testing and measure the child’s manual dexterity and current symptom severity. Besides receiving MRI brain scans, participants in the study will be evaluated at the start of the study period, and then three months later and 12 months after the first appearance of tics. Follow-up examinations will involve clinical tests but won’t include MRI scans.

The study is supported by grants from the National Institute of Mental Health and the Tourette Syndrome Association.

For more information, call study coordinator Mary Creech at 314.362.7651, or e-mail MaryC@npg.wustl.edu. Further information about the study can be found at NewTics.org.

Laboratory News | Ordering of Non-blood Specimens in KiDDOS

In order to avoid unnecessary cancellation of orders, effective February 4, 2011, all non-blood specimens ordered in SLCH’s KiDDOS clinical information system have their order status default automatically to “conditional.” As a result of having “conditional” status, these orders must be activated when the specimen is obtained, rather than when it is ordered. The order remains in the system as a pending order until it is activated. The laboratory label for the order prints at the time of activation. Orders with a status other than “conditional” (all blood samples) remain on the pending collection list for 24 hours. If such a specimen has not been received in the laboratory 24 hours after it is ordered, the order is cancelled by the laboratory computer system. No call indicating this cancellation is made to the ordering physician; however, the comment “Specimen not received by lab” appears in the KiDDOS order as an alert that the test was cancelled. No record of the order appears in Clinical Desktop.

The Wellsoft System in the EU does not automatically recognize non-bloods as conditional orders. Therefore, any specimen orders, blood and non-blood, are cancelled after 24 hours if not received by the lab.

For more information, contact Susan Deuser at smd6071@bjc.org.

Research Update | Researchers Study Children at Risk for Tourette Syndrome
Children who have asthma but are experiencing few or no symptoms often stop using daily asthma medications, much to their doctors’ chagrin. However, results of a new study suggest taking medication at the onset of symptoms is better than taking nothing at all.

Standard treatment for mild asthma includes daily use of a low-dose inhaled corticosteroid to tamp down inflammation that causes symptoms such as coughing and wheezing, as well as a rescue inhaler with albuterol to treat the symptoms.

In the study, researchers at Washington University School of Medicine in St. Louis and at four other U.S. medical centers found that children with asthma who discontinued daily therapy could still get good results in controlling mild asthma by using the rescue inhaler (albuterol) followed by a low-dose inhaled corticosteroid only when they were having symptoms.

“We found that if a child is perfectly controlled on low-dose inhaled corticosteroid, an alternative to stopping the medication might be to use the inhaled steroid only when needed,” Dr. Strunk says. “But simply discontinuing inhaled corticosteroids increases markedly the risk of asthma exacerbations.”

Children would have to carry two inhalers with this method, he says, but the children in the study adapted well.

In the study, called TReating children to prevent EXacerations of Asthma (TREXA), researchers conducted a 44-week double-blind trial on 288 children ages 6-18 who had mild asthma that was well controlled using a daily low-dose inhaled corticosteroid. The children were randomly divided into four groups. The first group used a low-dose inhaled corticosteroid (beclomethasone) daily and a rescue inhaler in addition to albuterol when needed for symptoms. The second group also used beclomethasone daily but had a placebo rescue inhaler in addition to albuterol. The third group had a placebo daily and beclomethasone as a rescue inhaler in addition to albuterol, and the fourth group had placebo inhalers for daily and rescue use as well as albuterol.

Results of the trial showed that 28 percent of children in the group using the daily low-dose inhaled corticosteroid and a placebo rescue inhaler had exacerbations, or asthma attacks, during the trial that required oral corticosteroids to reduce inflammation. About one-third of children in the group that received daily beclomethasone and rescue beclomethasone had exacerbations, and about 33 percent of children in the group that received a daily placebo and rescue beclomethasone had exacerbations. In the children who did not use beclomethasone either daily or with symptoms, nearly half had exacerbations, despite also using albuterol.

While the children’s asthma was in control nearly 90 percent of the time, nearly one-fourth of children in the group that used two placebos and albuterol required two courses of oral steroids for exacerbations within a six-month period, compared with less than 9 percent of children who received beclomethasone either daily or as a rescue medication.

“Parents often stop giving their child the daily, inhaled corticosteroid because symptoms are well controlled or because the drug has been shown to slow growth,” Strunk says. In the TREXA study, children in the groups that received daily beclomethasone grew 1.1 centimeters less on average than those in the groups that did not, a drawback that justifies the search for alternative treatments for mild asthma, the researchers say.

“Discontinuing inhaled corticosteroids causes an increase in exacerbations in children with mild persistent asthma,” Dr. Bacharier says. “Daily inhaled corticosteroids are the most effective treatment for preventing exacerbations. Using inhaled corticosteroids as a rescue medication with albuterol may be an effective step-down strategy for children with well controlled, mild asthma because it is more effective at reducing exacerbations than is use of rescue albuterol alone and avoids daily inhaled corticosteroids administration and growth impairment.”

This is the first study in which low-dose inhaled corticosteroids were used at the same time as a rescue inhaler together with albuterol in school-age children. Between 7 percent and 12 percent of children have asthma, which is the No. 1 cause of hospitalizations in children. Washington University School of Medicine enrolled 42 children in the trial. Other trial locations were the University of Wisconsin—Madison; National Jewish Medical and Research Center in Denver; University of Arizona in Tucson; and Kaiser Permanente in San Diego.


Funding for the study was provided by the National Heart, Lung, and Blood Institute. TEVA Pharmaceutical Industries Ltd. provided the beclomethasone dipropionate-HFA and placebo.
On March 3, medical experts joined together at St. Louis Children’s Hospital to voice support of HB300, the High School Sports Brain Injury Prevention Act in Missouri. Between 2005 and 2008, approximately 400,000 high school athletes nationwide sustained concussions, a type of traumatic brain injury (TBI). Since 2005, St. Louis Children’s Hospital’s emergency department has seen the number of high-school aged concussion patients spike by more than 25 percent.

“Every day, we see children threatened with long-term disability as a result of traumatic brain injury,” says Dr. Jose Pineda, director of the Pediatric Neurocritical Care Program at St. Louis Children’s Hospital. “We need to work together to educate our coaches, parents, and athletes about the dangers of one of the most common types of TBI.”

Currently, 11 states have laws regarding prevention of and response to sports concussions. In early March, Rep. Chuck Gatschenberger, R-Lake St. Louis in Missouri, held a hearing on HB300, the High School Brain Injury Prevention Act. The proposed legislation includes three essential elements:

• Informing and educating coaches, parents, and student athletes, requiring them to sign a concussion information form.
• Removal of student athletes who appear to have suffered a concussion from play or practice at the time of the suspected concussion for at least 24 hours.
• Requiring an athlete to be cleared by a licensed medical professional trained in the evaluation and management of concussion before returning to play or practice.

Another reason for the spike in concussions is greater awareness, explains Mark E. Halstead, MD, pediatric orthopedic specialist at St. Louis Children’s Hospital and assistant professor of orthopedic surgery and of pediatrics at Washington University School of Medicine.

“What we’re really seeing is more attention,” says Dr. Halstead. “People are seeking more medical attention because that’s what we’re recommending.”

Dr. Halstead, director of Washington University in St. Louis’ Sports Concussion Program, is first author on a report with new guidelines for managing sports-related concussions. The recommendations give advice to both parents and physicians and appear in the September 2010 issue of Pediatrics. The November 2010 issue of Doctor’s Digest includes a detailed account of those recommendations. Visit StLouisChildrens.org/dd for the complete article.

For more information, contact Children’s Direct at 800.678.HELP (4357) or Childrens_Direct@bjc.org.

Ted A. Green, MD
Instructor in Clinical Pediatrics, WUSM
Specialty: Pediatrics, Eureka Pediatrics, PC
Education/Training:
• Pediatric residency, SSM Cardinal Glennon Medical Center, St. Louis, MO
• Medical degree, University of Illinois School of Medicine, Peoria, IL

Richard J. Iken, MD
Instructor in Clinical Pediatrics, WUSM
Specialty: Pediatrics, Health Care for Kids
Education/Training:
• Pediatric residency, Mercy Children’s Hospital, Kansas City, MO
• Medical degree, University of Missouri School of Medicine, Columbia, MO

Departing Medical Staff Members
Jamika Hallman-Cooper, MD
Child Neurology
Jennifer L. Hanslick, MD
Newborn Medicine
Lori F. Wagner, MD
Pediatric Endocrinology
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Upcoming Event | Pediatric Mental Health Symposium in St. Louis on May 6

Join St. Louis Children’s Hospital as we highlight resources and care strategies for children with mental health problems at the spring Clinical Pediatric Update: Pediatric Mental Health Symposium. Topics include:

- Navigation of Mental Health Resources: A Roadmap for Primary Care Physicians
- Autism 201: Beyond the Basics of Evaluation and Treatment Approaches
- Assessment and Treatment of Adolescent Substance Abuse: Pearls for Primary Care Providers
- Evidence-Based Treatments for Children and Adolescents with Eating Disorders
- The Assessment of Adolescent Depression
- Parent-Child Interaction Therapy (PCIT) in Preschoolers and Its Evolving Applications
- Introduction to Motivational Interviewing: Skills for Enhancing Patient Adherence with Medical
- Disruptive Behavior: Unraveling the Mystery of Diagnosis and Treatment

The one-day symposium will be held at the Westin-St. Louis on Friday, May 6. Continuing medical education credits are available. Visit StLouisChildrens.org/Med_Ed for more information or to register.