

Hospital addresses pain interventions *Prevention efforts increase satisfaction scores*

Last year, Le Bonheur launched a hospital-wide effort to reduce the pain and anxiety children experienced from needle sticks. "Anytime there is going to be a poke, something will be done to help with the needle stick," said Debbie Hannah, Quality Improvement project manager.

Called Comfort Kids, the program teaches ways to decrease pain and distract children during procedures. The techniques include using a numbing cream, numbing spray, shot blocker and distraction kits. Developing a "poke plan" with parents helps caregivers understand each specific child's needs. The methods are also being used in Le Bonheur's Outpatient Center clinics.

The result has been a 9 percent increase in the patient satisfaction survey question: "Did the hospital staff do everything they could to help control your child's pain?"

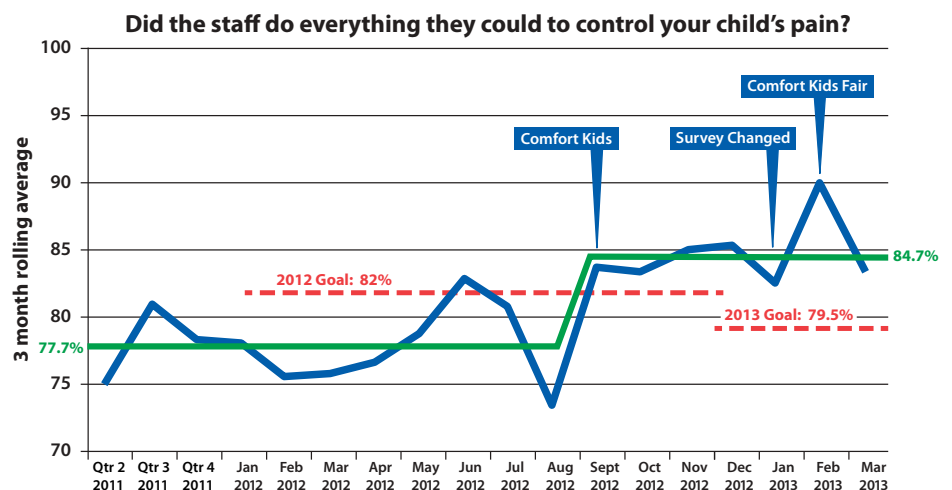
One area saw great benefits from the pain intervention project.

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Child Life Specialist Mary Holland Doan blows bubbles to distract patient Brantley Drewrey during a procedure while his mother holds him.

Le Bonheur implemented a hospital-wide pain prevention effort in September 2012. Since then, patient satisfaction surveys continue to show an increase in parents' response to the question, "Did the staff do everything they could to control your child's pain?" In January 2013, the hospital began using a new patient satisfaction survey tool, which was expected to bring a decline in the response. However, the scores reflect a positive response to Comfort Kids.



Study identifies why some experience pneumonia with influenza

A study published in the July issue of the *Journal of Immunology* helps explain why some humans contract bacterial super-infections like pneumonia with influenza. The research was led by Le Bonheur Pediatrician-in-Chief Jon McCullers, MD – an infectious disease specialist who is also chair of the Department of Pediatrics for the University of Tennessee Health Science Center (UTHSC).



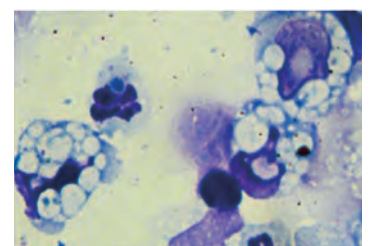
Jon McCullers, MD

"It's been known that the influenza virus does something to suppress host immune function, which can facilitate development of deadly secondary bacterial pneumonias," said McCullers. "But we haven't known what that was or why it happens."

McCullers' research was conducted at his National Institutes of Health-funded laboratory at St. Jude Children's Research Hospital by UTHSC graduate student Hazem Ghoneim. Ghoneim used advanced techniques to differentiate types of alveolar macrophages found in

the lungs and airways. Researchers found that of the three types identified, only one is truly capable of fending off secondary bacterial infection. This population of macrophages, labeled the resident alveolar macrophages, is depleted during a flu infection.

"We found that influenza is specifically killing these true alveolar macrophages," said McCullers. "The window of time someone is susceptible to secondary infections corresponds with the time it takes for the other two types of alveolar macrophages to differentiate so they are then able to fight off the infection."



Dying flu-infected macrophages

McCullers says his study is a step toward developing strategies for treatment.

"This discovery provides a roadmap for developing immunotherapies that can supplement the natural defenses of our body when they are at their weakest. Influenza and pneumonia are the seventh-leading cause of death in the U.S., and we desperately need research such as this to improve our armamentarium," said McCullers.



The pediatric affiliate of The University of Tennessee Health Science Center/College of Medicine

RESIDENCY PROGRAM CREATES INTEGRATED SERVICE TEAMS



Changes to the University of Tennessee Health Science Center's pediatric residency program at Le Bonheur Children's established a designated night-shift team and integrated service teams onto specific patient care floors.

Patient safety, continuity of care and quality of training are at the core of changes to the University of Tennessee Health Science Center's pediatric residency program at Le Bonheur Children's. The changes, which took effect July 1, eliminate call during wards months, establish a designated night-shift team and integrate service teams into existing specific patient care floors.

Eliminating call will help with continuity of care – a benefit for not only the patient and family, but also the doctor in training, says Jon McCullers, MD, chair of UTHSC's Department of Pediatrics and pediatrician-in-chief at Le Bonheur Children's. Under the old system, a resident could admit a patient, care for him or her during the day, and then never see the patient again. That patient could see a different resident each day – and an on-call different resident at night. Now, residents will be mapped to designated floors with one team covering the floors during the day and another team seeing patients at night. Resident teams will be assigned new floors each month.

"This way, residents are working with the same set of nurses and discharge teams for an entire month. It enhances the quality of training for the residents and also improves patient safety and satisfaction," said McCullers.

New changes also include a formal hand-off and teaching rounds each morning between 7 and 8 a.m. with the night and day teams, as well as the attending physician and patient's family. The goal is to enhance communication among the care team members and provide an opportunity for more learning.

Past residents tout the program's unique clinical experiences and relationships with diverse, dedicated faculty.

New program focuses on hip preservation

Early, less-invasive treatment gives teens, young adults new options

A new hip preservation program at Le Bonheur Children's is treating adolescents and young adults with hip problems. The comprehensive program aims to diagnose and treat early symptomatic hip conditions in order to delay or prevent total hip replacement or arthritis.

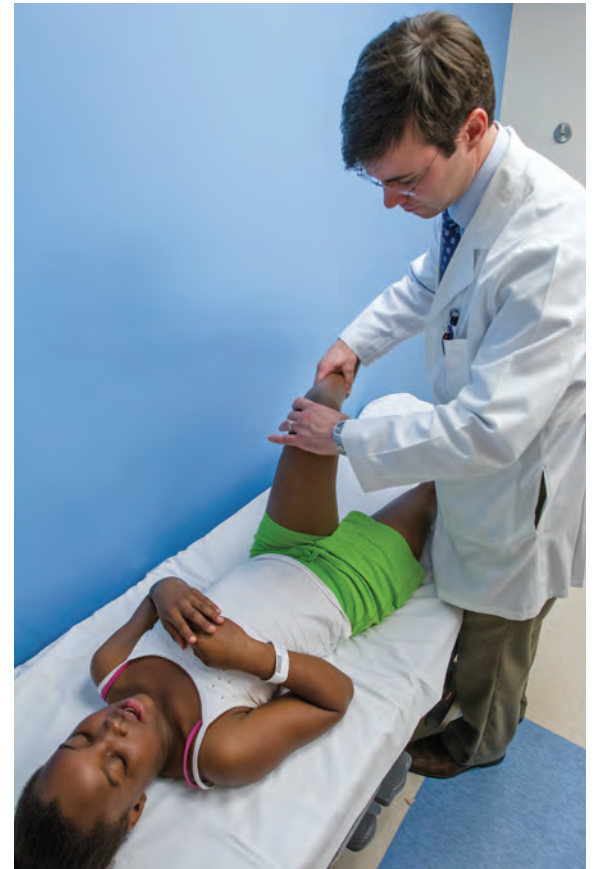
While childhood hip disorders such as dysplasia, Perthes and slipped epiphysis aren't new, Campbell Clinic and Le Bonheur physicians are now offering some new and innovative treatment alternatives with positive outcomes to address these and other hip deformities.

"There is a new field in orthopaedics that allows us to diagnose and treat children and young adolescents with hip disorders that benefit from 'hip preservation,'" said Le Bonheur/Campbell Clinic Pediatric Orthopaedic Surgeon James Beaty, MD. "This means we treat hip problems that would normally lead to early arthritis of the hip. We try to preserve complete use of their hip and delay the risk and onset of early arthritis of the hip."

The spectrum of treatment for hip preservation includes diagnosis, conservative non-surgical treatment and arthroscopic surgery of the hip. The program focuses on using less-invasive techniques like arthroscopy to treat hip conditions when possible. Other larger open operations like periacetabular osteotomy, acetabuloplasty and proximal femoral osteotomy are also offered when needed.

The hip preservation team includes adult and pediatric orthopaedic surgeons whose expertise ranges from congenital defects to sports-related hip injuries. It also includes radiologists, physical therapists and nurse practitioners experienced in diagnosing and treating hip conditions in a pediatric population.

"We have the knowledge and training to both diagnose and treat the full spectrum of adolescent and young adult hip disease," said Beaty.



Treatment for hip preservation includes diagnosis, conservative non-surgical treatment and arthroscopic surgery of the hip. Le Bonheur's hip program focuses on using less-invasive techniques like arthroscopy to treat hip conditions when possible.

Hip preservation research also continues to grow. Campbell Clinic and Le Bonheur orthopaedist Derek Kelly, MD, is part of the International Perthes Study Group – a multi-center research study evaluating Perthes in children. Legg–Calvé–Perthes Disease (Perthes) occurs when loss of blood supply to the femoral head leads to collapse or deformity of the hip joint. The study group has prospective study protocols currently in place for children ages 6-8 and ages 8-11. The group hopes to discover the utility of new diagnostic tools such as perfusion MRI and new treatments such as injectables or prolonged weight-bearing restriction.

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Nurses in the Infant/Toddler unit at Le Bonheur have improved parents' perception of treatment for pain by 50 percent.

"Treating pain is a specific challenge for our patient population. They can't tell us they're hurting. Many times parents aren't here to interpret their cries or actions. So we have to learn their individual responses," said Clinical Director Jessica Fleener, MSN.

The team implemented several strategies:

- Addressing pain and treatment at the bedside during nursing shift change
- Narrating all aspects of care
- Utilizing comfort techniques
- Partnering with child life specialists

Fleener says the nursing staff has used these strategies for years, but the key has been narrating care. "We needed to explain to parents as we were delivering care what we were doing. We had to help

them understand that techniques like swaddling were actually pain interventions," Fleener said.

The unit has a comfort tool kit that is available for staff to use during procedures. One of the items in the kit is a toy bee that vibrates. When placed on the skin above the stick site, it causes nerve conduction to minimize pain. The bee also has cold wings that help distract the child. Nurses also can use Sweet Ease, a sugar water solution in which the pacifier can be dipped.

"For many years it was believed that neonates and infants did not feel pain. We have since learned that is not true," said Hospitalist Cynthia Cross, MD. "The nurses in Infant /Toddler unit are true patient advocates. They have learned nonverbal ways that our youngest children express pain. Using this information they have worked to make our patients more comfortable."

Quality focus continues with bundles, root cause analysis

Tracking clinicians' compliance around certain tasks is translating into decreased infection rates at Le Bonheur. As part of the Ohio Children's Hospitals' Solutions for Patient Safety (OCHSPS) Foundation, Le Bonheur leaders are developing best practices and a culture "preoccupied with failure" to prevent hospital-acquired conditions.

The quality efforts are focused around nine hospital-acquired infections. The teams of physicians, nurses and ancillary staff have developed bundles or collections of tasks that are designed to prevent infection. For example, to prevent central line-associated blood stream infections (CLABSI) there is an insertion bundle and maintenance bundle. Each involves detailed check lists. Some of the bundles call for patient and family education as well. Reaching 90 percent compliance translates to drops infection rates, says Donna Vickery, director of Quality Improvement.

"Our goal is to increase compliance, so we're doing the right thing 100 percent of the time for 100 percent of the patients," said Vickery.

Working with OCHSPS, which started as eight pediatric hospitals working to decrease hospital-acquired conditions, gives the Memphis team access to best practices and expertise. The group received a Centers for Medicare and Medicaid Services' Hospital Engagement grant to expand the effort across the country. Le Bonheur hopes to reduce hospital-acquired conditions by 20 percent and preventable readmissions by 10 percent in 2013.

Part of the hospital's focus is creating a high reliability organization, which OCHSPS says includes a "preoccupation with failure." When a hospital-acquired infection is identified the physicians, front-line staff and quality team performs a root cause analysis and timeline of events.

"We want to get it right every time, and when we don't, we need to find out when and why things went wrong," Vickery said.

Physician leaders, and their nursing and ancillary colleagues, are focused on reducing hospital-acquired conditions in nine key areas, including:

- Adverse drug events
- Catheter-associated urinary tract infections
- Central line-associated blood stream infections
- Injuries from falls and immobility
- Pressure ulcers
- Venous thromboembolism
- Ventilator-associated pneumonia
- Surgical site infections
- Serious safety events

SCHWINGSHACKL EARNS K AWARD, NATIONAL GRANT

Critical Care Specialist Andreas Schwingshackl, PhD, MD, recently received two grants to study the field of Acute Lung Injury (ALI) and Acute Respiratory Distress Syndrome (ARDS). The National Institutes of Health's K12 Career



Andreas Schwingshackl, PhD, MD

Development Award and the American Lung Association Biomedical Grant will help him continue his research focus on the role of stretch-activated ion channels in the development of ALI and ARDS, inflammatory mediator secretion, loss of epithelial barrier function and propagation of lung inflammation.

His research team recently discovered that the 2-pore domain potassium channel TREK-1 plays a crucial role in the development of hyperoxia- and mechanical stretch-induced lung injury and functions as a key regulator in inflammatory cytokine secretion from alveolar epithelial cells. The grants will allow Schwingshackl to further study the signaling mechanisms responsible for the alterations in cytokine secretion and in alveolar barrier function observed in TREK-1-deficient epithelial cells and in a mouse model of ALI/ARDS.

Schwingshackl is an assistant professor at the University of Tennessee Health Science Center.

Short Scripts

Black named vice chair of AGA

Dennis Black, MD, director of the Children's Foundation Research Institute, vice president of Research for Le Bonheur Children's Hospital and J. D. Buckman Chair of Pediatrics, was recently elected to serve as vice-chair of the Nutrition and Obesity Section of the Council of the American Gastroenterological Association (AGA). He will serve as vice chair for two years, then will serve as chair for another two-year term.



Dennis Black, MD

Black also recently made a presentation about the causes of liver disease in children with inflammatory bowel disease and research into its treatment at an AGA symposium hosted by the American Association for the Study of Liver Disease and the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition.

Neurosurgeon named secretary of AANS

The American Association of Neurological Surgeons has named **Frederick Boop, MD, FAANS, FACS**, as its secretary. Boop is a professor and chairman of the neurosurgery department at the University of Tennessee Health Science Center and Le Bonheur Children's Hospital.



Frederick Boop, MD

Cohen trains Kenyan students

Radiologist **Harris L. Cohen, MD**, traveled to Kenya this summer as part of the International Visiting Professor Program offered by the Radiological Society of North America (RSNA). The program fosters international relations among radiology societies to assist with medical education in developing and newly developed nations. Cohen is a professor and chairman of radiology, professor of pediatrics, and professor of obstetrics and gynecology at the University of Tennessee Health Science Center.



Harris L. Cohen, MD

Edgerson honored by pharmacy association

Pharmacy Director **Brandon M. Edgerson, Pharm.D.**, has been named the 2013 Tennessee Society of Health-System Pharmacy's Pharmacist of the Year. Brandon was honored at the Tennessee Pharmacists Association annual meeting on July 18 in Chattanooga, Tenn.



Brandon M. Edgerson, Pharm.D

Le Bonheur, UTHSC named primary ciliary dyskinesia affiliate

Le Bonheur and the University of Tennessee Health Science Center (UTHSC) were recently selected by the PCD Foundation as a primary ciliary dyskinesia (PCD) Treatment and Education Affiliate. PCD is an inherited disorder of motile cilia.

With the designation, Le Bonheur and UTHSC were recognized for delivering high quality treatment based on latest standards of care and up-to-date patient education.

The PCD Foundation's mission is to accelerate research and provide education and support and improve therapeutic options that will eventually lead to a cure for PCD.

Physicians influence concussion legislation

Tennessee Gov. Bill Haslam has signed legislation that requires Tennessee schools and youth athletic organizations to adopt concussion policies. The legislation is designed to ensure that parents, coaches and students are educated about the symptoms and implications of concussion and defines what health providers are needed to release a youth athlete to resume exercise and play.

Paul Klimo, MD, chief of Pediatric Neurosurgery at Le Bonheur Children's and the University of Tennessee Health Science Center, and **Trey Eubanks, MD**, a pediatric surgeon and medical director of Trauma at Le Bonheur, worked with other advocates and groups including TMA, TNAAP, CHAT and Tennessee Disability Coalition to write the legislation. Klimo



Paul Klimo, MD



Trey Eubanks, MD

also served as a panelist on the University of Memphis' Papanas Public Policy Forum to educate lawmakers in Nashville on this important topic.

The legislation was overwhelmingly approved (93-3) in the House of Representatives and unanimously (30-0) in the state Senate. The law will go into effect on Jan. 1, 2014.

New England Journal of Medicine features research on IgA Nephropathy

Finding noninvasive ways to properly diagnose, monitor and treat kidney inflammation may be getting easier thanks to research by

Robert J. Wyatt, MD, professor in the Department of Pediatrics at the University of Tennessee Health Science Center (UTHSC). Wyatt is co-author of a Medical Progress report titled, "IgA Nephropathy" in the June 20 issue of *New England Journal of Medicine*. His co-author is Bruce A. Julian, MD, from the University of Alabama, Birmingham.

IgA nephropathy is the most prevalent primary chronic glomerular disease worldwide. Left unchecked, IgA nephropathy is a slow progression that leads to chronic renal failure in 25 to 30 percent of cases during a period of 20 years. In North America, about 75 percent of children and young adults with IgA nephropathy exhibit symptoms of macroscopic hematuria.

"Previously, the required method for diagnosing this disease was a painful and expensive kidney biopsy," said Wyatt, who performed his research at UTHSC and the Children's Foundation Research Institute at Le Bonheur Children's Hospital. "In the past decade, advances in analytic approaches have provided better insight into the molecular mechanism of this disease. These advances offer the potential for noninvasive tests for diagnosis and monitoring of disease activity and an opportunity to envision disease-specific therapy."



Robert J. Wyatt, MD

Le Bonheur
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Pediatric Notes is a quarterly publication for the medical staff of Le Bonheur Children's Hospital, produced by Le Bonheur Marketing & Communications Services.

Please submit comments or story ideas by calling (901) 287-6030.

Jon McCullers, MD
Pediatrician-in-Chief

Le Bonheur Children's Hospital
Physician Advisory Council

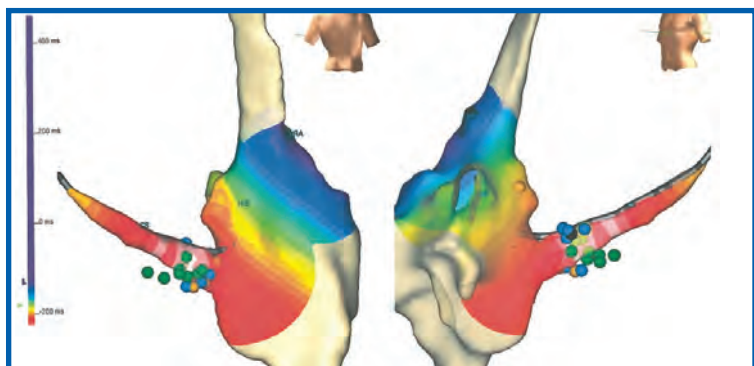
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Electrophysiology lab reduces fluoroscopy use

Le Bonheur's Heart Institute – the only center in the region offering pediatric electrophysiology expertise – has taken steps to reduce the use of fluoroscopy in its catheterization lab. Fluoroscopy, an imaging technique that uses X-rays to obtain real-time moving images of the heart's internal structures, is often used in conjunction with 3-D mapping to help pinpoint the origin of complex arrhythmias. Fluoroscopy is most often used to help guide catheters and to confirm the correct location for invasive procedures such as radiofrequency ablation and cryoablation.

Three-dimensional mapping, a non-invasive technology, is an increasingly popular alternative to radiation usage. Variations of 3-D imaging have been available for use in the cath lab setting for approximately 10 years, and Le Bonheur's electrophysiology team has been using the technology for eight years. As the 3-D technology improves and team members become increasingly comfortable using this modality for imaging, the lab is minimizing fluoroscopy time – aiming to complete procedures with relatively low or no radiation.



Fluoroscopy is most often used to help guide catheters and to confirm the correct location for invasive procedures such as radiofrequency ablation and cryoablation.

“While the amount of radiation exposure during these procedures has always been relatively low, our radiation usage now is ‘ALARA’ – as low as reasonably achievable – and there has been a definitive reduction in fluoroscopy time,” said Glenn Wetzel, MD, a Le Bonheur pediatric cardiologist and medical director of Pediatric Electrophysiology. “In addition to minimizing each patient's radiation exposure, we have avoided such alternatives as transesophageal echocardiogram and larger catheters placed in the leg, which are not appropriate for most children.”

Reducing radiation exposure is a key focus for all Le Bonheur subspecialties, particularly for children with chronic conditions who require multiple scans and procedures.

TOPICAL CREAM DEMONSTRATES POSITIVE RESULTS FOR TSC PATIENTS

Researchers at Le Bonheur and the University of Tennessee Health Science Center have developed a topical cream that has positive results in the treatment of facial lesions associated with Tuberous Sclerosis Complex (TSC). The initial study follows the treatment of two patients and was published online in the *Journal of Child Neurology*.

TSC is a neurocutaneous disorder characterized by excess cell growth and proliferation, resulting in multi-organ hamartomatosis. Skin lesions occur in more than 90 percent of TSC patients and are more common in late childhood or adolescence.

Historically, the skin lesions have been resistant to medical and surgical treatments. Oral rapamycin has been used in TSC patients, but side effects prevent its routine use in patients without significant internal involvement.

Neuroscience Institute Co-director James Wheless, MD, collaborated with Hassan Almoazen, PhD, to create a novel rapamycin cream. The cream is easy to compound and apply, does not cause local or systemic side effects, and results in a dramatic improvement of facial angiofibromas.



Patient at baseline



Patient at 12 months of treatment