SUMMER 2022

DELIVERING ON A PROMISE

One Chance to Hear

Le Bonheur otolaryngologist conducts cochlear implant surgery for youngest documented patient

THE UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

Le Bonheur Children's Hospital

SPEAKING UP FOR CHILDREN WITH TSC

Research shows infants with tuberous sclerosis complex (TSC) have delayed precursors of speech development

In the first published research of its kind, Le Bonheur Pediatric Neurologist and Neurodevelopmental Disabilities Specialist Tanjala Gipson, MD, and her colleague, Psycholinguist Kimbrough Oller, PhD, and his team at the University of Memphis, have found that precursors of speech development are delayed in infants with tuberous sclerosis complex (TSC). These findings may signal poor language and developmental outcomes, according to a study published by Gipson, who is director of the TSC-Associated Neuropsychiatric Disorders (TAND) Clinic, and colleagues, in *Pediatric Neurology*. Delays in early vocalizations were seen across all parameters in the study.

Children and infants with TSC can experience associated neurodevelopmental issues that are known as TSC-associated neuropsychiatric disorders (TAND), including significant problems in communication and language. Only 28% of people with TSC have typical lingual function and up to 50% of those with TSC have autism spectrum disorder, which also impacts communication and language.

"The earlier we can detect delays, the earlier we can provide intervention," said Gipson. "Currently children with TSC are diagnosed with autism at 7 years old on average. This research may allow us to detect autism as early as 6 to 9 months old."

The study analyzed 74 audio-video recordings from the TSC Autism Center of Excellence Research Network of 40 randomly-selected infants with TSC. Researchers reviewed samples and determined the number of canonical (well-formed syllable structure typified by consonant-vowel combinations) and non-canonical syllables produced by the infants. Results were compared with two groups of typically-developing (TD) infants – 41 infants recorded in a laboratory setting and 39 infants recorded all day in the home through Language Environment Analysis (LENA). All recordings analyzed were taken at 12 months old.

Researchers determined volubility (total number of protophone syllables per minute), canonical babbling (number of consonant-vowel combinations) and the canonical babbling ratio (canonical syllables/total syllables) and compared results between TD infants and infants with TSC.

Volubility for infants with TSC was less than half that of TD infants from laboratory recordings. TD infants had a mean of 9.82 syllables per minute compared to 3.99 for those with TSC. When compared with LENA recordings, the rate of vocalization was more than three times higher in TD infants compared to infants with TSC, with a mean of 14.65 syllables per minute. The canonical babbling ratio (CBR) of infants with TSC was a mean of .117 compared to .346 in the laboratory recordings and .173 in the LENA recordings.

"Our results showed delays across all study parameters – canonical babbling, volubility and CBR," said Gipson. "This data suggest that at 12 months many, perhaps most, infants with TSC show signs of delay in the vocal foundations for speech and language. The current results provide a benchmark suggesting that vocal development may be substantially delayed in TSC."

Gipson's long-term goal is to develop a body of knowledge in TSC about a variety of precursors to speech and language to help illuminate the development of language difficulties and other neurodevelopmental disorders in infants with TSC. Gipson and her team intend to conduct further research to standardize methodology, increase sample size and further assess the correlation between early vocalizations and language outcomes in infants with TSC. Their next step is assessing vocal precursors to language in all 130 infants in the TSC Autism Center of Excellence Research Network and relating them to the infant's language outcomes at 36 months.

At left, Le Bonheur Pediatric Neurologist and Neurodevelopmental Disabilities Specialist Tanjala Gipson, MD, recently published research showing that infants with tuberous sclerosis complex (TSC) have delayed precursors of speech development. This research may help lead to earlier detection of language delays and therefore earlier intervention.

Le Bonheur Children's Hospital

Le Bonheur Children's Hospital in Memphis, Tenn., treats more than 250,000 children each year in regional clinics and a 276-bed hospital that features state-of-the-art technology and family-friendly resources. Our medical staff of more than 240 physicians provide care in 45 subspecialties.

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One Chance to Hear

Le Bonheur otolaryngologist conducts cochlear implant surgery for youngest documented patient

After becoming the youngest documented child to receive cochlear implants, Eleanor's long-term prognosis is very good. She will continue working with an audiologist and eventually a speech therapist. With these tools, she should reach the same developmental milestones as other children her age.

Two-month-old Eleanor Nolen was up against the clock. Bacterial meningitis was turning her inner ear to bone. She had lost all hearing. Le Bonheur Otolaryngologist Joshua Wood, MD, knew that if Eleanor was going to have a chance to hear again, he would need to conduct cochlear implant surgery before time ran out.

But the FDA-approved age for cochlear implants is 9 months. And no documented patients younger than 3 months had ever undergone the surgery. Wood, with Eleanor's parents, Jacob and Rachel, had a decision to make.

"Once the ossification process starts, it's a time-sensitive situation," said Wood. "Many places wouldn't attempt cochlear implants this young, but that would mean she would be totally deaf her entire life with no later opportunity for cochlear implants. We knew we had the skill and training to change that for Eleanor."

Thanks to the expert team at Le Bonheur Children's, Eleanor became the youngest child ever documented to receive cochlear implants.

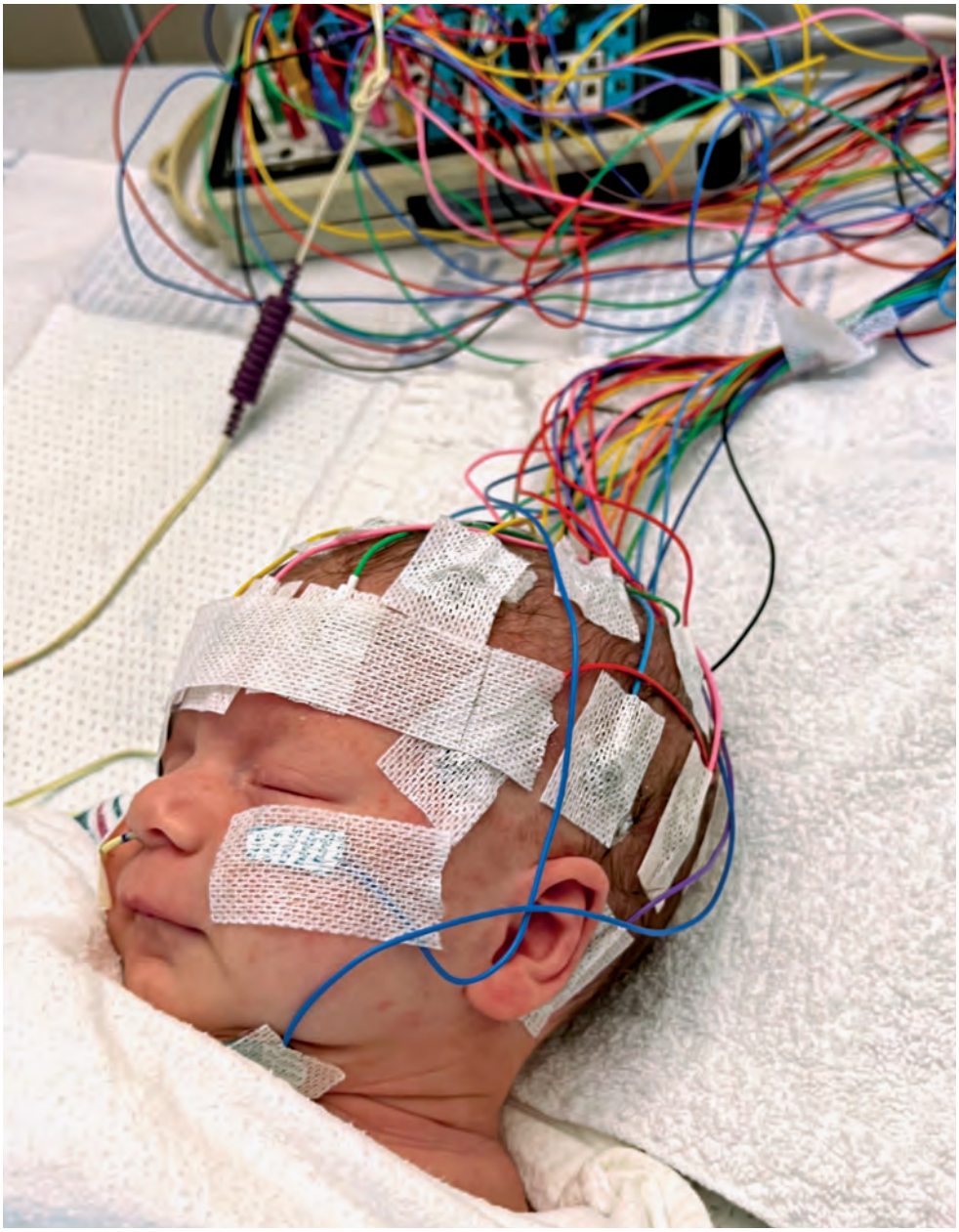
FIRST ALARM

After celebrating Eleanor's first Christmas with their families, Jacob and Rachel noticed that their daughter was lethargic and unresponsive. Their pediatrician in Jonesboro, Ark., sent them to Le Bonheur, just to be on the safe side. A spinal tap revealed that Eleanor had meningitis.

At first, the Nolens felt fortunate — Eleanor's bacterial meningitis was diagnosed early.

But events began to snowball for Eleanor. Her hospital stay stretched to 27 days. She developed a fever of 102 degrees. She had two strokes. And then, a hearing test revealed that she was completely deaf.

"We were having breakfast and drinking coffee, and the audiologist said she had bad news. She wasn't picking up any signals even on the highest pitches," said Jacob. "It was like everything froze and took my breath away. We were in total disbelief and shock — we knew it was a common side effect but



Eleanor Nolen spent 27 days at Le Bonheur Children's Hospital. Although bacterial meningitis was caught early, she went on to develop a 102 degree fever, suffer two strokes and completely lose her hearing.

didn't think it would happen to our baby."

An MRI revealed that Eleanor's inner ear structures were beginning to turn to bone — a condition known as labyrinthitis ossificans. The cochlear fluid was infected due to the meningitis, which was causing the ossification of those fluid-filled channels.

The clock was ticking.

"If the cochlea turns to bone, there is no way to put in a cochlear implant," said Wood. "We had to decide if we would implant much younger than is normally done."

TIME TO ACT

The U.S. Food & Drug Administration (FDA) has approved cochlear implants for children as young as 9 months with "normal" hearing loss. But if Wood waited until 9 months to perform cochlear implant surgery for Eleanor, it would be too late.

Cochlear implants function by bypassing the eardrum, middle ear and, to some extent, the inner ear structures. During the surgery, electrodes are placed through the cochlea to directly stimulate the hearing nerve. But if these inner ear structures turned to bone, no surgical approach could reach the hearing nerve.

After weighing the risks, the Nolens decided that to give their daughter the best chance to hear, they needed to proceed with the surgery.

"As a parent you want what's best for your kid. This was a tough decision as no one this young has ever undergone

this surgery," said Jacob. "We had faith in Dr. Wood and the way he explained the process to us. We felt comfortable with him and trusted him and his opinion when he said he could successfully perform the surgery."

On Jan. 21, 2022, Eleanor Nolen became the youngest documented child to undergo cochlear implant surgery.

"For an infant, the approach for cochlear implant surgery is a little different than traditional surgery, but Eleanor's surgery went smoothly with no issues," said Wood. "Without this surgery she would be deaf for her entire life. It's great that we were able to successfully do the surgery, but it's even more exciting to think about what this means for Eleanor for the rest of her life."

Even after a successful surgery, the Nolens still had to wait several long weeks to activate the implants to see if Eleanor could hear their voices again.

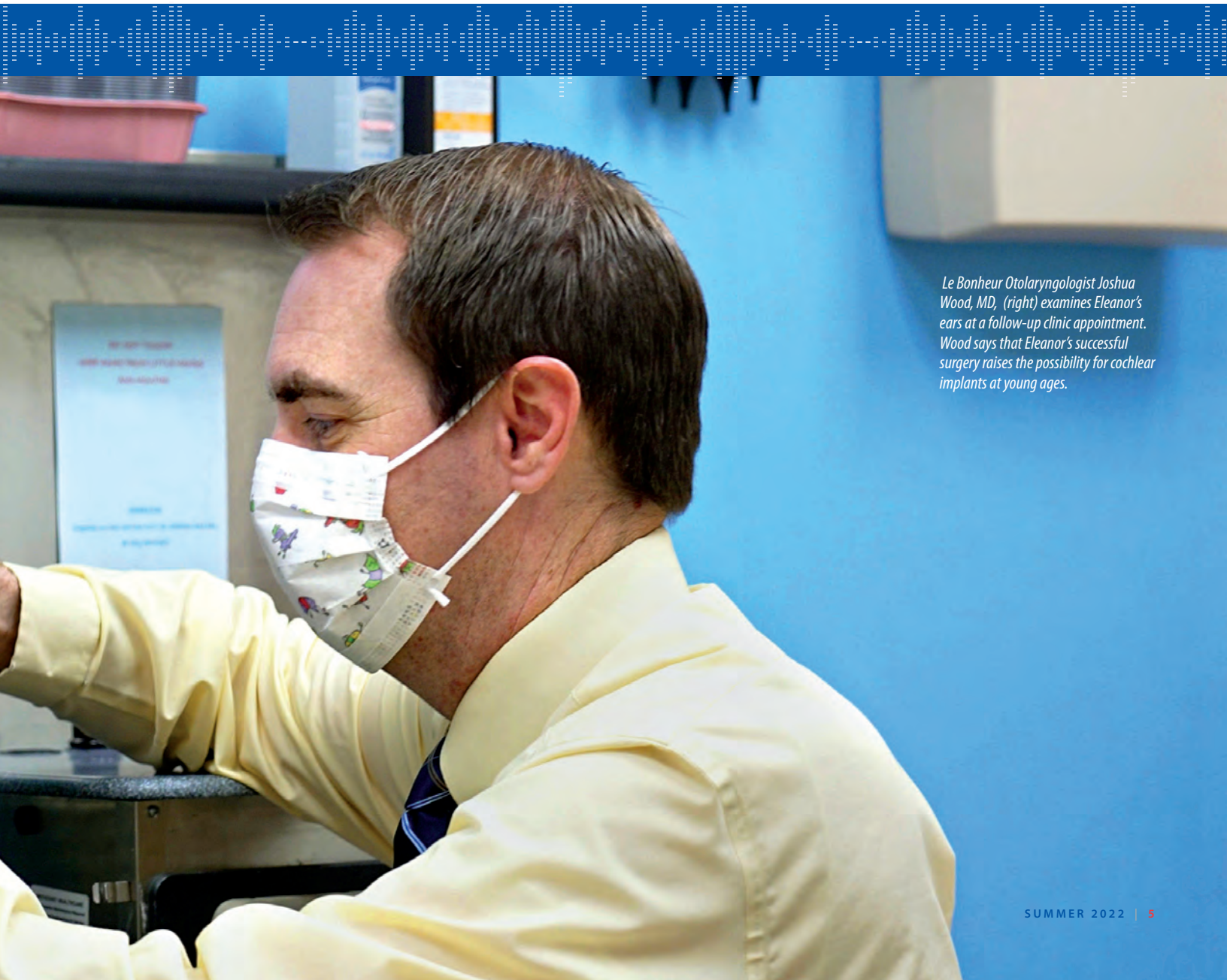
MOMENT OF TRUTH

Three weeks later it was time to find out — did the cochlear implants work for a child as young as Eleanor?

Eleanor's case was unique in that she could hear for the first month of her life and then lost all hearing. Normally, cochlear implants are placed in a child who has never heard in their life. The implant activation process can be startling.

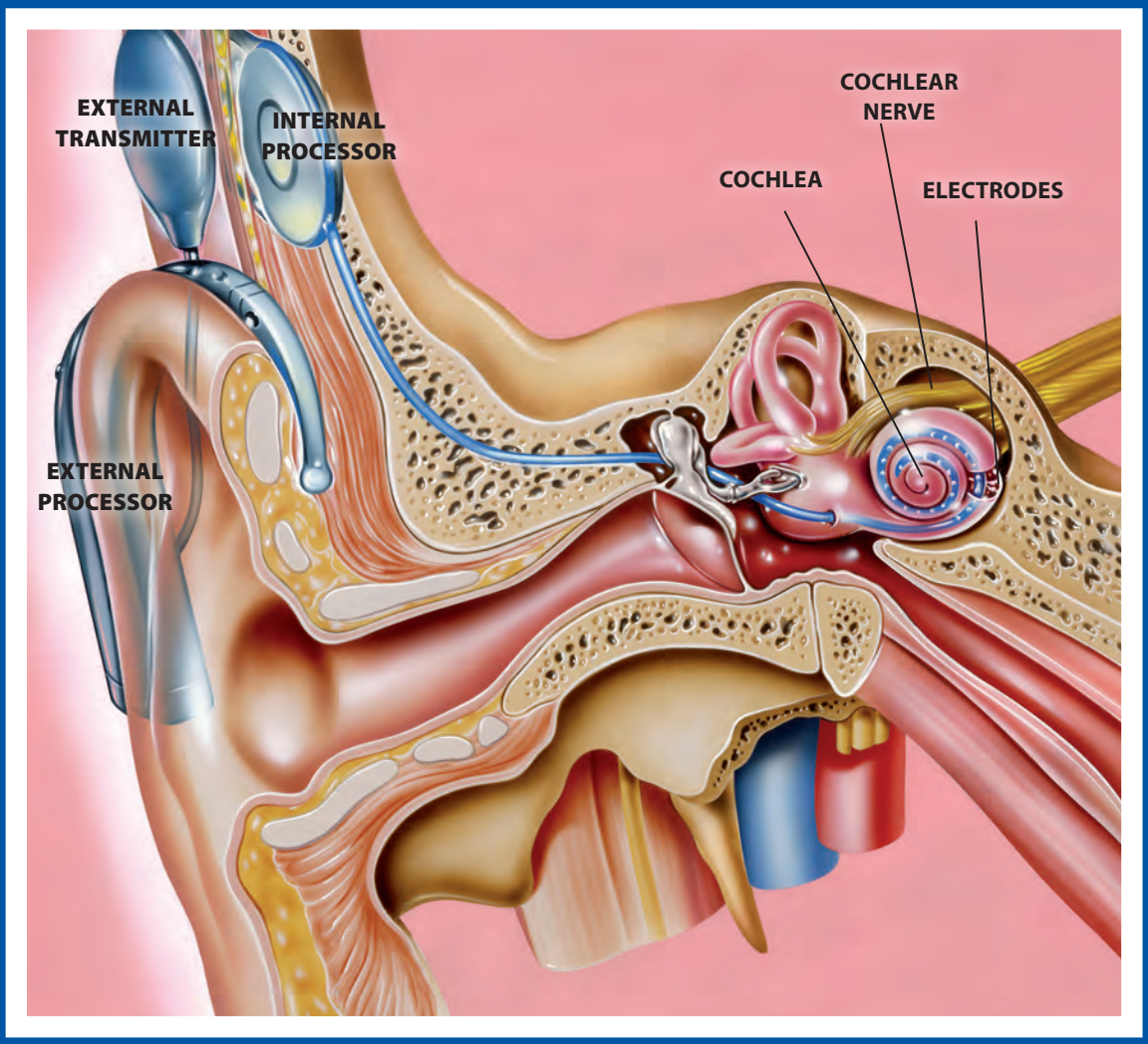
On Feb. 11, 2022, Jacob and Rachel watched their daughter's cochlear implant processors light up as she turned her head to the sound of their voices for the first time in weeks.

"Activation day was amazing. We were so excited to see



Le Bonheur Otolaryngologist Joshua Wood, MD, (right) examines Eleanor's ears at a follow-up clinic appointment. Wood says that Eleanor's successful surgery raises the possibility for cochlear implants at young ages.

HOW COCHLEAR IMPLANTS WORK



Cochlear implants provide a way to take sound, convert it into electrical energy and bypass the eardrum, middle ear and inner ear structures to stimulate the hearing nerve directly.

- **Electrodes are placed directly into the cochlea and is connected to an internal processor under the skin.**
- **The external processor contains a microphone that captures acoustic information and translates it into electrical information.**
- **This electrical information is transmitted through the electrodes sitting in the cochlea and can stimulate the cochlear nerve.**
- **The cochlear nerve sends the signal to the brain, which is heard as sound.**

Dr. Wood again and get started on Eleanor's hearing," said Rachel. "We were wearing masks, so the fact that she turned and tracked my voice was incredible."

And now the Nolens are enjoying introducing Eleanor to sound all over again, from the lilt of their voices to the barks of the family dog.

THE FUTURE

Eleanor will continue to meet with a Le Bonheur audiologist long-term to adjust her implants as needed so she can better hear the world around her. In the meantime, Eleanor's case opens the door for other children who need cochlear implants at a young age.

"The fact that we performed this surgery successfully goes a little bit against traditional teaching of when is 'too young' to get cochlear implants," said Wood. "It shows that this is a possibility for very young children."

Wood believes that Eleanor's long term prognosis for getting cochlear implants even at this young age will have a great outcome. She'll go to the appropriate speech therapies and should reach the same milestones in speech as other children her age. Rachel and Jacob are looking forward to what their daughter's future will look like, pursuing her passions and doing everything another child her age would.

"We're so thankful for the cochlear implants, and we want her to be proud of those — not letting them stop her from doing certain things because she's technically deaf," said Rachel. "Our plan is to let her find her passions and support her 100%."

Four weeks after surgery, the Nolens returned to have Eleanor's cochlear implants activated. Eleanor's face lit up as she heard her parents' voices for the first time in weeks.

Multiple MIS-C Mystery

Le Bonheur physicians highlight case of patient with two distinct illnesses consistent with multisystem inflammatory syndrome in children (MIS-C)

Some children may be at risk for multiple episodes of multisystem inflammatory syndrome in children (MIS-C), according to a new *Pediatrics* article from from physicians at Le Bonheur Children's Hospital and the University of Tennessee Health Science Center (UTHSC). The article describes the case of one child with two distinct illnesses seven months apart that were both consistent with MIS-C. The report highlights the need for more guidance and better understanding of the syndrome in order to improve diagnosis and treatment of these patients.

> *"Our case introduces the possibility that a subset of children may be more likely to have repeat MIS-C."*
>
> Bindiya Bagga, MD, Le Bonheur Infectious Disease Specialist

The article was published by a group of Le Bonheur and UTHSC physicians — former Pediatric Hospital Medicine Fellow W. Caleb Hancock, MD, Infectious Disease Fellow Amanda M. Green, MD, Child Neurology Resident Sariha Moyen, MD, Pediatrics Resident Caitlin Creel, Rheumatologist Kathleen P. Collins, MD, Vice Chair of Clinical Affairs and Rheumatologist Terri Finkel, MD, PhD, Hospitalist Stephen D. Pishko, MD, and Infectious Disease Specialist and UTHSC Pediatrics Residency Program Director Bindiya Bagga, MD.

"Our patient exhibited two distinct illnesses, both of which met the clinical and laboratory case definitions of MIS-C and could not be unambiguously explained by another etiology," said Bagga. "Our case introduces the possibility that a subset of children may be more likely to have repeat MIS-C."

In June 2020, a child presented to Le Bonheur Children's with primarily neurological and gastrointestinal symptoms as well as elevated inflammatory markers. A COVID-19 PCR test was negative, but the child had suspected exposure to COVID-19. When an extensive

workup for alternative diagnoses was negative, a SARS-CoV-2 antibody test was positive and the viral respiratory panel was negative, physicians gave the diagnosis of MIS-C. The child improved after intravenous immune globulin (IVIG) treatment and spent 14 days inpatient. Three weeks after discharge in outpatient follow up, the child had fully recovered from all symptoms.

"This case is not consistent with prior reports that have described rebound MIS-C symptoms after completion of therapy — it is possible the separate illnesses were triggered by different variants of SARS-CoV-2."

Bindiya Bagga, MD, Le Bonheur Infectious Disease Specialist

In January 2021 after seven months of good health, the child presented again — this time with fever, rash, gastrointestinal symptoms, elevated inflammatory markers and dilation of the left anterior descending coronary artery. The child had no known direct exposure to COVID-19. Symptoms, findings on electrocardiogram (EKG) and transthoracic echocardiogram (TTE) and abnormal laboratory results again led to a diagnosis of MIS-C. Treatment with high-dose aspirin, IVIG and methylprednisolone was initiated and by day five, all lab results except D-dimer were normal. At a follow up with cardiology two weeks after discharge, the coronary dilation had resolved.

Caleb Hancock, MD, former Pediatric Hospital Medicine Fellow, at left, and Infectious Disease Specialist Bindiya Bagga, MD, were part of a team who investigated the case of one child with two distinct illnesses consistent with MIS-C. Their findings were published in Pediatrics.

"In the interim between illnesses, the patient returned to a usual state of good health and demonstrated resolution of laboratory abnormalities," said Bagga. "This case is not consistent with prior reports that have described rebound MIS-C symptoms after completion of therapy — it is possible the separate illnesses were triggered by different variants of SARS-CoV-2."

Le Bonheur physicians posit that some high-risk variants of SARS-CoV-2 may be more likely to trigger MIS-C and that individuals with defects in inflammatory pathways may also be at increased risk.

"Further immunologic and virologic characterization of cases of MIS-C is warranted to improve our understanding of this entity, and we hope our case report increases awareness of the possibility that repeat MIS-C illness can occur in their patients," said Bagga.

Seeds of Healing

Le Bonheur Green provides outdoor retreat for patients, families

On May 24, 2022, Le Bonheur celebrated the grand opening of Le Bonheur Green: a nearly two-acre green space on the hospital's front lawn. For the Krull family, this grand opening is more than a decade in the making.

In 2011, Erik Krull paced up and down the sidewalk along Memphis' busiest street. The hot June sun beat down on him as he pushed a wheelchair holding his wife, Kate, and comatose 8-year-old daughter, Lucy, over cracked sidewalks.

On May 24, 2022, Le Bonheur Green officially opened. This nearly two-acre green space on the hospital's front lawn will give patients and families a place to rest and enjoy fresh air.

After spending 20 months in and out of hospitals, Lucy was tragically losing her battle with brain and spine cancer. Her doctor encouraged the Krulls to go outside and get Lucy fresh air.

"Having green space and open space is essential for our overall health and well-being and even more so during times of stress and crisis," said Jason Yaun, MD, clinical director of ULPS General Pediatrics. "Green spaces are linked to better health outcomes, giving patients and families a place for relaxation and stress relief."

But without a green space for families to utilize at Le Bonheur, the Krulls turned to the sidewalks of the busy Memphis medical district. They planned Lucy's funeral as they walked back and forth along the busy streets.

But then a miracle happened. After seven days in a coma, Lucy woke up and made an extraordinary recovery.

It was this experience outside that prompted the Krulls to give families at Le Bonheur the gift of an outdoor space that would provide healing and hope. Through a gift to the hospital, the process to create Le Bonheur Green began.

"To be able to feel the sunshine, even if you're in a wheelchair or have an IV pole, is a small slice of normal life for a child in the hospital," Kate Krull said. "For kids to hear birds chirping, cars driving by,

and feel the fresh air on their face is a reminder that life has not stopped because they are in a hospital bed. Rather, it is a reminder that 'All of this will still be there when I'm able to go home and the rest of the world is waiting for me.'"

Le Bonheur Green includes a pavilion for families to enjoy fresh air in the shade, a serenity garden with unique works of art and a wind chime instillation playing a tranquil melody as the breeze blows. A labyrinth will provide a walking path for families and an iris garden brings nature closer to the hospital.

"This will be a tremendous benefit for our patients, families and staff," said Yaun. "As we look toward our mental and emotional health, places and spaces like this and the time spent there are so valuable in protecting and promoting our wellness. I'm looking forward to our patients and families using Le Bonheur Green — and also using it myself!"

Above, Kate, Erik, Ella, Jack and Lucy Krull at the grand opening celebration for Le Bonheur Green. The Krull family longed for a green space during their daughter's battle against brain and spine cancer.

Families can walk out the front door of the hospital and access the new Le Bonheur Green. The space is 100% donor funded.

A CLEAR PATH

Omaha family finds answers, healing for son's rare brain tumor

Eleven-month-old Callum Kauzlarich of Omaha, Neb., had a bump on his head. His parents, Kyle and Blair, wanted a clear answer. Was this ridge on their son's skull something to be concerned about?

The answer wasn't so black and white.

A CT scan revealed that the ridge on Callum's skull was indeed harmless. But the scan also uncovered something else — Callum had a tumor in the middle of his brain.

"A whirlwind of emotions come over you," said Blair, who works in 3D medical printing. "I see these things all day, but you never think that it's going to be your kid."

Callum had a choroid plexus papilloma in the third ventricle, a rare and benign brain tumor. However, its location caused hydrocephalus leading to elevated pressure in his brain. Because of this, surgery was required. Soon.

This diagnosis threw the Kauzlarich family into a maze of doctors' appointments. They received diverging opinions from three separate consults with seemingly no clear way forward, they said.

"We were interviewing brain surgeons for a very important job, but how do you choose a path forward when you have no knowledge?" asked Blair, in reference to her search for the best place for Callum's surgery.

Above, Callum Kauzlarich plays prior to his brain tumor surgery. The Kauzlarichs found Le Bonheur and Chief of Pediatric Neurosurgery Paul Klimo, MD, MPH, through another family in their hometown whose child had also undergone brain tumor surgery with Klimo.

"After every one of these appointments we would sit in the car for an hour just trying to digest everything that had been told to us," added Kyle. "We were pretty frustrated because we were hearing different things from different doctors and none of the options felt quite right."

But after Kyle shared his son's diagnosis with his workout group, a new route emerged that put the Kauzlarichs on their journey to Le Bonheur Children's and Paul Klimo, MD, MPH, chief of Pediatric Neurosurgery and Co-director of the Neuroscience Institute at Le Bonheur. One of the members knew another Omaha family whose son was successfully treated through Le Bonheur's joint Pediatric Brain Tumor Program with St. Jude Children's Research Hospital.

The family put the Kauzlarichs in direct contact with Klimo, and within minutes they were texting him Callum's brain imaging.

One look at the scans and Klimo told them: "I know I can do it." Performing almost 200 brain surgeries each year, Klimo was familiar with removing abnormalities in the same

Le Bonheur Chief of Pediatric Neurosurgery Paul Klimo, MD, MPH, holds Callum Kauzlarich at follow-up after a successful brain tumor resection surgery. Klimo was able to remove Callum's tumor in its entirety. Today, Callum's development is advancing by leaps and bounds.

anatomic space as Callum's tumor.

"Dr. Klimo offered a different approach, yet again, but he sounded very confident in what he was saying and very matter of fact," said Kyle. "He told us, 'We're going to do it this way, and we should have no problem getting the tumor out completely in one piece.'"

The path forward was finally clear for both Kyle and Blair. They drove their son to Memphis and checked in at FedExFamilyHouse — a free place for Le Bonheur families to stay directly across from the hospital.

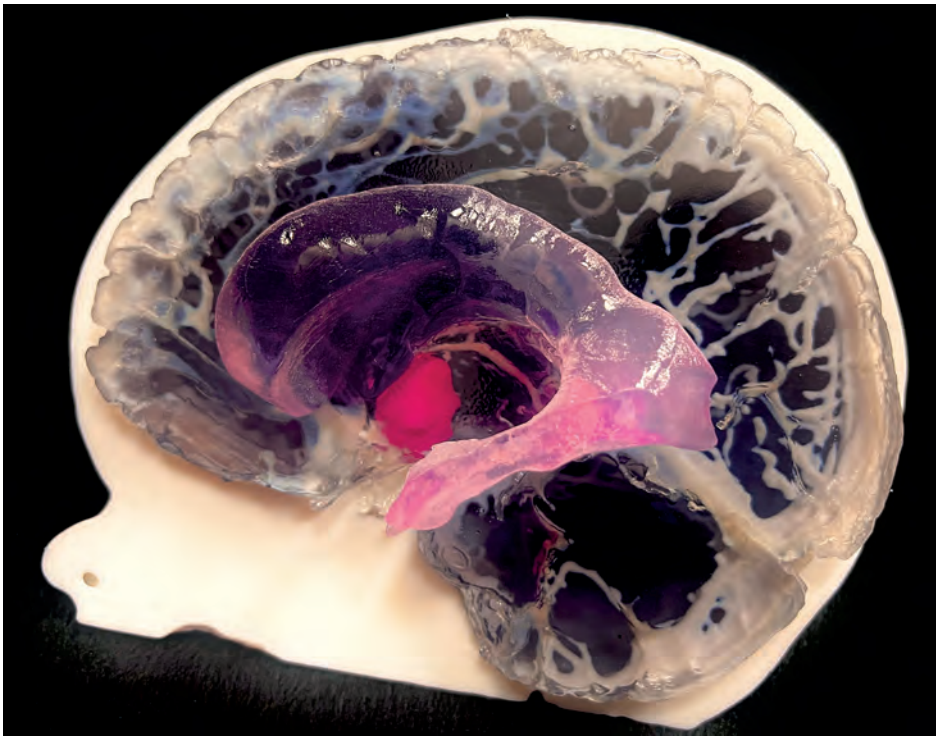
They met Klimo and his team on a Monday morning to prepare for surgery the next day.

"Dr. Klimo put us both at ease," said Blair. "He was finally the one person I could trust with my son's life. We knew Le Bonheur was the right place."

Callum had his resection surgery on Feb. 22. Klimo removed the tumor by approaching it between the two halves of the brain and making a small opening in the corpus callosum, the structure that connects the two halves. The tumor was removed in its entirety, and Callum did not require a drain. He came out of surgery with only a bandage on his head covering the three-inch incision.

"There was a new light in our son — his eyes and expressions were totally different. He had always been a sleepy kid, and we didn't realize why. He's so happy now."

Blair Kauzlarich, Callum's mother



A 3D model designed by Callum's mother, Blair Kauzlarich, and printed at the 3D Printing Center at Clarkson College shows the tumor in the third ventricle of Callum's brain. Le Bonheur Chief of Pediatric Neurosurgery Paul Klimo, MD, MPH, was able to remove the tumor in its entirety leaving Callum with only a three-inch incision after surgery.

After just two nights in the Neuro ICU, Callum was discharged to FedExFamilyHouse and a day later cleared to head back home. The Kauzlarichs returned to Omaha post-surgery just two short weeks after they first discovered the tumor in Callum's brain. Kyle and Blair saw an immediate change in their child.

"There was a new light in our son — his eyes and expressions were totally different," said Blair. "He had always been a sleepy kid, and we didn't realize why. He's so happy now."

Callum is growing by leaps and bounds. Since his surgery, he started therapy close to home, turned 1 year old and exploded in his motor skills. One potential side effect of his surgery was loss of short-term memory due to the location of the tumor, but Callum continues to perform well with short-term memory tasks.

He will visit St. Jude every three months for the next few years for follow-up and observation. Klimo and the Kauzlarichs anticipate no long-term impact from Callum's brain tumor.

"Callum has gone through a unique experience and, even though he's not going to remember any of this, I hope that he looks back

and recognizes all the love and compassion that so many people gave him and our family," said Kyle.

But the Kauzlarichs don't see their brain tumor journey as completely over. They now work to help other families facing a brain tumor diagnosis find the path that Callum took for healing through Le Bonheur's Brain Tumor Program and Klimo's expertise. Working with the SammyStrong Foundation, started by another Le Bonheur brain tumor patient family in Omaha with the mission to support children, families and organizations fighting pediatric brain cancer, the Kauzlarichs have already helped other families find their way to Klimo and Le Bonheur — from Omaha and beyond.

They have also donated part of Callum's tumor to St. Jude for research — another way that the Kauzlarichs are doing anything possible to help future families facing a similar journey.

"Through the whole experience, we were overwhelmed with an outpouring of compassion. Everyone at Le Bonheur and FedExFamilyHouse were very supportive and cared a lot about helping us work through this," said Kyle.

"It was the worst case scenario, but the best outcome possible," adds Blair. "I don't know how to put into words how grateful we are for Dr. Klimo and his crew."

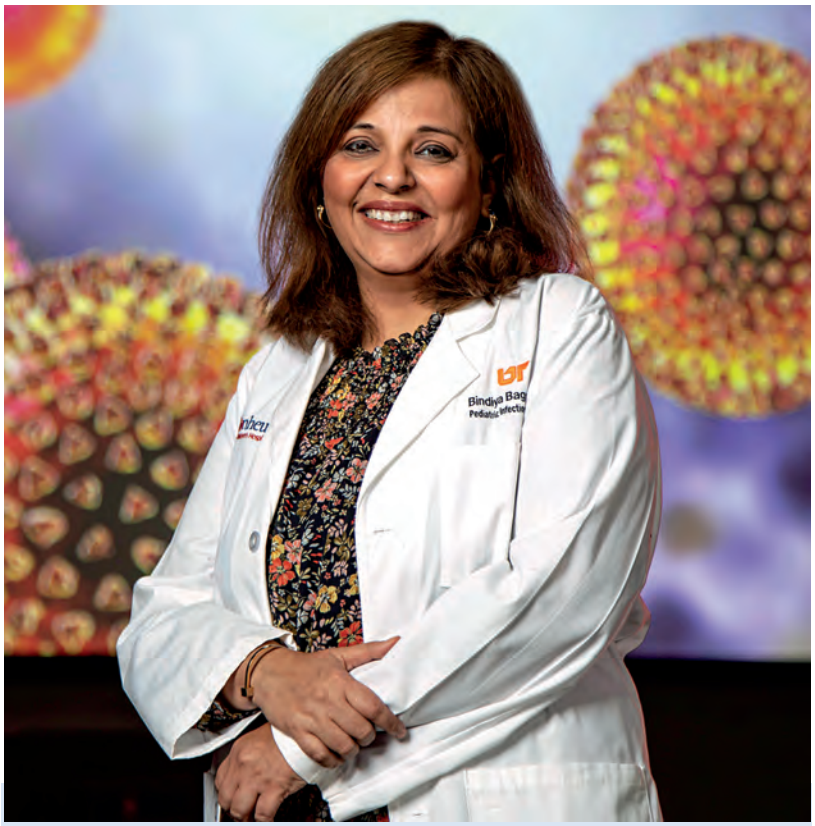
Callum Kauzlarich plays with his dad, Kyle, after his surgery. The brain tumor was removed in its entirety, and Callum returned from surgery with just a bandage and three-inch incision.

PROFILE: BINDIYA BAGGA, MD

Infectious disease specialist takes new role leading UTHSC's Pediatric Residency Program with empathy, expertise

Strength. Compassion. Determination.

These words are just the tip of the iceberg when describing Le Bonheur Infectious Disease Specialist Bindiya Bagga, MD. Her decades-long career in medicine has taken her from India to Louisiana and eventually to Tennessee, but her desire to positively impact lives has remained constant. In her newly-announced role as pediatric residency director at the University of Tennessee Health Science Center (UTHSC), she'll be impacting countless lives for years to come as she guides residents at the start of their medical careers.



Bindiya Bagga, MD

"I want to make sure my residents are getting the best training they can, but I want them to do more than just survive. I want them to thrive and avoid burning out ... I also want them to feel supported, giving them the skills they need to prevent burnout and enhance their wellbeing."

Bindiya Bagga, MD, Le Bonheur Infectious Disease Specialist and University of Tennessee Health Science Center Pediatric Residency Program Director

Bagga grew up in Kolkata, India, raised by two engineers who placed great emphasis on education. Her mother was the only woman in her engineering class, a feat Bagga both recognized and admired. Driven by the strength instilled by her mother, Bagga pursued medicine at the advice of her father. He realized she had the mind for science and the creativity required to consider situations from many different angles, qualities that went hand in hand with her boundless curiosity.

In 2008, Bagga came to Memphis for the combined UTHSC and St. Jude Children's Research Hospital infectious disease fellowship, eventually staying on as a faculty member.

"I was working with so many senior officials with years and years of experience, and I felt a bit like an imposter," Bagga said, "I over prepared because I couldn't help but feel that I was underprepared."

Eventually Bagga's extra preparation paid off, as it led to her recognition by students and residents as an outstanding educator both at the bedside and in the classroom. She'd begun her fellowship with the intention of a career in grant writing and research for RSV (respiratory syncytial virus), but when she discovered her true passion was teaching and mentoring, it made the transition to a clinician educator and leader in medical education a no-brainer.

Bagga's lifetime of intense curiosity made infectious diseases a natural fit. Her initial years of research focused primarily on RSV, a respiratory virus which can afflict some children with minor cold symptoms while others require lifesaving measures. Her work in seeking to understand prolonged RSV respiratory symptoms earned her the Caroline B. Hall Clinically Innovative Research Award from the Pediatric Infectious Disease Society in 2018.

"I love infectious diseases as it requires me to think outside the box a lot because I'm solving puzzles. I like to put on my detective hat," Bagga said.

Her other area of research interest is antimicrobial stewardship, which aims to optimize the selection and use of antibiotics with the ultimate goal of reducing antibiotic resistance. Bagga also serves as co-medical director of the Antimicrobial Stewardship Program at Le Bonheur, which she helped to develop.

Her time both as an educator and in infectious diseases has been quite successful. Bagga has earned multiple teaching and mentoring awards both from the department of Pediatrics at UTHSC and from pediatric residents. Bagga was inducted by the UTHSC College of Medicine into the inaugural class of the Academy of Master Educators in 2020 and selected as a member of the Beta Tennessee Chapter of the Alpha Omega Alpha Medical Honor Society in 2022.

After serving as an associate program director for UTHSC's Pediatric Residency Program, where she focused on and built the resident wellness and mentoring programs, Bagga was named the Pediatric Residency Program director earlier this year.

While recruiting and interviewing medical students is a large part of her job, Bagga takes her role much more seriously than just focusing on the day-to-day administrative logistics. She wants to ensure her residents are fulfilled and thriving, keeping a focus on their wellbeing and opportunities for mentorship.

"I'm recruiting the new generation of learners. I want to recruit the best applicants across the country, make them part of our UT and Le Bonheur family and prepare them to be pediatricians and leaders of tomorrow with the hope that many of them will stay in the Memphis area long term," said Bagga. "I believe our unique city of Memphis, the flagship programs at Le Bonheur and the outstanding faculty and facility have us well positioned to provide outstanding pediatric training. I am both honored and humbled to lead this wonderful program."

Bagga wants to ensure that residents receive a well-rounded education and exposure to a variety of situations, procedures and conditions. But Bagga also wants her residents to do more than just eke by and exhaustedly cross the finish line upon the completion of their term.

"I want to make sure they are getting the best training they can, but I want them to do more than just survive. I want them to thrive and avoid burning out," Bagga said. She believes that being proactive and intentional about wellbeing early in a physician's career is the best way to prevent future burnout.

UTHSC Pediatric Residency Director Bindiya Bagga, MD, rounds with residents at Le Bonheur. An infectious disease specialist by training, Bagga recently took over leadership of the Pediatric Residency Program.

"It can be tough to find the right balance. I want to challenge them and deliver best practices of training, but I also want them to feel supported, giving them the skills they need to prevent burnout and enhance their wellbeing," said Bagga.

Like her residents, Bagga strives to practice what she preaches, reminding herself daily that balance is key to a thriving life, both at home and at work. Bagga unwinds by journaling, reading, painting, practicing yoga and hopping on flights to see family and loved ones.

A self-proclaimed foodie and chai enthusiast, Bagga loves trying out different restaurants and testing new recipes in her kitchen. She's known to bring chai and other goodies to her residents. After raising their only son — a true Memphis boy she says — and sending him off to college, she and her husband enjoy their time as empty nesters with delicious meals and long walks through the city's Shelby Farms Park.

"Le Bonheur and UT keep me in Memphis. The relationships and friendships I have made here make this a home-away-from-home for me," Bagga explained. "Le Bonheur is a very special place, and it is truly a privilege to work here. Whether I'm seeing patients or helping my residents, I want them all to feel supported during their time with me and I want to bring my authentic self to each and every interaction."

Bindiya Bagga, MD

Education and Training
Kasturba Medical College, Mangalore, India – Medical School
Louisiana State University Health Sciences Center – Residency
University of Tennessee Health Science Center/St. Jude Children's Research Hospital – Pediatric Infectious Diseases Fellowship

Board Certifications
American Board of Pediatrics – General Pediatrics
American Board of Pediatrics – Pediatric Infectious Diseases

Society Memberships
Pediatric Infectious Disease Society
Society of Pediatric Research
Association of Pediatric Program Directors
Southern Society of Pediatric Research
American Academy of Pediatrics
Alpha Omega Alpha Medical Honor Society

Awards and Honors
Member, Academy of Master Educators, University of Tennessee Health Science Center
Faculty Award for Excellence in Mentoring, University of Tennessee Health Science Center, Department of Pediatrics
Quality Cup Award – Summit Level for Antimicrobial Stewardship, Greater Memphis Chamber and Southwest Tennessee Community College
2018 Caroline B. Hall Clinically Innovative Research Award, Pediatric Infectious Diseases Society
Le Bonheur Children's Hospital Teaching Award, 2016-2018
Associate of American Medical Colleges (AAMC) 2019 Mid-Career Women Faculty Leadership

Headache Help

Le Bonheur Comprehensive Headache Center Director Ankita Ghosh, MD, publishes research on pediatric headache

Pediatric Neurologist Ankita Ghosh, MD, examines a patient during headache clinic. Ghosh is a pediatric headache specialist and director of Le Bonheur's Comprehensive Headache Center. She recently published multiple papers on pediatric headache.

Study: Trigeminal autonomic cephalalgias can begin early in life and exhibit similar symptoms as adults

All five headache disorders comprising trigeminal autonomic cephalalgias (TAC) can begin early in life and exhibit many of the same symptoms as TACs in adult populations, according to a study published in *Cephalalgia* by Director of Le Bonheur's Comprehensive Headache Center Ankita Ghosh, MD. Literature on TACs in pediatric populations has been very limited and little is known about these headaches in children.

TACs include cluster headache, paroxysmal hemicrania, short-lasting unilateral neuralgiform headache attacks with conjunctival injection and tearing (SUNCT), short-lasting unilateral neuralgiform headache attacks with cranial autonomic symptoms (SUNA) and hemicrania continua. The lack of study into these headache disorders in children means that many can experience a delay in diagnosis or a misdiagnosis of their headache disorder.

"In cluster headache, the most common TAC, there is typically a delay in diagnosis of several years because of atypical headache features and lack of awareness of cluster headache in younger patients," said Ghosh. "The objectives of our review and meta-analysis were to report on the full age ranges of pediatric TACs and determine if kids and adults with TACs display similar symptoms."

In the meta-analysis, Ghosh and colleagues identified 86 studies for systematic review with patients from 24 countries and five continents. Results showed that every type of TAC can begin early in life. The youngest age of diagnosis for each TAC in this review was 1 year old for cluster headache and SUNA, 2 years old for paroxysmal hemicrania and SUNCT and 6 years old for hemicrania continua.

In this review, cluster headache was the pediatric TAC with the most available data. Cluster headaches were shown to be present in every pediatric age (1-18 years) and met the full criteria for cluster headaches established for adults in the ICHD-3 (International Classification of Headache Disorders). The most common differences between adult and pediatric symptoms were the frequency and location of attacks. Cluster headache diagnosis was also delayed or misdiagnosed as migraine in pediatric patients because pediatric patients had less cranial autonomic

> ***"In cluster headache, the most common TAC, there is typically a delay in diagnosis of several years because of atypical headache features and lack of awareness of cluster headache in younger patients."***
>
> Ankita Ghosh, MD, Director of Le Bonheur's Comprehensive Headache Center

features and restlessness but similar rates of migraine symptoms.

The other types of TACs reviewed in this meta-analysis met most but not all ICHD-3 criteria, and very few studies examined these headache disorders in children. Further study is needed to understand the differences between adult and pediatric onset for these headache disorders.

"Our review of current literature strongly suggests that all five TACs can start very early in life," said Ghosh. "These results have clinical implications for neurologists caring for pediatric patients with headache disorders to better diagnose and treat them appropriately."

CLINICAL IMPLICATIONS

1. **All five TACs can start early in life. Data is strongest for cluster headache.**
2. **Pediatric-onset and adult-onset cluster headache have similar features. Cluster headache may be confused with migraine in children because of lower rates of cranial autonomic features and a similar rate of prototypically migrainous features.**
3. **Pediatric cluster headache can be distinguished from migraine by attack duration less than two hours (more consistent with cluster headache) or more than three hours (more consistent with migraine). When the attack duration is two to three hours, pediatric cluster headache can be distinguished by number of attacks per day (more than one), presence of restlessness and strictly unilateral pain.**

Case Series: Orthostatic headaches in young patients

Children and adolescents with spontaneous intracranial hypotension (SIH) failing to improve after treatment by epidural blood patching (EBP) should be evaluated for orthostatic intolerance, says Le Bonheur Pediatric Neurologist and Director of the Neuroscience Institute's Comprehensive Headache Clinic Ankita Ghosh, MD, in research published in *Child Neurology*. Ghosh's case series shows that SIH and orthostatic intolerance together can cause orthostatic headaches, and although symptoms may overlap, each condition requires different treatments.

> ***"Spontaneous intracranial hypotension due to leaking spinal cerebrospinal fluid is an increasingly recognized cause of orthostatic headaches, although still considered rare in pediatric patients. Co-existence of SIH and orthostatic intolerance has not been described in young patients until our case series."***
>
> Ankita Ghosh, MD, Director of Le Bonheur's Comprehensive Headache Center

"Spontaneous intracranial hypotension due to leaking spinal cerebrospinal fluid is an increasingly recognized cause of orthostatic headaches, although still considered rare in pediatric patients," said Ghosh. "Co-existence of SIH and orthostatic intolerance has not been described in young patients until our case series."

The research reviewed the cases of seven young patients presenting with orthostatic headaches, a headache that develops while standing and is relieved by laying horizontal, who were initially diagnosed with SIH. All seven patients were diagnosed with a cerebrospinal fluid (CSF) leak by CT myelography and were treated with EBP. However, patients continued to have symptoms of autonomic dysfunction, syncope and orthostatic headaches after multiple EBPs. Patients then underwent a head up tilt table test (HUTT) and were diagnosed with orthostatic intolerance.

The case study showed that the clinical symptoms, including nausea, dizziness and light headedness, of SIH and orthostatic intolerance can overlap. Together, SIH and orthostatic intolerance can cause orthostatic headaches in a patient. All patients in the study improved after treatment for both SIH and orthostatic intolerance.

"We recommend that young patients with SIH who do not obtain significant headache relief after multiple blood patches be evaluated for autonomic dysfunction with physiological studies such as HUTT," said Ghosh. "All our patients improved with treatment for both SIH and orthostatic intolerance."

Pioneers for Preemies

Interventional cardiologist brings PDA closure to the NICU bedside

As medical director of Le Bonheur's Interventional Catheterization Laboratory, Shyam Sathanandam, MD, FSCAI, saw an opportunity to improve the care of his tiniest patients. Sathanandam had already pioneered transcatheter PDA closure (TCPC) in extremely low birth weight (ELBW) neonates at Le Bonheur, but one of the largest risks for complications was still a major concern — transport.

To undergo TCPC in Le Bonheur's cath lab, neonates are transferred from their birth hospital, which includes neighboring facilities in Memphis but also as far as Johnson City, Tenn., a nearly 500-mile journey. Sathanandam recognized that for the welfare of these children, he and his team needed to be able to bring TCPC directly to the bedside of these neonates to minimize complications and give them the best possible outcomes.

"Transfer of extremely low birth weight neonates outside of the NICU is associated with increased morbidity and mortality," said Sathanandam. "Despite the many benefits of performing TCPC in the cath lab, the best place for the patient to stay may be in the NICU for their procedure."

As a result, Sathanandam and colleagues in pediatric cardiology, neonatology, anesthesiology and medical transport worked together to safely bring TCPC to the NICU bedside and eliminate the need for transport of this vulnerable patient population. Sathanandam and colleagues published their methods and roadmap to TCPC closure at the NICU bedside in *Congenital Cardiology Today*.

"The highest-risk part of transcatheter PDA closure is transport," said Mark Weems, MD, medical director of Le Bonheur's NICU. "These small babies are particularly sensitive to stimulation, changes in temperature and differences in ventilator settings, which are inevitable when moving a patient from the NICU to the cath lab."

Moving the procedure to the

Le Bonheur Medical Director of the Interventional Catheterization Laboratory Shyam Sathanandam, MD, FSCAI, a pioneer of transcatheter PDA closure (TCPC) in extremely low birth weight infants, has expanded accessibility and improved patient safety by bringing TCPC to the NICU bedside.

patient's bedside eliminates many of the risk factors, keeps the patient more stable and allows physicians to see the benefits of early PDA closure, says Weems. He and the neonatologists at Le Bonheur see the best outcomes when the PDA is closed prior to 1 month old, as delayed closure means a baby's lungs recover slower. Weems and his team believe that offering TCPC in the NICU will allow earlier PDA closure and therefore more rapid improvement in these tiny patients.

An Innovative Program

The option to even consider bedside TCPC is a result of years of refining a multidisciplinary program and building expertise among all parties who work with ELBW neonates. In 2019, Sathanandam was the first in the world to implant the first commercially approved medical device for TCPC in ELBW neonates — the Amplatzer Piccolo™ Occluder. Since then, Le Bonheur has used the device to close more than 350 PDAs in babies weighing less than 4 kilograms.

The success rate has been excellent, says Sathanandam, with low adverse events suggesting that earlier closure (before 4 weeks old) is associated with improved outcomes. As a result, patients at Le Bonheur have undergone TCPC at progressively younger ages and lower weights.

This success is thanks to expertise in PDA management across divisions including neonatology, cardiology, anesthesiology, pulmonology, neurodevelopment, nutrition, speech therapy, social work, medical transport and research collaboration.

"Creating procedure expertise amongst all individuals assisting in TCPC is essential," said Sathanandam. "As available devices improved, we have refined our cath lab closure process. The immense experience and expertise we have performing TCPC in ELBW neonates in the cath lab allowed us to even consider performing TCPC at the bedside."

Leaving the Cath Lab

Many aspects of PDA closure are the same at the bedside as in the cath lab, but the smaller space puts some constraints on the procedure. One of the major differences is the limited availability of fluoroscopy at the bedside. Sathanandam and interventional cardiologists refined their TCPC methods with limited fluoroscopy in the cath lab relying heavily on transthoracic echocardiogram (TTE) instead to test this obstacle.

Based on early experience, NICU bedside TCPC appears to be just as safe and effective as TCPC in the cath lab, says Sathanandam. Patients no longer require transport — a frequent concern of TCPC in ELBW neonates. As a result, Sathanandam expects an increase in device closures of PDA in ELBW neonates as previously the transfer of a patient could lead to hesitancy of neonatologists to fully support TCPC.

"Although we have an incredible safety record for closing PDAs in the cath lab, we still have referring physicians choose to delay closure

Thanks to years of refining PDA closure in the cath lab, Le Bonheur experts can now bring the procedure to a NICU patient's bedside. Above, Sathanandam conducts a case in the cath lab.

PDA Closure: Cath Lab vs. NICU Bedside

The following chart highlights the similarities and differences between locations for transcatheter PDA closure (TCPC).

TCPC in the Cath Lab	TCPC at the NICU Bedside
An anesthesiologist, CRNA and two to three cath lab staff transport the patient from the NICU to the cath lab.	A portable cart containing supplies routinely used for TCPC in the cath lab is brought to the bedside in the NICU.
A sonographer performs TTE at the head of the table during setup.	A cardiologist performs TTE during setup. The minimal space does not allow for a sonographer at the bedside.
The device is placed in the PDA via the femoral vein using ultrasound-guided vascular access and biplane fluoroscopy.	Biplane fluoroscopy is not available at the bedside, and the implanter must direct the catheter with TTE and a portable, single plane C-arm.
A lateral angiogram with contrast confirms the device is in the correct position.	Angiograms are not performed. Babies are not exposed to iodine containing contrast agents and receive very little or no radiation exposure.
Angiograms and TTE are performed again to check for left pulmonary artery or aortic obstruction, device position, residual shunt tricuspid regurgitation, left ventricle function and effusion.	TTE is used for assessment. TTE is repeated just after releasing the device and again five minutes later.

because they fear the risk remains too high in the first few weeks," said Weems. "We believe that offering PDA closure in the NICU will decrease transport-related risks and allow us to close the PDA earlier."

Future of PDA Closure

Moving PDA closure to the bedside marks a significant program shift that is a result of years of refining methods and building expertise at Le Bonheur Children's. Now, NICU bedside TCPC is the preferred method at Le Bonheur, and the majority of TCPCs are performed at the bedside.

For Weems, the potential for this option is already clear. In a recent case, a baby on a high-frequency ventilator with a high oxygen requirement had a PDA closed in the NICU at just 3 weeks old. The baby was extubated only four days later.

"These are the types of successful cases that make this procedure so rewarding," said Weems.

The team is actively collecting data on the procedure at the bedside and anticipate similar procedure times, lower radiation exposure and similar success and complication rates as the cath lab.

Sathanandam and the PDA closure team continue to bring education around TCPC for this neonate population through their PDA Symposium — a multispecialty symposium on the advanced management of PDA in newborns. In the four PDA Symposiums held to date, Le Bonheur cardiologists and neonatologists have covered a variety of topics related to PDAs including benefits of closure for premature infants, avoiding complications, ongoing clinical trials and, this year, how bedside TCPC is the way forward. Sathanandam has completed close to 20 live cases for education purposes at the PDA Symposium, Pediatric Interventional Cardiology Society meetings and directly to hospitals. All babies were less than 1 kilogram at the time of the procedure.

2022 PDA Symposium

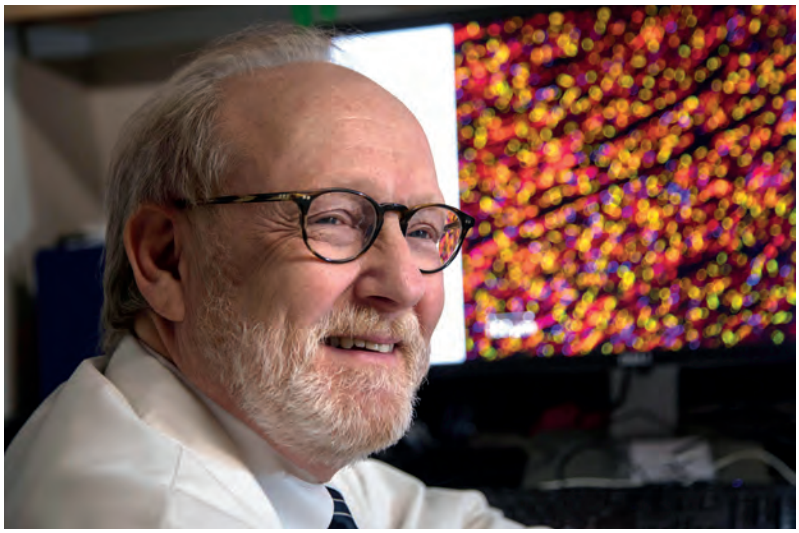
This year's PDA Symposium was held in partnership with the NeoHeart Society on Aug. 5-6 in Anaheim, Calif. This multispecialty symposium focuses on advanced management of PDA in newborns bringing together experts from around the world to have robust discussion on the current management of PDA in premature infants.
Visit pdasymposium.com to learn more.

A CONSENSUS CARE MODEL FOR HCM

Le Bonheur Heart Institute Co-Executive Director publishes new guidelines for diagnosis, evaluation and management of hypertrophic cardiomyopathy

Co-Executive Director of Le Bonheur Children's Heart Institute Jeffrey A. Towbin, MD, recently published the state-of-the-art reviews "Diagnosis and Evaluation of Hypertrophic Cardiomyopathy" and "Management of Hypertrophic Cardiomyopathy" with an expert panel for the *Journal of the American College of Cardiology (JACC)*. These consensus documents create a comprehensive best care model for hypertrophic cardiomyopathy (HCM) based on clinical practice experience, personal research and peer-reviewed literature.

Towbin is also chief of Cardiology and medical director of the Cardiomyopathy, Heart Failure and Heart Transplant Program at Le Bonheur Children's, medical director of Cardio-Oncology and Cardio-Hematology at St. Jude Children's Research Hospital and professor of Pediatric Cardiology at the University of Tennessee Health Science Center.



Co-Executive Director of Le Bonheur Children's Heart Institute Jeffrey A. Towbin, MD, recently published two state-of-the-art reviews creating a best care model for hypertrophic cardiomyopathy (HCM). Evidence-based management strategies for HCM have drastically changed the outcomes for the disease.

According to the reviews, HCM is an under-recognized disease that occurs in one in 200 to one in 500 individuals worldwide. Because HCM is highly treatable, has seen advances in care and provides family screening opportunities, a timely diagnosis is crucial. In the first article, the *JACC* expert panel systematically reviewed a range of issues related to HCM, from best practices for initial evaluation to genetic testing to exercise and physical activity in an effort to provide a best care model for this patient group. The second article covered the management of HCM including sudden death prevention, surgical options for reversing heart failure and considerations for heart transplant.

> ***"In recent years, effective management strategies for major HCM complications have emerged which improve clinical course, lower mortality and morbidity rates substantially and enhance the likelihood of normal longevity and good quality of life."***
>
> Jeffrey A. Towbin, MD, Co-Executive Director of Le Bonheur Children's Heart Institute

"Comprehensive initial patient evaluations are important for reliable diagnosis, accurate portrayal

of HCM and family history, risk stratification and to distinguish HCM forms," said Towbin. "In recent years, effective management strategies for major HCM complications have emerged which improve clinical course, lower mortality and morbidity rates substantially and enhance the likelihood of normal longevity and good quality of life."

Recommendations and insights from the expert panel in the review "Diagnosis and Evaluation of Hypertrophic Cardiomyopathy" included the following:

- **Initial HCM evaluation should prioritize diagnosis with assessment of left ventricular (LV) morphology and function, symptom severity, sudden death risk, family history, lifestyle modification and a surveillance plan.**
- **Routine re-evaluation after diagnosis should take place at 12-month intervals.**
- **Echocardiography and cardiac magnetic resonance (CMR) imaging are established strategies for HCM diagnosis. CMR should be obtained on initial evaluation and every three to five years.**
- **Genetic testing is important for family screening, but not reliable for prognosis or clinical course. At-risk and asymptomatic family members, as well as those who can transmit the disease to children, should have genetic testing.**
- **First-degree and other close family members should begin HCM screening with diagnostic imaging on a yearly basis beginning at 12 years old until 18 to 21 years old and then at five-year intervals.**
- **The panel does not recommend screening prior to age 12 as HCM characteristics and adverse events are rare before adolescence, and screening can cause unnecessary anxiety and false positives.**
- **Most athletes with HCM should be disqualified from intense competitive sports because of the risk of sudden death. The responsibility for this decision should rest with the physician who understands the risk for their patient.**

"Through these guidelines, our panel aimed to express key principles for HCM in 'real-world' clinical language, largely

One of the established imaging strategies for hypertrophic cardiomyopathy (HCM) is echocardiography for diagnosis and follow-up, as pictured above.

Hugo Martinez, MD, visits with a patient during hypertrophic cardiomyopathy clinic. Martinez is co-director of the Hypertrophic Cardiomyopathy Program with Jeffrey A. Towbin, MD.

focused on young adults," said Towbin. "While we support and promote the advantages of HCM Centers of Excellence like Le Bonheur's, an equally important objective was to more expansively inform cardiovascular practitioners caring for HCM patients in general cardiology environments."

Better understanding of the disease, improved diagnostic technologies and advances in therapeutics have consequently transformed the treatment and management of HCM. This has evolved from management primarily through medication to management with devices and interventional therapies. As a result, HCM mortality has been reduced tenfold.

Guidelines from the expert panel from the review "Management of Hypertrophic Cardiomyopathy" included the following:

- **Sudden death can be prevented through a mature risk algorithm with predictive markers and the use of implantable cardioverter defibrillators (ICD).**
- **Little evidence exists showing that medication reliably prevents progression of heart failure in this population, therefore transaortic septal myectomy is the preferred treatment option for patients with drug-refractory heart failure symptoms.**
- **Percutaneous alcohol septal ablation is the primary alternative intervention for patients who are not optimal candidates for myectomy.**
- **Nonobstructive HCM patients should have medical therapy at the onset of heart failure symptoms, but heart transplant for refractory nonobstructive end-stage heart failure patients is considered when quality of life has become unacceptable and no other options for treatment are available.**
- **Atrial fibrillation in HCM can be controlled through medications, catheter ablation and maze surgical procedure.**

"Evidence-based and guideline-directed personalized treatment strategies have transformed HCM into a starkly different disease entity," said Towbin. "More widespread implementation of these advances in regional and community-based populations and worldwide, remains an important challenge for this disease that has now emerged from the darkness."

Intervention for IBD

Research shows potential of psychological intervention to improve quality of life for at-risk adolescents with inflammatory bowel disease

Psychological interventions for adolescents with inflammatory bowel disease (IBD) may help to improve adherence to treatments and health-related quality of life (HRQoL), says research published in *Behavioral Medicine* by Le Bonheur Gastroenterologists Mark R. Corkins, MD, and John R. Whitworth, MD.

The research was conducted in conjunction with Psychologist Kimberly L. Klages and colleagues from the Department of Psychology at the University of Memphis. Their study of adolescents with IBD showed that psychosocial problems, disease severity and identifying as Black led to lower HRQoL scores.

"Youth with IBD typically experience disruptions to their health-related quality of life," said Whitworth. "The findings of our study show that a psychological approach to coping with psychosocial problems and IBD symptoms may influence patients to better adhere to their treatment plan and improve their quality of life."

HRQoL of youth is influenced by three interacting factors — sociodemographic and disease characteristics, psychosocial problems and health-related behaviors. This is the first time that research has looked at the impact of these factors on HRQoL of adolescents with IBD, with the study aiming to better understand the relationship among these factors and their influence on HRQoL.

Data was collected from 107 adolescent-caregiver pairs in Le Bonheur's outpatient gastroenterology clinic. Patients were between 12 and 20 years old with a diagnosis of ulcerative colitis or Crohn's disease. The patient and caregiver each independently completed the following questionnaires and measurements:

- The Medication Adherence Questionnaire (MAM)
- Self-Care Inventory-Revised (SCI-R-IBD)
- A visual analog scale to measure medication adherence
- The Pediatric Symptom Checklist-17 (PSC-17)
- PedsQL™ Gastrointestinal Symptoms Scales

The results of the study showed:

- Psychosocial problems were associated with worse HRQoL and adherence behaviors.
- HRQoL scores were lower for youth who were Black, had more severe disease or had greater psychosocial problems.
- Those with more severe disease had better adherence behaviors.
- Those with nonpublic insurance were associated with greater adherence behaviors and lower psychosocial problems.
- Age, disease duration, disease activity and gender did not predict psychosocial problems, adherence behaviors or HRQoL.

"Out of all of our study findings, we found the effect of psychosocial problems on HRQoL and adherence to be quite large," said Corkins. "Our findings indicate factors by which youth with IBD can be quickly and cost-effectively screened to identify those at risk for lower HRQoL."

> ***"The findings of our study show that a psychological approach to coping with psychosocial problems and IBD symptoms may influence patients to better adhere to their treatment plan and improve their quality of life."***
>
> John R. Whitworth, MD, Le Bonheur Gastroenterologist

The results of the study have clinical and economic significance for patients and clinicians treating IBD. By screening patients for risk factors such as insurance status, disease severity, psychosocial problems, race and adherence behaviors, clinicians can offer interventions to prevent decline in quality of life. Implementing psychological interventions focused on psychosocial problems, symptom coping and medication adherence may help enhance adherence behaviors and HRQoL while also preventing the treatment cost for long-term medical and psychological complications that can occur among adolescents with IBD. Le Bonheur gastroenterologists plan to use the data to demonstrate the need for psychologists in the care of pediatric patients with IBD.

Le Bonheur opens inpatient satellite unit in West Tennessee

Le Bonheur Children's recently opened a 21-bed pediatric inpatient unit inside Jackson-Madison County General Hospital in Jackson, Tenn. This collaboration with West Tennessee Healthcare will improve the health status of West Tennessee children by enhancing access to expert, specialized care close to home.

Sheyn named chief of Otolaryngology

Anthony Sheyn, MD

Anthony Sheyn, MD, has been named division chief of Pediatric Otolaryngology at Le Bonheur Children's Hospital and the University of Tennessee Health Science Center (UTHSC). Sheyn is also an associate professor in the UTHSC Department of Otolaryngology and chief of Otolaryngology at St. Jude Children's Research Hospital.

Prajapati named to editorial board of *Global Journal of Medical Pharmaceutical and Biomedical Update*

Hasmukh Prajapati, MD, DNB

Le Bonheur Radiologist Hasmukh Prajapati, MD, DNB, was recently named to the editorial board of the *Global Journal of Medical Pharmaceutical and Biomedical Update*. The editorial board provides guidance and focus for the journal gathering medical experts from various fields.

Maller appointed co-editor and co-chair of ACR CPI pediatric module

Vijetha Maller, MD

Le Bonheur Radiologist Vijetha Maller, MD, was appointed co-editor and co-chair of the recently published American College of Radiology (ACR) Continuous Professional Improvement (CPI) pediatric module. Maller is also assistant professor of Radiology at the University of Tennessee Health Science Center.

Ramos named to *MBJ* "Top 40 Under 40"

Andres Ramos, MD

Le Bonheur Psychiatrist Andres Ramos, MD, was named to the *Memphis Business Journal* "Top 40 Under 40" Class of 2022. This recognition honors individuals making a difference in their careers at Memphis organizations. Since the fall of 2020, Ramos has served as psychiatric consultant and liaison for Shelby County Schools, helping county leaders navigate the pandemic and the serious effects that at-risk children faced.

Epilepsy program receives NAEC reaccreditation

The Comprehensive Epilepsy Program in Le Bonheur's Neuroscience Institute recently earned reaccreditation as a Level 4 Epilepsy Center from the National Association of Epilepsy Centers (NAEC). This is the highest level awarded to epilepsy centers and one of only a few Level 4 centers in the United States.

Bagga named program director of Pediatrics Residency at UTHSC

Bindiya Bagga, MD

Bindiya Bagga, MD, has been named program director of the Pediatric Residency Program at the University of Tennessee Health Science Center (UTHSC). She previously served as associate program director of the Pediatric Residency Program for seven years, contributing to numerous areas of the residency including an enhanced focus on resident wellness and mentoring. Bagga also serves as co-medical director of Le Bonheur's Antimicrobial Stewardship Program and as southeast region chair of the Association of Pediatric Program Directors. Bagga is a pediatric infectious diseases physician at Le Bonheur and a professor at UTHSC. Read more about her on page 16.

Bugnitz named assistant dean for program improvement in the Office of GME

Mark Bugnitz, MD

Mark Bugnitz, MD, was recently named assistant dean for program improvement in the Office of Graduate Medical Education at the University of Tennessee Health Science Center (UTHSC). Bugnitz previously served as program director of the Pediatric Residency at UTHSC for 21 years, where he oversaw tremendous growth and the evolution of the residency curriculum and recruitment. Bugnitz is a critical care specialist at Le Bonheur and a professor at UTHSC.

Le Bonheur Sleep Disorders Center receives AASM reaccreditation

Le Bonheur Sleep Disorders Center recently received reaccreditation through the American Academy of Sleep Medicine (AASM). The AASM is the gold standard through which the medical community and public evaluate sleep medicine providers and facilities, given its focus on high quality, patient-centered care through adherence to rigorous, evidence-based clinical and quality standards.

McCullers receives Change Makers award

Jon McCullers, MD

Jon McCullers, MD, Le Bonheur pediatrician and University of Tennessee Health Science Center (UTHSC) chair of the Department of Pediatrics, received the 2022 Change Makers award from Leadership Memphis. Leadership Memphis considers Change Makers to be rare and unique forces of positive change whose work has enhanced the community, uplifted others and made Memphis a better place.

First phase of Le Bonheur's critical care expansion complete

Le Bonheur celebrated the completion of the first phase of a $95.4-million addition with a ribbon cutting on the ninth floor of the hospital. Twelve beds on the ninth floor were converted to critical care beds to ease capacity needs during the next phases of construction. The ninth floor will be the temporary home for the Heart Institute, while work on the larger four-story addition to the hospital continues. The expansion will create a 31-bed dedicated Cardiovascular Unit and a new MRI-guided catheterization lab.

Wiggins named to *MBJ* Power 100

Michael Wiggins, DBA, FACHE, Le Bonheur president, was named to *Memphis Business Journal's (MBJ)* Power 100 for 2022. Each year *MBJ* names 100 individuals as the city's most influential and powerful leaders in the Memphis area.

Michael Wiggins, DBA, FACHE

UT Le Bonheur Pediatric Specialists win HHS P4 challenge

The U.S. Department of Health & Human Services (HHS) named UT Le Bonheur Pediatric Specialists (ULPS) as one of 20 winners of the Promoting Pediatric Primary Prevention (P4) Challenge, a nationwide competition to increase pediatric vaccination rates and well-child visits. To address the steep decline in well-child visits, in partnership with Legacy of Legends Community Development Corporation (LLCDC), Le Bonheur has held a series of community pop-up clinics at a neighborhood church for the past two summers. This grant from the Health Resources and Services Administration (HRSA) allows this important work to continue and meet families where they are with quality, convenient care.

Jancelewicz named to CDH International Medical Advisory Board

Le Bonheur Pediatric Surgeon Tim Jancelewicz, MD, was named to the CDH International Medical Advisory Board. CDH International is a global initiative founded to stop congenital diaphragmatic hernia (CDH) and help support and educate parents whose children have been diagnosed with CDH.

Tim Jancelewicz, MD

Le Bonheur, UTHSC join Genomic Information Commons

Le Bonheur Children's and the University of Tennessee Health Science Center (UTHSC) recently joined the Genomic Information Commons (GIC), a continuously updated and searchable genomic data commons. As part of this partnership, Le Bonheur and UTHSC will provide deidentified genomics and clinical data to the collaborative members and will be able to query other partner institutions for data and sample contributions. The GIC was founded by leaders at Boston Children's Hospital, Harvard Medical School, Cincinnati Children's Hospital Medical Center, the Children's Hospital of Philadelphia, St. Louis Children's Hospital/Washington University at St. Louis and the University of Pittsburgh Medical Center.

GIC Genomic Information Commons

Radiology earns ACR reaccreditation in MRI

Le Bonheur's Radiology department was recently reaccredited by the American College of Radiology (ACR) in magnetic resonance imaging (MRI) earning the gold seal of accreditation. This represents the highest level of image quality and patient safety and is awarded only to facilities meeting ACR practice parameters and technical standards. The radiology department also holds ACR accreditation in nuclear medicine, ultrasound and computed tomography (CT).

AMERICAN COLLEGE OF RADIOLOGY ACR AMERICAN COLLEGE OF RADIOLOGY ACCREDITED FACILITY

Fetal Center receives ultrasound accreditation

The American Institute of Ultrasound in Medicine (AIUM) Ultrasound Practice Accreditation Council recently recognized the Fetal Center at Le Bonheur as an Accredited Ultrasound Practice. The Fetal Center was recognized in the areas of adjunct detailed fetal anatomic ultrasound and obstetric — first, second and third trimester.

2022–2025
AIUM Accredited Practice
STANDARD OBSTETRICS WITH ADJUNCT IN DETAILED FETAL ANATOMY

Project ADAM: Lawson's Legacy certifies first "Heart Safe School"

Lawson's Legacy, the Le Bonheur chapter of Project ADAM, aims to prevent death due to sudden cardiac arrest in children and teens. Recently, Collierville High School was the first school designated as "Heart Safe" by Project ADAM: Lawson's Legacy. Le Bonheur Cardiologists Karine Guerrier, DO, MPH, and Jennifer Kramer, MD, serve as co-medical directors of the program.

Lawson's Legacy
An affiliate of Project ADAM
At Le Bonheur Children's Hospital

Le Bonheur East Surgery Center named a Leapfrog Top Ambulatory Surgery Center

Le Bonheur East Surgery Center was named a Leapfrog Top Ambulatory Surgery Center (ASC) in 2021, one of only 13 selected nationally for the competitive award. This is the inaugural year of Leapfrog's Top ASC award which honors top performers in quality and safety, as verified by the Leapfrog ASC Survey.

THE LEAPFROG GROUP
TOP AMBULATORY SURGERY CENTER
2021

Heart Institute redesignated as CCF Center of Care

Le Bonheur's Heart Institute was recently redesignated as a Center of Care by the Children's Cardiomyopathy Foundation (CCF), a national nonprofit committed to improving the health outcomes and quality of life for children with cardiomyopathy. The Heart Institute received this recognition for consistently providing high-quality cardiac care and specialized disease management for children with cardiomyopathy. Centers are recognized based on meeting CCF's criteria of managing a high volume of cardiomyopathy patients, offering a variety of pediatric services, specializing in the treatment and management of cardiomyopathy in children and affiliation with an academic research institution.

Children's Cardiomyopathy Foundation
Recognized Center of Care

The "Best" for 12 Years!

Le Bonheur Children's Hospital has been recognized as a "Best Children's Hospital" for 2022-23 by *U.S. News & World Report* for the 12th consecutive year.

The annual "Best Children's Hospitals" rankings and ratings are designed to assist patients, their families and their doctors in making informed decisions about where to seek care for challenging health conditions. The rankings recognize the top 50 pediatric facilities across the U.S. in pediatric specialties.

Le Bonheur was recognized in three specialties — Cardiology and Heart Surgery, Gastroenterology and GI Surgery, and Pulmonology and Lung Surgery.

Le Bonheur Children's Hospital

Le Bonheur Children's Hospital

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CELEBRATING 70 YEARS

Le Bonheur marks seventy years of providing healing and hope for children and their families

This year, Le Bonheur Children's Hospital is celebrating 70 years of serving children in the Memphis area and worldwide. The journey began in 1944, when Memphis was in need of a hospital committed to children. Le Bonheur Club, a group of women dedicated to serving underprivileged children in the community, answered the call raising more than $2 million to build the facility.

On June 15, 1952, Le Bonheur Club's president released red balloons with keys to the hospital attached — signifying that the doors would always be open to any child in need — and officially welcomed families to Le Bonheur Children's Hospital.

In the course of 70 years, Le Bonheur has transformed from a small community hospital to a nationally-ranked health care leader caring for children across the globe. Strong programs of excellence provide cutting-edge treatment and groundbreaking discoveries that save lives.

Celebrating 70 Years
Le Bonheur Children's Hospital

Though technology has changed and medicine has advanced in the last 70 years, one thing remains the same: Le Bonheur Children's commitment to kids.

Today Le Bonheur heals the tiniest neonates with critical needs, operates on young adults who require complex brain surgeries and cares for children with serious heart defects. Because of Le Bonheur, children who might not have survived a few decades ago are now thriving.