

## Back to the Future

For private-practice pediatricians, “The times they are a-changin’,” notes Maryland pediatrician Dan Levy.



Regardless of the demands he faces in daily practice, pediatrician Dan Levy takes a thoughtful, upbeat approach in caring for his patients.

**O**wings Mills, Md., pediatrician **Dan Levy** recalls driving by a park a few summers ago not too far from his favorite summer vacation spot, Lake George in upstate New York. The sign at the entrance—“The Abraham Jacobi and Carl Schurz Memorial Park”—stopped him in his tracks.

“I did a double take and pulled the car over,” says Levy, a self-described medical history buff who knew well the story of Abraham Jacobi, the so-called father of pediatrics who established one of the first children’s clinics and pediatric departments in this country. “I found the town historian, who took me into the town hall, a back room and a whole file on Jacobi.”

Rummaging through the archive, Levy reflected on his own 35 years as a pediatrician and changes in pediatric medicine during that time—like managed care, the Affordable Care Act, and the retail medicine craze. So when

he was asked earlier this year to do a presentation at Johns Hopkins’ annual Pediatric Trends conference on Sept. 20, it was only natural that he’d select “Imagining the Future of Pediatric Medicine” as his topic, but in the context of what physicians like Abraham Jacobi brought to pediatrics.

“We have to start thinking about the changing dynamics and demographics of pediatric practice, and we have to adapt to that and understand the realities,” Levy said. “But we can’t talk about the future until we talk about where we came from.”

Jacobi and some of his contemporaries, Levy explained, initiated and developed concepts like prevention, wellness and primary care for children in this country. The initial concept of prevention was well-baby clinics and care rendered in pediatric offices, Levy explained. “The expectation,” Levy said, “was you’d walk into the office and the doctor would sit and talk with you.”

What evolved out of that era of the simple doctor-patient relationship, starting in the mid-1960s, were groups like the American Academy of Pediatrics and guidelines for preventive care and wellness, which led to Bright Futures, the gold standard of pediatric care today. In the 1990s came managed care and initiatives to make health care more efficient and affordable. What it meant for a lot of pediatricians, Levy added, was less control of care and more work for the same or less amount of compensation. An expansion of pediatric sub-specialists—and a decline in pediatric primary care—followed, along with higher expectations among consumers.

“This put more pressure on the system because there’s more demand for the services we can provide but there just aren’t enough of us to provide that service,” Levy said. “Fewer and fewer people are interested in going into primary care.”

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**George Dover, M.D.**  
 Director, Johns Hopkins  
 Children's Center  
 Given Professor  
 of Pediatrics

## Looking back, moving ahead

As I'm pretty sure you've heard by now, we've moved into a marvelous new building, The Charlotte R. Bloomberg Children's Center. As we look ahead at how pediatric medicine might change in our new home, we thought it might be constructive to look back to our origins, which surprisingly were in a tiny two-story building known as the "Bath House." Apparently, in 1896 baths were considered therapeutic.

At the time we had no full-time pediatric faculty, training or research program. But with the opening in 1912 of the Harriet Lane Home came the first full-time academic department in pediatrics in this country. The melding of pediatric research and training with patient care followed and Hopkins became known for pioneering pediatric treatments. By the late 1950s the Harriet Lane Home was outmoded and drawings were drafted for the Children's Medical & Surgical Center (CMSC), where pediatric academic medicine would thrive over the next half century. The CMSC eventually outlived its space, too, and in 1998 we began planning a new building—Bloomberg Children's Center—with a new challenge: How would we sustain the innovation that sustained the Harriet Lane Home and CMSC?

Interestingly, in a parallel way, pediatrician **Dan Levy** in this issue looks back at pioneers in pediatrics like Abraham Jacobi and his emphasis on primary care, prevention and wellness—and shares how such early hallmarks of pediatric medicine are being stressed in new models of care today. Similarly, neonatologist and informatics expert **Chris Lehmann** opens a wide window to our future with electronic health records in this era of dynamics like the Affordable Care Act. The take-home reminder is that regardless of whether our space is a state-of-the-art children's hospital with a rich history or a demanding pediatric practice, we all bring ideas to the table. Collaboration and innovation continue to be essential as we strive to provide the very best care possible for children. ■



**In Bloomberg Children's Center's upgraded echocardiography suite, equipped with advanced telemedicine technology, pediatric cardiologists W. Reid Thompson, left, and Phil Spevak review images.**

## Screening for Critical Congenital Heart Disease

**C**ritical congenital heart disease (CCHD)—heart conditions like pulmonary atresia associated with hypoxia that require interventions like surgery or catheterization soon after birth—has been responsible for more deaths in the first year of life than any other birth defect. Fortunately, around half of CCHD patients are diagnosed by ultrasound prenatally—and of those missed about 60 percent by symptoms on physical exam soon after birth—and appropriately treated. But some 280 infants born with CCHD in the United States each year are undetected and discharged from nurseries, notes Hopkins Children's Center pediatric cardiologist **Phil Spevak**, placing them at greatest risk of deteriorating before diagnosis.

"They may get metabolic acidosis, poor perfusion and, potentially, brain and kidney failure," Spevak says. "It's not the controlled prenatal presentation where you're stabilized in the neonatal intensive care unit (NICU) and have elective management."

However, a new non-invasive screening test recommended by the Department of Health and Human Services and mandated by the state of Maryland aims to significantly reduce the number of missed diagnoses among those born with CCHD. The test, called pulse oximetry, involves placing a small sensor on both the baby's hand and foot to measure the amount of oxygen in the blood. If no other reason for low oxygen saturation is found, pediatric cardiology is consulted

and an echocardiogram is done to check for CCHD. Studies have shown that the combined use of pulse oximetry and a physical exam along with focused prenatal echocardiography identifies 80 percent of infants with CCHD.

Through simulations and actual screens, Hopkins staff in obstetrics, neonatology and pediatric cardiology prepared for the statewide screening kickoff Sept. 1. At Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center the test is administered in term infants by a pediatric nurse practitioner or nurse in the nursery. Neonatologist **Christopher Golden** explains that physiologic changes in the neonatal heart in the first 24 hours after birth may give false positive or false negative readings; hence, screening is done after one day of life. If the infant fails the first screen, a second and, if necessary, third screen is done, each an hour apart. If all three tests are abnormal or borderline, an echocardiogram is ordered.

Spevak stresses that pediatric cardiology staff have added resources, including advanced telemedicine technology, to handle the anticipated increase in calls from both Johns Hopkins and other Maryland hospitals requesting echo readings: "We have the ability to receive the calls, interpret the test, and get the results out quickly." ■

For more information on CCHD screening, visit the Centers for Disease Control and Prevention at [www.cdc.gov/ncbddd/pediatricgenetics/pulse.html](http://www.cdc.gov/ncbddd/pediatricgenetics/pulse.html)

# Imaging for Kids Only

It wasn't too long ago, Children's Center Pediatric Radiology Director **Thierry Huisman** notes, that a 4-year-old would find himself in a radiology waiting room sitting next to a 85-year-old man, or a healthy child next to a sick child. That's because pediatric radiologists shared space with their adult counterparts where they treated both inpatient and outpatients. Also, their offices and the imaging suites they used were dispersed throughout the hospital. In a sense, the division had no home.

No more. Now housed on the fourth floor of the new Charlotte R. Bloomberg Children's Center, pediatric radiologists—for the first time—have their own space.

"It's much more convenient for parents and children to go to one place in a pediatric setting," says Huisman. "They do not have to walk into a hospital for adults."

Another plus, Huisman notes, is pediatric radiology's proximity to the pediatric intensive care unit (PICU), pediatric operating rooms, and pre-op and post-op care units, all of which are also on the fourth floor of Bloomberg Children's Center. That translates into safer transport of pediatric patients and a more rapid response from radiologists.

Imaging is safer and more family friendly in the new suite, too, notes Huisman, pointing to separate waiting

areas for inpatients and outpatients that reduce their risk of infection. Also, Children's Center radiologists are using the newest imaging equipment optimized for low-dose radiation, reducing exposure to children.

Family-friendly initiatives include glass-enclosed alcoves in the radiology suites to allow young patients to have visual contact with their parents while undergoing imaging. Also, dedicated "quiet rooms," designed to have a calming, soothing effect on young children awaiting imaging, is helping them avoid general anesthesia. Huisman notes that over a recent two-month period, 13 children scheduled for an imaging study under general anesthesia were able to complete their studies without it thanks to the quiet rooms and the support of the recently recruited full-time Child Life specialist in pediatric radiology.

Having a radiologic reading room in the Pediatric Emergency Department, another first, allows greater interaction between pediatric radiologists conducting

the studies and ED physicians. "This will greatly improve the quality of interpretation of imaging studies," says Huisman, "which should make a big difference in service."

Huisman also notes that thanks to Johns Hopkins leadership's support, he has been able to grow his division from three pediatric radiologists four years ago to more than six today. That means quicker referrals and more accurate imaging studies.

"The acquisition of new faculty will mean much better end results," says Huisman. "And it should be a much more enjoyable experience for patients and their families." ■



In the new CT suite for children only, (from left to right) pediatric radiologists **Melissa Spevak, Thierry Huisman and Aylin Tekes.**

## Research Briefs

### Abnormal Carotids in Children with Kidney Disease

A federally funded study led by researchers at Johns Hopkins Children's Center has found that children with mild to moderate kidney disease have abnormal narrowing of the thick neck arteries, a condition known as carotid atherosclerosis, usually seen in older adults with a long history of elevated cholesterol and untreated hypertension. The findings—published online ahead of print on Sept. 13 in the *Clinical Journal of the American Society of Nephrology*—are particularly striking, the researchers say, because they point to serious blood vessel damage much earlier in the disease process than previously thought. As a result, they add, even children with early-stage kidney disease should be monitored aggressively and treated promptly for both hypertension and high cholesterol to reduce the risk for serious complications down the road.

### Out-Of-Tune Protein Leads to Heart Muscle Failure

A new Johns Hopkins study has unraveled the changes in a key cardiac protein that can lead to heart muscle malfunction and precipitate heart failure. Troponin I, found exclusively in heart muscle, is already used as the gold-standard marker in blood tests to diagnose heart attacks, but the new findings reveal why and how the same protein is also altered in heart failure. Scientists have known for a while that several heart proteins—troponin I is one of them—get "out of tune" in patients with heart failure, but up until now, the precise origin of the "bad notes" remained unclear. The discovery, published online ahead of print on Sept. 12 in the journal *Circulation*, can pave the way to new—and badly needed—diagnostic tools and therapies for heart failure, believed to affect more than 6 million adults in the United States, the researchers say.

For more on these findings and others from Johns Hopkins Children's Center, go to [www.hopkinschildrens.org](http://www.hopkinschildrens.org) and see "Latest News."

# The Future Role of **Technology**

Medical informatics expert makes the case for greater participation by pediatricians in health information technology.

**S**o, just why is it that only 25 percent of pediatricians report using an electronic health record (EHR), compared with 43 percent of adult providers?

That was among the questions pediatric neonatologist **Chris Lehmann** posed at Johns Hopkins annual Pediatrics for the Practitioner conference Sept. 21. And as a member of the Board of Directors of the American Medical Informatics Association, Director of the American Academy of Pediatrics (AAP) Child Health Informatics Center, and editor of *Applied Clinical Informatics*, perhaps there's no better figure in pediatrics than Lehmann to address such questions. His answer?

Most EHRs, Lehmann explained, are not well designed for the practice of pediatrics, which require certain features like weight-based dosing, immunizations and growth charts, not to mention developmental issues that tend to be more variable in children and adolescents: "With adults you can generally do the same baseline functional assessment, but the 16-year-old has different developmental issues, and EHRs are not well designed to incorporate these issues into the documentation process."

Nonetheless, EHRs and other forms of health information technology, or HIT, can be beneficial, said Lehmann, citing a recent initiative designed to improve compliance with drug-drug interaction alerts in Hopkins Children's Center's EHR. One internal review showed that house staff had been ignoring 97 percent of such alerts because they appeared irrelevant and lengthy. Indeed, two months of surveillance



**High-tech informatics specialist Chris Lehmann.**

showed no patient-safety benefit. But by building a customized medical logic module, Lehmann said, Hopkins Children's Center improved compliance with alerts significantly.

"All of a sudden the alerts became meaningful and acted on," Lehmann said. "They were truly things that you should care about as a provider."

In another quality improvement initiative designed to increase immunization rates at Hopkins' Harriet Lane primary care clinic, charge nurses were paged whenever a patient due for a shot showed up on the database when arriving for an appointment. Immunization rates skyrocketed.

Pediatricians, however, are not taking full advantage of HIT, nor optimizing long-term health and financial returns on investments of health information technology, noted Lehmann. Now is the time to get involved, he added, pointing to new state and federal programs, prompted by the Affordable Care Act, that will rely on pediatricians having an EHR.

"And if you don't have an EHR, you'll be left out," Lehmann said, noting that practices that implement certified EHR technology, depending on their Medicaid panel, will have the potential to receive between \$44K and \$62K per physician.

So, how will HIT and EHRs on the horizon work? Lehmann

described a collaborative effort in which pediatricians and the AAP provide IT vendors with evidence-based best practices guidelines like Bright Futures, which the IT vendors, in turn, develop for real-time digital access via the Internet, mobile devices and clinical information systems. The AAP is already in the business of distributing knowledge of how to do child health in the best possible way, Lehmann said, so a natural next step would be integrating that knowledge, including Bright Futures guidelines, into EHRs.

"With Bright Futures there're so many actionable key items you should be doing on visits, which makes it hard for people to remember everything. Going back and pulling up those forms and doing it on paper is a real pain," Lehmann said. "Wouldn't it be nice to integrate that directly into your EHR?"

With considerations like costs, interoperability of systems and training, Lehmann noted, implementation will be tricky. But help is available, he added, pointing to resources like the Child Health Informatics Center, or CHIC, which serves as the AAP home for health information technology, and the Council on Clinical Information Technology, or COCIT. Such resources can help pediatricians identify the EHR that might be best suited for their particular practice. Also, "Buddy Lists" assist pediatricians in finding a colleague who has already implemented an EHR.

"These resources can help you do the best job at implementation," Lehmann said, "as well as help you get money from the federal government." ■

For more information, go to: [www.aap.org/CHIC](http://www.aap.org/CHIC)

# Sickle Cell and Asthma

**T**he question of how many children with sickle cell disease (SCD) also have asthma is unknown, notes Hopkins Children's Center pediatric pulmonary fellow **Christy Sadreameli**. But the answer is important, she adds, because SCD patients who also have asthma tend to have more frequent acute chest syndrome episodes, painful crises, hospitalizations and higher mortality than those who do not have asthma.

"Sickle cell patients with asthma may die at a younger age," Sadreameli says, "and we are trying to understand how to prevent this."

Better detection will mean earlier treatment and improved asthma outcomes, says Sadreameli, which is why she and pediatric hematologist **John J. Strouse** launched a pilot one-year asthma screening program at Hopkins Children's Center's in September, Sickle Cell Awareness Month. Thanks to a grant from the Thomas Wilson Foundation for a portable spirometer and other expenses, Sadreameli and Strouse are conducting the screenings in Hopkins Children's hematology clinic. The screenings, which include a pulmonary function test and a questionnaire, should also enhance understanding of the relationship between the



**Screening a sickle cell patient for asthma, pediatric hematologist John J. Strouse and pediatric pulmonologist Christy Sadreameli.**

two disorders, Sadreameli says, and hopefully lead to more effective asthma treatments.

"There's not a whole lot in the literature on this subject and no one really understands whether sickle cell disease patients' risk of higher morbidity and mortality is modifiable with good asthma care," Sadreameli says. "Does treating the asthma help you have less pain than someone with untreated asthma? We don't know."

Another unresolved issue is the impact of tapering down a common asthma medication – fast-acting systemic steroids – to stop severe asthma attacks. Sadreameli cites a rebound effect of acute pain and complications for some sickle cell patients when steroids are withdrawn.

"Sometimes doctors are a little more

hesitant to give oral steroids to the sickle cell patient having an asthma attack, but if it's bad enough you have to give it," says Sadreameli. "That's all the more reason to keep the asthma under control so oral steroids are needed less frequently."

The asthma should continue to be treated by the pediatric pulmonologist, and the sickle cell disease by the pediatric hematologist, but there needs to be more coordination of care by the two specialists, stresses Sadreameli. The sickle cell patient with asthma should be seen by a pulmonologist at least every six months, she adds, and have pulmonary function testing yearly. ■

**For more information, call 410-614-0050. For appointments with Pediatric Pulmonology, call 410-955-2035.**

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Such dynamics, Levy explained, have contributed to the fractionalization of health care and the phenomena of retail care and minute clinics, as though medicine had become a fast-food service. With increased availability of information via media and the Internet, many families have been willing participants. But what these families fail to realize, Levy said, is that when their child comes in for a sick visit, more often than not there're other issues regarding the health of that child.

"It's not likely that someone in a walk-in center is going to sit there and think thoughtfully about all the other issues that could be causing that sore throat," Levy said. "But if we can't convince people that the best place to bring their child for anything is the doctor who knows them best, then it's our fault. We have to change the system."

How? Levy painted somewhat of a "Back to

the Future" picture in which pediatric primary care is redesigned with greater emphasis on some of the hallmarks of its past – prevention and wellness and the collaborative medical home model in which the child's family, school and community are incorporated into his care. More and more, Levy explained, future pediatricians will be focused on the concerns of children with special health-care needs, with conditions ranging from attention deficit disorder to multiple handicaps. Consequently, care will be both individualized and coordinated with the primary care pediatrician the hub for all care.

"It can't be one size fits all anymore, and the pediatrician really has to tailor care in terms of time, the needs of the family, and the supportive care they need," Levy said. "If we redesign care to deal with these new realities, it's likely the pediatrician's time is going to be spent more usefully, using more of our knowledge base and our ability not only to care for kids but to

coordinate the care, too."

Other issues include the Affordable Care Act, where Levy sees improved compensation for improved quality of care, and the further development of electronic health records, or EHRs (see page 4). Epigenetics and how the patient's environment and experience impact expression of the genome will also influence pediatric care. Virtually stirring this pot, Levy can't contain his optimism.

"With all this stuff I'm dealing with in my office now with EHRs and thinking how we're going to redesign care for kids, I'm really excited," Levy said. "This is an opportunity for pediatricians to speak out with an increasingly larger voice to promote primary care but also how to interact smoothly with our subspecialty colleagues, our academic colleagues, and our colleagues in the community. That's what this new model is all about – it's much more inclusive and much more thoughtful than the way we've been providing care." ■

# Bringing Less-Invasive Surgery to GBMC

**J**ohns Hopkins general pediatric surgeon **Jeffrey Lukish** is not shy about discussing the increasing number of inguinal hernia cases he sees at community hospitals, including Anne Arundel Medical Center (AAMC), Howard County General Hospital (HCGH) and Greater Baltimore Medical Center (GBMC). He doesn't question the care these children receive in undergoing the traditional open repair of this bulge in the abdominal wall, in which surgeons make an incision over the groin, divide the skin and underlying muscle to access and tie off the hernia sac. But he'd like to see them have the option of the minimally invasive inguinal hernia repair, in which three small incisions are made instead of the single large and painful cut.

"In the open surgery, you have to cut through the muscles of the groin, mobilize an area that has some very delicate structures, the testes and vessels that carry sperm," Lukish says. "Now in this less-invasive approach, we're able to thread a 2.9 millimeter telescope through the belly button, project the image of these inguinal hernias on a digital screen, which allows us to close the hernia defect without making a



Children can now have laparoscopic inguinal hernia repair at GBMC, reports pediatric surgeon Jeffrey Lukish.

painful incision in the groin."

But such innovative minimally invasive procedures have historically been performed only at academic medical centers like Johns Hopkins. No more, says Lukish, who in a randomized controlled trial with pediatric surgeon **Fizan Abdullah** is now offering children the minimally invasive hernia repair at GBMC. Half of the children in the trial of 151 patients under age 3 will undergo the open surgery and half the laparoscopic procedure to compare outcomes. Both the open and laparoscopic approach require general anesthesia, and both are same-day outpatient procedures. Retrospective studies have measured end points like cosmetic results, pain medication use and return to physical activity, but until now there has been no randomized controlled trial evaluating the two approaches.

"We know the recurrence rate and post-op complications in open repair, and in laparoscopic repair we think the recurrence



rate is the same but with less pain," Lukish says. "But we really don't know. This will be the first study to give us an answer."

"This is a great opportunity," adds Abdullah, "for parents in the community to get a laparoscopic inguinal hernia repair without having to travel to Johns Hopkins in East Baltimore."

Abdullah and Lukish plan to open up the trial to patients at AAMC and HCGH, too. Says Lukish, "We're trying to partner with these outstanding community hospitals and bring innovation to the table out there because it's the right thing to do." ■

For more information, call 410-955-1983. For referrals and patient appointments at GBMC, call 443-849-6201.



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