Multivisceral transplant rewrites the book on a rare congenital disease
Cleveland Clinic Children’s
RESOURCES FOR PHYSICIANS

24/7 HOSPITAL TRANSFERS/ADMISSIONS
Cleveland Clinic Children’s, main campus
216.448.7000 or 866.547.1467
Cleveland Clinic Children’s Hospital for Rehabilitation
216.448.6400 or 800.635.2417

Critical Care Transport
To arrange a pediatric transfer via Cleveland Clinic Children’s Critical Care Transport fleet, call
216.448.7000 or 866.547.1467.

INFORMATIONAL RESOURCES
Referring Physician Center and Hotline
For 24/7 access to information on our pediatric specialists and services, call 855.REFER.123
(855.733.3712).

Pediatric Physician Liaison
For service-related issues or information about our pediatric specialists and services, contact
Janet Zaibek, RN, zaibekj@ccf.org.

Staff Directory and Services
To view our specialists and services, visit clevelandclinicchildrens.org/staff.

Track Your Patients’ Care Online
Establish a secure online DrConnect account for real-time information about your patients’
treatment at Cleveland Clinic. Visit clevelandclinic.org/drconnect.

SINGLE CULTURE OF CARE, MULTIPLE ENTRY POINTS
Cleveland Clinic Children’s offers comprehensive medical, surgical and rehabilitative care at
more than 40 community locations throughout Northeast Ohio.

OUTPATIENT CARE
Diverse pediatric subspecialty outpatient services are available at:
• Our main campus in Cleveland
• Fairview, Hillcrest and Medina hospitals
• Multiple family health centers across Northeast Ohio

INPATIENT CARE HIGHLIGHTS
Cleveland Clinic Children’s, main campus
• Inpatient unit with 24/7 pediatric hospitalist staffing and dedicated pediatric ancillary
  services (radiology, anesthesiology, general surgery, etc.)
• Special Delivery Unit and level IIIC NICU
• Child life services

Cleveland Clinic Children’s Hospital for Rehabilitation
• Lerner School for Autism and Center for Autism
• Inpatient unit with 24/7 hospitalist coverage
• Day hospital
• Dedicated pediatric dialysis unit
• Outpatient care and therapy services (PT, OT, speech, aquatic)

Fairview and Hillcrest hospitals
• Inpatient unit with 24/7 pediatric hospitalist staffing and dedicated pediatric ancillary
  services (radiology, anesthesiology, general surgery, etc.)
• 24/7 pediatric emergency department
• Level III NICU
• Child life services

Stay connected to Cleveland Clinic
Dear Colleagues,

What creates an outstanding reputation? For a medical center, the answer is multifaceted and complex. Most have attractive, patient-friendly facilities, the latest technology and an excellent medical staff. But this is not enough.

Here at Cleveland Clinic Children’s, we provide the most advanced subspecialty care available anywhere in the world. Yet we are unable to cure every child who enters our doors. That means we must do everything we can to move medicine forward.

As Chairman and Physician-in-Chief, I am dedicated to building a staff of physicians who are powerfully driven to improve patient care, physicians who are focused on finding answers to medical enigmas that prevent every child from getting well.

In this issue of Update, you will read about two recent hires whose niche interests have the potential to change outcomes for very sick patients — not only here in Cleveland, but worldwide. Both were hired as department chairs:

- Oncologist Johannes Wolff, MD, offers one of only three known programs of targeted therapy for children who have failed traditional chemotherapies.
- Critical care physician Leticia Castillo, MD, has investigated the nutritional requirements of critically ill patients for years; her findings hold promise for children recovering from devastating illnesses.

In this issue, you can also read about how we use evidence-based care paths to standardize optimal treatment, reduce radiation from cardiac procedures to improve long-term patient safety, and treat urinary tract infections when guidelines are inadequate.

There are no secrets here at Cleveland Clinic Children’s. We make our knowledge and experience available to you for the benefit of your patients. In this regard, we hope you will attend our first annual pediatric conference, to be held May 8 to 10 (see back cover). Our speakers will cover some of the most challenging clinical issues you face.

We look forward to meeting you and collaborating with you when your patients need specialized care.

Respectfully,

Giovanni Piedimonte, MD
Chairman, Pediatric Institute | Physician-in-Chief, Cleveland Clinic Children’s
President, Cleveland Clinic Children’s Hospital for Rehabilitation
piedimg@ccf.org
Khaled wasn’t supposed to have made it to Cleveland Clinic Children’s. He was born with Martinez-Frias syndrome, a very rare disorder with autosomal recessive inheritance and an abundance of life-threatening manifestations. In Khaled’s case, these included intestinal failure, neonatal diabetes and destructive iron accumulation, among others.

There were no reports of any child with the condition reaching his or her second birthday.

Yet today Khaled is an energetic and chatty 5-year-old whose experience is rewriting the books on Martinez-Frias syndrome after he underwent a landmark four-organ multivisceral transplant at Cleveland Clinic Children’s last September.

Defying early expectations

From his birth, Khaled was constantly in the hospital, on total parenteral nutrition (TPN) and in need of hourly monitoring of his sugar levels around the clock. “He had a line placed and had infections all the time,” his mother recalls. “He didn’t gain weight at all. He weighed only 3 kg on his first birthday.” His doctors were preparing his family for his death soon after that birthday.

But somehow little Khaled hung on. After he turned 2, his doctors in his home country in the Middle East began suggesting that his parents explore options for a transplant abroad.

They eventually connected with Kareem Abu-Elmagd, MD, PhD, Director of Cleveland Clinic’s Transplant Center and the leading member of a pioneering team of transplant surgeons who developed multivisceral transplantation in the early 1990s. He proposed a complex transplant procedure to provide Khaled with a new intestine, duodenum, liver and pancreas.

The hope was that because the new organs would be of a different genetic makeup, a life-saving cure could theoretically be achieved. “The fact that Khaled had survived longer than any other patient with Martinez-Frias syndrome suggested he might fare well,” says Dr. Abu-Elmagd. “It prompted us to try to give him a second chance through transplantation.”

Enduring the wait with comprehensive care

So Khaled and his parents came to Cleveland Clinic in August 2012, when he was almost 3½ years old, to wait for suitable organs to become available. Thus began months of inpatient therapy in the care of Kadakkal Radhakrishnan, MD, Cleveland Clinic Children’s Director of Nutrition and Intestinal Rehabilitation as well as Medical Director of Intestinal and Multivisceral Transplantation. His team provided Khaled with complex IV nutrition, maintained his fluid balance, worked with pediatric endocrinology colleagues to manage his diabetes and ensured his lines were clean to prevent infection.

“The little guy has always been upbeat, charming and friendly despite everything his family has gone through,” says Dr. Radhakrishnan.

Transplant and transformation: No more diabetes or TPN

In September 2013, a little more than a year into Khaled’s stay at Cleveland Clinic Children’s, donor organs became available and Dr.
Before Khaled, there were no reports of any child with Martinez-Frias syndrome reaching his or her second birthday.

Abu-Elmagd led a team of five operating surgeons through a 15-hour transplant procedure on 4-year-old Khaled. The transplant was a success, with all four donor organs grafting well.

Khaled was discharged less than two months later with his diabetes cured and on an unrestricted oral diet. His favorite foods include mussels, octopus and lobster — delicacies he learned about watching food programs on television during his post-transplant recovery.

At five months after transplant, Khaled was faring well on his unrestricted diet with no need for TPN or insulin. Dr. Abu-Elmagd plans to monitor him throughout his life, studying what happens to someone with Martinez-Frias syndrome as he ages and grows — something that had never been possible before.

More than surgical and immunologic expertise

While Khaled’s mother is deeply grateful for the clinical expertise Dr. Abu-Elmagd, Dr. Radhakrishnan and their fellow clinicians brought to bear for Khaled over his many months at Cleveland Clinic Children's, she singles out the “specialness” of the caregiving they offered, particularly Dr. Abu-Elmagd. “Not only did he take care of our son,” she says, “but he really served as a psychiatrist to us as parents,” offering reassurance throughout many trying months.

For his part, Dr. Abu-Elmagd is gratified as an academic surgeon “to be able to show humanity this outcome” in a disease with such a traditionally dismal prognosis, but he is even more satisfied by helping to give Khaled a second chance. “I am confident he won't have recurrent disease with the new organs,” he says. “I want to see the boy continue to be healthy, leading a normal life and enjoying his family.”

Khaled's 15-hour, five-surgeon multivisceral transplant in September 2013 illustrates the breadth of Cleveland Clinic’s transplantation offerings for pediatric patients. The operation drew on the expertise of surgeons from the programs for intestinal, liver and pancreas transplant as well as specialists with Cleveland Clinic Children's Nutrition and Intestinal Rehabilitation Program.

Cleveland Clinic Children’s is one of a small number of centers in the world where a child can receive virtually any type of transplant — solid organ, multivisceral, cellular or composite tissue — under one roof.
Initiation of Cleveland Clinic’s pediatric transplant programs

- 1963: Kidney
- 1985: Heart
- 1985: Liver
- 1991: Lung
- 1994: Heart-Lung
- 1998: Pancreas
- 2011: Bone Marrow
- 2013: Multivisceral

646 total pediatric transplants

- 362 kidney transplants
- 135 heart transplants
- 98 liver transplants
- 25 lung transplants
- 19 bone marrow transplants
- 7 heart-lung transplants

NOTE: Totals are through end of 2013 for patients under age 21.
Making Reduced Radiation Exposure a Priority in Pediatric Cardiology

Committed to the principle of ALARA, “as low as reasonably achievable,” pediatric cardiologists at Cleveland Clinic Children’s have taken multiple steps to reduce the radiation young patients are exposed to through diagnostic tests and invasive procedures.

“We know the risks of radiation exposure are dose-dependent and cumulative over time, which makes reduction of radiation exposure in pediatric patients highly desirable,” says Peter Aziz, MD, a pediatric electrophysiologist in the Department of Pediatric Cardiology in the Center for Pediatric and Congenital Heart Disease.

Although performing procedures with a minimum of radiation is the goal in all patients, it is particularly important when caring for patients with congenital heart disease, who will undergo multiple procedures over their lifetime.

“The risk due to low doses of radiation — primarily cancer — is unknown, but is assumed to be directly proportional to dose, without a threshold. Therefore, limiting the dose to only what is necessary to successfully complete the task at hand is of utmost importance, especially in pediatrics, where the risk is greater than in adults,” says Lourdes Prieto, MD, Director of the Pediatric Catheterization Laboratory in the Center for Pediatric and Congenital Heart Disease.

With patient safety in mind, the cardiologists have taken steps to reduce radiation exposure by shortening procedures, adopting technology that obtains high-quality images with less radiation and using new techniques that promote radiation-free testing.

Decreasing procedure time

Two years ago, Cleveland Clinic Children’s opened its first hybrid catheterization lab. This advanced facility allows a cardiologist and thoracic surgeon to work together on patients with complex congenital heart defects. This, in turn, reduces procedure time, anesthesia and recovery time — and, in some cases, eliminates the need for cardiopulmonary bypass.

“Collaboration between the surgeon and the interventional cardiologist facilitates certain interventional procedures that would otherwise require much more time and radiation exposure, or may not otherwise be possible, particularly in very small patients,” says Dr. Prieto.

Using advanced imaging technology to shorten procedure time may also reduce radiation exposure. The cardiologists are currently testing pediatric applications of a 3-D to 2-D registration technology that allows anatomic structures from a prior cardiac MR or CT scan to be superimposed over fluoroscopy. This technology facilitates access to a desired structure — for example, a collateral vessel, pulmonary artery branch or pulmonary vein — by providing a road map visible on fluoroscopy.

“We expect it will likely result in decreased radiation exposure and decreased contrast administration,” says Dr. Prieto.

Rotational angiography capability in the cath lab improves the diagnostic quality of a procedure and allows the cardiologist to more accurately select the best angiographic angles for any given intervention. “From a 3-D data set, it is possible to register the radiation needed to access a desired structure,” Dr. Prieto explains.

Low-radiation technology

In February of this year, Cleveland Clinic Children’s added a second pediatric cath lab equipped with the latest detector technology approved by the FDA. Siemens Healthcare’s Artis Q.zen system utilizes a crystalline (vs. amorphous) silicon detector that reduces electronic noise.

“The importance of this technology is that it appears to reduce image quality,” says Dr. Prieto.

The interventional cardiologists have worked closely with medical physicists to develop a series of algorithms based on patient weight and intended procedure to minimize radiation exposure in both cath labs.

“We have several different settings to choose from, and we always use the lowest possible exposure for what we need to do. As a result, over the past year we achieved a 40 percent reduction in radiation
exposure for transcatheter pulmonary valve implantation in patients of similar weight and procedure duration,” says Dr. Prieto.

**Reduced-radiation catheter ablation**

At the same time, a 3-D electroanatomical navigation system has enabled Cleveland Clinic Children’s electrophysiologists to decrease radiation exposure during catheter ablations. Major cardiac structures are mapped and used as reference points for tracking the location of the ablation catheter with magnets.

The system allows most right heart ablations to be performed without fluoroscopy.

When an arrhythmia is generated on the left side, fluoroscopy is required to guide the transseptal puncture, but the ablation can be performed without fluoroscopy.

In a review of 20 pediatric patients who underwent limited fluoroscopic 3-D electroanatomical mapping for catheter ablations for supraventricular tachyarrhythmias at Cleveland Clinic Children’s, the mean procedure time did not differ significantly from that of age-matched controls who underwent the same procedures under fluoroscopic guidance. The procedural success was also equivalent. However, the mean fluoroscopy time of 5.1 minutes using the limited fluoroscopic 3-D mapping approach was significantly lower than the 35.44 minutes required with traditional fluoroscopy. Twelve patients in the 3-D mapping group (60 percent) required no fluoroscopy at all.

“The more quickly we can adopt these techniques and technologies, the more quickly we can reduce radiation exposure in our patients,” says Dr. Aziz.

To refer a patient to one of Cleveland Clinic Children’s cardiologists, call 216.445.5015.
Targeted Therapy: Homing in on Pediatric Cancer

When a malignant tumor fails to respond to traditional treatments, targeted therapy may be effective in extending life.

Targeted therapy individualizes treatment based on tumor markers, and it’s a specialty interest and passion of Johannes Wolff, MD, new Chairman of the Department of Hematology and Oncology and Blood and Marrow Transplantation at Cleveland Clinic Children’s.

“In personalized therapy, we do not pull a protocol off the shelf. Instead, we determine exactly what we are treating and select the drug most likely to be effective against the tumor. This novel approach has the highest chance of extending event-free survival time,” says Dr. Wolff (pictured at right with a patient).

Because aggressive chemotherapy has resulted in high cure rates for many pediatric cancers, individualized treatment is reserved for the most complicated patients.

“Our typical patient has been told in a different hospital that nothing else can be done,” says Dr. Wolff.

Targeted therapy is extremely time-consuming for a physician — requiring as much as a full day to sort out past medical records, review tumor-marker findings and recent literature, and design the best approach for one patient. This type of time commitment is not possible for most practicing oncologists. Therefore, Cleveland Clinic Children’s is among very few centers offering the procedure at this time.

An epiphany: The promise of an individualized approach

About 10 years ago, Dr. Wolff had an epiphany. “All my professional life, I had tried to cure patients who weren’t considered curable. Although we had made some progress, it became clear that progress wasn’t moving fast enough to achieve anything meaningful before the end of my career,” he remembers.

About that time, he moved from Germany to MD Anderson Cancer Center, where the number of complicated patients who did not qualify for any protocol reinforced his desire to find a new approach. This time, the timing was right: New drugs had become available, and knowledge of tumor biology had advanced to the point that an individualized approach to treating cancer with biologic agents was possible.

“It came to me that we were slowing our progress by sticking to traditional broad diagnoses made through the microscope only, diagnoses like medulloblastoma or osteosarcoma,” he says. “If the umbrella diagnosis did not reflect the individual biology of the tumor, we were approaching treatment in the wrong way. I was convinced that treatment must reflect the specific biology of every single tumor.”

A bullet to the heart of a tumor

Three components are needed for a patient to receive targeted therapy: a summary of all chemotherapeutic agents tried in the past and their degree of success or failure, past MRI images and a sample of tumor tissue. “Ideally, we would like to have all of these, but we take whatever we can get,” says Dr. Wolff.

The patient’s tissue sample is analyzed for tumor markers, and a drug — usually an oral agent — is chosen based on its history of success against tumors with the same molecular profile.

Because Dr. Wolff may add chemotherapy to the biologic agent of choice to achieve synergistic effects, he carefully reviews the history of chemotherapy successes and failures. “In some cases, several chemo agents may have been tried, and some may have worked. Other patients may not have received all possible drugs known to shrink their kind of tumor,” he says.

How success is evaluated

Dr. Wolff uses historical controls to predict the outcome for each patient. Successful targeted therapy usually results in tumor shrinkage. In certain fast-growing tumors, however, preventing continued growth may be considered a success.

Event-free survival time is the most common measure of success.
“We focus on whether the treatment outcome is better or worse than predicted. If a patient lives longer than expected, we consider the treatment good. The results are then quantified by the number of days or weeks the treatment extended life,” he explains.

The future of targeted therapy

As the results of each patient are added to Dr. Wolff’s database, his ability to select the optimal treatment for each patient grows more quickly.

“Picking a drug based on a tumor marker requires a literature search. It’s slower than picking a protocol off the shelf,” he says. “By ranking drugs by their effectiveness or lack of effectiveness in a particular type of tumor, and entering this information into a database, the more effective drugs are rising to the top of the list. We learn from every patient,” he says.

As this knowledge becomes more accessible, targeted therapy will become less time-intensive, allowing the technique to become more common.

“I was convinced that treatment must reflect the specific biology of every single tumor.” — JOHANNES WOLFF, MD

“I believe it will become a primary treatment for a small number of cancers in the next year or two,” Dr. Wolff predicts.

Physicians can reach Dr. Wolff at 216.445.3588.
Meet Clinician-Researcher
Leticia Castillo, MD

New Chair, Pediatric Critical Care Medicine, and staff member, Department of Pathobiology, Lerner Research Institute

*Specialty interests:* Sepsis, inflammatory response, nutrition biochemistry

*Background:* Residency in pediatrics, Tufts-New England Medical Center; fellowship in pediatric critical care, Massachusetts General Hospital; postdoctoral fellowship in nutrition biochemistry, Laboratory of Human Nutrition, Massachusetts Institute of Technology

*Why she accepted the position:* “Because Cleveland Clinic has an innovative way of thinking about patients. There is an incredible environment here. It is recognized internationally as a Center of Excellence in clinical care as well as in research, education, quality and efficiency.”

*Departmental goals:* “To position our department among the top 10 in the near future. We will include an ACGME-approved pediatric critical care fellowship starting in July 2015. Our goal is to have a well-rounded program where trainees not only learn clinical excellence and clinical, basic, translational or outcomes research, but also focus on innovation, efficiency, quality and service, which are part of Cleveland Clinic’s DNA.”

*NIH-funded research:* “Nutrients serve more than nutritional purposes; nutrients are active molecules with physiologic and potentially pathologic properties. Patients who are critically ill receive parenteral nutrition. How these nutrients are utilized, what the requirements may be and whether they should be supplied intravenously under conditions of critical illness have not been extensively studied.

“Thanks to NIH funding, I have begun to explore the requirements of nutritional components — mainly amino acids — in critically ill children. We have found that some amino acids, such as those that contain sulfur, are utilized differently in sick children of different ages, which may explain the susceptibility to various complications in different age groups. In reality, we do not know the amount of specific nutrients that sick patients may need or how they are utilized during disease.”

*Other research:* “Humans evolved to eat and work during the day, and rest and fast at night. Our bodies prepare us for these activities. However, current lifestyles require night work and eating during the night. When people eat at night, their molecular circadian clocks become desynchronized, and they become susceptible to metabolic syndrome, diabetes, breast and colon cancer, and heart disease.

Critically ill patients are fed and exposed to light 24 hours a day. We aim to determine the impact of this standard on patients’ molecular circadian clocks, which has not been studied. We propose a more physiologic approach with day feeding and night fasting to improve metabolic abnormalities.”

*Multidisciplinary collaboration:* “I am working with Satish Kalhan, MD, an expert on metabolism, and Serpil Erzurum, MD, Chairman of Pathobiology and a recognized expert on translational research. We share similar clinical research interests with R. Duncan Hite, MD, Chairman of Adult Critical Care Medicine. I am excited about the potential for collaboration and the new ideas that will arise from these experienced Cleveland Clinic collaborators.”

*Physicians can reach Dr. Castillo at 216.444.6022.*
Creating a Value-Based Care System with Disease-Specific Care Paths

As both private and federal payers slowly change their reimbursement structure to reward providers based on outcomes and quality measures rather than volume, Cleveland Clinic is leading the transition to value-based care by creating disease-specific care paths.

“We are committed to the potential value created by care paths. We believe they are essential to improving patient and family satisfaction and consistently good clinical outcomes,” says Steven J. Spalding, MD, who is overseeing the development of care paths at Cleveland Clinic Children’s.

“Care paths will reduce variation in clinical care across the Cleveland Clinic health system. Referring physicians can be assured that families will receive the same level of care at all Cleveland Clinic facilities, regardless of provider or location,” he emphasizes.

Care paths will also reduce the cost of medical care, which benefits patients as well as providers.

“As employers shift more of the cost of healthcare coverage to employees, care paths will assure our patients they are getting the highest quality of care at a lower cost,” says Dr. Spalding.

**Beyond practice guidelines**

Cleveland Clinic care paths are evidence-based algorithms embedded within the electronic health record (EHR) system that guide providers and patients through episodes of care for a specific disease state.

Cleveland Clinic Children’s leadership began the project by creating multidisciplinary teams directed by physician champions for each targeted disease state. Each team is charged with developing a guide that describes the standard of care that should be applied to patients with the condition. The guides are reviewed by a variety of stakeholders from nursing, quality and patient safety, patient experience and compliance, as well as from finance, radiology, laboratory medicine and pharmacy.

After a guide is approved, its creators work with an operational oversight committee to develop enterprise-wide policies and procedures, as well as standardized documentation templates, order sets, clinical decision support and predictive analytical tools to assist providers in delivering care according to standards set forth in the guide.

The last stage of the care path is developing a performance-improvement process that will help determine compliance with standard of care and allow assessment of cost reduction, variation in care delivery and impact on clinical outcomes.

**Moving ahead with multiple care paths**

Cleveland Clinic Children’s has embraced the development of care paths with enthusiasm. To date, five guides have been written and approved for the treatment of conditions as varied as hyperbilirubinemia, diabetic ketoacidosis, closed head injury, attention-deficit hyperactivity disorder and asthma.

Additional guides are currently underway and include medical management of obesity and sickle cell disease.

“We really want to help transform the way we deliver care. Our physicians understand that productivity is no longer the measure of importance, as we move toward a value-based world that emphasizes quality and outcomes,” says Dr. Spalding.

**ASTHMA: How the care path evolved**

High rates of hospitalization and ER use associated with exacerbations make asthma an ideal target for a care path.

Cleveland Clinic Children’s found that when patients admitted with an asthma exacerbation had a consult with a pediatric pulmonologist, the six-month risk of readmission dropped significantly, compared with children who did not see a pulmonologist. The differentiator was clinical follow-up after discharge.

“Our pediatric pulmonologists contact every family after discharge to schedule a follow-up appointment, at which they ensure the family has the medications their child needs, understands the instructions and is compliant,” says Dr. Spalding.

Asthma patients who did not see a pulmonologist during their inpatient admission were less likely to follow up with a specialist on an outpatient basis, and the opportunity to reinforce these critical points was compromised.

Due to these data-driven insights, the care path for inpatient asthma care specifies that every child admitted with an asthma flare will have a consult with a pulmonologist.

“A hospital admission for asthma is an indication of disease severity, and we feel the patient would benefit from consultation with a specialist in pulmonology. Once the patient and family are comfortable on the prescribed treatment regimen, management is transitioned back to the pediatrician,” says Dr. Spalding.
Treating Urinary Tract Infection and Vesicoureteral Reflux: Reading Between the (Guide)Lines

Diagnostic and treatment guidelines for urinary tract infection issued by the American Academy of Pediatrics (AAP) and for primary vesicoureteral reflux issued by the American Urological Association fall short of providing all the answers a primary care physician may need.

“They fail to address some frequent clinical challenges — at least not with the specificity that real-world practice can demand,” says Halima Janjua, MD, of Cleveland Clinic Children’s Center for Pediatric Nephrology (pictured with a patient at right).

Below, Dr. Janjua and her colleagues share their perspective on handling urinary tract infection (UTI) and vesicoureteral reflux (VUR) challenges for which guideline recommendations are lacking.

**Diagnosis**

- **Persistent high fever** is not a reliable differentiator between upper and lower UTI. The risk of renal scarring is comparable in children with and without persistent high fever. Therefore, we recommend meticulous treatment and prevention of both nonfebrile and febrile UTI.

- **Evaluation for VUR** is required when children younger than 2 years of age have an abnormal renal ultrasound or more than one febrile UTI, as recommended by the AAP. We do not routinely perform voiding cystourethrography (VCUG) in children older than 2 who have symptoms of lower urinary tract dysfunction.

- **Assessment for renal scarring** with a dimercaptosuccinic acid (DMSA) renal scan is also recommended when renal and bladder ultrasonography is abnormal, when there is grade III-V VUR, or in the presence of hypertension, proteinuria or elevated serum creatinine.

**Antibiotic therapy**

- **Initial uncomplicated cystitis** should be treated with five to seven days of oral antibiotics.

- **Febrile UTI and complicated or recurrent cystitis** merit 10 to 14 days of oral antibiotics.

- **Intravenous therapy** is needed for infants younger than 1 month or for children who have high-grade fever for more than 48 hours after initiating antibiotics, who present with nausea and vomiting, or who require rehydration.

- **Broader coverage** for *Enterococcus* and/or *Pseudomonas* and a renal ultrasound are required when febrile UTI fails to defervesce in 48 hours despite adequate treatment.

**Test of cure**

- **Repeat urine cultures** are not recommended to prove eradication of UTI except in cases of recurrent infections, infections with drug-resistant organisms, immunosuppression or urological abnormalities.

**Antibiotic prophylaxis**

- **Infants younger than 1 year** with febrile UTI and any grade VUR, or with grade III-V VUR, require prophylaxis.

- **Children of any age** with bladder/bowel dysfunction (BBD) and VUR require prophylaxis due to increased risk of renal damage.

- **Children with BBD** tend to experience breakthrough UTI more frequently on antibiotic prophylaxis. Symptoms include urinary incontinence, dysuria, urinary frequency or infrequent voiding, constipation, and encopresis.

**BBD: Beyond antibiotics**

- **Treatments for BBD** include constipation management, behavioral therapy, anticholinergic medications, alpha blockers, and biofeedback or pelvic floor muscle retraining to strengthen and coordinate bladder contractions. Animated biofeedback encourages interest and attains results more quickly.

*If you have questions on the treatment of UTIs and VUR, or would like to refer a patient to one of our five pediatric nephrologists, please call 216.448.6420.*
Earn CME credit for live and web-based pediatric CME from Cleveland Clinic’s Center for Continuing Education.

**LIVE CME**

May 29-30, 2014

**7th Annual Helen and Ronald Ross Symposium:**
The Intimate Relationship of Morphology, Echocardiography and Treatment of Congenital Heart Disease

*Bunts Auditorium, Cleveland Clinic main campus, Cleveland, Ohio*

This longstanding symposium from the Center for Pediatric and Congenital Heart Disease has been expanded to 1½ days to cover more advances and clinical challenges in the management of congenital heart disease in pediatric and adult patients. This year’s focus on morphology, echocardiography and treatment is addressed in a mix of lectures, panel discussions, and case and research presentations. No registration fee. Preregister at staltal@ccf.org or 216.636.9042 by May 23 (after that date, on-site registration only).

August 25-29, 2014

**20th Annual Pediatric Board Review Symposium**

*Renaissance Cleveland Hotel, Cleveland, Ohio*

A comprehensive review to prepare physicians for pediatric board certification or recertification. The quality and breadth of the symposium’s content is also valuable for individuals needing a comprehensive review of basic pediatric clinical information. Access the symposium program and registration at ccfmce.org/PedReview14.

**VIRTUAL CME**

Access a selection of free online CME activities by visiting ccfmce.org and choosing “Pediatrics” under “Browse by Specialty.” Topics of recently added activities (webcasts and case-based lessons) include:

- Pediatric multiple sclerosis
- Recurrent fevers in children
- Well-baby care

Visit ccfmce.org for a complete listing of virtual CME offerings.

**CLEVELAND CLINIC CHILDREN’S**

**NEW STAFF**

Cleveland Clinic Children’s welcomes the following new pediatric subspecialists:

**CRITICAL CARE MEDICINE**

**Leticia Castillo, MD**

*Chair, Critical Care Medicine*

*Location: Main campus*

*p: 216.444.6022*

*e: CASTILL@ccf.org*

**CARDIOLOGY**

**Yasser Al-Khatib, MD**

*Location: Main campus, Canton, Lorain, Medina*

*p: 216.444.2430*

*e: ALKHATY@ccf.org*

For a directory of all Cleveland Clinic Children’s staff, visit clevelandclinicchildrens.org/staff.

**The Cleveland Clinic Way**

*By Toby Cosgrove, MD, CEO and President of Cleveland Clinic*

Great things happen when a medical center puts patients first.

Visit clevelandclinic.org/ClevelandClinicWay for details or to order a copy.
Want to know how RSV can spread from a pregnant mother to a fetus, and how early RSV bronchiolitis may develop into asthma?

Eager for advice on how to discuss weight issues with a child’s parents and suggest practical ways to lower their child’s weight?

Interested in a refresher course on the emergency management of FULWLFDOO\LOOFKLOGUHQZKRSUHVHQWDWWKHRIÀFHXVLQJKDQGVRQWUDLQLQJ with human simulators?

These are only three of the many challenging clinical issues to be symposium from Cleveland Clinic Children's.

"Every speaker will address very common problems seen by the primary care pediatrician,” says course director Camille Sabella, MD. “They’ll discuss the most recent advances and controversies in a practical manner, so pediatricians will know how to diagnose and treat different problems, which drugs to use, how to deal with side effects and when to refer patients."

FEATURED TOPICS INCLUDE:

• Immunizations: recommendations and challenges
• The implications of public health reports on clinical care
• Trends in the diagnosis and management of adolescent health concerns
• Identification of school problems
• Management of behavioral disorders and ADHD
• Latest thinking in the treatment of asthma
• Identification of learning disorders and autism
• Guidelines for sinusitis and otitis media
• Practice-based dermatology

WORKSHOPS:

• Obesity and management of the overweight child
• Simulation training in pediatric emergency care
• Sleep apnea and upper airway dysfunction
• Common GI disorders
• Urinary tract infections

FACULTY

Nearly two dozen Cleveland Clinic Children’s experts will be joined by two special guest speakers:

• Renowned physician Catherine D. DeAngelis, MD, MPH, the first pediatrician and first woman to be editor-in-chief of JAMA. She is currently a University Distinguished Service Professor Emerita at Johns Hopkins University School of Medicine. She will present her perspective on the future of pediatrics and present a plenary session on professionalism.

• Larry K. Pickering, MD, of the Centers for Disease Control (CDC) and editor of The Red Book from the American Academy of Pediatrics. He will present the latest guidelines for immunization and “Articles from the MMWR that Impact Clinical Practice.”

NETWORKING OPPORTUNITY

An evening reception on Thursday, May 8, will provide an opportunity for attendees to network with speakers and ask questions in an informal environment.

REGISTER NOW!

This symposium is targeted to pediatricians, family medicine physicians, physician assistants and pediatric nurse practitioners. For more details, CME credit information and registration/accommodation information, visit ccfcme.org/pediatrics.

For registration questions, email cmeregistration@ccf.org or call 216.448.0777.