Pediatric Insights

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An Update from the Division of Pediatric Gastroenterology, Hepatology, and Nutrition

## In This Issue



UPMC Children's Hospital of Pittsburgh is affiliated with the University of Pittsburgh School of Medicine and nationally ranked in nine clinical specialties by *U.S. News & World Report*.

UPMC CHILDREN'S HOSPITAL OF PITTSBURGH

# New Motility Center Will Expand Treatment Options for Pediatric GI Patients at UPMC Children's

In January, UPMC Children's Hospital of Pittsburgh Division of Gastroenterology, Hepatology, and Nutrition welcomed **Vibha Sood, MD**, as its newest faculty member and director of the new motility and neurogastroenterology program for pediatric patients with motility or functional gastrointestinal disorders.

Dr. Sood is fellowship-trained in pediatric gastroenterology (Golisano Children's Hospital at the University of Rochester Medical Center). Upon completion of her fellowship, Dr. Sood joined the division of pediatric gastroenterology and hepatology at MedStar Georgetown University Hospital in Washington D.C. While at Georgetown, Dr. Sood developed an interest in motility and functional gastrointestinal disorders in children, which eventually led her to pursue an additional of training in motility disorders. She has completed a year of advanced pediatric motility and neuro-gastroenterology fellowship at the Cincinnati Children's Hospital Medical Center. During her fellowship training, as a part of her research, Dr. Sood had the opportunity to study the spectrum of gastrointestinal and motility disorders in patients with a hypermobile type of Ehlers-Danlos syndrome.

"Pediatric motility and neurogastroenterology is a rapidly progressing field, with exciting emerging technologies for diagnosis and management of patients with dysmotility. My fellowship training exposed me to a wide gamut of complex gastrointestinal motility disorders, including colorectal disorders, in children," says Dr. Sood.

Dr. Sood brings with her to UPMC Children's proficiency in performing colonic, antroduodenal esophageal, and anorectal manometry procedures, along with interpretation and application of these studies in the clinical realm.

Neuromodulation is an exciting and emerging field within neurogastroenterology, explains Dr. Sood, who has gained experience in taking care of patients who have received various neuromodulation devices, including sacral nerve stimulation (SNS) for intractable constipation, electro auricular device (EAD) for functional gastrointestinal disorders, and gastric electrical stimulation (gastric pacemaker) for gastroparesis.

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# Pediatric IBD: Unique Aspects, Barriers to Care, the Importance of Diet

**Sandra Kim, MD**, is a nationally recognized expert in pediatric and adolescent inflammatory bowel diseases (IBD). Dr. Kim co-directs the Inflammatory Bowel Disease Center at UPMC Children's Hospital of Pittsburgh with David Keljo, MD, PhD, (founder of the IBD center.) She is an associate professor of pediatrics at the University of Pittsburgh School of Medicine.

*"It is important for physicians to understand and remember that pediatric IBD has characteristics that differ significantly from the same disease in adults. Keeping this in mind is of the utmost importance in the provision of care and therapeutic options."*

*— Sandra Kim, MD*

Dr. Kim has published extensively on pediatric and adolescent IBD. Her clinical and research interests focus on pediatric IBD including adolescent transitioning and quality improvement. She has experience in basic science research on the impact of gastrointestinal microbiota in IBD. She has mentored numerous fellows on IBD-related research projects.

Dr. Kim sits on the Physician Leadership Committee of ImproveCareNow, and together with Sapana Shah, MD, began UPMC Children's participation in this national multicenter quality improvement collaborative.

Dr. Kim has worked closely with the Crohn's and Colitis Foundation for more than 20 years and is currently Chair of the Foundation's Government and Industry Affairs/Advocacy Committee and sits on their National Scientific Advisory Committee. She is an organizer of and frequent speaker at national physician meetings such as Digestive Disease Week and Advances in IBD as well as national retreats for Pediatric GI Fellows. She has been awarded the Rosenthal Award by the Foundation in 2011 and 2018 due to her leadership roles in patient education and advocacy for individuals living with IBD.

## Unique Aspects of Pediatric IBD

Dr. Kim continually emphasizes one fundamental aspect of IBD in pediatric patients that she believes ought to be a defining mantra for the care of young patients with the disease: children with IBD are *not* small adults with IBD.

"It is important for physicians to understand and remember that pediatric IBD has characteristics that differ significantly from the same disease in adults. Keeping this in mind is of the utmost importance in the provision of care and therapeutic options," says Dr. Kim.

Dr. Kim explains that while symptomatology in children and adults may be similar, children with the disease often have a much more severe clinical presentation and manifestation of symptoms. Importantly, children also can be profoundly affected in terms of their growth and physiological development during childhood and adolescence. Furthermore, while both populations of patients can and often do have significant social and psychological impact that affect quality of life, IBD often hits young patient much harder in this respect.

"These aspects of IBD in pediatric patients deserve significant attention by treating physicians. However, there is another factor of care in this disease that disproportionately affects children: the cost of care. Recent studies show that for patients under the age of 19, there exists an almost two-fold increase in the annual cost of IBD-related medical care versus adult aged patients. The reasons for this are numerous, and the problem globally is of great importance in my work, research, and advocacy on the national front to improve upon the disparities and barriers of care that currently exist for children and teens with IBD and their families," says Dr. Kim.

### Advocacy for and Improving Access to Care

Dr. Kim and other colleagues both at UPMC Children's and nationally are involved in IBD care advocacy through the Crohn's and Colitis Foundation. As the chair for government affairs and advocacy for the organization, she is involved in several ongoing projects to improve access to care.

Nutritional therapies for the treatment of IBD are in most instances not covered by insurance carriers. Formula therapies or nutritional supplements routinely can approach $1,000 or more per month.

## About the UPMC Children's IBD Center

The Inflammatory Bowel Disease (IBD) Center at UPMC Children's employs a multidisciplinary team approach to provide each patient with the most advanced medical care available and compassionate support for the entire family. The team is comprised of pediatric gastroenterologists, surgeons, IBD nurse practitioner, nurses, dietitian, psychologists, social worker, quality improvement specialist, and research coordinators dedicated to improving the care of all children living with IBD. Currently, they care for over 900 children and young adults living with IBD in Pennsylvania and surrounding states.

The IBD Center provides comprehensive, state-of-the-art clinical care to control the symptoms of IBD and to improve the quality-of-life for children with the disease. The Center's clinical services include:

- Individualized clinical teaching sessions for newly diagnosed patients
- A full range of diagnostic services, such as upper endoscopy, colonoscopy and capsule endoscopy
- Nutritional services to optimize children's diets to treat their disease and facilitate growth
- Complete radiology services, including CT scans, MRI, and interventional radiology
- Complete pediatric surgical services including minimally invasive surgery
- Access to the latest, most innovative therapies
- Clinical trials for novel therapeutics
- Involvement in ImproveCareNow, a pediatric IBD quality improvement collaborative

Furthermore, the IBD Center is committed to providing educational and social support to patients and families living with IBD. The Center hosts an annual education day for teenagers living with IBD ("IBD Grow"). In addition, the IBD Center is actively involved in the Western PA chapter of the Crohn's and Colitis Foundation. Members of the Center serve on the Board of Directors, volunteer in the Camp Oasis program, and donate time and other efforts in all philanthropic events.

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# Pediatric IBD *Continued from Page 3*

However, these therapies overall are less expensive than many of the medications used to treat IBD, which can often exceed $10,000 per infusion or injection depending on the medication/biologic agents but are generally covered by insurance. However, nutritional therapies/medical foods usually are not covered by insurance companies; therefore, the patients and their families bear the brunt of covering these costs.

Work to combat this discrepancy and gap in most insurance coverage is ongoing through the development and advocacy for a medical nutrition equity access bill. Organizations such as the American Academy of Pediatrics (AAP), North American Society for Gastroenterology, Hepatology, and Nutrition (NASPGHAN), and the Crohn's and Colitis Foundation are actively advocating for this bill's passage, and Dr. Kim and numerous physician colleagues across the country are working with these organizations to push for its adoption.

"This measure would ensure that health insurance providers provide coverage for the formulas that are crucial or essential parts of many IBD patients' ongoing care. Part of what this act says is that if you have a condition that requires the use of these formulas/medical necessary foods, it is a part of your therapy and should be covered. As clinicians and researchers, we can develop new and highly effective diets or formulas for our patients, but if they cannot get access to them either because they are prohibitively expensive or because insurance does not cover it as a part of therapy, patients will needlessly suffer," says Dr. Kim

Dr. Kim and colleagues also are working locally at UPMC Children's to better understand the barriers to care and therapeutic options so that they can improve access to these effective parts of IBD care. One of the current pediatric GI fellows, Angela Sandell, MD, is working alongside Dr. Kim on several advocacy and research projects examining barriers to care, and Dr. Sandell is working with colleagues to develop a position paper for the Crohn's and Colitis Foundation on addressing medical nutrition access for patients living with IBD.

"I have always believed that barriers to care or access to effective therapies should never be influenced by your doctor, your socioeconomic status, or where you happen to live. Every child should have the same access to care," says Dr. Kim.

## Diet and Dietary Therapies and Their Importance to IBD Care

Diet and dietary compliance are highly important aspects to not only the clinical care of IBD patients but also to much ongoing research in the field — basic science and mechanistic studies and translational and clinical trials. The role of diet in general, in terms of patients living with Crohn's disease or ulcerative colitis, has produced significant research in recent years examining its importance in broad populations, and how diet affects the risks of developing IBD as well as the course of the disease.

'We know that diets consisting of high proportions of processed foods and the additives they contain such as emulsifiers, saturated fats, simple sugars, and others factor into the complexity of increasing not only the risk for developing IBD but worsening of inflammatory responses in those that already have the condition. There is a tremendous amount of research being conducted examining the mechanistic role of diet in relation to disease, how various diets or dietary components mechanistically alter disease progression and severity, inflammation, bacterial composition of the gut, and how all of this affects the development and progression of the disease," says Dr. Kim. This ongoing research in the field is informing how clinicians utilize dietary interventions alone and in conjunction with other medical and surgical treatments to improve the disease profile and manifestations in patients.

There is much research at UPMC Children's on the basic and translational aspects of IBD, along with active clinical trials for new therapeutic agents with Dr. Kim and her colleagues in the gastroenterology and pediatric surgery divisions, but they also have ongoing projects examining how to improved utilization and understanding of specific defined diets as part of treatment in their pediatric IBD patients.

One specific aspect of dietary therapy that Dr. Kim and colleagues advocate for at UPMC Children's is the use of the Crohn's Disease Exclusion Diet (CDED). This diet addresses a number of components that are thought to be pro-inflammatory and lead to worse symptoms and disease progression.

"This type of diet for IBD patients excludes processed foods and components such as emulsifiers and additives that have been shown in animal studies to breakdown the lining of the intestinal tract and cause inflammation. It also cuts out simple sugars, reflecting studies in both humans and animal models alike that show a high simple sugar diet can facilitate or increase the growth of pro-inflammatory microbes. Saturated fats can also lead to similar inflammatory responses," says Dr. Kim.

To be sure, the impact of dietary factors on IBD is multifactorial. Diet plays roles in GI tract permeability, immune cell activation, food antigen recognition, and other aspects that we are learning more about with each passing year. Dr. Kim explains that enteral therapy is useful as both induction and maintenance regimens in pediatric Crohn's disease, and that specific diets such as the specific carbohydrate diet (SCD) or Crohn's disease exclusion diet (CDED) may be effective in uncomplicated cases of IBD (primary and adjunct). More research is needed in all these areas, but Dr. Kim and her IBD colleagues are actively pursuing answers to many of these questions.

# New Motility Center *Continued from Page 1*

## Designing a Motility Program

Dr. Sood's primary objective in her early work at UPMC Children's is to formally establish, staff, and grow the motility and neurogastroenterology program. Prior to the establishment of this program at UPMC Children's, patients with motility and functional gastrointestinal disorders in need of specialized diagnostics studies and procedures had to be referred to other institutions. The closest referral centers to Pittsburgh are in Cincinnati or Columbus, Ohio, which could mean travel of hundreds of miles and many hours for some patients.

Dr. Sood's program now will allow these patients to remain at UPMC Children's for their entire spectrum of care, eliminating the need for long trips and time away from home, improving continuity of care, and provision of seamless communications and patient discussions — all within the campus of UPMC Children's.

Dr. Sood has several goals for the new motility and neurogastroenterology program that go beyond building the necessary infrastructure and staffing for the program.

"Our goals are to build the program into a center of excellence that provides comprehensive evaluation and treatment of pediatric patients with complex motility and functional gastrointestinal disorders, and to build a multidisciplinary care service with colorectal surgery, intestinal rehabilitation, and the intestinal transplant center and aerodigestive programs for the co-management of patients with esophageal, intestinal, and colonic dysmotility," says Dr. Sood.

In the long-term, Dr. Sood's goal for the program is to make UPMC Children's a regional and national referral center for patients with complex motility and functional GI disorders, and to provide training in these disorders to new generations of gastroenterology specialists.

## Subspecialty and Multidisciplinary Collaborations

The breadth of services and care that is provided at UPMC Children's will allow for many collaborative efforts in the future between Dr. Sood, her gastroenterology colleagues, and others, such as colorectal surgery, small bowel transplant and intestinal rehabilitation programs.

"A motility program such as we are building will allow additional care and expertise to be provided to some of our more complex patients, including our intestinal transplant patients. I am looking forward to developing collaborations with my colleagues in that program, and to helping care for these patients who need long-term, complex follow-up," says Dr. Sood.

Dr. Sood's also plans to work in close collaboration with colleagues in colorectal surgery and assist in developing a multidisciplinary approach to taking care of patients with longstanding, severe constipation issues or complicated anorectal malformation disorders.

"I think a combined approach to caring for these patients is highly desirable, and I hope that we will be able to establish a collaborative working methodology where I can lend my expertise in motility and functional disorders to the care of these patients," says Dr. Sood.

Another collaborative way that Dr. Sood ultimately sees her expertise being leveraged in the patient care arena at UPMC Children's is by extending the utilization of motility studies in existing multidisciplinary aerodigestive program with her colleagues in pediatric otolaryngology and pulmonology who care for children with complex feeding and ENT problems.

### Disorders Treated in the Neurogastroenterology and Motility Program

- Anorectal malformations
- Colonic dysmotility
- Hirschsprung disease
- Intractable constipation and encopresis
- Dysphagia and feeding disorders
- Rumination
- Achalasia
- Gastroparesis
- Intestinal pseudo-obstruction
- Pre- and post-small bowel transplant motility evaluation
- Functional gastrointestinal disorders
- Aerodigestive disorders

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# UPMC Children's Hospital of Pittsburgh Launches New Pediatric Research Podcast Series

UPMC Children's Hospital of Pittsburgh has launched a new medical podcast series for physicians, scientists and other health care professionals featuring the hospital's leading researchers and clinicians.

Episodes of "That's Pediatrics" will include compelling interviews with scientists at UPMC Children's Hospital who are performing innovative basic, translational, and clinical research. New episodes will be released every two weeks.

"Going back to the polio vaccine, Pittsburgh has always been a hub of very innovative research, and in recent years really has become a nexus for some groundbreaking research in pediatric medicine," said **John Williams, MD**, chief of the Division of Pediatric Infectious Diseases at UPMC Children's and one of the podcast hosts. "There is a spirit of collaboration here in Pittsburgh that makes it somewhat unique nationally and we really want to explore the research that is happening here and how we have a real opportunity to change the way pediatric medicine is practiced around the world."

### Current episodes of "That's Pediatrics" include:

"Gene Therapy" with **George Gittes, MD**, director of the Richard King Mellon Foundation Institute for Pediatric Research and co-scientific director, UPMC Children's Hospital

"All About Acute Flaccid Myelitis" with **John Williams, MD**, chief, Division of Pediatric Infectious Diseases

"Don't Rule Out Brain Injuries" with **Rachel Berger, MD, MPH**, chief, Child Advocacy Center, UPMC Children's Hospital

UPMC Children's Hospital "Neonatal Cardiovascular Research" with **Thomas Diacovo, MD**, chief, UPMC Newborn Medicine Program, and director of Neonatal Cardiovascular Research, Heart Institute at UPMC Children's Hospital

"In Pursuit of the Self-Healing Heart" with **Bernhard Kühn, MD**, associate director, Richard King Mellon Foundation Institute for Pediatric Research, and director, Research in Cardiology at UPMC Children's Hospital

"A History of Pediatric Liver Transplantation" with **George Mazariegos, MD**, chief, Pediatric Transplantation

"A Passion for Pediatric Emergency Medicine" with **Mioara Manole, MD**, president, Children's Community Pediatrics, and chief, Division of General Academic Pediatrics

"Let's Talk About Ears" with **Alejandro Hoberman, MD**

"From the U.S. Navy to UTIs" with **Tim Shope, MD, MPH**, professor of pediatrics

"The First Handshake" with **Tim Hand, PhD**

"Beyond Corn and Carrots: The Future of Pediatric Diabetes" with **Radhika Muzumdar, MD**, chief, Division of Pediatric Endocrinology, Diabetes, and Metabolism

"Mysteries That Affect Our Children" with **Terence Dermody, MD**, Vira I. Heinz Professor and chair, Department of Pediatrics; Physician-in-Chief and Scientific Director, UPMC Children's Hospital.

### In addition to Dr. Williams, "That's Pediatrics" hosts are:

**Carolyn Coyne, PhD**, director, Center for Microbial Pathogenesis, UPMC Children's Hospital

**Stephanie Dewar, MD**, director, Pediatric Residency Training Program, UPMC Children's Hospital

**Brian Martin, DMD**, vice president, Medical Affairs, UPMC Children's Hospital

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Subscribe to "That's Pediatrics" in iTunes or Google Play Music to have new episodes automatically download to your phone for free when they become available.

# GI Research Spotlight

In October 2018 in the journal *Gastroenterology,* researchers from the Division of Pediatric Gastroenterology, Hepatology, and Nutrition, including Sohail Husain, MD; Dean Yimlamai, MD, PhD; Amitava Mukherjee, PhD; Li Wen, MD, PhD; and Tanveer Javed published new findings on the origins of pancreatitis after endoscopic retrograde cholangio-pancreatography (PEP).

Their basic science study examined how and what effects arise from hydrostatic pressure on pancreatitis in a murine model in which acute pancreatitis is induced via clamping of the proximal common bile duct in conjunction with retrograde biliopancreatic ductal or intraductal saline infusion at constant pressures.

The researchers found that intraductal pressures at both 100 mm Hg and 150 mm Hg, respectively, both were responsible for inducing pancreatitis in the models. The 100 mm Hg threshold was lower than pressures from previous studies in similar murine models where 130 mm Hg of pressure induced an inflammatory response in the pancreas.

The responses in the models to the various intraductal pressures for short periods of time (10 minutes in the current experiments) showed activation of calcineurin within the pancreas, highlighting not only the importance of calcineurin signaling for the development of acute pancreatic inflammation and pancreatitis, but also that the calcineurin pathway may be a viable target for pharmacological therapies able to inhibit the calcineurin response and prevent the onset of acute pancreatitis.

The research team is continuing their experiments and will be investigating the effects of inhibiting the calcineurin pathway further in future studies.

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# UPMC Physician Resources

For the latest free CME courses, videos, news, and events for physicians, please visit **UPMCPhysicianResources.com/PedsGI**.

## CME Courses in Pediatric Gastroenterology, Hepatology, and Nutrition

**Blood, Sweat, and Cheers! Scientific Discovery and Cystic Fibrosis Research**

*Presented by Andrew Feranchak, MD*
*Chief, Division of Pediatric Gastroenterology, Hepatology, and Nutrition*

Dr. Feranchak gives a presentation on the history of cystic fibrosis and important research discoveries impacting the disorder.

## Video Rounds

**Video Rounds** is a series of short, informative, and educational videos created for physicians, covering a variety of medical and surgical disciplines.

**Pediatric Metabolic Liver Disease**
*Presented by Patrick McKiernan, MD*
*Director, Pediatric Hepatology Program*

**Treatment of Acute Liver Failure**
*Presented by Robert Squires, MD*

**Treating Pediatric Inflammatory Bowel Disease**
*Presented by David Keljo, MD, PhD*
*Director, Inflammatory Bowel Disease Center*

# About the Division of Gastroenterology, Hepatology and Nutrition at UPMC Children's Hospital of Pittsburgh

The Division of Pediatric Gastroenterology, Hepatology and Nutrition provides a full range of diagnostic procedures and treatments related to the gastrointestinal tract, liver, and pancreas. Procedures performed include endoscopy of the upper and lower gastrointestinal tracts; biopsy of the esophagus, stomach, small bowel, large bowel and liver; polypectomy; sclerotherapy of varices; capsule endoscopy; tests of secretory function of the pancreas; pH probe testing for gastroesophageal reflux; and breath hydrogen testing.

Enterostomal therapy is offered for children with stomas, incontinence, dermal ulcers and other select skin conditions or those needing wound care.

### Special Programs

In combination with colleagues in the Hillman Center for Pediatric Transplantation and the Division of Pediatric General and Thoracic Surgery, the Division of Pediatric Gastroenterology offers care in several multidisciplinary programs.

### Hepatology Center

The Hepatology Center offers consultative services and comprehensive care for children with a wide range of hepatobiliary disorders. Services provided include inpatient and outpatient consultation; diagnosis using a variety of methods; collaborative consultation and care with the Hillman Center for Pediatric Transplantation and the Division of Pediatric General and Thoracic Surgery; care plan coordination; long-term follow-up care; and state-of-the-art clinical research.

### Inflammatory Bowel Disease (IBD) Center

The IBD Center uses a team approach to provide each patient with the most advanced medical care available and compassionate support for the whole family. The center provides comprehensive, state-of-the-art clinical care to control the symptoms of IBD and to improve the quality of life for children with the disease.

### Intestinal Care and Rehabilitation Center (ICARE)

UPMC Children's Intestinal Care and Rehabilitation Center (ICARE) provides expert care for patients with complex intestinal disease. It follows children with poorly functioning intestines and provides expert care for children with complicated nutritional needs including those on parenteral nutrition. The Division of Pediatric General and Thoracic Surgery and the transplant team participate in this center. Moreover, Children's small-bowel transplant program is one of the largest in the country.

### Medical Coping Clinic

The Medical Coping Clinic is an integral part of the Division of Pediatric Gastroenterology and provides expertise in treating issues related to coping with a chronic illness using a broad range of treatment options. The Medical Coping Clinic provides comprehensive, state-of-the-art clinical care to improve the quality of life for children with GI-related problems.

### Pancreatic Center

Children with acute recurrent or chronic pancreatitis can find hope at the Pancreatic Center at UPMC Children's Hospital of Pittsburgh. Here families will find a team of doctors who understand pancreatitis, have a wealth of experience caring for children who have this condition, and can answer the many questions families often have about it.

### Division Faculty and Clinical Providers

Andrew Feranchak, MD — *Division Chief*
Jeffrey Rudolph, MD — *Clinical Director, and Director, ICARE*
Feras Alissa, MD
Maria Ines Clavell, MD
Kristen Critelli, MD
John Eisses, MD, PhD
Kate Ellery, DO
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## About UPMC Children's Hospital of Pittsburgh

Regionally, nationally, and globally, UPMC Children's Hospital of Pittsburgh is a leader in the treatment of childhood conditions and diseases, a pioneer in the development of new and improved therapies, and a top educator of the next generation of pediatricians and pediatric subspecialists. With generous community support, UPMC Children's Hospital has fulfilled this mission since its founding in 1890. UPMC Children's is recognized consistently for its clinical, research, educational, and advocacy-related accomplishments, including ranking 15th among children's hospitals and schools of medicine in funding for pediatric research provided by the National Institutes of Health (FY2018).

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