

Motility Disorders from Simple to Complex

The Motility Center diagnoses and treats an array of motility problems. The following is a list of some common disorders:

Chronic Intestinal Pseudo-Obstruction (CIP)

This is a rare disorder where the intestines act as if there is a mechanical obstruction or blockage, but no physical evidence of a blockage is found. It is considered a failure of the "intestinal pump," much like heart failure is a failure of the heart pump. The consequence of this failure is that food and other intestinal contents fail to move efficiently from the more proximal to the most distal portions of the intestine.

Constipation

Many children have trouble with constipation at one time or another. Usually, this is not a long-term problem; however, some children may be constipated for many months or years. While constipation may have different meanings to different people, it can be defined as:

- More than three days between bowel movements
- Stools that are large, hard and painful to pass
- Incomplete bowel movements where stool backs up in the bowel despite daily bowel movements

Encopresis

The accidental loss of control of bowel contents, encopresis most often occurs in children with chronic constipation and abnormalities of the spinal cord, as well as children who have had anal surgery and those who have emotional problems, such as oppositional defiant behavior and conduct disorders. Encopresis reported in children younger than 4 may be the result of the child not yet being fully toilet trained.

Gastroesophageal Reflux

Gastroesophageal reflux is very common and considered normal in infancy. For those infants with more severe reflux, physicians at Nationwide Children's are pioneering the use of impedance, a relatively new technology that detects all reflux events and assesses the height of the esophagus reached by those reflux episodes.

Gastroparesis

Gastroparesis occurs when the stomach contracts less frequently and less powerfully, causing food to lie in the stomach for prolonged periods of time. Many conditions can cause gastroparesis, including viral infections, diabetes, adrenal and thyroid gland problems, scars and fibrous tissue, prescription medication, previous stomach surgery and neurologic disorders. In up to 60 percent of cases, the cause of gastroparesis in children is not known.

Hirschsprung's Disease

Hirschsprung's disease occurs when nerves in a part of the bowel do not develop properly, preventing that part of the bowel from working as it should. Treatment requires surgical removal of the affected portion of the bowel, with or without temporary placement of a colostomy.

 Motility Disorders
in Children



Motility Disorders in Children

The Motility Center, known as CARING (Center for Advanced Research in Neuromuscular Gastrointestinal disorders), at Nationwide Children's Hospital leads the nation in expert care of children with motility disorders. From behavioral-related motility problems to complex abnormalities of the enteric nervous system, the Motility Center experts are pioneering innovative tests and treatments to help families understand the reasons for their children's symptoms and give them new hope that quality of life will be improved.



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Diagnosing and Treating Motility Problems

Motility problems may cause vomiting, diarrhea, constipation, abdominal distension, abdominal pain, and difficulty swallowing, and can result in significant physical and emotional distress. Diagnosis and treatment of such disorders is often elusive and associated with much uncertainty.



Carlo Di Lorenzo, MD, Chief of Gastroenterology, Hepatology and Nutrition, and **Hayat Mousa, MD**, Medical Director of the CARING Motility Center, specialize in the evaluation and management of previously unexplained causes of pediatric gastrointestinal dysmotility.

They use a comprehensive biopsychosocial approach, which includes access to child psychologists, dietitians and social workers, to care for children with complex GI neuromuscular disorders. Dedicated research fellows and research coordinators, basic scientists, pathologists, radiologists, surgeons and neonatologists contribute to advance the research agenda of the center. The center also provides the only formal training fellowship in pediatric GI motility in the U.S.



To make a referral or schedule a consultation, call (614) 722-3450. The patient's most recent medical information and testing can be faxed to (614) 722-3454.

Advanced Diagnostic Techniques

Children are diagnosed through the team's use of advanced techniques that allow the team to study how the intestine moves, contracts and relaxes. The techniques can also measure intestinal perception, including the threshold for discomfort and pain from the intestine.

- Esophageal manometry
- Esophageal impedance studies
- Antroduodenal manometry
- Colonic manometry
- Anorectal manometry
- Transit studies
- Electronic barostat
- Electrogastrography (EGG)
- High-resolution imaging
- Scintigraphic colonic transit time

Technology Highlight

Esophageal Impedance (Multi-channel Intraluminal Impedance MII)

This is a relatively new technique designed to detect intraluminal bolus movement allowing for the detection of both acid and non-acid reflux. Impedance testing depends upon measurement of changes in resistance to alternating electrical current when a bolus passes by multiple sensors (channels) placed on the catheter. The electrical current between the sensors is conducted by the few ions present in the esophageal mucosa. Multi-channel measurement of impedance allows for determination of direction of bolus movement based upon temporal differences in bolus entry and exit.

Antroduodenal Manometry

Antroduodenal manometry is used to study how the stomach and the first part of the small intestine are working. It helps measure both the strength and coordination of muscle contractions. A small flexible tube (catheter) is passed through the nose, down the esophagus, through the stomach and into the small intestine. The tube is passed after the child is sedated, but the manometry test is done after the child wakes, often the next day. If the child has a gastrostomy tube, the catheter will be passed through the gastrostomy instead of through the nose.

Indications:

- Recurrent vomiting
- Abdominal pain or distension
- Post-fundoplication feeding disorders

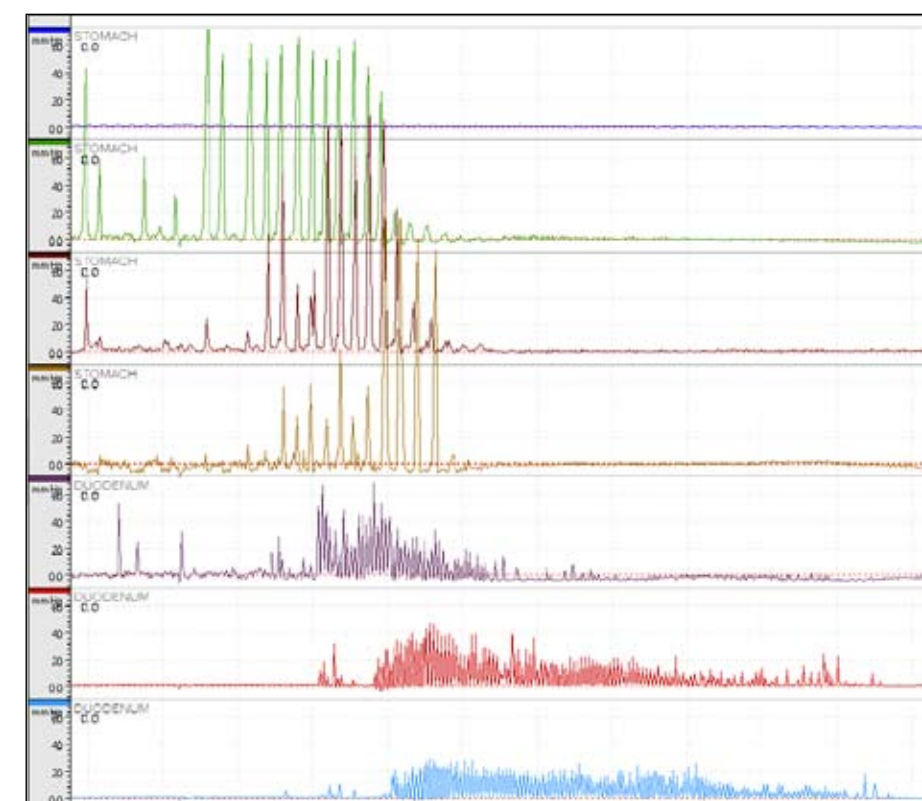
Colonic Manometry

This procedure helps discriminate normal colonic motor function from neuromuscular disorders. It guides medical and surgical management in patients with defecation disorders.

Indications:

- Differentiation of behavioral versus organic causes of constipation
- Post surgical repair in Hirschsprung's disease: fecal incontinence, constipation, poor growth
- Assessment of colonic function in GI neuromuscular diseases
- Prior to multivisceral transplant

Example of Antroduodenal Manometry



Motility Disorders in Children

Disorders Most Commonly Referred to GI Motility Center

Suspected Disorder	Clinical Presentation	First-line Diagnostic Procedures	Motility Center Diagnostic Procedures
Chronic intestinal pseudo-obstruction	Feeding intolerance, abdominal distension, vomiting and constipation	UGI-SBFT*, EGD*, gastric emptying scan	Antroduodenal manometry, colonic manometry, anorectal manometry
Hirschsprung's disease	Constipation, abdominal distension, fecal incontinence, diarrhea	Barium enema, rectal biopsy	Colonic manometry, anorectal manometry, scintigraphic colonic transit time
Gastroparesis	Early satiety, bloating, excessive belching, nausea, vomiting, weight loss, abdominal pain	UGI*, EGD*, gastric emptying scan	Antroduodenal manometry, electrogastrography (EGG), esophageal impedance
Severe chronic constipation	Bloating, abdominal distension, fecal incontinence	Barium enema, sitz marker transit study	Colonic manometry, anorectal manometry, scintigraphic colonic transit time
Gastroesophageal reflux (GER)	Vomiting, failure to thrive, recurrent aspiration pneumonia	UGI*, EGD*	Esophageal dual pH/impedance, antroduodenal manometry
Food aversion	Food refusal, failure to thrive, weight loss	UGI*, video swallow study, EGD*	Esophageal manometry, Esophageal dual pH/impedance

* Upper gastrointestinal series (UGI); small bowel follow through (SBFT); esophagogastroduodenoscopy (EGD)

What to Expect at the Initial Consultation with the Motility Center

Upon referral, patients presenting with these symptoms will be evaluated in the GI Clinic at Nationwide Children's Hospital. The evaluation may include: upper/lower endoscopy, small bowel imaging with an upper gastrointestinal series and small bowel follow through, and/or gastric emptying scan. Depending on the results of the GI evaluation, the gastroenterologist will make the determination whether the patient should be referred to the Motility Center for more specialized diagnostic procedures. Motility results are reported to the gastroenterologists who will coordinate communication with the referring pediatrician's office.

If you have questions regarding patients with a suspected motility disorder or other gastrointestinal problems, please contact us at (614) 722-3450.