Complex Child E-Magazine

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Tests to Diagnose Reflux and Motility Problems

by Susan Agrawal

- Upper GI: Also called a Barium Swallow, an Upper GI is a test that uses fluoroscopy to take "live" X-rays of the upper GI tract. The child is asked to drink a liquid that has barium added to it or the barium is inserted through an NG or G tube. The barium allows the radiologist to view how liquid progresses through the stomach and into the small intestine. In some cases, the radiologist may follow the barium all the way through the small bowel, called an Upper GI with Small Bowel Follow-through. The primary reason this test is performed is to rule out structural anomalies or anatomic abnormalities such as pyloric stenosis, webs, or malrotation. This test only detects reflux if reflux occurs during the short time that the test is administered. It is not considered diagnostic for reflux.

- pH Probe: Considered the "gold standard" for diagnosing reflux, this test involves long term monitoring of the acidity of the esophagus, usually over 20-24 hours. A thin catheter is threaded through the nostril and into the esophagus. A probe on the end of the catheter monitors the pH of the esophagus, transmitting to a recorder box. Parents are asked to press a button on the recorder or note on paper any reflux or reflux-related symptoms such as coughing, arching, or difficulty breathing. Reflux symptoms are then correlated with pH readings to determine if acid reflux is present.

- Impedance Probe: This test is similar to a pH Probe, but it measures impedance (the flow of liquids and gases in the esophagus) as well as pH. It is able to detect acid reflux, non-acid reflux, and belches at several different points in the esophagus.

- Upper Endoscopy with Biopsies: This test uses a small camera to look at the esophagus, stomach, and upper part of the small intestine. The child is usually anesthetized or sedated for the procedure, which takes about 20 minutes. Pictures are taken of the upper GI tract, and small biopsies of different areas are taken to test for inflammation and eosinophils. This test is best to detect damage to the esophagus from reflux, Barrett's esophagus, or eosinophilic esophagitis.

- Video Swallow Study: Similar to an Upper GI, this test instead looks at the swallow and progression of food from the mouth into the esophagus. Different foods and liquids are laced with barium and a radiologist and speech therapist

watch how they are swallowed. This test is used to detect aspiration and problems with the swallow (dysphagia).

- Gastric Emptying Scan: This test shows how well the stomach empties into the small intestine over a two hour period. The child is given food or drink containing a radioactive isotope. Pictures are taken using a nuclear medicine scanner approximately every 5 minutes for the first part of the test. Additional pictures are taken at less frequent intervals for another one to two hours. A computer program determines what percentage of food/liquid has reached the small intestine and in what period of time. This test is best for diagnosing Delayed Gastric Emptying or Rapid Gastric Emptying.

- Manometry Testing: There are several different types of Manometry testing, all of which detect pressure within the GI tract to determine the efficacy of a child's motility. They are used to measure the strength, frequency, and coordination of peristalsis and contractions throughout the GI tract. *Esophageal manometry* uses a catheter threaded through the nose to evaluate the motility of the esophagus. Children are asked to swallow liquids with the catheter in place. This test is commonly done together with fluoroscopy, like a video swallow study. *Antroduodenal manometry* also uses a catheter through the nose or a G-tube to measure the contractions within the stomach and duodenum. Children are often sedated during the placement of the catheter. Once placed, the child remains in bed for several hours while the contractions in the lower stomach and upper part of the small intestine are recorded. In some cases, medications that affect motility may be administered to see if motility changes. *Colonic manometry* is used to measure contractions within the colon. The catheter is placed through the rectum using colonoscopy or by a radiologist. Children may be sedated during placement. The catheter remains in place for several hours to monitor activity within the colon. *Anorectal manometry* tracks the function of the rectum and anus. A catheter with a balloon on the end is inserted into the rectum and the balloon is inflated to mimic stool. The response of the rectum and particularly the anus is noted during the exam. All manometry tests are used to determine motility in the gut, and can help to diagnose disorders ranging from dysphagia to intestinal dysmotility or chronic constipation.

- Bronchoscopy: A bronchoscopy looks at the airway and the lungs. A bronchoscopy may be done using a flexible or rigid scope and looks at the entire airway from the pharynx and larynx all the way into the lungs. Washes of the lungs may be done to determine if infection or particulates are present. This test is useful to determine if aspiration of reflux or liquids is occurring.

- Chest CT or X-ray: These tests are also used to detect signs of chronic aspiration or aspiration pneumonia. A chest X-ray is typically done in an upright position and looks at the lungs using a traditional X-ray. A Chest CT, which may require sedation, takes more detailed pictures of the lungs and is useful for diagnosing bronchiectasis and damage to the lungs from aspiration of reflux or liquids.

- Abdominal X-ray or Ultrasound: These tests use traditional X-rays or ultrasonography to view the anatomy of the abdomen, including the stomach, intestines, liver, pancreas, gall bladder, bladder, and kidneys.