GI Resident Responsibilities

Resident coverage in the general/GI/GU area is continuous from 8AM to 5PM. The resident should be present or at least readily available for fluoroscopy exams and plain film consultation all day, including the lunch hour. For all exams that are not immediately dictated with an attending, the resident must write (legibly!) both the clinical indication and their preliminary report on the requisition or prelim report form.

Do not perform any studies on pediatric patients without discussing with the attending. Residents who have completed their pediatric rotations may proceed if comfortable.

While there are general guidelines for the different types of GI exam, each must be tailored to the specific situation. Before beginning any exam, it is vital to understand what questions need to be answered. If there is any doubt, contact the referring physician for clarification. Relevant clinical information to know prior to beginning includes:
   a) the anatomy related to any surgical procedures in the area
   b) the results of prior radiological exams (including review of the actual films)

Evaluation

Because this rotation involves direct patient contact, residents will be evaluated using the “360 degree” model.

Patients will complete an evaluation form at the completion of each exam. Additionally, the techs will complete an evaluation of the residents. It is important to realize that the physician is a member of a larger health care delivery team. Evaluations will also be completed by the rotation attendings.

Teaching File

Each resident is responsible for adding two interesting cases (one GI and one GU) to the teaching file during their rotation. The write-up should include the clinical history, imaging findings, surgical/pathology follow-up, and appropriate journal/textbook references.

Barium

Barium suspensions are most often described as percent weight-to-volume (% W/V) which is the number of grams of barium sulfate per 100 cc of suspension. The more dilute suspensions for single-contrast
exams are often referred to as "thin" barium, while the denser suspensions for air-contrast studies are called "thick" barium.

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Concentration</th>
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<tbody>
<tr>
<td>Double Contrast UGI</td>
<td>250% W/V</td>
</tr>
<tr>
<td>Single Contrast UGI</td>
<td>40-60% W/V</td>
</tr>
<tr>
<td>Small Bowel Meal</td>
<td>35-45% W/V</td>
</tr>
<tr>
<td>Double Contrast LGI</td>
<td>100% W/V</td>
</tr>
<tr>
<td>Single Contrast LGI</td>
<td>15-25% W/V</td>
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</tbody>
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Barium is used for most exams except when there is a suspicion of perforation or extravasation. Extravasated barium may cause severe peritonitis or mediastinitis. Barium does not inspissate in the small bowel and is not contraindicated in a small bowel obstruction. However, orally administered barium may inspissate in the colon and potentially convert a partial obstruction to a complete obstruction. Additionally, if a severe colon obstruction/narrowing is encountered during a barium enema, only a small amount of barium should be allowed to pass proximally.

**Water-Soluble Agents (Hypaque, Gastrografin)**

These agents should be used when GI perforation is suspected. While generally benign if spilled into the mediastinum or peritoneum, they can cause severe and possibly fatal pulmonary edema if aspirated into the lungs. Such agents should be avoided in patients at risk for aspiration. If both aspiration and a leak are suspected, options would include:

1. using a low-osmolar agent, though they are expensive
2. using small amounts of thin barium; minimal extravasated barium in the mediastinum may be less severe than aspiration of a hyperosmolar agent into the lungs

If no evidence of a leak is seen with the water-soluble agent, a repeat exam with barium is often done, as its increased density may better define a small leak.

Water-soluble small bowel exams should generally be avoided. They are hypertonic, drawing water into the bowel, and become diluted limiting the exam. Dangerous fluid shifts might occur in the unstable or pediatric patient. Occasionally, the clinical service is most interested in whether Gastrografin reaches the colon, rather than in mucosal detail. Some also feel that Gastrografin may help open up a partial small bowel obstruction, or stimulate the bowel in cases of post-op ileus. However, prior to performing such a study, it should be confirmed that these exceptions are what the referring attending is after.

**Glucagon**

Hypotonic agent used to abolish peristalsis in the stomach, duodenum, small bowel, and colon, but not effective in the esophagus. Improves the double-contrast UGI by allowing better distension of the stomach and duodenum and preventing early spill of barium into the duodenum and small bowel. Note that is does increase the time to do the exam,
requiring an IV injection and occasionally delaying examination of the duodenum. Seems to improve patient comfort during a lower GI, but probably does not increase the quality of the exam. May be useful for the patient with a lot of colon spasm (or to help differentiate spasm from a true narrowing).

The stomach and small bowel are very sensitive to glucagon and an IV dose of 0.1 mg is effective in most cases. In post-operative cases, especially where the anatomy is uncertain, a higher dose of 0.5-1.0 mg is helpful. For a colon exam, 1 mg is standard.

Contraindications to glucagon include pheochromocytoma, insulinoma, brittle diabetes, and prior reactions to glucagon. If given to a diabetic, they should be warned that they may spill sugar in the urine for a day or two.

Preparation for UGI Studies
- NPO p MDNT
- this includes smoking or chewing gum which increase saliva production and thus fluid in the stomach

**Double-Contrast Upper GI**

**Single-Contrast Upper GI**

**Barium Swallow (pharyngo-esophagram)**
- Oral-Pharyngeal Exam
- Esophagram

**Water-Soluble Esophagram or Upper GI**

**Post-Op UGI**
- post-esophagectomy
- post-gastrectomy

**Small Bowel Exam**

a) small bowel follow-through

b) dedicated small bowel series

c) enteroclysis

**Double-Contrast Lower GI**

**Single-Contrast Lower GI**

**Ileostomy/Colostomy Injection**

**ERCP**
ERCP is performed in the GI lab. Images are mounted with the general cases.

**Emergency GI Exams**

a) Rule Out Esophageal/Gastric/Duodenal Perforation
b) Rule Out Esophageal Obstruction/Impaction/Foreign Body
c) Rule Out Gastroduodenal or Small Bowel Obstruction
d) Rule Out Colon Perforation
e) Rule Out Colon Obstruction
   - Sigmoid Volvulus

**GU exams**

IVP (excretory urogram)
Hysterosalpingogram
Retrograde urethrogram
Voiding cystourethrogram
cystogram

**GI Radiology References**

GASTROINTESTINAL RADIOLOGY: THE REQUISITES, 2nd Edition
by Robert Halpert and Peter J. Feczko, Mosby, 1999
- good overview/introductory text
- easily read within a rotation

GASTROINTESTINAL RADIOLOGY: Performing and Interpreting Fluoroscopic Examinations
by David Gelfund, Churchill Livingstone, 1984
- excellent descriptions of how to perform various GI exams
- good for the first GI rotation

DOUBLE CONTRAST GASTROINTESTINAL RADIOLOGY, 3rd Edition
by Marc Levine, Steve Rubesin & Igor Laufer, W.B. Saunders, Co., 2000
- classic text on double-contrast techniques

GASTROINTESTINAL RADIOLOGY: A PATTERN APPROACH, 3rd edition
by Ronald Eisenberg, J.B. Lippincott, 1996
- good illustrations of the various pathologies encountered

TEXTBOOK OF GASTROINTESTINAL RADIOLOGY, 2nd Edition
by Richard Gore, Marc Levine, & Igor Laufer, W.B. Saunders, 2000
- 2 volume comprehensive reference

DYNAMIC RADIOLOGY OF THE ABDOMEN: NORMAL AND PATHOLOGIC ANATOMY, 5th Edition
by Meyers MA, Springer Verlag, 2000
- classic text on radiologic anatomy of the abdomen
- important for understanding of compartments, fascial planes, and spread of disease

INTERPRETATION OF ERCP
by Taylor AJ, Bohorfoush III, Lippincott-Raven, 1997
- basic coverage of ERCP