# MRAD 254: Fluoroscopic Imaging

Outcomes: 2 and 3

Small Bowel Exams

## Objectives

2.1) Describe the gross anatomy, relational anatomy, and physiology of the digestive system

2.2) Describe the radiographic procedures used for imaging the digestive system

2.3) Identify contrast media used for individual imaging procedures of the digestive system

2.5) List the indications and contraindications for examinations of the digestive systems

2.6) State the key components when verifying a patient's clinical history

2.7) Determine patient preparation and post-procedural care of each of the individual digestive system procedures

2.8) Identify procedures for prioritizing examinations according to medical status and resource availability

3.4) Identify topographical landmark locations of the digestive system

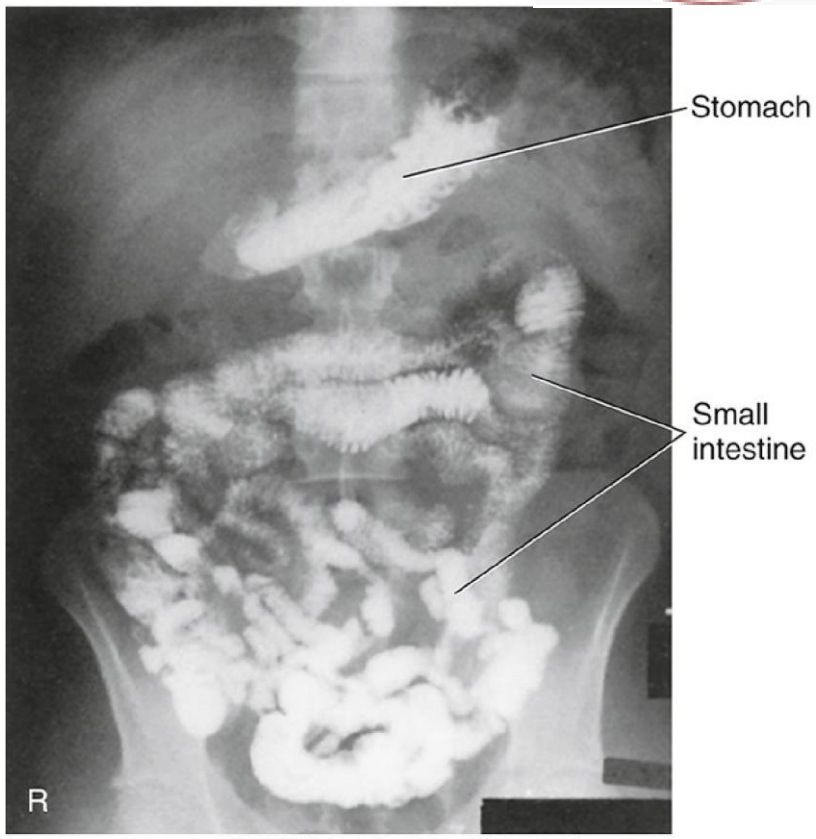
Generalize how to increase patient comfort during an exam of the digestive system

# Anatomy – Small Bowel

- 3 parts
- Duodenum
- Jejunum
- Ileum

- Second and longest portion of thedigestive tract

- Absorbs the nutrients from what weeat

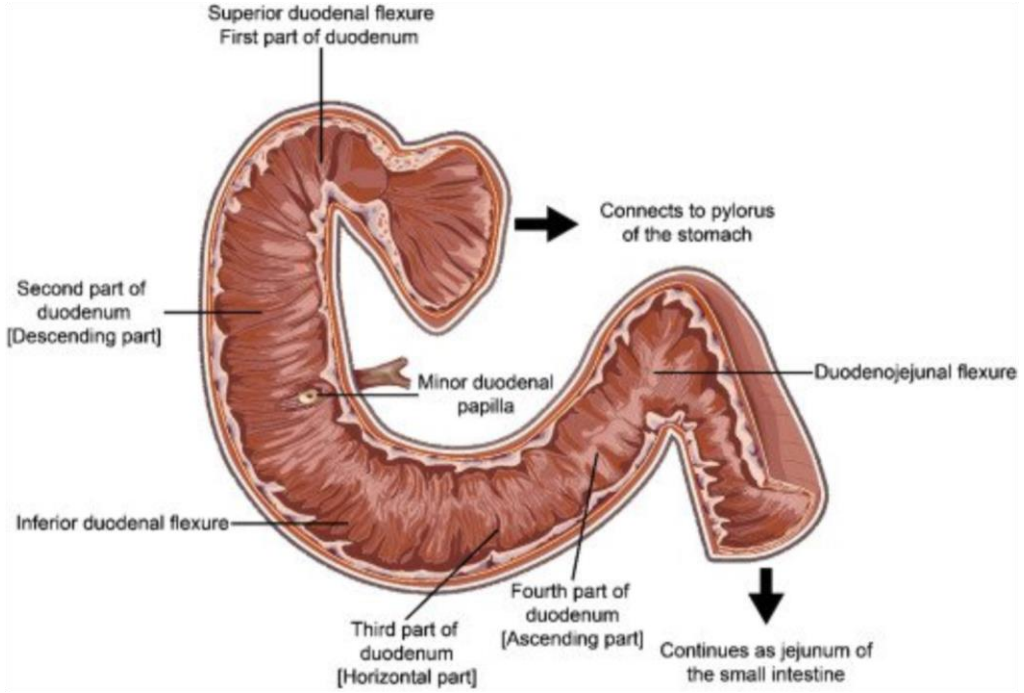


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- 4 layers of tissue

## Anatomy - Duodenum

- First, shortest, and widest segment




- 4 parts
- Bulb
- Descending
- Transverse
- Ascending

- Ends at the duodenojejunal flexure

https://www.sciencedirect.com/topics/medicine-and-dentistry/duodenojejunal-flexure

## Anatomy - Jejunum

- Second segment

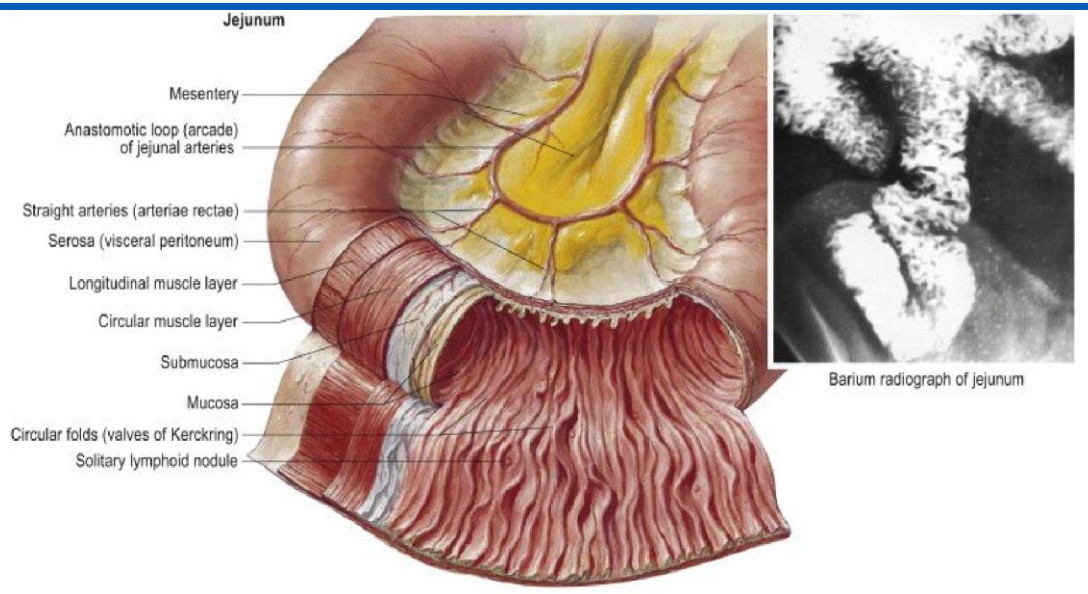
- Joins to duodenum at DJ flexure
- Ligament of Treitz

- Many mucosal folds with villi
- Increase surface area

- Why would more surface area be good?

- Majority of nutrients absorbed here

Anatomy - Ileum



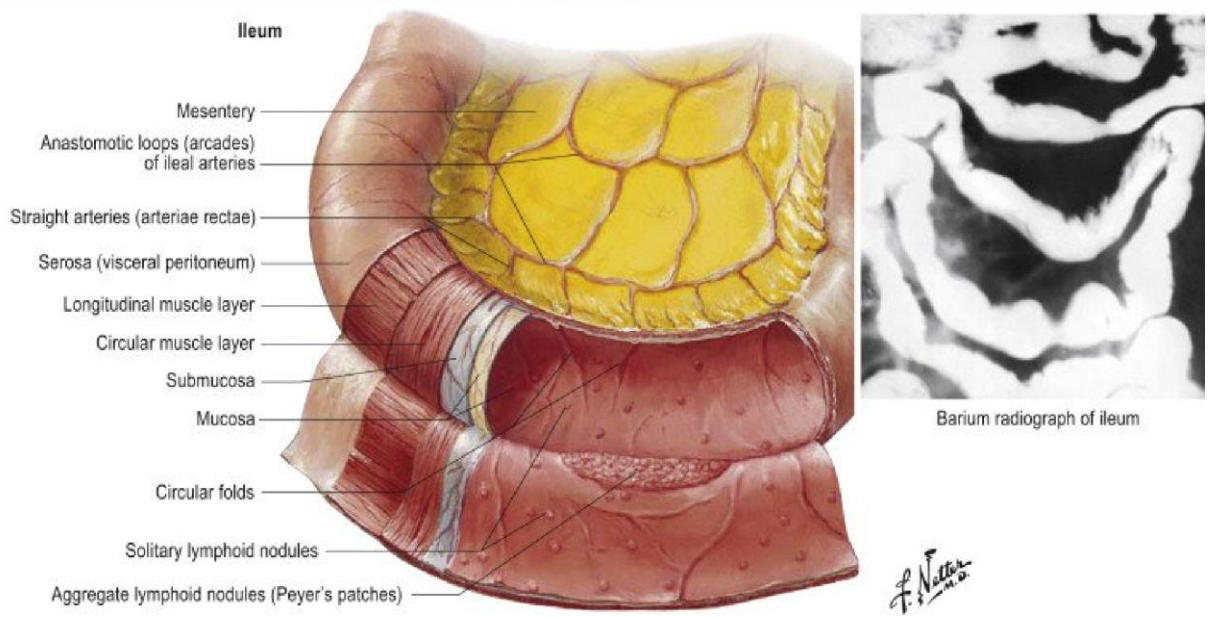

https://www.sciencedirect.com/topics/medicine-and-dentistry/circular-folds

- Last and longest segment

- Fewer mucosal folds and villi thanjejunum
- Almost smooth when it reaches largebowel

- Final nutrient absorption site

https://www.sciencedirect.com/topics/medicine-and-dentistry/circular-folds




Barium radiograph of ileum

- Terminal ileum joins to cecum atileocecal valve

Imaging the Small Bowel

- Small Bowel Follow Through

- Done following a UGI or independently•

  Uses both general X-ray and fluoroscopy

https://www.flickr.com/photos/40827567@N05/3835717633




On the Requisition

• Abdomen pain• Diarrhea/constipation • Weight loss •

Blood on the stool • Occult or visible • ? Malabsorption disorder • IBD • Crohn’s

## Patient Preparation & Contrast

- Same as UGI
- 8 hours NPO

- Diluted barium
- Thin barium diluted even further

- Why do we want it very thin?

# Contraindications to SBFT

- Pregnancy
- Allergy
- Perforation (known or suspected)
- Obstruction

## SBFT Exam

- Begins very similarly to UGI
- Double ID & patient history

- Symptoms

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- Prior surgery (Do they still have their appendix!)
- Family history of bowel disorders

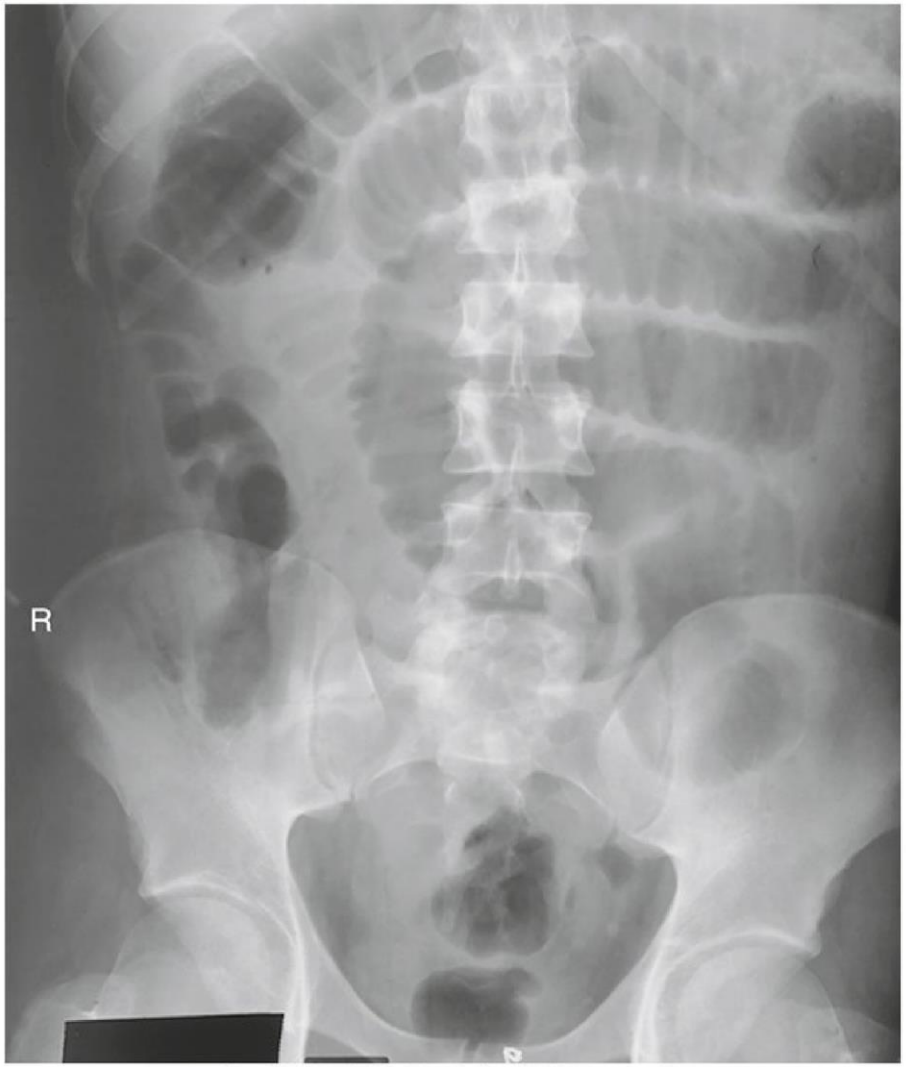
- Preliminary image
- Done before any administration of barium
- Supine abdomen from pubic symphysis up

- Looking for obvious contraindications
- Signs of obstruction
- Retained barium from prior exams
- May show to radiologist

# Preliminary Images



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# Barium Administration

- Give patient appropriate amount of barium

- Usually 2 large cups

- PA abdomen radiographs
- First one 5-30 minutes after barium
- First image must include all of the stomach (centered high)
- All other images centered at crests

- Site protocol determines timing of images
- May be a set routine
- May show radiologist each image

## SBFT Images

- Transit time very important

- 2-3 hours is average

- 4+ hours = food or drink to encourage peristalsis

- Time annotations on images!!

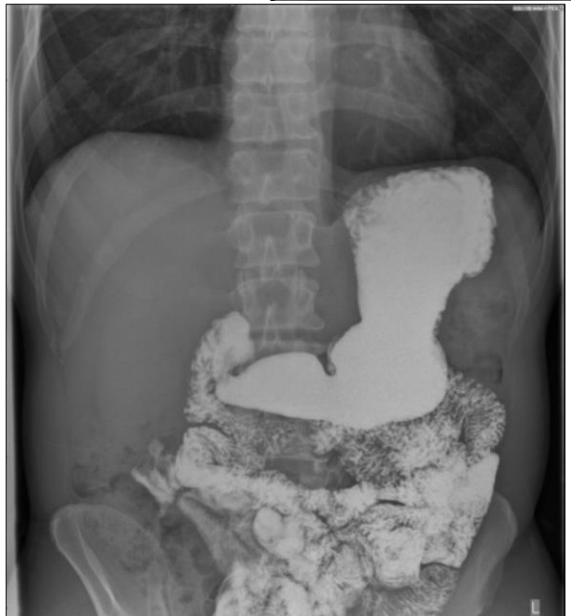
- How will you know when the barium has reached the terminal ileum andentered the large bowel?

- How well will this be tolerated by your patient?

# Terminallleum

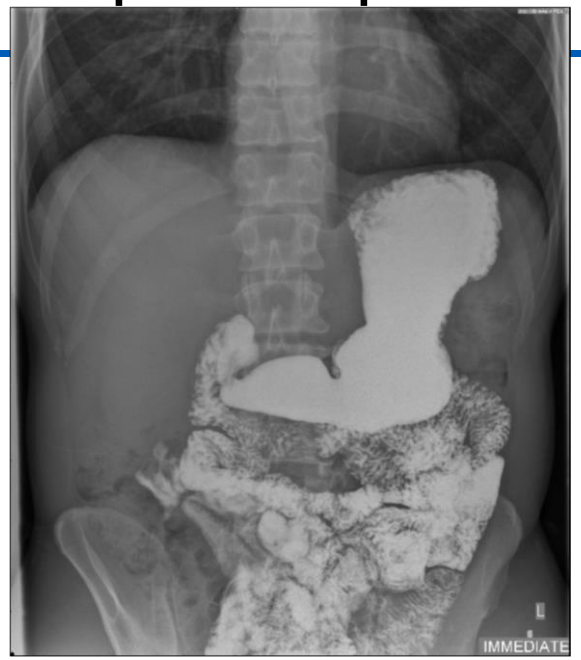






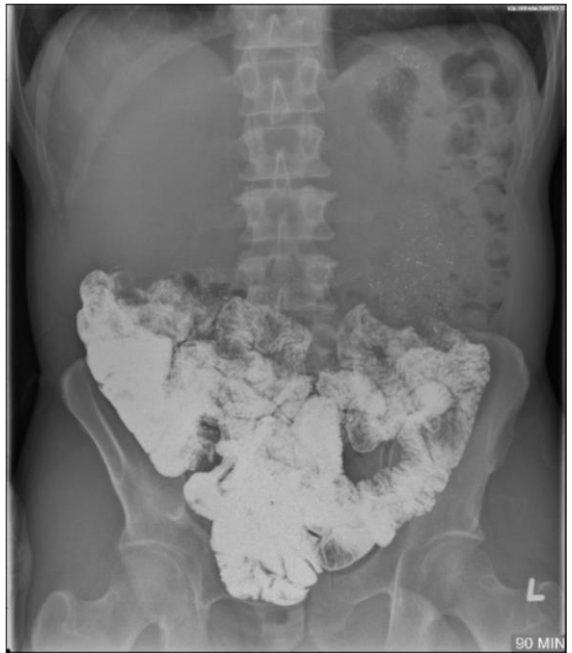


# The Proper Sequence













ImagescourtesyofCanadaDiagnosticCentres

# After the Terminal Ileum

- Bring patient into fluoro room and laysupine on bed


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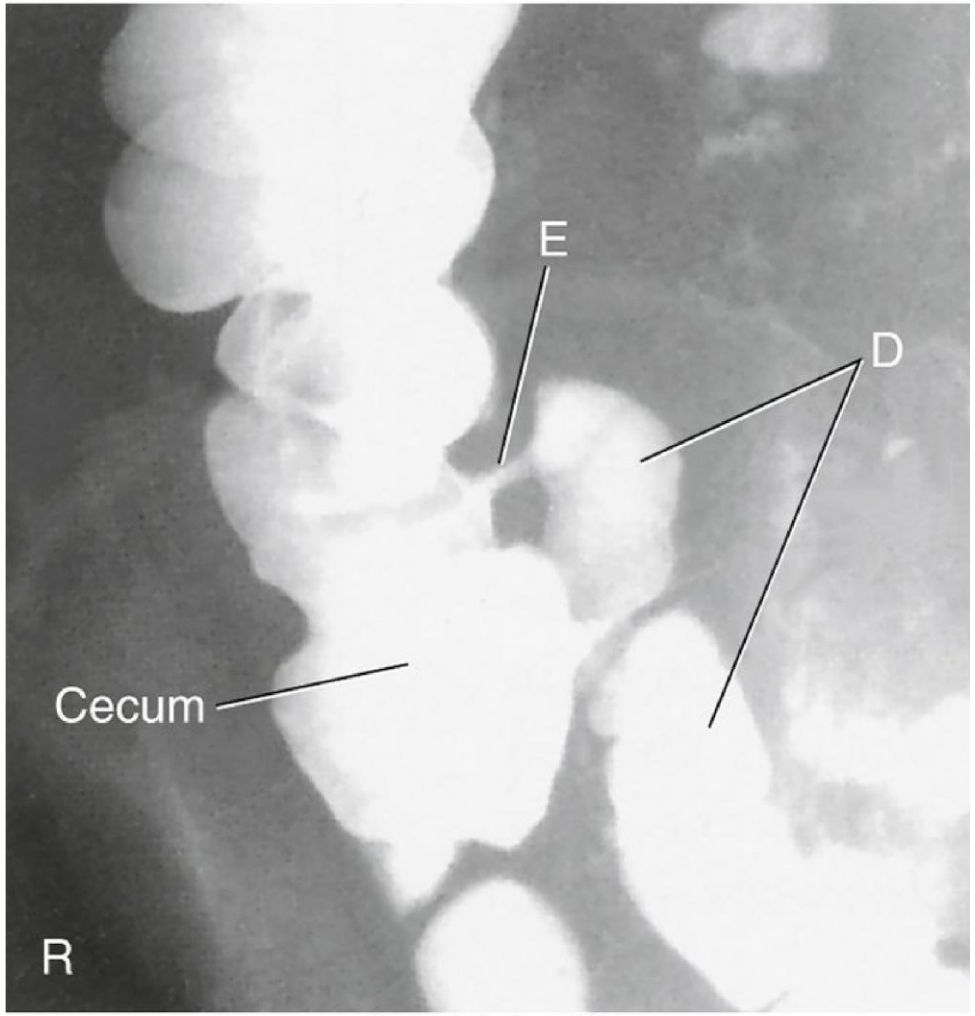
- Radiologist will take abdominal images
- Compression paddle or cone to move bowel loops
- Looking to isolate T.I.
- Appendix used as landmark



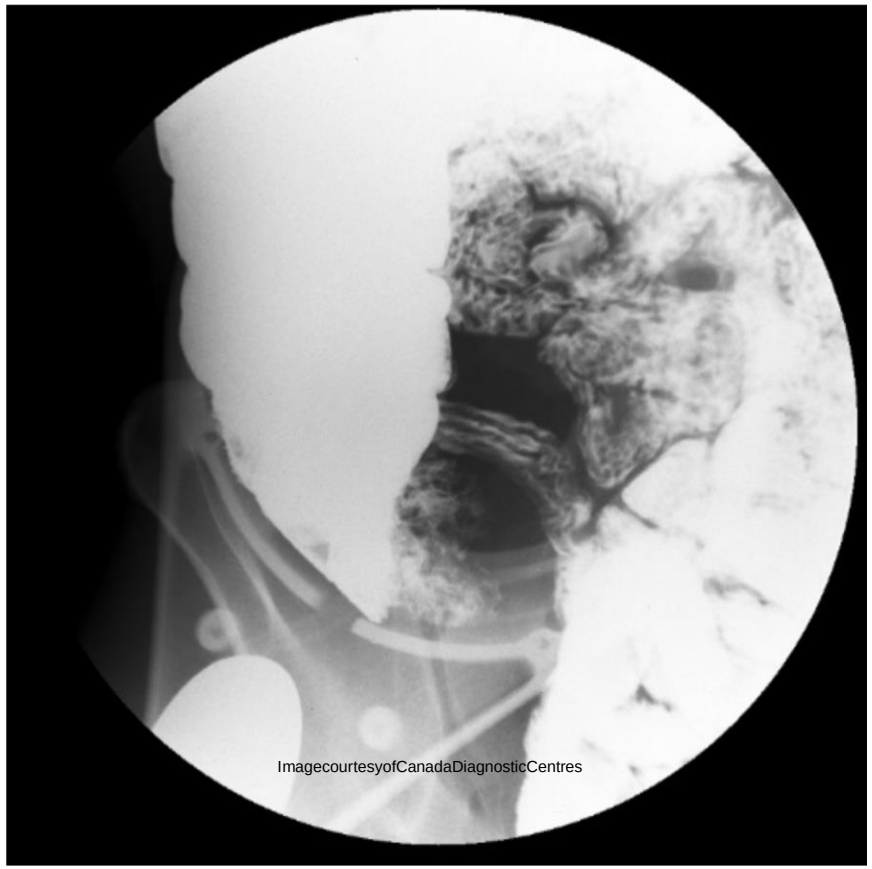
https://www.universalmedicalinc.com/pneumatic-radiology-compression-paddle.html

- Post care instructions

# Fluoro Spot Images



Courtesy J. Sanderson, RT.




# Pathology - Obstruction

- Functional

- Adynamic ileus
- Usually seen after surgery

- Mechanical
- Physical object obstructing bowellumen
- Fecal matter, scar tissue, foreignbody

- Dilated loops of bowel proximal toobstruction
- Ladder sign

## Malabsorption Disorders

- Crohn’s most common

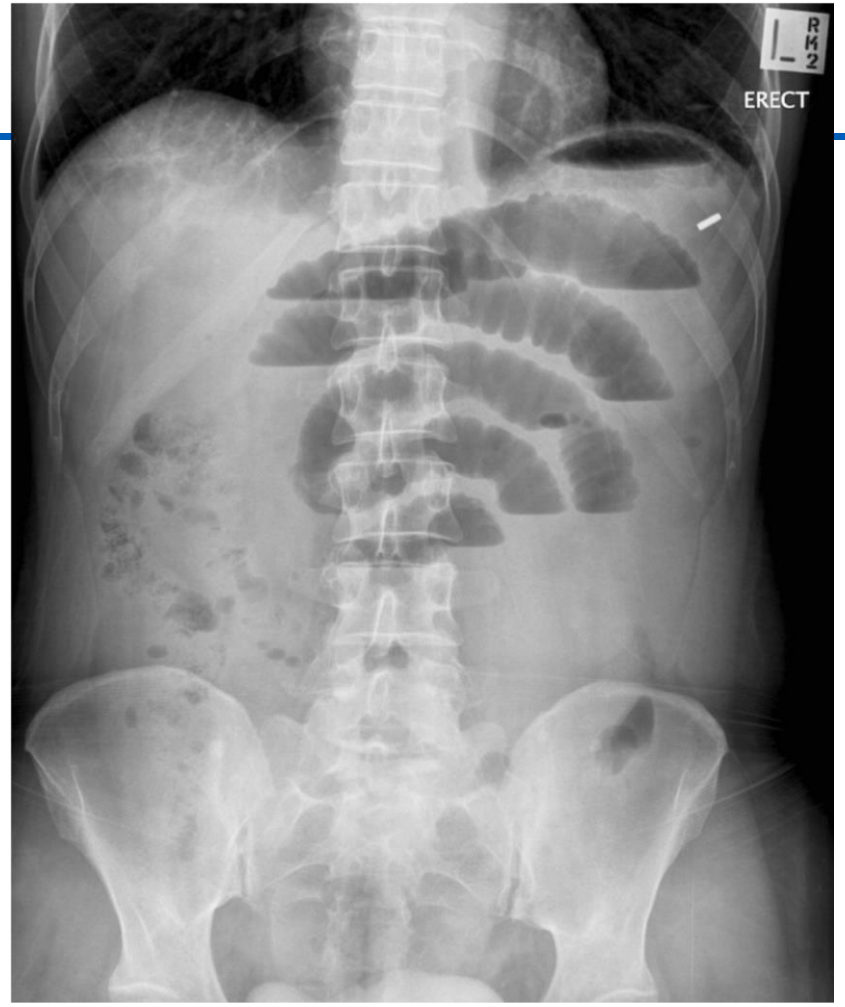



Image courtesy of Canada Diagnostic Centres

- Usually in T.I.

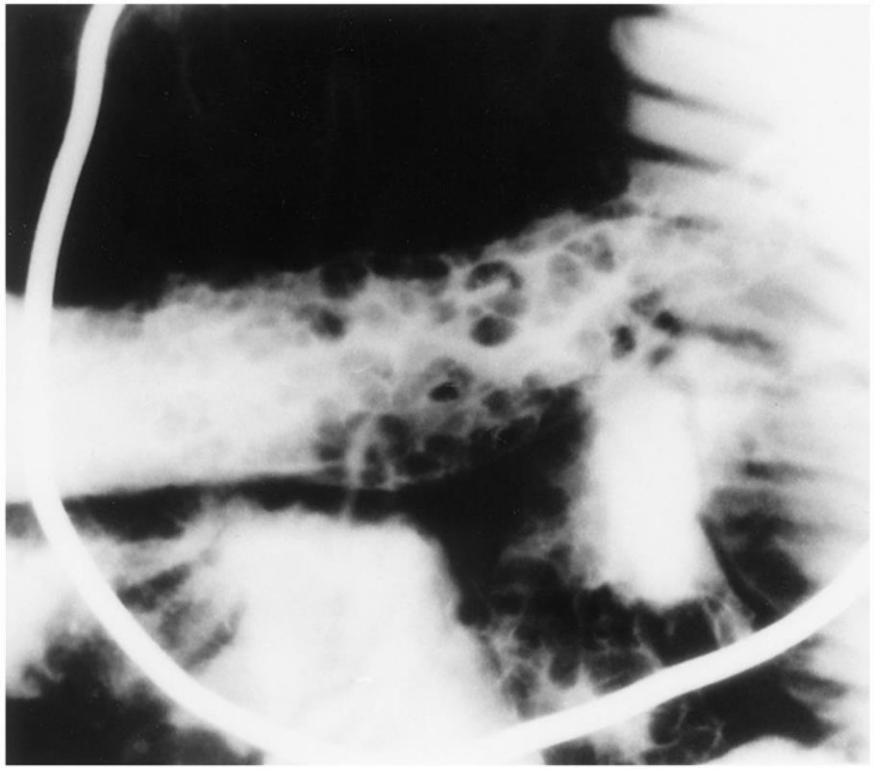
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- Can be anywhere along GI tract

- Cobblestone, skip lesion, and string signs

- Affects all 4 layers of bowel
- Can create fistulas between bowel loops when advanced

# Crohn’s Disease



From Eisenberg RL, Johnson NM: *Comprehensive radiographic pathology*, ed 5, St. Louis, 2012, Mosby.




Image courtesy of Canada Diagnostic Centres