Reading Hospital School of Health Sciences

Medical Imaging Program

2021

MI 263

Fluoroscopy Procedures Lower GI System & Invasive Studies

Rev. 8/2021 CNW

1

Anatomy

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Small Intestine

- Duodenum: "C loop" (8 – 10" long)
- Jejunum: Feathery appearance. Second section of the small bowel.
- Ileum: Last part of the small bowel.

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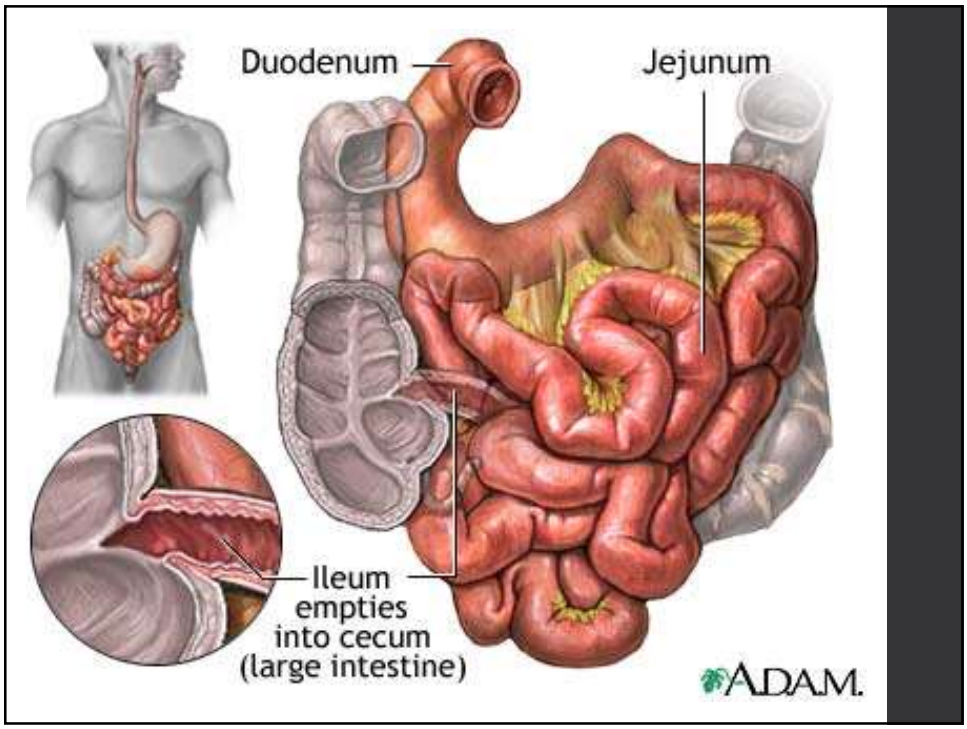

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Other terms to know…

- Villi – series of fingerlike projections in the SB mucosa
- Duodenojejunal flexure – where the end portion of the duodenum joins the jejunum
- Terminal Ileum – most distal portion of the ileum
- Ileocecal valve – projects into the lumen of the cecum and guards the opening between the ileum and the cecum

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More info on Small Bowel

- Follows barium from the stomach to entrance of large intestine (timed study)
  - Timing is important – can indicate disease.
- The first part of the Ba usually reaches the large intestine in 2 –3 hours.
- Nationally: images of the small bowel taken *approximately* every 30 minutes
  - Each image will be marked as a time:
    - First image: "Zero minute"
    - Second image: "30 Minute"…so on
- Study is complete when barium passes through ileocecal valve (cecum first part of large intestine)
- When the barium reaches the cecum, the Radiologist Assistant will spot fluoro over this area.
  - Focus will be at the terminal ileum entering into colon

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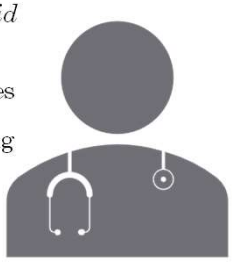
Small Bowel Prep

- NPO 8 hours prior
- RH NPO after midnight
- Do you think a scout image is necessary for a Small Bowel study?

7

What are a tech's responsibilities?

- Take Scout abdomen and show Radiologist Assistant/Radiologist
- Give barium to patient *(1 bottle (16oz) of Liquid EZ Paque)*
- Take the overheads, monitoring **time** of images
- Assist patient and Radiologist Assistant during fluoro part of the study



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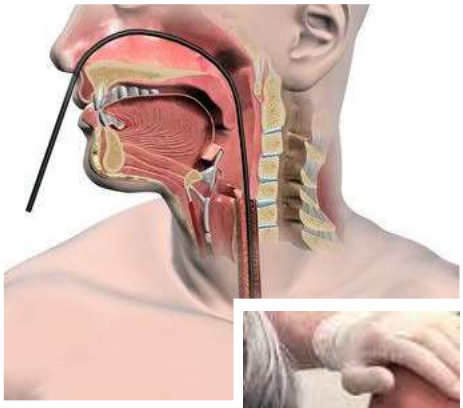

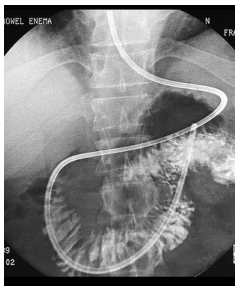

If a patient can not swallow the contrast or has pyloric difficulties, but Small Bowel needs to be evaluated…..

- **<u>Enteroclysis</u>**
  - Insertion of a tube through the nose or mouth into the patient's stomach and into the beginning of the small bowel.
  - Stops at end of duodenum (duodenojejunal flexure)

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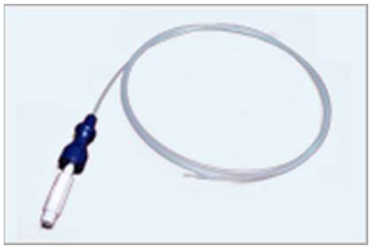
Bilbao or Sellink tube



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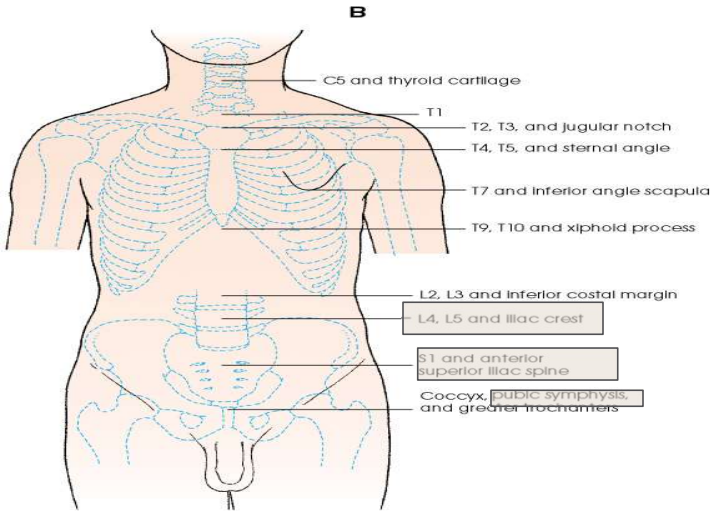
Landmarks used for Small Bowel and BEs



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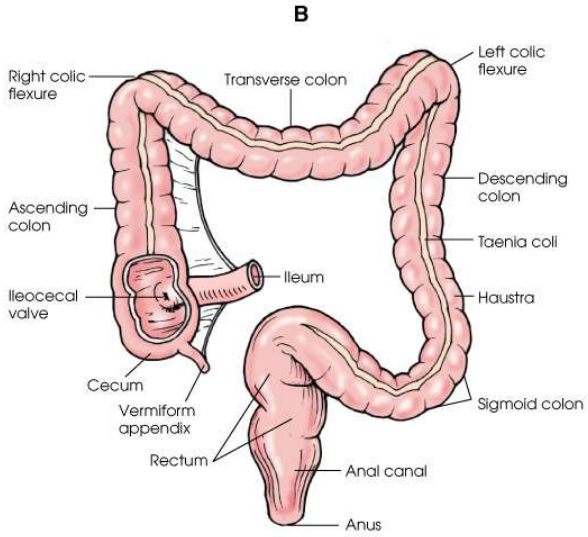
Large Intestine



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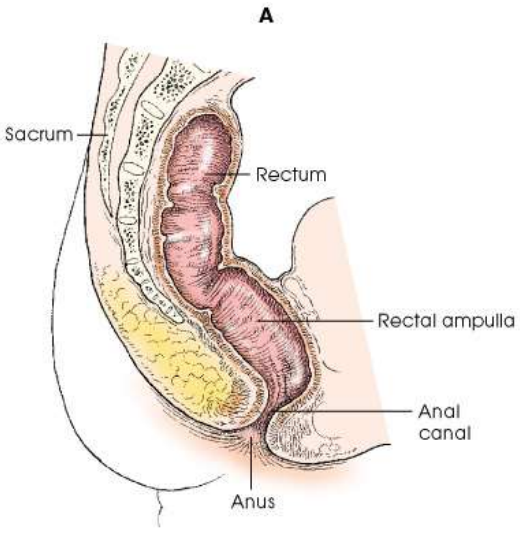

Anal Canal and Rectum

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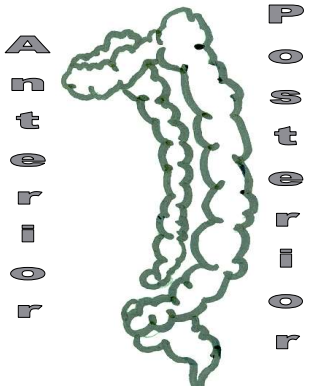
Lateral view of the Large Intestine



Transverse and most of Sigmoid colon is ANTERIOR

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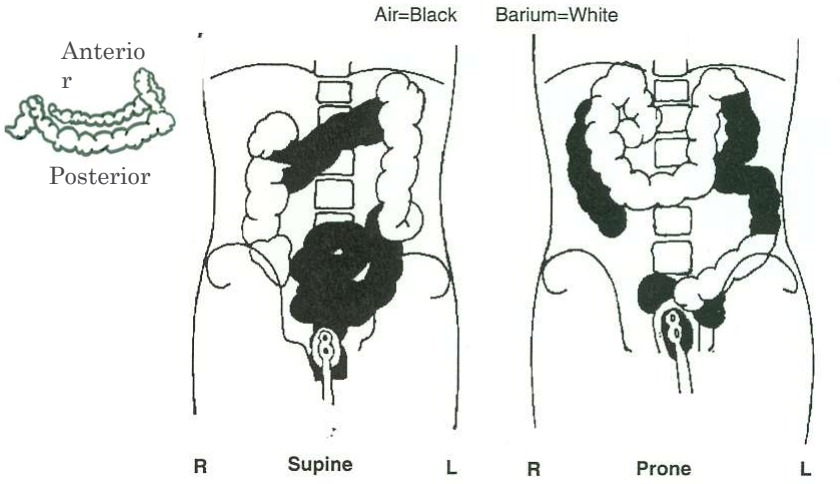
Barium vs. Air Positioning



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Patient Prep for Barium Enemas:

- **Clear Liquids Only day prior to and morning of examination**
  - **No solid food should be consumed**
  - **Clear liquids consist of:**
    - **Bouillon**
    - **Coffee**
    - **Fat-free broth**
    - **Fruit ices**
    - **Fruit juice (apple, grape, white cranberry, and grapefruit)**
    - **JELL-O**
    - **Tea**

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Miralax Prep

3:00PM: Take 2 Dulcolax tablets (5mg each) with one glass of water

5:00PM: Drink 8oz of prepared Gatorade/Miralax every 10-15 minutes until entire 64oz is consumed

8:00PM: Take 2 more Dulcolax tablets (5mg each) with one glass of water if you are still having bowel movements

Try to be us and active as much as possible while drinking solution

DO NOT BECOME DEHYDRATED

Day of exam:

- Clear liquids can be consumed
- Medication can be taken with liquids
  - Consult your physician regarding diabetic medication

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Magnesium Citrate Prep

Drink at least one full glass of water at 1, 3, 7, and 10PM on the day prior to the exam

8:00PM: Drink one bottle of citrate of magnesium (cold)

10:00PM: Take 4 Dulcolax tablets (5mg each) with one glass of water

Morning of Exam:

- Drink 1 ½ glasses of water
- Insert one Dulcolax suppository rectally 3 hours prior to the exam

Day of exam:

- Clear liquids can be consumed
- Medication can be taken with liquids
  - Consult your physician regarding diabetic medication

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Why are Scout images important for BEs????

- Radiologist Assistant - still looking to see if patient is cleaned out, and if there are any obvious abnormalities…
- Techs- Look at the gas pattern as well. How the intestines lay will determine whether or not you need to do the films portrait, landscape or both.

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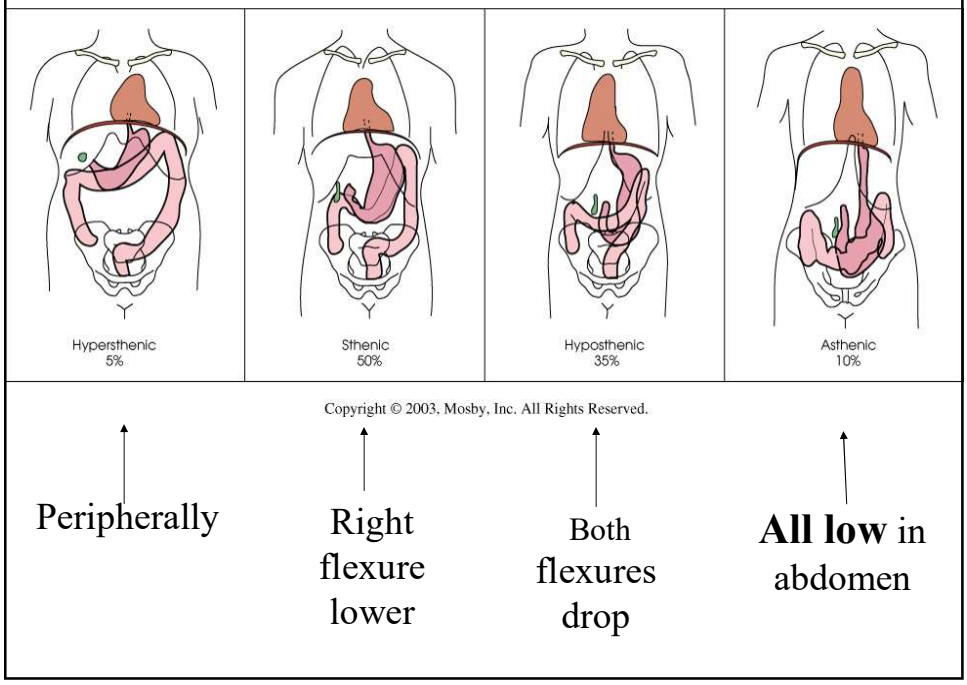

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So what will be your game plan be to get started….

01

Look at patient's body habitus.

02

Look at gas pattern on Scout KUB.

03

Remember: Air and Ba are going to make the intestine even larger.

21

Now the question is single vs. double contrast BE

Radiologist Assistant will make the decision

Rules to follow:

- Single
  - 400 cc Liquid Polibar Plus
  - 1600 cc water
- Double – done majority of the time
  - 750cc Liquid Polibar Plus
  - Bring Barium jug into the room in case more is needed

Tip: Never hang the bag more than 24"-30" above tabletop.

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So, you want to learn how to TIP!!!!!

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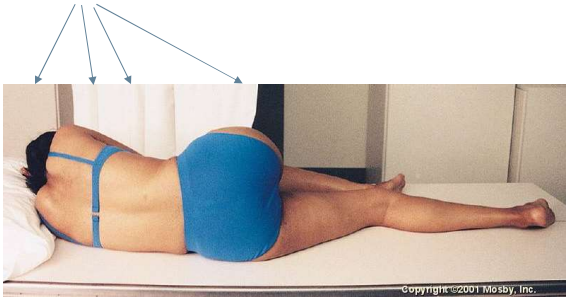
Prior to tipping….

- Explain to the patient what you're doing.
- Make sure barium is 'cleared' all the way to the enema tip.
- GLOVES! Lubricant!
- Have the Patient in Sims position



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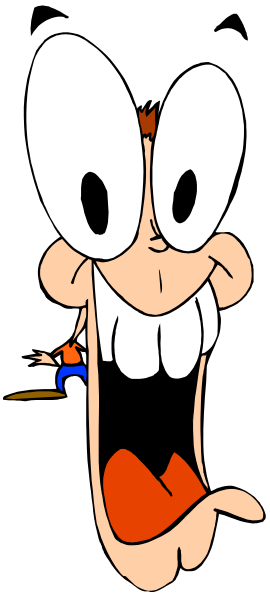

Inserting the tip…..

- **MUST** lift patient's upper buttock in order to visualize the rectal area.
- Tell them to take in a big breath and exhale. Tip in on exhalation.
- Slide tip from their back to front.
- Inserting anteriorly and superiorly. (follow the curve of the rectum)
  - Insertion: No more than 4 inches

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At Reading Hospital

- Do NOT blow-up balloon – Radiologist Assistant does this under fluoro guidance.
- You will clamp balloon tubing with hemostats and remove the square sponge.

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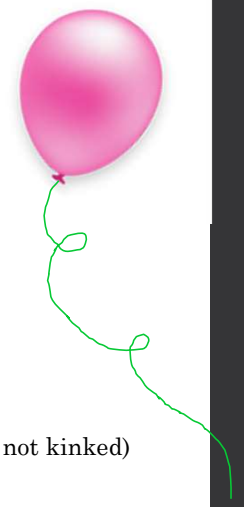
Removing the tip….



- Gloves
- Head cover/Gauze
- Trash can

- Have all supplies ready
- Unclamp the hemostat
- Allow air to release from balloon (make sure line is not kinked)
- Slowly remove – if resistance STOP!!!!

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Invasive Procedures

Arthrogram

Hysterosalpingograms

Myelograms

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Arthrogram

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Arthrogram

- An **arthrogram** is a test using X-ray and a contrast material (such as a dye, water, air, or a combination of these) to take pictures of a joint. – WebMD
- To evaluate the glenoid fossa with contrast in order to rule out labral and rotator cuff tears. – RH Fluoro Bible
- Pneumoarthrography: Using gas as a contrast.
- Opaque arthrography: Uses water-soluble iodinated contrast.
- Double contrast arthrography: Using both.

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- Shoulder most common.
- Radiologist injects contrast into joint space and manipulates part to ensure even distribution.
- Done under fluoro guidance.
- Spot images taken.
- Shows tears or disruptions in joint space.

Other Joints which can be imaged:

- Elbow
- Wrist
- Hips
- Knees

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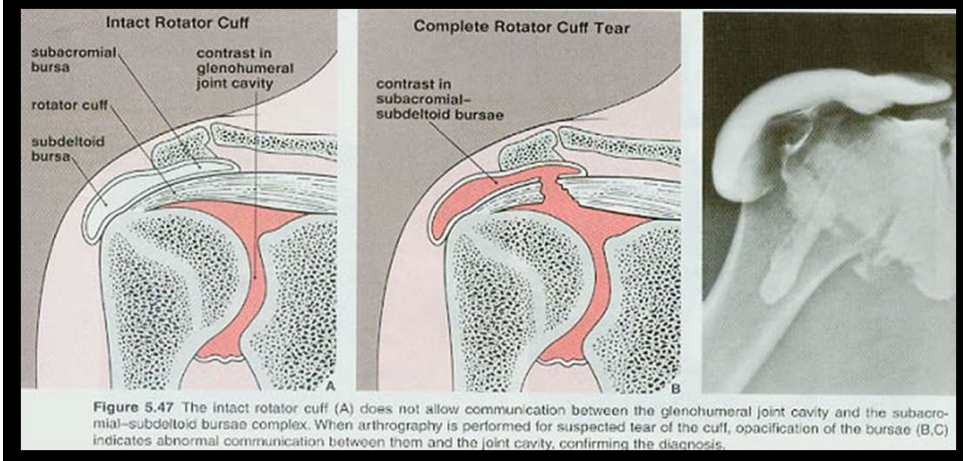

Figure 5.47 The intact rotator cuff (A) does not allow communication between the glenohumeral joint cavity and the subacromial–subdeltoid bursae complex. When arthrography is performed for suspected tear of the cuff, opacification of the bursae (B,C) indicates abnormal communication between them and the joint cavity, confirming the diagnosis.

Average kVP = 90-120

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At Reading Hospital what is the documents that needs to be done?

Consent form

Medication form

Computer documents:

- Universal protocol (timeout)
- EPIC documents

MAR

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PATIENT: _____ DATE OF BIRTH: _____

PHYSICIAN: _____

PROCEDURE: _____

RISKS INCLUDING BUT NOT LIMITED TO: _____

My Signature Indicates That:

- I authorize the physician and healthcare team to perform this procedure and any procedure indicated as a result of unforeseen conditions revealed during the procedure.
- I understand the nature and purpose of the procedure, the potential benefits and the risks involved of the proposed procedure, and the possibility of complications, and the possible alternative treatments.
- I understand the reasonable alternative(s) to the procedure, including the risks, benefits, and side effects related to the alternatives and the risks related to not receiving the proposed procedure.
- I understand that my physician may direct or provide sedation or local anesthesia as deemed appropriate, and I understand the risks and benefits.
- If my procedure requires administration of general, regional, or monitored anesthesia care (MAC) anesthesia, I understand an Anesthesiologist will review and obtain consent for its administration.
- I understand that qualified medical practitioners other than the physician listed above may perform important tasks or parts of the procedure based on ability and under supervision as may be necessary.
- I acknowledge that no guarantees or assurances as to the results of the procedure have been made.
- I understand that a pathologist may examine all tissues and devices removed during the procedure. I consent to their possible use to advance medical education or research, and agree to allow the Hospital to dispose of these tissues and devices in accordance with all laws and regulations.
- I understand that during my procedure photographing, videotaping, audio recording, and/or televising ("Recordings") may occur for care/treatment purposes and will become part of my medical record.
- I understand that Recordings may be taken for education, training, educational/research publication, or quality assurance purposes. These recordings will be de-identified prior to external use and will not become part of my medical record.
- I understand that observers may be present during the procedure for medical education or other healthcare purposes.
- I understand that if my care involves a medical device required to be tracked under the Safe Medical Devices Act that certain items of my Protected Health Information will be shared with the manufacturer for the purpose of tracking. This will help the manufacturer notify me in the future of any potential serious health risks associated with the device(s).

Additional Discussion (if applicable): _____

CONSENT FOR PROCEDURE

RH3541 Revised 7.17 (1 of 2)

Informed Consent

Procedure must be discussed with patient, with performing doctor

- Contents of **Consent for Procedure** sheet:
  - Patient name/DOB
  - Performing Physician
  - Name of procedure
  - Risks, benefits, alternate treatments

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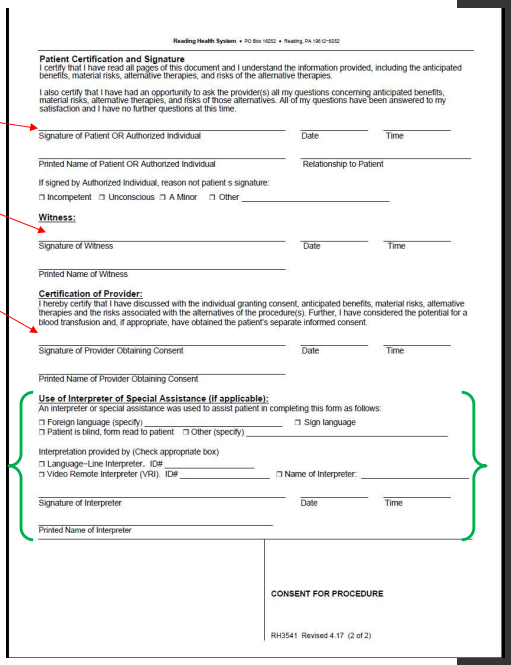
- Signatures of:
  - ***Patient***
  - ***Witness***
  - ***Doctor***

If an interpreter was used for the procedure, you must complete this area.



Reading Health System • PO Box 16052 • Reading, PA 19612-6052

Patient Certification and Signature
I certify that I have read all pages of this document and I understand the information provided, including the anticipated benefits, material risks, alternative therapies, and risks of the alternative therapies.

I also certify that I have had an opportunity to ask the provider(s) all my questions concerning anticipated benefits, material risks, alternative therapies, and risks of those alternatives. All of my questions have been answered to my satisfaction and I have no further questions at this time.

Signature of Patient OR Authorized Individual | Date | Time

Printed Name of Patient OR Authorized Individual | Relationship to Patient

If signed by Authorized Individual, reason not patient s signature:
❒ Incompetent ❒ Unconscious ❒ A Minor ❒ Other

Witness:

Signature of Witness | Date | Time

Printed Name of Witness

Certification of Provider:
I hereby certify that I have discussed with the individual granting consent, anticipated benefits, material risks, alternative therapies and the risks associated with the alternatives of the procedure(s). Further, I have considered the potential for a blood transfusion and, if appropriate, have obtained the patient's separate informed consent.

Signature of Provider Obtaining Consent | Date | Time

Printed Name of Provider Obtaining Consent

Use of Interpreter of Special Assistance (if applicable):
An interpreter or special assistance was used to assist patient in completing this form as follows:
❒ Foreign language (specify) ❒ Sign language
❒ Patient is blind, form read to patient ❒ Other (specify)

Interpretation provided by (Check appropriate box)
❒ Language-Line Interpreter. ID#
❒ Video Remote Interpreter (VRI). ID# ❒ Name of Interpreter:

Signature of Interpreter | Date | Time

Printed Name of Interpreter

CONSENT FOR PROCEDURE

RH3541 Revised 4.17 (2 of 2)

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Reading Hospital · PO Box 16052 · Reading, PA 19612

Radiology Medication List

Patient Name:

MRN: DOB:

☐ Patient is currently not using any medication.

	Medication Name Please include prescription, over the counter, and herbal medications.
1	
2	
3	
4	
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This form must be document scanned into the Electronic Medical Record.

RH 4813 7.14

Medication List Form

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Universal Protocol

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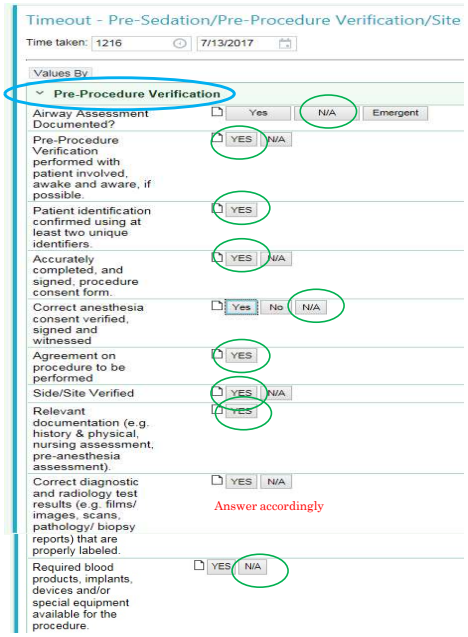
Pre-Procedure Verification



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Site Marking

For Arthrograms, select 'Exempt from site marking'

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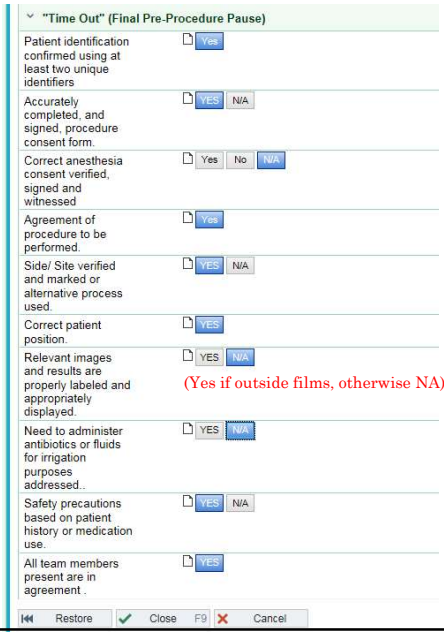
Time Out

Must be initiated <u>before</u> the doctor starts the procedure (insertion of needle)



(Yes if outside films, otherwise NA)

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How to perform the Time Out

This is only a suggestion, find what works for you.

- Can you tell me your name and date of birth?
- We have Dr. _____ to perform a Right Shoulder Arthrogram prior to MRI. We have signed orders and consent.
- There is no need for anesthesia consent.
- The patient is supine and the Right shoulder is prepped and exposed.
- There are no relevant images.
- There is no need to administer antibiotics.
- The patient has no allergies or no blood thinning medication.
- All team members present are in agreement

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Now that you know all the documentation components. What is the workflow of the procedure?

Prior to getting the patient

- If MRI arthro, you must obtain the Gadavist from MRI around 11:30
  - Make sure there is a label on it and put it in the tupperware container located in Rm 7
- Have supplies out and the sterile tray ready for when RA and Rad are present
  - Make sure supplies are within expiration date
- Have a sheet on the table, sandbag located for immobilization, lead shield in place
- Obtain and prepare all documents as necessary

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Here's is what you will need for the room to be ready….

Equipment needed in Contrast Box

- (2) 16g needles
- 20cc syringe
- Label for contrast mixture
- Contrast mediums
- Bacteriostatic sodium chloride

Additional Supplies

- Dakin
- Radiopaque marker (washer or wand) and felt pen
- Band-aid
- Double female luer lock (if MRI or CT arthrogram)
- Lidocaine 1%
- Sandbag

Equipment needed for Sterile Field

- Universal tray
  - Needles
  - Chloraprep
  - Sterile 4x4 gauze
  - Sterile drape
- 22g 3.5" spinal needle(physician preference for size)
- 20cc syringe
- Sterile Label Kit
  - Pre-made labels
  - Sterile marking pen
- Tubing w/stopcock (green clamp)
- Sterile gloves

*Radiologist Assistant will prepare contrast for the study at the beginning of the procedure with the Radiologist present.

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Room/Equipment Prep

If room 5:

- Marker on grid
- Remember, shield on top of patient
- Orient using fluoro controls
- Mobile shield

If room 7:

- Plexiglass insert for marker
- "low kVp" selected
- Remember, shield on top of patient
- Orient using fluoro controls
- Portrait bucky for fluoro
- Floating shield

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The patient arrives and you take them to a conference room (old rm 6)/small bowel waiting room…

Obtain history followed by Consent

- Patient 2 identifiers
- History/current complaints
- Allergies to: medications (including lidocaine), food, xray dye
- Is the patient taking any blood thinners?
  - If yes, need to inform the Radiologist

- After history is taken, page the Radiologist to come to the conference room or SB waiting room to obtain consent
  - Signing consent- must have an RT and Radiologist present
  - Consent form and entire top half of the Universal Protocol must be completed *prior* to bringing the patient into the x-ray room.

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Once the patient is in the X-ray room…

- Remove affected arm from sleeve of gown
- Shield if within reproductive age
- Assist Radiologist Assistant in drawing up contrast and lidocaine 1%
  - Technologist verbally reads the medicine labels and expiration dates and the Radiologist Assistant should be visually seeing this occur – document in the IAD
- Fluoro for Radiologist if Radiologist Assistant unavailable
  - may need to collimate, magnify and move the arm into different positions as requested
- Time Out performed – document as you are performing it in EPIC
  - A RT must be signed in on the computer
  - This is performed before the Radiologist inserts the needle (after cleaning the shoulder)
- "Spot Shot/Can Image" (Fluoro Store) the image of the needle successfully inserted
- Must digitally record Neutral, Internal, and External shoulder views at the end
  - You must annotate which view is which prior to sending to PACS

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Post Procedure Images

- Neutral
  - Arm by side, thumb up
  - Annotate neutral
- External
  - Palm facing forward
  - Tina – raises arm up
  - Annotate external

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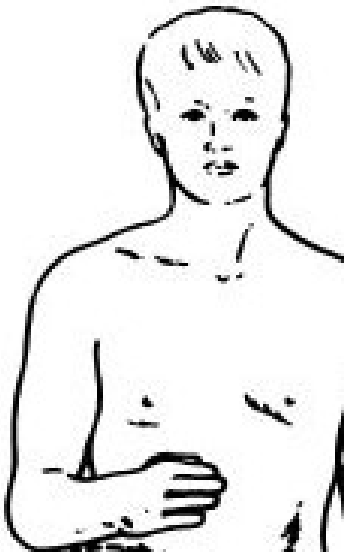
Post Procedure Images

- Internal
  - Tina – arm across belly
  - Annotate internal



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Patient Positioning During Procedure

Shoulder - Patient supine, arm down by side and immobilized by sandbag at wrist.

Wrist - Patient supine with arm down. Or – patient prone with arm flexed above head. Radiologist makes two injections. Routine views as directed.

Knee - Patient supine, affected knee *away* from Radiologist (Rad. injects knee medially). AP and Lateral views as directed.

Elbow - Patient supine with arm down. Or – patient prone with elbow flexed at 90° above head. Routine views as directed.

Hip - Patient supine. Routine views as directed.

Ankle - Patient supine. Routine views as directed.

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The study is completed for the patient

- Note how much contrast and lidocaine 1% was used (ask the Radiologist)
- Note the amount of time used with fluoro and air kerma
- Walk patient to dressing booth, MRI, or CT
- Make sure your shoulder images are annotated
- Complete the EPIC documentation and all paperwork
- Rad Reserve the procedure to the Radiologist
- Scan appropriate paperwork and file paperwork
- Clean up room

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What happens to all this documentation at the completion of the exam????

- Consent form – scan and then file it in the blue folder on shelf next to the facilitator's computer
- Medication list – scan in
- Universal protocol – completed prior to needle insertion in EPIC
- MAR – completed in EPIC

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HSG

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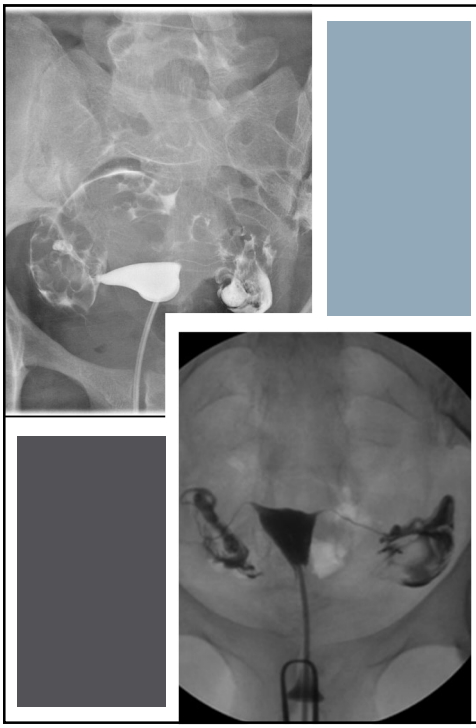

Hysterosalpingograms

- Introduction of a radiopaque, water-soluble contrast through a uterine cannula
- What is the purpose?
  - Determines size, shape and position of uterus and uterine tubes
  - Delineates lesions such as polyps, sub mucous tumor masses, or fistula tracts
  - Investigates the patency of the uterine tubes in patients who have been unable to conceive
  - To identify surgery to prevent conception has been successful

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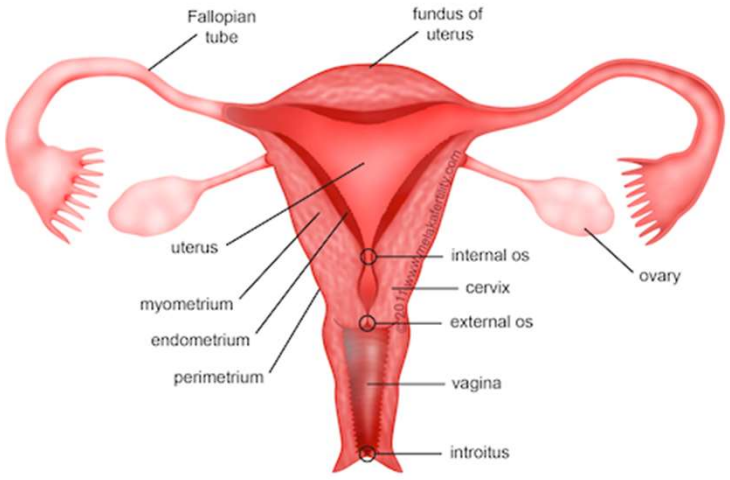
Anatomy



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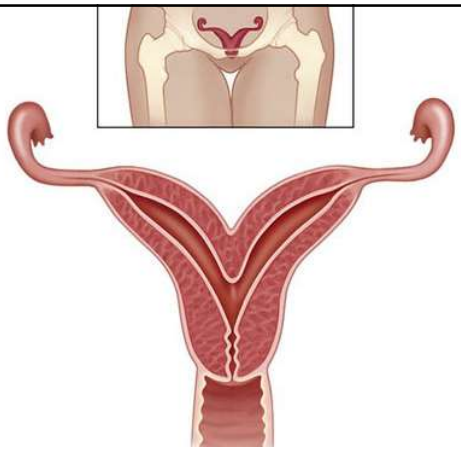

Bicornuate Uterus

- Paired uterine horns extend to the uterine tubes

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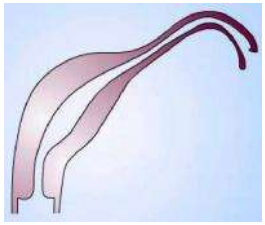
Unicornuate Uterus

- Uterine cavity is elongated and has a single uterine tube emerging from it



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Uterus didelphys

- Complete duplication of the uterus, cervix, and vagina

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Pre-care of Patient

Exam should be scheduled approximately 10 days after onset of menstruation

Patient should empty her bladder

- Prevents displacement of the bladder on the pelvic genitalia

Antibiotics are issued for the patient to prevent infection

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Exam at Reading Hospital

- Performed by OBGYN
- Pt is supine, knees flexed over stirrups
- Physician inserts uterine cannula through cervical canal
- Fits rubber plug firmly against external cervical os
- Injection of contrast into the uterine cavity
- Spot films are taken of the contrast filling the uterus and tubes

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Supplies needed at RH:

- **Omnipaque 240**
- HSG tray (located in PET CT area)
- Betadine solution
  - If patient has an iodine allergy use Hibiclens 4.0% w/v
- Sterile plastic bowls
- 2 packs – sterile ob/gyn applicators
- Gooseneck light
- Cover for light
- Sanitary napkin
- Sterile gloves for physician
- Disposable Redi-HSG catheter
- Cervical Dilator
- Sterile label kit
- Wash cloth and towel

Paperwork:
RA Form

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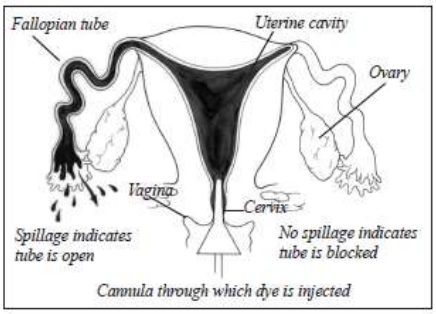
After the study what is done….

- Have patient lay for 5 minutes prior to assisting to the bathroom
- Dispose of all appropriate supplies or place in central supply container
- Complete all documentation and file all paperwork appropriately



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Myelogram

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Myelogram

Radiographic study of the spinal cord and its nerve root branches utilizing a contrast medium

Indications:

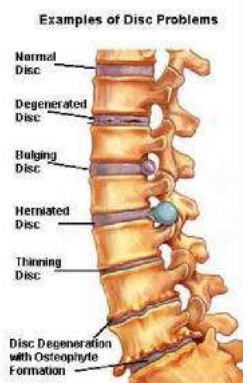
HNP

Tumor

Spinal Stenosis

Cyst

Trauma (bony fragments)



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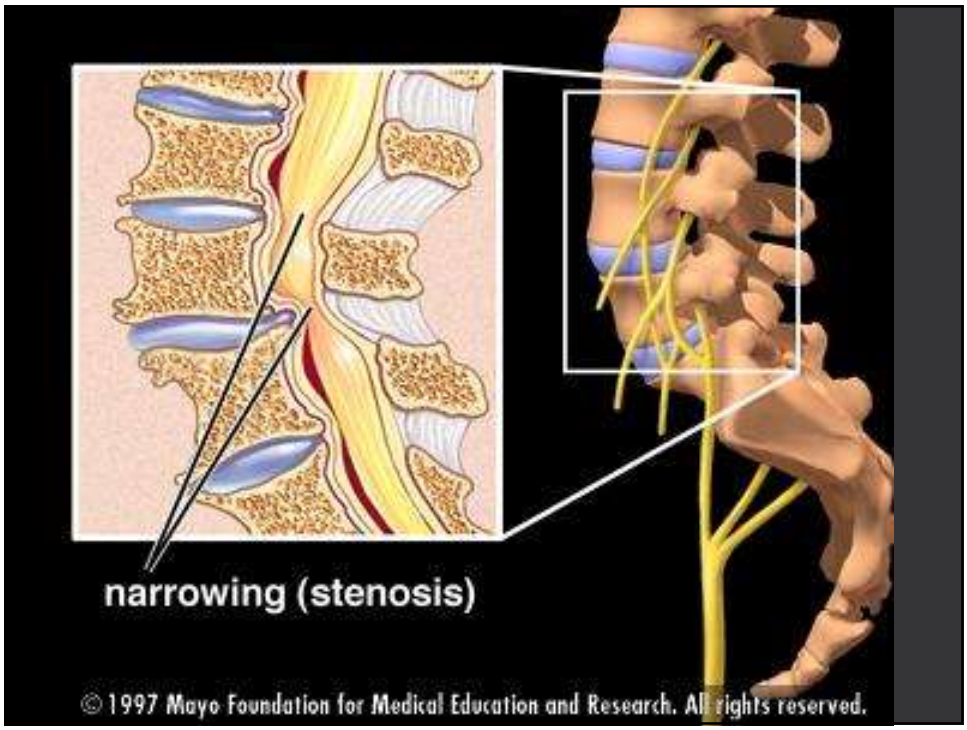

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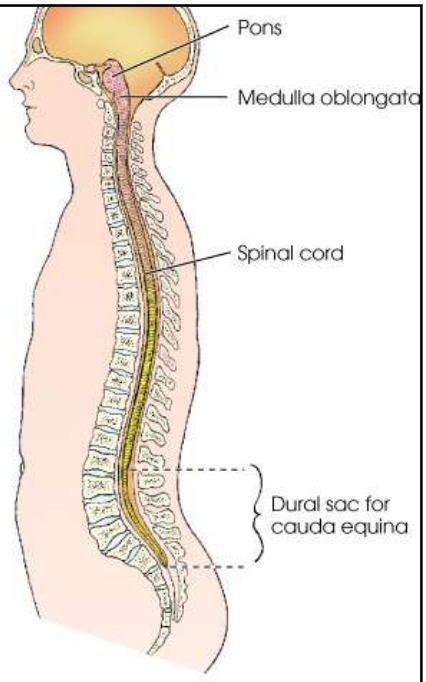
Spinal Cord

- Slender elongated structure consisting of an inner and outer section.
- Extends from medulla oblongata (level of foramen magnum) to approximately L1-L2 disk space



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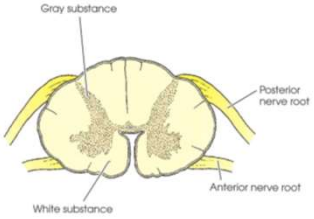
Spinal Nerves

- 31 pairs of spinal nerves
- Thoracic/Lumbar– nerves exit below the corresponding vertebrae
- Cervical – nerves exit above the corresponding vertebrae

(8 cervical spinal nerves)



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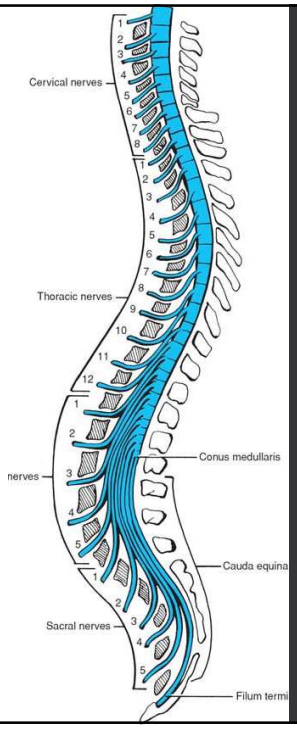
Spinal Cord

- Conus medullaris
  - Pointed lower extremity of spinal cord
  - L1-L2
- Cauda Equina
  - Spinal nerves below termination of cord (L2)
  - Extend inferiorly through vertebral canal



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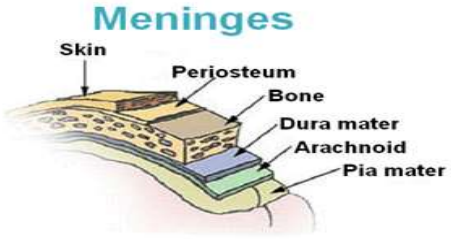
Meninges

Protective membrane that enclose the brain and spinal cord

- ***Pia mater*** (soft mother) – closest to brain/spinal cord
- ***Arachnoid*** (central layer)
  - Contains subarachnoid space, through which CSF flows
  - Myelogram injections go into subarachnoid space
- ***Dura mater*** (hard mother – outermost layer)
  - Strong, fibrous



Dura mater -- outer layer lining skull
Arachnoid (mater) -- contains blood vessels
Subarachnoid space -- filled with CSF
Pia mater -- covers brain

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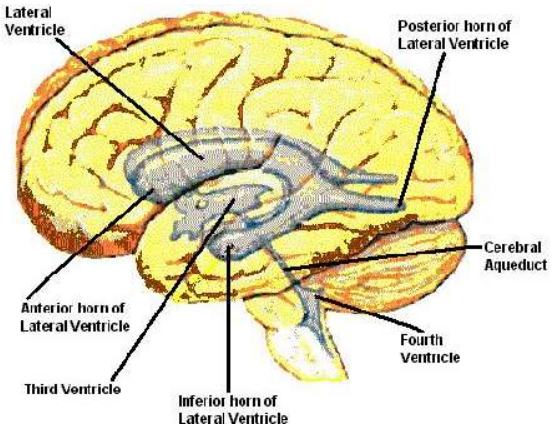

Cerebral Spinal Fluid (CSF)

Manufactured in the ventricles
- Clear, colorless
- Surrounds and cushions the brain and spinal cord

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Room Preparation

Supplies

Spinal tap tray (check expiration date and integrity)
Biohazard bag (if collecting CSF)
Lab vials (if collecting CSF)
Connecting tubing
18g needle
25 1 ½" needle
Sterile gloves
10cc syringe
20cc syringe
Chloraprep
Band-aid
Alcohol wipes
22g 3.5 spinal need (or MD preference)
Image Receptor
Grid/Grid holder
Pillow (placed under patient's belly if MD requests)
Lead apron for physician
Sterile medication labels
Stent guide ruler

Stent guide ruler

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Omnipaque 300
- Cervical
- Complete

Omnipaque 240
- Lumbar
- Thoracic

Even more supplies…

Injectables

- Lidocaine 1%
- Intrathecal Contrast (Omnipaque)

And more supplies…

- Shoulder braces
- Foot board
- Right bubble marker or small "R" placed in the appropriate area for fluoro room
- Head pillow

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Prior to the patient going to the room…

- Verify orders, allergies and medication on EPIC
- Complete Screening Form in EPIC
- Just like an arthrogram, you must ask history and patient identification
- You must also ask:
  - Allergies
    - Should be pre-medicated if allergies to iodine or iv contrast
  - Blood thinners (refer to policy)
  - Metformin - should be held 48 hours after the exam
- Consent form completed

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The Exam

- ***Patient Position***:
  - Prone, head extended, chin on pillow
    - Place pillow under abdomen to elevate the spine upon physician's request
- ***Assist the doctor in…***
  - Opening sterile tray and dropping needed supplies on sterile tray
  - Drawing up Lidocaine 1% and Contrast
    - Show label to doctor before lidocaine/contrast is drawn up
      - State:
        - Name and strength of medication
        - Expiration date
- Perform Timeout!

All persons involved in the procedure must wear a mask and hair bouffant

The RA may be present during this time and may assist with the sterile tray

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Exam continued…

- Skin prep with Chloraprep
- Lidocaine 1% may be injected as local anesthesia
- Spinal needle placed with Fluoro guidance (Subarachnoid space)
- Possible CSF collection

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How does the CSF collection work?

- Performed prior to contrast injection
- Doctor will collect and RT will label
  - If only an LP is done, RA may do collection
- **Use gloves** when handling CSF samples!
- Usually three vials of CSF are collected
- Label each vial with sample number, amount of fluid, time collected and UO (HS) number
- Cap vials
- Secure biohazard bag with a twisty
- Staple CSF form to bag for delivery to lab

All persons involved in the procedure must wear a mask and hair bouffant

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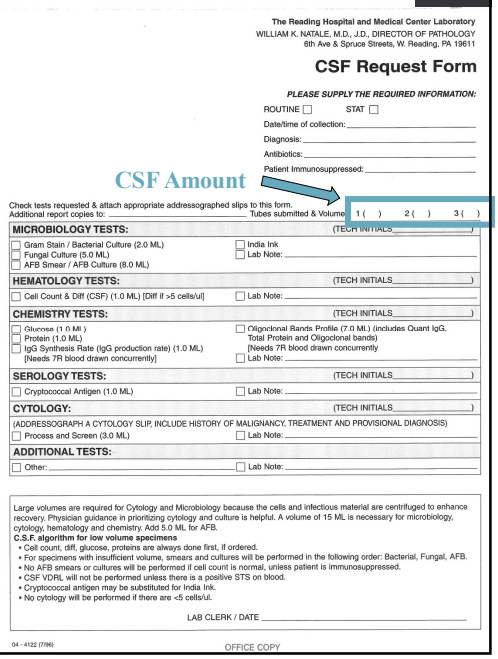
Paperwork Completion

CSF Request Form

- List amount of each sample and time taken
- Staple to biohazard bag with samples
- Must be taken to the lab on C3

This form can also be printed from EPIC



The Reading Hospital and Medical Center Laboratory
WILLIAM K. NATALE, M.D., J.D., DIRECTOR OF PATHOLOGY
6th Ave & Spruce Streets, W. Reading, PA 19611

CSF Request Form

PLEASE SUPPLY THE REQUIRED INFORMATION:

ROUTINE ☐ STAT ☐
Date/time of collection: _____
Diagnosis: _____
Antibiotics: _____
Patient Immunosuppressed: _____

CSF Amount

Check tests requested & attach appropriate addressographed slips to this form.
Additional report copies to: _____ Tubes submitted & Volume: 1 ( ) 2 ( ) 3 ( )

MICROBIOLOGY TESTS: (TECH INITIALS_____)
☐ Gram Stain / Bacterial Culture (2.0 ML)
☐ Fungal Culture (5.0 ML)
☐ AFB Smear / AFB Culture (8.0 ML)
☐ India Ink
☐ Lab Note: _____

HEMATOLOGY TESTS: (TECH INITIALS_____)
☐ Cell Count & Diff (CSF) (1.0 ML) [Diff if >5 cells/ul]
☐ Lab Note: _____

CHEMISTRY TESTS: (TECH INITIALS_____)
☐ Glucose (1.0 Ml)
☐ Protein (1.0 ML)
☐ IgG Synthesis Rate (IgG production rate) (1.0 ML) [Needs 7R blood drawn concurrently]
☐ Oligoclonal Bands Profile (7.0 ML) (includes Quant IgG, Total Protein and Oligoclonal bands) [Needs 7R blood drawn concurrently]
☐ Lab Note: _____

SEROLOGY TESTS: (TECH INITIALS_____)
☐ Cryptococcal Antigen (1.0 ML)
☐ Lab Note: _____

CYTOLOGY: (TECH INITIALS_____)
(ADDRESSOGRAPH A CYTOLOGY SLIP, INCLUDE HISTORY OF MALIGNANCY, TREATMENT AND PROVISIONAL DIAGNOSIS)
☐ Process and Screen (3.0 ML)
☐ Lab Note: _____

ADDITIONAL TESTS:
☐ Other: _____
☐ Lab Note: _____

Large volumes are required for Cytology and Microbiology because the cells and infectious material are centrifuged to enhance recovery. Physician guidance in prioritizing cytology and culture is helpful. A volume of 15 ML is necessary for microbiology, cytology, hematology and chemistry. Add 5.0 ML for AFB.

C.S.F. algorithm for low volume specimens
- Cell count, diff, glucose, proteins are always done first, if ordered.
- For specimens with insufficient volume, smears and cultures will be performed in the following order: Bacterial, Fungal, AFB.
- No AFB smears or cultures will be performed if cell count is normal, unless patient is immunosuppressed.
- CSF VDRL will not be performed unless there is a positive STS on blood.
- Cryptococcal antigen may be substituted for India Ink.
- No cytology will be performed if there are <5 cells/ul.

LAB CLERK / DATE _____

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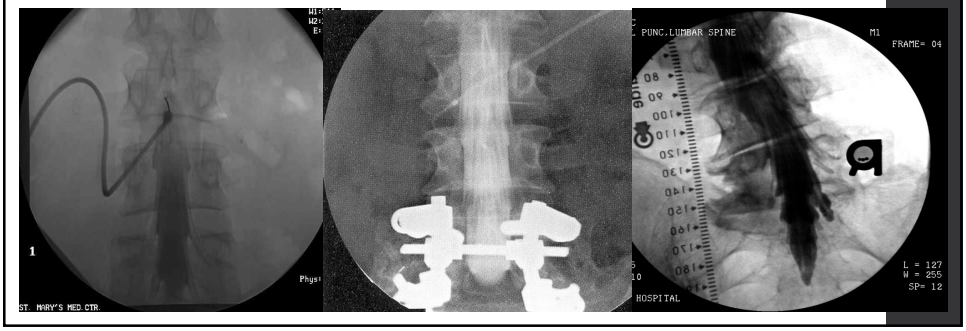
Back to the exam…

After CSF Collection…

- If Neuro physician is performing exam -Page Radiologist Assistant/Radiologist if not present when contrast injection begins
- After injection is complete, needle is removed
- Radiologist Assistant does spot films



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Once Radiologist/Radiologist Assistant is complete, its your turn for images……

- A X-table lateral image will be taken
- An AP T may also be requested by the physician

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