

Brigham & Women's Hospital

Resident Guide for Lumbar Puncture/Myelogram

2016-2017

Introduction to LP/Myelogram Service

The service for fluoroscopy-guided lumbar puncture and myelogram is separate from the Head, Neck, Spine Intervention (HNSI). Specifically, these cases are performed with the Room Czar attending and not the HNSI attending. Currently, residents are required to perform at least 5 LPs and/or myelograms during residency. There is not yet a specified rotation on this service in the curriculum so please touch base with the fellow/attending on service during your Neuroradiology rotation to get involved.

The cases are performed in the fluoroscopy suite room 18, on L1 (in the same area as GI/GU fluoro suite). The patient shows up to the Cardiovascular Recovery Room on L2 (the same recovery room as Angio IR)- this is where you'll go to consent patient.

The schedule can be checked on epic, under Neuro CSIR Room 18.

Work-up

Both LP and myelogram cases are typically pre-worked up one week in advance by the HNSI or Czar fellow. Please touch base with any of the neurorad fellows to obtain additional information from the work up.

However, cases may be added on, i.e. inpatient request. Even if the cases are pre worked up, I would suggest going through the patient's medical record on your own to make sure there is no red flag.

Lumbar Puncture

-Work up the case by reviewing referring clinician's note. Review patient's any coagulation issue and medication list.

- Lumbar puncture and myelogram is considered Category 0 exam and we follow the same departmental guideline for anticoagulation (see **Appendix II** for anticoagulation guideline).

-Confirm the indications for LP, which could be for large volume CSF removal, CSF analysis, measurement of opening/closing pressure, or intrathecal chemotherapy administration. If this is unclear from the order or note, contact the referring clinician to confirm.

-If CSF needs to be sent, check to make sure there are CSF lab orders placed on Epic by the ordering physician, under "Labs".

-It is important to review prior imaging studies. Either spine imaging or CT of abdomen/pelvis would give you important information about the patient's anatomy and allow you to plan the approach (midline or paramedian, the best level) as well as the appropriate length of the spinal needle.

Myelogram

-Work up is same as above, with a few additional points:

-There is a small potential risk of seizure caused by intrathecal contrast. There is a long list of medications (most are antiseizures and antidepressants) that may lower the seizure threshold and thus should be stopped, typically for 48 hours, prior to the procedure and started at 24 hours post procedure. The complete list can be found at <http://www.hopkinsmedicine.org/radiology/patient-information/exams-procedures/myelogram.html>, "View complete list of medications" halfway down the page). Alternatively, search on Google for "Johns Hopkins, myelogram".

-Patient needs to be NPO after midnight (not because we use sedation, but because of concern of seizure).

Patient needs someone to drive them home (also out of concern of seizure).

Consent

- See **Appendix III** for consent and discharge instruction forms. These can also be found in the reading room (underneath the printer). Ask fellow if you can't find them.

-Consent patient who will be in the cardiovascular recovery room (same as angio/IR reading room) on L2. The discharge instructions can also be discussed, signed by you and left in chart at the time of consent. CVRR nurse will go over with patient again before discharge. Inpatients should be consented on the floor.

-In addition to the usual bleeding, infection, injuring of nerve, also consent for temporary worsening of symptoms and post LP headache. For myelogram, patient may have headache when contrast reaches the high cervical/brain level. Of course, also mention seizure when consenting for myelogram.

- **Post LP headache:** affects 10 to 30 percent of patients following lumbar puncture, is one of the most common complications of the procedure. Post-lumbar puncture headache is caused by leakage of cerebrospinal fluid from the dura with resultant traction on pain-sensitive structures. Characteristically present with frontal or occipital headache within 6 to 72 hours of the procedure that is exacerbated in an upright position and improved in the supine position. Associated symptoms may include nausea, vomiting, dizziness, tinnitus, neck stiffness, and visual changes. Without treatment, the headache typically lasts 2 to 15 days. Recommend patients to take Tylenol if this happens.

-Call IR coordinator at **x27245** (typically Lynn or Peter) to let them know when you finish consenting so they can help coordinating with the assigned technologist and to get transport.

Epic-Navigation

-Complete Pre-procedural assessment on Epic (See **Appendix IV**).

Post-procedure

-Call CVRR nurse to give verbal sign out when procedure is completed at **617-930-1697**. This is usually brief but must be done. Let the nurse know if there is any complication, where the puncture site is and to confirm when they can discharge patient.

-Complete post-procedure note and orders on Epic (see **Appendix IV** on this).

-Typically monitor patient for 1 hour after LP, 2 hours after myelogram

-CSF fluid for outpatients should be labeled with patient's sticker and delivered (by you) to the lab which is on the second floor 75 Francis St, under the stairs, just to the left of Amory elevators and the Shapiro bridge.

-CSF fluid for inpatients can go back with them to the floor or submitted by you to the lab. If sent to floor, call resident to let them know.

Appendix I: Phone Numbers

• Neuroradiology Reading Room	• x32450, x27237 option 5
• IR coordinator	• x27245
• CVRR nurse for sign out	• 617-930-1697
• Room 18	• x80823
• Neuroradiology fellow on call pager	• p11890

Appendix II: Anticoagulation Guidelines

ELECTIVE PROCEDURE RISK CATEGORY

Category 0: Procedures with Very Low Risk of Bleeding

Paracentesis (see appendix A), LP, myelogram, spine or joint (including pubic symphysis, SI joint, iliopsoas bursa, trochanteric bursa) injections for pain, arthrograms

Category I: Procedures with Low Risk of Bleeding

Thoracentesis, superficial biopsy (e.g. superficial inguinal node or subcutaneous mass), superficial needle aspiration or catheter drainage of fluid (e.g. subcutaneous fluid collections and Baker's cysts), drainage catheter exchange (excluding catheters within solid organs, e.g. liver, kidney); biopsy of intramuscular masses, bone biopsies including bony pelvis but excluding spine

Category II: Procedures with Moderate Risk of Bleeding

Fine needle biopsy of visceral solid organs or lung, drainage catheter exchange (within solid organ), retroperitoneal non-solid organ catheter drainage, alcohol ablations; all neck or spine biopsy procedures

Category III: Procedures with Significant Bleeding Risk, Difficult to Detect or Control

Large needle (core) biopsies of solid organs (parenchymal or focal masses) or lung, thermal ablations (RF, Cryo, Microwave), intraperitoneal catheter drainage, solid organ catheter drainage

PRE-PROCEDURE LABS

All patients should be screened for a history of bleeding disorders, anticoagulant medications, or bleeding risk factors. In the absence of these clinical risk factors, the ordering of both PT and PTT should be uncommon and requires documentation of medical necessity in the medical record of separate indications for both PT and PTT (example, patient being transitioned from warfarin to unfractionated heparin). For procedure risk categories II or III, in patients without identifiable risk factors or anticoagulant medications, documented values within guidelines for PT within 30 days and PTT any time in the past are acceptable. In the absence of risk factors and without prior documented normal values, PT, PTT, and CBC may all be ordered to screen for unsuspected coagulopathies prior to Category II or III procedures.

Lab	Procedure Risk	Acceptable	Reason(s) to measure
PTT	Category 0 or I	PTT < 2 x	Unfractionated Heparin, uncharacterized bleeding history/risk factor
	Category II or III	PTT < 1.5x	Routine, unless previous normal documented value and no risk factors
PT	Category 0 or I	INR ≤ 3	Warfarin, Known/suspected liver disease, uncharacterized bleeding history/risk factor
	Category II or III	INR ≤ 1.5	Routine, unless previous normal documented value within 30 days and no risk factors
CBC	Category 0 or I	PLT ≥ 25K	Suspected thrombocytopenia, DIC, sepsis, malignancy and/or chemotherapy, medications including chloramphenicol, colchicine, H2 blockers, hydralazine, indomethacin, isoniazid, quinidine, streptomycin, sulfonamide, thiazide diuretics, tolbutamide
	Category II	PLT ≥ 50K	Routine (also provides baseline Hct) within 30 days
	Category III	HCT ≥ 25 PLT ≥ 50K*	Routine (also provides baseline Hct) within 30 days; *Consider PLT ≥ 90K prior to liver cryoablation.

MEDICATION MANAGEMENT

Aspirin (includes aspirin combination drugs, e.g. Aggrenox)

Do not stop if used for secondary prophylaxis (e.g., prior CV event such as CVA, MI, or coronary stent placement) without cardiovascular or PATC consult. Benefits v. risks must be carefully considered. Many procedures can be performed while on ASA with minimal increased risk of bleeding complications.

Primary prophylaxis, 81 mg:

Category 0, or I: continue ASA

Category II or III: stop 5 days before, restart >24 hours after

Primary prophylaxis, > 81 mg:

Category 0: continue ASA

Category I: stopping prior to procedure is optional, timing is at the discretion of the radiologist, restart > 12 hours

Category II or III: stop 5 days before, restart >24 hours

Non-elective/emergency: ignore

Clopidogrel (Plavix) or Prasugrel (Effient)

Do not stop if used for secondary prophylaxis (e.g., prior CV event such as CVA, MI, or coronary stent placement) without cardiovascular or PATC consult. Benefits v. risks must be carefully considered.

Consider deferring elective procedures or employing bridging strategy if procedure is critical to care.

Primary prophylaxis:

Category 0: optional - stop \geq 5 days, restart > 12 hours

Category I: stop \geq 5 days, restart >12 hours

Category II or III: stop \geq 5 days, restart >24 hours

Non-elective/emergency procedures: Consider PLT transfusion if stopped < 5 days; transfuse at least 6 hrs after last dose

Heparin (unfractionated, IV or SQ)

SQ, Prophylactic dose:

Category 0: ignore

Category I-III: stop 4-6 hours, do not need to recheck PTT; restart > 12 hours

Therapeutic dose:

Category 0 or I: stop for 4-6 hrs; restart >12 hours

Category II or III: stop for 4-6 hrs; optional recheck PTT, restart >24 hours

Non-elective/emergency: consider protamine reversal (by referring medical/surgical team)

LMW Heparin (low-molecular weight, e.g. Lovenox, dalteparin/Fragmin)

Prophylactic dose, 5,000 IU once per day:

Category 0: ignore

Category I: stop 12 hours before, restart > 12 hours

Category II or III: stop 12 hours before, restart > 24 hours

Therapeutic dose, \geq 5,000 IU once per day:

Category 0: optional stop 24 hours before, restart > 12 hours

Category I: stop 24 hours before, restart > 12 hours

Category II or III: stop 24 hours before, restart >24 hours

Urgent procedure: ignore prophylactic LMWH, can perform 8-10 hours after last therapeutic dose

NSAIDS (other than ASA)

Category 0 & I: ignore

Category II or III: consider stopping 48 hours (optional)

Non-elective/emergency: ignore

Warfarin (Coumadin)

Consider LMW heparin bridge if high risk for VTE, e.g. heart valve surgery, recent PE, DVT.

Category 0: optional to stop \geq 5 days, restart > 12 hours

Category I: stop \geq 5 days, restart >12 hours

Category II or III: stop \geq 5 days, restart >24 hours

Non-elective/emergency: consider FFP/Vit K

Other anticoagulants

Category I, II, or III:

Direct thrombin inhibitor (non-reversible): dabigatran (Pradaxa), Factor Xa inhibitors: Fondaparinux (Arixtra), rivaroxaban (Xarelto), apixaban (Eliquis), edoxaban (Savaysa) - stop for 48 hrs; if EGFR < 50, stop for 4 days - stop for 48 hrs

Antiplatelet: Tirofiban (Aggrastat) or eptifibatide (Integrillin): stop for at least 6 hrs

Reversible direct thrombin inhibitors (do not cause HIT): Argatroban - stop for 4 hours, consider checking PTT; also Bivalirudin (Angiomax) infusion: stop for \geq 2 hours

Phosphodiesterase inhibitor (inhibits plt aggregation) - cilostazol (Pletal); stop 4 days

Appendix III: Consent and Patient Discharge Instruction Forms

See next page.



BRIGHAM AND WOMEN'S HOSPITAL
A Teaching Affiliate of Harvard Medical School
75 Francis Street, Boston, Massachusetts 02115

CONSENT FOR PROCEDURE

Use Patient ID Plate
PATIENT MUST BE IDENTIFIED BY
NAME AND MEDICAL RECORD NUMBER

PROCEDURE: Myelography

I have explained to the patient the nature of his/her condition, the nature of the procedure, and the benefits to be reasonably expected compared with alternative approaches.

I have discussed the likelihood of major risks or complications of this procedure including (if applicable) but not limited to infection, hemorrhage, drug reactions, complications of transfusion, blood clots, loss of sensation, loss of limb function, paralysis, brain damage and loss of life. I have also indicated that with any procedure there is always the possibility of an unexpected complication, and no guarantees or promises can be made concerning the results of any procedure or treatment.

Complications related to myelography are:

- Headache
- Nausea/vomiting
- Temporary accentuation of back pain/leg pain

Rare complications:

- Dizziness
- Tingling sensations in limbs
- Neck stiffness
- Allergic contrast reaction
- Seizures
- Disorientation
- Infection

Additional comments (if any):

All questions were answered and the patient consents to the procedure.

M.D.

Dr. _____ has explained the above to me and I consent to the procedure.



BRIGHAM AND WOMEN'S HOSPITAL
A Teaching Affiliate of Harvard Medical School
75 Francis Street, Boston, Massachusetts 02115

Department of Neuroradiology
Myelogram Home Care Instructions

Date of Myelogram ____ / ____ / ____

Discharge Time ____ am/pm

To be home alone ____

To be with Family/Friends ____

To a Facility ____

Address: _____

Telephone in AM (____) _____

1. **Activity:** Do not drive today. A companion must drive you home. Have a companion place the seat back in the car in a low position with your head elevated 30 - 40 degrees. Rest in bed with your head elevated 30 - 40 degrees until bedtime. Then you may lie flatter with at least one or two pillows under your head. You may walk to the bathroom and may sit briefly for meals.

NOTE: For today, keep your head above your waist at all times.

2. **Medications:** Resume taking ☐ all or ☐ listed below

Medicine	Dose	When to take	Action
_____	_____	_____	_____
_____	_____	_____	_____

Prescriptions given to patient: ☐ - Check if information on Medications Attached: ☐

- NOTE:** a. If a headache occurs, take _____ or the pain reliever of your choice.
b. If headache continues or persistent nausea or vomiting should occur tonight, call your referring physician.

3. **Diet Instructions:** Eat lightly today. Drink plenty of fluids, (e.g. fruit juices, carbonated beverages and water). Avoid alcoholic beverages today.

4. Patient given a copy of "A Patient's Guide to Myelography" ☐ Yes ☐ No

5. Instructions given to: ☐ patient ☐ companion

If you have any questions please call Dr. _____ at (____) _____

M.D. Clinical I.D. #

--	--	--	--

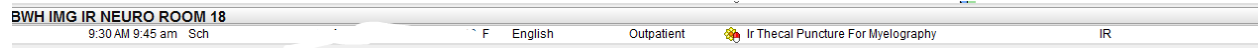
R.N.

Patient/Companion

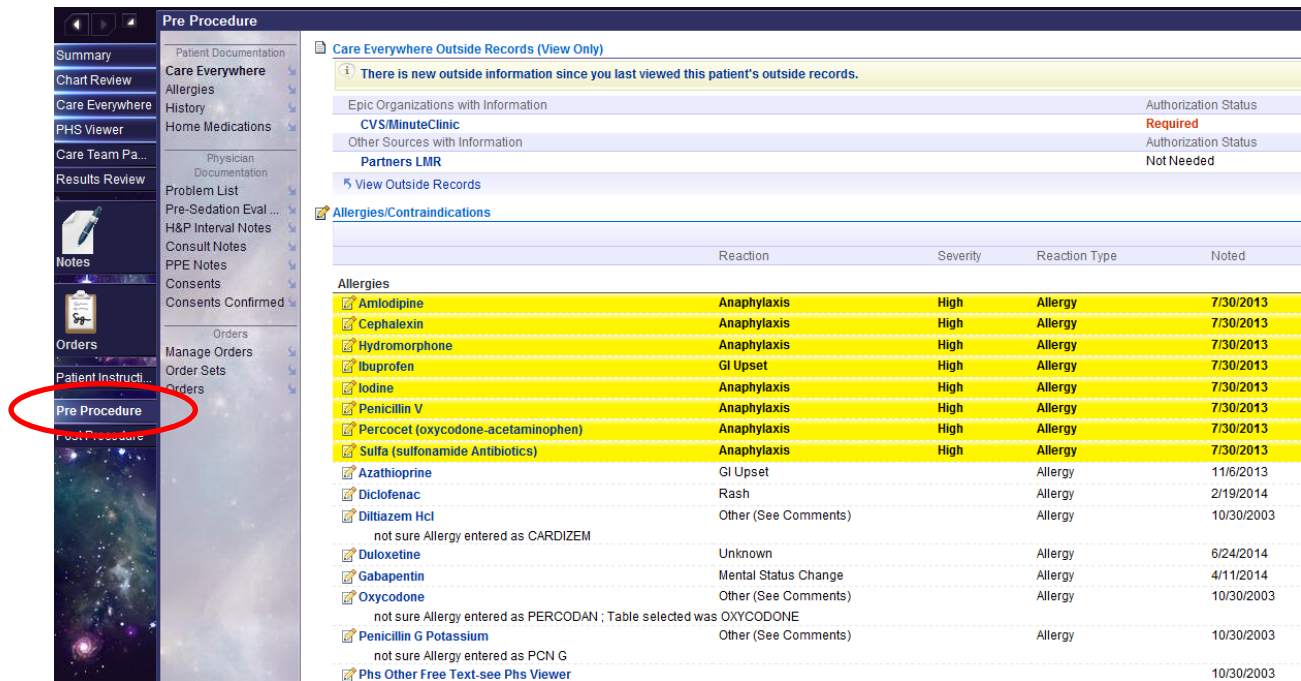
Appendix IV: Navigating Epic

Navigating EPIC for Lumbar punctures/drains or Myelograms

Off the Status Board in EPIC, select the patient off Room 18 and double click on the name.



Once you are in the patient's chart you will see a screen like this in the Pre Procedure:



Pre Procedure

Summary
Chart Review
Care Everywhere
PHS Viewer
Care Team Pa...
Results Review
Notes
Orders
Patient Instruct...
Pre Procedure
Post Procedure

Patient Documentation
Care Everywhere
Allergies
History
Home Medications
Physician Documentation
Problem List
Pre-Sedation Eval ...
H&P Interval Notes
Consult Notes
PPE Notes
Consents
Consents Confirmed
Orders
Manage Orders
Order Sets
Orders

Care Everywhere Outside Records (View Only)

There is new outside information since you last viewed this patient's outside records.

Epic Organizations with Information
CVS/MinuteClinic
Other Sources with Information
Partners LMR

Authorization Status
Required
Authorization Status
Not Needed

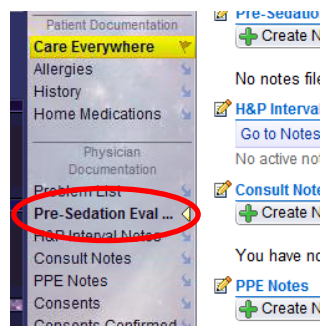
View Outside Records

Allergies/Contraindications

	Reaction	Severity	Reaction Type	Noted
Allergies				
Amlodipine	Anaphylaxis	High	Allergy	7/30/2013
Cephalexin	Anaphylaxis	High	Allergy	7/30/2013
Hydromorphone	Anaphylaxis	High	Allergy	7/30/2013
Ibuprofen	GI Upset	High	Allergy	7/30/2013
Iodine	Anaphylaxis	High	Allergy	7/30/2013
Penicillin V	Anaphylaxis	High	Allergy	7/30/2013
Percocet (oxycodone-acetaminophen)	Anaphylaxis	High	Allergy	7/30/2013
Sulfa (sulfonamide Antibiotics)	Anaphylaxis	High	Allergy	7/30/2013
Azathioprine	GI Upset		Allergy	11/6/2013
Diclofenac	Rash		Allergy	2/19/2014
Diltiazem Hcl	Other (See Comments)		Allergy	10/30/2003
not sure Allergy entered as CARDIZEM				
Duloxetine	Unknown		Allergy	6/24/2014
Gabapentin	Mental Status Change		Allergy	4/11/2014
Oxycodone	Other (See Comments)		Allergy	10/30/2003
not sure Allergy entered as PERCODAN ; Table selected was OXYCODONE				
Penicillin G Potassium	Other (See Comments)		Allergy	10/30/2003
not sure Allergy entered as PCN G				
Phs Other Free Text-see Phs Viewer				10/30/2003

Check patient's allergies and make sure they are not allergic to contrast if doing a myelogram (which in this case this patient is allergic to iodine). Hopefully they are on prophylaxis. 😊

For LPs and myelograms, you have to do a Pre-sedation Evaluation. Click on Pre-sedation Evaluation:



Patient Documentation
Care Everywhere
Allergies
History
Home Medications
Physician Documentation
Problem List
Pre-Sedation Eval ...
H&P Interval Notes
Consult Notes
PPE Notes
Consents
Consents Confirmed

Pre-Sedation
Create N
No notes file
H&P Interval
Go to Notes
No active no
Consult Note
Create N
You have no
PPE Notes
Create N

Which will lead to a page like this:

NoteWriter
ROS/Med HX Physical Exam Plan Note
Adult ROS/Med HX
Unable to Complete Review
Hx of anesthetic complications
Cardiovascular neg
HTN
Elevated Cholesterol/Hyperlipidemia
CHF
CAD
Angina
MI
CABG/Stent
Valvular problems/Murmurs
Dysrhythmias
Pacemaker/AICD
Cardiac testing reviewed
EKG echo
cardiac cath
holter monitor
stress test
Exercise tolerance
good poor
unable to assess
Pulmonary neg
Pneumonia
COPD
Asthma
Shortness of breath
Current URI Recent URI
Snoring
Sleep apnea
Active Smoker
GI/Hepatic/Renal neg
GERD
Hiatal hernia
Peptic Ulcer Disease
Hepatitis
Liver disease
Renal disease
Dysphagia
Bowel prep
Neuro/Psych neg
Motion sickness
Seizures
Neuromuscular disease
CVA/TIA
Headaches
Depression
Anxiety
Dementia Delirium
? of Competence
Psychiatric Hx
Endo/Metabolic/Other neg
Chronic Diabetes
Hypothyroidism Hyperthyroidism
Malignancy
Hematologic neg
Anemia Bleeding
Hyper AntiCoagulant
Musculoskeletal neg
Service: Interventional Ra Date: 7/5/2015 Time: 08:04 PM Bookmark

Fill out the form by checking off things as reasonably as you can. Then move onto the **Physical Exam**:

NoteWriter
ROS/Med HX Physical Exam Plan Note
Airway Unable to Assess
Mallampati: I II III IV
Neck ROM: full limited TM distance: Normal Short
Mouth opening: normal limited
Artificial airway: trached
Cardiovascular normal
Rhythm: regular irregular
Murmur JVD
Carotid bruits Peripheral edema
Weak pulses
Dental normal
Dentures
Upper Jaw Crowns/Implants
Lower Jaw Crowns/Implants
Chipped
Missing
Pulmonary normal
Breath sounds clear to auscultation
Rhonchi
Decreased breath sounds
Wheezing
Rales
Service: Interventional Ra Date: 7/5/2015 Time: 08:04 PM Bookmark

Then keep moving to the right on the tabs to Plan:

NoteWriter

ROS/Med Hx Physical Exam **Plan** Note

No sedation needed.

Sedation Plan

Planned Level of Sedation: moderate deep

Plan details

bag valve mask

cardiac monitor

continuous capnography

continuous pulse oximetry

intubation and emergency airway equipment available

IV access

oxygen

suction

Medications

Ativan Etomidate Fentanyl Ketamine Propofol Versed Narcan Flumazenil

Informed Consent

Sedation plan and risks discussed with:

patient spouse father mother legal guardian healthcare proxy

☐ Unable to Discuss/Obtain Consent

Comments

Service: Interventional Radiology Date: 7/5/2015 Time: 08:04 PM Bookmark

Since we usually do NOT need any sedation for LP or myelograms, type in either:

“No IVCS sedation necessary” or “.CSIRNOIVCS” (use this for patients not requiring sedation)

The procedure is planned without the need for IVCS. Local anesthesia may be employed. Informed consent for the procedure was obtained and the signed consent form is ready to be scanned into the medical record.

A paper informed Consent should be obtained and the “patient” button should be clicked so it turns blue

Informed Consent

Sedation plan and risks discussed with:

patient spouse father mother legal guardian healthcare proxy

☐ Unable to Discuss/Obtain Consent

Comments

Service: Interventional Radiology Date: 7/5/2015 Time: 08:04 PM Bookmark

If informed consent was obtained by healthcare proxy, click that instead.

Click on the **Note** tab and finish by Pending or Signing the note. I like to pend the note and sign it afterward (e.g., after the procedure is completed).

NoteWriter

Service: Interventional Ra Date: 7/5/2015 Time: 08:04 PM

☐ Cosign Required

History/ROS
No past medical history on file.
No past surgical history on file.
No family history on file.

History
Substance Use Topics
• Smoking status: Former Smoker
• Smokeless tobacco: Not on file
• Alcohol Use: Not on file

Review of Systems

Physical Exam
There were no vitals taken for this visit.

Physical Exam

Sedation Plan
Sedation Assessment: No sedation needed.

Informed Consent:

Pend **Share** **Sign**

After pending/signing the presedation evaluation, go to the “Order sets”

Pre Procedure

Order Sets and Pathways

Search Add Advanced

Favorites

- ☐ IR Neuro Interventional Ablation Post Procedure
- ☐ IR Neuro Interventional Biopsy Post Procedure
- ☐ IR Neuro Interventional Blood Patch Post Procedure
- ☐ IR Neuro Interventional Lumbar Puncture/Myelogram Post Procedure
- ☐ IR Neuro Interventional Pre Procedure
- ☐ IR Neuro Interventional Spine Injection Post Procedure
- ☐ IR Non Vascular Biopsy Post Procedure
- ☐ IR Non Vascular Pre Procedure
- ☐ IR Vertebral Augmentation Post Procedure
- ☐ Lumbar Puncture Labs

Right click on an Order Set to add to favorites. ☒ Open Order Sets ☒ Clear Selection ☒ Remove Open

Restore Close F9 Previous F7 Next F8

Orders

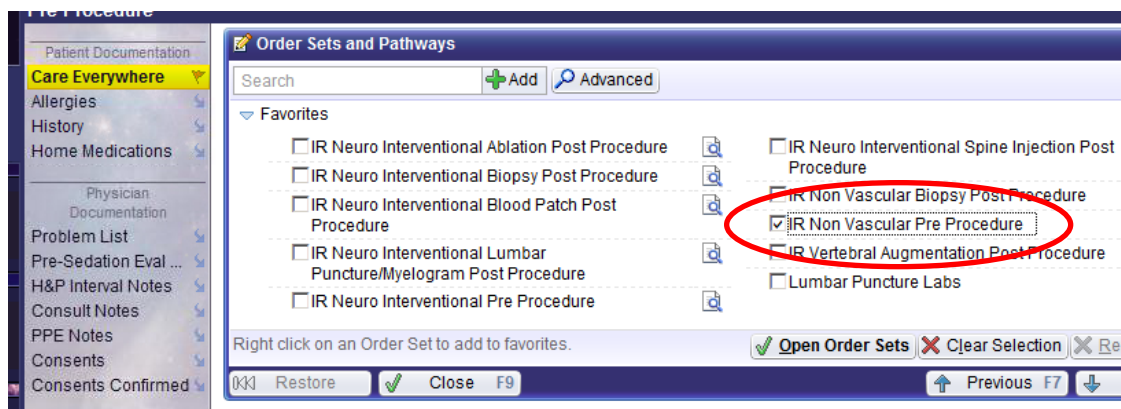
Manage Orders

Order Sets

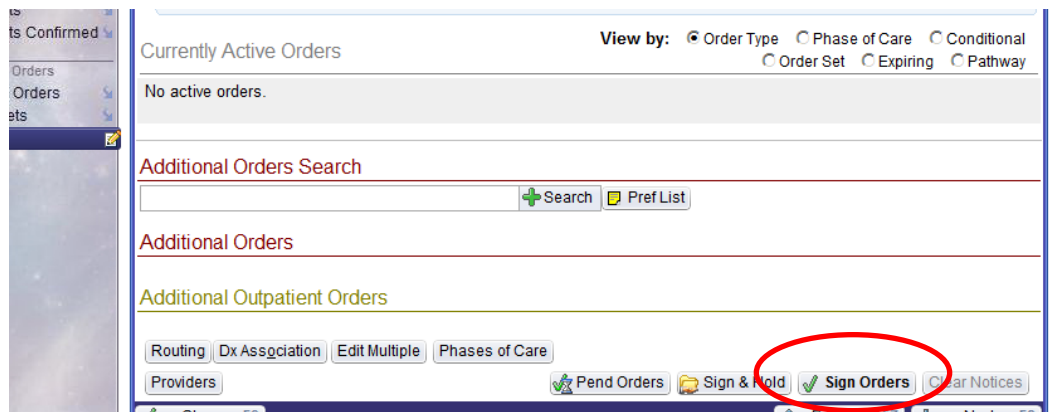
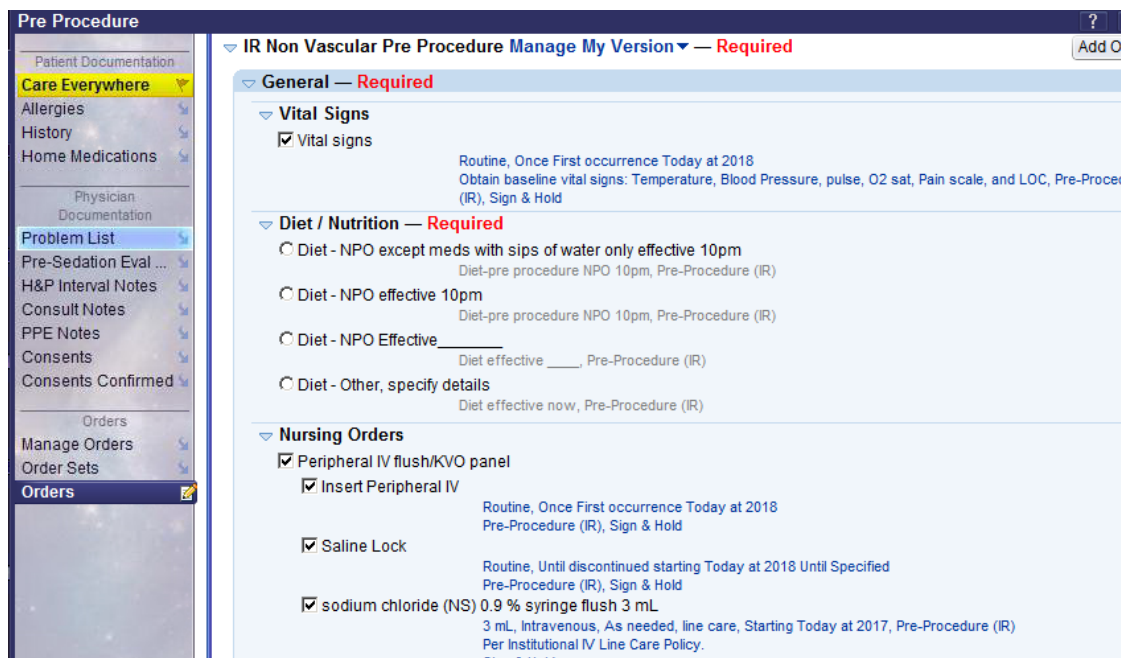
Orders

Select Pending Orders New Order

Select the IR Non Vascular **Pre Procedure** order set



For myelograms and lumbar drains you will need IV access. For myelograms they need to be NPO prior to the procedure. Lumbar drains and LP do NOT need to be NPO but just click it since diet is required. For just lumbar puncture, you do **NOT** need to put in IV access, just vitals and diet. Select what you need and sign orders at the bottom



After you have completed the procedure, go back to EPIC and go to Post Procedure. HERE is a very IMPORTANT step depending whether you are discharging the patient 1) **home**, sending them 2) **back to floor**, or 3) **admitting the patient**. **For lumbar drains, neurosurgery will be admitting the patient and they will enter all the post-procedure orders. We the neurorad service do NOT need to enter post-procedure orders.**

1) If discharging patient **home**, select tab **Post Procedure Discharge**

The screenshot shows the EPIC 'Post Procedure' interface. The 'Post Procedure Discharge' tab is selected and circled in red. The left sidebar contains various navigation options, with 'Pre Procedure' and 'Post Procedure' circled in red. The main content area displays the following sections:

- Brief Op Notes**: Includes 'Create Note', 'Go to Notes', and 'Refresh' buttons. A message states: 'You have no filed Brief Op Note for this patient within the last 24 hours.'
- Procedure Log...**: A link to view the procedure log.
- Orders Needing Cosign**: A section titled 'Orders Need Cosign' showing orders requiring cosignature by Liangge Hsu, MD. The start date is 07/06/15 1059. An order for 'iohexol (OMNIPAQUE-300) 300 mg iodine/mL injection 10 n' is listed.
- Prescription Routing - Make Selection to Default Order Class for All Orders Prior to Disc**: Includes a 'New Reading' button and a message 'No data found.'
- Discharge Med Rec**: A link to 'Go to Medication Reconciliation'.
- Patient Instructions (F3 to enlarge)**: A link to view patient instructions.

If you are discharging patient home, click on the “Discharge Med Rec” and Reconcile the meds.

The screenshot shows the EPIC 'Post Procedure' interface with the 'Discharge Med Rec' link circled in red in the main content area. The 'Discharge Med Rec' option in the left sidebar is also circled in red. The main content area displays the following sections:

- Discharge Med Rec**: A link to 'Go to Medication Reconciliation'.
- Patient Instructions (F3 to enlarge)**: A link to view patient instructions.

Go thru each: 1. Reconcile Problem List for Discharge; 2. Review orders for Discharge; 3. New orders; 4. Review and Sign

The screenshot shows the 'Discharge' module interface. The top navigation bar includes '1. Reconcile Problem List for Discharge', '2. Review Orders for Discharge', '3. New Orders', and '4. Review and Sign'. The main section is titled 'Discharge Problem List'. It features a 'Create Patient Care Coordination Note' button, an 'Add a new problem' button with an 'Add' icon, and a 'DxReference' button. A yellow banner states: 'New problems from outside sources are available for reconciliation. Reconcile outside problems with the problems in the patient's chart.' Below this, a text box instructs: 'Review all problems to determine which can be resolved and which still require a plan for treatment after discharge.' A 'Highlight Unrec...' button is on the right. A table lists problems with columns for 'Diagnosis', 'Hospital', 'Principal', and 'Sort Priority'. One problem is listed: 'Hypertensive disorder' with a status of 'Unprioritized'. Below the table are buttons for 'Mark as Reviewed', 'Never Reviewed', and 'Close F9'.

In the “New Orders” you will see the order sets. Click and open order set “IR Neuro Interventional Lumbar Puncture/Myelogram Post Procedure” order set. Select diet, PRN meds, etc. and sign the orders.

The screenshot shows the 'Discharge' module interface, specifically the '3. New Orders' step. The top navigation bar includes '1. Reconcile Problem List for Discharge', '2. Review Orders for Discharge', '3. New Orders', and '4. Review and Sign'. The main section is titled 'Place New Orders'. It features a 'Pend' button, a '+ New Order' button, and a 'Clear All C' button. Below this is a 'Pharmacy' section with 'No Selected Pharmacy'. There are sections for 'Additional Orders Search', 'Additional Inpatient Orders', and 'Additional Discharge Orders'. A 'Close F9' button is at the bottom left. The 'Order Sets and Pathways' section includes a search bar, an 'Add' button, and an 'Advanced' button. It lists various order sets under 'Suggestions' and 'Favorites'. The 'IR Neuro Interventional Lumbar Puncture/Myelogram Post Procedure' order set is highlighted with a red circle. At the bottom right, the 'Open Order Sets' button is also highlighted with a red circle. A note at the bottom states: 'Right click on an Order Set to add to favorites.'

Discharge

1. Reconcile Problem List for Discharge 2. Review Orders for Discharge **3. New Orders** 4. Review and Sign

Place New Orders

Pend New Order Clear All Orders Next

Pharmacy No Selected Pharmacy

Multiple Versions of User Order Sets Do Not Show This Again

You can now save multiple versions of user order sets. Click the Manage My Version link below to begin. Learn More

Order Sets

▼ **IR Neuro Interventional Lumbar Puncture/Myelogram Post Procedure** Manage My Version Add Order

▼ **Inpatient Orders**

▼ **Lines**

☒ Discharge criteria

Activity 1 of 2 selected

☒ Bed rest - Flat

Diet/Nutrition

☐ Diet - NPO

☒ Diet Clear liquid

☐ Diet - Regular

Whom to Call

☒ Notify Responding Clinician (Covering Interventionalist)

(Skip this next part if the patient is an outpatient and you already completed the steps above. Go to the [Brief Op Notes section](#))

2) If sending patient to the floor, select the **Post Procedure Back to Floor** tab.

Post Procedure

Post Procedure Discharge **Post Procedure Back to Floor** Post Procedure Admit

Brief Op Notes

Create Note Go to Notes Refresh

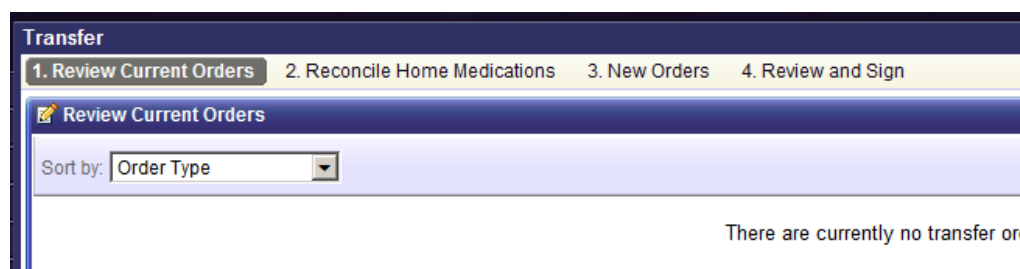
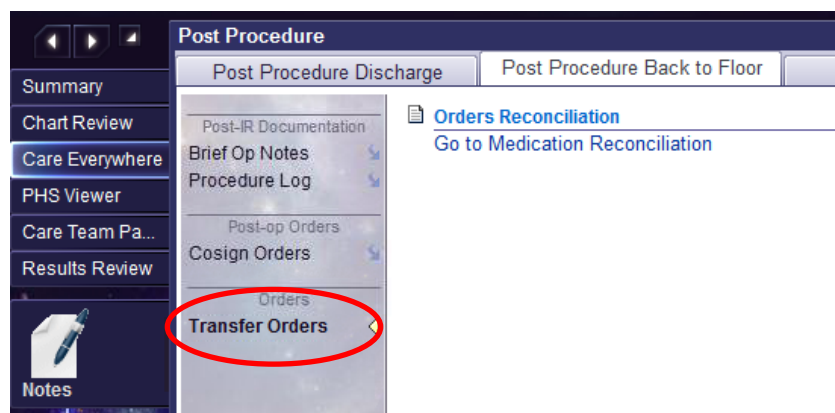
You have no filed Brief Op Note for this patient within the last 24 hours.

Procedure Log...

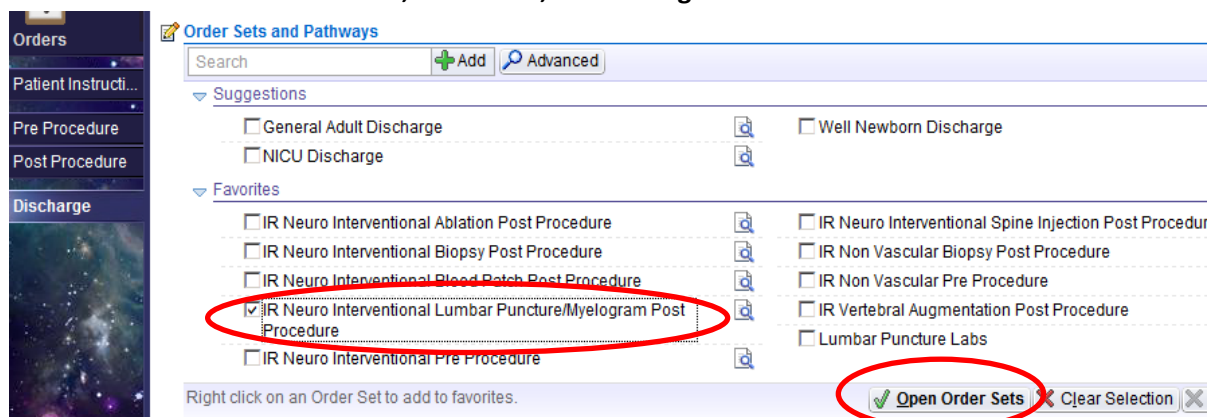
Orders Needing Cosign

Orders Need Cosign

Select Transfer Orders and go thru several steps:



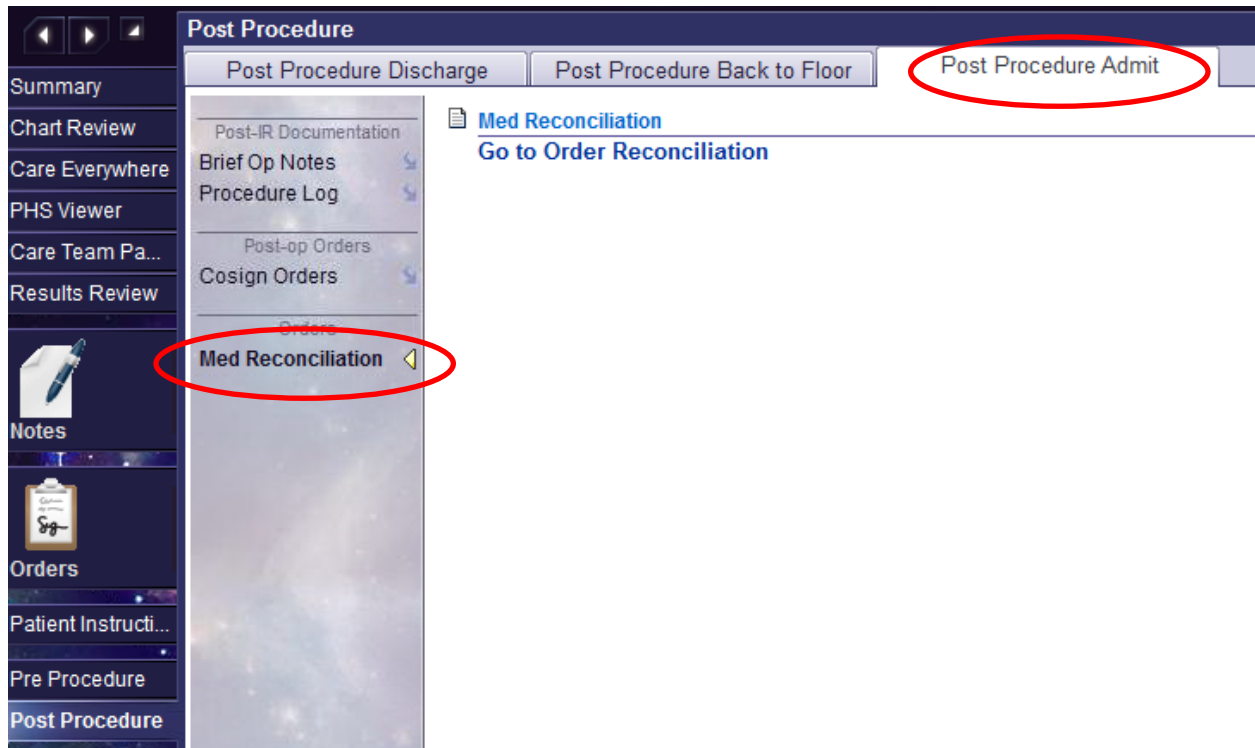
1. Review Current Orders (this is a list of all meds placed on hold when the patient was transferred to CSIR) – click on “continue unselected” which allows the floor to resume all preprocedure meds. You can elect to discontinue or modify a drug that you think is not appropriate following your procedure, e.g. an anticoagulant. You must complete this reconciliation before returning patient to floor.
2. Reconcile Home Medications – we generally do not need to do anything here
3. **New orders – Click on “IR Neuro Interventional Lumbar Puncture/Myelogram Post Procedure” order set. Select diet, PRN meds, etc. and sign the orders.**



4. Review and sign – review and sign your reconciliation.

3) If admitting patient to the floor, select the **Post Procedure Admit** tab.

Select Med Reconciliation and reconcile meds. (Admitting is usually only done for lumbar drains. You do NOT need to put any other orders since Neurosurgery is the admitting team.)



Brief Op Notes section

Either after or before the post-procedure orders and reconciliations are completed, select Brief Op Notes and type in “.CSIROPNOTES”

Summary
Chart Review
Care Everywhere
PHS Viewer
Care Team Pa...
Results Review
Notes
Orders
Patient Instruct...
Pre Procedure
Post Procedure

Post-IR Documentation
Brief Op Notes
Procedure Log
Discharge Orders
Cosign Orders
Rx Routing
Discharge Med Rec
After Visit Summary
Patient Instructions
Print AVS

Brief Op Notes (F3 to enlarge)
Service: Interventional Re Date: 7/12/2015 Time: 08:58 PM
☐ Cosign Required
Insert SmartText
.csiropnote
Abbrev Expansion
★ CSIROPNOTE Procedure: Operators: Findings and Results: Specimens: Se...
Refresh (Ctrl+F11) Close (Esc)
033 Restore Close F9 Cancel
Procedure Log...

Fill out the following:

Post-IR Documentation
Brief Op Notes
Procedure Log
Discharge Orders
Cosign Orders
Rx Routing
Discharge Med Rec
After Visit Summary
Patient Instructions
Print AVS

Brief Op Notes (F3 to enlarge)
Service: Interventional Re Date: 7/12/2015 Time: 08:58 PM
☐ Cosign Required
Insert SmartText
Procedure:
Operators:
Findings and R
Specimens:
Sedation or Proc
Disposition: .csirpatient
Refresh (Ctrl+F11)

Procedure: ***

Operators: ***

Findings and Results: ***

Versed: *** mg, fentanyl: *** mcg

Supplies: ***

Specimens: ***

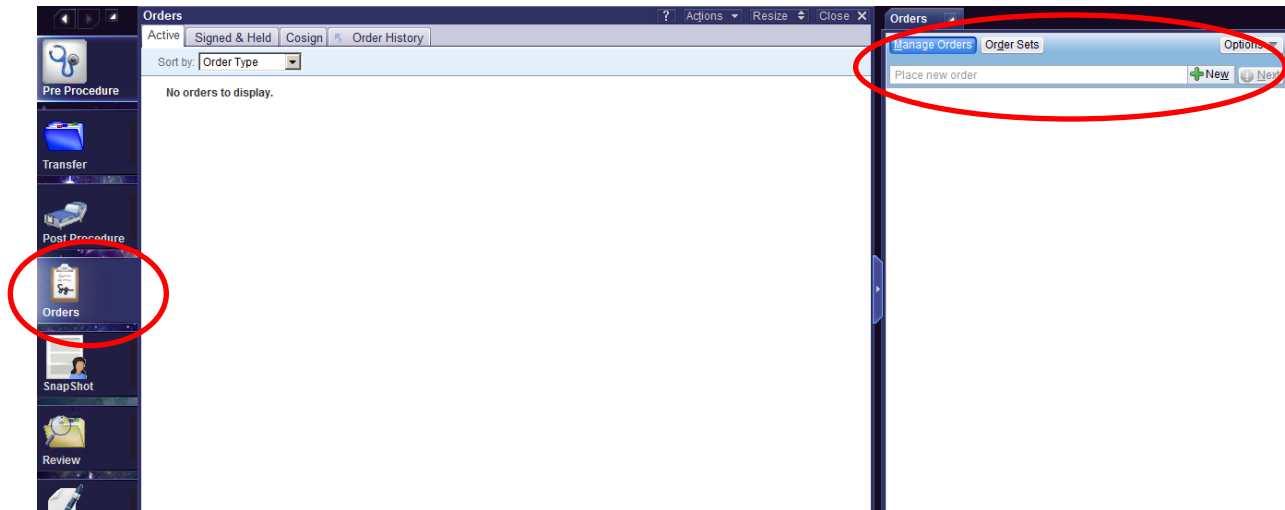
Sedation or Procedural Adverse Events: ***

Disposition: ***.CSIRPATIENTINSTRUCTIONS (use this after the procedure in the Patient Instruction box):

Type in a BRIEF op note and pend/sign it.

For myelograms, make sure the clinicians have entered a separate CT order for the CT part (e.g., CT lumbar spine, CT whole spine). If they did not, you will be called to order a CT by the techs.

If they need you to put in an order, go to **Orders** and type in “CT lumbar spine, CT thoracic spine, CT cervical spine” depending on what you need. For the entire spine you will need to place orders for all three!



Selecting CT Lumbar spine will launch this:

This screenshot shows the 'CT Lumbar Spine' order form. The form is divided into several sections. At the top, there are tabs for 'Routine', 'STAT', and 'Accept/Cancel'. Below these are fields for 'Priority' (set to Routine), 'Frequency' (1 time imaging), 'Starting' date (7/5/2015), and 'First Occurrence' (Today 2053). There is a 'Reason for Exam' field with a red error icon. The 'Questions' section contains four prompts with corresponding answer buttons: 1. 'Does this exam require anesthesia or sedation?' with buttons for 'Anesthesia', 'Sedation', and 'Neither'. 2. 'Intravenous Contrast Request' with buttons for 'Per Radiologist discretion/standard protocol based on indications', 'Should NOT be used (radiology may call to confirm)', and 'SHOULD be used (radiology may call to confirm)'. 3. 'Oral Contrast Request' with similar buttons. 4. 'Does the patient have a known prior contrast reaction?' with 'Yes' and 'No' buttons. At the bottom, there is a 'Comments (F6)' field with a text editor, and 'Accept' and 'Cancel' buttons. On the right side, there is a 'New Orders' panel showing the selected 'CT Lumbar Spine' order with its details and a 'Sign' button at the bottom.

Select Reason for Exam, then accept and sign the order! Hopefully you are done!