Brigham & Women's Hospital
Radiology Residency Rotation Guide
2018-2019

Angio/IR Supplement

Location: L2[1]

Hours: 6:30 AM – 5-7 PM (variable)

Conference: Wednesday at 7:30 AM

Patient Lists: BWH Interventional Radiology Consult
Snapboard: BWH IMG IR ANGIO/NEURO Exams
Snapboard depot: BWH IMG IR ANGIO/NEURO Tech Scheduled Orders

Relevant numbers:
Angio/IR on-call pager: 11801
(you need to call the page operator at 617-732-6660 - or just 00 when in hospital - to have this forwarded to you when you're on call)
Angio/IR work area (charge nurse/lead tech): 617-732-7245
Angio/IR on call nurse: p13612
Angio/IR on call tech: p11475
CSIR pager: p14520
Anesthesia consult: p33300, or call OR desk x71000 and ask for Anesthesiologist on call
BWH main number: 617-732-5500
Angio/IR reading room workstations: x27985, x27984
Angio/IR scheduling: 617-732-7240
Angio/IR clinic nurse: 617-732-4766
Call room: use the Radiology resident call room on 1st floor in the ED/old MSK area (code is 1-3-5)

[1] Take the Amory elevators at 75 Francis down to L2. Take a right out of the elevator. There are two doors with frosted glass windows next to each other on the right side of the hallway. The first one of these with a card reader is the IR reading room. Just knock on the door on your first day. The door immediately across the hall has sign reading BWH Revenue Operations. If no one answers, turn around and go back towards the elevators. Take a left at the end of the hall towards the Cardiovascular Recovery Room (CVRR). Take your first left through a set of double doors and ask someone in the break room or stock room to let you in.

Updated 03/30/2018 by Ariadne DeSimone, Liwei Jiang, and Peter Schaefer

Work flow of typical day:

- 6:30 a.m.: Arrive early enough to consent any outpatients and add-on inpatients that need to be consented in the CVRR (scheduled inpatients should have been consented the night before). Chart check inpatients we are following and update the handoff ("BWH Interventional Radiology Consult" list). You should also load imaging studies for that day's cases (excluding line cases) on the PACS workstation so it can be projected during rounds.
- 7:30 a.m.: Table rounds with attendings, fellows/residents, nurses, techs, and that day's anesthesiologist in the reading room. All the day's cases are presented by the people whose names are assigned (resident/fellow, PAs for lines). For line placement, state the type of line, why we are placing, h/o prior lines, side we'll be placing or TBD, whether or not anesthesia consult is required, and any other pertinent medical info (e.g. allergies, code status). For all other cases, state procedure, brief HPI, whether or not anesthesia consult is required, and any other pertinent medical info (e.g. allergies, code status, on any anticoagulants).
- 8:00 a.m. (immediately following that day's case rounds): Inpatient rounds where the fellow usually refers to the handoff and updates the attendings on the inpatients. Usually very brief.
- 8:30 a.m.: Cases usually start around this time. Go in on your cases as they come. Feel free to go in on any other case, just ask beforehand whether you can scrub in or not.
- 5:00 p.m.: Start getting a sense for the end of the day schedule. It is usually bad form to leave if multiple rooms are still running and the on-call person is still busy. Check with the on-call person before you go and let them know of any outstanding issues.

Work to do during the day:

- Fellows/residents work up cases on inpatients as consults are received that day, and the cases on outpatients that are scheduled for the next day (ALL CASES should have a name assigned and be thoroughly worked up prior to the next day's morning rounds).
- The PAs will generally work up the outpatient lines scheduled in rooms 3 and 4. Any case that does not have a name assigned is up for grabs.
- For all cases, there are various pre procedure and post procedure tasks to do (ask someone to show you the steps for the first few times):
    - Pre Procedure

        These steps only apply to inpatient procedures

        - Ordering MD pages consult pager with request for Angio/IR procedure
        - Before calling the team back, look through Epic (make sure to open the patient's "Hospital Chart" if an inpatient) and gather relevant information, such as HPI, current medications (any anticoagulants, opioids, antibiotics, pressors), labs (specifically WBC, Hgb/Hct, PLT, PT/INR, Cr, blood cultures), pertinent imaging, prior IR procedures, reason for consult. Call back the ordering provider/responding clinician to discuss the order and discuss any immediately apparent issues (anticoagulation, PT/INR, NPO status?, indication, timing, etc.).
            - If the patient is on an anticoagulant, refer to the SIR Anticoagulants Consensus Guidelines and bring it up with the attending.
            - Blood cultures have be clear for 48 hours prior to placing a venous access device (tunneled line).
        - Discuss the case with an attending to see if it's approved.
            - If *yes*, call the team back to let them know and then proceed to the following steps.
            - If *no*, then still let the team know the reasoning and write a consult note to document the discussion.
        - Have ordering MD place Epic order for "IP Consult to Angio/IR" (if inpatient; not needed if request for venous access or IVC filter) and also any orders if biopsy is being taken, fluid sent, or catheter tip being sent for culture.
        - Place order for procedure (except ordering MD places order for "IR Venous Access Placement," "IR IVC Filter Placement," and "IR Peritoneal Drainage Permanent Cather").
        - Ask that day's head RN to move the ordered procedure from the depot ("BWH IMG IR ANGIO/NEURO Tech Scheduled Orders") to the Snapboard to schedule it

- Go and see patient, and write consult note (make sure to associate note with the Epic order for consult)
    - Can use template from one of the fellows through Epic SmartPhrases
    - Keep it brief

These steps apply to both inpatient and outpatient procedures

- Assign yourself to the case (right click on case in the Snapboard and assign yourself)
- Protocol order (right click on case in the Snapboard and "Update Protocols")
- Use "IR Non Vascular Pre Procedure" or "IR Vascular Pre Procedure" order set
    - There isn't much to change in these order sets, except you will have to select an antibiotic for surgical prophylaxis (as below). Sign & Hold the orders (to be activated by RN when patient pre-op status).
        - G/GJ tube: none
        - IVC filter: none
        - PCN: Levaquin 500 mg (even if the patient is taking an oral fluoroquinolone)
        - Biliary tube: Ceftriaxone 1 g (if < 60 kg) or 2 g (if > 60 kg), AND Flagyl 500 mg (or Levaquin 500 mg or Clindamycin 600 mg) – ask one of the fellows for help
        - Port: Ancef 2 g (Clindamycin if PCN allergy)
- Fill out Pre-Sedation Evaluation
    - Fill in the ROS/Med Hx
        - Add summary of HPI at the top and include information about pertinent labs, allergies, prior venous access (if applicable), prior sedation and doses (if applicable), code status
    - Fill in Physical Exam
        - Includes evaluation of airway (Mallampati score), CV, Pulm, Neuro
    - Fill in the Sedation Plan
        - Includes ASA Score
        - Sedation Plan
            - If you have questions about if IVCS is appropriate for patient and think Anesthesia should evaluate the patient, you can request Anesthesia consult (In the Snapboard, right click on the case and under "Events" select "Anesthesia Consult")
        - Medication Plan
            - Usually select: Versed 0.5mg IV (and PRN titrate), Fentanyl 25mcg IV (PRN titrate), and select other PRN and reversal agents listed just in case
        - "Share" note (so others can use it if they end up consenting the patient)
- Consent patient (if not already done) and complete/sign Pre-Sedation Evaluation
    - Procedure-specific consent forms are located in stacks in the reading room
    - For outpatient consented in CVRR, leave consent form on the patient's side table with other paperwork
    - For inpatient, bring consent form back down to Angio/IR and put in the day's black plastic hanging folder (on the wall near room 4)
    - Update Snapboard with the "Consent obtained" icon (right click on the case and under "Events" select "Consent obtained") and you can also let the day's head RN know as well

- The Case
    - You can scrub into cases you worked up, and even those you didn't but want to see. Just talk to the fellow/PA who is assigned to the case.

        - There is common lead hanging out in the hallway near rooms 1/2 that is free to use. On your first day, take the time to find a top, bottom, and thyroid shield that fit well and set them aside to use during the rotation. There are available hooks on the far side of the control room near the break room.
        - Scrub into cases (put on lead, scrub cap, eye protection, and mask before going into the room)
        - Let the room tech know you will be scrubbing in so they can make sure a gown is ready and leave gloves out for you.
    - Post Procedure
        - Within the Post Procedure tab, select the appropriate tab at the top: "Post Procedure Discharge" (if outpatient), "Post Procedure Back to Floor" (if inpatient), and (rarely) "Post Procedure Admit" (usually used for TACE and Y-90 patients)
        - Complete Brief Op Note
            - Use .irpost SmartPhrase
        - Complete Discharge Med Rec
        - Fill out Add't Pt Instruction (get pertinent SmartPhrases from the PAs/fellows)
        - Complete more comprehensive procedure note in PowerScribe (use the harmonized Angio/IR templates)
            - To do this, the tech will have to mark complete the procedure first (turns gray).
            - Search for the MRN or accession number then select the procedure you did to open a blank report.
            - The tech will come into the reading room and hand you a slip with the technical information you need to complete the report, including amounts of Versed, Fentanyl, and contrast (used and wasted), Sedation Time, Fluoro Time, cumulative dose, DAP, device lot #, etc. The techs will put all of this information on a little slip and give it you or the fellow.
        - Update HI-IQ procedure entry (see below for more details)
        - If an inpatient case that is *not* vascular access, add patient to BWH Interventional Radiology Consult patient list
        - If a follow up procedure is needed, then:
            - Open a "Orders Only" encounter (via top Epic task bar > "Order Entry" button on left-hand side) and order the pertinent IR procedure
                - PCN check/exchange: q3 months
                - G/GJ tube exchange: q6 months
                - Perc chole: if acalculous, q6 weeks; if calculous, q3 weeks or until gallbladder removed
                - Biliary: usually q3 months (can discuss with attending)
                - Email "BWH Angio Scheduling" in Outlook with relevant details (name, MRN, procedure, timing) so they can officially schedule it

Appendix

A. HI-IQ:

- **Enter the case into Hi-IQ (**http://brigham.hi-iq.com**)**
    - Email Frantz Pierre ahead of time to gain access
    - Find patient on the schedule
    - If the patient is not on the schedule, then search via their MRN. You may need to create a new record for the patient.Click Create Encounter
    - Under Procedure tab click add/edit under the Services header and pick the correct procedure and # (if bilateral)
    - Mark Inpt or Outpt
    - Under Resources tab add attending/fellow/PA/resident
    - Under Outcome tab, click "none occurred" check box
    - Note: it is important to document any complications (even very minor ones) which occur within 30 days of the procedure. You can go back to the date of the procedure, double click the encounter, select the "complication" tab and enter the complication category on the left-hand side. To the right, there is an open section for "notes" – be as detailed as possible. These will be discussed at monthly M&M conference.
    - Each entry must have 3 key elements to be considered complete: (1) Procedure, (2) Resources, and (3) Outcome. Someone will show you how to do this on your first day.
    - It's super easy and must be done for every case (including line removals). The website interface is terrible and fairly confusion, so don't hesitate to ask someone how to do it.
    - Tip: anything with a little green lightning bolt is a required field

B. Venous Access:

Removing tunneled lines: (routinely done at the bedside or in the CVRR)

- Indication: No longer needed (completed therapy, pre-d/c), local infection, bacteremia. Often make sure that a clear indication is described in the order requisition. If not, call the ordering MD to discuss.
- If removed for infection, primary team may want to send tip for culture (they place the order in Epic)
- PLATELET GOAL >10,000, INR < 3.0
- Make sure to double check which catheter the team wants removed
- Review when the catheter was placed and what type of catheter it is
- Supplies:
    - venous cutdown tray
    - IV3000 dressing
    - extra gauze
    - sterile gloves
    - sterile specimen cup (if going to send catheter tip for culture)
    - can usually get mask, yellow gown, and eye protection on the floor
- Call up to the floor and ask the nurse about an appropriate time to remove the catheter. Often the patient is getting an infusion via the line, wants to take a shower, or is otherwise preoccupied. If not available at that moment, get a sense for what time would be good.
- Make sure to get verbal consent for the catheter removal. Talk about the risks of line removal and the aftercare instructions (remain in bed for 20 min, no lying flat for 3 hours, keep dressing dry for 24 hours, risk or air embolism).
- After pulling the line, ask one of the techs to mark the exam complete. Then enter a Brief Op Note and a PowerScribe report.

The PAs will orient you. Lines that have been in for greater than 1 month in patients with normal healing responses or those where the cuff is positioned more than 2 cm from the exit site can be very difficult to pull out. Occasionally, a cut down is needed. Occasionally, the cuff is retained.
Helpful tips: palpate the tunnel prior to injecting the lidocaine to see where the cuff lies so you know where to inject/dissect. As you pull the line out, make sure to put pressure over the venipuncture site and ask the patient to hum to prevent air embolus.

Tunneled Hickman and small bore catheter placement:

- Indications: Chemotherapy, Stem cell transplant, IV antibiotics/meds/fluids, home inotropes, TPN,
- Contraindications: Infectious concerns (last blood cultures should be negative for 48 hours).
- Placed under IVCS, or with Anesthesia if pt is not appropriate for IVCS.
- GOALS: Platelets >25K, INR < 2.0

Tunneled HD catheter placement:

- Indications: HD, pheresis
- Contraindications: Infectious concerns (last blood cultures should be negative for 48 hours).
- Placed under IVCS, or with Anesthesia if pt is not appropriate for IVCS.
- GOALS: Platelets >50 K, INR <1.5

Controlling bleeding status post line placement: Have patient sit upright. Further options include:

1) Manual pressure (best option). Be sure to press over the expected position of the actual hole in the vein, not over the skin puncture site.
2) "Dirt" – Statseal powder with dressing. Place this and then hold pressure over it.
3) D-Stat Pressure bandage (contains thrombin)
4) Primary team can order DDAVP if patient is uremic and platelets not functioning well.
5) Primary team should correct clotting factors or transfuse platelets.
6) Suture around catheter

Chest port placement:

- Indications: Chemotherapy, pheresis, intermittent IV access. Length of use is typically months to years.
- Contraindications: Infectious concerns (last blood cultures should be negative for 48 hours).
- Placed under IVCS, or with Anesthesia if pt is not appropriate for IVCS.
- Prophylactic antibiotics given: Ancef 2 gm IV (1 gm if less than 60 kg), Clindamycin if PCN allergy
- GOALS: Platelets >50 K, INR <1.5

Double Lumen Ports

1. Bard 9.5 Fr DL PowerPort Duo – power injectable
2. Bard 7 Fr DL Rosenblatt Slimport - not power-injectable. For very thin patients. Patient must understand they would need a peripheral IV placed for any power-injected imaging studies

Single Lumen Ports (all are power-injectable)

1. Bard 8 Fr SL PowerPort –WITH bumps, to be used for very large patients.
2. Bard 6 Fr SL ISP ClearVUE
3. Bard 6 Fr SL ClearVUE Slim Port (for thin patients)

Vortex or Tidal ports for pheresis

1. Angiodynamics 11.4 Fr DL Vortex –not power-injectable.
2. Angiodynamics 9.6 Fr SL Vortex –not power-injectable
3. Tidal Port (new)

Chest port removal:

- Indications: Completed chemotherapy, bacteremia.
- Done under IVCS, or with Anesthesia if pt is not appropriate for IVCS.
- GOALS: Platelets >50 K, INR <1.5

C. When on call:

Consults for which you shouldn't call the attending on call unless absolutely necessary (when in doubt it is always better to call):

- Pulling out tunneled lines: If patient is septic, needs to come out. Make sure to check beforehand with nurse to see if they think it can come out or tip needs to be cultured. Usually can't pull it until they get other access. DO CALL attending and verify with the team if patient is bacteremic but not septic particularly if the patient has a history of difficult access (i.e. a trans-lumbar HD catheter) as these patients may need to have the line changed over a wire.
- Bleeding post line placement.

Weekends:

- Call officially starts on Friday morning and ends on Monday morning.
- Usually chart check inpatients each day and update the handoff.
- Work up consults as you would during the week. Helpful tip is to ask the team how urgent they deem the procedure to be.
- Pull any lines that need to be pulled. Make sure to keep track to let the tech know to add the case to the Snapboard and complete it.
- Consent any inpatients for Monday cases that haven't already been consented.
- Do cases as they come.
- You will likely also get pages sent through the page operator from outpatients who have concerns/questions. It's helpful to first take some time to look the patient up in Epic and try to anticipate what they're calling about. Try your best to answer their questions. If unsure, you can always get in touch with the fellow who did the procedure or ask the attending on call.
    - If questions about any vein procedures, see more details below.
- Consults:
    - Do some basic phone triage and figure out if you need to go in. For example, if the primary team calls you at 3 AM and the patient had just eaten a sandwich (true story), then there is no need to go in until the morning. Also, if they are paging about an abscess drain or thoracentesis, just redirect them to the CSIR pager. Reasons for legit emergent cases are only really bleeding or infection. PCN for hydronephrosis and biliary drain for painless jaundice are not emergent cases. **Definite emergent cases are pyelonephritis, GI bleeding (only with active extravasation on CTA), cholangitis.**
    - For uncontrollable uterine bleeding: OB/GYN will page you an FYI just in case surgical management fails and they need emergent UAE. Let attending know about these consults. Patients/HCPs will need to be consented for UAE prior to surgery, sooner rather than later.
    - In general, discuss cases with attending prior to going in and seeing the patient.
    - If necessary, go in and evaluate the patient.
    - Call or page the attending. The attending makes the determination whether the case will happen overnight. If necessary, then page
        - **1) Angio O/C nurse (p13612)** AND
        - **2) Angio O/C tech (p11475)**
        - Also, the Angio/IR on call schedule is available through the Epic Phone Directory (search for "Angio")
    - On call tech will most often be in house from 7:30 a.m.-8p.m. on weekend days. They are a very helpful resource during the day.
    - When working up the patient, make sure to consider whether anesthesia will be needed. Helpful to get in touch with them about availability and coordinating (OR desk – x71000).

    - Make sure you talk to the attending beforehand regarding best way of contacting them, some prefer call/text and others page.
- Ask Julie about cab vouchers and cafeteria meal coupons for call.
- If you are up all night when you are on call, you are allowed to take a post call day off. No one advertises this but you should take it if you need it.

D. Vein Center patient and after-hours calls:

Occasionally you may receive an "emergent" call from a patient that had a procedure at one of the vein centers. In general these patients will call with leg pain and will be concerned about the possibility of DVT or infection. If the pain is severe and they cannot wait until the morning, you should tell the patient to come to the ER for evaluation. If the pain is tolerable and is not associated with any other concerning symptoms such as significant swelling, SOB, or fever then you should tell them to call the vein center where they had the procedure done in the morning to schedule an appointment to be seen. The phone numbers for the three offices are Newton Corner: (617) 796-7181, East Bridgewater (508) 350-2910 or Foxboro (508) 718-4010.

The three types of procedures done are listed below with a short summary of what is done and what is typical to expect post procedure.

EVLT (Endovenous Laser Treatment): Ablation of the superficial veins usually the great saphenous vein or small saphenous vein using ultrasound guidance and a laser fiber that goes through a 4 french sheath placed in the distal thigh or calf. Patients typically have pain and tenderness in the treatment area for 1-2 weeks, the pain typically peaks on the 3rd day. It can be associated with redness and tender lumpy area if the vein is located close to the skin. Patients placed in a compression stocking which they should wear for 24 hours after the procedure and then during the day for 10 days.

Phlebectomy: Removal of superficial tributary varicose veins through a series of 5-15 2 mm incisions which are closed with steri-strips. Patients typically placed on 5 days of prophylactic antibiotics. Pain and ecchymosis are common afterward with majority of pain during the first 1-3 days. A bulky compression dressing of gauze and coban is placed and then a compression stocking is placed over the dressing which should be left in place for 48 hours. After 48 hours the patients can take the dressing off, shower and then wear the stocking during the day for 10 days. Common to have hard tender lumpy areas in the treatment areas post procedure. If bleeding from the incision develops, patients should lie down and hold pressure on the area for 10 minutes. If bleeding persists after that they should call 911 and continue to hold pressure.
Sclerotherapy: Injection of sclerosing agent into varicosities of various sizes. Compression stocking placed for 24 hours and then during the day for 5-7 days. Pain and redness with superficial thrombophlebitis in the treated veins is common afterwards and usually becomes evident 1-3 weeks post treatment. Risk of DVT post sclerotherapy is extremely low. Patients should call vein centers the following day to schedule therapeutic thromboaspiration if they have pain in the treatment area.

E. Things to do prior to the rotation:

1. HI-IQ: Email Frantz Pierre (fpierre@partners.org) for access to HI-IQ (https://brigham.hi-iq.com/). No big deal if you don't, but it will save you some hassle when you start if you already have it set. Frantz manages the Angio/IR stockroom and can add you on your first day, if you don't have access yet when you start. This is the way Angio/IR tracks all of the cases and records adverse outcomes.
2. Snapboard ("BWH IMG IR ANGIO/NEURO Exams"): You need to be added as a "Resource" for the BWH IMG IR Angio/Neuro Snapboard in Epic (so you can assign yourself to cases). There are two methods of accomplishing this. (1) Call IT and open a ticket for them to add you permanently. (2) Manually add yourself for each day you'll be on service. Use the following steps: In Snapboard, click the arrow all the way on the left side of the screen in the middle to expand the side panel. Click the green plus sign icon at the top left -> Radiology Resident -> find your name -> Accept. It's probably best to do this once at the start of your rotation for all the days you are on Angio/IR, that way you don't have to think about it again.

3. Epic SmartPhrases: Copy relevant Angio/IR SmartPhrases from one of the fellows/PAs to be used mainly for Epic notes and patient instructions.
4. Badge access: We generally don't have access when starting. Ask Peter (head tech) or other tech on your first day to help you obtain access.
5. Inpatient lists: Patient Lists -> BWH entity -> Interventional Radiology -> BWH Interventional Radiology Consult (inpatients that we are actively monitoring and following).
6. Snapboard depot: Add the Snapboard depot lists - "BWH IMG IR ANGIO/NEURO Tech Schedule Orders."
7. Scrubs: Huge stash in the OR locker rooms on L1. Go past the Amory elevators in the direction opposite Radiology/Abdomen/US/Abrams. Take a right at the end of the hall. There's an OR Staff Lounge down the hall on the right and locker rooms.