UBC Radiology Residency On-call Guide

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Introduction

Dear PGY-2:

Welcome to your many nights on call. Call is a rite of passage for doctors of all specialties and can at times seem frightening. You are an absolutely essential service provider for any hospital. Once you've made that call correctly to send that patient to the O.R., and your staff has said, "good pick-up", you'll be able to know, deep-down, that you've saved a life, and that at least for this brief moment, being on call is ***fun***. Call is more than just moments of terror interspersed with moments of dread. It's where you actually, really, finally learn something. You learn how to work efficiently, how to deal with interruptions pleasantly, where you develop the search patterns you'll use for the rest of your life, where you'll have your 'A-ha!' moments for doing ultrasounds, and where you'll learn many of the necessary skills to get you through the next 40 years of your career that you just can't learn in the reading room during the day.

In PGY-2 year, call may seem like you're in the ninth circle of Dante's Inferno (treachery), but by PGY-5 year, call will just seem like the first circle and then you will surface and "rebehold the stars". Call will slowly, gradually progress from being an extremely unpleasant experience due to so many issues, to one that is just mildly irritating, like a pebble in your shoe, from one where you're courting impending adrenal failure, to one where you snooze your way through most of the studies you're looking at.

We promise.

By the time you're a PGY-5, and looking out the window, as the train slows down approaching the station marking the end of your residency, call becomes one of the few times of the week when you actually know what you're doing. Where the ER docs, you having earned their respect over the years, are pleasant and defer to your judgement on many matters. Where the surgeons stop asking, "have you reviewed this with your staff?"

Back to the time being: You'll miss findings on call. Patients might get hurt. It's almost inevitable, because from time to time, you'll come up against something that you don't know that you don't know. Dealing with these times can be challenging, but know - really know - that your colleagues are there for you. Because *it's happened to everyone before*. Just know that being a doctor is hard work. It's not just hard because of long hours and large volumes of knowledge to assimilate, and that patients can be hard to deal with. No, it's hard because you have to deal with failure, your own failures, all the time. There's never been a great doctor - Osler, Cushing, Blalock, *Yee* - who hasn't hurt a patient. You don't get the money, respect, and occasional fame of being a doctor without having an animal that comes to you in the darkest of nights and gnaws on your soul, knowing what you missed.

So - all that being said, welcome to call. This guide isn't intended to be the most comprehensive guide of everything - but it's there to put things into categories, to help you track down the things you need when you need them. You might use it a lot; you

might never read past the first page. It's also a living document - ever year, the goal is that it will get bigger and better. So please do your part to pay it forward when time comes.

In the words of Chris Hadfield, "You need to be an optimist to fly a Rocketship", so chin up! I hope that this document makes your transition to call easier as you take on the torch and charge forward through the night (or day if you are on VGH-A).

And a quick caveat before we begin: In the case where anything in this guide conflicts with either the department's official policy manual, or established medical advice or best practices, the advice, guideline, or other information provided in the other documents always supersede this document.

A Few Words About Professionalism

"Power tends to corrupt and absolute power corrupts absolutely."
- Lord Acton

Call is quite literally where you're the boss. You alone control access to one of the hospital's most important resources, and you are essentially the end of the line. If you tell someone that a study isn't going to happen tonight, then it's not going to happen or you need to tell when it will be done. And so with this great power comes great responsibility. Your responsibility, first and foremost, is to your patients. If someone telephones you for a study, they are consulting you - just as though you're an internal medicine resident and you've been consulted for your 10th CHF patient of the night.

So, with a consultation comes a responsibility. If you refuse to perform a study, you are essentially refusing a consultation. In the chart (and in a court of law), this would be read as, "At 10:00pm, Dr. Smith of the ER telephoned Dr. Blurp, the on-call radiology resident, to perform a CT scan for suspected intracranial hemorrhage. Dr. Blurp was at home in bed, and did not believe that it was worth his time to help the patient, and so refused to perform this study. The patient died of respiratory arrest from his intracranial hemorrhage at 5:00am".

Unfortunately, for many maladies faced by our patients, the symptoms can be subtle, non-specific, poorly localizing, and barriers to communication such as language and physical handicaps can prevent clinicians from obtaining a good, accurate history. We have to have the foresight and temerity to see through these obstacles and work with our clinicians to help our patients however we can.
When in doubt, unless it is a young patient for which someone is requesting a high-radiation scan, or the story makes absolutely no sense, you should probably just do the scan. The PACS system of any hospital is filled with horrendomas hidden in the bodies of patients who presented with mild, non-specific symptoms.

Also, keep in mind that you are also a physician. Use the clinical skills that you have acquired throughout your medical school training as well as your internship year to get more specific clinical history. For example, if someone is inquiring about stroke, ask about symptoms, the side, onset of symptoms, and the neuro exam findings. This will help you triage the study more appropriately and focus your search when you're looking at the scan later.

If you truly believe a study is not indicated and/or could get done the next day, politely ask the clinical reasoning behind it. For example - "for my learning, can you explain why you are asking for this study for a patient with these symptoms" or "how will this affect the patient's management overnight?". You will find that usually the referring clinicians are very reasonable and sometimes just want to put something on your radar or make sure it gets done in the morning.

A few more helpful tips:

1. Answer the phone, “Good Evening, Radiology, John speaking”
2. Try also, “How can I help?”
3. Answer pages promptly.
4. Don’t fall prey to the ‘It’s not my job’ mentality. You are the face of the entire radiology department. If it’s something that someone wants from imaging, you should try to help them.
5. Be nice to your fellow residents and med students - they will be your future colleagues and consultants.
6. If you’re in a complicated study, and someone comes in the reading room, acknowledge them quickly but politely ask them to wait. If they storm off, that’s their problem, not yours. Alternatively, you can ask if it is ok to call them as soon as you are finished with what you are doing. It can be hard to concentrate when you have someone standing behind your chair waiting to talk to you and you don’t want to rush helping them either.

How Call Works

As of the writing of this document, the UBC Residency program covers call for 4 hospitals:

1. Vancouver General Hospital (VGH)
2. University of British Columbia Hospital (UBCH)
3. St. Paul’s Hospital (SPH)
4. BC Children’s Hospital

NIGHT FLOAT

At VGH we use a "Night Float" (NF) System where a resident does 1 week of night shifts (7 nights in a row). Each resident in the program will be required to do 2 weeks of Night Float per year, except in PGY-5 where only one week is required and done prior to Jan 1 of the academic year when the PGY-5s traditionally stop doing night call in preparation for the college exam. The evenings starting at 1700 are covered by the ER2 resident.

The week begins on Friday night (you are excused from clinical duties Friday during the day) and ends on the following Friday morning. The NF resident begins their shift at 2300 hrs Monday-Friday and 2000 hrs Saturdays, Sundays and holidays. The shift ends at 0800 hrs the following day. The following table outlines a typical week of night float:

Day 1	Friday	2300 - 0800
Day 2	Saturday	2000 – 0800
Day 3	Sunday	2000 – 0800
Day 4-7	Monday – Thursday	2300 - 0800

After a resident is finished NF on Friday morning, s/he will have the weekend off and will return to their normal clinical rotation on the following Monday. During their week of NF you are not expected to attend AHD or any other clinical work besides the night shifts.

A resident can only do 1 week of NF per four week block. If the resident is scheduled for NF, they cannot take vacation during that block nor are they scheduled for ANY other call responsibility.

If the resident wishes, they can switch with another resident who is scheduled for the same block in order to break up the call week.

If the resident is ill and cannot fulfill their NF responsibility, they are responsible for arranging a fellow resident to take on their shifts. In order to make this process fair, the switch would ideally be made with a resident who is also scheduled for NF during the same block or the next block.

All residents (no matter their PGY year) will always have an ER/general fellow and staff in-house with them in the ER reading room. The staff & fellow ER radiologists also do a night-float system, and their overnight shift is referred to as the "ER3" shift. Subspecialty (abdo, neuro, IR) fellows and staff are also on-call overnight and are available for any urgent subspecialty matters.

Responsibilities:

1) Residents (and fellows) are responsible for protocolling and looking at **emergency department CT studies**. These will be reviewed with staff and dictated, just like on a regular rotation. Once a study has been reviewed, the **results must be telephoned to the ordering physician** – make note of who you spoke to and at what time at the end of your report.

2) Residents are also responsible for protocolling and reviewing **all urgent inpatient CT studies**. Because the staff and fellow on with you are primarily responsible for covering the Emergency Department, you are essentially the on-call "inpatient radiologist" for the night. Thus, urgent inpatient studies should take priority over ER studies (which the fellow can take care of) – just let your staff know if you get bogged down with looking at inpatient studies.

   Inpatient studies that were protocolled during work day hours tend to get scanned after hours, just to reduce wait times. However, not all of these studies need to be reviewed overnight (e.g. routine metastatic workup,OR planning). If you have time, it is a good idea to look at these studies to make sure there are no life-threatening findings such as a PE or misplaced ETT.
   The inpatient studies that you ARE responsible for "preliming" include:
   - **ALL** ICU/CCU studies
   - **ANY** study categorized as STAT/Urgent (regardless of whether you received handover about it)
   - Any inpatient studies that were handed over to you by the day-time subspecialty fellows or previous resident
   - Any inpatient studies that you had protocolled on your shift
   - Any inpatient studies where a review was requested by the clinical team.
   - Note: The ER radiology staff are NOT responsible for routine inpatient studies. However, if you are unsure most staff and fellows are nice and will answer questions. Just check with them and ask "can I ask you something about this inpatient study?" – most will say yes, if they say no then you can call the appropriate fellow on call. Remember that you always have backup and it is better to be safe than sorry.

   For the inpatient studies listed above, you must:
   1. **CALL** the clinical team with a verbal preliminary report – only ER physicians have access to the prelims on PACS so other services will not be able to see your typed preliminary report, so it's important to call.
   2. **PRELIMINARY REPORT** must be typed up in the "Comments" box in Impax (Agfa PACS used at VGH), documenting the time and name of the person you spoke to.

If you are unsure of findings or have any concerns regarding inpatient studies, check first with the fellow or ER staff that is in-house with you. If they are too busy with ER studies or the exam is beyond their scope of practice, call the appropriate subspecialty fellow on-call. **If one of these studies is on the "PGY-2 Call Back List," it must be reviewed by the appropriate fellow and this should be documented in your prelim note.** You can find contacts for on-call subspecialties across VGH including radiology in this link (https://viewvchoncall.hssbc.ca/BrowseSchedules/) or simply through switchboard.

If any logistical questions regarding inpatients come up (e.g. what is the best test to arrange for an inpatient study the next day, reviewing results from studies earlier on in the day), try your best to take care of it as best you can. If you don't know, ask the on-call subspecialty fellows (Abdo/Neuro/IR) if urgent, or handover to the appropriate department the next day.

Finding the clinical service responsible for an inpatient can be confusing. In general:

- Internal Medicine CTU ward patients discuss with IM Clinical Associate (CA) or Cross Coverage on call (if no CA for that night)
- Internal Medicine subspecialty ward patients discuss with Cross Coverage on call
- HPB and general surgery ward patients discuss with General Surgery on call
- If you do not immediately recognize who the patient is under, check the patient's location on the requisition and call the ward to ask who is responsible for the patient overnight

3) Residents are also responsible for performing any clinically-indicated **ultrasound** studies (provided no ultrasonographer is available in-house). Call the abdo fellow if the indication is one listed on the PGY-2 callback list. Please refer to **Appendix A** for steps on how to schedule an ultrasound exam.

   When you are ready to perform an ultrasound, ask the CT technologist to help arrange a porter that will bring the patient to the ER Ultrasound room. They will also bring the patient back when you are done.

   Run all ultrasounds by the in-house ER staff before and after performing. They may be comfortable with you dictating the study under them however if it is a more complicated case, they may refer you to call the Abdo Fellow, in which case the study will be dictated the next day by the Abdo staff. If this occurs, be sure to leave a preliminary report on PACS as you would for an inpatient CT exam.

Always document when a study was reviewed with a fellow.

4) Residents are also responsible for looking at any **plain films** they are asked to, no matter who is asking (e.g. IV Therapy Team, nursing, etc). These can be read-out with ER staff. Leave a prelim for these too.

Residents are not responsible for any MRI study interpretations or bookings - these all require the subspecialty fellow or staff to be called.

Residents are not required to perform interventions/biopsies/drainages/tube adjustments on call. Any referring clinician with a question about procedures should be asked to call the appropriate fellow directly (*do not act as the go-between*). Please see the end of appendix C for non-vascular procedures performed by IR vs those performed by Abdominal Radiology. MSK performs joint aspirations and all vascular procedures are performed by the IR fellow.

ER 2 ROTATION (1700-2300 hrs):

Tips for ER/NF Resident Handover for Inpatient Studies:

The resident scheduled on the ER 2 Rotation begins their work day at 1700 hrs until 2300 hrs when the NF resident arrives. The ER resident performs all the functions of the overnight NF resident, as described above. The ER 2 resident is still expected to attend Grand Rounds and Academic Half Days.

If the ER Rotation Resident is sick and cannot perform their shift, the on call UBCH resident will cover and be in house at VGH from 5-8pm, and the NF resident will come in early at 8pm onwards. From 5-8pm, the UBCH resident on-call should inform the UBCH switchboard of their location and contact information as they will still be responsible for UBCH coverage. If the UBCH resident covering in the VGH ER is called for an US at UBCH, the US takes priority and the VGH ER is covered by the in house staff/fellow Radiologists.

Please refer to **Appendix B** for the official resident policy for the ER rotation and NF shifts.

Incoming (NF) Resident and Handover:

- Open "***VGH Resident Call Last 12 Hrs***" worklist (***be sure this is the worklist you are using - this is different from what the ED fellow/staff use. This worklist includes ALL patients being scanned in the hospital, not just ED patients)
- Run through the list with the outgoing resident. Check which scans need to be prelimed and get any additional info the resident may have.
- Identify ***which studies still need to be looked*** that require a note. Although it is the formal expectation that you are responsible for

scans done **after 5pm**, occasionally, you will find unread urgent studies done earlier. Some of us check them to make sure there are no urgent findings, some prelim them, and some don't look at them at all.

- Get a ***list of pending inpatients*** to be scanned.

Outgoing (ER) Resident:
Run the worklist with incoming resident (as above).

- ***Ensure notes are left on all inpatients scanned on your shift*** that require one. It is reasonable to leave any inpatients scanned in the last 30min of your shift to the incoming resident, but try to take care everything before then. This may mean staying a little later, but it really helps out the incoming resident to not have to worry about those.
- Provide incoming resident with ***list of pending inpatient studies*** that will need a note/call to clinician. The more information, the better!
- ***Protocol ALL studies you agreed to before leaving.*** Sometimes a team requests an inpatient study but they haven't put in the requisition yet (or they "wrote it in the chart but the clerk hasn't put it in the computer yet"). If the requisition still has not been entered at the end of your shift, call the ordering team or ward (listed on the top right corner of the requisition and can also be found under patient demographics on PCIS online) and remind them to enter it in ASAP and protocol it if possible. Ensure that the incoming resident has all the info necessary to print (MRN and name) and protocol the requisition (clinical info you got over the phone). Because of this it is helpful to ask the ordering team while on the phone if the reacquisition is already in and if it isn't you can remind them that you cannot put in the scan on your end until you have the requisition.

WEEKEND/STAT DAY SHIFTS (0800-2000 hrs):

This is a regular call shift and the responsibilities are the same as those for the ER 2 rotation and Night Float. The only exception is that subspecialty **Abdo and Neuro fellow and staff are in-house** for part of the day (usually 0900-1700 hrs). During this time they will read the neuro and abdo cases <u>including</u> ultrasounds. You should focus on the other cases which will mostly be chest, as well as the emergency patients. If for some reason you have nothing to read, you can communicate with the inpatient team and ask if you should prelim any of them or report and read out – although this is not usually done.

WHICH FELLOW SHOULD THE CLINICAL TEAM CALL?
Drain placements abdominal fellow
Joint aspirations CSI fellow
G-tubes, embolizations IR
Neurointervention neuro

* these fellows can be reached directly through switchboard

UBC Hospital Home Call (1700-0800 hrs weekdays and 0800-0800 hrs weekends/holidays)

The on-call radiology resident is responsible for coordinating and protocolling inpatient CT scans as well as performing US exams for any inpatients and Urgent Care Center patients. The Urgent Care Center closes at approximately 11pm, and so you are rarely called after then.

UBCH call resident takes all the requests via phone from UBCH and triages those calls appropriately:

1. Get ordering physicians name, patient's name, MRN, age, type of study, indication and relevant clinical history as needed, as well as the GFR if applicable.
2. Check who the ER staff at VGH is. Certain staff (such as Dr. Luck Louis) would like to hear about every single study before you protocol them. So in that case, call them, discuss it and then move on to step 3. If the ER staff is happy with you protocoling studies without discussing it with them (almost 90% of the ER staff), you can skip step 2 and go to step 3.
3. Call/page CT tech on call for UBCH (throught UBC switchboard) to let them know of the study and the protocol you would like. For example: "Hello, there is a CT PE ordered for Mr. Smith". They may ask for more info but usually don't.
4. Ask the CT tech to inform you when the scan is done.
5. After the scan is complete, call the VGH ER reporting room to let them know of the study. If you got any helpful info from the ER doc on the phone tell the VGH person since they will likely not have it on the requisition.

For ultrasound exams:

- Gather the clinical info over the phone as above. Call the x-ray tech at UBC – they can start the scan on the machine and also call for a porter to bring the patient over.
- Check in with the VGH in-house ER staff and let them know of the scan you will be going in to perform.
- Go into UBC and perform the scan.
- You can review the study over the phone with the VGH staff while the patient is still in the US room and see if they want more pictures.
- Dictate the study (you can use working stations at UBCH near the ultrasound room) depending on the staff's preference. Make sure you have reviewed the study with the VGH staff and then assign it to them on Fluency. Also call the UBCH ordering physician and give them a verbal prelim. If the VGH ER staff is not comfortable with the case, then the resident leaves a preliminary report in the comments box on PACS and

calls the abdo fellow to let them know that the study has been done. The Abdo staff at VGH on US reports the case the next day. If a resident has a question about a case or if it is on the PGY-2 Call Back List, then she/he contacts the Abdominal Radiology Fellow and the case is reported by the Abdominal fellow or staff by the next day. Note that the callback list for VGH also applies to UBCH.

Generally speaking, residents are not called for plain film interpretations. If you are called for a plain film interpretation, ask them to call VGH ER.

Due to the light workload of call at UBCH, there is no pre- or post-call daytime work hours protection.

NOTE: UBCH does not have anyone on call for CT 0000-0800 as the tech finishes at midnight. So if a clinician (inpatients, as urgent care closes at 11pm) needs an urgent CT, they need to consider transferring the patient to VGH. This is rare and you can check in with VGH if you are unsure what to do.

You can get reimbursed for parking if you get called in - https://med-fom-pgme.sites.olt.ubc.ca/files/2019/08/On-call-Parking-Form.pdf.

St. Paul's Hospital Call (1800-0800 hrs weekdays and 0800-0800 hrs weekends and holidays)

On regular weekdays, the on-call resident goes to work the normal time at 8am on the day of call, works a full day, finishes at 5pm and starts call at 6pm. After the shift you get a post-call day. Residents usually sit in the body reading area during call.

In terms of staff coverage, there is a 'late-shift' staff radiologist that remains in-house with you until 11pm on weekdays. They mainly report the plain films, while the resident handles CTs and US. The staff will also report CTs, usually after you have had a chance to leave a prelim, or sometimes before you've even opened the study!

Typically, the resident operates independently, even though staff are around, protocolling all studies, leaving preliminary reports on all CTs, and performing ultrasounds. Occasionally, staff will ask you to dictate studies you have left prelims on. Depending on the staff and how busy it is, you can also review and dictate scans to get some teaching in.

After 11pm on weeknights and on weekends, there are usually 2 staff radiologists on-call – one covering Body/Ultrasound, another covering Neuro/IR. Be sure to contact the appropriate staff for any questions on studies overnight. Fellows/staff are usually in during the weekend days to report plain films and perform urgent interventions.

Refer to Appendix G for US tech hours. You are responsible for dictating ultrasound studies performed by the tech on the weekends. If you are uncomfortable with the study, feel free to ask the staff for assistance. (NOTE that male sonographers do not perform EV scans at SPH so this will be up to the on call resident.)

There is a dedicated radiology call room on the 6th floor of the Burrard Building where radiology residents can sleep.

There is a pager that the on-call resident is expected to carry at all times, which is kept behind the front desk in the tall wooden cabinet at the imaging department reception desk.

SPH Reporting On-Call:

Preliming studies on call at SPH is slightly different from VGH. At SPH when you are on call, you will **claim and start dictating the study on fluency,** the same way you would during your daytime work. However, you do not have to do a full dictation. You can just dictate your preliminary report and send it to the **"on-call SPH pool"**. This way the staff will claim them from the pool and dictate them. Following the implementation of Cerner in 2020 there has been some ongoing changes with whether these show up for the ER physicians on Cerner and residents still copy-and-paste the prelims into Inteleviewer which only the ER docs can see (see how things are done by the time you do your buddy shifts). Make sure to call and communicate any emergent findings to the referring physician and document it.

It is important that for any studies of any modality that you look at, that you provide a preliminary note in Inteleviewer/PACS to indicate what you told the person who asked you to look at the study (once a staff dictates over your prelim report there is no record of it).

Porter services are available 24 hours a day to move patients into the radiology department for CT scans and ultrasounds, and can be arranged by the front desk staff, or after 11pm, by the on-call Xray/CT technologist.

BC Children's Hospital

Call at BCCH is completely governed by the staff radiologist who makes their schedule. While at BCCH, you are not responsible for any call outside of BCCH. Details regarding call will be provided by the BCCH staff prior to starting your pediatric radiology rotations.

Keeping Track of Studies on Call

No CT or US (or MRI at SPH) studies on-call happen without the 'say so' of the on-call radiology resident. One of the biggest challenges on call is keeping track of all the studies that people have called you about to perform for them.

Included in Appendix F is a sample table for you to print out. The headings, rows, and columns that you might want to use to keep track of your studies are provided, but feel free to make it your own (almost every resident has made their own version).

At VGH there are pre-printed out sheets to keep track of studies on call present at the clerk desk across from the ER reading room (Fishbowl). If there are only a few left ask the clerk if they can print more.

The basic information you need to know is:

- Patient Name
- Patient MRN
- Patient Age, Gender (e.g. 72F)
- Indication for study/brief history (e.g. unwitnessed fall, found down, c-spine tender)
- Patient location (will be on the req in most cases)
- Referring physician
- *Referring physician contact number (see below)*
- How soon they think the study needs to be done (e.g. STAT - now, Priority - within 1 hour, Routine - 2-4 hours)
- Patient GFR (Recent studies have shown if the patient is under the age of 65 with no history of hypertension or diabetes it is okay to proceed without a GFR. However, this is personal preference and risk must be weighed against the urgency of the study.)

IF YOU HAVE SPOKEN TO A CLINICIAN ABOUT A STUDY AND FOR WHATEVER REASON THERE IS NO REQUISITION, PHONE BACK THE REFERRING CLINICIAN AND REMIND THEM TO "ENTER" THE REQUISITION OTHERWISE THE STUDY WILL NOT BE DONE. THIS IS WHY YOU **DO NOT HANG UP THE PHONE WITHOUT THE REFERRING CLINICIAN'S PAGER NUMBER.**

SPH:

The front desk staff or the overnight technologist will, usually, bring you the incoming requisitions or phone you about them, they also print at the front by their desk so you can go look at them if you have downtime. Protocol them and hand them to the clerk at the front of the radiology department, or tube them down to the ER CT (sometimes it is easier to do yourself).

VGH:

ED PATIENTS: Requisitions for ED patients will print out in the ER reading room printer usually followed by a phone call from the requesting physician to discuss the request.

INPATIENTS: After the requesting physician calls you to ask for a scan (and the requisition is entered) you print out the requisition from PCIS. Make sure that the ED Reporting Room printer is selected. You can also print from the “Fishbowl” computer where it will automatically print.

On your buddy call shifts the resident you are working with will introduce you to the PCIS system.

How to use the PCIS system:

After receiving a request from a physician and gathering the appropriate information (MRN most importantly) login to PCIS which can usually be found under a folder called VP applications.

Once opened enter the MRN of the patient in the bottom search bar.

The patients name and information should appear at the top of the screen.

Click on the tab that says “orders” under it select “review orders” – inpatient or emergency depending on the situation (sometimes an admitted patient may still be under emergency – try both).

In the orders list find the appropriate “RAD” type order which will have an order number.

Next in the bottom right of the screen there will be a tab that says print requisition. Click it and a new screen will pop up that will ask for an order number, this can be found to the left of the order on the previous page. Make sure that the visit/admission number (the longer number) in the pop-up window matches the number from the background screen where the order number is listed.

Before hitting print hit the select printer tab and find radiology printers and select “ER reading room”.

Lastly, take the req to the ER CT room where you drop it off after you have protocolled it.

Do not stress over these steps or worry about reading them as it will be much easier to understand once a resident shows you.

Calling for Help

"When should I call for help?" - please understand that this is always a difficult question to answer.

Fellow/staff are available to assist you with interpretation of difficult cases. According to UBC Radiology departmental policy, there are certain types of studies that trigger an automatic call to the fellow for assistance with interpretation. Please see this list in **Appendix C**.

Before you call a fellow or staff for interpretation assistance with a difficult case, you should:

- Get all the relevant clinical history straight.
- Think about if there are any additional studies you can do to solve the problem on your own.
- Check all the patient's relevant previous studies.
- Talk to the clinician to obtain any additional relevant information, and see if the issue which you are questioning can wait until the morning, or is an issue that needs to be solved tonight.

Often throughout the first 6 months of pre call training you will get to meet most of the fellows from the core rotations and this is a great way to introduce yourself to them to make calling them on call less intimidating.

If you are worried about a study on call use switchboard to page/call the fellow on call for the subspecialty of the study. Do not feel bad to reach out as they are often more than willing to help and have home access to PACS.

Be aware that some services call the fellows directly and so they may even be in-house, performing a study when you call.

If a fellow refuses to look at a study for you, this is unacceptable for any reason. You should tell the fellow that you will then call the staff, and you should call the staff for assistance with interpretation.

Interventional Radiology

Often there will be clinical situations that call for a consult to the interventional radiology department (e.g. g-tube placement questions, trauma with active extravasation in the pelvis). In these cases, the clinical team should speak directly to IR. In the event that there is no IR fellow on call the interaction should be staff-to-staff. To avoid confusion, do not act as the go-between.

Communicating Findings

This is a really, really important part of call. This is why doctors get sued all the time.

When you communicate a finding to a referring physician, you need to document what findings you told him or her, when you told them, and via what method. This needs to go in to your preliminary report, and/or in the comments box in PACS.

This is the only way that the radiologist who dictates the final report the next day will be able to know if there has been a discrepancy between your report and the final report.

As well, it also establishes the timeline for events in the radiology department. Every patient in every department is tracked as to the time they arrive in the department, the time their scan is done, and the time it is completed in PACS. When you write down on your preliminary report, “the on-call General Surgery junior resident, Dr. Smith, was telephoned at 0030h with these findings”, what they do with the patient then becomes their/the hospital’s problem, and is essentially out of your hands (assuming your diagnosis was correct).

A special circumstance is when doing ultrasound on call at VGH. These requests will come through the ER and are performed by the resident with full dictated reports and reviewed with the ER staff in house. Again, at the end of your report include “ Findings discussed with Dr. X on (date) at (time).

Protocoling Studies

No document can really tell any radiology resident how to protocol every single study, but here are some basic guidelines that will get most residents through most nights. You can and should apply protocols that you think will help solve the clinician's problems best, while balancing the risk of radiation exposure to the patient with the risk of bad outcomes from

Ultrasound:

- DVT study - straightforward - just do a venous study of the lower limb from the CFV to the popliteal vein. These should only be done on weekends at UBC unless the patient can't be anticoagulated for the evening. At SPH and VGH in most cases the patient can be anti coagulated and have a departmental ultrasound in the morning.
- Ectopic pregnancy/torsion (see pathway in Appendix D) - both a transabdominal, and definitely, an endovaginal study should be performed. An EV study is the standard of care to assess for ectopic pregnancy. Because of the invasive nature of the study, male residents must have a female nurse present while performing the study. Just call the referring ERP and have them send over a female staff member with the patient when they come for their study (This must be a nurse or clinician and not a clerk). At SPH the same protocol goes where a nurse/clinician must accompany the patient during the scan provided by the emergency department. At anytime, a female resident can request a female chaperone if they deem it necessary.
- Testicular torsion – Standard exam
- Abdominal pain NYD – These should be rarely be performed on call and it varies from resident to resident as to what they are willing to perform (for example focused appendix or gallbladder).

CT:

1) Head:
    a. Trauma – non-contrast
    b. Acute Stroke – non-contrast
    c. R/o intracranial hemorrhage – non-contrast
    d. Intracranial mass – non-contrast + post-contrast (5min delay)
2) CTA Head/Neck:
    a. Neck dissection – CTA Arch to Vertex
    b. Acute stroke – CTA Arch to Vertex (Multi-phase if at VGH)
    c. R/o Aneurysm – CTA Arch to Vertex, CTA Circle of Willis (COW) if no concern about neck vessels
    d. R/o vasospasm (post-neurosurgery) – CTA COW
3) Facial Bones

a. Facial fractures – non-contrast CT Facial Bones
b. Mandibular fractures – non-contrast CT Mandible (additional oblique reformats of each mandible)

4) Orbits (FB, cellulitis) – usually with IV contrast
5) Cervical Spine:
    a. Trauma – non-contrast
    b. Disc/Discitis – with IV contrast
6) Neck Soft Tissues:
    a. Abscess – with IV contrast
    b. FB – non-contrast, followed by IV-contrast
    c. Retropharyngeal abscess – with IV contrast, be sure to extend down to mediastinum
7) Chest:
    a. Trauma – non-contrast Trauma protocol (includes T-spine reformats)
    b. R/o PE – PE protocol (with IV contrast), *ensure patient has at least a 20G IV access in the antecubital fossa*
    c. R/o Aortic Dissection – CTA Aortic Dissection protocol (from aortic arch bifurcation)
    d. Hemoptysis – CT Chest Hemoptysis protocol (non-contrast)
    e. R/o loculated pleural effusion – with IV contrast
    f. R/o "cancer" – non-contrast if no known mass, with IV contrast if known mass
    g. R/o aspergillus (immunocompromised patient) – non-contrast Hemoptysis protocol
    h. Esophageal rupture – give patient oral contrast on CT scan table to drink, and scan immediately non-contrast CT chest
8) Abdo/Pelv:
    a. Renal stone – CT KUB
    b. Abdo pain NYD/Appendicitis/Diverticulitis – CT Abdo/Pelv with IV +/- oral contrast (wait 2 hours to scan after giving oral contrast, consider up to 2.5-3 if ?diverticulitis). Oral contrast preference varies from staff to staff at VGH. **EXCEPTION**: *no oral contrast on SPH emergency patients.*
    c. Bowel Obstruction – CT abdo/pelvis IV only, no oral (unless partial obstruction suggested, then oral contrast plus 2-3hr delay is ok)
    d. Acute bowel/mesenteric ischemia – CTA Ischemic Bowel protocol (no oral contrast)
    e. GI bleed – CTA GI Bleed protocol (no oral contrast)
    f. Post-surgical anastamotic leak or abscess – CT abdo/pelvis with IV and oral contrast
        i. If low rectal anastomosis – add rectal contrast (common in SPH)
    g. Post-op complicated HPB surgery – CT abdo/pelv with IV contrast. Oral contrast is usually not necessary, but discuss with HPB/GenSx on call before protocolling.
    h. ?PEG-tube leak – CT abdo/pelv with IV + Telebrix (oral)

contrast through PEG tube

9) Polytrauma – discuss all cases with staff
    a. Stable RIPIT (most patients, only a few seconds longer than unstable RIPIT and much better diagnostic information)
    **** ask if CTA arch to vertex needs to be added (not part of standard RIPIT)*
        i. CT Head +/- CTA Arch to Vertex
        ii. CT C-spine
        iii. CT Chest
        iv. CT Abdo/Pelv +/- delay (perform if suspected bleed or any free fluid seen on initial scan)
        v. CT T/L-spine – reformatted from chest/abdo/pelv
    b. Unstable RIPIT
10) Extremities:
    a. Abscess/Tumor – with IV contrast
    b. Fractures – non-contrast
    c. Ischemic leg – CTA leg run-off protocol
11) Angio/IR cases:
    a. Ask the tech about Angio/IR specific protocols

Call IR fellow prior to protocolling if a team is considering IR management, just in case they need something slightly different

On-call Ultrasound

While it may seem like a big hassle at the time, performing ultrasounds on call is in your job description, and in fact, it is probably where your ultrasound skills will improve the most throughout your residency. It is those hour-long studies, with your hand on the probe, where it's up to you, and not the tech standing behind you, to make the diagnosis, that's when you learn the most.

The question of whether a study is indicated or not needs to at least be mentioned, because ultrasounds are time-consuming, and can seriously affect your workflow if you're not thoughtful about what studies you accept.

Providing a list of what is acceptable/not acceptable to ask for/perform at night is extremely subjective and situation-dependent. Generally, most clinicians these days are pretty good about knowing which studies can wait in the AM, and which studies need to get done tonight.

Here is a list of indications for studies which need to be performed urgently:

- Ovarian torsion
- Testicular torsion
- Ectopic pregnancy
- DVT in the setting of possible phlegmasia cerulea dolens
- Renal transplant or liver transplant cases (at VGH these studies are performed by fellows)
- Head ultrasound in a newborn (at SPH these studies are performed

by staff, and as common as pink unicorns)
- Cholecystitis

Some of these studies can wait until the AM, but often it's a discussion that you need to have with the clinician first. Quite possibly the patient can have a departmental ultrasound performed at 8am, with no harm done (cholecystitis is a good example). See the study triaging guide created by one of our residents Csilla.

If you need help with a study, don't be afraid to ask for help from the fellow or staff, but it is important that you perform the study first and try to figure out what is going on with the patient.

Ultrasound at SPH

Most US scans are performed in Room 33 (door code 68006). This is the dedicated room in the radiology department for performing inpatient ultrasounds, and where the techs usually scan on weekends. It always has a Toshiba ultrasound machine in it, with a good selection of probes and linens. Additional EV probes are available in the clean/dirty utility room in the main ultrasound area (where you will have your ultrasound rotation), and used EV probes should be returned to the green bucket in this room for processing by the US department aide. If for some reason it is not working, you can use the portable US from the US department IN room 33. You are not supposed to scan IN the US department because of safety policies.

If you have to do an US in the emergency department, there is a portable machine in the reading room next to the ED scanner/DTU. All necessary equipment should be available in the reading room next to the ED scanner. If you need to perform a study that requires more privacy (i.e. EV or testicular ultrasound), have the ER doc or patient's nurse arrange to move the patient into a private room (e.g. Gyne examination room in RAZ or Treatment). Additional probes can be found hanging up on the wall. Used EV probes should be wrapped in a towel and placed in one of the empty plastic boxes that can be found on the trolley in the reading room, and brought back up into the main US department clean/dirty utility room.

When you accept a patient for an ultrasound before 11 pm, you should alert the front desk staff that you will be performing an ultrasound, and that they should schedule the patient when they show up in the department. This adds them to the departmental modality worklist server so you can find them on the ultrasound machine worklist. Double check the patient's name and DOB. Ultrasounds ordered after 11 pm will appear automatically on the worklist.

When you are done your exam, you should wheel the patient back to the front desk area and ask the front desk staff to call a porter to return the patient to the ward/ED (if you are using Room 33).

Give the requisition to the front desk staff/x-ray/MRI tech to ‘complete’ the exam, which will make it available in PACS for dictation. They should also scan your requisition into PACS. After 11 pm, you usually have to complete the scan yourself on the Cerner worklist. Alternatively, you can ask an x-ray/MRI tech to help you.

Previously-dictated Studies

At VGH/SPH/UBCH, studies dictated by residents/fellows during the day that have not yet been signed off by the staff are in "limbo" and do not show up on PACS. To see these in progress reports, here is the suggested work-around:

1) Go to the "Orders List" tab in Fluency
2) In the "RIS Status" drop-down box, select "Check All"
3) Ensure the "Issuer" field matches the site you're looking for (IDX-VG for VGH, IDX-UH for UBCH, ALL for any site)
4) Use the other search fields such as study date, MRN, Accession, etc. to find the patient/report you're looking for
5) Click on the magnifying glass icon to perform search
6) In the report list that comes up, the report should be viewable by clicking the icon of a small piece of paper with a magnifying glass on it in the left-most column.

Occasionally, after reading the dictation, the clinician will still have questions, either about an imaging finding, or about something that they saw on the scan, or about some potentially operative question that was not commented on in the dictation. It is your job to help the caller out in this situation, and you should suggest that they come to the radiology department to review the study in person with you. Any "additional" interpretation that you provide has to be reviewed by the staff radiologist, you can enter an additional impression into the comments box and let the staff radiologist know about your interpretation in the AM. You can also request that any additional info you provide be reviewed by the clinical team requesting the information with the staff radiologist in the AM (a less reliable option).

Again, the importance of not introducing errors into the imaging chain cannot be overstated, and the temptation to 'save the day' and re-interpret the study in real time should be avoided. The clinical team wants the right answer, and while they might grumble about how complicated this process is, it is up to us to ensure that patients get the right diagnosis as often as possible.

Make sure you add a prelim note to PACS documenting that you have discussed this case with them.

Preliminary Reports

On call, your job is to produce a 'wet read' of a study, basically answering the question for which the study was done and picking up any major findings. If incidental findings are present that will alter management tonight, then you should also relay these incidental findings to the ordering physician.

For every study that you offer an opinion on, you need to somehow let the dictating radiologist know what you have said, so that in case of error, this can be corrected upon final dictation, hence the prelim report is necessary.

Thus, every time you look at a study, you need to create some kind of a preliminary report. The preliminary reporting style varies by resident from the brief "nil acute" to a full on report. The ideal is probably in the middle, and as a PGY2 you want to comment on more things to communicate that you looked at them. Here is an example of things to include:

1. "RESIDENT PRELIMINARY REPORT"
2. "NOT REVIEWED BY STAFF RADIOLOGIST" – some people put this at the beginning, some at the end
3. Patient history/additional history – like B-HCG etc.
4. Comparison to previous reports
5. Findings (include important pertinent negatives)
6. Impression (if useful or your findings got a little wordy and you want to summarize)
7. Your name and PGY-year
8. "Findings communicated with Dr. X at (time) on (date)"

We are often called and given a reasonable history, but the unit clerk that has entered the Head CT requisition has chosen, "Rule out Pneumonia" as the reason for the study, it is helpful for the dictating staff the next day if you include a short section in the findings section of your report of "additional patient history". Also useful to add any additional information that may explain why you did or didn't do something (ex. Patient refused oral contrast or was uncooperative with exam or in too much pain etc etc.)

Regarding the content of your report, keep it as brief as possible. You do not need to mention the 1cm adrenal adenoma. If the study is negative for why it was ordered, the phrase, "No acute abnormality seen" as the entire report is sufficient, and if any incidental findings won't change management tonight.

I realize that last sentence is open to interpretation, and yes you should pay attention to that adrenal mass and if it's anything other than a benign adenoma, then people should know about it tonight.

It's always help to follow up on the final reports on cases you've prelimed and learn from any errors.

Contrast Guidelines

The science of the side effects of iodinated intravenous contrast is far from perfect and constantly changing. This is dangerous stuff, and a 150cc injection of 320mg/mL Visipaque is an injection of 48g of Iodine - 48g!

There are basically three things that can go wrong when someone is being administered iodinated IV contrast:

1. An allergic-type reaction (e.g. hives, anaphylaxis, hypotension, hypertension, bradycardia).
2. An organ-specific reaction (see table below)
3. Extravasation of contrast due to interstitial injection

The next section of this document has some quick guidelines for treating the first category. The described types of organ-specific reactions are:

Organ	Reaction
Adrenal glands	Hypertension - small risk in patients with pheochromocytoma
Brain	Headache, confusion, dizziness, seizure, rigors, loss of consciousness, loss of vision
GI Tract	Nausea, vomiting, diarrhea, intestinal cramping
Heart	Hypotension, dysrhythmia, PEA, acute CHF
Kidney	Oliguria, hypertension, contrast-induced nephropathy
Pancreas	Swelling / pancreatitis
Respiratory	Laryngeal edema, bronchospasm, pulmonary edema

system	
Salivary glands	Swelling / parotitis
Skin and soft tissues	Pain, edema, flushing, erythema, urticarial pruritis, compartment syndrome (from extravasation)
Thyroid	Exacerbation of thyrotoxicosis
Vascular system	Hemorrhage, thrombophlebitis

Patients With Known IV Contrast Allergies

Patients with a history of a prior allergic reaction to contrast media can have an up to five fold increased likelihood of experiencing a subsequent reaction. Your first question should be: Does this study really require IV contrast? And your second question should be: Can I use another modality here? If the answer to the first is yes, and the answer to the second is no, then a pre-medicaton protocol should be used. These protocols and their guidelines for use are described in the ACR Contrast Manual, but check for any superseding VCH/SPH protocols, and as always - talk to the patient first. (the 2020 ACR manual: https://www.acr.org/-/media/ACR/Files/Clinical-Resources/Contrast_Media.pdf)

Patients With Limited Renal Function

On a day-to-day basis, you *will* have to deal with the risk of contrast-induced nephropathy (CIN) because you *will* be asked to perform scans with IV contrast on patients with limited renal function. The policy at VGH now is that a GFR>30 is acceptable for IV contrast administration. Still recommend pre-hydration to the clinical team as appropriate.

Before any scan is performed with IV contrast, the patient's renal function has to be known. The exception to this is when it is a case of such urgency (e.g. polytrauma, AAA rupture, code stroke within window for intervention) that the benefit of the diagnosis greatly outweighs any possible complication. The other people who get a 'free pass' in terms of being able to scan patients with limited renal function are ICU patients. Because the ICU has the ability to dialyze any patient they need, they can deal with the complications of CIN. This is not to say that you shouldn't have the conversation - you should *always* have the conversation about renal function (remember: primum non nocere), but it's OK to scan with IV contrast if it's one of these two conditions. Write the name of the clinician who agreed to proceed with a

GFR<30 on the requisition and document that. It is up to the ordering physician to decide. You should be familiar with the basic risks (which frustratingly are a little controversial) and inform them however. Refer to the ACR manual.

Assuming that it is for a more routine on-call indication, every patient needs a GFR either done by the lab (eGFR) or a calculated GFR based on creatinine/Cockcroft-Gault from within 72 hours of their scan.

Clinical Practice Standard: Contrast Induced Nephropathy Prevention Guidelines

NOTE that more current data exists, the guidelines have not been updated.

DEPARTMENT: Integrated Medical Imaging

MODALITY: Computed Tomography and Interventional Radiology/Angiography

APPROVED BY: Integrated MI Medical Practice Leadership, BC Provincial Renal Agency

POLICY NUMBER: Numbering system still to be determined

CONTRAST INDUCED NEPHROPATHY PREVENTION GUIDELINES

1. Purpose

To ensure that Integrated Medical Imaging Departments (FHA, PHC, PHSA, VCH) identify patients at risk for Contrast Induced Nephropathy (CIN) and take appropriate measures to prevent CIN for patients receiving intravascular iodinated contrast media.

2. Statement

2.1 Outpatients require Serum Creatinine (SCr) and eGFR within 3 months of examination.
2.2 Inpatients require SCr and eGFR within 72 hours of examination.
2.3 Protocols are based on the 2011 Canadian Association Radiologists Consensus Guidelines for the Prevention of Contrast Induced Nephropathy and consultation with the BC Provincial Renal Agency.

2.4 The protocols establish a “reasonable standard” – individual cases may require alternate approaches depending on physician judgment.
2.5 Protocols apply to adult patients (> 19 years of age).
2.6 All patients receiving intravascular contrast will complete, or have completed for them, a prescreening questionnaire prior to the examination.
2.7 Medical Radiation Technologists and/or Nurses will screen each patient prior to administering contrast media.

3. Scope

This clinical practice standard applies to all Medical Imaging Staff involved in pre-screening adult patients for intravascular contrast media injection in FHA, PHC, PHSA and VCH.

4. Principles

The risk factors for CIN are:

- Diabetes mellitus
- Renal disease or Solitary kidney
- Sepsis or Acute Hypotension
- Dehydration
- Age > 70 yrs
- Previous chemotherapy
- Organ Transplant
- Vascular disease

Contrast induced nephropathy (CIN) is an acute decline in renal function that occurs 48 – 72 hours after intravascular injection of contrast medium. These guidelines will be used to identify and
manage patients that are at risk for CIN. **Patients on**

Metformin:

Patients can continue taking this drug up to the time of the intravascular contrast injection.

If the eGFR is > 60 mL/min -, the patient can continue Metformin after the injection of contrast media. The very minimal risk of CIN and Metformin induced lactic acidosis is outweighed by the risk of stopping Metformin.

If the eGFR is ≤ 60 mL/min -, Metformin should be stopped for 48 hours following intravascular contrast injection. Metformin therapy can be restarted if renal function is normal (< 25% change from baseline).

Nephrotoxic Drugs:

It is recommended that whenever possible nephrotoxic drugs should be withheld 48 hours prior to IV contrast injection for patients with eGFR < 60 mL/min. The referring physician needs to determine if the nephrotoxic drugs can be safely withheld. Listed below are some examples of nephrotoxic drugs.

NSAIDs/Amphotericin B/Aminoglycoside antibiotics/ACE inhibitors/Diuretics/Vancomycin/Some chemotherapy drugs

5. Procedures

Outpatients:

All outpatients require SCr and eGFR within 3 months of scheduled procedure.

Inpatients:

All inpatients require SCr and eGFR within 72 hours of scheduled procedure.

6. Risk Assessment and Prophylactic Strategies

eGFR ≥ 60 mL/min	eGFR 30 – 59 mL/min	eGFR < 30 mL/min
• Avoid dehydration • No specific intervention needed. Proceed with examination	• Avoid dehydration • Hold nephrotoxic drugs (NSAIDs, ACEi, ARBs and diuretics) for 24-48 hours prior to IV contrast • Consider alternate imaging examinations not involving contrast media • Minimize contrast volume • Avoid repeat iodinated contrast exams within 48 hrs	• Avoid dehydration • Hold nephrotoxic drugs (NSAIDs, ACEi, ARBs and diuretics) for 24-48 hours prior to IV contrast • Radiologist to discuss examination with referring physician • IV hydration recommended • Follow up SCr and eGFR in 48 – 72 hrs • Consider alternate imaging examinations not involving contrast media • Minimize contrast volume • Avoid repeat iodinated contrast exams within 48 hrs

Contrast Reactions – Acute Management

All contrast reactions, and treatments administered, and further management need to be documented in the patient chart by you. The following guidelines for treatment of acute reactions in adults are taken from the ACR Manual 2020. Note following refers to management in adults and not the pediatric population (less relevant for call).

Urticaria

1. Discontinue injection if not completed
2. Monitor vitals and preserve IV access
3. No treatment needed in most cases
4. Give H1-receptor blocker: diphenhydramine (Benadryl®) PO/IM/IV 25 to 50 mg
5. If severe or widely disseminated:
    a. Pulse oximeter
    b. O2 by mask 6-10L/min
    c. If normotensive, observe.
    d. If hypotensive –
        i. IV NS (0.9%) or Ringer's Lactate 1L bolus
        ii. If unresponsive to fluid bolus, give alpha agonist (arteriolar and venous constriction): epinephrine IM(1:1000) 0.3mL (0.3 mg); can repeat every 5-15 min up to 1mL OR*** epinephrine(1:10 000) IV (preferred) 1 mL; can repeat every few minutes as needed up to 10 mL
        iii. CALL FOR HELP (ASK ER PHYSICIAN TO COME)_

Facial or Laryngeal Edema

1. Preserve IV access, monitor vitals, pulse oximeter
2. Give O2 by mask 6-10L/min
3. Give epinephrine **IM(1:1000)** 0.3mL (0.3 mg); can repeat every 5-15 min up to 1mL OR*** epinephrine(**1:10 000) IV** (preferred in setting of hypotension) 1 mL; can repeat every few minutes as needed up to 10 mL
4. IF NOT RESPONSIVE, CALL FOR HELP (ASK ER PHYSICIAN TO COME)/CODE BLUE

Bronchospasm

1. Preserve IV access, monitor vitals, pulse oximeter
2. Give O2 by mask 6-10L/min
3. Give beta-agonist inhaler; albuterol [Ventolin®]) 2 to 3 puffs; repeat up to 3 times.
4. If unresponsive to inhalers, give epinephrine IM(1:1000) 0.3mL (0.3 mg); can repeat every 5-15 min up to 1mL OR*** epinephrine(1:10 000) IV 1 mL (**administer slowly in running IV infusion of fluids or saline flush;** preferred in setting of hypotension); can repeat every few minutes as needed up to 10 mL
5. IF NOT RESPONSIVE, CALL FOR HELP (ASK ER PHYSICIAN TO COME)/CODE BLUE

Hypotension with Tachycardia (Pulse > 100bpm) (anaphylactoid)

1. Preserve IV access, monitor vitals, pulse oximeter
2. Give O2 by mask 6-10L/min
3. Elevate legs at least 60 degrees
4. IV NS (0.9%) or Ringer's Lactate 1L bolus
5. If unresponsive to fluids, give epinephrine IM(1:1000) 0.3mL (0.3 mg); can repeat every 5-15 min up to 1mL OR*** epinephrine(1:10 000) IV 1 mL (**administer slowly in running IV infusion of fluids or saline flush;** preferred in setting of hypotension); can repeat every few minutes as needed up to 10 mL
6. If still poorly responsive seek appropriate assistance (e.g. cardiopulmonary arrest response team)

Hypotension with Bradycardia (Pulse < 60bpm) (Vagal Reaction)

1. Preserve IV access, monitor vitals, pulse oximeter
2. Give O2 by mask 6-10L/min
3. Elevate legs at least 60 degrees
4. IV NS (0.9%) or Ringer's Lactate 1L bolus
5. If unresponsive to fluids, Atropine 0.6-1 mg IV (administer into running IV infusion of fluids; can repeat up to 3mg total).
5. IF NOT RESPONSIVE, CALL FOR HELP (ASK ER PHYSICIAN TO COME)/CODE BLUE

Hyertensive Crisis (Diastolic BP > 120 mmHg or Systolic BP > 200 mmHg; symptoms of end-organ compromise)

1. Preserve IV access, monitor vitals, pulse oximeter
2. Give O2 by mask 6-10L/min
3. Give labetalol 20 mg IV, administer slowly over 2 minutes, and double dose q 10 min (40mg, 80mg, etc.)_up to 300 mg
4. Alternatively, if labetalol not available, Nitroglycerin SL 0.4 mg tablet, repeat q 5-10 minutes AND give Lasix 40 mg IV administer slowly over 2 minutes
5. CALL FOR HELP (ASK ER PHYSICIAN TO COME)/CODE BLUE

Seizures or Convulsions

1. Observe and protect the patient
2. Turn patient on side to avoid aspiration
3. Suction airway, as needed
4. Preserve IV access, monitor vitals, pulse oximeter
5. Give O2 by mask 6-10L/min
6. IF NOT RESOLVING, CALL FOR HELP (ASK ER PHYSICIAN TO COME)/CODE BLUE
7. Give Lorazepam IV 2-4 mg IV, administer slowly to maximum dose of 4mg

Pulmonary Edema

1. Preserve IV access, monitor vitals, pulse oximeter
2. Give O2 by mask 6-10L/min
3. Elevate head of bed (30 degrees)
4. Give Lasix 40 mg IV administer slowly over 2 minutes
5. CALL FOR HELP (ASK ER PHYSICIAN TO COME)/CODE BLUE

Hypoglycemia

1. Preserve IV access, monitor vitals, pulse oximeter
2. Give O2 by mask 6-10L/min
3. If patient able to swallow safely, oral glucose – 2 sugar packets or 15g of glucose table/gel or ½ of fruit juice
4. Otherwise, D50W 1 ampoule (25 grams) IV administered over 2 minutes and D5W at 100 mL/hour
5. If not IV access, glucagon IM 1mg
6. IF NOT RESPONSIVE, CALL FOR HELP (ASK ER PHYSICIAN TO COME)/CODE BLUE

Extravasation of Contrast Media

The following information is taken from [2] - refer to the ACR Contrast Manual for further details:

There is no clear consensus regarding effective treatment for contrast medium extravasation.

Initial Symptoms and Signs

- Swelling, tightness, stinging, burning pain at extravasation. Some experience little or no discomfort. On physical examination, extravasation site may be edematous, erythematous and tender.

Evaluation

- Ask about symptoms of pain and paresthesias
- Brief exam: assess for tenderness, swelling, erythema, active and passive range of motion of the fingers, and perfusion.
- Document in patient's chart: site of injection/extravasation, material injected, estimated volume of interstitial injection, neurovascular status of limb distal to injection, physical exam findings.

Treatment:

- Close clinical follow-up for several hours is essential for all patients in whom extravasations occur
- Elevation of the affected extremity above the level of the heart to decrease capillary hydrostatic pressure and thereby promote resorption of extravasated fluid is recommended.
- There is no clear evidence favoring the use of either warm or cold compresses in cases of extravasation. As a result there are some radiologists who use warm compresses and some who use cold compresses. Those who have used cold have reported that it may be helpful for relieving pain at the injection site. Those who have used heat have found it helpful in improving absorption of the extravasation as well as in improving blood flow, particularly distal to the site. Nonetheless, many surgeons recommend initial use of cold compresses.
- Aspiration is not recommended. Do not inject other material such as corticosteroids to the extravasation site.
- Clear instructions should be given to the patient to seek additional medical care, should there be any worsening of pain, swelling, or should the patient develop paresthesias, diminished range of motion of the fingers (active or passive), skin ulceration, or other neurologic or circulatory symptoms
- Plastic surgical consultation prior to discharge should be obtained

whenever there is concern for a severe extravasation injury.

- An immediate surgical consultation is indicated for any patient in whom one or more of the following signs or symptoms develops: progressive swelling or pain, altered tissue perfusion as evidenced by decreased capillary refill at any time after the extravasation has occurred, change in sensation in the affected limb, worsening passive or active range of motion of the elbow, wrist, or fingers, and skin ulceration or blistering. **It is important to note that initial symptoms of a compartment syndrome may be relatively mild (such as limited to the development of focal paresthesia).**
- Those at higher risk of extravasation:
  - Those unable to communicate
  - Severely ill or debilitated patients
  - Patients with abnormal circulation in injected limb
  - Those with vascular disease or prior vascular treatment (both arterial and venous)
  - Certain access sites more likely to result in extravasation (hand, wrist, foot, ankle) -> although may be necessary due to lack of availability of more traditional locations.
  - Indwelling peripheral IV more than 24 hours, and IV's requiring multiple punctures

REITERATE IMPORTANCE OF DOCUMENTATION OF EVENTS AND TREATMENT BOTH IN CHART AND DICTATION. NOTIFY THE REFERRING PROVIDER IN THE EVENT OF A REACTION.

PICC, Line, and Tube Placement

Throughout your evenings on call, you will invariably be telephone by different services throughout the hospital, asking you to interpret an X-ray image for line or tube position.

Unfortunately, the person calling you is usually a nurse who is trying to fill orders to administer medication via the line in question, and he or she really just wants to know whether or not it is 'OK to use' this line.

It is important to understand the concept that without orthogonal views, it is impossible to reliably indicate line position, and to tell a person whether it is OK to use a line or not. With a single frontal view, a central line that appears to be in good position in the jugular vein/SVC could just as easily be in the carotid artery/brachiocephalic artery, and most definitely be not okay to use. That feeding tube that looks like it is in the stomach could be through an esophageal perforation and be sitting in the costophrenic recess.

With only a single view however, it is certainly your job to tell people where a line is 'projected over', and then leave it up to them (or the clinician) to determine whether or not this line is OK for its intended use.

Sometimes you need to spell this out to the caller and tell them, "I can not tell you whether or not a line is OK to use with a single view; I can only tell you where the line is projected over. Please call the clinical team if you need to know if this line is OK to use". However, many people do say it is ok and give the nursing team the go ahead to use – you will get varying staff opinions on this.

PICC Lines (see diagram in Appendix D): the landmark which we use is the carina which is usually a structure that is fairly easy to visualize on a frontal radiograph. We tell IV therapy team member where the PICC tip is, in relation to the carina. The ideal location for a PICC line is between 6-7cm (or two vertebral body heights) below the carina, i.e. at the cavoatrial junction.

NG Tubes: Again, the risk with NG tubes is that they could be through a perforation in the airway or along the enteric tract and be outside the lumen of the gut. Just provide an assessment of location in terms of "the NG tube is projected over the patient's stomach". Ensure that the **side-port** is below the expected location of the gastroesophageal junction.
Although this seems redundant as well as obvious please remember to exercise patience and remain courteous when it comes to the answering questions regarding PICC line and NG tube placement. It can be frustrating dealing with such phone call on any night but it remains a part of our job.

Studies from other Institutions

You are not licensed to review studies performed at outside institutions, and thus you should not do so. A radiologist somewhere has been paid to review that study, so you should have the referring clinician/resident get in touch with the originating hospital to get a copy of their report.

That being said, you should always be helpful. If someone has a CD from an outside hospital, and needs technical help with it, you should just let them know that you're not licensed to review the study, but you can help them try to load it on your PACS workstation so that they can view it.

You can help yourself if a patient has previous relevant imaging at another hospital in the province that you need pushed to WebDI. The film library staff, or after hours, the on-call inpatient X-ray admin staff can contact other hospitals, and have studies pushed/pulled to/ from WebDI to assist you.

That said, if you provide an interpretation of outside imaging, YOU MUST HAVE THE REQUESTING CLINICIAN ENTER A REQUISTION FOR "A REVIEW OF OUTSIDE IMAGES" SO THAT A TRACK RECORD EXISTS AND THE STAFF RADIOLOGIST ALSO REVIEWS THE IMAGES IN THE AM IN ORDER TO PROVIDE A FINAL REPORT AND MAKE SURE YOUR INTERPRETATION IS CONCORDANT.

Before You Head Home in the AM

1. It's been a long night. You're brain stopped working at around 4am, you haven't had a shower in 20 hours, and the only thing you've eaten since noon yesterday was that bag of gummi bears you washed down with a large double-double from Tim Horton's. It's time to go home.
2. But before you do go home to eat, sleep, engage in some post-call retail therapy, and start to obsess about that case where you thought there might have been a subtle parenchymal hemorrhage, there are a few things that you need to do:
3. **Leave the pager (SPH)** - the person the next day needs it. This is critical. More critical is you not coming back to the hospital to drop it off when you wake up.
4. **Visit the Ultrasound Department**, and ensure that you speak with the front desk staff about any studies that you were called about last night that have to happen in the morning. Ensure they have requisitions for these studies and that they are scheduled/ protocoled appropriately. This is actually far more critical. Letting patients get 'lost' because no req got put in even after you agreed to ensure the study got done in the AM isn't acceptable; you accepted the consult – and the responsibility. Also make sure you CLEANED the US machine if you used it.
5. **Talk to the day fellows** and/or staff about any CT studies from last night that are still pending, and ensure that the study is protocoled, and that the CT techs (or for inpatients, that the CT booking desk staff) know about them.
6. **Review any questionable cases**, or particularly acute/high priority cases where you think a radiologist needs to know about them ASAP with the appropriate radiology staff.
7. **Pat yourself on the back**. It's been a long night. You've earned your rest.

Final Words

You'll get through call. We all do. Yes, it's getting tougher every year, but we get more and more concessions that make it easier every year as well.

If it seems unbearable - and for some people it really does become unbearable, talk to someone. Talk to your mentor, talk to the program director, talk to the chief residents. If you don't like what you hear, talk to someone different until you find someone who lends you a sympathetic ear and has the advice you need to hear.

And be sympathetic to your fellow residents. Some people just get slaughtered on call while others have good luck. Some have terrible cases that are just bad luck where patients get hurt. And just remember - your next night on call - it could be you, so help out your fellow residents whenever you can. *Schadenfreude* isn't something that any of us can afford.

And no matter how hard you try, you will lose your temper at some point in time. It's important to track the person down the next day, and just say you're sorry. Don't attempt to justify it - you were wrong - just say you're sorry.

And at some point in time, someone will lose their temper with you, and they *won't* say they're sorry. Unfortunately, it's just something we have to live with. But if you do feel unfairly singled out, or are the victim of an abusive, personal attack, don't hesitate to tell the program director. Sometimes these problems arise, and the person causing the problems needs to have their issues addressed professionally. There is already a framework in place in the hospital/university for dealing with these situations, so don't hesitate to engage it when it's needed. And if you go to the program director, or department head, or whoever, and they ignore or downplay or minimize your complaint, then talk to Resident Doctors of BC or Doctors of BC if you still feel that you haven't achieved resolution. They're your union, and that's one reason why they're there.

So - welcome to the adventure of radiology call. I'd say good luck, but that's supposed to be bad luck. I'd say 'break a leg' - but better that you see the broken leg rather than break your own. Instead, just go out there, try to help, remember that we're all a little crazy, and try to have some fun. It's what you signed up for, after all.

Resources and Links to Help You On-Call

Schedules and UBC:

	Link	Username	PW
VGH staff schedule	https://lblite.lightning-bolt.com/?origin=http://lblite.lightning-bolt.com/viewer	VCHUBC	vch2015
SPH Staff schedule	https://cernpss.physicianscheduler.com/Prod/STDRCD/Login.aspx?ReturnUrl=%2fProd%2fSTDRCD%2fWebScheduling%2femp%2fdaily.aspx	Guest	Leave blank
UBC Radiology Website Call and NF schedules	https://postgrad.radiology.med.ubc.ca/		Radioactive
Call change form	https://postgrad.radiology.med.ubc.ca/rot-call-schedules/call-schedule-change-request-form/		
Grand Rounds Schedule	https://radiology.med.ubc.ca/grand-rounds/radiology-schedule/		
Neuroradiology Website (protocolling and rotation info)	http://neuroradiology.ca/	Make one at start of rotation	

Quick References:

- StatDX - http://my.statdx.com
- IMAIOS (e-anatomy) - http://www.imaios.com/en
- Radiographics - http://radiographics.rsna.org
- ACR Manual on Contrast Media - https://www.acr.org/-/media/ACR/Files/Clinical-Resources/Contrast_Media.pdf
- ACR Radiation in Pregnancy - https://www.acr.org/-/media/ACR/Files/Practice-Parameters/pregnant-pts.pdf
- Radiation risk calculator: https://www.xrayrisk.com/calculator/

Other:

1. The CMPA (get your insurance) - http://www.cmpa-acpm.ca
2. The Primer - get a copy (paper or electronic) - it's a lifesaver.

Lecture Resources

AUR - https://radiologyresidentcorelectures.com/
ASER - https://veritastv.org/programs/collection-callprep
Entrada (UBC) - https://entrada.med.ubc.ca/community/radiology
Neuro - https://www.asnr.org/education/neurocurriculum-live/
MSK - https://radiologycorelectures.org/msk/
ARRS (requires login) - https://www.arrs.org/ARRSLIVE/Education/WebLectures/ARRSLIVE/Education/WebLectures.aspx?hkey=7539443f-75cc-4eb2-a683-778f81e80e9c

Recommended Books

1-Interpretation of Emergency Head CT: A Practical Handbook
A good book to start with to learn basic Brain CTs , one of the most common studies encountered oncall.

2-Emergency Radiology by Krishnam.
Shows a vast majority of oncall cases . Another good book to start with and familiarize your self with what you might see oncall.

3- Accident and Emergency Radiology: A Survival Guide

Good for plain film trauma.

References

1. Provenzale JM, Kranz PG. Understanding errors in diagnostic radiology: proposal of a classification scheme and application to emergency radiology. Emerg Radiol (2011) 18:403–408

2. American College of Radiology. Manual on Contrast Media v7. (2010) Downloaded October 27, 2011 from: http://www.acr.org/SecondaryMainMenuCategories/quality_safety/contrast_manual/FullManual.aspx3.

3. Consensus Guidelines for the Prevention of Contrast Induced Nephropathy, Canadian Association of Radiologist. Owen RJ, Hiremath S, Myers A, Fraser-Hill M, Barrett B. June 17, 2011.http://www.car.ca/uploads/standards%20guidelines/2011061 7_en prevention_cin.pdf

Appendix A: VGH After-Hours Emergency Patient Ultrasounds

Residents & Fellows

1. Once the request has been placed in order entry call inpatient x-ray clerk local **62520** with the patient name, MRN and exam requested.

2. The clerk will schedule the ultrasound and you will be able to look-up patient under worklist on the ultrasound machine. Most techs will print the requisition themselves but some will ask you to bring it. You can print ultrasound requisitions similar to CT requisitions described previously on PCIS.

3. Upon completion of the scan, images are sent to PACS. If you need to take more images, go back and find the patient in the worklist. Additional images will amend to PAC once you end the exam. If more images are required follow the instructions to "restart" the case.

4. Call inpatient x-ray clerk local 62520 once the exam is complete and images are available on PACS. Provide start time and end time and your name to the clerk. You will not be able to dictate the study without completing it first. If you complete the study, the patient will no longer show up on the worklist on the ultrasound machine. If you need to add more images, you need to call the techs to open the study again. Therefore, make sure you are happy with the images before completing a study.

5. If needed for EV scans (mandatory for all male residents), chaperones should be a female nurse.

6. An inpatient Radiographer will complete the exam in IDX with begin and end time and the Residents name and scan the requisition. Bring the completed req back to inpatient x-ray with the time of the ultrasound listed on the back.

HOUSEKEEPING – VERY IMPORTANT

You MUST tidy the ER US room after use. This includes:

- Throw away any debris.
- Changing sheets to clean sheets.
- Wipe down all probes and cords.
    - EV probe: **Please wrap it in a damp cloth and place it in the bin near the door to the room.** It is very difficult to clean if the debris is hardened. This is for infection control and safety of subsequent patients. *These probes are also very expensive to replace and costs are into the thousands, so also please do your best to also not run over any of the cords for any of the probes (this has happened in the past and the probe replacement costed $20,000).*

If you come on shift and the last resident has not done this, PLEASE do it for them ☺ Call can get busy and it's important to help each other out.

Appendix B: VGH ER2/ER3 Official Policy (as of June 2020)

ER2/ER3 POLICY:

The staff are aware to optimize/preserve the resident educational experience of graded responsibility in the traditional after-hours period.

The residents will continue their consultant role with the ER physicians and be the primary contact person, retain responsibility for protocoling studies and make the preliminary call. Of course the degree of this responsibility will be PGY level dependent. The residents will receive feedback/guidance on their management and interpretation skills.

If the night is slow, then the residents will interpret plain films and read them out with staff.

1. The resident working in the ER after-hours will be responsible for interpreting CT scans performed on ER, Trauma and ICU patients with the ER staff radiologist working that evening/night.

2. The resident will give preliminary reads on exams requested by the inpatient clinical service. This includes PICC line positioning, and results of an inpatient CT completed that evening/night.

3. If the resident is unsure of any of the findings on inpatient exams, he/she will consult the ER staff radiologist or contact the appropriate fellow or staff radiologist on call, if the study is not in the ER staff's scope of comfort.

4. The resident is not required to review all inpatient cases that are scanned that evening on the ER CT scanner, only those which have been handed over to the resident by the radiologist/fellow, those that are marked as STAT/URGENT, or at the request of the clinical service. Please note that inpatients are being scanned in the evening to expedite imaging of these inpatients, but the residents do not have to review these cases, unless requested to do so. The resident can ask the ER Rad for an opinion and if it is not in the scope of the ER Rad, then the appropriate fellow/staff would then be consulted.

5. For Neuro/Neurosurgery CT/CTA cases: If the resident is not sure of the findings, he/she will run it by the ER2/3 radiologist. If the ER2/3 radiologist is also unsure, then the neuro fellow on call will be contacted. Neuro CTAs that are part of a trauma series will be taken care of by the ER2/3 radiologist/fellow. They will contact the neuro fellow on call if they are concerned about any finding on a neuro CTA.

For PGY2s: Only neurology/neurosurgery CTAs are on the mandatory callback list (not CT heads). PGY2s will review the case with the ER2/ER3 radiologist, or if questions remain, with the neuro fellow.

Again for all the residents: a reminder to use the protocol sheets and if you have ANY questions or have ANY UNCERTAINTY about protocoling or interpretation of an inpatient case, please contact the appropriate fellow, unless of course the ER2/3 staff also works in the appropriate section.

Appendix C: VGH/UBCH PGY-2 Mandatory Call-Back List (as of Jan 2020)

The following exams are mandatory calls for inpatients interpreted by one of our PGY-2s.

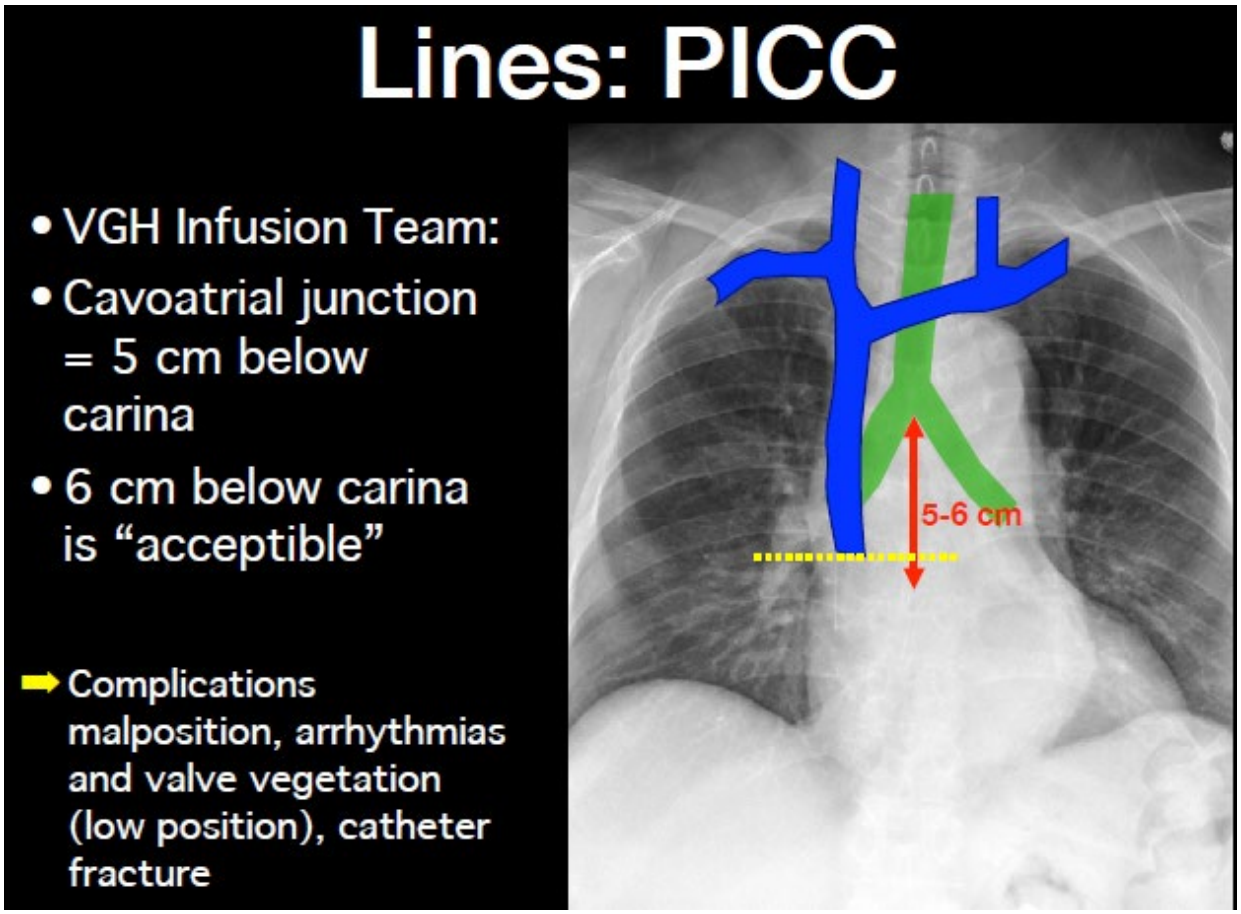
1. Unsure of findings that may affect patient management /disposition before 0800h.
2. All IR body CTA cases (call IR Fellow)
3. CTA Neuro, specifically requested for review (review with ER staff, if there are any concerns call Neuro Fellow)
4. CT Ischemic bowel protocol (call Abdo Fellow
5. ICU Abdominal CT cases (call Abdo Fellow)
6. ICU/PAR or organ transplant ultrasounds (call Abdo Fellow)
7. Ectopic ultrasound (call Abdo Fellow)
8. Testicular or ovarian torsion ultrasounds (call Abdo Fellow)
9. Any MR (call appropriate subspecialty)
10. Any interventions (call appropriate subspecialty)

This list may be subject to change in the future. An updated list will be sent around before call starts pending department updates.

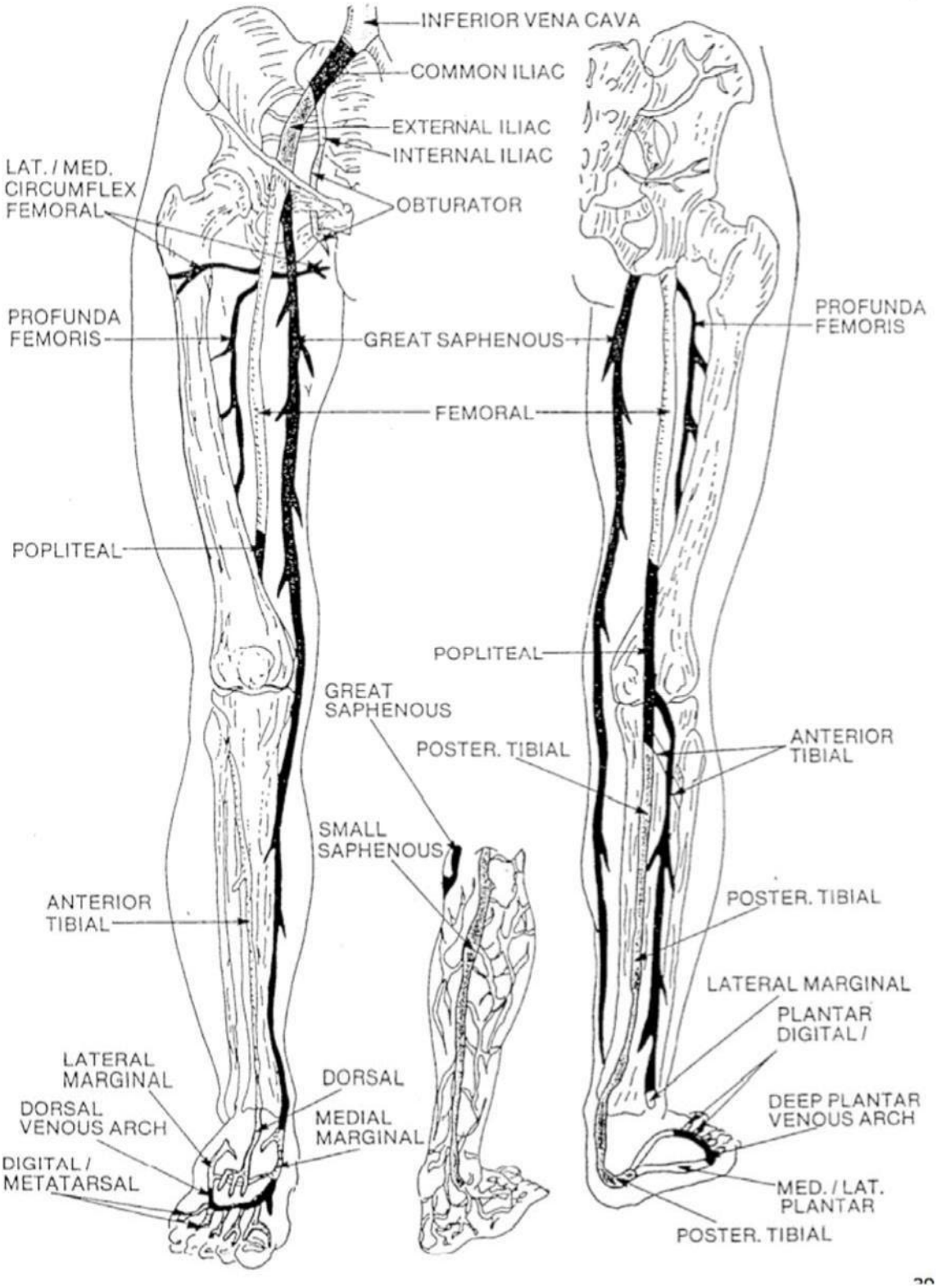
Interventional radiology	**Abdominal radiology**
▪ Enteroflex or NG tube insertion ▪ Biliary and gastric tube check/repositioning ▪ PTC ▪ Cholecystostomy tube insertion (in the radiology department)	▪ US and CT guided drainages ▪ ICU portable cholecystostomy tube insertion ▪ Diagnostic GI requests: gastrograffin swallows, hypagque enemas etc

Non-vascular Procedures Performed by IR vs Abdominal Radiology

Appendix D: PICC Line Placement Diagram



From Dr. Sedlic's lecture


INFERIOR VENA CAVA
COMMON ILIAC
EXTERNAL ILIAC
INTERNAL ILIAC
OBTURATOR
LAT. / MED. CIRCUMFLEX FEMORAL
PROFUNDA FEMORIS
GREAT SAPHENOUS
FEMORAL
POPLITEAL
GREAT SAPHENOUS
SMALL SAPHENOUS
ANTERIOR TIBIAL
LATERAL MARGINAL
DORSAL VENOUS ARCH
DIGITAL / METATARSAL
DORSAL
MEDIAL MARGINAL
PROFUNDA FEMORIS
POPLITEAL
POSTER. TIBIAL
ANTERIOR TIBIAL
POSTER. TIBIAL
LATERAL MARGINAL
PLANTAR DIGITAL /
DEEP PLANTAR VENOUS ARCH
MED. / LAT. PLANTAR
POSTER. TIBIAL

Appendix F: Sample Study Tracking List

- VGH has their own similar pre-printed ones

VGH INPATIENT TRACKING LIST

Patient Name	Patient MRN	Study Type	Indication	Ordering Dr/Service	Contact #	Protocolled?

VGH PHONE NUMBERS

ER Unit Clerk: 54995 (option 1)

CT	
CT 1	63765
CT 2	63763
CT 4	63418
CT ER	69412
CT CATH LAB	62264
CELIA/RITA	54287
CT ER FAX	55764
CT CLERICAL	63444
CT CLERICAL FAX	55453
FISHBOWL CLERK	67798
RON	61761
(pgr 604-686-0141)	
KAREN M	63711

RADIOLOGISTS	
NEURO	62307
CHEST	63766
ABDO	67237
BONE	68424
ER	55516
Rad Res pgr 604-205-1653	

IMAGING	
ANGIO	78126
BIOMED	54288
CATH LAB	62264
DAYBED	54078
DIAMOND XRAY	67162
FILM LIBRARY	63741
GIGU	68937
GIGU Rm 4/5	66695
IN PT XRAY	63743
LITHO	54494
MRI	62279
NUC MED	63471
OR XRAY	66353
OUT PTS	54287
PACS	68517
(on-call pgr 604-871-7904)	
PAYROLL	55413
SERVICE	68585
ULTRASOUND	66003

EMERGENCY	
TRAUMA	66589
ACUTE A	66585
	63555
	62393
ACUTE B	61141
	66586
TREATMENT	62883
	69741
DTU	62228
MAU	54561
PAU	62890
TRIAGE	62975
ADMITTING	62238
CHARGE NURSE	54675

ICU	
CLERK	54275
ICU 1 (BED 1-7)	54232
(BED 7)	66869
(BED 8-19)	54275
ICU 2 (BED 20-27)	54525
CSICU	62230
	54277
NICU (T5A)	54281
CCU	
CCU 1	54312
CCU 2	54210
BPTU	54030
OR	66310
PAR	66300
PCC (SDAC)	54488

HEATHER PAVILLION	
D10	55105
BP3	62531
BP4	62533

WARDS	
T4 A/B/S	NONE
T4C	54330
T4D	54822
T4F	61604
T5A NICU	54281
T5B	54188
T5S	54281
T6A	54530
	55530
T6B	55279
T7A	54053
T7D	54984
T8A	54186
T8B	54170
T8S	68920
T9A	54169
T9B	55278
T9D	61911
T9S	55080
T10C	55131
T10H	54182
T10F	54561
T10S	62827
T11A	54394
T11D	55136
T12 RAU	61312
T12A	54094
T12B	54174
T12S	63969
T14C	55569
T14D	54561
T14E	54172
T14F	54561
T14S	62382
T15A	54343
T15B	68583
T16 (PCU)	54715

HEALTH CENTER	
E1	62660
E2	55720
W1	62558

CENTENNIAL PAVILLION	
C5A	54056
C5B (W3)	54414
C6AB (BMT)	63608
C6C (CELL SEP)	54962
C6D (DVT)	69275
C7AB	55762
C7CD	55783
C8AB	55569
C8CD (TB2)	62599
C9AB (SDU)	55800
C9B (after 3pm)	69175
C9CD	55800
C10AB	54364
C10C	54638

OTHER AREAS	
ARAMARK	604-694-6300
BC BEDLINE	604-215-5911
BMT	63608
DIALYSIS	54181
ECG	66696
ECHO	63246
ESCORT	63121
HELP DESK	54334
IDX PRINTER HELP DESK	62086
INTERPRETER	54566 / 604-297-8400
IV THERAPY	63855 / 870-3066
LAB RESULTS	1-800-992-8801
LAB VGH	61381 / 875-4123
LINEN	54123
OP LAB	61071
PCC (PERI-OP)	54488
PHARMACY	62481 / 870-3388
	(fax 63616)
POWER PLANT	66999
PATIENT ESCORT	63121
RESP EQUIPMENT	870-3446
RESP THERAPY	66349 / 870-3354
SLINGS	473-3065
SPLINT ROOM pgr	62737 / 870-3065
TB CONTROL	604-660-6100
TELEPHONE REPAIR	64334

VGH RADIOLOGY DEPARTMENT
TELEPHONE LIST

Revised Sep 11/19 v2

RADIOLOGISTS		iPHONES
Ali, Ismail		313-1747
Andrews, Gordon		358-4631
Barrett, Sarah		790-3615
Bilawich, Ana-Maria	68031	839-8813
Buckley, Jean	63728	358-4216
Chang, Silvia	61679	358-4183
Chew, Jason	63016	842-2439
Chu, Sammy	63700	970-5584
Chung, John	66553	679-1137
Guest, Will		221-4266
Hadjivassiliou, Anastasia		679-1162
Harris, Alison	61620	358-4284
Heran, Raju	63384	358-4218
	871-5751 pg	
Ho, Stephen	55253	356-3386
Khosa, Faisal	55516	358-3651
Klass, Darren	68025	236-988-4221
Legiehn, Gerald	62948	358-4286
Liu, Dave	63755	778-887-3548
Louis, Luck	62093	209-1326
Machan, Lindsay	66553	218-5469
Mallinson, Paul		356-2845
Martin, Tanya		358-4615
Mayo, John	63193	358-4156
Muller, Nestor		778-999-3392
Muly, Sudha		778-227-4382
Munk, Peter	63735	358-4132
Murray, Nicolas		354-8482
Ni Mhurchu, Elaine		788-6864
Nicolaou, Savvas	63659	358-4129
O'Neill, Siobhan		358-4620
Ouellette, Hugue	20526	358-4130
Pang, Emily		778-227-5082
Rohr, Axel	63757	314-5851
Sabiq, Farahna		314-7391
Sedlic, Anto ("Tony")	63700	358-4311
Settecase, Fabio	63016	314-0889
Shewchuk, Jason	63759	356-8003
Thakur, Yogesh	67698	871-0741
Vertinsky, Talia	69331/new54620	358-3408
Worsley, Daniel	54629	871-5269
Yee, William	63707	328-0061
Zwirewich, Charles	63705	356-7858
Radiology Switchboard		**54533**
Rad Admin Fax:		**875-5498**
Barton, Brent	314-6608	63696
Behra, Zaheda (Clin.Instr.)	870-3756	63717
Bymoen, Annemarie	778-875-4571	21496
Chitsaz, Ron	655-9357	62161
Friesen, Tim	pg: 877-2985	55417
Hollerbaum, Rhonda	778-928-1514	61079
Janovjak, Martina (Billing Clerk)		63722
Jongedijk, Elizabeth	857-3849	63264
Larson, Susan	614-9206	54052
Marchinkow, Lorie	312-6548	63716
McCullough, Karen	369-8008	63711
Mudri, Michael		264-7667
Pettypiece, Sheila	778-879-6911	77744
Su, Shelley		63719
West, Sean	209-6110	69329
Yim, Samuel	817-0440	69476
Radiology Classroom		68033
Seminar Room		66127
PACS (Cheryl & Roger)-24 HRS pg: 871-7904		68517
CARDIAC CATH LAB		**68080**
LSP OR Karen Moti	pg: 871-1622	66353
DIAMOND CTR (Ultrasound)		**54074/66916**
Techs Fax: 54071		**67176/67178**
EMERG FAX		**68945**
Emerg Fishbowl		67798
Emerg.X-Ray Reception		62520
Emergency X-Ray (Tech.)		54217
Emerg Reporting		55516
Emerg. Bowling Alley		67676/67420/69748
Gen. Inpatient /Tim Friesen		63743/63744
Greek Room		62847
INTERVENTIONAL RADIOLOGY		
Chiu, Rosalin		68263
Nursing Station/IR Inpatient		68612
IR Outpatient booking		55776
IR Injections		54595

FILM LIBRARY		**63741**
Fax:		**875-4508**
Film Desk		66600/66622
Merge Desk (Lori/Barb)		63734/63973
Mattoo, Nelli		62540
Kisbee, Michele		55760
Steen, Deanna		315-1412
Chest Reporting		**61351**
Bone Report Room		**63738/68424**
GI/GU BOOKING		**54770**
Patel, Rina	205-0933 pg	63726
Fluoro Desk		68937/66695
GI Report Room		62990/62991
Lithotripter Control		54494
Litho. Nurse		63737/62668
Litho Room - Uroradiologist		62584
GI.DHCC RADIOLOGY		**67005/67007**
Techs: Fax 54071		**67162**
OP Bone/ Chest @ Blusson		54287/66519
Fax:		**875-5831**
D-REG		66525
Outpatient Tech		66605
MRI RECEPTION		**62279**
Fax:		**875-4175**
MRI Booking		54684
Dobbs, Mindy	877-5983 pg	63128
MRI Viewing (Neuro)		63125/62552
MRI #1(Echo)		63126
MRI#2 (Twin Speed)		68990/63123
Lounge		62545
NEURORADIOLOGY-CT SCAN		**54366**
Fax:		**875-5453**
CT Booking Line		54368
Reception		63444
Bains, Ranjit		66494
Powell, Jen		61761
Fax:		**55764**
CT Emerg.		69412
CT #1		63765
CT #2		63763
CT #4		63418
Cardiac CT		54669
Chest CT Reporting		63766
Abdo CT Reporting		67211/67193/67194
Neuro Reporting		62259/62307
NUCLEAR MED BOOKING (Inpatient)		**63471**
NUCLEAR MEDICINE (Outpatient)		**55369**
Fax: 875-5009 Reception		**63813**
Lu, Minh		66534
RADIOLOGY SERVICE		**68585**
Parin Walji	788-0900	61146
Bruce Krishna	872-9819 pg	61430/ 68585
TRANSCRIPTION (Karen Kaplan)		**61075/63998**
Reports Fax: 54508		**63767**
Husein, Karima		63736
UBC ACADEMIC OFFICE Fax:		**675-3662**
Choi, Loretta		675-3665
Fellowship Program Asst.		23132
Kwan, Ariel		23089
Murphy, Sean		23099
O'Neil, Susanna		23096
Taliani, Marwan		69509
Westman, Wendy		23094
Zarrinkafsh, Soudabeh		23097
UBC HEALTH RECORDS		**54070**
Fax:		**822-7248**
ULTRASOUND reception		**66972**
Fax:		**875-4228**
U/S Booking		68158
Front Desk		66003/66972
Cairnduff, Marion		66627
U/S Report Room		61605/63727/66868
VGH HEALTH RECORDS (Manjit)		**875-4109**
Fax:		**875-5635**
X-Ray BLUSSON		**875-4287**
Fax:		**875-5831**
CROTHALL (Housekeeping)		**1-844-372-1959**
IMITS (Service Desk)		**54334**

SPH PHONE NUMBERS

MDC/MSS	62437
GI Clinic	62713
ICU	62264/62036
ICU Rooms	6330 + room
CCU	62285
SDC	62275/62315
OR	62330
PAR	62273/62274
HAU	63520
CCR/CSICU	62117
3Maternity	62432
SCN	62397
2North	62423
~~**2East**~~	~~62427~~
4NW	62971
5A (5001-5012)	62304/62312
5B (5014-5025)	62646/62870
5C/D CIU/CSS	63256/63255
EMERG	63022/62834
Triage	62282/68016
Fast Track	68766
Trauma Room	62018
Blood Bank	68003
Ward stock	62214
Pharmacy	62173
Pharmacy Fax	68885
└ **Stat**	69634
Cytology	68181
Lab Results	68810
IV Therapy	62284
└ **Pager**	34045
└ **Stat**	63477

6A	68288
6B (6014-6025)	62290/62697
6C (6028-6036)	69017
6D Hemodialysis (5) room	62398/62393/68453 63173
7A (7001-7012)	62501/63928/63248
7B (7014-7025)	62185/62199
7C (7026-7037)	69393/62726
7D (7038-7049)	62389/69279
8A (8001-8012)	62307/62504
8B	68818
8C (8026-8038)	66599/62189
8D MDC/MSS	62010/62437
9A Psych	63927
9B Elder Care	69386
9C (9027-9045)	62462/62837
9D (9032-9037)	62435
10A (1001-1012)	62303/62301
10B (1014-1025)	62189/65189
10C	62187/62176
10D (1041-1049)	62297/62586
Pt Info	68011
Housekeeping	63969
Tower porter pgr	173-184
SPD	62327
ECG pgr	34149
RT pgr	34076
Anesthesia Assistant	34013
Anesthesia Secretary	62813
SPH Cath Lab	63636
VGH Vascular Lab	604-875-4111
	└ ext 68621

Radiology Department:

Main Reception	**62780**
CT Room 21	**62475**
CT Room 15	**63229**
CT Emerg Scanner	**63887/63434**
Emerg Reporting	**63469**
CT Body Hot Seat	**62624**
MRI 1	**63353**
MRI 2	**62677**
PACS Support	**63631**

Appendix G: US Tech Hours (Updated May 2020)

	VGH **Pager 604-872-9755**	**SPH**
Mon	1700-2200*	NO evening tech
Tue-Fri	1700-2200*	0700-2130
Sat	0800-2100** Regular day shift techs also in house	0730-1700
Sun	0800-2100** If Sunday tech calls in sick there will be no tech after 1730	0730-1700
STAT	0930-1730 main department US	0800-1600

* The last time a case can be approved for a Sonographer to scan is 8:45 pm Mon-Fri.
** The last time the Sonographer can accept a scan is around 7.45pm on Sat & Sunday.
VGH weekends and STAT Holidays from 0800-1700 the US are dictated by the abdo fellow/staff (reporting room phone # 63767)
Regular daytime hours: VGH 0800-1700, SPH 0700-1730.