

Telerad Service Notes

Raghav Raman, MD

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Service summary

The service starts at 5.30 pm and ends at 2 am. You sit at your desk and dictate all the cases put on the Telerad list. You fax each report if it is an ER report, using a faxmodem. Then you finalise the report (with your callback number called a grasshopper number at the bottom of the report). The grasshopper number allows you to redirect to a phone tree so you can have two lines dedicated to receiving calls.

Working from home

This is one of my pet projects. While the technology and capital outlay can be significantly less than what the hospital has to spend to get a PACS workstation, it is a labor of love to get the required hardware and software working together and to have enough familiarity to be confident that your setup will work day after day, week after week. Those you live in Sac will be able to go to a hospital to work if your system goes down, but it is still quite a inconvenience if it goes down in the middle of the shift. So you won't spend tens of thousands like the hospital does, but expect to spend thousands of dollars on your setup.

Other than the technology, you'll have to dedicate a quiet, comfortable, ergonomic space to do it in. Basically the key is to be as uncompromising, if possible more, than hospital IT in your creation and protection of your home office.

If you do it right you should have no problem keeping any distractions away from your home office. One of the others actually went to another house to keep away from the kids but that is not necessary - but you get the idea.

HRS-D (the web-based full PACS that works as an activex control on internet explorer) cannot talk to SpeechQ (the dictation system) even if both of them have the ability to do so, because HRS-D is working without VPN for speed and SPEECHQ is on VPN. To get around this, my dad wrote some software for us that grabs the current accession number from HRS-D and transfers it to SpeechQ via a serial cable link between the two computers. You'll need both computers to have COM ports, but you can get USB COM ports. I have the details.

If any of you are interested in a wireless bluetooth headset, the one to use is the Plantronics Calisto Pro (headset +bluetooth dongle for PC + charger). Setup is straightforward but not as easy as plugging it in, you also have to install software but actually that's about it. It works,

and after charging can be used continuously for 9 hours without problems. You can't buy this from Plantronics, there is a special combo of stuff to buy from Amazon. Here is the link:

http://www.amazon.com/Plantronics-77043-03-Headset-Assembly-Calisto/dp/B001O6M8CC/ref=pd_rhf_shvl_1

Go down to "Frequently Bought Together"

buy the following items:

Plantronics 77043-03 Spare Headset Assembly Calisto Pro

Voyager Discovery Explorer AC Wall Power Adapter Charger by Plantronics

Plantronics Bluetooth USB Adapter BUA-100

Price For All Three: \$126.69 or thereabouts

You have to have faith that the above 3 components work together - they do. **Advantages** are: wireless, also the microphone does not sit in front of your mouth, it is lighter overall than the Parrot Vxl talkpro USB, and the Vxl has a foam earpiece that is hot. **Disadvantages**: Have to charge it, have to install software on speechq computer, it is not "over the head" instead it hangs off your ear, slightly more expensive, and has RF emissions into brain.

If you want a wired headset mic, search for Parrot Vxl talkpro USB on Ebay, that is the best place to get one for about \$70 or less. So the setup from home can be quite basic if you are not planning on doing full shifts from home. You could use a single computer with about 2 GB of RAM and any core 2 duo processor to run the VPN, speechQ and HRS-D all on one computer. You would have to enter accession number manually.

For a full shift, it's pretty intense especially in the first 6 hours, I would recommend a separate computer for HRS-D and one for speechQ, both with 4 GB of RAM and a minimum of a core2duo processor with 2.6 GHz. SpeechQ is actually even more processor intensive than HRS-D. HRS-D is memory and network intensive.

You main cost will be the diagnostic monitor, either way. My totoku 2MP apparently cost \$2000 but Mike will be able to give you current prices. Also need a diagnostic color monitor for US to do it right, about \$800. The speechQ machine needs a 21 inch monitor with 1600x1200 resolution to have enough real estate to compose the reports. It would be nice to have a separate monitor to show Greg's worklist, so that the techs don't surprise you by putting on 8 cts at a time, which they do about once a shift or so...

A connection at 3 mbps may be too slow to keep up with a full load, especially for the PE studies, and surely for the angios. My preference is 16mbps, but 8 may be ok.

if you want to have a separate monitor for the worklist, then you'll need two graphics cards in your HRS-D computer, that increases cost because you need a motherboard with two PCI-E 16 slots. BTW for the HRS-D i would recommend a high end consumer video card - my preference is nvidia geforce, it should cost a few hundred dollars. You don't need the expensive nvidia

quadro cards.

Finally, to connect the two computers (HRS-D and speechQ) for accession number transfer I am happy to install my ANTS software so you don't have to enter accession numbers all the time. It works >90% of the time, sometimes it fails due to some reason or the other...since the speechq computer is isolated by VPN, the only way to get HRS-D to transfer the accession number to speechq is by using a serial cable, which is what my software does. You'll need two USB to serial converters, I can give you details later.

You might want to get a good UPS mainly for the fact that it is better than a surge protector in protecting against surges that might be pretty devastating. Power cuts can fry motherboards...

Starting the Shift

At 5.30 remember to switch your grasshopper to your phone. Note that the grasshopper site requires internet explorer, and does not work with certain versions of firefox or IE. It will let you know if your browser is incompatible. I personally use a cellphone so that I can use a bluetooth headset with it and also use the voice dialing function. I use my home phone as the secondary calling number, but really, my cellphone just takes a message and I answer the message back. So in my case I do take notice when my cellphone says that I have got a message during the shift.

Ending the shift

Remember to check for any studies still in dictates status. The studies on the Telerad List should all be in Reported status by the time you finish the shift, unless there is a problem or exception that you know about, or have told the techs to leave a message for the morning people to fix it, or you have forgotten to dictate an inpatient or some case that you have been sequestering to dictate later. Nothing irks you more than having to dictate a complex triphasic CT for 30 minutes after you thought your shift was over, in the middle of the night...

When logging off SpeechQ let it finish uploading and closing. Dont just shut down the computer without loggin off speechQ. Also, make sure your fax software has finished faxing before you turn off your computer.

Don't foget to turn off your bluetooth mice. Or else you might come back to a dead mouse the start of the next shift. Check the battery. You may need to put it on recharge overnight. Don't leave your mice on recharge every night - that will introduce memory into your battery. If you have taken my advice and gotten a Plantronics Bluetooth headset to fry your brain with while dictating, you'll either need to charge it every night or get two of them, one of which is charging all the time. Note, with the amount of dictating you do you will not get through a whole shift without changing bluetooth headsets once. If you have two headsets you can just switch whenever the headset starts telling you your battery is low. It does this every few seconds while you are dictating - nothing more annoying than that!

By the way, if you plan to keep your computer on all the time, like me, make sure you set your power saver settings or your expensive diagnostic monitor will burn through its LCD life.

HRS-D Worklist

There is an option to use the "basic" or "advanced" worklist on HRS-D. Using the basic worklist is my preference because the advanced worklist is too advanced. The advanced worklist has the ability to refresh itself, and you will find that each person will have his or her own preference.

Handling the volume

If you are on with another person, handling the volume should be easier since one of you can focus on harder studies and act as overflow.

If you are on alone, the techs may give you up to 6 CTs and all the ultrasounds and a bunch of xrays too, making you too overwhelmed. Even though the temptation is to just suck it up and get everything done by 45 minutes each, this makes you prone to transcription errors at least, and raises the temptation to just fax all reports that are not absolutely critical to call. This reduces your rapport with the clinicians and increases risk a lot. The busier it gets, the more everybody cuts corners, and the ER docs are also cutting corners because they hope that you will call for the important results - they then ignore your faxes for longer times. It is a cascade effect - the only way to avoid errors is to have everybody in the chain check for errors as if they were the last line of defence, and you can't do this if you are too busy. On a philosophical level, radiologists are the accountants of the hospital - If we don't take care with every case as if it was the only one we had to do for the day, nobody else in the hospital is in the position to do it for us. So moral of the story is, if you feel you are cutting corners, do something about it. Call the techs and send some cases to VR.

In my long experience, if you tell the techs that they can give you a maximum of 3 CTs, that will ensure you are safe. They will give you more than 3 anyway, and that will keep you on your toes. Having 6 CTs on the list is too much, even if you think you can do it you are unconsciously cutting corners.

Getting hold of inpatient clinicians

You can call the operator to get connected to the ward as listed in the requisition. The operator can look up the patient by name. Then tell the ward nurse who answers the exact room number. If you tell her the patient name she will ask you for the room number, you might as well cut to the chase. Once the nurse answers, for pretty much everything but critical results I tell the nurse the main finding and ask her to contact the hospitalist. I leave my 1-888 number at the end of the report and tell the nurse that my number is at the end of the report and that the report is "in the computer". She handles it from there. I get her name and document the call. Generally, you are not on hold a lot if you are efficient and give every link in the chain the exact information

they require. The hospitalist will call you back if he has any questions. Put your exact findings and recommendation for consults or followup exams in the impression to avoid calls. If you want to talk to the doc, tell the nurse and put it in your "call notebook" so you don't forget to follow up if the hospitalist does not call about a critical result.

Getting hold of ER docs

No problem - just call the ER and ask for the doc that is listed on the req. Even if it is not the doc currently taking care of the patient, it will be at least the one who ordered the study and they are happy to take the information you are calling about. Get to know the doctors, and compliment them on the complexity of the cases they are handling or find something to be pleasant about whenever you have time. That makes them remember you and adds value to the service, you are "the home team" not just some contractor. This might make them forgive you for your eventual transgressions.

Getting hold of Folsom techs and Methodist techs

If they are not answering their numbers call the operator and ask them to "find the xray tech on his/her spectralink". This will get it done, the tech will call you back. The techs change spectralinks and are also very short staffed. They have been unable to maintain reliable communications, but the operator will get it done. Your backup is the nursing supervisor for the shift. She is capable of anything.

Managing the list

Many of the below points may become invalid if you are working with another person, but I list them here anyway:

- Look quickly at routine inpatients, then mark them read. You can dictate them later. This gets it off the list so you can take more CTs.
- I usually just dictate the inpatient ultrasounds, I don't sequester them for later unless I am really busy, they are quick so it does not warrant having to look through the images twice.
- Try if possible to read the xrays and ultrasounds first, as long as the CTs are <30 minutes in the queue. Especially the PICC line Xrays, so the poor PICC nurses can go home quicker.

If an ER case is really really full of incidental findings and one big obvious acute one, then you can consider calling the ER doc and letting them know immediately, and then marking it read for eventual dictation. If the patient is going to be admitted anyway you can take a bit more time to read the scan as long as the patient disposition from the ER is decided. However, I usually do these as soon as I have time, I don't let it sit for hours.

Public Relations

I buy the techs pizza occasionally. Don't ever reprimand a tech without being tactful about it. They are not in your hierarchy of power so your relationship with them is based entirely on being their friend... Nobody wants to work in an environment where people are treating you "by the book". Also, if they call with a seemingly stupid question just answer it and go on with your day. Sometimes it's nice to get questions that you know the answer to. It makes them happy and they will pay you back somehow.

ER docs are your clients. They're always very happy to get calls on complex cases. On the phone, you can give them your off the record opinion on what to do with the patient. Especially those of you who were surgery interns or remember your surgery runs - you should know maybe even better than the ER docs about what to do about those surgical emergencies. Tell it like it is - you'll help the patient and expedite care.

The techs are actually happy to talk to the ER to get some clinical background on the case and change the scan accordingly. You don't have to do that as long as you tell them what your parameters are. I usually reserve precious phone time to communicate results and to add value with the clinicians.

Specific protocol issues after hours

If you recommend a triphasic liver, renal protocol, IVP etc. on an ER patient, tell the tech in the appropriate hospital not to accept random erroneous orders so you don't get a simple A/P with contrast instead of your meticulously protocolled study. The ER is capable of completely ignoring your recommendation in the impression.

If you do a CTA runoff on a patient, do a delay from the knees to the toes to catch delayed perfusion.

If you do a mesenteric artery evaluation, do a CTA A/P then a venous phase CT to look for bowel wall enhancement.

Suggest to the tech sto make sure they give the patients a bottle of water to drink (if not volumen) before they do a pancreatic protocol CT.

If you get a Chest CTA r/o dissection, unless you are really busy ask the tech to call you after the chest CT noncon is done, so you can decide whether you need to do a CTA C/A/P for a large dissection or IMH. It will avoid getting an inadequate study on the arterial phase. Watch out for pelvis ultrasounds with a history that says "check for appy" - the techs may even forget to give you RLQ images, but they would have looked and you should try not to dictate that the RLQ was not evaluated on the images. You'll have to phone the tech and see if they did look at the RLQ; If they did, you can say they did and did not get any images because no abnormal pathology was seen.

Please look for and dictate that there is no placenta previa on every ob US.

Cardiac gating is very time consuming for the techs. We usually do not gate aorta angios unless there is a real worry about ascending aortic injury.

Final notes

A lot of the above assumes a lot of familiarity with CHW, PACS, SPeechQ and the many players in our large group. Just remember that I am here to help - you can email me at ctisme@gmail.com or call me at (408) 646-2704. You'll be ok.

A Few Other Suggestions

by Lynda Tsinany

During your orientation period, try to observe different radiologists at work. Each have their own style and personal preference for setting up different protocols on McKesson PACS and templates on Speech Q. You can learn very useful and time saving pointers from different users.

Get a programmable mouse and add the most used functions on it. For example, start dictation, measurement tools, zoom, pan, etc... I also have a separate numeric pad next to my mouse and have assigned different window levels to each number. So rather than having the different windows in different stages, I use the numeric pad to quickly change window levels.

McKesson is a highly versatile PACS. Spend time to set up your hanging protocols to your preference. You can also save time by copying the protocols from other users, if there is a particular one that you like.

Speech Q

Unfortunately there is no instruction manual available.

Use the wizard to set up the speech mic to your voice level when switching to a new or different workstation.

You can not copy templates from other sources and need to set up each template individually. Just start with the basic ones you'll be needing most and build more as you go. The more templates the better. Also had phases that you may use frequently to save dictation time. Keep the font at courier 10, apparently this is supposed to be better for the program.

It not recommended to copy and paste, this will mess up your voice file. Do not just delete part of you report, select the portion you want to delete and record over it or use " scratch it"

When making correction instead of correcting just the single word, select a group of words or short segment of your sentence; this will more quickly increase the accuracy of the voice recognition system. After you have made the same correction several times, you can try to repeat the wrong segment over and over until the system gets the correct one. Try to use even pace of dictation.

Workflow

Always work with the telerad list on. It will help you prioritize which study need to be dictated

next and alert you of the ones that have reached the 20 min, 30 min, and 45 min mark with different color codes (you do not want to see a lot of red!)

Try to do the easy cases first. This improves your overall turnaround time.

When you get a complex case you know will take a long time to dictate, try to do the ones immediately after it first so that if you default in time on the complex case you are not defaulting on all the other cases after it. This will make you feel less rushed about dealing with a complex case.

If you get overwhelmed with CTs or have a very long list of ultrasounds as well, you may need to call the CT techs to request them to remove a case from your list.

Occasionally, cases will drop off the telerad list. There is usually a warning to notify you. If it is an ultrasound, please call the ultrasound tech to have it put back on the list. If the ultrasound tech has already left you can ask the X-Ray or CT tech to do this. If it is a CT, call the CT tech to check if they have decided to send the case to VR instead. If not, ask them to put it back on the list.

If you are unable to create a report on Speech Q and get the following error message “ The order or examination is not known in Speech Q...” try going to Orders List and typing the accession number manually. If the study does not come up , call the CT/ultrasound tech and ask them to verify if the case has been completed and charged out. If they confirm that the study has been completed and charged, the last thing to try is to ask them to take the case off the telerad list and put it back on again. Check to see if you are then able to dictate the case. If all fail, the case will need to be sent to VR and taken off the telerad list.

If working from home, there is usually a slight delay when the selected case is being loaded up on your computer. In order to use this time more efficiently, as soon as you finish viewing a case, open the next one immediately and while the next case is loading up, you can proof-read your prior report and send it to the ER.

Contacting the physicians

You can set up Speech Q so that the patient info shows up on top of the report. This will include patient location/room number. If you do not like this option because it takes up screen space, another way of obtaining this information is to click on print preview (next to the print button). This way you can tell the operator/physician what room the patient is in.

You may also consider getting a hands free mic for your phone so you can continue working while being on hold and waiting for the nurse/physician (it's more comfortable than trying to wedge the phone between your head and shoulder!).

Home office

If you have the space , having a large L shaped desk is very nice because you will have multiple computer screens on it. The one I use is from Ikea and has a very nice curve (Galant series) the leg are adjustable in height. I also use an extra wide pull out shelf which fits a keyboard, two mice and numeric pad with extra room (from Staples). A lit keyboard is very nice. Ergonomics are very important, make sure that you will be comfortable working at your desk for hours, invest in a good chair.

I have two monitors hooked up to the Speech Q computer, one shows the Speech Q program, the other shows the telerad list.

If you can, install a dimmer switch on your overhead light, it's nice to be able to adjust the ambient light..

I use two telephone lines, one is reserved for the fax modem, the other is used for phone calls. You can also use a Magic Jack as your second line (less expensive). Have all the hospital numbers programmed on your phone for quick dialing.

If you have any other questions, feel free to contact me at Itsinany@hotmail.com or (916) 435-8627.

Even more tips...

Greg Rogalski, 916-538-4734 greg@grogo.org

Virtual Radiologic studies

We'll use Virtual Radiologic Corp (VRC) as a backup telerad solution at night, at least for the near future. This will provide coverage after our own Telerad shift ends at 2:00am, and also overflow studies even when you are on.

This means that you need to be careful when VRC and you both read the same study. Normally, the techs will control the flow of studies so that you won't encounter this situation. All the studies meant for you will show up on their own Telerad worklist, and VRC studies will just go on the regular hospital worklists. However, there may be times when you're caught up with Telerad studies, and want to pick up some more exams from the hospital lists to give you something to do.

Here's where you need to be careful. If there's a CT or US (or eventually MR) sitting on one of the hospital worklists, **do not read it unless you see the scanned VR preliminary read in the PACS!** Otherwise, you and VRC may come to a different conclusion without knowing it, which could lead to a huge problem, medically and legally. When you do read the exam yourself, look over VRC's report, and note any discrepancies, which come up rarely but can be very important. If there is a significant miss or other error, it's your responsibility to track down the ordering clinician and explain it, and document that very clearly in your report. This is especially important for Trauma studies.

Additionally, we need to log all discrepancies from VR for our own QA purposes, and to document that VRC is meeting its obligations for quality. For this reason, when you do find a discrepancy from VR's read, please send a fax to the MSJ Reading Room, addressed to Stacey, at 864-5828. Include a copy of the report, what was missed, whom you talked to, and rate the miss according to the following guidelines:

- Level 4- Huge blunder, hard to imagine how this was missed or misread. Indefensible in suit.
- Level 3- Error that shouldn't be made but understandable how it could be made. Would consider defending in a suit.
- Level 2- Minor finding not reported or very subtle finding that would be often missed by a general radiologist. Also, most overcalls. Waste basket for anything that doesn't fit into the other levels
- Level 1- Agree with report.

For level 2,3 or 4 you must also decide if the error is "clinically significant".

Additional Resources

- [Schedule Explanation](#): separate document describing how to read our work schedule
- [New radiologist orientation](#) - meant for general rads, but may have useful info
- Sametime Access: doc describing how to use the Sametime instant messaging client at work
- More resources on the schedule blog: <http://mrgschedule.com/>