**Emergency Radiology Rotation (ED)**

**Goals and Objectives:**

All residents should be guided by the overall educational goals and objectives outlined in the section on ACGME general competencies detailed in the program handbook. ACGME competencies are marked in **bold and underlined** after each assignment or goal.

**R1-R2:**

*Patient Care, Medical Knowledge, Interpersonal and Communication Skills*

- This rotation requires basic prior knowledge of CT, Ultrasound, Plain films and Pediatric Radiology. All plain radiographs, CT, and U/S ordered on patients in ED, including all trauma patients, are handled on this rotation. Requests for GI/GU/fluoroscopy studies and MR should be directed to GI/GU and MR Board, respectively.
- Become familiar with imaging evaluation of acute trauma of the entire body, especially spine fractures, head trauma, blunt abdominal trauma, musculoskeletal trauma.
- Become familiar with signs of acute appendicitis, ectopic pregnancy, pulmonary embolism on imaging.
- Recognize vascular emergencies such as aortic dissection and transection, abdominal aortic aneurysm rupture.
- Recognize contrast reactions.
- Become familiar with renal stone protocol and work-up of flank pain, back pain, abdominal pain, and neck pain.
- Act as a consultant to the ED physicians, help in triaging urgent studies, recognize that acute trauma cases take precedence over other studies in most cases. (*Interpersonal and Communication Skills and Practice-Based Learning and Improvement*)
- Enter “I” box wet reading on PACS on all ED studies as soon as it is looked at with an attending, even if the actual dictation maybe delayed.
- Always call all significant findings, in addition to providing a wet reading on PACS. (*Interpersonal and Communication Skills*)
- If there is a discrepancy between the ED reading and the radiologist reading, call the ED to notify the discrepancy, FAX the report to the ED and document appropriately the communication in the report. (*Interpersonal and Communication Skills*)
- Always promptly answer all pages and learn to prioritize workload. (*Professionalism, Practice-Based Learning and Improvement*)

**R3-R4:**

All of the above, AND

- Play a bigger role in acting as a consultant to the ED physicians on the most appropriate, cost-effective and least invasive methods of imaging different clinical scenarios. (*Systems-based Practice*)
- Become increasingly confident in providing wet reads on your own with faculty supervision closely monitoring your competence. (*Practice-Based Learning and Improvement*)
- Be absolutely familiar with the critical standards notification (JCAHO guidelines) in Radiology. (*Systems-based Practice; Practice-Based Learning and Improvement*)
- Be closely familiar with all department protocols on the ED service.
- Learn how to manage contrast reactions.
- Master multi-tasking skills on the rotation (e.g. providing wet reads, protocoling studies, communicating expeditiously with the technologists, etc.)
Resident Responsibilities: rev: 5/05, 04/09, 05/09, 6/10, 5/12

Basics

- All plain radiographs, CT, and U/S ordered on patients from Emergency Department (ED) and Express Care Unit, including all trauma patients, are handled on this rotation. Requests for fluoroscopy studies and MR should be directed to fluoroscopy and MR Board, respectively.
- The coverage is as follows. During a regular workday, the ED resident and attending cover from 9am to 12pm, and 1pm to 5pm; the attending covering the department covers from 8 to 9am, and 12pm to 1pm; the on-call (swing and night shifts) residents cover from 5pm to 8am (an attending is in-house until 10pm on weekdays). On weekends and holidays, the on-call residents cover the service (an attending is in-house 8am to 5pm). For further details of after-hours coverage, refer to the On-Call policy.
- A single pager is used (275-4805) at all times (24 hours a day, 7 days a week) for communication between ED and radiology. The pager is passed to the next person covering as above. (The pager is passed from the night resident to the 8am attending, then to the ED resident at 9am, then to the noon attending, then to the ED resident at 1pm, then to the swing shift resident at 5pm, then to the night resident.) All who cover ED should also carry their personal pagers in addition to the ED pager (Except for Stanford residents). Any pending study should be signed out in detail for continuity of care.
- All wet readings for plain radiographs, including cases not originating from ED, are handled on this rotation. When busy with more urgent cases, the ED radiologist should request help with this from the radiologist assigned to Outpatient Board, or anyone else in Reading Room C.

Plain film reading

- Look for the worklist “New ED/Exp Care Radiographs” and “New ED (nonEDMD).”
- The ED2 attending is responsible in the morning for reading up to 6am cases. (On Mondays and days following holidays, there will be additional cases from the weekend or the holiday.) The ED2 attending typically reads without the resident.
- The ED1 attending/resident is responsible throughout the rest of the day for exams performed up to 2pm.
- The evening (swing) attending is responsible for reading cases performed up to 6pm on weekdays.
- Be sure to check any wet reading entered by the ED personnel or by another radiologist, by looking in the “comment box.” (Make sure you are reading the information page that belongs to the correct patient). If there is any discrepancy between the final report and the wet reading, it is critical to inform ED. See the following section, “Communication of Discrepant Results.”

Communication of Discrepant Results to ED

This applies to a situation where there is a discrepancy between the ED doctor's initial interpretation of plain radiographs entered in the “comment box” and your final reading, or if there is no entry in the “comment box” for a positive finding.

- In IMPAX (PACS), mark the case with the Keyword, “aa ED DISCREPANCY,” which is found near the top of the list. (effective March 2010)
- In TALK, use the macro “ED DISCREPANCY” at the end of the final report. It contains the statement to the effect that the case has been marked for ED to review in a timely manner.

If the finding is of urgent nature or if the patient is likely still in ED and may benefit from an expedited notice, a phone call should also be made to ED. Ask to speak to the ordering ED physician directly, or if s/he is unavailable, the “administrative physician.”
Please note that the following documentation process should occur even if there is a verbal notification for an urgent result.

**Wet reading – plain film**
- All wet reading requests on plain radiographs need to be handled promptly. For a positive finding, speak directly to the ordering or covering physician. For a negative finding, a message can be left with a floor nurse or clinic personnel.
- All wet readings must be recorded in PACS in the “comment box,” unless the requisition is available and the final dictation done right away.
- Locations frequently requesting a wet reading by phone include the following:
  - Maternity x56666
  - ED x56900, 02
  - Express Care x54545
  - Pedi UC x54719, 21
  - Recovery Room x55242
- Occasionally, a requisition with a wet reading request is brought to the ED board by the tech or Image Library. After giving a wet reading, it should be dictated at the ED board at the next readout.
- For a positive finding, the final dictation should include the fact that a wet reading to that effect has been given.
- All CT and U/S ordered from ED and Express Care require a wet reading. See below.

**CT**
- The following non-contrast studies can be ordered by an ED attending without prior consultation with a radiologist: head, cervical spine, abdomen/pelvis for the renal stone or appendix protocol. These are performed by the technologist, who then informs the radiologist, once the study is completed. If additional history is needed at that time, the radiologist should initiate contact with the ordering ED doctor.
- For non-contrast studies other than the above and all CTs requiring contrast media, the ED attending will call to consult the ED radiologist. Once the study type is determined, the radiologist should call the technologist with the patient name, room #, MR #, and CT protocol number (CT Tech pager 920-8625, CT3 x56123, CT2 x56384, CT1 x56389).
- The following information is needed for all IV contrast studies: clinical history, BUN / Cr, GFR for patients of age 65 or older, drug allergies, and pregnancy information for women aged 12 - 55. The technologist is to record the information, but the radiologist has the ultimate responsibility.
- When oral contrast is to be given, inform the ordering ED physician beforehand.
- Contrast injection: refer to the same section under the CT rotation description.
- All CTs ordered by ED and Express Care require immediate wet readings. They should be entered in the “comment box.”
- For trauma cases, it is essential to give a wet reading in a timely manner. For a single body part exam, the reading should be available to the trauma team within 15 minutes of the scan being completed, 30 minutes for a multi-organ study, and 15 minutes for plain film from the time a verbal request is made by the trauma team.
- Paperless CT reading: CTs are read without the paper requisition. Before dictating, please check all information on the scanned-in requisition in order to obtain all the necessary accession numbers for the study, information on the contrast media used, any additional information from the technologist. If there are multiple accession numbers for the same dictation, be sure to enter all the additional accession numbers before dictating by clicking “add report” in TALK.
Stroke alert protocol
When a patient suspected of an acute stroke presents to ED, a stroke alert may be activated, which includes an immediate notification to the CT tech by ED for a non-contrast head CT. The CT tech then pages the ED pager with a suffix 811. When the exam is completed, it should be interpreted immediately, a phone call should be made to ED, and a wet reading should be entered in the “i” box. The PACS time stamp of the wet reading determines our response time. Please note that the JCAHO expectation of a stroke center is to have a 45 minute door-to-CT interpretation turnaround time. When the attending is in-house, s/he is responsible for the wet reading.

Starting February 2012, all stroke alert CTs for INPATIENTS will also be handled by the ED board. Please enter the wet reading in the comment box right away and call the inpatient team.

US
- Starting February 2012, ED/Exp Care will simply place an order in the computer during the hours when the US tech is in-house. (Sunday 11PM through Friday 11PM).
- At other times, an ED attending will call the ED board to request an U/S study. Please obtain patient information and call the technologist in.
- Occasionally, a patient in ED or Exp Care is given an appointment for US for the following workday. When the patient is scanned, the result is to be handled by the US board. If you receive a call inquiring about such a case, the call should be directed to the US board. (effective Feb 2010)
- For a pelvic study to rule out an ectopic pregnancy, a Foley catheter is not required. Instead, the patient should not void, and initially an abdominal scan is done on a partially full bladder followed by an endovaginal scan. For all other pelvic studies, ED is to place a Foley catheter in the patient.
- The tech brings the requisition to the ED board when the exam is done. A wet reading is to be entered in the comment box promptly.

Emergent Breast US: (effective April 2010)
- During the regular work hours, all urgent or emergent ultrasound (to rule out an abscess) should be dictated by breast imaging.
- After hours, a wet reading should be given and documented in PACS. The paper requisition should be left by the US tech at the breast imaging board for a final dictation on the next business day using PenRad.

CRITICAL FINDINGS NOTIFICATION
This is a TJC requirement. The department has established the following list of conditions for which prompt notification of the findings to the referring physician or his/her designate and documentation to that effect are expected.
- Tension pneumothorax
- Acute intracranial hemorrhage
- Acute cervical spine fracture
- Acute cord compression
- Unexplained pneumoperitoneum
- Active extravasation from a vessel or major vascular injury
- Ectopic pregnancy
- Misplaced tubes and catheters posing immediate danger
- Any other finding deemed to justify an immediate notification by the radiologist

After notifying the clinician, use the existing MACRO NOTIFICATION in TALK. Fill out the time of discovery of the finding, the time the provider was notified, and the name of the provider. This should be placed in CONCLUSION of the dictation.
NOTIFICATION of CORRECTED RESIDENT WET READING  (effective 12/14/09)
This applies to after hours studies in which the initial resident wet reading is changed as a result of the attending readout (typically the following morning).

- Call ED at 56912 to obtain information from the ED clerk about patient disposition (Alternatively, look up the patient in Wellsoft, which is available on the stand-alone PC next to the ED Workstation.)
- For patients who have been admitted to the floor, speak to the appropriate team about the changed interpretation. (No need to speak to an ED physician.)
- For patients who are still in ED or have been sent home, speak to the administrative physician in ED.
- In any case, document the fact that a physician was verbally notified in your final dictation.

SENDING the PATIENT from CLINIC to ED or EXPRESS CARE  (effective 12/14/09)
This applies to the situation where the ordering physician from the clinic requests that radiology send the patient to ED/Exp Care if there is a positive finding, or any other situation where radiology needs to send a patient to ED/Exp Care.

- The radiologist should call ED and speak to the administrative physician of the day. The conversation should include the radiology findings as well as instructions on where to send the patient.

Resident Supervision:
- All studies are to be supervised by an attending radiologist.
- All wet reads given on PACS must be done with an attending first, when a first year resident is on the ED rotation.
- All studies must be reviewed by an attending radiologist prior to dictation.
- Cancellation of any study has to be approved by an attending radiologist.

Evaluation Tools:
- Global Faculty Evaluation
- Participation in departmental QI/QA and regulatory activities
- Performance on the ABR and annual ACR in-service examinations
- Participation in the monthly Trauma Performance Improvement Conference (TPIC)
- Resident Portfolio (Self-Assessment Modules)