CSIR:
Goals and Expectations for Radiology Residents
Brigham and Women’s Hospital
2010-2011

I. Overall educational goals for the program:

The Cross-Sectional Interventional Radiology (CSIR) program is designed to provide Radiology residents extensive training and experience pertaining to the spectrum of image-guided, percutaneous interventional procedures performed with CT, MRI, US, or PET/CT guidance. The program provides comprehensive training leading to a detailed understanding of the appropriate clinical utilization of these procedures including indications, contraindications, and alternatives. Extensive training in pre-procedural, peri-procedural, and post-procedural management of patients is emphasized. Closely supervised, hands-on, training in the performance of CSIR procedures is provided by experienced faculty radiologists in order to provide residents with broad, state-of-the-art technical skills needed to safely and effectively perform these procedures independently upon entering practice. While the standard CSIR rotations are focused on clinical patient care, ample opportunities are available for clinical research on topics related to CSIR.

II. Competency-based goals and objectives for each trainee assignment at each educational level:

Rotation 1. The educational goals of this rotation contribute to the overarching goals of this program through the active participation of the trainee in all clinical aspects of the CSIR service. The six categories of activities in which trainees participate lend themselves to the achievement of proficiency in the following ACGME core competencies:

Patient Care:
- The PGY1/2 or first rotation on CSIR will include an introduction to a variety of patient care skills and responsibilities.
- Receiving consultations and requests for CSIR procedures
- Evaluating the indications and appropriateness of requested procedures, including a consideration of alternative tests or procedures.
- Pre-procedure patient evaluation including, but not limited to, an assessment of clinical lab values, procedural risk factors, medication allergies, anesthetic risk, and all other clinical factors relevant to the requested procedure.
- Peri-procedural patient management, including assessment of vital signs, airway, mental status, intravenous access, etc.
- Performance of a targeted history and physical in assessing patients for an interventional procedure.
Post-procedural patient management, including assessment for complications, diagnosis and treatment of complications, confirming results of the procedure, managing devices such as drainage catheters, etc.

Medical Knowledge:
- The PGY1/2 rotation or first rotation on CSIR will allow for an introduction to CSIR and acquisition of a basic fund of knowledge and experience pertaining to all clinical and procedural activities of the service.
- Ability to interpret all relevant medical imaging studies and assess findings as they pertain to consideration of a CSIR procedure, planning the procedure, and performing the procedure.
- Learning the indications, alternatives, and contraindications for the various CSIR procedures.
- The trainee should acquire an understanding of basic pre-procedural, peri-procedural, and post-procedural patient management.
- The trainee should acquire a basic set of technical skills in performing CSIR procedures.
- Read educational materials prepared by the faculty of the CSIR service, including the CSIR manual, CSIR coagulation guidelines, and procedure specific summaries.
- Read journal articles from the peer-reviewed literature on topics related to current cases.
- Read from interventional radiology text books.
- Participate in daily CSIR rounds, usually at 0745, at which all of the cases for the day are reviewed and discussed in detail with the attending radiologist.
- Attend weekly CSIR case conferences and monthly didactic CSIR lectures/demonstrations.
- Develop a commitment to continuous learning and self-improvement.

Practice-based Learning and Improvement:
- The trainee, during the PGY1/2 or first CSIR rotation, should acquire knowledge and skills from active participation in all aspects of the CSIR service.
- Objectives include learning how to obtain a history, perform a targeted physical exam, prepare and maintain a sterile field, choose the appropriate instruments and devices for each procedure, plan the approach and steps of the procedure, and develop an understanding of how conscious sedation, monitored anesthesia, and general anesthesia can be appropriately utilized to facilitate safe and successful procedures.
Learn the advantages and disadvantages of CT, MRI, US, and PET/CT in performing various interventional radiology procedures.

Learn how to effectively and safely utilize these imaging modalities in performing CSIR procedures.

Understanding the fundamentals of infection control, including routine washing of hands, appropriate use of masks or respirators, and appropriate handling/disposal of sharps.

Observation of interventional procedures

Learn how to perform a spectrum of image-guided biopsy and drainage procedures, beginning with more basic procedures such as paracentesis and thoracentesis. Other examples would include liver parenchymal biopsy and needle aspiration of fluid collections.

Rounding on inpatients following procedures to assess their clinical status, evaluate for complications, and manage drainage catheters.

Closely supervised performance of interventional procedures, beginning with technically easier procedures and techniques.

Prepare and deliver case presentations for CSIR case conferences.

**Interpersonal and Communication Skills:**

During the PGY1/2 or first CSIR rotation, the trainee will learn and practice a variety of skills involving effective and professional interaction with colleagues and patients, as well as skills related to written communication in the form of radiology report dictations and other written components of the medical record.

Learning how to effectively interact and communicate with patients and family before, during and after a procedure.

Understanding the importance of compassion and integrity in all interactions with patients and family facing a stressful situation.

Learning the elements of a complete radiology procedure report.

Learning how to dictate an accurate, concise, and complete procedure report.

Communicating and documenting communication of significant or unexpected imaging findings or procedural outcomes.

Writing legible and complete notes in the patient chart.

Interacting effectively with members of the healthcare team from other departments, including becoming an effective consultant.

Interacting effectively with all members of the Radiology healthcare team, including nurses, technologists, physicians, administrators, and clerical personnel.

**Professionalism:**

The PGY1/2 or first rotation on CSIR will place the trainee in a clinical setting involving considerable patient contact and contact with many other healthcare teams and providers. During this rotation the trainee will have extensive opportunities to refine
skills, practices, and behaviors consistent with a high level of professionalism.

- Obtaining informed consent from patients and family effectively, openly, and with compassion. This includes a balanced and realistic presentation of the indications, alternatives, attendant risks, and potential complications/benefits of the procedure.
- Understanding the critical importance of a professional demeanor and professional conduct at all times in the hospital work environment.
- Understanding what constitutes appropriate discussions and conduct in the presence of a patient or patient’s family, even if the patient is sedated.
- Requirement of professional attire and grooming in the hospital.
- Maintaining patient privacy and dignity and not discriminating based on religion, ethnic, sexual, or educational differences.
- Not compromising confidential patient information through public conversations, unsecure electronic communications, on-line social media, or other avenues.
- Recognizing ones limits as a member of the CSIR team and knowing when to seek help or advice from faculty or other experienced members of the team.
- Demonstrating commitment to patient welfare, respect for colleagues and all support staff, dependability, punctuality, and adherence to all relevant policies/procedures.

Systems-based Practice:

- The PGY1/2 or first rotation on CSIR will introduce the trainee to the use of many tools enabling a systems-based approach to our CSIR service.
- The trainee will make extensive use of multiple information systems in the hospital including the longitudinal medical record (LMR), BICS hospital order entry and patient tracking, PERCIPIO radiology order entry and tracking, RadXT radiology procedure protocol tool, and GE PACS (picture archiving and communication system) for radiology. Other online tools are used for educational and research purposes.
- Understand the rationale and importance of policies pertaining to confirming patient identity, appropriate procedure, correct organ and side, and presence of appropriate personnel before performing an interventional procedure.
- Understanding medicolegal considerations of a CSIR practice, including the importance of complete and accurate documentation in the medical record and dictated radiology reports.
- Participating in and understanding the importance of quality assurance or morbidity/mortality rounds as a means to identify areas for improving patient care and outcomes.
Learn how to apply diagnostic and procedural codes for the various procedures performed in the section.

Rotation 2. The educational goals of this rotation build on all of the core competency goals and objectives outlined above.

**Patient Care:**
- The PGY2/3 or second rotation on CSIR will add additional experience and responsibility to the trainees patient care education.
- Learning how to fully evaluate consultations and requests for CSIR procedures
- Making decisions regarding indications and appropriateness of requested procedures, including a consideration of alternative tests or procedures.
- Independently conducting pre-procedure patient evaluation and presenting impressions to the attending.
- Independent peri-procedural patient management, with assistance from attending as needed.
- Independent performance of a targeted history and physical in assessing patients for an interventional procedure and presenting results to attending.
- Increased responsibility in post-procedural patient management, with continued consultation with attending.

**Medical Knowledge:**
- The PGY2/3 rotation or second rotation on CSIR will allow for expanding the trainees fund of knowledge and experience pertaining to all clinical and procedural activities of the CSIR service.
- Improving skills in interpreting all relevant medical imaging studies and assessing findings as they pertain to consideration of a CSIR procedure, planning the procedure, and performing the procedure.
- Refining understanding of the indications, alternatives, and contraindications for the various CSIR procedures.
- The trainee will become more proficient in pre-procedural, peri-procedural, and post-procedural patient management.
- The trainee will improve on and learn new technical skills in performing CSIR procedures. Examples would include becoming more comfortable with the use of coaxial biopsy techniques and modified Seldinger fluid drainage techniques.
- Continue to study educational materials prepared by the faculty of the CSIR service, including the CSIR manual, CSIR coagulation guidelines, and procedure specific summaries.
- Make a habit of reading journal articles from the peer-reviewed literature on topics related to current cases.
- Continue reading from interventional radiology text books.
- Participate in daily CSIR rounds, usually at 0745, at which all of the cases for the day are reviewed and discussed in detail with the attending radiologist.
- Attend weekly CSIR case conferences and monthly didactic CSIR lectures/demonstrations.
- Develop a commitment to continuous learning and self-improvement.

**Practice-based Learning and Improvement:**
- The trainee, during the PGY2/3 or second CSIR rotation, will acquire increasing knowledge and skills from active participation in all aspects of the CSIR service.
- Objectives include becoming more proficient in obtaining a history, performing a targeted physical exam, preparing and maintaining a sterile field, choosing the appropriate instruments and devices for each procedure, planning the approach and steps of the procedure, and understanding of how conscious sedation, monitored anesthesia, and general anesthesia can be appropriately utilized to facilitate safe and successful procedures.
- Develop a critical understanding of the advantages and disadvantages of CT, MRI, US, and PET/CT in performing various interventional radiology procedures.
- Optimize the effective and safe utilization these imaging modalities in performing CSIR procedures.
- Follow strict fundamentals of infection control, including routine washing of hands, appropriate use of masks or respirators, and appropriate handling/disposal of sharps.
- Increasing hands-on performance of interventional procedures with supervision by the attending. The attending will intervene when in the best interest of the patient or to demonstrate a technique.
- Expand the spectrum of image-guided biopsy and drainage procedures for which the trainee is proficient. Examples would include biopsy of liver masses, renal parenchyma, and catheter drainage of diverticular abscesses.
- Actively manage inpatients by rounding following procedures to assess their clinical status, evaluate for complications, and manage drainage catheters.
- Advancing the technical difficulty of procedures and techniques performed by the trainee.
- Increasing responsibility to prepare and deliver case presentations for CSIR case conferences.

**Interpersonal and Communication Skills:**
- During the PGY2/3 or second CSIR rotation, the trainee will practice and improve on a variety of skills involving effective and
professional interaction with colleagues and patients, as well as skills related to written communication in the form of radiology report dictations and other written components of the medical record.

- Gaining experience in effectively interacting and communicating with patients and family before, during and after a procedure.
- Prioritizing the importance of compassion and integrity in all interactions with patients and family facing a stressful situation.
- Mastering the elements of a complete radiology procedure report.
- Improving skills in dictating an accurate, concise, and complete procedure report.
- Consistently communicating and documenting communication of significant or unexpected imaging findings or procedural outcomes.
- Always writing legible and complete notes in the patient chart.
- Taking on greater responsibility for interacting effectively with members of the healthcare team from other departments, including becoming an effective consultant.
- Consistently interacting effectively with all members of the Radiology healthcare team, including nurses, technologists, physicians, administrators, and clerical personnel.

**Professionalism:**

- The PGY2/3 or second rotation on CSIR will continue to involve the trainee in considerable patient contact and contact with many other healthcare teams and providers. During this rotation the trainee will have extensive opportunities to refine skills, practices, and behaviors consistent with a high level of professionalism.
- Gaining experience in obtaining informed consent from patients and family effectively, openly, and with compassion. This includes a balanced and realistic presentation of the indications, alternatives, attendant risks, and potential complications/benefits of the procedure.
- Maintaining a commitment to a professional demeanor and professional conduct at all times in the hospital work environment.
- Beginning to develop an understanding of the leadership role played by physicians in the operation of a CSIR service.
- Maintaining patient privacy and dignity and not discriminating based on religion, ethnic, sexual, or educational differences.
- Not compromising confidential patient information through public conversations, unsecure electronic communications, on-line social media, or other avenues.
- Continuing to recognize ones limits as a member of the CSIR team and knowing when to seek help or advice from faculty or other experienced members of the team.
- Setting an example for junior trainees through commitment to patient welfare, respect for colleagues and all support staff.
dependability, punctuality, and adherence to all relevant policies/procedures.

Systems-based Practice:
- The PGY2/3 or second rotation on CSIR will allow the trainee to master the use of many tools enabling a systems-based approach to our CSIR service.
- The trainee will continue to make extensive use of multiple information systems in the hospital including the longitudinal medical record (LMR), BICS hospital order entry and patient tracking, PERCIPIO radiology order entry and tracking, RadXT radiology procedure protocol tool, and GE PACS (picture archiving and communication system) for radiology. Other online tools are used for educational and research purposes.
- Understand the rationale and importance of hospital and accrediting body policies pertaining to confirming patient identity, appropriate procedure, correct organ and side, and presence of appropriate personnel before performing an interventional procedure.
- Improve understanding medicolegal considerations of a CSIR practice. Learn the importance of establishing an effective doctor-patient relationship based on communication, compassion, and respect. Learn how to handle adverse events through honest communication with the patient and family and by seeking assistance from hospital risk-management services.
- Continued participation in and understanding the importance of quality assurance or morbidity/mortality rounds as a means to identify areas for improving patient care and outcomes.
- Become more proficient in applying diagnostic and procedural codes for the various procedures performed in the section.

Rotation 3. The educational goals of this rotation build on all of the core competency goals and objectives outlined above and by the completion of the third rotation will lead to a strong level of competency in CSIR procedures, sufficient for functioning as an effective and safe independent practitioner.

Patient Care:
- The PGY3/4 or third rotation on CSIR will include and build on all previously mentioned objectives and goals.
- During the third rotation the trainee will assume greater responsibility and independence for the spectrum of competency-based activities and duties outlined above.
- For each of the competency-based goals and objectives listed under Rotations 1 and 2, the trainee on rotation 3, and on subsequent elective rotations, will continue to develop and practice the skills and attributes listed above. There are no artificial
divisions of objectives that can only be addressed on a particular rotation. The clinical situations and procedures presenting to the CSIR service tend to require a complete, comprehensive approach to patient management. Within this context, however, instruction by the faculty is tailored to emphasize basic skills on the first rotation and increasingly advanced skills on subsequent rotations. Each of the competencies described above is addressed on a continuous basis, taking into account individual trainee strengths and weaknesses, aptitude, and performance.

**Medical Knowledge:**
- The PGY3/4 rotation or third rotation on CSIR will expand the trainee’s fund of knowledge and experience pertaining to all clinical and procedural activities of the service.
- The trainee will increase his or her knowledge base in all of the competency goals and objectives outlined above.
- The importance of a life-long commitment to increasing medical knowledge will be stressed.

**Practice-based Learning and Improvement:**
- The trainee, during the PGY3/4 or third CSIR rotation, will continue to acquire knowledge and skills from active participation in all aspects of the CSIR service.
- Objectives include all of the competency based goals and objectives listed above, with increasing emphasis on decision making, clinical judgment, and independence.
- Many of the skills learned by the trainees are dictated by the challenges of the case at hand, more so than the level of training. In this regard, the high volume of image-guided procedures performed on a daily basis by the CSIR service provides ample opportunity to for the trainee to become facile with a broad range of clinical and procedural scenarios.
- The trainee will be allowed to progressively participate in and perform more difficult and more complex cases, always under the direct supervision of the attending radiologist, and as appropriate for the trainee’s level of competency.
- The trainee will perform increasingly difficult or challenging cases such as biopsy procedures with difficult access options, complex catheter drainage procedures involving multiple or loculated collections, and procedures requiring instillation of sclerosing agents or lytic agents.

**Interpersonal and Communication Skills:**
- During the PGY3/4 or third CSIR rotation, the trainee will practice and improve on a variety of skills involving effective and professional interaction with colleagues and patients, as well as
skills related to written communication in the form of radiology report dictations and other written components of the medical record.

- All of the competency objectives listed for the first and second rotations continue to be addressed during the third rotation, with the addition of a greater emphasis on responsibility and independence of the trainee.

**Professionalism:**

- The PGY3/4 or third rotation on CSIR will again place the trainee in a clinical setting involving considerable patient contact and contact with many other healthcare teams and providers. During this rotation the trainee will have extensive opportunities to refine skills, practices, and behaviors consistent with a high level of professionalism.
- All of the objectives and goals under this core competency category, as listed for rotations 1 and 2 will continue to be addressed during the third and elective rotations.
- All of the competencies relating to professionalism will be refined in the context of increasing trainee responsibility and independence.

**Systems-based Practice:**

- The PGY3/4 or third rotation on CSIR will enable the trainee to become very experienced and comfortable with the routine use of the many tools enabling a systems-based approach to our CSIR service.
- The trainee will improve on an understanding of and appreciation for the systems-based approach to healthcare, in the context of increasing trainee responsibility and independence. All of previously listed objectives pertaining to systems-based practice will continue to be addressed.
- The trainee on rotation 3 will assume primary responsibility for preparing and presenting cases at the CSIR Case conference and the CSIR-Pathology conference.
- The trainee on rotation 3 will assist in the orientation and education of trainees beginning their first rotation on CSIR.
- Opportunities for participating in research projects related to CSIR are available to trainees at any point in their training. The trainees are, however, encouraged to limit their research activities to a level that does not interfere with the overall educational objectives of the residency program.

**III. Regularly scheduled didactic educational experiences:**
A weekly CSIR Case conference is held each Tuesday morning involving attending CSIR radiologists, residents, fellows, and nurses. Active clinical cases are presented to allow for the presentation of challenging or interesting problems in an open forum. The conference covers topics related to indications for procedures, optimal approaches, overcoming technical challenges, preventing complications, managing complications, managing drainage catheters, use of fibrinolytics to facilitate drainage, patient care, and many other topics pertaining to optimizing the performance and outcomes of CSIR procedures. Quality assurance/morbidity mortality-related cases are also presented at this conference if they pertain to CSIR. This conference is prepared and presented by one of the trainees on the CSIR service.

A monthly CSIR-Pathology conference is held on the last Thursday of the month and includes the presentation of 4 or 5 cases with an emphasis on interesting disease processes based on radiologic imaging and/or pathology findings. This conference is prepared and presented by one of the trainees on the CSIR service.

Didactic teaching sessions are provided by the CSIR faculty in the form of lectures or demonstrations approximately once a month, and include topics such as sterile technique, use of US-guidance for interventional procedures, approach to liver biopsy, approach to kidney biopsy, approach to lung biopsy, catheter drainage techniques, and others.

IV. Delineation of trainee responsibilities for patient care, progressive responsibility for patient management, and supervision of trainees over the continuum of the program:

Trainees are encouraged to participate in all clinical aspects of the CSIR service as their knowledge base and experience allow. During the first rotation, the trainee observes many of the activities and procedures performed on the service, but also begins to actively participate under close supervision by the attending CSIR physician. The trainee does begin to perform procedures even on the first rotation, but only with careful step-by-step guidance and instruction by the attending. Throughout the second and third rotations, the trainee develops a more detailed and comprehensive fund of knowledge and greater procedural experience allowing them to function more efficiently and effectively. Trainees are evaluated by the attending CSIR radiologists at the completion of each week on the CSIR service through a formal electronic evaluation form that includes fields for comments. Evaluations take into account the trainees fund of knowledge, technical skills, quality of dictated reports, compassion and patient care, and other parameters. These formal evaluations and the day-to-day assessment by the faculty form the basis for allowing the trainee to ultimately perform all portions of an interventional procedure, in progressively more complex situations. The trainees maintain a procedure log which documents their procedural experience. By the end of the third rotation the trainee has achieved a high level of competence and is prepared to perform CSIR procedures independently as a practicing radiologist.