NATIONAL INSTITUTE FOR HEALTH SPECIALITIES

NIHS Entrustable Professional Activities (EPAs) for Specialty Education in Diagnostic Radiology

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List of EPAs:

Diagnostic Radiology

EPA 1: Navigating information systems used in Diagnostic Radiology

Key Features: This EPA focuses on accessing and using information systems to gather clinical data from the patient's chart and the image storage system (e.g., PACS).

- This includes summarizing the history, pertinent physical examination findings and results of relevant investigations from the clinical record and retrieving the imaging study and pertinent priors for review with a supervisor.
- This EPA may be observed in patients undergoing any medic al imaging study; the observation of this EPA is based on a single case.
- This EPA does not include the use of advanced PACS functions.

Assessment Plan:

Case review with staff radiologist or entrusted resident/fellow.

Use assessment form.

Basis for formal entrustment decisions:

Collect 2 observations of achievement.

- At least 2 different assessors

When is unsupervised practice expected to be achieved: PGY1

Relevant Tasks

1. PC 2.1 Access the medical record and retrieve clinical information (COM 2.2)
2. PC 2.2 Interpret the findings of the history, physical examination and investigations in light of the clinical question (ME 2.2)
3. SBP 8.1 Use the PACS system to retrieve images ME 3.4
4. SBP 8.1 Identify and retrieve pertinent prior imaging ME 3.4
5. SBP 8.1 Display images to review a study ME 3.4

Diagnostic Radiology:

EPA 2: Using the dictation system

Key Features: This EPA focuses on using a dictation system to record a simple or normal report.

- At this stage, the resident is not expected to interpret an image; this EPA is limited to documenting the report as reviewed with a supervisor.

Assessment Plan:

Review of report by staff radiologist

Use assessment form.

Basis for formal entrustment decisions:

Collect 1 observation of achievement.

When is unsupervised practice expected to be achieved: PGY1

Relevant Tasks:

1. PC 1.2 Use the dictation system to generate, edit and issue a report COM 5.1

Diagnostic Radiology

EPA 3: Recognizing normal anatomy in radiography and CT imaging

Key Features: This EPA focuses on applying knowledge of anatomy and imaging techniques to identify normal structures and landmarks.

Assessment Plan:

Image review with staff radiologist, or entrusted resident/fellow

Assessment form collects information on:

- Modality: radiography; CT; other [write in]
- Case mix: abdomen/pelvis; cardiothoracic; head; MSK; spine

Basis for formal entrustment decisions:

Collect 7 observations of achievement

- At least 1 abdomen/pelvis radiograph
- At least 1 abdomen/pelvis CT
- At least 1 chest radiograph (i.e., cardiothoracic)
- At least 1 chest CT
- At least 1 head CT
- At least 1 MSK radiograph
- At least 1 spine radiograph or CT

When is unsupervised practice expected to be achieved: PGY1

Relevant Tasks:

1. MK 4.1 Apply knowledge of image generation when using radiography and CT modalities ME 1.3
2. MK 4.2 Apply knowledge of patient positioning ME 1.3
3. MK 1.2 a Identify normal structures and anatomic landmarks ME 3.4
4. MK 4.2 Identify when image quality is affected by patient positioning ME 3.4

Diagnostic Radiology

EPA 4: Identifying and assessing unstable patients, providing initial management, and obtaining help

Key Features: This EPA includes recognizing serious, life-threatening, or critical illness and providing initial investigation and management.

- An important aspect of this EPA is the timely recognition of the need for additional assistance and/or notification to the attending physician.

Assessment Plan:

Direct observation and/or case review by supervisor (most responsible physician (MRP), other consulting staff, entrusted resident/fellow)

Assessment form collects information on:

- Case mix: acute respiratory distress; allergic reaction; altered level of consciousness; chest pain; hemodynamic instability; hypoglycemia; other

Basis for formal entrustment decisions:

Collect 5 observations of achievement.

- Any 4 different presentations

When is unsupervised practice expected to be achieved: PGY1

Relevant Tasks:

1. PC 4.2.b Recognize instability and acuity in a clinical presentation ME 2.1
2. PC 4.2.b Determine the priorities for patient care ME 2.1
3. P 3.2.b Work within personal limits, seeking assistance as needed P 1.1
4. PC 4.3.a Provide assessment and initial stabilization of ABCs ME 2.2
5. PC 2.2 Perform a history and physical exam relevant to the patient presentation, in a time-effective manner ME 2.2
6. PC 4.3.b Develop and implement a plan for initial management ME 2.4
7. ICS 2.2.a Consult as needed with other health care professionals, including other physicians COL 1.2
8. ICS 2.1 b Document the clinical encounter to adequately convey clinical reasoning and the rationale for decisions COM 5.1

Diagnostic Radiology

EPA 5: Assessing patients with common medical or surgical presentations

Key Features: This EPA includes performing a clinical assessment, including history and physical exam, developing a differential diagnosis, and selecting and prioritizing laboratory and imaging investigations.

- This EPA will be observed in the ambulatory, emergency department or inpatient setting, with adult and pediatric patients, in a range of clinical conditions.

Assessment Plan:

Case review with supervisor staff or entrusted resident/fellow.

Assessment form collects information on:

- Setting: inpatient; outpatient; emergency department
- Patient age: adult; pediatric; obstetric
- Case mix: medical; surgical

Basis for formal entrustment decisions:

Collect 7 observations of achievement

- At least 2 of each type of presentation
- At least 1 pediatric case

When is unsupervised practice expected to be achieved: PGY1

Relevant Tasks:

1. PC 2.2 Gather a relevant clinical history ME 2.2
2. ICS 1.2.b Use patient-centered interviewing skills COM 2.1
3. PC 2.2 Perform a physical exam relevant to the presentation ME 2.2
4. PC 2.2 Select and/or interpret investigations ME 2.2
5. PC 3.2 Develop a differential diagnosis ME 2.2
6. PC 3.3 Synthesize and organize clinical information for clear and succinct presentation to supervisor ME 2.2
7. ICS 1.3.b Convey information to the patient and/or family clearly and compassionately COM 3.1
8. SBP 3.2.a Work effectively as a member of the clinical team COL 1.2
9. PC 1.2.b Document the essential elements of a clinical encounter using a structured approach COM 5.1
10. P 2.2 Complete assigned responsibilities P 1.1

Diagnostic Radiology

EPA 6: Working effectively as a member of the interprofessional team

Key Features: This EPA focuses on the role of the physician as a member of the interprofessional team.

- This includes contributing to the work of the team, understanding, and respecting the roles of other team members, and demonstrating appropriate professional behaviors.
- This EPA will be observed in medical imaging as well as in clinical care settings.
- The observation of this EPA is based on a period of at least one week.

Assessment Plan:

Direct and indirect observation by supervisor, with input from other members of the interprofessional team

Assessment form collects information on:

- Setting: clinical rotation; medical imaging department
- Observer role (select all that apply): other supervisor(s); nurse(s); technologist(s); other physician/surgeon(s); other resident(s) or student(s); other [write in]

Basis for formal entrustment decisions:

Collect feedback

- At least 1 observation in medical imaging department
- At least 2 observations in clinical rotations
- At least 2 observations that include input from nurses or other health professionals

When is unsupervised practice expected to be achieved: PGY1

Relevant Tasks:

1. P 1.2.a. Behave in a professional manner P 1.1
2. ICS 2.3.a Demonstrate an understanding of the scope and expertise of other health care professionals COL 1.2
3. ICS 2.2.a Communicate effectively with physicians and other health care professionals COL 1.3
4. ICS 2.2.a Respond punctually to requests from patients or other health care professionals P 1.1
5. PBLI 2.2.a Respond appropriately to input from other health care professionals COL 1.1
6. SBP 3.3.c Identify patient needs and help provide access to health services and/or resources HA 1.1

Diagnostic Radiology

EPA 7: Recognizing normal radiologic anatomy and its variants

Key Features: This EPA include a variety of imaging modalities.

- Examples of the radiological anatomy expected at this stage include cardiothoracic anatomy (lung segments, heart chambers, vessels and their branches), MSK anatomy (major tendons/ligaments; osseous anatomy and variants), neuro and head and neck anatomy (branches of carotid arteries and Circle of Willis; brain lobar anatomy; neck spaces; facial bones) and abdominal/pelvic anatomy (liver segments; vascular anatomy of liver; major branches of the abdominal aorta; abdominal spaces; female pelvis).

Assessment Plan:

Image review with staff radiologist, entrusted resident/fellow, or by image quiz/OSCE

Assessment form collects information on:

- Modality: CT; radiography; ultrasound; other
- Case mix: abdomen/pelvis; cardiothoracic; MSK; neuro/head and neck

Basis for formal entrustment decisions:

Collect 12 observations of achievement.

- At least 3 from each body region
- A variety of imaging modalities
- At least 8 by image review
- At least 5 different assessors
- At least 3 staff radiologists

When is unsupervised practice expected to be achieved: PGY2

Relevant Tasks:

1. MK 1.2.a Apply knowledge of radiological anatomy ME 1.3
2. MK 1.2.a Identify normal structures and anatomic landmarks ME 3.4
3. MK 1.3.a Recognize normal anatomical variants ME 3.4

Diagnostic Radiology

EPA 8: Acquiring standard images using ultrasonography

Key Features: This EPA includes attention to patient comfort, privacy, and positioning, as well as applying knowledge of image generation and acquisition for ultrasound.

- This EPA does not include image interpretation.
- The observation of this EPA is based on a single US study.

Assessment Plan:

Direct observation and/or review of generated images by staff radiologist or entrusted resident/fellow, with input from the sonographer/technologist

Assessment form collects information on:

- Case mix: abdomen; testicle/scrotum; female pelvis; DVT; soft-tissue/surface; other
- Doppler: no; yes
- Transvaginal: no; yes
- Findings (write in):

Basis for formal entrustment decisions:

Collect 10 observations of achievement.

- At least 3 abdominal
- At least 1 testicular, including Doppler
- At least 3 female pelvises including at least 2 transvaginal and at least 1 with a finding of a first trimester embryo
- At least 1 assessment for DVT
- At least 1 soft-tissue/surface

When is unsupervised practice expected to be achieved: PGY2

Relevant Tasks:

1. MK 1.3.b Apply knowledge of anatomy, physiology and pathophysiology ME 1.3
2. MK 2.3 Apply knowledge of the physical principles of ultrasound, including Doppler ME 1.3
3. ICS 1.3.b Optimize the physical environment for patient comfort and privacy COM 1.2
4. MK 4.3 Adjust instrument settings to optimize image quality ME 3.5
5. MK 4.2 Obtain standard views ME 3.5
6. ICS 1.3.b Communicate effectively with the patient during the study/procedure COM 3.1
7. SBP 1.2.a Evaluate patient comfort and safety, and adjust the study/procedure as needed ME 3.5
8. MK 4.4 Record high quality images of significant findings COM 5.1
9. MK 2.4 Assess the quality and validity of the study and any impact on the diagnostic interpretation ME 3.4

Diagnostic Radiology

EPA 9: Protocolling requests for medical imaging for patients with acute and common presentations

Key Features: This EPA focuses on the work of a diagnostic radiologist to review, triage and plan for the delivery of medical imaging studies/procedures using different modalities.

- This includes gathering information about the patient's condition and purpose of the request, establishing the urgency, selecting the appropriate protocol, and demonstrating stewardship of medical imaging resources.
- This may include consideration of patient sedation or pre-treatment for prevention of contrast reactions.
- It also includes communicating with technologists and documenting the plan for the imaging study or procedure.
- The observation of this EPA is based on a batch of imaging requests.
- At this stage, the batch should focus on requests for acute and common, inpatient, or emergency department adult cases, primarily for CT and US imaging.

Assessment Plan:

Review of a batch of requests with staff radiologist, which may include input from technologist.

Assessment form collects information on:

- Number of requests in batch (write in):
- Batch of inpatient or emergency adult cases: no; yes
- Case mix (select all that apply): abdomen/pelvis; cardiothoracic; head and neck; MSK; neuro; soft tissue; spine; vascular; other [write in]
- Modality (select all that apply): CT; ultrasound; other [write in]

Basis for formal entrustment decisions:

Collect at least 5 observations of achievement.

- At least 5 different assessors

When is unsupervised practice expected to be achieved: PGY2

Relevant Tasks:

1. PC 2.2 Gather and synthesize patient information to establish the clinical question ME 2.2
2. PC 3.4 Apply diagnostic algorithms for the investigation of conditions examined by medical imaging modalities ME 3.1
3. MK 3.2 Modify and/or customize the request as needed ME 3.4
4. PC 2.2 Determine the priority of the request and triage the study ME 3.4
5. PC 1.4.a Document the plan for the imaging study or procedure COM 5.1
6. ICS 2.4.a Communicate effectively with technical staff about the urgency and/or customization of diagnostic radiology studies/procedures COL 1.2

Diagnostic Radiology

EPA 10: Applying a systematic search pattern to the analysis of medical imaging studies

Key Features: This EPA focuses on an approach that ensures a comprehensive analysis of an imaging study, including an assessment of the quality of the generated image.

- At this stage and for this EPA, it is not expected that the resident will identify or diagnose all relevant findings.

Assessment Plan:

Image review, case discussion and/or review of report by staff radiologist, entrusted resident/fellow.

Assessment form collects information on:

- Case mix: abdomen/pelvis; cardiothoracic; head; neck; MSK; spine; other [write in]
- Modality: CT; radiography; ultrasound

Basis for formal entrustment decisions:

Collect 10 observations of achievement.

- At least 1 abdomen/pelvis CT
- At least 1 abdomen/pelvis radiograph
- At least 1 abdomen/pelvis ultrasound
- At least 1 cardiothoracic CT
- At least 1 cardiothoracic radiograph
- At least 1 head CT
- At least 1 neck CT
- At least 1 MSK CT
- At least 1 MSK radiograph
- At least 1 spine radiograph

When is unsupervised practice expected to be achieved: PGY2

Relevant Tasks:

1. SBP 8.3 Display images to review a study ME 3.4
2. MK 1.2.a Apply knowledge of radiological anatomy ME 1.3
3. MK 1.2.a Identify normal structures and anatomic landmarks ME 3.4
4. MK 2.4 Assess the quality of the study and any impact on the diagnostic interpretation ME 3.4
5. PC 3.2 Demonstrate the use of a systematic search pattern ME 3.4

Diagnostic Radiology

EPA 11: Detecting acute and/or common abnormalities on imaging studies

Key Features: This EPA focuses on the application of the knowledge of anatomy and imaging techniques to address clinical questions.

- This includes identification of acute and/or common findings significant to the patient's care and recognition of critical findings that warrant communication with the referring physician.
- This EPA does not include identification of all findings on the image – for example, in a CT performed for pulmonary embolism, it is not expected that a resident at this stage would necessarily identify findings consistent with interstitial lung disease.

Assessment Plan:

Image review with staff radiologist, entrusted resident/ fellow, which may include input from technologists.

Assessment form collects information on:

- Case mix: abdomen/pelvis; cardiothoracic; MSK; neuro
- Setting: emergency department; inpatient; outpatient
- Modality: CT; fluoroscopy; radiography; ultrasound
- Finding (write in):

Basis for formal entrustment decisions:

Collect 20 observations of achievement.

- At least 5 of each body region
- At least 1 emergency department case for each body region
- At least 2 CTs
- At least 2 radiographs
- At least 2 ultrasounds
- A variety of findings
- At least 5 different assessors
- At least 3 staff radiologists

When is unsupervised practice expected to be achieved: PGY2

Relevant Tasks:

1. PC 2.3. Gather and synthesize patient information to establish the clinical question ME 2.2
2. MK 2.4 Assess the quality of the study and any impact on the diagnostic interpretation ME 3.4
3. MK 1.2.a Identify normal structures and anatomic landmarks ME 3.4
4. MK 1.2a Identify key findings and common or significant incidental findings ME 3.4
5. PC 3.2 Recognize critical findings that warrant verbal reporting to the referring physician ME 3.4

6. P 3.2 Work within personal limits, seeking assistance as needed P 1.1

Diagnostic Radiology

EPA 12: Generating a differential diagnosis for patients with acute or common findings

Key Features: This EPA focuses on integrating the findings of an imaging study to generate a differential diagnosis.

- Examples of acute or common findings include pulmonary nodule/mass consolidation; interstitial abnormalities; cardiomegaly; pneumomediastinum; pleural effusion; intra-axial intracranial hemorrhage; intra-axial mass; hydrocephalus; neck mass; bone lesion; soft tissue mass; joint effusion; arthritis; abdominal/pelvic solid organ lesion/mass; bowel wall thickening; dilated bowel; pneumoperitoneum; adnexal mass; hydronephrosis.

Assessment Plan:

Image review and/or review of primary report by staff radiologist, entrusted resident/fellow. Assessment form collects information on:

- Case mix: abdomen/pelvis; cardiothoracic; MSK; neuro
- Finding (write in):

Basis for formal entrustment decisions:

Collect 16 observations of achievement.

- At least 4 from each body region
- A variety of findings
- At least 5 different assessors
- At least 3 different staff radiologists

When is unsupervised practice expected to be achieved: PGY2

Relevant Tasks:

1. PC 2.3 Gather and synthesize patient information to establish the clinical question ME 2.2
2. MK 1.3.a Apply knowledge of anatomy, physiology and pathophysiology ME 1.3
3. PC 3.2 Summarize pertinent positive and negative findings ME 3.4
4. PC 3.3 Correlate findings with clinical information and other imaging modalities ME 3.4
5. PC 3.3 Generate an appropriate differential diagnosis ME 3.4
6. PC 3.4 Provide an appropriate order for the differential diagnosis based on the imaging findings and clinical context ME 3.4

Diagnostic Radiology

EPA 13: Communicating critical findings of medical imaging studies

Key Features: This EPA focuses on recognizing when a finding needs timely communication with the referring service and communicating effectively with that service.

- This includes contacting the responsible clinician, clearly conveying the findings and their significance, answering questions, and providing recommendations.
- It also includes documenting the interaction in the imaging report.

Assessment Plan:

Direct observation by staff radiologist, with review of resident's documentation

Use assessment form

Basis for formal entrustment decisions:

Collect 3 observations of achievement.

- At least 2 different assessors

When is unsupervised practice expected to be achieved: PGY2

Relevant Tasks:

1. PC 3.2 Recognize critical findings that warrant verbal reporting to the referring physician ME 3.4
2. ICS 2.4.b Summarize findings of clinical relevance ME 3.4
3. PC 3.4 Provide suggestions for further testing and/or patient disposition as relevant ME 2.4
4. ICS 2.4.b Convey information to clinicians in a manner that enhances patient management COL 1.3
5. P 1.2.a Behave in a professional manner P 1.1
6. PBLI 2.3.b Demonstrate insight into one's own limits of expertise ME 1.6
7. ICS 2.4.b Document in the imaging report actions taken to communicate significant or unexpected findings COM 5.1

Diagnostic Radiology

EPA 14: Providing reports for acute and/or common findings of medical imaging studies

Key Features: This EPA focuses on the written communication skills of documenting the findings of imaging studies. This includes generating an accurate and concise report, and recommending appropriate management, next steps and/or follow-up.

- The observation of this EPA is based on the review of a single report, which must be solely the work of the resident.

Assessment Plan:

Review of report by staff radiologist, entrusted resident/fellow.

Assessment form collects information on:

- Case mix: abdomen/pelvis; chest/cardiac; MSK; neuro
- Modality: CT; radiography; ultrasound; other [write in]
- Diagnosis: infection; neoplasm; trauma; vascular; other [write in]

Basis for formal entrustment decisions:

Collect 12 observations of achievement.

- At least 5 of each body region (any modality)
- At least 2 abdomen/pelvis CT
- At least 2 chest/cardiac CT
- At least 2 MSK CT
- At least 2 neuro CT
- At least 2 ultrasounds
- A variety of diagnoses
- At least 5 assessors
- At least 3 staff radiologists

When is unsupervised practice expected to be achieved: PGY2

Relevant Tasks:

1. ICS 2.4.b Summarize findings of clinical relevance ME 3.4
2. PC 3.3 Generate an appropriate differential and most likely diagnosis ME 3.4
3. PC 1.4.a Use a systematic method of reporting, integrating clinical and imaging information COM 5.1
4. PC 1.4.b Provide clear, concise, accurate and grammatically correct reports COM 5.1
5. ICS 2.4.b Convey information to clinicians in a manner that enhances patient management COL 1.3
6. ICS 2.3.b Convey diagnostic uncertainty, as needed COL 1.3
7. PC 3.4 Provide suggestions for further testing and/or patient disposition as relevant ME 2.4

Diagnostic Radiology

EPA 15: Interpreting diagnostic radiology imaging studies

Key Features: The focus of this EPA is the detection and interpretation of major and minor findings in imaging of any of the body region using any imaging modality.

- This includes assessing image quality, applying a systematic approach to image review, integrating findings with the clinical information and prior imaging studies, establishing a most likely diagnosis and a differential diagnosis, and providing recommendations for management.
- The observation of this EPA is based on a batch of imaging studies; a batch being at least a half-day's work.
- The observations for this EPA should document achievement in the full breadth of body regions and imaging modalities, in patients of all ages and with a variety of presentations and acuity of illness (i.e., inpatient, emergency, outpatient, follow-up).

Assessment Plan

Review of a batch of imaging studies with staff radiologist

Assessment form collects information on:

- Number in batch (write in):
- Number of pediatric cases (write in):
- Case mix (select all that apply): abdomen/pelvis; breast; cardiac; chest; head and neck; MSK; neuro; spine; obstetrical; vascular.
- Modality (select all that apply): CT; fluoroscopy; mammography; MRI; nuclear medicine; radiography; ultrasound.

Basis for formal entrustment decisions:

Collect 75 observations of achievement.

- At least 20 abdomen/pelvis batches
- At least 6 breast batches
- At least 2 cardiac batches
- At least 8 chest batches
- At least 10 MSK batches
- At least 10 neuro batches
- At least 3 batches that include head and neck imaging
- At least 5 batches that include spine imaging
- At least 3 batches that include vascular imaging
- At least 2 nuclear medicine batches
- At least 6 ultrasound batches
- At least 2 ultrasound batches that include obstetrical ultrasound
- At least 6 batches that include pediatric cases, across diverse modalities
- At least 2 assessors for each body region and/or modality

When is unsupervised practice expected to be achieved: PGY2-4

Relevant Tasks

1. MK 2.4 Assess the quality of the study and any impact on the diagnostic interpretation ME 3.4
2. PC 2.3 Gather and synthesize patient information to establish the clinical question ME 2.2
3. MK 4.4 Use computer applications to optimize the images and/or views needed to answer the clinical question ME 3.4
4. MK 1.4 Identify anatomic landmarks, normal anatomy and variants, artefacts and imaging pitfalls ME 3.4
5. MK 1.4 Identify all major and minor findings ME 3.4
6. ICS 2.4.b Summarize findings of clinical relevance ME 3.4
7. PC 3.3 Correlate findings with clinical information and other imaging modalities ME 3.4
8. PC 3.3 Generate an appropriate differential and most likely diagnosis ME 3.4
9. PC 3.2 Recognize critical findings that warrant verbal reporting to the referring physician ME 3.4
10. ICS 2.4.b Provide recommendations for further imaging and/or management ME 3.4

Diagnostic Radiology

EPA 16: Providing reports that guide patient management

Key Features: This EPA focuses on the communication skills of documenting the findings of imaging studies.

- This includes generating an accurate concise report in a timely manner, with a focus on grammar and appropriate lexicon.
- The achievement of this EPA requires competence across the breadth of imaging studies (i.e., all modalities, all body regions), including some cases with diagnostic uncertainty or complexity.
- The observation of this EPA is based on the supervisor review of a batch of reports; a batch representing at least a half day's work.

Assessment Plan:

Review of a batch of reports by staff radiologist

Assessment form collects information on:

- Number in batch (write in):
- Number of pediatric cases (write in):
- Case mix (select all that apply): abdomen/pelvis; breast; cardiac; chest; head and neck; MSK; neuro; obstetrical; spine; vascular
- Modality (select all that apply): CT; fluoroscopy; mammography; MRI; nuclear medicine; radiography; ultrasound

Basis for formal entrustment decisions:

Collect 25 observations of achievement.

- At least 4 abdomen and pelvis batches
- At least 2 breast batches
- At least 2 cardiac batches
- At least 2 chest batches
- At least 3 MSK batches
- At least 3 neuro batches
- At least 2 batches that include head and neck imaging
- At least 2 batches that include spine imaging
- At least 3 batches that include vascular imaging
- At least 2 nuclear medicine batches
- At least 3 ultrasound batches
- At least 2 ultrasound batches that include obstetrical ultrasound
- At least 3 batches that include pediatric cases, across diverse modalities
- At least 2 assessors for each body region and/or modality

When is unsupervised practice expected to be achieved: PGY2-4

Relevant Tasks:

1. ICS 2.4.b Summarize findings of clinical relevance ME 3.4
2. PC 1.4.a Use a systematic method of reporting, integrating clinical and imaging information COM 5.1
3. PC 1.4.b Provide clear, concise, accurate and grammatically correct reports COM 5.1
4. ICS 2.4.b Provide recommendations for further imaging and/or management ME 3.4
5. ICS 2.4.b Convey information to clinicians in a manner that enhances patient management COL 1.3
6. ICS 2.3.b Provide an appropriately ordered differential diagnosis and convey diagnostic uncertainty COM 5.1
7. ICS 2.2.b Communicate critical results urgently to the referring clinician COM 5.1
8. P 2.2 Report the caseload of imaging studies within an appropriate turnaround time L 4.1

Diagnostic Radiology

EPA 17: Planning and performing invasive image-guided procedures

Key Features: This EPA includes diagnostic and therapeutic image-guided procedures using any imaging modality and in any body region.

- This includes reviewing the request and assessing patient suitability and eligibility for the procedure or alternative procedures and planning the procedure, including the choice of imaging modality, approach to the procedure and choice of equipment.
- It includes all aspects of performing the procedure: obtaining consent, providing patient sedation and pre-procedural care; performing the technical skills of the procedure; documenting the procedure; and providing post-procedural care.
- It also includes providing management for any immediate reactions, adverse events or complications arising from the procedure.

Assessment Plan:

Direct observation by staff radiologist, entrusted resident or fellow, with input from medical radiation technologist, sonographer and/or nurse

Assessment form collects information on:

- Procedure: aspiration - joint; aspiration – paracentesis; aspiration – thoracentesis; aspiration - other; biopsy; catheter manipulation; drainage tube insertion; enteric tube placement; lumbar puncture; vascular access; other
- Case mix: abdomen/pelvis; breast; chest/lung; other
- Modality: CT; fluoroscopy; US
- Patient age: adult; pediatric

Basis for formal entrustment decisions:

Collect 30 observations of achievement.

- At least 3 vascular access procedures
- At least 5 fluoroscopic guided procedures, including at least 2 lumbar punctures
- At least 5 image-guided aspiration procedures, including at least 1 paracentesis and at least 1 thoracentesis
- At least 3 image-guided drainage tube insertions, including at least 1 abdominal/pelvic drainage tube insertion and 1 chest drainage tube insertion
- At least 10 image-guided biopsies, including at least 2 CT-guided and at least 2 US guided biopsies, and at least 2 breast, at least 2 abdominal solid organ and at least 2 lung biopsies

When is unsupervised practice expected to be achieved: PGY2-4

Relevant Tasks:

1. PC 2.3 Assess the patient's suitability to proceed with the procedure, reviewing relevant investigations and medical history ME 2.2

2. P 1.1.b Obtain and document informed consent, explaining the risks and rationale for the procedure ME 3.2
3. PC 4.4.a Demonstrate effective pre-procedure planning and preparation ME 3.5
4. PC 4.4.a Demonstrate aseptic technique: skin preparation; draping; establishing and respecting the sterile field; hand cleanse, gown and glove ME 3.5
5. SBP 1.2.a Evaluate patient comfort and safety, and adjust the study/procedure as needed ME 3.5
6. PC 4.4.a Perform the procedure in a skillful and safe manner ME 3.5
7. ICS 2.4.a Communicate effectively with supervisor, nurses, and/or assistants during the procedure COL 1.2
8. P 3.2.b Work within personal limits, seeking assistance as needed P 1.1
9. SBP 6.4 Apply safe practices in the imaging suite to minimize occupational and patient risk ME 5.2
10. PC 4.4.b Recognize and manage immediate complications ME 3.5
11. P 2.3 Document the procedure COM 5.1

Diagnostic Radiology

EPA 18: Acquiring standard images using fluoroscopy

Key Features: This EPA includes attention to patient comfort, privacy and positioning, and applying knowledge of image generation and acquisition for fluoroscopy.

- This includes decisions about the use of contrast agents.
- This EPA does not include image interpretation.

Assessment Plan:

Direct observation and/or review of generated images by staff radiologist or entrusted fellow, with input from the technologist

Assessment form collects information on:

- Case mix: gastrointestinal; genitourinary; other [write in]
- Patient age: adult; pediatric
- Acuity: elective; urgent; emergent

Basis for formal entrustment decisions:

Collect 13 observations of achievement.

- At least 5 gastrointestinal studies
- At least 5 genitourinary studies
- At least 3 other fluoroscopic studies
- At least 2 studies in the pediatric age group

When is unsupervised practice expected to be achieved: PGY2-4

Relevant Tasks:

1. MK 1.3.b Apply knowledge of anatomy, physiology and pathophysiology ME 1.3
2. ICS 1.3.b Optimize the physical environment for patient comfort and privacy COM 1.2
3. MK 2.4 Position the patient to optimize the study/procedure ME 3.5
4. MC 4.3 Adjust instrument settings to optimize image quality ME 3.5
5. MK 3.3 Use pharmacologic agents, contrast and/or other techniques to optimize the study ME 2.4
6. ICS 1.3.b Communicate effectively with the patient during the procedure COM 3.1
7. SBP 1.2.a Evaluate patient comfort and safety, and adjust the study/procedure as needed ME 3.5
8. MK 4.3 Record high quality images of significant findings COM 5.1
9. MK 2.4 Assess the quality and validity of the study and any impact on the diagnostic interpretation ME 3.4
10. ICS 2.4.a Work effectively with technologists and other health care providers COL 1.2

Diagnostic Radiology

EPA 19: Assessing, investigating and optimizing the quality of imaging studies

Key Features: This EPA focuses on the radiologist's role in ensuring the diagnostic quality of imaging studies to answer a clinical question, applying knowledge of image generation and acquisition for that modality.

- This includes assessing the quality of images acquired and determining whether quality impacts diagnostic interpretation and/or patient safety, e.g., motion artefact, suboptimal contrast timing, misplaced markers.
- It includes the development of a plan to address the quality issue.
- Examples include adjusting the process of the study (patient positioning, additional views, using contrast, using sedation), retaking certain images, acquiring supplemental images as necessary (e.g., acquiring US images, requesting thin reformats of CT), or recommending another diagnostic study.
- This EPA does not include protocoling, image interpretation and reporting.
- The observation of this EPA is based on an individual case with image quality concerns raised by the technologist or raised by the resident upon review of the image(s).

Assessment Plan:

Review of imaging case with staff radiologist, may include input from technologist

Assessment form collects information on:

- Modality: CT; mammography; MRI; radiography; ultrasound
- Issue identified by: technologist; resident; other [write in]

Basis for formal entrustment decisions:

Collect 15 observations of achievement.

- At least 3 CT studies
- At least 3 mammography studies
- At least 3 MRI studies
- At least 3 radiography studies
- At least 3 ultrasound studies
- At least some issues that were identified by resident

When is unsupervised practice expected to be achieved: PGY2-4

Relevant Tasks:

1. PC 2.3 Gather and synthesize patient information to establish the clinical question ME 2.2
2. MK 4.2 Detect issues with image quality, such as artefacts, incorrect markers and positioning ME 3.4
3. MK 2.4 Identify the cause(s) of poor image quality ME 3.4
4. MK 4.3 Apply knowledge of image generation, including technical aspects, patient positioning and use of contrast media or additional pharmaceuticals ME 1.3

5. ICS 2.4.a Provide feedback to technical staff COL 1.2
6. ICS 2.4.a Work with technical staff to solve imaging challenges and optimize the quality of studies COL 1.2
7. MK 4.4 Adjust the process of the study ME 3.4
8. MK 4.4 Acquire supplemental images, as necessary ME 3.4
9. SBP 6.4 Apply the ALARA principle ME 5.2
10. MK 4.4 Determine whether a study needs to be repeated or whether a different medical imaging study would be better to resolve the clinical question ME 3.4

Diagnostic Radiology

EPA 20: Advising physicians and other health care providers on the selection and timing of diagnostic radiology studies and procedures

Key Features: This EPA includes gathering the needed clinical information about the request and synthesizing clinical data with results of other investigations to develop an understanding of the clinical question and make recommendations about selection, sequence and/or timing of further investigation.

- Examples include recommending a follow-up study/procedure; altered renal function prohibiting the requested examination; incorrect or inappropriate study/procedure ordered based on clinical history; expediting the timing of a radiology study/procedure based on history or findings; conveying the urgency of the need for a radiology study/procedure; and working with the clinician to develop a management plan based on the imaging finding.
- The observation of this EPA is based on the supervisor directly observing a single interaction between the resident and a referring physician/team - in person, via telephone or in a simulated scenario.

Assessment Plan:

Direct observation by staff radiologist

Assessment form collects information on:

- Modality: CT; MRI; radiography; ultrasound
- Case mix: abdomen/pelvis; breast; chest; MSK; neuro
- Setting: clinical; simulation

Basis for formal entrustment decisions:

Collect 3 observations of achievement.

- Different modalities and body regions
- No more than 1 in simulation
- At least 3 different assessors

When is unsupervised practice expected to be achieved: PGY2-4

Relevant Tasks:

1. SBP 3.2.a Establish positive relationships with other members of the health care team COL 1.1
2. PC 2.2 Gather patient information from another health professional ME 2.2
3. PC 2.2 Correlate prior investigations, including the results of relevant laboratory investigations and imaging ME 2.2
4. PC 2.3 Integrate and synthesize patient information to establish the clinical question ME 2.2
5. ICS 2.4.b Advise referring physicians on the most appropriate selection, sequence and/or

timing of investigation(s) ME 2.4

6. ICS 2.4.b Identify when a study and/or procedure is not appropriate ME 2.4
7. ICS 2.4.b Convey information to clinicians in a manner that enhances patient management COL 1.3
8. ICS 2.4.a Support clinical colleagues in the development and implementation of a management plan COL 1.3
9. SBP 3.3.c Respond to individual patient diagnostic needs and issues as part of patient care HA 1.1

Diagnostic Radiology

EPA 21: Protocolling requests for medical imaging

Key Features: This EPA focuses on the work of a diagnostic radiologist to review imaging requests and plan imaging studies.

- This includes gathering information about the patient condition and purpose of the request, triaging the urgency of the request, selecting the appropriate protocol, and demonstrating attention to radiation, contrast and patient safety, as well as stewardship of imaging resources.
- At this stage, this EPA includes adult and pediatric patients, in any clinical setting, and includes patient-specific factors that impact upon imaging such as impaired renal function, contrast allergy and pregnancy.

Assessment Plan:

Review of a batch of requests by staff radiologist, or entrusted resident/fellow, which may include input from technologist.

Assessment form collects information on:

- Case mix (select all that apply): abdomen/pelvis; cardiothoracic; head and neck; MSK; neuro; soft tissue; spine; vascular; other.
- Modality (select all that apply): CT; MRI; nuclear medicine; radiography; ultrasound; vascular; other [write in]
- Number of requests in batch (write in):
- Number of requests that need modifications (write in):

Basis for formal entrustment decisions:

Collect at least 12 observations of achievement.

- At least 3 batches of abdomen/pelvis requests
- At least 3 batches of cardiothoracic requests
- At least 3 batches of MSK requests
- At least 3 batches of neuro requests
- At least 3 batches with requests that needed modification
- At least 4 batches that include CT requests
- At least 4 batches that include MRI requests
- At least 5 different assessors

When is unsupervised practice expected to be achieved: PGY2-4

Relevant Tasks:

1. PC 2.3 Gather and synthesize patient information to establish the clinical question ME 2.2
2. PC 2.3 Identify patient factors that may affect the choice of imaging protocol ME 2.2
3. PC 2.2 Correlate prior investigations, including the results of relevant laboratory investigations and imaging ME 2.2

4. ICS 2.4.b Identify when a study and/or procedure is not appropriate ME 2.4
5. MK 3.4 Determine whether the patient requires sedation and/or pre-treatment for prevention of contrast reactions ME 3.4
6. MK 3.3 Minimize exposure to contrast agents and radiation ME 2.2
7. MK 3.4 Modify and/or customize the request as needed ME 3.4
8. ICS 2.4.a Determine the priority of the request and triage the study ME 3.4
9. PC 1.4.a Document the plan for the imaging study or procedure COM 5.1
10. ICS 2.4.a Communicate effectively with technical staff about the urgency and/or customization of diagnostic radiology studies/procedures COL 1.2
11. PC 2.4 Allocate imaging resources judiciously, recognizing redundancies and demonstrating awareness and stewardship of medical imaging resources L 2.1

Diagnostic Radiology

EPA 22: Discussing imaging findings with patients and their families

Key Features: The focus of this EPA is the application of communication skills to convey clearly and compassionately imaging findings, including a diagnosis and the limits of the findings, to patients and families.

- This EPA may be observed in any setting, including simulation, but is most likely to be relevant in breast imaging, fluoroscopy, obstetric, pediatric, interventional, and ultrasound settings.

Assessment Plan:

Direct observation by radiologist, which may include input from other health professionals.
Assessment form collects information on:

- Setting: clinical; simulation

Basis for formal entrustment decisions:

Collect 3 observations of achievement.

- No more than 1 in simulation setting
- At least 3 different assessors

When is unsupervised practice expected to be achieved: PGY2-4

Relevant Tasks:

1. ICS 1.4.b Demonstrate empathy, respect and compassion COM 1.1
2. ICS 1.4.b Provide accurate information COM 3.1
3. ICS 1.2.b Use plain language and avoid medical jargon. COM 3.1
4. ICS 1.2.b Verify the patient's and/or family's understanding COM 3.1
5. ICS 1.2.b Answer questions from the patient and/or family COM 4.3
6. ICS 1.4.b Communicate in a manner that is respectful, compassionate, non- judgmental, and culturally aware COM 4.1
7. P1.3.a Recognize when strong emotions (such as anger, fear, anxiety, or sadness) are impacting an interaction and respond appropriately COM 1.5
8. ICS 1.4.a Respond to patients' non-verbal communication and use appropriate non-verbal behaviors to enhance communication COM 1.4
9. P1.3.a Establish boundaries as needed in emotional situations COM 1.5

Diagnostic Radiology

EPA 23: Participating in interdisciplinary rounds

Key Features: This EPA focuses on the role of the diagnostic radiologist as a participant in and contributor to interdisciplinary clinical decision-making.

- This EPA includes preparing and presenting cases, including a review of relevant literature, responding to questions from the interdisciplinary group and communicating effectively in this setting.
- At this stage, the resident is not yet expected to be the sole source of Diagnostic Radiology expertise for the rounds.

Assessment Plan:

Direct observation by staff radiologist, which may include input from other health professionals.

Assessment form collects information on:

- Type of rounds (write in):

Basis for formal entrustment decisions:

Collect 2 observations of achievement.

When is unsupervised practice expected to be achieved: PGY2-4

Relevant Tasks:

1. SBP 3.3.a Synthesize cases for discussion at interdisciplinary rounds ME 1.4
2. PC 1.4.b Present the information in an organized manner S 2.4
3. PC 1.3 a Use audiovisual aids effectively S 2.4
4. ICS 2.4.b Convey information to clinicians in a manner that enhances patient management COL 1.3
5. ICS 2.4.b Encourage discussion, questions, and interaction relevant to the case COL 1.3
6. ICS 2.4.a Support clinical colleagues in the development and implementation of a management plan COL 1.3
7. SBP 3.3.a Participate effectively at interdisciplinary rounds COL 1.3
8. SBP 3.3.c Respond to individual patient diagnostic needs and issues as part of patient care HA 1.1
9. P 1.2.a. Behave in a professional manner P 1.1

Diagnostic Radiology:

EPA 24: Managing a radiology service

Key Features: This EPA focuses on the diagnostic radiologist's role in the overall delivery of safe patient care in a medical imaging department, maintaining the volume and quality of the work.

- This includes all aspects of the work of a diagnostic radiologist: interpreting and reporting a case load of imaging studies, providing consultation, performing/supervising procedures, triaging patients, protocolling requests, attending clinical rounds, etc.
- This EPA also includes teaching and providing feedback to junior learners, as well as working effectively with the other health care professionals in the department as well as referring services.
- Observation of this EPA should occur in at least two different medical imaging settings or services.
- The observation of this EPA is based on a day of clinical activity and may include daytime as well as after-hours work.

Assessment Plan:

Direct and indirect observation by staff radiologist, with input from technologists

Assessment form collects information on:

- Case complexity on average: low; medium; high
- Includes after-hours call: no; yes
- Case mix (select all that apply): abdomen/pelvis; cardiothoracic; head and neck; MSK; neuro; soft tissue; spine; vascular; other [write in]
- Modality (select all that apply): CT; MRI; nuclear medicine; radiography; ultrasound; vascular; other [write in]

Basis for formal entrustment decisions:

Collect 5 observations of achievement.

- At least 2 medium or high complexity days
- At least 1 that includes after-hours call
- At least 2 different modalities or body regions
- At least 2 different assessors

When is unsupervised practice expected to be achieved: PGY5

Relevant Tasks:

1. PC 2.4 Carry out professional duties in the face of multiple competing demands ME 1.5
2. PC 2.4 Prioritize requests for diagnostic radiology studies ME 2.1
3. SBP 3.3.a Coordinate scheduling of cases with technical and other staff COL 1.2
4. MK 4.4 Guide technical staff to resolve clinical or imaging challenges COL 1.2
5. PC.4.4.a Perform procedures in a skillful and safe manner ME 3.5

6. PC 3.2 Interpret diagnostic radiology studies/procedures ME 3.4
7. P 2.3 Provide reports of the caseload of diagnostic radiology studies within an acceptable time frame COM 5.1
8. P 2.4 Set priorities and manage time to fulfil diverse responsibilities L 4.1
9. PC 2.5 Integrate supervisory and teaching responsibilities into the overall management of the service L 4.1
10. PBLI 1.3 Integrate best evidence and clinical expertise S 3.4
11. P 3.2.b Work within personal limits, seeking assistance as needed P 1.1

Diagnostic Radiology:

EPA 25: Developing plans for patients for whom there is uncertainty in diagnosis and/or management

Key Features: This EPA focuses on the investigation and/or management of patients for whom there is uncertainty in diagnosis and/or uncertainty in determining optimal treatment.

- This EPA includes the interpretation of available imaging, synthesis with other clinical and laboratory information, integration of opinions from other radiologists and other physicians, as well as effective communication of uncertainty to the patient/family and/or the referring physician.
- This EPA may require scholarly review of the literature and/or consultation with external experts.

Assessment Plan:

Case discussion and/or review of images with staff radiologist

Assessment form collects information on:

- Description of case (write in):
- Case complexity: low; moderate; high

Basis for formal entrustment decisions:

Collect 3 observations of achievement.

- The cases for decisions regarding achievement must be moderate or high complexity
- At least 2 assessors

When is unsupervised practice expected to be achieved: PGY5

Relevant Tasks:

1. P 3.4.b Identify limits in their own expertise P 1.1
2. ICS 2.3.a Gather and/or clarify the indication for testing and/or clinical information with the referring physician COL 1.3
3. PC 2.3 Gather additional clinical information from the medical record ME 2.2
4. PC 2.3 Integrate findings from prior investigations ME 2.2
5. ICS 2.4.a Consult with colleagues with different expertise COL 1.3
6. ICS 2.4.a Incorporate the opinions and perspectives of other physicians COL 1.3
7. PC 3.2 Provide an interpretation of the medical imaging study/procedure ME 1.1
8. PC2.3 Provide recommendations that may clarify the diagnosis, such as other investigations or follow-up testing ME 3.4
9. PBLI 1.4 Articulate complexities and/or diagnostic uncertainty in the report, such as limitations and areas of uncertainty COM 5.1

Diagnostic Radiology:

EPA 26: Contributing expertise in interdisciplinary rounds

Key Features: This EPA builds on the knowledge and skills demonstrated at the Core stage.

- This EPA focuses on the role of the diagnostic radiologist as the authority providing radiologic expertise to the team discussion, advocating for the patient and demonstrating professional behavior.
- The observation of this EPA is based on one patient/case presentation (i.e., not on the entire meeting).

Assessment Plan:

Direct observation by staff radiologist or another member of the interprofessional team

Assessment form collects information on:

- Type of rounds (write in):
- Observer role: diagnostic radiologist; treating physician/surgeon; other health care professional

Basis for formal entrustment decisions:

Collect 4 observations of achievement:

- At least 2 different types of rounds

When is unsupervised practice expected to be achieved: PGY5

Relevant Tasks:

1. PC 2.4 Present and discuss cases effectively in the role of a consultant in Diagnostic Radiology ME 1.4
2. PBLI 1.3 Integrate best evidence and clinical expertise S 3.4
3. ICS 2.4.b Convey information to clinicians in a manner that enhances patient management COL 1.3
4. SBP 3.3.c Respond to individual patient diagnostic needs and issues as part of patient care HA 1.1
5. ICS 2.4.a Support clinical colleagues in the development and implementation of a management plan COL 1.3
6. SBP 3.4.a Facilitate the development of consensus when there are differences in recommendations provided by other health care professionals COL 2.2
7. P 1.2.a. Behave in a professional manner P 1.1

Diagnostic Radiology:

EPA 27: Conducting scholarly work relevant to Diagnostic Radiology

Key Features: This EPA includes using appropriate methods, analyzing results, critically reflecting on the findings, and disseminating results. It may include obtaining grant funding and preparing a manuscript for publication.

- This may include basic or clinical science related to diagnostic radiology, medical education research or quality improvement projects.
- The achievement of this EPA may be based on preparation of a manuscript suitable for submission to a peer-reviewed journal, or presentation of the project at a peer- reviewed local, regional, provincial, national, or international scientific meeting.

Assessment Plan:

Review of submitted manuscript and/or direct observation of presentation by research supervisor.

Use Assessment form.

Basis for formal entrustment decisions:

Collect 1 observation of achievement.

When is unsupervised practice expected to be achieved: PGY5

Relevant Tasks:

1. Generate focused questions for scholarly investigation S 4.4
2. Critically evaluate the literature S 3.3
3. Summarize the findings of a literature review S 4.5
4. Select appropriate methods of addressing a given scholarly question S 4.4
5. Identify ethical principles in research, including patient privacy concerns S 4.2
6. Collect data for a scholarly project S 4.4
7. Perform data analysis S 4.4
8. Interpret and integrate data in the context of existing literature S 4.4
9. Disseminate the findings of scholarly activity, in written or oral form S 4.5

Diagnostic Radiology:

EPA 28: Planning and completing personalized training experiences aligned with career plans and/or specific learning needs

Key Features: This EPA allows the resident to individualize training to prepare for fellowship training, prepare for practice in a specific setting and/or a setting requiring distinct skills, or act on performance gaps identified through self-assessment or by the clinical competence committee.

- This EPA may be used for any structured training experience: clinical or academic. Examples include pursuing fellowship-specific clinical experiences, developing a scholarly focus.
- The assessment of this EPA is based on the achievement of outcomes identified by the resident and approved by the program director/program committee. These outcomes must be SMART (specific, measurable, achievable, relevant, timely).

Assessment Plan:

Review of resident's plan and its outcome by supervisor, academic advisor, or program director.

Use assessment form.

Basis for formal entrustment decisions:

Collect 1 observation of achievement.

When is unsupervised practice expected to be achieved: PGY5

Relevant Tasks:

1. PBLI 2.4.a Demonstrate a commitment to maintaining and enhancing competence P 2.1
2. PBLI 2.3.b Interpret data on personal performance to identify opportunities for learning and improvement S 1.2
3. PBLI 2.3.c Define learning needs related to personal practice and/or career goals S 1.1
4. PBLI 2.4.b Generate focused questions that address knowledge gaps S 3.1
5. PBLI 2.3.c Create a learning plan that is feasible, includes clear deliverables and a plan for monitoring ongoing achievement S 1.1
6. PBLI 2.4.c Adjust educational experiences to gain competencies necessary for future practice L 4.2


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