Entrustable Professional Activities (EPAs)

List of EPAs for Diagnostic Radiology

EPA Title	EPA Entrustment Level to be Attained by Exit
EPA 1: Reporting of Radiographs (X-rays)	Level 5
EPA 2: Performing Basic Image-guided Interventional Procedures	Level 4
EPA 3: Protocoling and Reporting MRI scans	Level 4
EPA 4: Protocoling and Reporting CT scans	Level 4
EPA 5: Performing and Reporting Ultrasound Studies	Level 4
EPA 6: Performing Fluoroscopy Procedures	Level 4
EPA 7: Reporting of Mammograms (X-rays) and Breast Ultrasound scans	Level 4

Entrustment Scale

Entrustment Level	Description
Level 1	Not allowed to practise EPA, allowed to observe.
Level 2	Allowed to practise EPA only under direct supervision
Level 3	Allowed to practise EPA under indirect supervision
Level 4	Allowed to practise EPA under remote supervision
Level 5	Allowed to supervise others in practice of EPA independently

Diagnostic Radiology EPA 1

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Title	*Reporting of Radiographs (X-rays)*
Specification and limitations	This EPA is applicable to radiographs for patients in the emergency department, outpatient, and inpatient settings: 1. Interprets radiographs (X-rays) in emergency department, outpatient, and inpatient settings. 2. Reports on findings: Write concise and informative reports. 3. Gives diagnosis or differential diagnosis based on clinical information provided. 4. Makes appropriate recommendations on the next management steps. 5. Obtains additional clinical information in the electronic medical records when appropriate. 6. Discusses with clinicians when appropriate and understands context in which request is made. 7. Uses appropriate methods to notify referring clinician for critical results.
	Limitations: This EPA does not include second opinion reporting or reports deemed necessary to be reported by a specialist registered radiologist for medical legal reasons.
EPA Entrustment Level to be Attained by Exit	Level 5

Diagnostic Radiology EPA 2

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Title	*Performing Basic Image-guided Interventional Procedures*
Specification and limitations	1. To be able to obtain informed consent for procedures that are routinely performed by radiologists. a. Understand the concept of patient's autonomy and rights. b. To be able to clearly explain to patient in layman terms, the procedure, the indications, contraindications, benefits and potential risks of complications as well as alternative(s) for the procedure. c. Able to tailor the consent to the patient's requirements and wishes. d. Allowing patient and family to clarify or ask questions and verifying patient's understanding of the procedure and risks. e. Use necessary aids and media to help patient or family understand. f. To adequately document the entire consent process, including conditions that are specific to the patient. 2. a. Performs image-guided drainages, e.g. abdominal and chest drains b. Performs image-guided biopsies, e.g., fine needle aspiration or core biopsy of solid organs c. Performs image-guided venous access, e.g. peripherally inserted central catheters 3. Understands indications and assess suitability of patient for above mentioned procedure. Knows alternative treatments. 4. Recognises that among the above procedures, that there will be a subgroup of complex, unusual, and technically more difficult variations of these procedures. 5. Protocols post-procedure care tailored to the individual. 6. Recognise and appropriately manage complications from the procedure.
	Limitations: • A summative entrustment decision for this EPA is only applicable with hemodynamically stable, cognitively competent adult patients. • The subgroup of complex, unusual, and technically more difficult variations of these procedures would require the resident to consult his/her supervisor before performing these procedures. • Consent for complex subspecialty high risk invasive procedures that not commonly performed are excluded.
EPA Entrustment Level to be Attained by Exit	Level 4

Diagnostic Radiology EPA 3

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Title	*Protocoling and Reporting MRI Scans*
Specification and limitations	**Protocoling** 1. Protocol scans based on clinical question and patient's condition. 2. Appropriate use of intravenous contrast and selection of the correct contrast when indicated. 3. Recognise contraindications to MRI and make recommendations for appropriate alternatives **Reporting** 1. Differentiate normal from abnormal findings. 2. Identify apparent as well as subtle abnormalities. 3. Compare with previous Radiological studies if relevant. 4. Formulate differential diagnoses and give single diagnosis when appropriate. 5. Recognize critical findings and notify clinician when needed. 6. Make suggestions for additional imaging when appropriate, relying on peer-reviewed published guidelines and algorithms or clinical literature for management when available.
	Limitations: MRI scans uncommonly performed or only done at subspecialty level.
EPA Entrustment Level to be Attained by Exit	Level 4

Diagnostic Radiology EPA 4

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<table>
<tr><td>Title</td><td>Protocoling and Reporting CT Scans</td></tr>
<tr><td rowspan="2">Specification and limitations</td><td>This EPA is applicable to scans for patients in the emergency department, outpatient and inpatient settings.

Protocoling
1. Select appropriate scan protocol based on clinical question, patient’s condition, and using the ALARA principle.
2. Appropriate use of contrast, including IV, oral and rectal contrast. Use correct contrast injection rates and appropriate number of phases to answer clinical question.
3. Recognise contraindications to CT or contrast usage, and make recommendations for appropriate alternatives

Reporting
1. Make core observations and detect subtle abnormalities.
2. Differentiate normal from abnormal findings
3. Compare with previous radiological studies if necessary.
4. Formulate and prioritises differential diagnoses and give single diagnosis when appropriate.
5. Recognize critical findings and notify clinicians as needed.
6. Make suggestions for additional imaging when appropriate, relying on peer-reviewed published guidelines and algorithms or clinical literature for management when available.
7. Able to use advanced computer workstation for post processing of routine cases.</td></tr>
<tr><td>Limitations:
CT scans uncommonly performed or only done at subspecialty level.</td></tr>
<tr><td>EPA Entrustment Level to be Attained by Exit</td><td>Level 4</td></tr>
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<table>
<tr><td>Title</td><td>Performing and reporting ultrasound studies</td></tr>
<tr><td rowspan="2">Specification and limitations</td><td>Perform ultrasound study:
To perform hands on ultrasound study independently with the aim of obtaining optimised and appropriate images of diagnostic quality.
Use suitable presets for studies and practice ultrasound safety, using the ALARA principle.
Document images according to standardised protocols. i.e., with inclusion of important anatomical landmarks, annotations and key significant findings.
Practice safe hygiene standards to prevent cross-contamination, understanding the differences between low and high level disinfection and able to demonstrate proper disinfection of equipment, transducers, and ultrasound machine.
Address patient care needs and concerns during the period of the scan.
Reporting ultrasound study
To interpret ultrasound studies performed by oneself or a qualified practitioner, e.g., radiographer; making accurate diagnoses, communicating the findings efficiently as well as making appropriate recommendations.
Be able to correlate and make comparison of ultrasound images with images obtained from other radiological modalities.
Obtain relevant clinical information to aid the interpretation of ultrasound studies, either from discussion with clinical colleagues or review of available clinical record.
Provide appropriate recommendations for subsequent imaging or clinical action when necessary.
Scope of EPA:
Able to perform and report ultrasound examinations in the outpatient, inpatient as well as portable settings.
Scope of ultrasound examinations:
Abdomen, Pelvis (including gynaecological, first trimester scans), Urinary system, Scrotum, Groin for hernia, Thyroid, Vascular arterial and venous (Doppler studies and deep vein thrombosis evaluation).
Paediatric, Musculoskeletal, Interventional radiology
Contrast enhanced ultrasound studies.</td></tr>
<tr><td>Limitations:
Exclude highly specialised high risk obstetric US or US not done routinely in a radiological practice. (e.g., US lung)
Exclude Breast Ultrasound as assessed in EPA 7.</td></tr>
<tr><td>EPA Entrustment Level to be Attained by Exit</td><td>Level 4</td></tr>
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Diagnostic Radiology EPA 6

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Title	*Performing Diagnostic Fluoroscopy Procedures*
Specification and limitations	Radiologists are to perform fluoroscopic procedures for diagnosis purposes in the ambulant and inpatient settings. 1. Be familiar with the clinical context and define the clinical problem being addressed. 2. Be able to identify pertinent clinical information and draw upon ancillary tests (as necessary) to refine the procedure and identify potential complications and contraindications. 3. Be familiar with the technical requirements and equipment used to optimise image quality. 4. Use ALARA principle and appropriate radiation protection methods to reduce exposure for patient, staff and self. 5. Uses the correct contrast media (barium, water-soluble, non-ionic) in the appropriate setting. 6. Be able to identify common causes of pathology and pathophysiology 7. Recognise limitations and exercise judgement in obtaining expert opinion and assistance when necessary. 8. Be able to form a clear working diagnosis and form differential diagnoses. 9. Be able to communicate results clearly to clinical teams and generate a clear written document that transmits these findings. 10. Being able to hand-over cases safely to a colleague when transferring care of patient to another colleague or team. 11. Be cognisant of patient safety. 12. Able to recommend follow-up action where appropriate. List of procedures: Common procedures include Barium meal and Barium swallow, water soluble contrast swallow and water-soluble contrast enema. Less common procedures include barium enema, etc. and lymphangiograms.
	Limitations: Does not include use of fluoroscopy in advanced diagnostic procedures such as cerebral or visceral angiograms or aortogram.
EPA Entrustment Level to be Attained by Exit	Level 4

Diagnostic Radiology EPA 7

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Title	*Reporting of Mammograms (X-rays) and Breast Ultrasound scans*
Specification and limitations	1. Interprets mammograms (X-rays) and breast ultrasound scans for screening and diagnostic purposes. 2. Reports on findings: Write concise and informative reports. 3. Gives diagnosis or differential diagnosis based on clinical information provided. 4. Makes appropriate recommendations on the next management steps, including additional views for mammograms, ultrasound scans, advanced imaging e.g., MRI breast; localisation of lesions and biopsy options. 5. Obtains additional clinical information in the electronic medical records when appropriate. 6. Discusses with clinicians when appropriate and understands context in which request is made. 7. Uses appropriate methods to notify referring clinician for critical results.
	Limitations: This EPA does not include second opinion reporting or reports deemed necessary to be reported by a specialist registered radiologist for medicolegal reasons.
EPA Entrustment Level to be Attained by Exit	Level 4