RADIATION ONCOLOGY RESIDENCY PROGRAM
Competency Evaluation of Resident

Resident's Name:	
Rotation:	Clinical Rotation 5
Inclusive dates of rotation:	
Director or Associate Director:	

Competency Assessment Scheme:

1. Unsatisfactory
   - Performance/Knowledge is below standard
2. Needs Improvement
   - Performance/Knowledge is below standards in certain areas and improvement is needed
3. Meets Expectations
   - Performance/knowledge that consistently meets high standards of competency
4. Above Expectations
   - Performance/Knowledge exceeds expectations
   - Performance/Knowledge is consistently high quality
5. Outstanding
   - Performance/Knowledge is exceptional and consistently superior

Evaluation criteria	Competency (from 1 – 5)	Explanatory Notes & Mentor Signature
Magnetic Resonance Imaging (MRI) - General		
a. Demonstrates an understanding of the basic imaging principles behind MRI		
b. Compares the treatment planning-related advantages and limitations of MRI with those of CT		
c. Demonstrates an understanding of the role of MRI for radiation therapy applications, providing examples		
Magnetic Resonance Imaging (MRI) - QA		
a. Demonstrates an understanding of the quality assurance processes and frequencies of checks for MR simulators (e.g., image quality, image integrity, safety and mechanical checks, network connectivity)		

Ultrasound (US) - General		
a. Demonstrates an understanding of the basic imaging principles behind US imaging		
b. Demonstrates an understanding of the role of US in external beam and brachytherapy treatments using trans-rectal as opposed to trans-abdominal probes, providing examples		
Ultrasound (US) - QA		
a. Describes methods for QA of US imaging probes prior to clinical uses in procedures such as prostate implants and prostate external beam therapy		
Positron Emission Tomography (PET) - General		
b. Demonstrates an understanding of the basic imaging principles behind PET		
c. Compares the advantages and limitations of PET with those of CT for treatment planning		
d. Demonstrates an understanding of the role of PET for radiation therapy applications, providing examples		
Positron Emission Tomography (PET) - QA		
a. Demonstrates an understanding of the quality assurance processes and frequencies of checks for PET-CT simulators (e.g., image quality, image integrity, safety and mechanical checks, network connectivity)		
SPECT - General		
a. Demonstrates an understanding of the basic imaging principles behind SPECT		
b. Describes the comparative advantages and limitations for treatment planning of SPECT and CT		
c. Demonstrates an understanding of the role of SPECT for external beam and radiopharmaceutical therapy applications, providing examples		

Informatics		
a. Uses information technology to retrieve and store patient demographic, examination, and image information		
b. Understands how image processing is used to create radiographic images for display presentation and depict 3D structures in CT and MR		
c. Uses information technology to investigate clinical, technical, and regulatory questions		
d. Uses and understands common information systems used in radiation oncology (e.g., record and verify, electronic medical records, image handling)		
e. Demonstrates an understanding of the various methods of data transfer, storage, and security, including:		
i. PACS		
ii. DICOM		
iii. DICOM in radiation therapy (DICOM-RT)		
iv. Health Level 7 (HL7)		
v. Integrating the Healthcare Enterprise (IHE)		
vi. IHE Radiation Oncology (IHE-RO)		
f. Understands the roles of physics and information technology staff, including their work in network integration and maintenance		
h. Describes issues associated with the transfer of images (e.g., connectivity, image dataset integrity)		
i. Describes accuracy checks for the following output devices:		
i. Printers		
ii. Record and verify systems		
iii. DICOM output		
Image Registration/Fusion		

a. Describes the rationale behind and the advantages/challenges of image registration and image fusion		
b. Defines the image features on which registration can be based (e.g., landmarks, segments, intensities)		
c. Defines the different forms of registration (e.g., rigid, affine, deformable) and Describes their advantages and limitations		
d. Defines similarity metrics used to assess quality of registration (e.g., squared intensity differences, cross-correlation, mutual information)		
e. Describes how to commission imaging modalities such as MRI, PET-CT, and diagnostic CT for the purpose of image registration to a radiation oncology planning CT		
f. Describes issues associated with the transfer of images (e.g., connectivity, image dataset integrity)		
g. Describes issues associated with patient positioning (e.g., bore size, couch top, lasers, compatibility of immobilization devices, differences in patient position/ organ filling, motion)		
h. Describes issues associated with the choice of image acquisition technique (e.g., length of scan, slice thickness, FOV, kV, mAs)		
Imaging Tests		
a. Describes the tests that would be performed to ensure that the imported image data are correct		
b. Demonstrates that images can be imported from CT, MR, and PET or PET/CT scanners		
c. Demonstrates that the above imaging sets can be accurately fused with the primary treatment planning image set		
d. Describes the different image fusion algorithms available on a treatment-planning system (e.g., CT-CT, CT-MR, CT-PET)		
On-Board MV and kV Imaging - General		
a. Describes the different detector technologies that have been used for on-board MV and kV imaging		

b. Describes the imaging dose associated with on-board MV and kV imaging technologies		
c. Understands and performs the different measures of radiographic image quality as part of the routine duties		