

### Appendix 3: ACR Appropriateness Criteria<sup>40-42</sup>

The American College of Radiology (ACR) uses a modified Delphi process to reach its appropriateness criteria. ACR authors first review relevant information and create a summary. This summary is reviewed by clinicians and other medical professionals. The process allows for the incorporation of expert consensus when published evidence is lacking. A panel of experts rates the information to determine appropriateness of the imaging intervention.

Appropriateness is rated between 1 and 9 and is grouped into three categories: “usually not appropriate” (scores of 1, 2, and 3) or as not indicated in a certain clinical setting and unlikely to have a favourable risk-benefit ratio for patients; “maybe appropriate” (scores of 4, 5, and 6) or as potentially indicated in certain clinical settings and having potential to have an equivocal risk-benefit for patients; and “usually appropriate” (scores of 7, 8, and 9) or as indicated in certain clinical settings and having a favourable risk-benefit ratio for patients. All ratings are based on peer-reviewed literature and the opinions of the expert panel. The expert panel must reach consensus (defined as 80% agreement) after three rounds of scoring before the ACR appropriateness scores are finalized.

**Table 12: American College of Radiology Appropriateness Criteria**

<b>Breast Cancer</b>	
<b><i>Type: Stage I carcinoma — initial presentation is asymptomatic</i></b>	
<b>Modality</b>	<b>Rating and comments</b>
<sup>99m</sup> Tc bone scan — whole body	Rating = 1 (“usually not appropriate”)
Myelography and post-myelography CT spine	Rating = 1 (“usually not appropriate”)
MRI with or without contrast — area of interest	Rating = 1 (“usually not appropriate”)
<sup>18</sup> FDG-PET scan — whole body	Rating = 1 (“usually not appropriate”)
<b><i>Type: Stage I carcinoma — purpose is to rule out bone metastases</i></b>	
<b>Modality</b>	<b>Rating and comments</b>
<sup>99m</sup> Tc bone scan — whole body	Rating = 2 (“usually not appropriate”)
<sup>18</sup> FDG-PET scan — whole body	Rating = 2 (“usually not appropriate”)
<b><i>Type: Stage II carcinoma — presenting with back and hip pain</i></b>	
<b>Modality</b>	<b>Rating and comments</b>
<sup>99m</sup> Tc bone scan — whole body	Rating = 9 (“usually appropriate”)
<sup>99m</sup> Tc bone scan (with SPECT) — hip and spine	Rating = 1 (“usually not appropriate”)
Myelography and post-myelography CT spine	Rating = 1 (“usually not appropriate”)
CT (with or without contrast) — hip and spine	Rating = 1 (“usually not appropriate”)
MRI (with or without contrast) — hip and spine	Rating = 1 (“usually not appropriate”)
<sup>18</sup> FDG-PET scan — whole body	Rating = 5 (“may be appropriate”)
<b><i>Type: Known bone metastatic disease — presenting with pathological fracture of left femur on x-ray</i></b>	
<b>Modality</b>	<b>Rating and comments</b>
<sup>99m</sup> Tc bone scan — whole body	Rating = 9 (“usually appropriate”)
<sup>18</sup> FDG-PET scan — whole body	Rating = 5 (“may be appropriate”); if bone scan is negative, findings on PET will influence the use of systemic treatment.
CT without contrast — femur	Rating = 1 (“usually not appropriate”)
MRI without contrast — femur	Rating = 1 (“usually not appropriate”)

**Table 12: American College of Radiology Appropriateness Criteria**

<b>Prostate Cancer</b>	
<b>Type: Nodule on physical exam; moderately or well-differentiated carcinoma; PSA &lt; 20mg/mL; asymptomatic patients</b>	
Modality	Rating and comments
<sup>99m</sup> Tc bone scan — whole body	Rating = 1 (“usually not appropriate”)
CT with or without contrast — area of interest	Rating = 1 (“usually not appropriate”)
MRI with or without contrast — area of interest	Rating = 1 (“usually not appropriate”)
<sup>18</sup> F-DG-PET scan — whole body	Rating = 1 (“usually not appropriate”)
<b>Type: Nodule on physical exam; poorly differentiated carcinoma; PSA ≥ 20mg/mL; asymptomatic patients</b>	
Modality	Rating and comments
<sup>99m</sup> Tc bone scan — whole body	Rating = 9 (“usually appropriate”)
CT with or without contrast — area of interest	Rating = 1 (“usually not appropriate”)
MRI with or without contrast — area of interest	Rating = 1 (“usually not appropriate”)
<sup>18</sup> F-DG-PET scan — whole body	Rating = 1 (“usually not appropriate”)
<b>Lung Cancer</b>	
<b>Type: 1 cm lung nodule; NSCLC at needle biopsy — presenting for staging and resection</b>	
Modality	Rating and comments
<sup>99m</sup> Tc bone scan — whole body	Rating = 9 (“usually appropriate”); not needed if a PET scan is performed for initial nodule workup.
<sup>18</sup> F-DG-PET scan — whole body	Rating = 9 (“usually appropriate”)
CT without contrast — chest	Rating = 1 (“usually not appropriate”)
MRI without contrast — chest	Rating = 1 (“usually not appropriate”)
<b>Type: Non-invasive staging of NSCLC</b>	
Modality	Rating and comments
<sup>99m</sup> Tc bone scan — whole body	Rating = 5 (“may be appropriate”); not needed if a PET scan has been performed
<sup>18</sup> F-DG-PET scan — skull base to mid-thigh	Rating = 9 (“usually appropriate”); attenuation correction by radionuclide or CT
CT with or without contrast — chest	Rating = 9 (“usually appropriate”); contrast is preferred if not contraindicated
CT with contrast — abdomen	Rating = 5 (“may be appropriate”); contrast is preferred if not contraindicated
CT with contrast — head	Rating = 5 (“may be appropriate”); used if MRI is contraindicated and the patient has neurological symptoms
MRI with or without contrast — head	Rating = 7 (“usually appropriate”); if the patient has neurological symptoms; or if the patient is asymptomatic, but the tumour is > 3 cm and has adenocarcinoma histology or mediastinal adenopathy
MRI with or without contrast — chest	Rating = 3 (“usually appropriate”); evaluating chest wall or cardiac invasion and for local staging of superior sulcus tumours.

CT = computed tomography; <sup>18</sup>F-DG = 18F-fluorodeoxyglucose; MRI = magnetic resonance imaging; NSCLC = non-small cell lung cancer; PET = positron emission tomography; PSA = prostate-specific antigen; SPECT = single-photon emission computed tomography; <sup>99m</sup>Tc = technetium-99m.