

Evidence-based Cancer Imaging Program
Appropriate Use Criteria

Cervical or Neck Pain

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Memorial Sloan Kettering
Cancer Center



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Background

The Evidence-based Cancer Imaging Program (ECIP) was established to ensure ongoing compliance with the Centers for Medicare and Medicaid Services (CMS) Appropriate Use Criteria Program by expanding upon our existing evidence-based practices at Memorial Sloan Kettering Cancer Center (MSK). ECIP develops and implements appropriate use criteria (AUC) for ordering advanced diagnostic imaging services, and takes into consideration the unique needs of patients with cancer and our expertise as a cancer center.

AUC are guidelines developed by our Imaging Disease Management Teams (IDMT) that link: a specific clinical condition or presentation; one or more imaging exams; and an assessment of the appropriateness of each exam. Using AUCs helps to achieve the goal that all patients receive only what imaging is best for them, while avoiding unnecessary tests.

Abbreviations

Abbreviation	Definition
AUC	Appropriate use criteria
CAP	Chest, abdomen, and pelvis
CMS	Centers for Medicare and Medicaid Services
CT	Computed tomography
ECIP	Evidence-based Cancer Imaging Program
FDG	Fluorodeoxyglucose

Abbreviation	Definition
IDMT	Imaging Disease Management Team
IV	Intravenous
MRI	Magnetic resonance imaging
MSK	Memorial Sloan Kettering Cancer Center
OCEBM	Oxford Centre for Evidence-Based Medicine
PET	Positron emission tomography

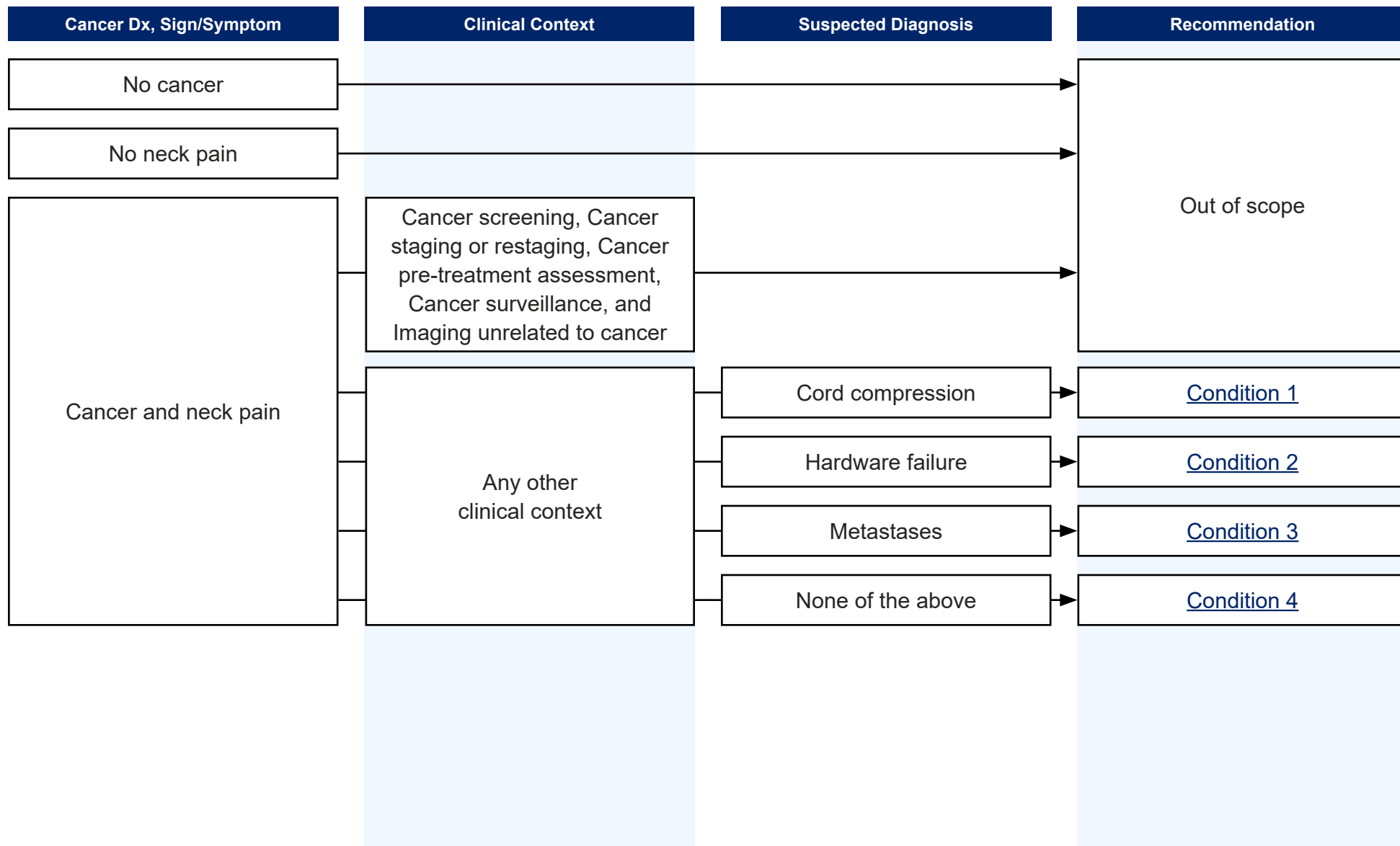
Clinical Context

Clinical Context	Description	Relevant for this AUC?
Cancer screening	Neoplasm detection in asymptomatic patients. Imaging type and schedule informed by guidelines.	<input type="checkbox"/>
Neoplasm detection or diagnostic workup	Assessment of signs or symptoms concerning for neoplastic disease.	<input checked="" type="checkbox"/>
Cancer staging or restaging	Establishing location and extent of neoplastic disease. Restaging may occur after treatment or intervention.	<input type="checkbox"/>
Cancer pre-treatment assessment	Imaging performed to optimize the cancer treatment plan.	<input type="checkbox"/>
Therapeutic response assessment	Assessment of treatment response to guide subsequent management.	<input checked="" type="checkbox"/>
Therapeutic complication assessment	Evaluation of possible treatment-related complications or adverse events.	<input checked="" type="checkbox"/>
Cancer complication or comorbidity assessment	Evaluation of cancer or comorbidity-related complications or adverse events.	<input checked="" type="checkbox"/>
Cancer surveillance	Ongoing scheduled assessment of neoplastic disease status.	<input type="checkbox"/>
Survivorship	Assessment of long-term or late effects from cancer or cancer treatment as well as ongoing health needs of cancer survivors.	<input checked="" type="checkbox"/>
Imaging unrelated to cancer	Imaging obtained for indication or concern not related to cancer.	<input type="checkbox"/>

Age

Adults only (≥ 18 years)

Appropriate Use Criteria



Condition 1: Cervical or Neck Pain, Cancer, Cord Compression Suspected

USUALLY APPROPRIATE	SOMETIMES APPROPRIATE	RARELY APPROPRIATE
<p>MRI total spine without and with IV contrast MRI total spine without and with contrast is usually appropriate as an initial study if readily available.</p>	<p>MRI cervical spine without and with IV contrast MRI cervical spine without and with contrast is also appropriate as an initial study in cases where MRI total spine is not readily available.</p>	<p>CT total spine without IV contrast</p>
<p>MRI total spine without IV contrast MRI total spine without contrast may be useful if contrast is contraindicated.</p>	<p>MRI cervical spine without IV contrast MRI cervical spine without contrast may be useful if contrast is contraindicated.</p>	<p>CT cervical spine without IV contrast</p>
	<p>CT total spine with IV contrast CT total spine with contrast is sometimes appropriate if MRI is contraindicated.</p>	<p>FDG PET/CT head to toe/limbs</p>
	<p>CT cervical spine with IV contrast CT cervical spine with contrast is sometimes appropriate if MRI is contraindicated.</p>	<p>FDG PET/CT neck/CAP</p>
	<p>CT myelography cervical spine CT myelogram may be appropriate in certain situations where MRI is contraindicated or diagnostically equivocal.</p>	<p>X-ray cervical spine</p>

- MRI is more sensitive and specific than CT total spine especially for detecting intraspinal disease.



Condition 2: Cervical or Neck Pain, Cancer, Hardware Failure Suspected

USUALLY APPROPRIATE

X-ray cervical spine

CT total spine without IV contrast

CT cervical spine without IV contrast

SOMETIMES APPROPRIATE

RARELY APPROPRIATE

Condition 3: Cervical or Neck Pain, Cancer, Suspected Metastases

USUALLY APPROPRIATE	SOMETIMES APPROPRIATE	RARELY APPROPRIATE
<p>MRI total spine without and with IV contrast MRI total spine without and with contrast is usually appropriate as an initial study if readily available.</p>	<p>MRI cervical spine without IV contrast MRI cervical spine without contrast may be useful if contrast is contraindicated.</p>	<p>CT myelography cervical spine CT myelogram may be appropriate in certain situations where MRI is contraindicated or diagnostically equivocal.</p>
<p>MRI total spine without IV contrast MRI total spine without contrast may be useful if contrast is contraindicated.</p>	<p>CT total spine with IV contrast CT total spine with contrast is sometimes appropriate if MRI is contraindicated.</p>	<p>X-ray cervical spine</p>
<p>MRI cervical spine without and with IV contrast MRI cervical spine without and with contrast is also appropriate as an initial study in cases where MRI total spine is not readily available.</p>	<p>CT total spine without IV contrast CT total spine without contrast is sometimes appropriate if MRI is contraindicated.</p>	
	<p>CT cervical spine with IV contrast CT cervical spine with contrast is sometimes appropriate if MRI is contraindicated.</p>	
	<p>CT cervical spine without IV contrast CT cervical spine without contrast is sometimes appropriate if MRI is contraindicated.</p>	
	<p>FDG PET/CT head to toe/limbs PET/CT is useful when MRI is nondiagnostic for detecting metastases.</p>	
	<p>FDG PET/CT neck/CAP PET/CT is useful when MRI is nondiagnostic for detecting metastases.</p>	

- MRI is more sensitive and specific than CT total spine especially for detecting intraspinal disease.

Condition 4: Cervical or Neck Pain, Cancer

USUALLY APPROPRIATE	SOMETIMES APPROPRIATE	RARELY APPROPRIATE
<p>MRI total spine without and with IV contrast MRI total spine without and with contrast is usually appropriate as an initial study if readily available.</p>	<p>MRI cervical spine without IV contrast MRI cervical spine without contrast may be useful if contrast is contraindicated.</p>	<p>CT myelography cervical spine CT myelogram may be appropriate in certain situations where MRI is contraindicated or diagnostically equivocal.</p>
<p>MRI total spine without IV contrast MRI total spine without contrast may be useful if contrast is contraindicated.</p>	<p>CT total spine with IV contrast CT total spine with contrast is sometimes appropriate if MRI is contraindicated.</p>	<p>FDG PET/CT head to toe/limbs PET/CT may be appropriate when MRI is nondiagnostic for bone metastases.</p>
<p>MRI cervical spine without and with IV contrast MRI cervical spine without and with contrast is also appropriate as an initial study in cases where MRI total spine is not readily available.</p>	<p>CT total spine without IV contrast CT total spine without contrast is sometimes appropriate if MRI is contraindicated.</p>	<p>FDG PET/CT neck/CAP PET/CT may be appropriate when MRI is nondiagnostic for bone metastases.</p>
	<p>CT cervical spine with IV contrast CT cervical spine with contrast is sometimes appropriate if MRI is contraindicated.</p>	<p>X-ray cervical spine</p>
	<p>CT cervical spine without IV contrast CT cervical spine without contrast is sometimes appropriate if MRI is contraindicated.</p>	

- MRI is more sensitive and specific than CT total spine especially for detecting intraspinal disease.

Key Evidence

CERVICAL OR NECK PAIN

Ref No.	Published Evidence	Grade*
1	Balcha TE, Getaneh FB, Woldeyohannes AM. A Retrospective Analysis on Cervical Spine Magnetic Resonance Imaging Findings in Patients with Neck Pain in a Tertiary Hospital, Addis Ababa, Ethiopia. <i>Ethiop J Health Sci.</i> 2021 Sep;31(5):1025-1032. PMID: 35221620	5
2	Cook AM, Lau TN, Tomlinson MJ, Vaidya M, Wakeley CJ, Goddard P. Magnetic resonance imaging of the whole spine in suspected malignant spinal cord compression: impact on management. <i>Clin Oncol (R Coll Radiol).</i> 1998;10(1):39-43. PMID: 9543614	5
3	Henschke N, Maher CG, Ostelo RW, de Vet HCW, Macaskill P, Irwig L. Red flags to screen for malignancy in patients with low-back pain. <i>Cochrane Database Syst Rev.</i> 2013 Feb;(2):CD008686. PMID: 23450586	2
4	McDonald MA, Kirsch CFE, Amin BY, et al. ACR Appropriateness Criteria® Cervical Neck Pain or Cervical Radiculopathy. <i>J Am Coll Radiol.</i> 2019 May;16(5S):S57-S76. PMID: 31054759	5
5	Shah LM, Jennings JW, Kirsch CFE, et al. ACR Appropriateness Criteria® Management of Vertebral Compression Fractures. <i>J Am Coll Radiol.</i> 2018 Nov;15(11S):S347-S364. PMID: 30392604	5

Notation	Consensus-based Statement	Grade*
§	<p>In addition to reviewing the published literature for evidence, the MSK NeuroOncology/Cervical or Neck Pain Imaging Disease Management Team leveraged consensus-based expert opinion and clinical best practices to supplement the evidence in this area to define the appropriate imaging guidelines for this clinical condition.</p> <p>Key points:</p> <ul style="list-style-type: none"> • Patients with known cancer should be scanned when new cervical or neck pain develops or if the characteristics of cervical or neck pain change or progress. • In the presence of cervical or neck pain, imaging should be primarily directed to identify osseous metastases, benign or pathologic fractures, epidural disease and leptomeningeal disease. 	5

*Grade assigned in accordance with the Oxford Centre for Evidence-Based Medicine (OCEBM) Levels of Evidence 2011: <https://www.cebm.ox.ac.uk/resources/levels-of-evidence/ocebml-levels-of-evidence>



Multidisciplinary Imaging Disease Management Team

Memorial Sloan Kettering Cancer Center

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Neuroradiologist
- **Kathleen N.S. Cathcart, MD**
Medical Oncologist
- **Marina Chilov, MLS**
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- **Kendra Godwin, MLIS**
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- **Eric Lis, MD**
Radiologist
- **Stephanie Lobaugh, MS**
Research Biostatistician
- **Chaya Moskowitz, PhD**
Biostatistician
- **Adam Schmitt, MD**
Radiation Oncologist
- **Max Vaynrub, MD**
Surgeon

Methodology

Details about our methodology can be found here:

<https://www.mskcc.org/departments/radiology/evidence-based-cancer-imaging/methodology>

Resources

CMS Appropriate Use Criteria Program Website

<https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Appropriate-Use-Criteria-Program>

MSK's ECIP Website

<https://www.mskcc.org/departments/radiology/evidence-based-cancer-imaging>

OCEBM Levels of Evidence

<https://www.cebm.ox.ac.uk/resources/levels-of-evidence/ocebml-levels-of-evidence>