CLINICAL GUIDELINES

Oncology Imaging Policy

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eviCore healthcare Clinical Decision Support Tool Diagnostic Strategies: This tool addresses common symptoms and symptom complexes. Imaging requests for individuals with atypical symptoms or clinical presentations that are not specifically addressed will require physician review. Consultation with the referring physician, specialist and/or individual's Primary Care Physician (PCP) may provide additional insight.

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Abbreviations for Oncology Guidelines

ACTH	adrenocorticotropic hormone		
AFP	alpha-fetoprotein	**AP**	anteroposterior
betaHCG	beta human chorionic gonadotropin		
CA 125	cancer antigen 125 test	**CA 19-9**	cancer antigen 19-9
CA 15-3	cancer antigen 15-3	**CA 27-29**	cancer antigen 27-29
CBC	complete blood count		
CEA	carcinoembryonic antigen	**CNS**	central nervous system
CR	complete response		
CTA	computed tomography angiography	**DCIS**	ductal carcinoma in situ
DLBCL	diffuse large B cell lymphomas		
DRE	digital rectal exam	**EGD**	esophagogastroduodenoscopy
ENT	ear, nose, throat		
ERCP	endoscopic retrograde cholangiopancreatography		
ESR	erythrocyte sedimentation rate	**EUA**	exam under anesthesia
EUS	endoscopic ultrasound		
FDG	fluorodeoxyglucose	**FNA**	fine needle aspiration
FUO	fever of unknown origin		
GE	gastroesophageal	**GI**	gastrointestinal
GU	genitourinary	**GTR**	Gross total resection
HIV	human immunodeficiency disease		
HRPC	hormone refractory prostate cancer		
LCIS	lobular carcinoma in situ	**LDH**	lactate dehydrogenase
LFT	liver function tests		
MALT	mucosa associated lymphoid tissue		
MEN	multiple endocrine neoplasia	**MG**	myasthenia gravis

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MGUS	monoclonal gammopathy of unknown significance		
MIBG	I-123 metaiodobenzylguanidine scintigraphy		
MRA	magnetic resonance angiography	**MRI**	magnetic resonance imaging
MUGA	'multiple gated acquisition' cardiac nuclear scan		
NaF	Sodium Fluoride		
NCCN®	National Comprehensive Cancer Network		
NHL	non-Hodgkin's lymphoma	**NPC**	nasopharyngeal carcinoma
NSABP	National Surgical Adjuvant Breast and Bowel Project		
NSAIDS	nonsteroidal anti-inflammatory drugs		
NSCLC	non-small cell lung cancer		
NSGCT	non-seminomatous germ cell tumor	**PA**	posteroanterior
PCI	prophylactic cranial irradiation		
PET	positron emission tomography	**COG**	Children's Oncology Group
PSA	prostate specific antigen	**RFA**	radiofrequency ablation
RPLND	retroperitoneal lymph node dissection		
SqCCa	squamous cell carcinoma	**SCLC**	small cell lung cancer
SIADH	syndrome of inappropriate secretion of antidiuretic hormone		
TCC	transitional cell carcinoma	**TNM**	tumor node metastasis staging system
TSH	thyroid-stimulating hormone		
TURBT	trans-urethral resection of bladder tumor		
VIPoma	vasoactive intestinal polypeptide		
WM	Waldenstrom's macroglobulinemia	**WBXRT**	Whole brain radiation therapy

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ONC-1: General Guidelines

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ONC-1.1: Key Principles

Imaging based on Age at diagnosis:

- Patients age ≥ 18 years old at initial diagnosis should be imaged according to the Oncology Imaging Guidelines, and patients age < 18 years at initial diagnosis should be imaged according to the Pediatric Oncology Imaging Guidelines, except where directed otherwise by a specific guideline section
- Patients age 15 to 39 years old at initial diagnosis are defined as Adolescent and Young Adult (AYA) Oncology patients:
  - When unique guidelines for a specific cancer type exist only in either Oncology or Pediatric Oncology, AYA patients should be imaged according to the guideline section for their specific cancer type, regardless of the patient's age
  - When unique guidelines for a specific cancer type exist in both Oncology and Pediatric Oncology, AYA patients should be imaged according to the age rule in the previous bullet

General Principles:

- A recent clinical evaluation (within 60 days) (history and physical examination, laboratory studies, non-advanced imaging studies) or meaningful contact (telephone call, electronic mail or messaging) should be performed prior to considering advanced imaging, unless the patient is undergoing guideline-supported scheduled off therapy surveillance evaluation. The clinical evaluation may include a relevant history and physical examination, including biopsy, appropriate laboratory studies, and non-advanced imaging modalities.
- Advanced imaging is not indicated for monitoring disease in individuals who choose to not receive standard oncologic therapy, but may be receiving alternative therapies or palliative care and/or Hospice. All advanced imaging indicated for initial staging of the specific cancer type can be approved once when the patient is considering initiation of a standard therapeutic approach (surgery, chemotherapy, or radiation therapy).
- Conventional Imaging (mostly CT, sometimes MRI or bone scan) of the affected area(s) drives much of initial and re-staging and surveillance
  - CT imaging should be performed with contrast for known or suspected body regions, unless contraindicated.
  - Shellfish allergy is not a contraindication to contrast. Patients with known shellfish allergy do not have contrast reaction any more often than other atopic individuals or patients with other food allergies.
  - For iodinated contrast dye allergy, either CT scans without contrast or MRI scans without and with contrast are indicated. If CT scanning is considered strongly indicated in a patient with known contrast allergy, CT with contrast may be considered to be safely performed following prednisone premedication over a 24 hour period prior to the study.For patients with renal insufficiency which precludes contrast use, CT without contrast appropriate disease-specific areas

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should be offered. Further imaging (such as MRI) may be indicated if noncontrast CT results are inconclusive.

- Severe renal insufficiency, i.e. an eGFR less than 30, is a contraindication for an MRI using a gadolinium-based contrast agent (GBCA) as well. In patients with eGFR greater than 40, GBCA administration can be safely performed. GBCA administered to patients with acute kidney injury or severe chronic kidney disease can result in a syndrome of nephrogenic systemic fibrosis (NSF), but GBCAs are not considered nephrotoxic at dosages approved for MRI.
- Gadolinium deposition has been found in patients with normal renal function following the use of gadolinium based contrast agents (GBCAs). The U.S. Food and Drug Administration (FDA) is investigating the risk of brain deposits following repeated use of GBCAs. The FDA has noted that, “It is unknown whether these gadolinium deposits are harmful or can lead to adverse health effects.” and have recommended: To reduce the potential for gadolinium accumulation, health care professionals should consider limiting GBCA use to clinical circumstances in which the additional information provided by the contrast is necessary. Health care professionals are also urged to reassess the necessity of repetitive GBCA MRIs in established treatment protocols.
- The use of MRI in place of CT scans to reduce risk of secondary malignancy is not supported by the peer-reviewed literature. Unless otherwise specified in the Guidelines, MRI in place of CT scans for this purpose alone is not indicated. In some instances (i.e., testicular cancer surveillance), MRI may be considered inferior to CT scans.
- PET is not indicated for surveillance imaging unless specifically stated in the diagnosis-specific guideline sections
- Routine imaging of brain, spine, neck, chest, abdomen, pelvis, bones, or other body areas is not indicated. Except where explicitly stated in a diagnosis-specific guideline section, advanced imaging of the neck, chest, abdomen, and/or pelvis are not indicated in oncological evaluations unless one of the following applies:
  - Known prior disease involving the requested body area
  - New or worsening symptoms or physical exam findings involving the requested body area (including non-specific findings such as ascites or pleural effusion)
  - New finding on basic imaging study such as plain x-ray or ultrasound
  - New finding on adjacent body area CT/MRI study (i.e., pleural effusion observed on CT abdomen)
- Brain imaging is performed for signs or symptoms of brain disease
  - MRI Brain without and with contrast (CPT® 70553) is the recommended study for evaluation of suspected or known brain metastases. If a non-contrast CT head shows suspicious lesion, MRI brain may be obtained to further characterize the lesion
  - CT without and with contrast (CPT® 70470) can be approved when MRI is contraindicated or not available, or if there is skull bone involvement
  - Certain malignancies including, but not limited to melanoma, lung cancer and renal cell cancer have indications for brain imaging for asymptomatic patients

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- If stage IV disease is demonstrated elsewhere or if systemic disease progression is noted, refer to disease specific guidelines
- Initiation of angiogenesis therapy is not an indication for advanced imaging of the brain in asymptomatic patients (Avastin/Bevacizumab; < 3% risk of bleeding and < 1% risk of serious bleeding)

- Bone scan supplemented by plain x-rays are the initial imaging modalities for suspected malignant bone pain. For specific imaging indications, see also:
  - **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**
  - **ONC-31.5: Bone (including Vertebral) Metastases**
  - **ONC-31.6: Spinal Cord Compression**
  - **ONC-31.7: Carcinoma of Unknown Primary Site**
- Patients receiving cardiotoxic chemotherapy (such as doxorubicin, trastuzumab, mitoxantrone, etc.) may undergo cardiac evaluation – at baseline and for monitoring while on active therapy with Echocardiography (CPT® 93306, CPT® 93307, or CPT® 93308) instead of MUGA scan.
  - See also: **CD-3.5: MUGA Study - Oncologic Indications f or Cancer Therapeutics-Related Cardiac Dysfunction (CTRCD)**.
  - See: **CD-3.4: MUGA Study – Cardiac Indications -** for exceptions when a MUGA Study may be approved rather than an Echocardiogram
- Whole body MRI imaging is considered investigational for all oncology indications at this time. See also: **Preface-5.2: Whole Body MR Imaging** for details.
- CTA or MRA of a specific anatomic region is indicated when requested for surgical planning when there is suspected vascular proximity to proposed resection margin.

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ONC-1.2: Phases of Oncology Imaging and General Phase-Related Considerations

Phases of Oncology Imaging	Definition
Screening	Imaging requested for patients at increased risk for a particular cancer in the absence of known clinical signs or symptoms
Suspected Diagnosis	Imaging requested to evaluate a suspicion of cancer, prior to histological confirmation
Initial work up and Staging	Imaging requested after biopsy confirmation and prior to starting specific treatment
Treatment response or Interim Restaging	Imaging performed during active treatment with chemotherapy, endocrine therapy or maintenance therapy
Restaging of locally treated lesions	Imaging performed to evaluate primary or metastatic lesions with ablation using radiofrequency, radioactive isotope, microwave or chemotherapy
Restaging / Suspected Recurrence	Imaging requested when there is suspicion for progression or recurrence of known cancer based on clinical signs/symptoms, laboratory tests or basic imaging studies
Surveillance	Imaging performed in patients who are asymptomatic or have chronic stable symptoms, and are not receiving active treatment

General phase-related considerations:

- Imaging performed prior to diagnosis should not be repeated prior to surgical resection or initiation of chemotherapy unless there is a delay of at least 6 weeks since previous imaging and consultation or there are new or significantly worsening clinical signs or symptoms
- Interim Restaging
  - After definitive local therapy of primary tumor (surgery or radiation therapy), imaging is recommended according to surveillance guidelines as the patient does not have measurable active disease. Unless stated in a diagnosis-specific guideline section, advanced imaging while receiving adjuvant chemotherapy is not indicated.
  - For patients receiving chemotherapy or immunotherapy, guideline-appropriate imaging of the involved body area(s) should be considered no more frequently than every 2 cycles (generally every 6 to 8 weeks)

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- For patients receiving endocrine/hormonal therapy only, guideline-appropriate imaging of the involved body area(s) should be considered no more frequently than every 3 months
- For patients with measurable or metastatic disease being observed without therapy ("chemo-holiday") or for those with minimal metastatic disease on maintenance therapy, imaging should be considered no more often than every 3 months or when new signs/symptoms suggest progression

- Restaging of Locally Treated Lesions:
  - Regardless of the methodology used for embolization, PET imaging is not indicated for assessing response to this mode of therapy
  - See: **ONC-31.2: Liver Metastases** for guidelines to monitor primary and secondary cancers to the liver treated with ablation
  - See: **ONC-17.4: Surveillance** for guidelines to monitor renal cell carcinoma treated with ablation
  - For monitoring of ablated metastases to any other sites, please refer to individual disease-specific guidelines

- Surveillance:
  - Certain tumor types do not require surveillance with advanced imaging as patient outcomes following relapse are not improved by surveillance imaging. See diagnosis-specific guideline sections for details.
  - PET imaging is not supported for surveillance imaging unless specifically stated in elsewhere in the diagnosis-specific guideline sections
  - For patients with history of metastatic cancer who have had complete response and are taken off therapy, follow-up/surveillance imaging is not indicated beyond 5 years from the diagnosis of metastatic disease.

ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology

- This section does not apply to PET imaging. PET imaging considerations can be found in **ONC-1.4: PET Imaging in Oncology**

- Bone Scan
  - Primarily used for evaluation of bone metastases in patients with solid malignancies.
  - Indications for bone scan in patients with history of malignancy include – bone pain, rising tumor markers, elevated alkaline phosphatase or in patients with primary bone tumor.
  - Any one of the following CPT® codes may be approved where bone scan is indicated: CPT® 78300 (Nuclear bone scan limited), CPT® 78305 (Nuclear bone scan multiple areas), CPT® 78306 (Nuclear bone scan whole body), CPT® 78320 (Nuclear bone scan SPECT)
  - SPECT scan (CPT® 78320) may be approved for any of the indications for which a bone scan can be approved.
    - If the request is for CPT® 78300 and CPT® 78320 then only the CPT® 78320 is to be approved if medical necessity is established.
    - If the request is for CPT® 78305 or CPT® 78306 and CPT® 78320 then two codes can be approved if medical necessity is established

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- CPT® 78315 has no specific indications for evaluation of malignant disease

- Other NM studies
  - Octreotide scan – CPT® 78800 (Radiopharmaceutical localization of tumor limited area), CPT® 78801 (Radiopharmaceutical localization of tumor multiple areas), CPT® 78802 (Radiopharmaceutical localization of tumor whole body single day study), CPT® 78803 (Radiopharmaceutical localization of tumor SPECT), or CPT® 78804 (Radiopharmaceutical localization of tumor whole body two or more days)
    - Specific for low and intermediate grade neuroendocrine tumors which express specific cell surface markers. See cancer specific guidelines for recommended use.
    - Bone marrow imaging – CPT® 78102 (Limited area), CPT® 78103 (Multiple areas), or CPT® 78104 (Whole body)
    - Myeloproliferative disorders, sickle cell bone infarct or ischemia, avascular necrosis, asymmetric marrow distribution e.g. Myeloma
  - Spleen imaging (CPT® 78185):
    - Splenic metastases
  - Brain imaging SPECT (CPT® 78607):
    - Immunocompromised patients with mass lesion detected on CT or MR for differentiation of lymphoma and infection
  - CSF leakage detection (CPT® 78650):
    - Evaluation of post-lumbar puncture headache
  - Radiopharmaceutical imaging of inflammatory process CPT® 78805 (Limited area), CPT® 78806 (Whole body), or CPT® 78807 (SPECT)]:
    - Evaluate drug-induced pulmonary reactions or toxicity due to cyclophosphamide, busulfan, or bleomycin
  - Gallium Isotope Scan (CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804)
    - Used if PET scan not available and PET is indicated by guidelines for lymphoma, sarcoma, melanoma or myeloma

ONC-1.4: PET Imaging in Oncology

NOTE: Some payors have specific restrictions on PET imaging, and those coverage policies may supersede the recommendations for PET imaging in these guidelines.

- CPT codes:
  - PET imaging in oncology should use PET/CT fusion imaging (CPT® 78815 or CPT® 78816) unless there is clear documentation that the treating facility does not have fusion capacity, in which case PET alone (CPT® 78812 or CPT® 78813) can be approved along with the appropriate CT studies. Unbundling PET/CT imaging into separate PET and diagnostic CT codes is otherwise not supported.
  - The decision whether to use skull base to mid-femur (“eyes to thighs”) procedure code for PET (CPT® 78812 or CPT® 78815) or whole body PET (CPT® 78813 or CPT® 78816) is addressed in the diagnosis-specific guideline sections.

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- ‘Limited area’ protocol is done infrequently, but may be considered, and is reported with PET (CPT® 78811) or for PET/CT, (CPT® 78814) and should be forwarded for Medical Director review.

- Radiotracers:
  - Unless specified otherwise, the term “PET” refers to ^{18}F-FDG-PET and PET/CT fusion studies
  - PET/CT imaging using isotopes other than ^{18}F-FDG is considered investigational/experimental at this time with exceptions listed below where restricted use of non-FDG radiotracer PET/CT scan is permissible. See also: diagnosis-specific guideline sections for details.
    - ^{68}Gallium DOTATATE (NETSPOT®) for low grade neuroendocrine tumors
    - ^{11}C Choline and ^{18}F-Fluciclovine (AXUMIN®) for prostate cancer

- Unless specified in diagnosis-specific guideline section PET/CT Imaging is NOT indicated for:
  - Infection, inflammation, trauma, post-operative healing, granulomatous disease, rheumatological conditions
  - Concomitantly with separate diagnostic CT studies
  - Distant or diffuse metastatic disease
  - Metastatic disease in the central nervous system (CNS)
  - Lesions less than 8 mm in size
  - Follow up after localized therapy (i.e. radiofrequency ablation, embolization, stereotactic radiation, etc.)
  - Rare malignancies, due to lack of available evidence regarding the diagnostic accuracy of PET in rare cancers
  - Surveillance
    - Serial monitoring of FDG avidity until resolution.
    - PET/CT avidity in a residual mass at the end of planned therapy is not an indication for PET/CT imaging during surveillance.
    - Residual mass that has not changed in size since the last conventional imaging does not justify PET imaging
  - Unless otherwise specified for a specific cancer type, once PET has been documented to be negative for a given patient’s cancer or all PET-avid disease has been surgically resected, PET should not be used for continued disease monitoring or surveillance

- PET/CT may be indicated if:
  - Conventional imaging (CT, MRI or bone scan) reveals findings that are inconclusive or negative, with continued suspicion for recurrence
  - The patient is undergoing salvage treatment for a recurrent solid tumor with residual measurable disease on conventional imaging and confirmed repeat negative PET imaging will allow the patient to transition from active treatment to surveillance.
  - PET/CT may be considered prior to biopsy in order to determine a more favorable site for biopsy when a prior biopsy was nondiagnostic or a relatively inaccessible site is contemplated which would require invasive surgical intervention for biopsy attempt

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- PET/CT for rare malignancies not covered by eviCore guidelines due to lack of available evidence regarding diagnostic accuracy of PET/CT in the majority of rare cancers. Conventional imaging studies should be used for initial staging and treatment response for these diagnoses. PET/CT can be approved if all of the following apply:
  - Conventional imaging (CT, MRI or bone scan) reveals equivocal or suspicious findings
  - No other specific metabolic imaging (MIBG, octreotide, technetium, etc.) is appropriate for the disease type
  - The submitted clinical information describes a specific decision regarding the patient's care that will be made based on the PET/CT results
  - These requests will be forwarded for Medical Director review
- Delay PET/CT for at least 12 weeks after completion of radiation treatment, unless required sooner for imminent surgical resection. PET/CT requests < 12 weeks from completion of radiation treatment should be forwarded for Medical Director review.
- PET mammography (PEM, generally reported with CPT®78811) is considered experimental and investigational at this time.

ONC-1.5: Unlisted Procedure Codes in Oncology

- eviCore authorizes requests for CT or MRI associated with image-directed biopsy or radiation therapy treatment planning for some payors.
- eviCore does not routinely authorize requests for PET associated with image-directed biopsy or radiation therapy treatment planning.
- There is often no unique procedure code for a service performed solely for treatment planning purposes. AMA instructions in the CPT state that if no specific code exists for a particular service, the service is reported with an unlisted code.
- Advanced imaging being used for radiation therapy treatment planning should not be authorized using any of the diagnostic imaging codes for CT, MRI or PET. In the absence of written payor guidelines, advanced imaging performed in support of radiation therapy treatment planning should be reported with:
  - **CPT® 76498 for Unlisted MRI** – when MRI will be used for treatment planning of radiation therapy to be delivered ONLY to the brain, prostate and cervix. The use of this code for radiation treatment planning of any other cancers/body parts not listed above, may be reviewed on a case-by-case basis and should be sent for Medical Director Review.
  - **CPT® 76497 or CPT® 77014 for Unlisted CT** – may NOT be used for radiation treatment planning. CT imaging performed in support of radiation therapy treatment planning is bundled in with the concurrent radiation treatment authorization codes and a separate authorization for treatment planning is not required.
  - **CPT® 78999 for Unlisted procedure, nuclear medicine (PET)** – eviCore does not perform prior authorization for this CPT code for any payor. This code may not be reviewed or offered as an alternative recommendation to the provider.

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- Imaging associated with image-directed biopsy should be reported with the corresponding interventional codes. See also: **Preface-4.2: CT-, MR-, or Ultrasound-Guided Procedures.**
- For advanced imaging used solely for the purpose of Surgical planning, see **Preface-4.3: Unlisted Procedures/Therapy treatment planning**

ONC-1.6: Predisposition Syndromes

For predisposition syndrome screening in adult patients, see **PEDONC-2: Screening Imaging in Cancer Predisposition Syndromes**

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ONC-2: Primary Central Nervous System Tumors

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This guideline section applies to primary CNS tumors only. For imaging guidelines in metastatic brain cancer, see the appropriate diagnosis-specific section or **ONC-31.3: Brain Metastases** for imaging guidelines.

ONC-2.1: General Considerations

- Primary brain tumors presenting only with uncomplicated headache are very uncommon. Most primary brain tumors present with specific CNS symptoms.
- Histologic confirmation is critical. Therapeutic decisions should not be made on radiographic findings alone, except for the following:
  - Medically fragile patients for whom attempted biopsy carries excess medical risk, as stated in writing by both the attending physician and surgeon.
  - Brain stem tumors or other sites where the imaging findings are pathognomonic and the risk of permanent neurological damage is excessive with even a limited biopsy attempt.
- MRI Brain without and with contrast (CPT® 70553) is appropriate for both characterization and follow-up of all brain tumors
  - CT Head without and with contrast (CPT® 70470) can be approved when MRI is contraindicated or not available, or there is skull bone involvement
  - CT Head (contrast as requested) can be approved for preoperative planning when requested by the operating surgeon
- MRA or CTA are not routinely indicated in primary CNS tumors but can be approved for preoperative planning or to clarify inconclusive findings on MRI or CT
- For suspected brain tumors in neurofibromatosis, see: **PEDONC-2: Screening Imaging in Cancer Predisposition Syndromes**
- MRI Brain without and with contrast (CPT® 70553) can be repeated within 24 to 72 hours following brain tumor surgery
- MRI Brain without and with contrast (CPT® 70553) is appropriate when a patient with a diagnosed brain tumor deteriorates or develops new features.
- Rare tumors occurring more commonly in the pediatric population should be imaged according to the imaging guidelines in: **PEDONC-4: Pediatric Central Nervous System Tumors**

MR Spectroscopy in Brain Tumors (MRS, CPT® 76390)

NOTE: Some payors have specific restrictions on MR Spectroscopy, and those coverage policies may supersede the recommendations for MRS in these guidelines

- MRS is only supported for use in brain tumors of specified histologies where diagnostic accuracy has been established in peer-reviewed literature
  - See diagnosis-specific guidelines for MRS indications
- MRS is considered investigational/experimental for all other histologies and indications not listed in a diagnosis-specific guideline section. These requests should be forwarded for Medical Director review

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PET Brain Imaging (CPT® 78608 and CPT® 78609)

NOTE: Some payors have specific restrictions on PET Brain Metabolic Imaging, and those coverage policies may supersede the recommendations for this study in these guidelines.

- PET Brain Metabolic Imaging (CPT® 78608) is only supported for use in brain tumors of specified histologies where diagnostic accuracy has been established in peer-reviewed literature
  - See diagnosis-specific guidelines for PET indications below.
  - According to Medicare NCD 220.6.17, FDG-PET may be approved once for initial treatment strategy and three times for subsequent treatment strategy for brain tumors. See: **ONC-32.3: Brain PET** for details.
- PET Brain metabolic imaging (CPT® 78608) is considered investigational/experimental for all other histologies and indications not listed in a diagnosis-specific guideline section and should be forwarded for Medical Director review
- PET Brain perfusion imaging (CPT® 78609) is not indicated in the evaluation or management of primary CNS tumors, and is nationally non-covered by Medicare per NCD 220.6.17.
- Body PET studies (CPT® 78811, CPT® 78812, and CPT® 78813) and fusion PET/CT studies (CPT® 78814, CPT® 78815, or CPT® 78816) are not indicated in the evaluation or management of primary CNS tumors

ONC-2.2: Low Grade Gliomas

These tumors are defined as having a WHO histologic grade of I or II (out of IV), can occur anywhere in the CNS, and includes the following tumors:

- Pilocytic Astrocytoma
- Fibrillary (or Diffuse) Astrocytoma
- Optic Pathway Gliomas
- Pilomyxoid Astrocytoma
- Oligodendroglioma
- Oligoastrocytoma
- Oligodendrocytoma
- Subependymal Giant Cell Astrocytoma (SEGA)
- Ganglioglioma
- Gangliocytoma
- Dysembryoplastic infantile astrocytoma (DIA)
- Dysembryoplastic infantile ganglioglioma (DIG)
- Dysembryoplastic neuroepithelial tumor (DNT)

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- Tectal plate gliomas
- Cervicomedullary gliomas
- Pleomorphic xanthoastrocytoma (PXA)
- Any other glial tumor with a WHO grade of I or II

Indication	Imaging Study(ies)
Initial Staging	◆ MRI Brain without and with contrast (CPT® 70553) if not already done ◆ MRI Spine without and with contrast (Cervical-CPT® 72156, Thoracic-CPT® 72157, Lumbar-CPT® 72158) ◆ MRI Spine with contrast only (Cervical-CPT® 72142, Thoracic-CPT® 72147, Lumbar-CPT® 72149) can be approved if being performed immediately following a contrast-enhanced MRI Brain
After initial resection or other treatment (XRT, etc.)	◆ MRI Brain without and with contrast (CPT® 70553)
For patients undergoing chemotherapy treatment	◆ MRI Brain without and with contrast (CPT® 70553) every 2 cycles
One of the following: ◆ Determine need for biopsy when transformation to high grade glioma is suspected based on clinical symptoms or recent MRI findings ◆ Evaluate a brain lesion of indeterminate nature when the PET findings will be used to determine whether biopsy/resection can be safely postponed	◆ PET Brain metabolic imaging (CPT® 78608)
One of the following: ◆ Distinguish low grade from high grade gliomas ◆ Evaluate a brain lesion of indeterminate nature when the MRS findings will be used to determine whether biopsy/resection can be safely postponed ◆ Distinguish radiation-induced tumor necrosis from progressive disease within 18 months of completing radiotherapy	◆ MR Spectroscopy (CPT® 76390)
Surveillance	◆ MRI Brain without and with contrast (CPT® 70553) every 3 months for 2 years, then every 6 months for 3 years, then annually ◆ Patients with spinal cord involvement at diagnosis can have MRI spine without and with contrast (Cervical-CPT® 72156, Thoracic-CPT® 72157, Lumbar-CPT® 72158) on the same schedule as MRI Brain

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ONC-2.3: High Grade Gliomas

These tumors are defined as having a WHO histologic grade of III or IV (out of IV can occur anywhere in the CNS (though the majority occur in the brain), and includes the following tumors:

- Anaplastic astrocytoma
- Glioblastoma multiforme
- Diffuse intrinsic pontine glioma (DIPG, or "brainstem glioma")
- Gliomatosis cerebri
- Gliosarcoma
- Anaplastic oligodendroglioma
- Anaplastic ganglioglioma
- Anaplastic mixed glioma
- Anaplastic mixed ganglioneuronal tumors
- Any other glial tumor with a WHO grade of III or IV

Indication	Imaging Study(ies)
Initial Staging	◆ MRI Brain without and with contrast (CPT® 70553) if not already done ◆ MRI Spine without and with contrast (Cervical-CPT® 72156, Thoracic-CPT® 72157, Lumbar-CPT® 72158) ■ MRI Spine with contrast only (Cervical-CPT® 72142, Thoracic-CPT® 72147, Lumbar-CPT® 72149) can be approved if being performed immediately following a contrast-enhanced MRI Brain
Immediately following partial or complete resection	◆ MRI Brain without and with (CPT® 70553)
Immediately following radiation therapy (XRT)	◆ MRI Brain without and with contrast (CPT® 70553) once within 2 to 6 weeks following completion of treatment, and then go to surveillance imaging
For patients undergoing chemotherapy treatment	◆ MRI Brain without and with contrast (CPT® 70553) every 2 cycles

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One of the following: ◆ Distinguish low grade from high grade gliomas ◆ Evaluate a brain lesion of indeterminate nature when the MRS findings will be used to determine whether biopsy/resection can be safely postponed ◆ Distinguish radiation-induced tumor necrosis from progressive disease within 18 months of completing radiotherapy	◆ MR Spectroscopy (CPT® 76390)
One of the following: ◆ Distinguish radiation-induced tumor necrosis from progressive disease within 18 months of completing radiotherapy ◆ Evaluate inconclusive MRI findings when the PET findings will be used to determine need for biopsy or change in therapy, including a change from active therapy to surveillance ◆ Evaluate a brain lesion of indeterminate nature when the PET findings will be used to determine whether biopsy/resection can be safely postponed	◆ PET Brain metabolic imaging (CPT® 78608) ◆ PET Brain is not indicated in gliomas occurring in the brain stem due to poor uptake and lack of impact on patient outcomes
Surveillance	◆ MRI Brain without and with contrast (CPT® 70553) every 3 months for 3 years and every 6 months thereafter ◆ Patients with spinal cord involvement at diagnosis can have MRI spine without and with contrast (Cervical-CPT® 72156, Thoracic-CPT® 72157, Lumbar-CPT® 72158) on the same schedule as MRI Brain

ONC-2.4: Medulloblastoma and Supratentorial Primitive Neuroectodermal Tumors (sPNET)

Medulloblastoma and sPNET imaging indications in adult patients are identical to those for pediatric patients. See **PEDONC-4.4: Medulloblastoma (MDB), Supratentorial Primitive Neuroectodermal Tumors (sPNET), and Pineoblastoma** for imaging guidelines.

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ONC-2.5: Ependymoma

Ependymoma imaging indications in adult patients are identical to those for pediatric patients. See **PEDONC-4.8: Ependymoma** for imaging guidelines.

ONC-2.6: Central Nervous System Germ Cell Tumors

Central nervous system germ cell tumor imaging indications in adult patients are identical to those for pediatric patients. See **PEDONC-4.7: CNS Germinomas and Non-Germinomatous Germ Cell Tumors (NGGCT)** for imaging guidelines.

ONC-2.7: CNS Lymphoma (also known as Microglioma)

Indication	Imaging Study
Initial Staging	All of the following are indicated: ◆ MRI Brain without and with contrast (CPT® 70553) ◆ MRI Cervical spine without and with contrast (CPT® 72156) ◆ MRI Thoracic spine without and with contrast (CPT® 72157) ◆ MRI Lumbar spine without and with contrast (CPT® 72158)
Extra-neural evaluation to confirm CNS primary *Patients with CNS Lymphoma that is metastatic should be imaged according to: ◆ **ONC-27 : Non-Hodgkin Lymphomas** for patients age ≥ 18 years ◆ **PEDONC-5.3: Pediatric Aggressive Mature B-Cell Non-Hodgkin Lymphomas (NHL)** for patients age ≤ 17 years	Any or all of the following are indicated: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ PET/CT (CPT® 78815) can be approved for evaluation of inconclusive findings on CT imaging
Treatment Response	◆ MRI without and with contrast of all positive disease sites every 2 cycles
Surveillance	◆ MRI without and with contrast of all positive disease sites every 3 months for 2 years, then every 6 months for 3 years, then annually thereafter

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ONC-2.8: Meningiomas (Intracranial and Intraspinal)

Indication	Imaging Study(ies)
Initial Staging of Intracranial Meningioma	Any or all of the following are indicated: ◆ MRI Brain without and with contrast (CPT® 70553) ◆ CT Head (contrast as requested) ◆ Octreotide or Gallium Brain scintigraphy (CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804)
Initial staging of Intraspinal Meningioma	Any one of the following: ◆ MRI without and with contrast of appropriate spinal region (Cervical, Thoracic and Lumbar) ◆ CT without and with contrast of the appropriate spinal region (Cervical, Thoracic and Lumbar)
Treatment Response	◆ MRI without and with contrast of all positive disease sites every 2 cycles
Surveillance for Grade I (low grade) and Grade II (atypical) meningioma (completely resected, partially resected and unresected)	◆ Intracranial Meningioma: MRI Brain without and with contrast (CPT® 70553) at 3, 6, and 12 months, then every 6 months for years 2 and 3, then annually for years 4 and 5 and then every 3 years thereafter ◆ Intraspinal Meningioma: MRI without and with contrast CPT® 72156 (Cervical spine), CPT® 72157 (Thoracic spine), CPT® 72158 (lumbar spine) OR CT without and with contrast CPT® 72127 (Cervical spine), CPT® 72130 (horacic spine), CPT® 72133 (Lumbar) of the involved spinal level at 3, 6 and 12 months, and then every 6 months for years 2 and 3, then annually for years 4 and 5, and then every 3 years thereafter
Surveillance for Grade III (malignant or anaplastic) meningioma	◆ MRI Brain without and with contrast (CPT® 70553) every 3 months for 3 years, and then every 6 months thereafter

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ONC-2.9: Spinal Cord Tumors (Benign and Malignant)

- See also: **ONC-2.2: Low Grade Gliomas** and **ONC-2.3 High Grade Gliomas** for imaging guidelines of low grade and high grade gliomas of the spinal cord
- See also: **PEDONC-4.9: Malignant Tumors of the Spinal Cord** for imaging guidelines for other malignant spinal cord tumors
- See also: **PEDONC-2.3: Neurofibromatosis 1 and 2 (NF1 and NF2)** for spinal tumors in patients with Neurofibromatosis 1 or 2
- See also: **ONC-31.6: Spinal Cord Compression** for known secondary malignancy involving the spine/spinal canal/spinal cord

ONC-2.10: Choroid Plexus Tumors

Choroid Plexus Tumor imaging indications in adult patients are identical to those for pediatric patients. See **PEDONC-4.13: Choroid Plexus Tumors** for imaging guidelines.

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ONC-3: Squamous Cell Carcinomas of the Head and Neck

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General Considerations

- Patients with esthesioneuroblastoma should be imaged according to this guideline section
- CT Pelvis is not indicated for the initial work up of any head and neck malignancy except for work up of an occult primary to lower neck nodes, where CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast is indicated
- Imaging of the CNS (head, spine) is indicated only to evaluate specific signs or symptoms or if concern for base of skull invasion suggesting spread to those areas
- Stage III/IV disease encompasses any primary tumor larger than 4 cm or documented lymph node positive disease
- CT Chest is not indicated for routine surveillance of head/neck cancers. In patients with smoking history, annual low dose CT for lung cancer screening may be approved if criteria's met see also: **CH-34: Lung Cancer Screening**.

ONC-3.1: Suspected/Diagnosis

- See also: **NECK-6.1: Imaging** for imaging guidelines for evaluation of suspected malignancy in the neck
- PET may be considered prior to biopsy in order to determine a more favorable site for biopsy when a prior biopsy was nondiagnostic or a relatively inaccessible site is contemplated which would require invasive surgical intervention for biopsy attempt

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ONC-3.2: Initial Work-Up/Staging

Diagnosis	Imaging Study
All Stages of Disease	◆ CT Neck with contrast (CPT® 70491) or MRI Orbits/Face/Neck (OFN) without and with contrast (CPT® 70543) ◆ Chest x-ray or CT Chest with contrast (CPT® 71260) ◆ Lymph system imaging (lymphoscintigraphy, CPT® 78195) is indicated for sentinel lymph node evaluation when nodes are not clinically positive
Nasal cavity and paranasal sinuses (bony erosion or skull base and intracranial involvement)	Any one of the following studies is indicated: ◆ CT Maxillofacial with contrast (CPT® 70487) ◆ CT Neck with contrast (CPT® 70491) ◆ MRI Orbits/Face/Neck without and with contrast (CPT® 70543)
Nasopharyngeal (NPC) Cancer	◆ MRI Orbits/Face/Neck without and with contrast (CPT® 70543) is the preferred study ■ CT Neck (CPT® 70491) and/or CT Maxillofacial (CPT® 70487) with contrast can be approved if contraindication to MRI ◆ Chest X-ray or CT Chest with contrast (CPT® 71260)
For any of the following: ◆ Known stage III or IV disease ◆ Prior to start of primary chemoradiotherapy and have not undergone definitive surgical resection ◆ Nasopharyngeal primary site ◆ Inconclusive findings on conventional imaging (CT, MRI) ◆ In order to direct laryngoscopy/exam under anesthesia for biopsy ◆ Pulmonary nodule(s) ≥ 8 mm in size (see: **ONC-31.1 Lung Metastases**) ◆ Cervical lymph node biopsy positive for squamous cell carcinoma and no primary site identified on CT or MRI ◆ Inconclusive findings suggestive of disease outside the head and neck area	◆ PET/CT (CPT® 78815)
Signs or symptoms of abdominal metastatic disease, including elevated liver function tests	◆ CT Abdomen with contrast (CPT® 74160)
Any head and neck cancer with neurological findings or suspicion of skull base invasion	◆ MRI Brain without and with contrast (CPT® 70553)

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ONC-3.3: Restaging/Recurrence

Indication	Imaging Study
Following complete resection and/or radical neck dissection	See Surveillance imaging below
Following primary chemoradiotherapy for Stage III or IV disease	◆ CT Neck with contrast (CPT® 70491) or MRI Orbits/Face/Neck without and with contrast (CPT® 70543) ◆ PET/CT is indicated (no sooner than 12 weeks post completion XRT) for: ■ Evaluating the need for salvage surgery/radical neck dissection in patients with measurable residual disease on physical exam or recent CT or MRI ■ Distinguishing active tumor from radiation fibrosis
Induction chemotherapy response	◆ CT neck with contrast CPT® 70491) or MRI Orbits/Face/Neck without and with contrast (CPT® 70543)
Suspected local recurrence	◆ CT Neck with contrast (CPT® 70491) or MRI Orbits/Face/Neck without and with contrast (CPT® 70543); ◆ CT Chest with contrast (CPT® 71260)
Biopsy proven local recurrence	Either one of the following: ◆ PET/CT (CPT® 78815) **OR** ◆ CT Neck with contrast (CPT® 70491) **or** MRI Orbits/Face/Neck without and with contrast (CPT® 70543) **AND** CT Chest with contrast (CPT® 71260)
Inconclusive conventional imaging (CT or MRI)	◆ PET/CT (CPT® 78815)
If new symptoms or chest previously involved	◆ CT Chest with contrast (CPT® 71260)

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ONC-3.4: Surveillance/Follow-Up

Indications	Imaging Study
Stage III-IV carcinoma with any of the following primary sites: ◆ Nasopharynx ◆ Oropharynx ◆ Hypopharynx ◆ Glottic or supraglottic larynx Any stage carcinoma with any of the following primary sites: ◆ Sinus ◆ Lip	Once within 6 months of completing all treatment: ◆ CT Neck with contrast (CPT® 70491) **or** MRI Orbits/Face/Neck without and with contrast (CPT® 70543) ◆ CT with contrast of any other involved body area
After initial post-treatment study, for any of the following: ◆ Nasopharyngeal primary site ◆ Physical exam unable to evaluate primary site for recurrence	Annually for 3 years: ◆ CT Neck with contrast (CPT® 70491) **or** MRI Orbits/Face/Neck without and with contrast (CPT® 70543)
All other primary sites and stages not listed above	◆ Routine advanced imaging is not indicated

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ONC-4: Salivary Gland Cancers

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General Considerations

- Salivary gland tumors may originate within the parotid, submandibular, sublingual or minor salivary glands in the mouth.
- Histological subtypes include mucoepidermoid, acinic, adenocarcinoma, adenoid cystic carcinoma, malignant myoepithelial tumors and squamous cell carcinoma. Lymphoma and metastatic squamous carcinoma can also occur in the parotid gland.
- Over 80% of parotid gland tumors are benign. A bilateral parotid tumor is most likely Warthin's tumor.
- The role of PET in salivary gland tumors has yet to be established.

ONC-4.1: Suspected/Diagnosis

See **NECK-6.1: Imaging** for evaluation of salivary gland masses, salivary gland stones and neck masses.

ONC-4.2: Initial Workup/Staging

Diagnosis	Imaging Study
Biopsy-proven malignancy (only if none of these imaging studies has already been done)	Any one of the following can be approved: ◆ MRI Orbits/Face/Neck without and with contrast (CPT® 70543) ◆ CT Neck with contrast (CPT® 70491) ◆ CT Neck without contrast (CPT® 70490)
Skull base invasion	◆ MRI Brain without and with contrast (CPT® 70553)
Abnormalities on chest x-ray or if lymphadenopathy in neck	◆ CT Chest with contrast (CPT® 71260)
Only for suspicious lung abnormalities	◆ PET/CT (CPT® 78815) See also: **CH-16: Solitary Pulmonary Nodule(SPN)**

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ONC-4.3: Restaging/Recurrence

Indication	Imaging Study
Patients with unresected disease receiving systemic therapy (chemotherapy)	One of the following may be approved every 2 cycles: ◆ CT Neck with contrast (CPT® 70491) and any other sites of disease ◆ MRI Orbits/Face/Neck without and with contrast (CPT® 70543) and any other sites of disease
Recurrence or progression suspected based on new or worsening signs or symptoms	One of the following may be approved: ◆ CT Neck with contrast (CPT® 70491) ◆ MRI Orbits/Face/Neck without and with contrast (CPT® 70543) In addition, for all patients: ◆ CT Chest with contrast (CPT® 71260)
All other patients	◆ No routine advanced imaging indicated

ONC-4.4: Surveillance/Follow Up

Indication	Imaging Study
Total surgical resection	◆ No routine advanced imaging indicated
Unresectable or partially resected disease, including those treated with XRT	◆ Either CT Neck (CPT® 70491) or MRI Orbits/Face/Neck (CPT® 70543) once within 6 months of end of treatment and then no further routine imaging unless there are new or worsening signs or symptoms

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ONC-5: Melanomas and Other Skin Cancers

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General Considerations (Melanoma)

- Melanomas can metastasize in an unpredictable fashion.
- Primary orbital/ocular melanomas include those tumors arising in the orbit, uveal tract (iris, ciliary body, and choroid), and conjunctiva and tend to metastasize to the liver.
- Primary mucosal melanomas (i.e., gastrointestinal or sinus mucosa) and orbital/ocular melanomas are considered (and should be managed as) Stage III (i.e., node positive) at initial diagnosis.

ONC-5.1: Suspected/Diagnosis (Melanoma)

Suspected/Diagnosis	Imaging Study
All	◆ Imaging is not indicated until histologic diagnosis is confirmed

ONC-5.2: Initial Work-Up/Staging (Melanoma)

Melanoma	Imaging Study
Stage 0 or Ia (in situ or disease < 1 mm)	◆ Routine advanced imaging is not indicated
◆ Stage Ib (≤ 1 mm with ulceration or high mitotic rate) ◆ Stage II (lesions > 1 mm thick, but node negative)	◆ CT with contrast or MRI without and with contrast of specific areas, only if signs or symptoms indicate need for further evaluation ◆ Lymph system imaging (lymphoscintigraphy, CPT® 78195) is indicated for sentinel lymph node (SLN) evaluation
Any of the following: ◆ Stage III (sentinel node positive, palpable regional nodes) ◆ Stage IV (metastatic) ◆ Mucosal, including lip primary ◆ Ocular/orbital primary site	◆ CT with contrast of Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) **or** PET/CT (CPT® 78815 or CPT® 78816) ◆ CT Neck with contrast (CPT® 70491) is indicated for head or neck primary sites or if palpable lymph nodes are present in the neck ◆ MRI Brain without and with contrast (CPT® 70553)
◆ Primary site of melanoma is unknown and CT Chest and Abdomen/Pelvis are negative	◆ MRI Abdomen without and with contrast (CPT® 74183) and ◆ PET/CT (CPT® 78815 or CPT® 78816)

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ONC-5.3: Restaging/Recurrence (Melanoma)

All recurrences should be confirmed histologically, except when excessive morbidity from a biopsy may occur, such as a biopsy requiring craniotomy.

Melanoma	Imaging Study
Patients receiving chemotherapy, with measurable disease	◆ CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast every 2 cycles (commonly every 6 to 8 weeks)
All in SITU recurrences	◆ Restaging imaging is not needed after adequate aggressive local therapy (see Surveillance below)
Documented or clinically suspected (see top of page regarding biopsy morbidity) recurrence at: ◆ Primary site ◆ In-transit disease ◆ Regional lymph nodes ◆ Metastatic site	◆ CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast ◆ MRI Brain without and with contrast (CPT® 70553) ◆ PET/CT (CPT® 78815 or CPT® 78816) if inconclusive conventional imaging or isolated metastatic based on results of conventional imaging, initially
Brain imaging is indicated for: ◆ New discovery of metastatic disease or progression of metastatic disease ◆ Signs or symptoms of CNS disease ◆ If considering Interleukin (IL-2) therapy	◆ MRI Brain without and with contrast (CPT® 70553)

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ONC-5.4: Surveillance/Follow Up (Melanoma)

Melanoma	Imaging Study
Stage 0, IA, IB and IIA Melanomas	◆ No routine advanced imaging indicated
Stage IIB, IIIA and IIIB Melanomas	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis (CPT® 74177) with contrast every 6 months for 5 years ◆ MRI Brain without and with contrast (CPT® 70553) annually for 5 years
Stage IIIC and IV Melanomas	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis (CPT® 74177) with contrast every 3 months for 3 years, then every 6 months for 2 years ◆ MRI Brain without and with contrast (CPT® 70553) annually for 5 years
Ocular/Orbital Melanomas	◆ CT Chest (CPT® 71260) and CT Abdomen with contrast (CPT® 74160) every 6 months for 2 years, then annually for 3 years **Surveillance imaging beyond 5 years is not supported by guidelines
Liver metastases treated with focal therapy	◆ See also: **ONC-31.2: Liver Metastases**

General Considerations (Non-Melanoma skin cancers)

- Advanced Imaging is generally not indicated for basal cell and squamous cell skin cancers
- PET/CT scan is not indicated for evaluation of non-melanoma skin cancers unless specified within the guidelines below (e.g. Merkel cell carcinoma)
- Merkel cell carcinoma is an unusual skin cancer with neuroendocrine-like histologic features, which has a high propensity (25% to 33%) for regional lymph node spread and occasionally, metastatic spread to lungs.
- Merkel cell carcinoma may present as a primary cancer or as a skin metastasis from a noncutaneous primary neuroendocrine carcinoma (i.e., small cell lung cancer), therefore conventional imaging is indicated initially to confirm the absence of metastasis prior to considering PET scan.

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ONC-5.5: Initial Work-Up/Staging (Non-Melanoma Skin Cancers))

Other Skin Cancers	Imaging Study
Body area with unexplained signs or symptoms	◆ CT with contrast of that body area
Perineural invasion or local regional extension (i.e. bone; deep soft tissue) involvement	One of the following may be approved of the primary site: ◆ MRI without contrast or without and with contrast ◆ CT (contrast as requested) ◆ PET/CT can be helpful for the regional staging of large squamous cell or basal cell carcinomas prior to operative treatment when normal size nodes are visualized but which may harbor metastatic tumor
Skin lesion may be a dermal metastasis from distant primary	◆ CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast ◆ PET/CT is indicated if conventional imaging (CT or MRI) is unable to identify a primary site
Squamous cell carcinoma head or neck skin with regional lymphadenopathy	◆ CT Neck (CPT® 70491) and CT Chest (CPT® 71260) with contrast
Merkel Cell carcinoma	◆ CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast ◆ CT with contrast of other involved body area(s) ◆ PET/CT if no metastatic disease identified on conventional imaging ◆ Lymph system imaging (lymphoscintigraphy, CPT® 78195) or sentinel lymph node evaluation ◆ Octreotide or MIBG scan (one of CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804) ◆ MRI Brain with and without contrast (CPT® 70553)

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ONC-5.6: Restaging/Recurrence (Non-Melanoma Skin Cancers)

All recurrences should be confirmed histologically, except when excessive morbidity from a biopsy may occur, such as a biopsy requiring craniotomy.

Other Skin Cancers	Imaging Study
Recurrence where planned therapy is more extensive than simple wide local excision	◆ CT with contrast of the primary and recurrent site(s) ◆ PET/CT can be helpful for the regional staging of recurrent squamous cell or basal cell carcinomas prior to operative treatment when normal size nodes are visualized but which may harbor metastatic tumor
Recurrence of Merkel cell carcinoma	◆ CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast ◆ MRI Brain without and with contrast (CPT® 70553) ◆ Octreotide or MIBG scan (one of CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804) ◆ PET/CT if no metastatic disease on any of the previous imaging studies

ONC-5.7: Surveillance/Follow up (Non-Melanoma Skin Cancers)

Other Skin Cancers	Imaging Study
Merkel cell cancer – only if node positive	◆ CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast every 6 months for 5 years ◆ Add CT Neck with contrast (CPT® 70491) if known prior neck disease or scalp/facial/neck disease
All others	◆ Routine advanced imaging for surveillance is not indicated ◆ Imaging indicated only for signs and symptoms of recurrent disease

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ONC-6: Thyroid Cancer

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General Considerations

- PET for initial staging for anaplastic thyroid cancer is currently not recommended before conventional imaging since recommendations for PET are derived from observational studies and clinical trials with other methodological limitations.
- Patients with measurable metastatic disease that are RAI refractory may be followed with conventional imaging, PET-CT scan is reserved for inconclusive findings.
- Whole body thyroid nuclear scan is coded with CPT® 78018. If CPT® 78018 is obtained and found to be positive, CPT® 78020 may be approved as an add-on test to evaluate the degree of iodine uptake.

ONC-6.1: Suspected/Diagnosis

See **NECK-9.1: Thyroid Nodule** for imaging guidelines for suspected thyroid malignancies

ONC-6.2: Initial Work-Up/Staging

Follicular, Papillary and Hürthle Cell Carcinomas	Imaging Study
Any one of the following: ◆ Fixation suggested by clinical exam and/or ultrasound ◆ Substernal or bulky disease ◆ Disease precluding full ultrasound examination	Any one of the following: ◆ MRI Neck without contrast (CPT® 70540) ◆ MRI Neck without and with contrast (CPT® 70543) ◆ CT Neck without contrast (CPT® 70490) ◆ CT Neck with contrast (CPT® 70491) can be approved if contrast study is necessary for complete pre-operative assessment and use of IV contrast will not delay post-operative use of RAI therapy.
Post-thyroidectomy to assess thyroid remnant for one of the following: ◆ Extent of thyroid remnant cannot be accurately ascertained from the surgical report or neck ultrasound ◆ When the results may alter the decision to treat ◆ Prior to administration of RAI therapy	◆ Whole body thyroid nuclear scan (CPT® 78015, CPT® 78016, CPT® 78018, or CPT® 78020)
Skeletal pain	Any one of the following: ◆ Bone scan see also: **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology** ◆ Nuclear Thyroid scan (CPT® 78015, CPT® 78016, CPT® 78018, or CPT® 78020)
Suspicious findings on CXR, US, or substernal extension of mass	◆ CT Chest without contrast (CPT® 71250)
All other patients	◆ Routine preoperative advanced imaging is not indicated

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Medullary Thyroid Carcinomas	Imaging Study
All patients with positive lymph nodes or calcitonin level > 500 pg/mL	Any or all of the following: ◆ CT Neck with contrast (CPT® 70491) ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen either with (CPT® 74160) or CT Abdomen without and with contrast (CPT® 74170) ◆ Bone scan see also: ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology ◆ Octreotide or MIBG scan (CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804)
Skeletal pain	◆ Bone scan (see also: **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**
Inconclusive finding on conventional imaging	◆ PET/CT (CPT® 78815)
Anaplastic Thyroid Carcinomas	**Imaging Study**
All	Any or all of the following: ◆ CT Neck with contrast (CPT® 70491) ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ Bone scan (see also: **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**
Skeletal pain	◆ Bone scan (see **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**)
Inconclusive finding on conventional imaging	◆ PET/CT (CPT® 78815 or CPT® 78816)

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ONC-6.3: Restaging/Recurrence

Follicular, Papillary and Hürthle Cell Carcinomas	Imaging Study
Within 2 weeks (ideally approximately within 3 to 7 days) of completion of Radioactive Iodine therapy dose	◆ Whole body thyroid nuclear scan (CPT® 78018)
Any of the following: ◆ Recurrence documented by biopsy ◆ Increasing thyroglobulin level without Thyrogen® stimulation ◆ Thyroglobulin level > 2 ng/mL or higher than previous after Thyrogen® stimulation ◆ Anti-thyroglobulin antibody present ◆ Evidence of residual thyroid tissue on ultrasound or physical exam after thyroidectomy or ablation	Any or all of the following: ◆ Thyroid Nuclear Scan (CPT® 78015, CPT® 78016, CPT® 78018, or CPT® 78020) ◆ CT with contrast of any symptomatic body area ◆ MRI without and with contrast of any symptomatic body area
Any of the following: ◆ Negative radioiodine scan and rising thyroglobulin level ◆ Inconclusive findings on conventional imaging (including I-131 study) – (See Practice note below)	◆ PET/CT (CPT® 78815)

Medullary and Anaplastic Thyroid Carcinomas	Imaging Study
Medullary carcinoma with elevated calcitonin or CEA, or signs or symptoms of recurrence	Any or all of the following: ◆ CT Neck with contrast (CPT® 70491) ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen either with (CPT® 74160) or without and with contrast (CPT® 74170) ◆ Octreotide or MIBG scan (CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804)
Anaplastic carcinoma with signs or symptoms of recurrence	Any or all of the following: ◆ CT Neck with contrast (CPT® 70491) ◆ CT Chest with contrast (CPT® 71260) ◆ Either CT Abdomen/Pelvis with contrast (CPT® 74177) **OR** MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast
Inconclusive conventional imaging	◆ PET/CT (CPT® 78815)

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ONC-6.4: Surveillance/Follow Up

Follicular, Papillary and Hürthle Cell Carcinomas	Imaging/Diagnostic Study
All patients	◆ Neck ultrasound (CPT® 76536), chest x-ray, and laboratory studies every 6 months for the first year, then annually ◆ Thyroid Nuclear Scan (CPT® 78015, CPT® 78016, CPT® 78018, or CPT® 78020) for node positive and high risk patients, and patients with RAI-avid metastases as per above time frames.

Medullary Carcinomas	Imaging/Diagnostic Study
All patients	◆ CEA and calcitonin are required for monitoring medullary carcinomas ◆ Routine surveillance imaging is not indicated

Anaplastic Thyroid Carcinomas	Imaging Study
All patients	Every 3 months for 2 years: ◆ CT Neck with contrast (CPT® 70491) ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177)

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ONC-7: Small Cell Lung Cancer

General Considerations	**47**
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General Considerations

- Combined histologies of Small and Non-Small cell are considered Small cell lung cancer.
- Imaging is presently guided by traditional staging of limited or extensive disease.
- Extensive stage is either metastatic disease or an extent which cannot be encompassed by a single radiotherapy portal. Limited staging is confined to one side of the chest.
- Patients treated curatively for SCLC are at increased risk for developing a second lung cancer. If new lung nodule is seen on imaging without any evidence of other systemic disease then should follow **CH-16: Solitary Pulmonary Nodule (SPN)** for work-up of nodule.
- For carcinoid (low grade neuroendocrine tumors) of the lung, see also: **ONC-31.1: Lung Metastases**

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ONC-7.1: Small Cell Lung Cancer (SCLC)

Indication	Imaging Study
Evaluation of pulmonary nodule or mass	See: **ONC-8.2: Suspected/Diagnosis** or **CH-16: Solitary Pulmonary Nodule (SPN)**
Initial staging	Any or all of the following: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ MRI Brain without and with contrast (CPT® 70553) ◆ Bone scan, if PET/CT not being done (See also: **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**)
Confirm limited stage (non-metastatic) disease if initial staging imaging (CT and MRI) shows disease limited to the thorax	◆ PET/CT (CPT® 78815)
Treatment Response for one of the following: ◆ After every 2 cycles of chemotherapy ◆ Following completion of chemoradiation	Any or all of the following: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen with contrast (CPT® 74160) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) may be substituted for known pelvic disease or pelvic symptoms ◆ Bone scan (See also: **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**) ◆ PET is not indicated for evaluation of treatment response in SCLC, but can be considered on a case-by-case basis. These cases should be forwarded for medical director review.
Restaging (suspected recurrence)	Any or all of the following: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen with contrast (CPT® 74160) ■ CT Abdomen/Pelvis with contrast (CPT® 74177) may be substituted for known pelvic disease or pelvic symptoms ◆ Brain MRI without and with contrast (CPT® 70553) ◆ Bone scan (See: **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**) ◆ PET is not indicated for evaluation of recurrent SCLC, but can be considered on a case-by-case basis. These cases should be forwarded for Medical Director review.
Complete or partial response to initial treatment, if prophylactic cranial irradiation (PCI) is planned.	◆ MRI Brain without and with contrast (CPT® 70553)

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Surveillance of systemic disease:	◆ CT Chest without (CPT® 71250) or CT Chest with contrast (CPT® 71260) **and** CT Abdomen without (CPT® 74150) or CT Abdomen with contrast (CPT® 74160) every 4 months for first two years, every 6 months for 3 years and then annually ◆ For new nodules, see: **ONC-31.1: Lung Metastases** for new nodule evaluation
Surveillance of brain metastases: ◆ If prophylactic cranial irradiation is not given	◆ MRI Brain without and with contrast (CPT® 70553) every 4 months for the first 2 years
Surveillance of brain metastases: ◆ After prophylactic cranial irradiation	◆ Routine imaging of the brain is not indicated

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ONC-8: Non-Small Cell Lung Cancer

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General Considerations

- Non-small cell lung cancer includes adenocarcinoma, squamous cell carcinoma, and large cell neuroendocrine tumors.
- PET/CT scan is not generally indicated for initial staging or restaging of NSCLC with distant metastatic disease, pleural/pericardial effusion, or for multiple sites that are located outside the chest cavity, when found on conventional imaging (i.e., liver, bone and adrenal metastases, etc.).
- PET/CT may be considered to confirm solitary focus of metastatic disease (i.e., brain or adrenal) if being considered for an aggressive surgical management.

ONC-8.1: Asymptomatic Screening

See **CH-34: Lung Cancer Screening** for criteria for low-dose CT scan chest for lung cancer screening.

ONC-8.2: Suspected/Diagnosis

Indication	Imaging Study
◆ Abnormal chest x-ray or clinical suspicion remains high despite a normal chest x-ray in symptomatic patient	◆ CT Chest without contrast (CPT® 71250) **or** ◆ CT Chest with contrast (CPT® 71260)
◆ Pulmonary nodule < 8 mm in size noted on CT Chest	◆ See: **CH-16: Solitary Pulmonary Nodule (SPN)**
◆ Pulmonary nodule 8 mm (0.8 cm) to 30 mm (3 cm) seen on CT Chest or MRI Chest	◆ PET/CT (CPT® 78815) ▪ If Negative: Repeat CT Chest with contrast (CPT® 71260) or CT Chest without contrast (CPT® 71250) at 6 months and repeat at 24 months from the first CT Chest. ▪ If Positive: Qualifies as initial staging PET/CT ▪ If Inconclusive: Repeat CT scan or biopsy. PET/CT may not be repeated.
◆ Pulmonary mass 31 mm (3.1 cm) or greater seen on CT or MRI	◆ PET/CT (CPT® 78815) can be approved prior to biopsy if one or more of the following applies: ▪ Resection will be performed instead of biopsy if PET confirms limited disease ▪ Multiple possible biopsy options are present within the chest and PET findings will be used to determine the most favorable biopsy site ◆ Biopsy is indicated prior to PET imaging for all other indications in pulmonary masses ≥ 31 mm (3.1 cm) in size
Mediastinal/Hilar Mass	See also: **CH-2: Lymphadenopathy**
Paraneoplastic syndrome suspected	See also: **ONC-30.3: Paraneoplastic Syndromes-General Considerations**

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ONC-8.3: Initial Workup/Staging

Indication	Imaging Study
All patients	Any or all of the following: ◆ CT Chest (CPT® 71260) with contrast ◆ CT Abdomen (CPT® 74160) with contrast ■ CT Abdomen may be omitted if CT Chest report clearly documents upper abdomen through level of adrenals ◆ Bone scan, if PET/CT not being done (See also: **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology.**)
Any of the following: ◆ All Stage I-IIIB disease ◆ Stage IV disease confined to the chest region (pleura/pericardium or solitary site including lung nodules) ◆ Conventional imaging is inconclusive ***PET is not indicated for metastatic disease outside the chest cavity (e.g. malignant pleural/pericardial effusion or bony metastases) present on CT, MRI or bone scan	◆ PET/CT (CPT® 78815) if not already completed prior to histological diagnosis
Any of the following: ◆ All Stage II-IV disease ◆ Stage I disease and considering surgical resection as primary therapy	◆ MRI Brain without and with contrast (CPT® 70553)
Superior sulcus (Pancoast) tumor suspected	Any or all of the following: ◆ MRI Chest without and with contrast (CPT® 71552) ◆ MRI Cervical spine without and with contrast (CPT® 72156) ◆ MRI Thoracic spine without and with contrast (CPT® 72157)

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ONC-8.4: Restaging/Recurrence

Indication	Imaging Study
Stage I or II patients who undergo definitive local treatment with surgery, radiation, or radiosurgery	◆ Restaging imaging is not indicated. See also: Surveillance **ONC-8.5: Surveillance/Follow-Up**
Measurable disease, undergoing active treatment	Any or all of the following every 2 cycles: ◆ CT Chest with (CPT® 71260) **or** CT Chest without contrast (CPT® 71250) ◆ CT Abdomen with contrast (CPT® 74160) ■ CT Abdomen/Pelvis with contrast (CPT® 74177) may be substituted for known pelvic disease or pelvic symptoms ◆ MRI Brain without and with contrast (CPT® 70553) for measurable brain metastases being treated with systemic therapy
Any of the following: ◆ Locally advanced (Stage III, non-metastatic, unresectable) ◆ Inoperable tumor if chemotherapy or chemoradiation was the initial treatment modality ◆ Inadequately resected disease ◆ Suspected recurrence	Any or all of the following: ◆ CT Chest with (CPT® 71260) **or** CT Chest without contrast (CPT® 71250) ◆ CT Abdomen with contrast (CPT® 74160) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) may be substituted for known pelvic disease or pelvic symptoms
Determine resectability following neo-adjuvant therapy	◆ MRI Chest without and with contrast (CPT® 71552)
Newly identified lung nodule(s)	◆ See **ONC-31.1: Lung Metastases** for new nodule evaluation
Any of the following: ◆ Suspected/biopsy proven recurrence localized to the chest cavity ◆ Inconclusive findings conventional imaging ◆ To differentiate tumor from radiation scar/fibrosis	◆ PET/CT (CPT® 78815) ***PET not indicated for metastatic disease outside the chest cavity (e.g. malignant pleural/pericardial effusion or bony metastases) present on CT, MRI or bone scan
Any of the following: ◆ Following a demonstrated adequate response to neoadjuvant therapy if intracranial disease will preclude surgery ◆ Documented recurrence/progression ◆ New or worsening neurological signs or symptoms	◆ MRI Brain without and with contrast (CPT® 70553)

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ONC-8.5: Surveillance/Follow-Up

Indication	Study
Stage I-II	◆ CT Chest with contrast (CPT® 71260) **or** CT Chest without contrast (CPT® 71250) every 6 months for 2 years and then annually ***Patients treated with radiation therapy and residual abnormality on imaging may undergo CT Chest every 3 months for the first year after therapy, every 6 months in year 2, annually thereafter
Stage III-IV (metastatic sites treated with definitive intent)	◆ CT Chest with contrast (CPT® 71260) **or** CT Chest without contrast (CPT® 71250) every 3 months for 2 years, every 6 months for 3 years and then annually
New lung nodule	See: **ONC-31.1: Lung Metastases**

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ONC-9: Esophageal Cancer

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General Considerations

- Clinicians must describe esophageal cancer by cell type and in which third of the esophagus it occurs.
- Cancers of the upper and middle third are usually squamous cell and are highly associated with tobacco and alcohol abuse.
- Cancers of the gastroesophageal (GE) junction are treated as lower third cancers. Lower third cancers are usually adenocarcinomas; 62% of these arise in the setting of Barrett's esophagus, a condition associated with high body mass index (BMI).

ONC-9.1: Suspected/Diagnosis

- See also: **NECK-3.1: Dysphagia** for imaging guidelines for evaluation of suspected esophageal malignancy

ONC-9.2: Initial Workup/Staging

Diagnosis	Imaging Study
Biopsy proven	◆ CT Chest and Abdomen with contrast (CPT® 71260 and CPT® 74160) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) may be approved instead of CT Abdomen if there are pelvic signs or symptoms
Upper 1/3 or neck mass	◆ CT Neck with contrast (CPT® 70491) for upper 1/3 primary and/or neck mass
Prior to start of neoadjuvant therapy in preparation for surgery and no evidence of metastatic disease by conventional imaging	◆ PET/CT (CPT® 78815)

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ONC-9.3: Restaging/Recurrence

Indication	Imaging Study
After primary chemoradiation therapy prior to surgery	◆ CT Chest (CPT® 71260) and CT Abdomen (CPT® 74160) with contrast
Post-surgical resection	◆ See Surveillance **ONC-9.4: Surveillance/Follow-up**
◆ If conventional imaging is inconclusive or ◆ Salvage surgical candidate with recurrence and no metastatic disease documented by conventional imaging	◆ PET/CT (CPT® 78815) PET imaging can be done as early as 6 weeks after completion of XRT if recent CT findings are inconclusive and PET findings will alter immediate care decision making
For any of the following: ◆ Signs or symptoms of recurrence ◆ Biopsy proven on follow-up endoscopy ◆ Recurrence suggested by other imaging (i.e. CXR or barium swallow)	◆ CT Chest (CPT® 71260) **and** CT Abdomen (CPT® 74160) with contrast
If previously involved or new signs or symptoms	◆ CT Pelvis with contrast (CPT® 72193) **and/or** CT Neck with contrast (CPT® 70491)

ONC-9.4: Surveillance/Follow-Up

Indication	Imaging Study
Stage 0-I disease	◆ No routine advanced imaging indicated
Stage II-III disease	◆ CT Chest (CPT® 71260) and Abdomen (CPT® 74160) with contrast every 6 months for 3 years
Stage IV disease	◆ See: **ONC-1.2: Phases of Oncology Imaging and General Phase-Related Considerations**

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ONC-10: Other Thoracic Tumors

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ONC-10.1: Malignant Pleural Mesothelioma—Suspected/Diagnosis

- See **CH-9: Asbestos Exposure** for imaging guidelines for evaluation of suspected mesothelioma

ONC-10.2: Malignant Pleural Mesothelioma—Initial Workup/Staging

Diagnosis	Imaging Study
Cytologically or pathologically proven	◆ CT Chest (CPT® 71260) **and** CT Abdomen (CPT® 74160) with contrast ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) may be approved instead of CT Abdomen if there are pelvic signs or symptoms ◆ PET/CT (CPT® 78815) if no evidence of metastatic disease or inconclusive conventional imaging
Preoperative planning	◆ MRI Chest without and with contrast (CPT® 71552)

ONC-10.3: Malignant Pleural Mesothelioma—Restaging

Indication	Imaging Study
Signs or symptoms of recurrence	◆ CT Chest (CPT® 71260) and CT Abdomen (CPT® 74160) with contrast ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) may be approved instead of CT Abdomen if there are pelvic signs or symptoms
Treatment with chemotherapy	Every 2 cycles: ◆ CT Chest (CPT® 71260) and CT Abdomen (CPT® 74160) with contrast ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) may be approved instead of CT Abdomen if there are pelvic signs or symptoms
Following induction chemotherapy prior to surgical resection	◆ CT Chest (CPT® 71260) and CT Abdomen (CPT® 74160) with contrast ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) may be approved instead of CT Abdomen if there are pelvic signs or symptoms ◆ PET/CT (CPT® 78815) if no evidence of metastatic disease
Inconclusive Chest CT	◆ MRI Chest without and with contrast (CPT® 71552)

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ONC-10.4: Malignant Pleural Mesothelioma—Surveillance

Indication	Imaging Study
All	◆ CT Chest with contrast (CPT® 71260) and previously involved regions every 3 months for 2 years, then annually thereafter

ONC-10.5: Thymoma and Thymic Carcinoma—Suspected/Diagnosis

➤ See **CH-20: Mediastinal Mass** for imaging guidelines for evaluation of suspected thymic malignancies

ONC-10.6: Thymoma and Thymic Carcinoma— Initial Workup/Staging

Diagnosis	Imaging Study
Encapsulated or invasive limited disease	◆ CT Chest with contrast (CPT® 71260)
Extensive mediastinal involvement on Chest CT	◆ CT Abdomen with contrast (CPT® 74160) ◆ CT Neck with contrast (CPT® 70491)
Inconclusive finding on CT	One of the following: ◆ Octreotide scan (CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804) ◆ PET/CT (CPT® 78815) ◆ MRI Chest without and with contrast (CPT® 71552)
Preoperative planning	◆ MRI Chest without and with contrast (CPT® 71552)
Thymic Carcinomas	◆ Image according to **ONC-8: Non-Small Cell Lung Cancer**

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ONC-10.7: Thymoma and Thymic Carcinoma— Restaging

Indication	Study
Adjuvant therapy following surgical resection	◆ Follow surveillance imaging
For suspected recurrence	◆ CT Chest with contrast (CPT® 71260)
Recurrence with extensive mediastinal involvement on chest CT	◆ CT Abdomen with contrast (CPT® 74160) ◆ CT Neck with contrast (CPT® 70491)
Thymic carcinomas	See **ONC-8: Non-Small Cell Lung Cancer**
Inconclusive finding on CT	One of the following: ◆ Octreotide scan (CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804) ◆ PET/CT (CPT® 78815) ◆ MRI Chest without and with contrast (CPT® 71552)
Extensive disease on chemotherapy	◆ CT Neck (CPT® 70491), Chest (CPT® 71260), and Abdomen (CPT® 74160) with contrast, every 2 cycles of therapy ◆ Following induction chemotherapy prior to surgical resection, PET/CT (CPT® 78815) if no evidence of metastatic disease

ONC-10.8: Thymoma and Thymic Carcinoma— Surveillance

Indication	Study
Thymoma	◆ CT Chest with contrast (CPT® 71260) and previously involved regions every 6 months for 2 years, then annually for next 10 years
Thymic carcinomas	◆ CT Chest with contrast (CPT® 71260) every 6 months for 2 years and then annually for 5 years

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ONC-11: Breast Cancer

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General Considerations

- Advanced imaging to evaluate for distant metastases is not indicated for pre-invasive or in-situ breast cancer (histologies such as DCIS and LCIS). Bone scan has a high concordance rate with PET for detecting bone metastases.
- Scintimammography and Breast Specific Gamma Imaging (BSGI) are considered experimental and investigational.
- **NOTE: Some payors have specific restrictions on PET imaging, and those coverage policies may supersede the recommendations for PET imaging in these guidelines.**
- PET is not indicated for the following:
  - Non-invasive breast cancers
  - Prior to lymph node sampling in a patient with clinical stage I, II, or operable IIIA disease
  - Obvious multi-organ metastatic disease is present on CT or MRI

ONC-11.1: Suspected/Diagnosis

See **BR-6: Breast MRI Indications** for imaging guidelines for evaluation of suspected breast cancer

ONC-11.2: Initial Workup/Staging

Initial Work-up/Staging	Imaging Study
Any of the following: ➢ Biopsy proven invasive breast cancer or carcinoma in-situ ➢ Adenocarcinoma in axillary lymph node	◆ Bilateral Breast MRI (CPT® 77059)
Operable disease (stage I and II)	◆ Bilateral Breast MRI is helpful in determining surgical margins and extent of disease if breast conserving therapy is being considered ◆ For planned sentinel lymph node (SLN) biopsy: Lymph system imaging (lymphoscintigraphy, CPT® 78195)
Clinical Stage III and Stage IV disease or for signs or symptoms of systemic disease (including elevated liver function tests or tumor markers)	Any or all of the following: ◆ CT Chest with contrast (CPT® 71260) **and** Abdomen/Pelvis (CPT® 74177) with contrast ◆ Bone scan (see also: **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**)
Inconclusive CT and bone scan	◆ PET/CT (CPT® 78815)
Bone pain	◆ Bone scan (see: **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**) ◆ See also: **ONC-31.5: Bone (including Vertebral) Metastases** ◆ See also: **ONC-31.6: Spinal Cord Compression**

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ONC-11.3: Restaging/Recurrence

Indication	Imaging Study
Any of the following: ◆ Biopsy proven breast or chest wall recurrence ◆ Suspicion of recurrence with inconclusive mammogram and/or ultrasound (BIRADS 0) ◆ Mammogram and ultrasound conflicts with physical exam ◆ End of planned neoadjuvant chemotherapy to determine resectability	Bilateral MRI Breast without and with contrast (CPT® 77059)
Any of the following: ◆ Elevated LFTs ◆ Rising tumor markers ◆ Signs or symptoms of recurrence ◆ Biopsy proven recurrence	Any or all of the following: ◆ CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast ◆ Bone scan (See also: **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**)
Treatment response in patients with metastatic disease and measurable disease on imaging	Any or all of the following for patients being treated with **chemotherapy, every 2 cycles**: ◆ CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast ◆ Bone scan (see also: **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**) ◆ MRI Brain without and with contrast (CPT® 70553) for patients receiving systemic treatment for brain metastases Any or all of the following for patients being treated with **endocrine/hormonal therapy, every 3 months**: ◆ CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast ◆ Bone scan (See **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**)
Inconclusive CT, MRI, and/or bone scan for suspected recurrence, and further characterization is needed to make treatment decisions	◆ PET/CT (CPT® 78815)
Any of the following: ◆ Assessing for residual disease after surgery ◆ Assessing response to neoadjuvant chemotherapy ◆ After lumpectomy or mastectomy, prior to adjuvant therapy	◆ Neither PET nor CT are indicated for systemic restaging after neoadjuvant chemotherapy or after surgery
Bone metastasis as the only site of stage IV disease (excluding brain metastases) and a prior bone scan has not been performed for serial comparison	◆ PET/CT (CPT® 78815)

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ONC-11.4: Surveillance/Follow Up

Indication	Imaging Study
Metastatic disease on a break from therapy with persistent measurable disease	Any or all of the following, every 3 months: ◆ CT Chest (CPT® 71260) **and** Abdomen/Pelvis (CPT® 74177) with contrast ◆ Bone scan (see also: **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**)
Asymptomatic non-metastatic disease	◆ No advanced imaging indicated
Breast imaging surveillance, including after bilateral mastectomy	◆ See **BR-6: Breast MRI Indications for imaging guidelines**

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ONC-12: Sarcomas – Bone, Soft Tissue and GIST

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ONC-12.1: Soft Tissue Sarcomas - General Considerations

Sarcomas are tumors of mesenchymal origin, classified as high-, intermediate-, and low-grade (G) tumors (sometimes described as “spindle cell” cancers). They can arise in any bony, cartilaginous, smooth muscle, skeletal muscle, or cardiac muscle tissue.

Sarcomas occur in both adult and pediatric patients, but some are more common in one age group than the other. Unless specified below, patients age ≥ 18 years old should be imaged according to this guideline section.

Exceptions include:

- Rhabdomyosarcoma patients of all ages should be imaged according to guidelines in **PEDONC-8.2: Rhabdomyosarcoma**
- Osteogenic sarcoma patients of all ages should be imaged according to guidelines in **PEDONC-9.3: Osteogenic Sarcoma (OS)**
- Ewing sarcoma and Primitive Neuroectodermal Tumor patients of all ages should be imaged according to guidelines in **PEDONC-9.4: Ewing Sarcoma and Primitive Neuroectodermal Tumors (ESFT)**.
- Kaposi’s sarcoma patients of all ages should be imaged according to guidelines in **ONC-31.10: Kaposi’s Sarcoma**

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ONC-12.2: Soft Tissue Sarcomas - Initial Workup/Staging

Indication	Imaging Study
Retroperitoneal or intraabdominal primary site	Any or all of the following: ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) ◆ Either CT Abdomen/Pelvis with contrast (CPT® 74177) **or** MRI Abdomen (CPT® 74183) and MRI Pelvis (CPT® 72197) without and with contrast
Any of the following: ◆ Extremity or trunk primary site ◆ Head or neck primary site ◆ Other histologies documented to have propensity for lymphatic spread and deep-seated tumors	Any or all of the following: ◆ MRI without and with contrast of involved area ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250)
Any of the following: ◆ Angiosarcoma ◆ Alveolar soft part sarcoma ◆ Clear cell sarcoma ◆ Epithelioid sarcoma ◆ Hemangiopericytoma ◆ Leiomyosarcoma ◆ Other histologies documented to have propensity for lymphatic spread and deep-seated tumors	Any or all of the following: ◆ MRI without and with contrast of involved area ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) ◆ Either CT Abdomen/Pelvis with contrast (CPT® 74177) **or** MRI Abdomen (CPT® 74183) and MRI Pelvis (CPT® 72197) without and with contrast
Myxoid round cell liposarcoma	Any or all of the following: ◆ MRI without and with contrast of involved area ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) ◆ Either CT Abdomen/Pelvis with contrast (CPT® 74177) **or** MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast ◆ MRI Cervical/Thoracic/Lumbar spine without and with contrast (CPT® 72156, CPT® 72157, and CPT® 72158)
Any of the following: ◆ Angiosarcoma ◆ Alveolar soft part sarcoma ◆ All patients with signs/symptoms of brain metastases	◆ MRI Brain without and with contrast (CPT® 70553)

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Indication	Imaging Study
Any of the following: ◆ Grade of tumor in doubt following biopsy ◆ Conventional imaging suggests solitary metastasis amenable to surgical resection ◆ Planning neoadjuvant therapy ◆ Prior to surgical resection for tumors > 3cm on conventional imaging	◆ PET/CT (CPT® 78815 or CPT® 78816)
Desmoid Tumors	One of the following: ◆ CT without contrast or with contrast of the affected body part ◆ MRI without contrast or without and with contrast of the affected body part ◆ Imaging of lung, lymph node, and metastatic site for these tumors is not indicated
Dermatofibrosarcoma Protuberans (DFSP)	One of the following: ◆ CT without contrast or with contrast of the affected body part ◆ MRI without contrast or without and with contrast of the affected body part ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) for ▪ pulmonary symptoms ▪ abnormal chest x-ray ▪ sarcomatous differentiation

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ONC-12.3: Soft Tissue Sarcomas—Restaging/Recurrence

Indication	Imaging Study
Any of the following: ◆ After preoperative radiotherapy ◆ After surgical resection ◆ After adjuvant radiotherapy	◆ MRI without and with contrast of affected body area ◆ CT without contrast or with contrast can be added if demonstrated bone involvement ◆ Chest or lymph node imaging is not indicated if no abnormality on previous imaging
Any of the following: ◆ Differentiate tumor from radiation or surgical fibrosis ◆ Determine response to neoadjuvant therapy ◆ Confirm oligometastatic disease prior to curative intent surgical resection	◆ PET/CT (CPT® 78815 or CPT® 78816)
Chemotherapy response for patients with measurable disease	◆ CT with contrast or MRI without and with contrast of affected body area every 2 cycles
Local recurrence suspected	◆ Repeat all imaging for initial workup of specific histology and/or primary site
Preoperative planning prior to resection	Any or all of the following: ◆ MRI without contrast or without and with contrast of involved area ◆ CT (contrast as requested) of involved area
Dermatofibrosarcoma Protuberans (DFSP)	One of the following: ◆ CT without contrast or with contrast of the affected body part ◆ MRI without contrast or without and with contrast of the affected body part ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) for: ▪ pulmonary symptoms ▪ abnormal chest x-ray ▪ sarcomatous differentiation

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ONC-12.4: Soft Tissue Sarcomas Surveillance/Follow Up

Indication	Imaging Study
Retroperitoneal/intraabdominal primary site	Any or all of the following every 3 months for 2 years, then every 6 months for 2 more years, then annually: ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast or MRI without and with contrast of any other involved body areas
Extremity, trunk, or Head/Neck primary site, low grade Stage I disease	Any or all of the following every 6 months for 2 years, then annually until year 10: ◆ Chest x-ray ■ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) is indicated for new findings on CXR or new/worsening pulmonary signs/symptoms ◆ CT with contrast, MRI without contrast, or MRI without and with contrast of primary site if primary site not easily evaluated by physical exam
Extremity, trunk, or Head/Neck primary site, Stages II-IV disease.	Any or all of the following every 3 months for 2 years, then every 6 months for 2 more years, then annually: ◆ CT with contrast, MRI without contrast, or MRI without and with contrast of primary site ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) ◆ CT with contrast or MRI without and with contrast of any other involved body areas
Desmoid tumors	One of the following every 6 months for 3 years, then annually: ◆ CT without contrast or with contrast of the affected body part ◆ MRI without contrast or without and with contrast of the affected body part
Dermatofibrosarcoma Protuberans	◆ No routine imaging unless clinical signs/symptoms of recurrence

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ONC-12.5: Gastrointestinal Stromal Tumor (GIST)

General Considerations

GISTs are mesenchymal neoplasms of the gastrointestinal (GI) tract, mostly found in the stomach and upper small bowel, commonly metastasizing to the liver and abdominal cavity and primarily treated with surgery.

Use of the tyrosine kinase inhibitors (TKI), Imatinib mesylate (Gleevec®) and Sunitinib malate (Sutent®) has substantially changed imaging and treatment paradigms for GIST.

Indication	Imaging Study
Suspected/Diagnosis	◆ CT Abdomen/Pelvis with contrast (CPT® 74177)
Initial Workup/Staging	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis (CPT® 74177) with contrast ◆ MRI Abdomen without and with contrast (CPT® 74183) is indicated for evaluation of liver lesions that are equivocal on CT imaging or for preoperative assessment of liver ◆ PET is indicated for evaluation of inconclusive findings on conventional imaging
Restaging/Recurrence	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT Chest with contrast (CPT® 71260) if prior evidence of chest disease or signs or symptoms of chest disease ◆ PET is indicated for evaluation of inconclusive findings on conventional imaging
Treatment Response	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT Chest with contrast (CPT® 71260) if prior evidence of chest disease or signs or symptoms of chest disease ◆ PET is indicated for evaluation of inconclusive findings on conventional imaging
Surveillance/Follow-up	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) every 6 months for 5 years, then annually

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ONC-12.6: Bone Sarcomas—Initial Workup/Staging

Indication	Imaging Study
Chondrosarcoma	Any or all of the following: ◆ MRI without contrast or without and with contrast of involved area ◆ CT (contrast as requested) of involved area ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250)
Chordoma	Any or all of the following: ◆ MRI without contrast or without and with contrast of involved area ◆ CT (contrast as requested) of involved area ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ MRI Cervical (CPT® 72156), Thoracic (CPT® 72157), and Lumbar spine (CPT® 72158) without and with contrast ◆ Bone scan (see also: **ONC-1.3 Nuclear Medicine (NM) Imaging in Oncology**) ◆ PET may be approved for inconclusive conventional imaging

ONC-12.7: Bone Sarcomas—Restaging/Recurrence

Indication	Imaging Study
Chondrosarcoma	Any or all of the following, after completion of radiotherapy or every 2 cycles of chemotherapy: ◆ MRI without contrast or without and with contrast of involved area ◆ CT (contrast as requested) of involved area ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250)
Chordoma	Any or all of the following, after completion of radiotherapy or every 2 cycles of chemotherapy: ◆ MRI without contrast or without and with contrast of involved area ◆ CT (contrast as requested) of involved area ◆ Bone scan (see also: **ONC-1.3 Nuclear Medicine (NM) Imaging in Oncology**) ◆ PET may be approved for inconclusive conventional imaging

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ONC-12.8: Bone Sarcomas—Surveillance/Follow Up

Indication	Imaging Study
Low Grade Chondrosarcoma	Any or all of the following every 6 months for 2 years, then annually: ◆ Plain x-ray of primary site ■ MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms. ◆ Chest x-ray ■ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) for new findings on CXR, or new/worsening signs/symptoms.
High Grade Chondrosarcoma	Any or all of the following every 6 months for 5 years, then annually: ◆ Plain x-ray of primary site ■ MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms. ◆ Chest x-ray or CT Chest with (CPT® 71260) **or** CT Chest without contrast (CPT® 71250)
Chordoma	◆ CT Abdomen with contrast (CPT® 74160) annually until year 10. Any or all of the following every 6 months for 5 years, then annually until year 10: ◆ Plain x-ray of primary site ■ MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms. ◆ Chest x-ray ■ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) for new findings on CXR, or new/worsening signs/symptoms

ONC–12.9: Benign Bone Tumors—General Considerations:

- Variety of diagnoses, including osteoid osteochondroma, chondroblastoma, desmoplastic fibroma, Paget's disease, osteoid osteoma and others
- Plain x-ray appearance is diagnostic for many benign bone tumors and advanced imaging is generally unnecessary except for preoperative planning
- MRI without and with contrast is the primary modality for advanced imaging of bone tumors, and can be approved to help narrow differential diagnoses and determine whether biopsy is indicated

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- Some benign bone tumor types carry a risk of malignant degeneration over time, but routine advanced imaging surveillance has not been shown to improve outcomes for these patients
- MRI without and with contrast can be approved to evaluate new findings on plain x-ray new/worsening clinical symptoms not explained by a recent plain x-ray
- There are no data to support the use of PET/CT in the evaluation of benign bone tumors, and PET requests should not be approved without biopsy confirmation of a malignancy
- Other benign bone tumor patients of all ages should be imaged according to guidelines in **PEDONC-9.2: Benign Bone Tumors**

ONC-12.10: Benign Bone Tumors—Initial Workup/Staging

Indication	Imaging Study
Giant Cell Tumor of Bone (GCTB)	Any or all of the following: ◆ MRI without contrast or without and with contrast of involved area ◆ CT (contrast as requested) of involved area ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) ◆ Bone scan (see also: **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**)
Enchondroma	◆ MRI without contrast or without and with contrast of primary site

ONC-12.11: Benign Bone Tumors—Restaging/Recurrence

Indication	Imaging Study
Giant Cell Tumor of Bone (GCTB)	Any or all of the following, after completion of radiotherapy or every 2 cycles of chemotherapy: ◆ MRI without contrast or without and with contrast of involved area ◆ CT (contrast as requested) of involved area ◆ Bone scan (see also: **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**)
Enchondroma	Generally no indication for this benign tumor unless symptoms

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ONC-12.12: Benign Bone Tumors—Surveillance/Follow Up

Indication	Imaging Study
Giant Cell Tumor of Bone (GCTB)	Any or all of the following every 6 months for 2 years, then annually until year 10: ◆ Plain x-ray of primary site MRI without and with contrast is indicated for new findings on plain x-ray or new/worsening clinical symptoms. ◆ Chest x-ray CT Chest with (CPT® 71260) or without contrast (CPT® 71250) for new findings on CXR, or new/worsening signs/symptoms.
Enchondroma	Plain films of primary site

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ONC-13: Pancreatic Cancer

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General Considerations

This guideline refers only to adenocarcinoma of the exocrine pancreas, which accounts for over 90% of pancreatic malignancies. This guideline may also be used for cancer of the Ampulla of Vater.

- Endocrine and carcinoid tumors of the pancreas are not included in this guideline;
- See: **ONC-15: Neuroendocrine Cancers and Adrenal Tumors**
- These guidelines or **ONC-14: Upper GI Cancer** guidelines may be used for cancer of the Ampulla of Vater, duodenum, or common bile duct.

ONC-13.1: Screening Studies for Pancreatic Cancer

Indications	Imaging Study
Age 40, or ten years earlier than the youngest affected family member, with any of the risk factors below*	**Initial/Baseline**: ◆ Endoscopic ultrasound (EUS) ◆ CT Abdomen (CPT® 74160) with or without and with contrast (CPT® 74170) **or** MRI Abdomen without and with contrast (CPT® 74183) **Follow-Up**: ◆ EUS every year ◆ CT Abdomen (CPT® 74160) with or without and with contrast (CPT® 74170) **or** MRI Abdomen without and with contrast (CPT® 74183) annually

***Increased risk factors for pancreatic cancer:**

- Family history of familial cancer syndromes including Peutz-Jegher's Syndrome, Hereditary Breast and Ovarian Cancer Syndrome, Familial Atypical Multiple Mole-Melanoma Syndrome (FAMMM), Familial Adenomatous Polyposis
- Hereditary pancreatitis
- Familial pancreatic cancer (two or more first degree relatives or any combination of 3 or more first/second degree relatives)
- Hereditary pancreatic neuroendocrine tumors (Multiple Endocrine Neoplasia Type I [MEN-1], Von Hippel-lindau disease, neurofibromatosis Type 1, tuberous sclerosis)

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ONC-13.2: Suspected/Diagnosis

Indication	Imaging Study
For any suspected symptoms only	◆ Ultrasound (CPT® 76700 or CPT® 76705)
Symptoms and abnormal lab(s), or physical exam findings, or abnormal ultrasound/ERCP	◆ CT Abdomen without and with contrast (CPT® 74170) **or** MRI Abdomen without and with contrast (CPT® 74183)
No resection or biopsy after abdomen CT	◆ Interval transabdominal ultrasound (CPT® 76705) or endoscopic ultrasound (preferred).
Preoperative studies for potentially resectable tumors without confirmed histologic diagnosis	◆ See also: **ONC-13.3: Initial Workup/Staging**

ONC-13.3: Initial Workup/Staging

Diagnosis	Imaging Study
All patients	◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with (CPT® 74177) or without and with contrast or (CPT® 74178) or ◆ EUS
Preoperative planning or CT insufficient to determine resectability	◆ MRI Abdomen without and with contrast (CPT® 74183)
No evidence of metastatic disease on CT or MRI	◆ PET/CT (CPT® 78815)

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ONC-13.4: Restaging/Recurrence

Indication	Imaging Study
For any of the following: ◆ After neoadjuvant chemoradiation ◆ Suspected recurrence	◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with (CPT® 74177) or without and with contrast (CPT® 74178) ◆ CT with contrast of other involved or symptomatic areas ◆ PET/CT (CPT® 78815) for inconclusive conventional imaging post chemoradiation (if given as definitive/curative therapy)
Unresectable disease or metastatic disease on chemotherapy	Every 2 cycles of treatment (commonly every 6 to 8 weeks): ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with (CPT® 74177) or without and with contrast (CPT® 74178) ◆ CT with contrast of other involved or symptomatic areas
Unexplained elevated liver enzymes or inconclusive recent CT abnormality	◆ MRI Abdomen without and with contrast (CPT® 74183)
If complete surgical resection was initial therapy	◆ See also: **ONC-13.5: Surveillance/Follow Up** for surveillance imaging

ONC-13.5: Surveillance/Follow Up

Indication	Imaging Study
All patients	Every 3 months for 2 years, then annually: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ Chest x-ray

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ONC-14: Upper GI Cancers

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ONC-14.1: Hepatocellular Carcinoma (HCC)/Biliary Tumors-General Considerations

- Imaging studies in Liver Transplantation – See: **AB-42.4: Transplant in the Abdomen Imaging Guidelines**
- Diagnosis: A biopsy is not always required for the diagnosis of Hepatocellular carcinoma (HCC). A dedicated triple-phase CT or MRI may be obtained. MRI with contrast is the test of choice for the evaluation of liver masses and offers soft tissue contrast resolution superior to CT as well as the possibility of using two different contrast agents, one of which if more blood flow based and the other which also is blood flow based and demonstrates hepatobiliary function (Eovist).Classical imaging findings include:
  - Arterial phase hyperenhancement
  - Venous phase washout appearance
  - Capsule appearance
  - Threshold growth
- For patients who are high risk for developing HCC (cirrhosis, chronic Hepatitis B or current or prior HCC), if the liver lesion is > 1 cm with 2 classic enhancements on triple-phase CT or MRI, the diagnosis is confirmatory and biopsy is not needed.
- For lesions less than 1 cm or with less than 2 classical enhancements or for any liver lesions in patients who are not high risk, a biopsy is needed for histological confirmation.
- PET/CT scan is not indicated for diagnosis or staging of Hepatocellular carcinoma

ONC-14.2: HCC and Biliary Tumors—Suspected/Diagnosis

- See **AB-26: Cirrhosis and Liver Screening for Hepatocellular Carcinoma**
- See **AB-29: for Liver Lesion Characterization**

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ONC-14.3: HCC and Biliary Tumors—Initial Workup/Staging

Diagnosis	Imaging Study
All patients	◆ CT Chest with contrast (CPT® 71260) One of the following: ◆ CT Abdomen with contrast (CPT® 74160) ◆ CT Abdomen without and with contrast (CPT® 74170) ◆ CT Abdomen and Pelvis with contrast (CPT® 74177) or without and with contrast (CPT® 74178) ◆ MRI Abdomen (CPT® 74183) and MRI Pelvis (CPT® 72197)without and with contrast
For primary biliary carcinoma (no HCC) if no evidence of metastatic disease by conventional imaging, and determining if patient is a surgical candidate	◆ PET/CT (CPT® 78815)

ONC-14.4: HCC and Biliary Tumors—Restaging/Recurrence

Indication	Imaging Study
Hepatocellular Carcinoma: ◆ After initial therapy ◆ For suspected recurrence or new liver lesions ◆ Patients receiving systemic chemotherapy (every 6 to 8 weeks) or immunotherapy (every 3 months)	◆ CT Chest with contrast (CPT® 71260) or CT Chest without contrast (CPT® 71250) One of the following: ◆ CT Abdomen with contrast (CPT® 74160) ◆ CT Abdomen without and with contrast (CPT® 74170) ◆ CT Abdomen and Pelvis with contrast (CPT® 74177) or without and with contrast (CPT® 74178) ◆ MRI Abdomen (CPT® 74183) and MRI Pelvis (CPT® 72197)without and with contrast
Hepatocellular Carcinoma treated with embolization	CTA Abdomen (CPT® 74175) can be approved immediately prior to embolization One of the following, immediately prior to and 1 month post-ablation: ◆ MRI Abdomen without and with contrast (CPT® 74183) ◆ CT Abdomen without and with contrast (CPT® 74170) For surveillance, see **ONC-14.5: HCC and Biliary Tumors-Surveillance/Follow Up** below
Biliary Tract Carcinoma: ◆ After initial therapy ◆ For suspected recurrence or new liver lesions ◆ Patients receiving systemic chemotherapy (every 2 cycles)	◆ CT Abdomen with contrast (CPT® 74160) ***or*** CT Abdomen without and with contrast (CPT® 74170) ***or*** MRI Abdomen without and with contrast (CPT® 74183) ◆ CT Chest with contrast (CPT® 71260) or CT Pelvis with contrast (CPT® 72193) may only be obtained for known disease or new signs/symptoms

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ONC-14.5: HCC and Biliary Tumors—Surveillance/Follow Up

Indication	Imaging Study
Hepatocellular Carcinoma: ◆ Treated with surgical resection ◆ Treated with embolization	Every 3 months for 2 years, then annually: ◆ CT Chest with contrast (CPT® 71260) or CT Chest without contrast (CPT® 71250) **And** any ONE of the following: ◆ CT Abdomen with contrast (CPT® 74160) ◆ CT Abdomen without and with contrast (CPT® 74170) ◆ CT Abdomen and Pelvis with contrast (CPT® 74177) or without and with contrast (CPT® 74178) ◆ MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast
Biliary Tract Carcinoma:	◆ CT Abdomen with contrast (CPT® 74160) every 6 months for 2 years, then annually up to 5 years
If unable to perform CT (due to contrast allergy or renal insufficiency)	◆ MRI Abdomen without and with contrast (CPT® 74183)

ONC-14.6: Gastric Cancers—Initial Workup/Staging

Diagnosis	Imaging Study
All patients	◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) **or** CT Abdomen/Pelvis without and with contrast (CPT® 74178)
◆ Gastric cancer ≥ T2 or higher with no metastatic disease by conventional imaging	◆ PET/CT (CPT® 78815)

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ONC-14.7: Gastric Cancers—Restaging/Recurrence

Indication	Imaging Study
After initial therapy and any suspected recurrence	◆ CT Abdomen with contrast (CPT® 74160), CT Abdomen without and with contrast (CPT® 74170), or MRI Abdomen without and with contrast (CPT® 74183) ◆ CT Chest with contrast (CPT® 71260) for known disease or new signs/symptoms
New liver lesion(s) and primary site controlled	◆ CT Abdomen (CPT® 74170) or MRI Abdomen without and with contrast (CPT® 74183) ◆ CT Chest with contrast (CPT® 71260)
Any one of the following: ◆ After neoadjuvant therapy for presumed surgically resectable disease or ◆ Post curative chemoradiation being treated without surgery	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis with contrast (CPT® 74177)
Inconclusive findings on conventional imaging	◆ PET/CT (CPT® 78815)

ONC-14.8: Gastric Cancers—Surveillance/Follow Up

Indication	Imaging Study
Stage I (treated with resection alone)	◆ No routine imaging unless clinical signs/symptoms of recurrence
Any of the following: ◆ Stage I treated with systemic therapy ◆ Stages II-III ◆ Stage IV - Metastatic disease (post definitive treatment of all measurable disease or being observed off therapy)	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis with contrast (CPT® 74177) annually for 5 years

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ONC-15: Neuroendocrine Cancers and Adrenal Tumors

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ONC-15.1: General Considerations

This guideline includes low-grade or well-differentiated carcinoid and endocrine tumors of the pancreas such as insulinoma, glucagonoma, VIPoma, gastrinoma, somatostatinoma and others as well as catecholamine-secreting tumors of the adrenal such as pheochromocytoma, paraganglioma, adrenocortical carcinoma, and others.

- For poorly-differentiated or high-grade or large cell neuroendocrine tumors of either GI/pancreatic primary or unknown primary origin see: **ONC-31.8: Extrathoracic Small Cell Carcinoma**
- For neuroendocrine tumor of unknown primary follow guidelines in **ONC-31.7: Carcinoma of Unknown Primary Site**
- Neuroblastoma, ganglioneuroblastoma, and ganglioneuroma occurring in adults should be imaged according to **PEDONC-6: Neuroblastoma**
- Also see **AB-15: Zollinger-Ellison Syndrome (ZES)** in the Abdomen Imaging Guidelines
- Many are associated with Multiple Endocrine Neoplasia (MEN) familial syndromes. – See **PEDONC-2.8: Multiple Endocrine Neoplasias (MEN)** for screening recommendations
- Somatostatin receptor-based imaging is more sensitive and specific for evaluation of well-differentiated neuroendocrine tumors and may be performed using ^{111}In DTPA Octreotide scintigraphy or ^{68}Gallium-labeled DOTATATE PET/CT scan. This study is not part of evaluation of poorly-differentiated or high grade neuroendocrine tumors, which are imaged according to (see: **ONC-31.8: Extrathoracic Small Cell Carcinoma**)

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ONC-15.2: Gastrointestinal/Pancreatic Neuroendocrine Cancers—Suspected/Diagnosis

Indication	Imaging Study
◆ Systemic symptoms strongly suggestive of functioning neuroendocrine tumor ◆ Suspicious findings on other imaging studies ◆ Unexplained elevation in any of the following: ■ Chromogranin A ■ 5HIAA ■ Insulin ■ VIP ■ Glucagon ■ Gastrin ■ Substance P ■ Serotonin ■ Somatostatin	Any or all of the following: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) or without and with contrast (CPT® 74178) ■ If CT inconclusive, MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast is indicated ◆ CT Chest with contrast (CPT® 71260) or CXR
◆ Continued suspicion with negative/inconclusive CT scan or MRI	Any ONE of the following: ◆ Octreotide scan (CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804) ◆ ^{68}Gallium-labeled DOTATATE PET/CT scan (CPT® 78815 or CPT® 78816)

ONC-15.3: Gastrointestinal/Pancreatic Neuroendocrine Cancers—Initial Workup/Staging

Indication	Imaging Study
Carcinoid, pancreatic endocrine tumors	If not already done: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) or without and with contrast (CPT® 74178) ■ If CT inconclusive, MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast is indicated ◆ CT Chest with contrast (CPT® 71260)
Inconclusive CT or MRI scans	Any ONE of the following: ◆ Octreotide scan (CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804) ◆ ^{68}Gallium-labeled DOTATATE PET/CT scan (CPT® 78815 or CPT® 78816)
All, after complete resection fails to resolve secretion of pathologic levels of hormones or neurotransmitter compounds, and nuclear imaging (Octreotide, or Somatostatin scintigraphy) is negative	◆ FDG-PET/CT scan (CPT® 78815)

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ONC-15.4: Gastrointestinal/Pancreatic Neuroendocrine Cancers—Restaging/Recurrence

Indication	Imaging Study
All after surgical resection	◆ See: Surveillance below
Unresectable/metastatic disease on treatment with somatostatin analogues	◆ CT of involved body area no more frequently than every 3 months
Unresectable/metastatic disease on treatment with chemotherapy	◆ CT of involved body area every 2 cycles (6 to 8 weeks)
Progression of symptoms, elevation of tumor markers	◆ CT Chest without (CPT® 71250) or with contrast (CPT® 71260) One of the following: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT Abdomen/Pelvis without and with contrast (CPT® 74178) ◆ MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast
Continued suspicion for recurrence with negative or inconclusive CT scan or MRI	Any ONE of the following: ◆ Octreotide scan (CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804) ◆ ^{68}Gallium-labeled DOTATATE PET/CT scan (CPT® 78815 or CPT® 78816)
All above studies done and negative/inconclusive	◆ FDG-PET/CT scan (CPT® 78815 or CPT® 78816)

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ONC-15.5: Gastrointestinal/Pancreatic Neuroendocrine Cancers—Surveillance

Indication	Imaging Study
Neuroendocrine tumors of the bowel (small/large)	◆ CT Abdomen/Pelvis (CPT® 74177) once at 3 to 12 months postoperatively and annually thereafter for 10 years
Neuroendocrine tumors of the upper abdomen (i.e., pancreas, stomach)	◆ CT Abdomen (CPT® 74160) once at 3 to 12 months postoperatively and annually thereafter for 10 years

ONC-15.6: Bronchopulmonary or Thymic Carcinoid – Initial Staging

Indication	Imaging Study
Initial diagnosis	If not already done: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) or without and with contrast (CPT® 74178) ■ If CT inconclusive, MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast is indicated
Inconclusive CT or MRI scans	Any ONE of the following: ◆ Octreotide scan (CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804) ◆ ^{68}Gallium-labeled DOTATATE PET/CT scan (CPT® 78815 or CPT® 78816)
All, after complete resection fails to resolve secretion of pathologic levels of hormones or neurotransmitter compounds, and nuclear imaging (MIBG, Octreotide, or Somatostatin scintigraphy) is negative	◆ FDG- PET/CT scan (CPT® 78815)

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ONC-15.7: Bronchopulmonary or Thymic Carcinoid – Restaging/Recurrence

Indication	Imaging Study
All after surgical resection	◆ See: Surveillance below
Unresectable/metastatic disease on treatment with somatostatin analogues	◆ CT of involved body area no more frequently than every 3 months
Unresectable/metastatic disease on treatment with chemotherapy	◆ CT of involved body area every 2 cycles (6 to 8 weeks)
Progression of symptoms, elevation of tumor markers	◆ CT Chest without (CPT® 71250) or with contrast (CPT® 71260) One of the following: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT Abdomen/Pelvis without and with contrast (CPT® 74178) ◆ MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast
Continued suspicion for recurrence with negative or inconclusive CT scan or MRI	Any ONE of the following: ◆ Octreotide scan (CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804) ◆ ^{68}Gallium-labeled DOTATATE PET/CT scan (CPT® 78815 or CPT® 78816)
All above studies done and negative/inconclusive	◆ FDG-PET/CT scan (CPT® 78815 or CPT® 78816)

ONC-15.8: Bronchopulmonary or Thymic Carcinoid – Surveillance

Carcinoid tumors of lung or thymus	◆ CT Chest with contrast (CPT® 71260) or CT Chest without contrast (CPT® 71250) once at 3 to 12 months post resection and annually thereafter for 10 years

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ONC-15.9: Adrenal Tumors—Suspected/Diagnosis

See **AB-16: Adrenal Cortical Lesions** for imaging guidelines for evaluation of suspected adrenal malignancies

If concern for genetic predisposition syndrome such as MEN, neurofibromatosis, or Von Hippel-lindau disease, see screening recommendations in **PEDONC-2: Screening Imaging and Cancer Predisposition Syndromes.**

ONC-15.10: Adrenal Tumors—Initial Workup/Staging

Indication	Imaging Study
For any of the following: ◆ Pheochromocytoma ◆ Paraganglioma ◆ Paraganglioneuroma	If not already done: ◆ CT Chest without (CPT® 71250) or with contrast (CPT® 71260) One of the following (if not already done): ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT Abdomen/Pelvis without and with contrast (CPT® 74178) ◆ MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast
Continued suspicion with negative/inconclusive CT scan or MRI	Any ONE of the following: ◆ MIBG Scan ◆ Octreotide scan (CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804) ◆ ^{68}Gallium-labeled DOTATATE PET/CT scan (CPT® 78815 or CPT® 78816)
All above studies done and negative/inconclusive	◆ FDG-PET/CT scan (CPT® 78815 or CPT® 78816)
Adrenocortical carcinoma	◆ CT Chest without (CPT® 71250) or with contrast (CPT® 71260) One of the following (if not already done): ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT Abdomen/Pelvis without and with contrast (CPT® 74178) ◆ MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast

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ONC-15.11: Adrenal Tumors—Restaging/Recurrence

Indication	Imaging Study
If surgery is primary therapy	◆ CT Abdomen (CPT® 74160) one time within first year post resection then go to surveillance recommendations
Recurrence, progression of symptoms, or elevation of tumor markers	◆ CT Chest without (CPT® 71250) or with contrast (CPT® 71260) One of the following: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT Abdomen/Pelvis without and with contrast (CPT® 74178) ◆ MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast
Continued suspicion for recurrence with negative or inconclusive CT scan or MRI	Any ONE of the following: ◆ MIBG scan (CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804) ◆ Octreotide scan (CPT® 78800, CPT® 78801, CPT® 78802, CPT® 78803, or CPT® 78804) ◆ 68Gallium-labeled DOTATATE PET/CT scan (CPT® 78815 or CPT® 78816)
All above studies done and negative/inconclusive	◆ FDG-PET/CT scan (CPT® 78815 or CPT® 78816)

ONC-15.12: Adrenal Tumors—Surveillance

Indication	Imaging Study
All patients	◆ CT Abdomen with contrast (CPT® 74160) and CT of other involved body areas with contrast annually for 10 years

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ONC-16: Colorectal Cancer

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General Considerations

- Duodenal and small bowel adenocarcinoma follows imaging guidelines for colorectal cancer.
- Neuroendocrine tumors of the small bowel are covered in: **ONC-15: Neuroendocrine Cancers and Adrenal Tumors**
- Appendiceal adenocarcinoma (including pseudomyxoma peritonei) follows imaging guidelines for colorectal cancer

ONC-16.1: Suspected/Diagnosis

- See **AB-22: GI Bleeding** or **AB-25: CT Colonography (CTC)** for imaging guidelines for evaluation of suspected colorectal malignancies

ONC-16.2: Initial Work-Up/Staging

Indication	Imaging Study
Carcinoma within a polyp that is completely removed	◆ No advanced imaging needed
Invasive adenocarcinoma	◆ CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast
Further evaluation of an inconclusive liver lesion seen on CT	◆ MRI Abdomen without and with contrast (CPT® 74183)
Any one of the following: ◆ Isolated metastatic lesion(s) on other imaging and patient is a candidate for aggressive surgical resection or other localized treatment to metastasis for curative intent ◆ Inconclusive conventional imaging	◆ PET/CT (CPT® 78815)
Rectal adenocarcinoma	In addition to above, for preoperative planning: ◆ Endorectal ultrasound (CPT® 76872) ◆ MRI Pelvis without and with contrast (CPT® 72197)

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ONC-16.3: Restaging/Recurrence

Indication	Imaging Study
Complete resection	◆ See Surveillance below
Recurrence suspected	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis (CPT® 74177) with contrast
After completion of planned neoadjuvant therapy	Patients without metastatic disease, when requested by operating surgeon for operative planning: ◆ CT with contrast or MRI without and with contrast of all operative sites All other patients: ◆ No advanced imaging since surgery is "planned"
Unresected primary disease or metastatic disease on chemotherapy	Every 2 cycles of chemotherapy treatment and at the completion of chemoradiotherapy: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of other involved or symptomatic areas
Any one of the following: ◆ Further evaluation of an inconclusive liver lesion seen on CT ◆ Postoperative elevated or rising CEA or LFTs with negative recent conventional imaging	◆ MRI Abdomen without and with contrast (CPT® 74183)
Any one of the following: ◆ Postoperative elevated or rising CEA or LFTs with negative recent conventional imaging ◆ Isolated metastatic lesion(s) on other imaging and patient is a candidate for aggressive surgical resection or other localized treatment to metastasis for curative intent ◆ Differentiate local tumor recurrence from postoperative and/or post-radiation scarring	◆ PET/CT (CPT® 78815)
New or worsening pelvic pain and recent CT imaging negative or inconclusive	◆ MRI Pelvis without and with contrast (CPT® 72197)

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ONC-16.4: Surveillance/Follow-Up

Indication	Imaging/Lab Study
Colon and rectal adenocarcinoma: ◆ **Stage I**	◆ No routine advanced imaging indicated
Colon and rectal adenocarcinoma: ◆ **Stage II-III**	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis (CPT® 74177) with contrast annually for 5 years
Colon and rectal adenocarcinoma: ◆ **Stage IV** - Metastatic disease (post definitive treatment of all measurable disease or being observed off therapy)	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis (CPT®74177) with contrast every 6 months for 2 years and then annually for 3 years
Pseudomyxoma peritonei	One of each of the following, every 3 months for first year, then every 6 months for 4 more years: ◆ CT Chest with (CPT® 71260) or without contrast(CPT® 71250) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) or MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast

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ONC-17: Renal Cell Cancer (RCC)

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General Considerations

- PET is not routinely indicated for initial diagnosis, staging or restaging of renal cell cancer.
- Data is lacking on improvements in outcomes of renal cell cancer survivors based upon surveillance imaging schedules.
- A minority of adult patients with renal cell cancer (RCC) will have translocations in TFE3 or TFEB, which have a different natural history than "adult type" RCC. Patients of any age with TFE3 or TFEB translocated RCC should be imaged according to guidelines in **PEDONC-7.4: Pediatric Renal Cell Carcinoma (RCC).**
- Patients of any age with Wilms tumor should be imaged according to guidelines in section **PEDONC-7.2: Unilateral Wilms Tumor (UWT)** or **PEDONC-7.3 Bilateral Wilms Tumor (BWT)**

ONC-17.1: Suspected/Diagnosis

- See **AB-35: Indeterminate Renal Lesion** for imaging guidelines for evaluation of suspected renal malignancies

ONC-17.2: Initial Workup/Staging

Indication	Imaging Study
All patients	If not done previously: ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) ◆ CT Abdomen/Pelvis, contrast as requested
Any of the following: ◆ Extension of tumor into the vena cava by other imaging ◆ Inconclusive findings on CT	◆ MRI Abdomen without and with contrast (CPT® 74183)
Bone pain	◆ Bone scan (See **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**)
Any of the following: ◆ Signs/symptoms of brain metastases ◆ IL-2 therapy being considered	◆ MRI Brain without and with contrast (CPT® 70553)

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ONC-17.3: Restaging/Recurrence

Indication	Imaging Study
Unresectable disease or metastatic disease on chemotherapy	Every 2 cycles of treatment (commonly every 6 to 8 weeks): ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of other involved or symptomatic areas
Recurrence suspected	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis with contrast (CPT® 74177)

ONC-17.4: Surveillance

Indication	Imaging Study
Stage I Disease, active surveillance	One of the following, once within 6 months of surveillance initiation: ◆ CT Abdomen with (CPT® 74160) or without and with contrast (CPT® 74170) ◆ MRI (CPT® 74183) Abdomen without and with contrast Annually for 5 years: ◆ Chest x-ray ◆ Abdominal ultrasound (CPT® 76770 or CPT® 76775) ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) is indicated for any of the following: ■ New or worsening thoracic symptoms ■ New or worsening CXR findings ■ Pulmonary nodule on prior CT Chest, see **ONC-31.1: Lung Metastases** for imaging guidelines ◆ CT (CPT® 74170) or MRI (CPT® 74183) Abdomen without and with contrast is indicated for any of the following: ■ New or worsening abdominal symptoms ■ New or worsening US findings
Stage I or II Disease, post-ablation therapy	One of each of the following, 3 to 6 months post-ablation: ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) ◆ CT (CPT® 74170) or MRI (CPT®74183) Abdomen without and with contrast Annually for 5 years: ◆ Chest x-ray ◆ Abdominal ultrasound (CPT® 76770 or CPT® 76775) ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) is indicated for any of the following: ■ New or worsening thoracic symptoms ■ New or worsening CXR findings ■ Pulmonary nodule on prior CT Chest, see **ONC-31.1: Lung Metastases** for imaging guidelines ◆ CT (CPT® 74170) or MRI (CPT® 74183) Abdomen without and with contrast is indicated for any of the following: ■ New or worsening abdominal symptoms ■ New or worsening US findings ■ Suspicious abnormality on post-ablative CT

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Indication	Imaging Study
Stage I Disease, after partial or complete nephrectomy	One of each of the following, 3 to 12 months post-resection: ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) ◆ CT Abdomen contrast as requested. Annually for 3 years: ◆ Chest x-ray ◆ Abdominal ultrasound (CPT® 76770 or CPT® 76775) ◆ CT Chest with (CPT®71260) or without contrast (CPT®71250) is indicated for any of the following: ■ New or worsening thoracic symptoms ■ New or worsening CXR findings ■ Pulmonary nodule on prior CT Chest, see **ONC-31.1: Lung Metastases** for imaging guidelines ◆ CT (CPT® 74170) or MRI (CPT® 74183) Abdomen without and with contrast is indicated for any of the following: ■ New or worsening abdominal symptoms ■ New or worsening US findings ■ Suspicious abnormality on post-operative CT
Stage II Disease, post-nephrectomy	One of each of the following, 3 to 6 months post-resection: ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) ◆ CT Abdomen with (CPT® 74160) or without contrast (CPT® 74150) One of each of the following, every 6 months for 3 years, then annually to year 5: ◆ Chest x-ray ◆ Abdominal ultrasound (CPT® 76770 or CPT® 76775) ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) is indicated for any of the following: ■ New or worsening thoracic symptoms ■ New or worsening CXR findings ■ Pulmonary nodule on prior CT Chest, see **ONC-31.1: Lung Metastases** for imaging guidelines ◆ CT (CPT® 74170) or MRI (CPT® 74183) Abdomen without and with contrast is indicated for any of the following: ■ New or worsening abdominal symptoms ■ New or worsening US findings ■ Suspicious abnormality on post-operative CT
Any of the following: ◆ Stage III Disease, post-nephrectomy ◆ Stage IV Disease, not receiving therapy, no measurable disease	One of each of the following, 3 to 6 months post-resection: ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) ◆ CT Abdomen with (CPT® 74160) or without contrast (CPT® 74150) One of each of the following, every 3 months for 3 years, then annually to year 5: ◆ CT Chest with (CPT® 71260) or without contrast (CPT® 71250) ◆ CT Abdomen with (CPT® 74160) or without contrast (CPT® 74150)

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Indication	Imaging Study
Metastatic disease on a break from therapy with persistent measurable disease	Any or all of the following, every 3 months: ◆ CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast ◆ CT with contrast of other involved or symptomatic areas

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ONC-18: Transitional Cell Cancer

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General Considerations

- Transitional cell cancers can include: tumors of the bladder, ureters, prostate, urethra, or renal pelvis. For primary cancer of the kidney, see **ONC-17: Renal Cell Cancer (RCC)**.
- Most common histology of bladder cancer is transitional cell (TCC) or urothelial carcinoma (UCC). Rare histologies include squamous cell (imaged according to **ONC-18: Transitional Cell Cancer**) or small cell (imaged according to **ONC-31.8: Extrathoracic Small Cell Carcinoma**)
- Urachal cancer is rare type of bladder cancer; the most common histology is adenocarcinoma. Rare histologies include transitional cell, sarcoma and small cell carcinoma. These are imaged according to muscle invasive bladder cancer.
- PET not routinely indicated in transitional cell cancer with exception noted below in **ONC-18.2: Initial Workup/Staging**

ONC-18.1: Suspected/Diagnosis

See **AB-39: Hematuria and Hydronephrosis** for imaging guidelines for evaluation of suspected transitional cell malignancies

ONC-18.2: Initial Workup/Staging

Indication	Imaging Study
All patients	One of the following: ◆ CT Abdomen/Pelvis without and with contrast (CPT® 74178) ◆ MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast if contraindication to CT contrast ◆ CT Abdomen/Pelvis without contrast (CPT® 74176) with retrograde pyelogram or renal ultrasound (CPT® 76770 or CPT® 76775) in patients who cannot receive either CT or MRI contrast
Any of the following: ◆ Muscle invasive bladder carcinoma ◆ Urethral carcinoma ◆ Urothelial carcinoma of the prostate	◆ CT Chest without (CPT® 71250) or with contrast (CPT® 71260)
Patients without metastatic disease, when requested by operating surgeon for operative planning	◆ CT with contrast or MRI without and with contrast of all operative sites
To determine neoadjuvant therapy versus surgery as initial treatment (if conventional imaging negative or inconclusive)	◆ PET/CT (CPT® 78815)

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ONC-18.3: Restaging/Recurrence

Indication	Imaging Study
Any stage > T1 or treated with definitive surgery	◆ "Baseline" CT Abdomen/Pelvis with contrast (CPT® 74177) after surgery if requested
Recurrence suspicion	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) or with and without contrast (CPT® 74178) ◆ CT Chest with contrast (CPT® 71260) if abnormal chest X-ray or lung nodules seen on other imaging
After neoadjuvant therapy and before resection	◆ CT Chest with contrast (CPT® 71260) and CT Urogram (CPT® 74178)
Monitoring therapy for metastatic disease	Every 2 cycles of therapy: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT Chest with contrast (CPT® 71260) if prior involvement or abnormal chest x-ray

ONC-18.4: Surveillance

Indication	Imaging Study
Superficial and minimally invasive (Tis and T1) transitional cell carcinoma of the bladder or upper tracts	◆ CT Urogram (CPT® 74178) every 2 years for high grade lesions for 10 years
Minimally invasive transitional carcinoma of the bladder treated with cystectomy	◆ CT urogram (CPT® 74178) at 3 months post-cystectomy, and then annually for 5 years
Any other muscle invasive lower and upper genitourinary tumors	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) or without and with contrast (CPT® 74178) every 3 months for 2 years, then annually for 3 more years ◆ Chest x-ray
Urethral cancers (high risk T1 or greater) and urothelial carcinoma of the prostate	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) or MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast every 3 months for 2 years and then annually ◆ Chest x-ray

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ONC-19: Prostate Cancer

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General Considerations

- The natural history of prostate cancer is highly variable. Therapeutic options may include surgery and radiation therapy along with Active Surveillance (also called observation, watchful waiting, expectant management, or deferred treatment).
- When working up patients with suspected new or recurrent prostate cancer, MRI should not be used to make a decision not to biopsy[5]. If the clinical suspicion is high enough, biopsy must be performed.
- PET imaging (with radiotracers ^{18}F-FDG and^{18}F-NaF) is considered investigational and experimental for all indications for prostate cancer at this time.
- PET/CT scan using newer radiotracers such as ^{11}C Choline have restricted use in prostate cancer, after conventional imaging are outlined below. Coverage may vary with individual health care plan.
- As laser prostate ablation is considered investigational and experimental at this time, advanced imaging for treatment planning and/or surveillance of laser prostate is not indicated.
- As high intensity focused ultrasound prostate ablation is considered investigational and experimental at this time, and advanced imaging for treatment planning and/or surveillance of high intensity focused ultrasound prostate ablation is not indicated.
- MR Spectroscopy (CPT® 76390) is considered investigational and experimental in the evaluation of prostate cancer at this time.
- Based on the local extent of tumor, PSA level and Gleason score, prostate cancer patients can be classified into risk groups as below:

Risk Category	T stage	Gleason score	PSA (ng/ml)
Very low	T1c	≤ 6	< 10
Low	T1-T2a	≤ 6	< 10
Intermediate	T2b-T2c	7	10-20
High	T3a	8 to 10	> 20

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Use of Imaging for Radiation Therapy Planning:

- The correct procedure codes for radiation therapy planning are CPT® 76497 for CT, CPT® 76498 for MRI, and CPT® 76873 for transrectal ultrasound.
- Post-implantation imaging following permanent transperineal brachytherapy implantation (also called “seed” therapy) should also be ordered with treatment planning codes rather than diagnostic CPT codes.

3D Rendering of MRI for MRI / Ultrasound Fusion Biopsy:

- When specific target lesion(s) is (are) detected on mpMRI prostate and classified as PIRADS 4 or 5, then 3D Rendering at independent workstation (CPT® 76377, 3D rendering requiring image post-processing on an independent workstation) for the radiologist to generate prostate segmentation data image set for target identification on MRI/TRUS fusion biopsy is approvable either as subsequent separate standalone request or as retrospective request for medical necessity.
- If there is no target lesion identified on MRI then 3D rendering and MRI/TRUS fusion biopsy is not generally indicated. The urologist may request MRI/TRUS fusion biopsy of a PIRADS 1-3 lesion. Then approval of 3D rendering at independent workstation (CPT® 76377) can be considered on a case-by-case basis. These cases should be referred for Medical Director review.
- The 3D rendering for the TRUS component of the fusion is a part of the UroNav Fusion Equipment Software and an additional 3D code CPT® 76376 or CPT® 76377 should not be approved.
- eviCore maintains that CPT® 76376 (3D rendering not requiring image post-processing on an independent workstation) should not be separately reimbursed, since this function is built into the imaging software

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ONC-19.1: Suspected/Diagnosis

Indication	Imaging Study
Elevated PSA, abnormal exam, or other clinical suspicion and no previous biopsy	◆ Transrectal ultrasound (TRUS, CPT® 76872) ◆ TRUS-guided biopsy (CPT® 76942) ◆ MRI is not appropriate as the initial imaging study ◆ MRI should not be used to make a decision not to biopsy[5]
At least one negative/non-diagnostic TRUS biopsy and one of the following: ◆ Continued increase in PSA ◆ Abnormal DRE	One of the following may be approved: ◆ MRI Pelvis without contrast (CPT® 72195) ◆ MRI Pelvis without and with contrast (CPT® 72197) ◆ MRI/US fusion biopsy (CPT® 77021 and CPT® 76942) ◆ MRI guided biopsy (CPT® 77021) ◆ Note: MRI should not be used to make a decision not to biopsy[5]
PIRADS 4 or 5 lesion identified on recent diagnostic MRI Pelvis (CPT® 72195 or CPT® 72197) and planning for biopsy to be done by MRI/TRUS fusion technique	◆ 3D Rendering (CPT® 76377) ◆ CPT® 76376 should not be separately reimbursed (See **Preface-4.1: 3D Rendering** for additional details)
Any of the following: ◆ Multifocal (3 or more lesions) high-grade prostatic intraepithelial neoplasia (PIN) ◆ Atypia on biopsy	◆ Extended pattern rebiopsy within 6 months by TRUS-guided biopsy (CPT® 76942)
Focal PIN (1-2 lesions)	One of the following may be approved: ◆ MRI Pelvis without contrast (CPT® 72195) ◆ MRI Pelvis without and with contrast (CPT® 72197) ◆ MRI/US fusion biopsy (CPT® 77021 and CPT® 76942) ◆ MRI guided biopsy (CPT® 77021)

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ONC-19.2: Initial Workup/Staging

Indication	Imaging Study
Pelvic imaging for patients with one or more of the following high risk criteria: ◆ Any Gleason score with palpable disease outside of the prostate capsule (T3 or T4 disease) ◆ PSA > 20 ◆ Gleason score ≥ 7 ◆ Gleason score of 6 with one of the following features: ■ Tumor involving > 50% of one lobe (T2b) ■ Tumor involving both lobes (T2c) ■ PSA > 10	Any one of the following can be approved: ◆ CT Pelvis with contrast (CPT® 72193) ◆ MRI Pelvis without and with contrast (CPT® 72197)
Abdominal imaging for patients with one or more of the following high risk criteria: ◆ Lymphadenopathy or extraprostatic disease on pelvic imaging ◆ Elevated creatinine for age ◆ Hematuria not related to prostate biopsy ◆ PSA > 20	One of the following can be approved: ◆ CT Abdomen with contrast (CPT® 74160) ◆ CT Abdomen without contrast (CPT® 74150) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) if being completed in the same imaging session as CT Pelvis
Bone pain and/or high risk patients	◆ Bone scan (See **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**) ◆ If neurological compromise, see: **ONC-31.5: Bone (Including Vertebral) Metastases**

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ONC-19.3: Restaging/Recurrence

Indication	Imaging Study
All patients with one or more of the following: ◆ New finding on most recent CT or MRI that was inconclusive ◆ PSA rising on 2 consecutive measurements while on endocrine/hormonal therapy ◆ Clinical suspicion of recurrence or progression	Any of the following can be approved: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ MRI Pelvis without contrast (CPT® 72195) or without and with contrast (CPT® 72197)
Patients with prior radical prostatectomy and any of the following: ◆ Palpable anastomotic recurrence ◆ PSA remains > 0.2 after at least 2 PSAs ◆ Initial undetectable PSA increasing on 2 consecutive PSAs	Any of the following can be approved: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ MRI Pelvis without contrast (CPT® 72195) or without and with contrast (CPT® 72197) if CT findings are inconclusive Continued rise in PSA **and** CT/MRI and bone scan negative for metastasis: ◆ ^{11}C Choline PET/CT scan (CPT® 78815 or CPT® 78816)
Patients with prior Radiation Therapy and any of the following: ◆ Clinical suspicion of relapsed disease ◆ PSA increasing on at least 2 consecutive values above post-XRT baseline	Any of the following can be approved: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ MRI Pelvis without contrast (CPT® 72195) or without and with contrast (CPT® 72197) if CT findings are inconclusive Continued rise in PSA **and** CT/MRI and bone scan negative for metastasis: ◆ ^{11}C Choline PET/CT scan (CPT® 78815 or CPT® 78816)
Hormone Refractory Prostate Cancer (HRPC): ◆ Receiving treatment with chemotherapy ◆ Receiving anti-androgen therapy	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) and CT scan of any involved body part every 2 cycles (6 to 8 weeks) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) and CT scan of any involved body part every 3 months
Prior to start of Xofigo (Radium-223) therapy	◆ One time CT Chest/Abdomen/Pelvis with contrast (CPT® 71260 and CPT® 74177).
All patients with one or more of the following: ◆ Obvious progression by DRE with plans for prostatectomy or radiation therapy ◆ Repeat TRUS biopsy for rising PSA shows progression to a higher Gleason's score with plans for prostatectomy or radiation therapy	◆ MRI Pelvis without contrast (CPT® 72195) or without and with contrast (CPT® 72197)

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ONC-19.4: Follow-Up on Active Surveillance

Active surveillance is being increasingly utilized in prostate cancer. This therapeutic option involves regimented monitoring of an individual with known diagnosis of low risk prostate cancer for disease progression, without specific anticancer treatment. While being treated with active surveillance, an individual is generally considered a potential candidate for curative intent treatment approaches in the event that disease progression occurs.

It is important to distinguish active surveillance from watchful waiting (or observation), which is generally employed in patients with limited life expectancy. Watchful waiting involves cessation of routine monitoring and treatment is initiated only if symptoms develop.

Current active surveillance guidelines suggest the following protocol:

- PSA every 6 months
- Digital Rectal Exam (DRE) every 12 months
- Repeat TRUS-guided prostate biopsy every 12 months

Routine use of multi-parametric prostate MRI or MR/US fusion biopsy in active surveillance patients is considered investigational/experimental at this time

MRI should not be used to make a decision not to biopsy[5]

Indication	Imaging/Lab Study
Patients on active surveillance	◆ Routine MRI or MR/US fusion biopsy for annual surveillance is considered investigational at this time ◆ MRI pelvis without (CPT® 72195) or without and with contrast (CPT® 72197) can be approved if one of the following apply: ■ Progression is suspected based on DRE changes or rising PSA and a recent TRUS biopsy was negative ■ Routine TRUS biopsy reveals progression of Gleason score

ONC-19.5: Surveillance/Follow Up For Treated Prostate Cancer

Indication	Imaging Study
All Stages	◆ PSA and DRE every 6 months, even in patients with metastatic disease. ◆ Routine imaging is not indicated for patients being monitored on or off therapy.

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ONC-20: Testicular, Ovarian and Extragonadal Germ Cell Tumors

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General Considerations

This section applies to primary germ cell tumors occurring outside the central nervous system in patients age > 15 years at the time of initial diagnosis. Patients age ≤ 15 years at diagnosis should be imaged according to pediatric guidelines in: **PEDONC-10: Pediatric Germ Cell Tumors**

- These guidelines are for germ cell tumors of the testicle, ovary and extragonadal sites as well as malignant sex cord stromal tumors (granulosa cell and Sertoli-Leydig cell tumors).
- Requests for imaging must state the histologic type of the cancer being evaluated.
- Classified as pure seminomas (dysgerminomas, 40%) or Non-seminomatous germ cell tumors (NSGCT, 60%).
  - Pure seminomas are defined as pure seminoma histology with a normal serum concentration of alpha fetoprotein (AFP). Seminomas with elevated AFP are by definition Mixed.
  - Required for TNM staging are the tumor marker levels indicated by "S" (TNMS)
  - Mixed tumors are treated as NSGCTs, as they tend to be more aggressive.
  - The NSGCT histologies include:
    - Yolk-Sac tumors
    - Immature (malignant) teratomas
    - Choriocarcinomas (< 1%)
    - Embryonal cell carcinomas (15% to 20%)
    - Endodermal Sinus Tumors (ovarian)
    - Combinations of all of the above (Mixed)
  - MRI in place of CT scans to reduce risk of secondary malignancy is not supported by the peer-reviewed literature. CT scans are indicated for surveillance and is the preferred modality of imaging to assess for recurrence.

ONC-20.1: Initial Workup/Staging

Indication	Imaging Study
Orchiectomy/oophorectomy is both diagnostic and therapeutic	All patients, following orchiectomy or oophorectomy: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177)
For any of the following: ◆ Non-seminoma histology ◆ Abdominal lymphadenopathy noted on CT scan ◆ Abnormal CXR or signs/symptoms suggestive of chest involvement	◆ CT Chest with contrast (CPT® 71260)

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Extragonadal Germ Cell Tumor	◆ CT Chest with contrast (CPT® 71260) and CT Abdomen/Pelvis with contrast (CPT® 74177)

ONC-20.2: Restaging/Recurrence

Indication	Imaging Study
Treatment response for stage II-IV patients with measurable disease on CT	◆ CT with contrast of previously involved body areas every 2 cycles
Seminoma with residual mass > 3 cm	◆ PET/CT (CPT® 78815) ■ PET imaging can be done as early as 6 weeks after completion of XRT if recent CT findings are inconclusive and PET findings will alter immediate care decision making
End of therapy evaluation for NSGCT post chemotherapy or post retroperitoneal lymph node dissection (RPLND)	◆ CT Abdomen/Pelvis with contrast (CPT® 74177)
Recurrence suspected, including increased tumor markers	◆ CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast ◆ Ultrasound (CPT® 76856 or CPT® 76857) of the remaining gonad if applicable
Unexplained pulmonary symptoms despite a negative CXR, or new findings on CXR	◆ CT Chest with contrast (CPT® 71260)
All others	◆ See Surveillance below

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ONC-20.3: Surveillance

Indication	Imaging Study
Stage I Ovarian Dysgerminomas or low grade immature Teratomas	◆ No routine advanced imaging needed
Stage I Seminoma treated with orchiectomy alone (no radiotherapy or chemotherapy, also called active surveillance)	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) at 3, 6 and 12 months post-orchiectomy, then annually until year 5
Stage I Seminoma treated with radiotherapy and/or chemotherapy	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) annually for 3 years
Stage IIA Seminomas treated with radiotherapy or chemotherapy	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) once at 3 months then once at 6 to 12 months after completion of therapy, then annually until year 3
Stage IIB, IIC, III, and IV Seminomas treated with chemotherapy	For patients with ≤ 3 cm residual mass: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) once at 3 to 6 months after completion of therapy, then no further routine advanced imaging For patients with > 3 cm residual mass and negative PET scan: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) at 6 and 12 months after completion of therapy, then annually until year 5 For patients with thoracic disease at diagnosis: ◆ CT Chest with contrast (CPT® 71260) every 2 months for 1 year, then every 3 months for 1 year, then annually until year 5
Stage IA Non-Seminomatous germ cell tumors treated with orchiectomy alone (no radiotherapy or chemotherapy, also called active surveillance)	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) at 6 and 12 months after orchiectomy, then annually until year 3
Stage IB Non-Seminomatous germ cell tumors treated with orchiectomy alone (no radiotherapy or chemotherapy, also called active surveillance)	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) every 4 months for 1 year, then every 6 months for 2 years, then annually until year 4
Stage IB Non-Seminomatous germ cell tumors treated with chemotherapy	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) annually for 2 years

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Indication	Imaging Study
Stage II-III Non-Seminomatous germ cell tumors with complete response to chemotherapy +/- post-chemotherapy RPLND	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) once at 6, 12, and 24 months after completion of therapy For patients with thoracic disease at diagnosis: ◆ CT Chest with contrast (CPT® 71260) every 6 months for 2 years, then annually until year 4
Stage IIA or IIB Non-Seminomatous germ cell tumors with post-primary RPLND complete resection +/- adjuvant chemotherapy	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) once at 3 to 4 months after completion of therapy
All female germ cell tumors	◆ No routine imaging unless elevated tumor markers or clinical signs/symptoms of recurrence
Sex cord stromal tumors (male and female)	◆ No routine advanced imaging indicated unless elevated tumor markers or clinical signs/symptoms of recurrence

MRI in place of CT scans to reduce risk of secondary malignancy is not supported by the peer-reviewed literature. CT scans are indicated for surveillance and is the preferred modality of imaging to assess for recurrence.

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ONC-21: Ovarian Cancer

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General Considerations

- Ovarian cancers include: epithelial ovarian cancers, ovarian cancers of low malignant potential and mixed Müllerian tumors, primary peritoneal and fallopian tube cancers.
- Germ cell tumors and sex cord stromal tumors (granulosa cell tumors), are imaged according to **ONC-20: Testicular and Non-epithelial Ovarian (Germ Cell) Cancer**.

ONC-21.1: Screening for Ovarian Cancer

Indication	Imaging/Lab Study
High Risk Factors: ◆ Family history of BRCA 1 or BRCA 2 mutations ◆ Family history of ovarian cancer ◆ Hereditary ovarian cancer syndrome that includes ovarian, breast, and/or endometrial and gastrointestinal cancers [Lynch II syndrome] in multiple members of two to four generations ◆ Low parity ◆ Decreased fertility ◆ Delayed childbearing	◆ Ovarian cancer screening is considered experimental & investigational and is not recommended. ◆ Genetic counseling is recommended for women with an increased-risk family history (USPSTF, 2015)
Known BRCA-1 or BRCA-2 mutation	◆ Transvaginal ultrasound (CPT® 76830), combined with CA-125 for ovarian cancer screening may be considered annually starting at age 30, until risk-reducing salpingo-oophorectomy is performed

ONC-21.2: Suspected/Diagnosis

- See **PV-5.2: Complex Adnexal Masses** – **Premenopausal** and **PV-5.3: Complex Adnexal Masses** – **Post Menopausal** for imaging guidelines for evaluation of suspected ovarian malignancies

Indication	Imaging/Lab Study
Elevated CA-125 and one of the following: ◆ Ultrasound is indeterminate or suspicious for ovarian malignancy ◆ Preoperatively prior to salpingo-oophorectomy ◆ Obstructive uropathy** ◆ Elevated LFTs	One of the following may be approved: ◆ MRI Pelvis with and without contrast (CPT® 72197) MRI is the test of choice for pre-operative evaluation of indeterminate ovarian lesions on ultrasound given its superior soft tissue contrast and ability to assess site of origin of pelvic masses ◆ CT Abdomen and Pelvis with contrast (CPT® 74177) **CT Abdomen/Pelvis without and with contrast (CPT® 74178) may be approved only for symptoms of obstructive uropathy

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ONC-21.3: Initial Workup/Staging

Indication	Imaging Study
Clinical stage II disease or higher	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT Chest with contrast (CPT® 71260) if abnormal signs/symptoms of pulmonary disease or abnormal chest x-ray
Any of the following: ◆ Primary peritoneal disease with biopsy-proven malignancy consistent with ovarian carcinoma ◆ Elevated tumor markers with negative or inconclusive CT imaging	◆ PET/CT (CPT® 78815)

ONC-21.4: Restaging/Recurrence

Indication	Imaging Study
Completely resected or definitively treated with chemotherapy and normal(ized) tumor markers	◆ No advanced imaging needed
Any of the following: ◆ Unresected disease ◆ Unknown preoperative markers ◆ Difficult or abnormal examination ◆ Elevated LFTs ◆ Rising tumor markers (CA-125, inhibin) ◆ Signs or symptoms of recurrence	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT Chest (CPT® 71260) for any of the following: ■ Prior known thoracic disease ■ New or worsening thoracic signs/symptoms or CXR findings ■ Rising CA-125/inhibin levels
◆ CT negative or inconclusive and CA-125 continues to rise or elevated LFTs ◆ Conventional imaging failed to demonstrate tumor or if persistent radiographic mass with rising tumor markers	◆ PET/CT (CPT® 78815)

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ONC-21.5: Surveillance

Indication	Imaging Study
Stages I-III	◆ No advanced imaging needed
Locally advanced/Metastatic with measurable disease	◆ See: **ONC-1.2: Phases of Oncology Imaging and General Phase-Related Considerations**

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ONC-22: Uterine Cancer

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General Considerations

- Gestational trophoblastic neoplasia (GTN) – see **PV-16: Molar Pregnancy and Gestational Trophoblastic Neoplasia (GTN)**
- PET is not routinely indicated for initial diagnosis; staging or restaging of uterine cancer.
- Most common cell type is adenocarcinoma
- Imaging not routinely indicated for laparoscopic/minimally invasive surgery unless initial staging criteria are met. Pelvic and para-aortic lymphadenectomy can still be performed.

ONC-22.1: Suspected/Diagnosis

- See **PV-14: Uterine Anomalies** for imaging guidelines for evaluation of suspected uterine malignancies

ONC-22.2: Initial Workup

Indication	Imaging Study
Extra-uterine disease suspected and/or Grade 3 tumor.	◆ MRI Pelvis without and with contrast (CPT® 72197) or CT Pelvis with contrast (CPT® 72193)
Any of the following: ◆ Abdominal symptoms or abnormal examination findings ◆ Elevated LFTS ◆ Other imaging studies suggest liver involvement	Any one of the following may be approved: ◆ CT Abdomen with contrast (CPT® 74160) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) if being completed in the same imaging session as CT Pelvis
Any of the following histologies: ◆ Papillary serous ◆ Clear cell ◆ Carcinosarcoma ◆ Soft tissue sarcoma of the uterus ◆ Leiomyosarcoma ◆ Undifferentiated sarcoma ◆ Endometrial stromal sarcoma	◆ CT Chest (CPT® 71260) and Abdomen/Pelvis with contrast (CPT® 74177)
Tumors detected incidentally or incompletely staged surgically AND any of the following high risk features: ◆ Myoinvasion > 50% ◆ Cervical stromal involvement ◆ Lymphovascular invasion ◆ Tumor > 2 cm	◆ CT Chest (CPT® 71260) and Abdomen/Pelvis with contrast (CPT® 74177)
Considering fertility sparing surgery for well-differentiated Stage IA (grade 1) uterine cancer	◆ Transvaginal ultrasound (CPT® 76830) and MRI pelvis without and with contrast (CPT® 72197)
All other patients	◆ Routine advanced imaging not needed

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ONC-22.3: Restaging/Recurrence

Indication	Imaging Study
Unresectable, medically inoperable, or incompletely surgically staged patients	One of the following: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) or ◆ MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast
◆ Unresected disease ◆ Difficult or abnormal examination ◆ Elevated LFTs or rising tumor markers ◆ Signs or symptoms of recurrence	◆ CT Chest (CPT® 71260) and Abdomen/Pelvis with contrast (CPT® 74177)
Papillary serous, clear cell and carcinosarcoma of the uterus	See: **Restaging/Recurrence** section in: **ONC-21.4: Ovarian Cancer**
Soft tissue sarcoma of the uterus, leiomyosarcoma, undifferentiated sarcoma, and endometrial stromal sarcoma	See: **Restaging/Recurrence** section in **ONC-12.3: Soft Tissue Sarcoma**

ONC-22.4 Surveillance

Indication	Imaging Study
Papillary serous, clear cell and carcinosarcoma of the uterus	See: **Surveillance** section in:**ONC-21.5: Ovarian Cancer**
Soft tissue sarcoma of the uterus, leiomyosarcoma, undifferentiated sarcoma, and endometrial stromal sarcoma	See: **ONC-12.4: Soft Tissue Sarcoma Surveillance/Follow-Up**
All others	No advanced imaging needed

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ONC-23: Cervical Cancer

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General Considerations

Primary histology for cervical cancer is squamous cell. Other, less common histologies are adenosquamous and adenocarcinoma. If biopsy is consistent with one of these less common histologies, it is necessary to clarify that tumor is not of primary uterine origin. If primary uterine in origin, follow imaging recommendations for uterine cancer.

(See: **ONC-22: Uterine Cancer**)

ONC-23.1: Suspected/Diagnosis

Indication	Imaging Study
All	Biopsy should be performed prior to imaging

ONC-23.2: Initial Workup/Staging

Indication	Imaging Study
Stage IB1 or less: < 4 cm confined to the cervix	◆ Chest x-ray ■ CT Chest with contrast (CPT® 71260) is indicated if abnormal CXR or new/worsening thoracic signs/symptoms ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ PET/CT (CPT® 78815) should be approved only to explain inconclusive findings on other advanced imaging studies. Requests will be forwarded to Medical Director.
Stage IB2 or higher stages	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) **or** PET/CT (CPT® 78815) ◆ CT Chest with contrast (CPT® 71260) if enlarged para-aortic nodes on CT Abdomen/Pelvis or positive paraaortic nodes found at surgery ◆ MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast if CT contrast allergy or inconclusive CT findings ◆ If radiation therapy is to be primary treatment modality, PET/CT (CPT® 78815) can be approved prior to start of XRT even if initial staging is done with CT scans ◆ If PET is done as initial staging CT scans not indicated prior to start of therapy
Any size cervical cancer incidentally found in a hysterectomy specimen	◆ Chest x-ray ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast if CT contrast allergy or inconclusive CT findings ◆ PET/CT (CPT® 78815) if inconclusive conventional imaging

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ONC-23.3: Restaging/Recurrence

Indication	Imaging Study
◆ Difficult or abnormal examination ◆ Elevated LFTs ◆ Signs or symptoms of recurrence	◆ CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast ◆ MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast if CT contrast allergy or inconclusive CT findings ◆ PET/CT (CPT® 78815) for inconclusive conventional imaging
If primary therapy was surgery	◆ See Surveillance guidelines **ONC-23.4: Surveillance**
If primary therapy radiation therapy ± chemotherapy (not adjuvant therapy)	◆ Chest x-ray ■ CT Chest (CPT® 71260) is indicated if abnormal CXR or new/worsening thoracic signs/symptoms ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ■ MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast if CT contrast allergy or inconclusive CT findings ◆ PET/CT (CPT® 78815) ■ If ordered for this restaging indication, only one PET/CT should be approved and only if surgical salvage is an option ■ After the one PET/CT, further follow-up imaging should be with CT or MRI

ONC-23.4: Surveillance

Indication	Imaging Study
All patients	◆ No routine advanced imaging needed.

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ONC-24: Anal & Vaginal Cancer, Cancers of the External Genitalia

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General Considerations

- Most are squamous cell carcinomas, although some transitional and cloacogenic carcinomas are seen.
- Tumors reported as adenocarcinomas of the anal canal are treated as rectal cancers
- Squamous cell carcinomas of the perianal and perigenital areas are skin cancers. See **ONC-5: Melanomas and Other Skin Cancers**.

ONC-24.1: Suspected/Diagnosis

Indication	Imaging Study
All	◆ Advanced imaging prior to biopsy is not needed

ONC-24.2: Initial Workup/Staging

Indication	Imaging Study
All patients	◆ CT Chest with contrast (CPT® 71260) One of the following: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT Abdomen with contrast (CPT® 74160) and MRI Pelvis without and with contrast (CPT® 72197)
Stage II-IV Squamous Cell Carcinoma of the Anal Canal (not Anal Margin such as Bowen's disease or Paget's disease)	◆ PET/CT (CPT® 78815)

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ONC-24.3: Restaging/Recurrence

Indication	Imaging Study
Stage I and II patients	◆ Routine advanced imaging not needed
Stage III and IV patients	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) every 2 cycles (generally 6 to 8 weeks) during treatment and at the end of planned chemotherapy treatment ◆ CT Chest (CPT® 71260) if chest x-ray is abnormal or if symptoms of chest involvement
◆ Difficult or abnormal examination ◆ Elevated LFTs ◆ Signs or symptoms of recurrence ◆ Biopsy proven recurrence	◆ CT Chest (CPT® 71260) with contrast One of the following: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast
Inconclusive findings on conventional imaging	◆ PET/CT (CPT® 78815)

ONC-24.4: Surveillance

Indication	Imaging Study
Anal canal cancer: Only for Stage 3 or greater	◆ CT Chest (CPT® 71260) with contrast annually for 3 years One of the following annually for 3 years: ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ MRI Abdomen (CPT® 74183) and Pelvis (CPT® 72197) without and with contrast
Penile cancer: Node positive disease only	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) every 3 months for year 1, and then every 6 months for year 2, then no further routine advanced imaging indicated
All other patients	◆ No routine advanced imaging needed

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ONC-25: Multiple Myeloma and Plasmacytomas

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General Considerations

- Multiple myeloma (MM) is a neoplastic disorder characterized by the proliferation of a single clone of plasma cells derived from B cells which grows in the bone marrow and adjacent bone, producing skeletal destruction.
- Multiple myeloma group of disorders can be classified as below, which influence imaging modality of choice.

Condition	Monoclonal protein	Bone marrow plasma cells	CRAB criteria**
Solitary Plasmacytoma (biopsy proven tumor containing plasma cells)	< 3 gm/dL	Absent	Absent
Monoclonal Gammopathy of Unknown Significance (MGUS)	< 3 gm/dL	< 10%	Absent
Smoldering Myeloma (SMM) (stage I MM or asymptomatic MM)	≥ 3 gm/dL	10% - 60%	Absent
Multiple Myeloma (MM)	≥ 3 gm/dL	≥ 10%	Present

**CRAB criteria = hypercalcemia, renal insufficiency, anemia, lytic bony lesions

- Diagnosis and monitoring of response to therapy is primarily with laboratory studies that include urine and serum monoclonal protein levels, serum light free chain levels, LDH and beta-2 microglobulin. Routine advanced imaging to monitor response to treatment is not indicated.
- PET scans have not been shown to significantly alter therapeutic decisions and may only provide prognostic information.
- Rarely, (< 5%), an individual may have Nonsecretory Myeloma, which does not produce measurable M-protein. These patients require imaging as primary method to monitor disease.
- For myeloma-like and lymphoma-like disease, see **ONC-27: Non-Hodgkin Lymphomas**.
- Other conditions that may present with Monoclonal Gammopathy include:
  - POEMS syndrome: Polyneuropathy, Organomegaly, Endocrinopathy, Monoclonal protein and Skin Changes – these patients may also have sclerotic bone lesions and Castleman's disease
  - Waldenstrom's Macroglobulinemia: IgM monoclonal protein along with bone marrow infiltration of small lymphocytes. See **ONC-27: Non-Hodgkin Lymphomas** for imaging recommendations.
  - Light chain Amyloidosis: light chain monoclonal protein in serum or urine with clonal plasma cells in bone marrow, systemic involvement of the kidneys, liver, heart, gastrointestinal tract or peripheral nerves due to amyloid deposition. See **ONC-25: Multiple Myeloma and Plasmacytomas** for imaging recommendations.

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ONC-25.1: Suspected/Diagnosis

Indication	Imaging Study
All	◆ X-ray skeletal series

ONC-25.2: Initial Workup/Staging

Indication	Imaging Study
Any of the following: ◆ Abnormal skeletal survey ◆ Negative/equivocal skeletal survey with abnormal myeloma labs and/or symptoms of multiple myeloma	One of the following: ◆ MRI Cervical (CPT® 72141), Thoracic (CPT® 72146), Lumbar spine (CPT® 72148), and Pelvis (CPT® 72195) without contrast ◆ MRI Cervical (CPT® 72156), Thoracic (CPT® 72157), Lumbar spine (CPT® 72158), and Pelvis (CPT® 72197) without and with contrast ◆ MRI Bone Marrow Blood Supply (CPT® 77084) ◆ CT contrast as requested of a specific area to determine radiotherapy or surgical candidacy, or for suspected extraosseous plasmacytoma
For any of the following (after the tests listed above are completed): ◆ Determining if a plasmacytoma is truly solitary ◆ Suspected extraosseous plasmacytomas ◆ Suspected progression of MGUS or SMM to a more malignant form and CT/MRI imaging are negative ◆ Inconclusive conventional imaging	◆ PET/CT (CPT® 78815 or CPT® 78816)

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ONC-25.3: Restaging/Recurrence

Indication	Imaging Study
Extra-osseous plasmacytoma response to initial therapy	◆ CT contrast as requested **or** MRI without contrast, **or** MRI without and with contrast of any previously involved area
Laboratory tests fail to normalize with treatment	◆ CT contrast as requested **or** MRI without contrast or MRI without and with contrast of symptomatic areas
Known spine involvement with new neurological signs/symptoms or worsening pain	◆ MRI Cervical (CPT® 72156), Thoracic (CPT® 72157), Lumbar spine (CPT® 72158) without and with contrast
Any of the following: ◆ Suspected relapse/recurrence ◆ Suspected progression of MGUS or SMM to a more malignant form ◆ To determine therapy response with inconclusive labs	Any one of the following: ◆ MRI without contrast, or MRI without and with contrast for any previously involved bony area or symptomatic area ◆ MRI Cervical (CPT® 72141), Thoracic (CPT® 72146), Lumbar spine (CPT®72148), and Pelvis (CPT® 72195) without contrast ◆ MRI Cervical (CPT® 72156), Thoracic (CPT® 72157), Lumbar spine (CPT® 72158), and Pelvis (CPT® 72197) without and with contrast ◆ MRI Bone Marrow Blood Supply (CPT® 77084)
Any of the following: ◆ Negative PET will allow change in management from active treatment to maintenance or surveillance. ◆ Determine additional therapies in refractory disease or non-secretory disease. These requests will be forwarded for Medical Director review.	◆ PET/CT (CPT® 78815 or CPT® 78816)
Bone marrow transplant consideration	One of the following, once before transplant and once after transplant: ◆ MRI Cervical (CPT® 72141), Thoracic (CPT® 72146), Lumbar spine (CPT® 72148), and Pelvis (CPT® 72195) without Contrast ◆ MRI Cervical (CPT® 72156), Thoracic (CPT® 72157), Lumbar spine (CPT® 72158), and Pelvis (CPT® 72197) without and with contrast

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ONC-25.4: Surveillance

Indication	Study
Plasmacytomas	◆ Skeletal survey annually
All others, including Bone Marrow Transplant	◆ No routine advanced imaging needed

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ONC-26: Leukemias, Myelodysplasia and Myeloproliferative Neoplasms

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ONC-26.1: General Considerations

- PET imaging is considered investigational and experimental for all indications in acute lymphoblastic leukemia, acute myeloid leukemia, and chronic myeloid leukemia.
- Routine advanced imaging is not indicated in the evaluation and management of Hairy cell leukemia in the absence of specific localizing clinical symptoms.

ONC-26.2: Acute Leukemias

- Imaging indications for acute lymphoblastic leukemia in adult patients are identical to those for pediatric patients. See **PEDONC-3.2: Acute Lymphoblastic Leukemia (ALL)** for imaging guidelines.
- Imaging indications for acute myeloid leukemia in adult patients are identical to those for pediatric patients. See **PEDONC-3.3: Acute Myeloid Leukemia (AML)** for imaging guidelines.

ONC-26.3: Chronic Myeloid Leukemias, Myelodysplastic Syndrome and Myeloproliferative Disorders

- Routine advanced imaging is not indicated in the evaluation and management of chronic myeloid leukemias, myelodysplastic syndromes or myeloproliferative disorders in the absence of specific localizing clinical symptoms or clearance for hematopoietic stem cell transplantation.
- See **ONC-29: Hematopoietic Stem Cell Transplantation** for imaging guidelines related to transplant.
- For work up of elevated blood counts, see **ONC-30.3: Paraneoplastic Syndromes-General Considerations**

ONC-26.4: Chronic Lymphocytic Leukemia (CLL)/Small Lymphocytic Lymphoma (SLL)

- PET imaging is not indicated in the evaluation of CLL/SLL with the exception of suspected Richter's transformation (see Suspected transformation, below)
- CLL/SLL is monitored with serial laboratory studies. Routine advanced imaging is not indicated for monitoring treatment response or surveillance, except when initial studies reveal bulky disease involvement.
- Bulky disease is defined as lymph node mass > 5 cm or spleen > 6 cm below costal margin

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Indication	Imaging Study
Initial Staging/Diagnosis	Any or all of the following may be approved: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177)
Treatment Response	◆ For patients with bulky nodal disease at diagnosis, CT with contrast of previously involved area(s) every 2 cycles of therapy ◆ Routine imaging is not indicated for patients without bulky nodal disease at diagnosis
End of Therapy Evaluation	◆ For patients with bulky nodal disease at diagnosis, CT with contrast of previously involved area(s)
Suspected progression	Any or all of the following may be approved: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of previously involved area(s)
Suspected transformation (Richter's) from a low grade lymphoma to a more aggressive type based on one or more of the following: ◆ New B symptoms ◆ Rapidly growing lymph nodes ◆ Extranodal disease develops ◆ Significant recent rise in LDH above normal range	◆ PET/CT (CPT® 78815)
Surveillance	◆ For patients with bulky nodal disease at diagnosis, every 6 months for two years, then annually: ▪ CT Chest with contrast (CPT® 71260) ▪ CT Abdomen/Pelvis with contrast (CPT® 74177) ▪ CT with contrast of previously involved area(s) ◆ Routine imaging is not indicated for patients without bulky nodal disease at diagnosis

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ONC-27: Non-Hodgkin Lymphomas

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ONC-27.1: General Considerations

- Lymphoma is often suspected when patients have any of the following:
  - Bulky lymphadenopathy (lymph node mass > 5 cm in size), hepatomegaly or splenomegaly
  - The presence of systemic symptoms (fever, drenching night sweats or unintended weight loss of > 10%, called “B symptoms”)
- CT Chest (CPT® 71260) and CT Abdomen/Pelvis (CPT® 74177) with contrast is indicated for evaluation of suspected or biopsy proven lymphoma. CT Neck with contrast (CPT® 70491) is indicated for patients with signs or symptoms of disease involving the neck. Routine advanced imaging of the neck in patients without clinical signs of neck involvement is not indicated
- All CT imaging recommended in this section refers to CT with contrast only.
  - Noncontrast CT imaging has not been shown to be adequate in the management of lymphomas
  - Given the limited utility of noncontrast CT imaging in lymphomas, MRI without OR without and with contrast is recommended in place of CT for patients who cannot tolerate CT contrast due to allergy or impaired renal function
- MRI Brain without and with contrast (CPT® 70553) is indicated for patients with signs or symptoms suggesting CNS involvement with lymphoma. See **ONC-1.1: Key Principles**. Routine advanced imaging of the brain in patients without clinical signs of CNS involvement is not indicated
- PET/CT scan is rarely indicated prior to histological confirmation of lymphoma, unless used to determine a more favorable site for biopsy when a relatively inaccessible site is contemplated
- Patients with AIDS-related lymphoma should be imaging according to the primary lymphoma histology
- Bone scan is inferior to MRI for evaluation of known or suspected bone involvement with lymphoma. MRI without and with contrast of symptomatic or previously involved bony areas can be approved in known lymphoma patients without prior plain x-ray or bone scan for diagnosis and monitoring treatment response
- See **ONC-31.11: for guidelines covering Castleman’s disease.**
- See **ONC-26.4: Chronic Lymphocytic Leukemia (CLL)/Small Lymphocytic Lymphoma (SLL)** for guidelines covering Chronic Lymphocytic Leukemia (CLL)/Small Lymphocytic Lymphoma (SLL).

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ONC-27.2: Diffuse Large B Cell Lymphoma (DLBCL)

- Grey zone lymphomas, primary mediastinal B cell lymphomas, and Grade 3 (high) follicular lymphoma should also be imaged according to these guidelines
- Post-transplant lymphoproliferative disorder (PTLD) or viral-associated lymphoproliferative disorder can rarely occur following solid organ or hematopoietic stem cell transplantation, or in primary immunodeficiency. These disorders may be treated similarly to high grade NHL when altering immunosuppressive regimens is unsuccessful, are highly FDG-avid, and should be imaged according to this section.

Phase of Therapy	Imaging Study
Initial Staging/Diagnosis	Any or all of the following may be approved: ◆ PET/CT (CPT® 78815 or CPT® 78816) ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177)
Treatment Response	Any or all of the following may be approved every 2 cycles of therapy: ◆ CT with contrast of previously involved area(s) ◆ Requests for PET/CT can be considered in rare circumstances. These cases should be forwarded for Medical Director review.
End of Chemotherapy and/or Radiation Therapy Evaluation	Any or all of the following may be approved: ◆ PET/CT (CPT® 78815 or CPT® 78816) may be approved at the end of chemo and again at the end of radiation ◆ CT with contrast of previously involved area(s)
Suspected or Biopsy-Confirmed Recurrence	Any or all of the following may be approved: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of previously involved area(s) ◆ Requests for PET/CT can be considered in rare circumstances. These cases should be forwarded for Medical Director review.
Surveillance	◆ Stage I and II: ■ No routine advanced imaging indicated ◆ Stage III and IV: ■ CT with contrast of previously involved area(s) every 6 months for two years, then no further routine advanced imaging

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ONC-27.3: Follicular Lymphoma

This section applies to follicular lymphomas with WHO grade of 1(low) or 2 (intermediate). Grade 3 (high) follicular lymphomas should be imaged according to **ONC-27.2: Diffuse Large B Cell Lymphoma (DLBCL)**

Phase of Therapy	Imaging Study
Initial Staging/Diagnosis	Any or all of the following may be approved: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ PET/CT (CPT® 78815 or CPT® 78816) can be approved if XRT is being considered for stage I or II disease
Treatment Response	◆ CT with contrast of previously involved area(s) every 2 cycles of therapy
End of Therapy Evaluation	One of the following may be approved: ◆ CT with contrast of previously involved area(s) ◆ PET/CT (CPT® 78815 or CPT® 78816)
Suspected Recurrence	Any or all of the following may be approved: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of previously involved area(s) ◆ Requests for PET/CT can be considered in rare circumstances. These cases should be forwarded for Medical Director review.
Suspected transformation (Richter's) from a low grade lymphoma to a more aggressive type based on one or more of the following: ◆ New B symptoms ◆ Rapidly growing lymph nodes ◆ Extranodal disease develops ◆ Significant recent rise in LDH above normal range	◆ PET/CT (CPT® 78815)
Surveillance	For all stages, every 6 months for two years, then annually: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of previously involved area(s)

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ONC-27.4: Marginal Zone Lymphoma

- MALT lymphomas in any location should also be imaged according to these guidelines
- Splenic Marginal Zone Lymphoma is diagnosed with splenomegaly, peripheral blood flow cytometry and bone marrow biopsy. Splenectomy is diagnostic and therapeutic. PET scan is not routinely indicated prior to splenectomy.

Phase of Therapy	Imaging Study
Initial Staging/Diagnosis	Any or all of the following may be approved: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ PET/CT (CPT® 78815 or CPT® 78816) can be approved if XRT is being considered for stage I or II disease
Treatment Response	◆ CT with contrast of previously involved area(s) every 2 cycles of therapy
End of Therapy Evaluation	One of the following may be approved: ◆ CT with contrast of previously involved area(s) ◆ PET/CT (CPT® 78815 or CPT® 78816)
Suspected Recurrence	Any or all of the following may be approved: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of previously involved area(s) ◆ Requests for PET/CT can be considered in rare circumstances. These cases should be forwarded for Medical Director review.
Surveillance	Only for Stage III or IV nodal marginal zone lymphoma, the following is indicated every 6 months for two years, then annually: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of previously involved area(s) All other stages/sites: ◆ No routine advanced imaging indicated

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ONC-27.5: Mantle Cell Lymphoma

Phase of Therapy	Imaging Study
Initial Staging/Diagnosis	Any or all of the following may be approved: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ PET/CT (CPT® 78815 or CPT® 78816) can be approved if XRT is being considered for stage I or II disease
Treatment Response	◆ CT with contrast of previously involved area(s) every 2 cycles of therapy ◆ Requests for PET/CT can be considered in rare circumstances; these cases should be forwarded for Medical Director review
End of Therapy Evaluation	One of the following may be approved: ◆ CT with contrast of previously involved area(s) ◆ PET/CT (CPT® 78815 or CPT® 78816)
Suspected Recurrence	Any or all of the following may be approved: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of previously involved area(s) ◆ Requests for PET/CT can be considered in rare circumstances. These cases should be forwarded for Medical Director review.
Surveillance	All Stages of Disease: ◆ No routine advanced imaging indicated

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ONC-27.6: Burkitt's Lymphoma

Phase of Therapy	Imaging Study
Initial Staging/Diagnosis	Any or all of the following may be approved: ◆ PET/CT (CPT® 78815 or CPT® 78816) ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177)
Treatment Response	◆ CT with contrast of previously involved area(s) every 2 cycles of therapy ◆ Requests for PET/CT can be considered in rare circumstances. These cases should be forwarded for Medical Director review.
End of Therapy Evaluation	Any or all of the following may be approved: ◆ PET/CT (CPT® 78815 or CPT® 78816) may be approved at the end of chemo and again at the end of radiation ◆ CT with contrast of previously involved area(s)
Suspected Recurrence	Any or all of the following may be approved: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of previously involved area(s) ◆ Requests for PET/CT can be considered in rare circumstances. These cases should be forwarded for Medical Director review.
Surveillance	All Stages of Disease: ◆ No routine advanced imaging indicated

ONC-27.7: Lymphoblastic Lymphoma

➤ Patients with lymphoblastic lymphoma (even those with bulky nodal disease) are treated using the leukemia treatment plan appropriate to the cell type (B or T cell). Imaging indications in adult patients are identical to those for pediatric patients. See **PEDONC-3.2: Acute Lymphoblastic Leukemia (ALL)** for imaging guidelines.

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ONC-27.8: Cutaneous Lymphoma and T Cell Lymphoma

- Includes Primary Cutaneous B Cell Lymphomas, Peripheral T-Cell Lymphomas, Mycosis Fungoides/Sézary Syndrome, Primary Cutaneous CD30+T Cell Lymphoproliferative Disorders

Phase of Therapy	Imaging Study
Initial Staging/Diagnosis	Any or all of the following may be approved: ◆ PET/CT (CPT® 78815 or CPT® 78816) ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177)
Treatment Response	◆ CT with contrast of previously involved area(s) every 2 cycles of therapy ◆ Requests for PET/CT can be considered in rare circumstances; these cases should be forwarded for Medical Director review
End of Therapy Evaluation	Any or all of the following may be approved: ◆ PET/CT (CPT® 78815 or CPT® 78816) may be approved at the end of chemo and again at the end of radiation ◆ CT with contrast of previously involved area(s)
Suspected Recurrence	Any or all of the following may be approved: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of previously involved area(s) ◆ Requests for PET/CT can be considered in rare circumstances. These cases should be forwarded for Medical Director review.
Surveillance	◆ Stage I and II: ■ No routine advanced imaging indicated ◆ Stage III and IV: ■ CT with contrast of previously involved area(s) every 6 months for two years, then no further routine advanced imaging

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ONC-28: Hodgkin Lymphoma

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ONC-28.1: General Considerations

- Lymphoma is often suspected when patients have any of the following:
  - Bulky lymphadenopathy (lymph node mass > 5 cm in size), hepatomegaly or splenomegaly
  - The presence of systemic symptoms (fever, drenching night sweats or unintended weight loss of > 10%, called “B symptoms”)
- CT Chest (CPT® 71260) and CT Abdomen/Pelvis (CPT® 74177) with contrast is indicated for evaluation of suspected or biopsy proven lymphoma.
- CT Neck with contrast (CPT® 70491) is indicated for patients with signs or symptoms of disease involving the neck. Routine advanced imaging of the neck in patients without clinical signs of neck involvement is not indicated
- All CT imaging recommended in this section refers to CT with contrast only.
  - Noncontrast CT imaging has not been shown to be adequate in the management of lymphomas
- Given the limited utility of noncontrast CT imaging in lymphomas, MRI without OR without and with contrast is recommended in place of CT for patients who cannot tolerate CT contrast due to allergy or impaired renal function
- MRI Brain without and with contrast (CPT® 70553) is indicated for patients with signs or symptoms suggesting CNS involvement with lymphoma. See **ONC-1.1: Key Principles**. Routine advanced imaging of the brain in patients without clinical signs of CNS involvement is not indicated
- PET/CT scan is rarely indicated prior to histological confirmation of lymphoma, unless it is being used to determine a more favorable site for biopsy when a relatively inaccessible site is contemplated
- Patients with AIDS-related lymphoma should be imaged according to the primary lymphoma histology
- Bone scan is inferior to MRI for evaluation of known or suspected bone involvement with lymphoma. MRI without and with contrast of symptomatic or previously involved bony areas can be approved in known lymphoma patients without prior plain x-ray or bone scan for diagnosis and monitoring treatment response
- The **Deauville Criteria is a 5-point scoring system,** which is internationally accepted and utilized five-point scoring system for the FDG avidity of a Hodgkin's lymphoma or Non-Hodgkin's lymphoma tumor mass as seen on FDG PET.
  - Score 1: No uptake above the background
  - Score 2: Uptake ≤ mediastinum
  - Score 3: Uptake > mediastinum but ≤ liver
  - Score 4: Uptake moderately increased compared to the liver at any site
  - Score 5: Uptake markedly increased compared to the liver at any site
  - Score X: New areas of uptake unlikely to be related to lymphoma

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ONC-28.2: Classical Hodgkin Lymphoma

Stage	Imaging Study
Initial Staging/Diagnosis	Any or all of the following may be approved: ◆ PET/CT (CPT® 78815 or CPT® 78816) ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177)
Treatment Response	◆ PET/CT (CPT® 78815 or CPT® 78816) as frequently as every 2 cycles ◆ CT with contrast of previously involved areas can be approved as a substitute for PET/CT for Stage IA or IIA
End of Chemotherapy and/or Radiation Therapy Evaluation	Any or all of the following may be approved: ◆ PET/CT (CPT® 78815 or CPT® 78816) may be approved at the end of chemo and again at the end of radiation (after 12 weeks of completion of radiation therapy) ◆ CT with contrast of previously involved area(s)
Suspected Recurrence	Any or all of the following may be approved: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of previously involved area(s) ◆ Requests for PET/CT can be considered in rare circumstances. These cases should be forwarded for Medical Director review.
Surveillance	Any or all of the following may be approved at 6, 12, and 24 months after completion of therapy: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of previously involved area(s) In addition to the above studies: ◆ A single follow-up PET/CT may be approved > 12 weeks after the end of radiation therapy if end of therapy PET/CT report documents Deauville 4 or 5 FDG avidity

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ONC-28.3: Nodular Lymphocyte-Predominant Hodgkin Lymphoma

Stage	Imaging Study
Initial Staging/Diagnosis	Any or all of the following may be approved: ◆ PET/CT (CPT® 78815 or CPT® 78816) ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177)
Treatment Response	◆ Patients treated with surgery alone go directly to Surveillance for additional imaging guidelines ◆ Patients treated with radiotherapy alone go directly to End of Therapy Evaluation for additional imaging guidelines ◆ PET/CT (CPT® 78815 or CPT® 78816) as frequently as every 2 cycles ◆ CT with contrast of previously involved areas can be approved as a substitute for PET/CT for Stage IA or IIA
End of Chemotherapy and/or Radiation Therapy Evaluation	Any or all of the following may be approved: ◆ PET/CT (CPT® 78815 or CPT® 78816) may be approved at the end of chemo and again at the end of radiation (after 12 weeks of completion of radiation therapy) ◆ CT with contrast of previously involved area(s)
Suspected Recurrence	Any or all of the following may be approved: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of previously involved area(s) ◆ Requests for PET/CT can be considered in rare circumstances. These cases should be forwarded for Medical Director review.
Suspected transformation (Richter's) from a low grade lymphoma to a more aggressive type based on one or more of the following: ◆ New B symptoms ◆ Rapidly growing lymph nodes ◆ Extranodal disease develops ◆ Significant recent rise in LDH above normal range	◆ PET/CT (CPT® 78815)
Surveillance	Any or all of the following may be approved at 6, 12, and 24 months after completion of therapy: ◆ CT Chest with contrast (CPT® 71260) ◆ CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT with contrast of previously involved area(s) In addition to the above studies: ◆ A single follow-up PET/CT may be approved > 12 weeks after the end of radiation therapy if end of therapy PET/CT report documents Deauville 4 or 5 FDG avidity

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ONC-29: Hematopoietic Stem Cell Transplantation

ONC-29.1: General Considerations for Stem Cell Transplant 169

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ONC-29.1: General Considerations for Stem Cell Transplant

Terminology:

A number of terms will be used to describe the transplant process of using chemotherapy ± radiation to ablate the recipient's bone marrow stores, depending on the source of the hematopoietic stem cells and the indication, including bone marrow transplant (BMT), stem cell transplant (SCT), and hematopoietic stem cell transplant (HSCT).

Transplant types:

Allogeneic ("allo"): The donor and recipient are different people, and there are multiple types depending on the source of the stem cells and degree of match between donor and recipient. This is most commonly used in diseases originating in the hematopoietic system, such as leukemias and lymphomas, and bone marrow failure syndromes or metabolic disorders. Common types are:

- Matched sibling donor (MSD or MRD): Donor and recipient are full siblings and HLA-matched
- Matched unrelated donor (MUD): Donor and recipient are HLA matched but not related to each other
- Cord blood: Donor stem cells come from frozen umbilical cord blood not related to the recipient, sometimes from multiple different donors at once
- Haploidentical transplant (haplo): Donor is a half-HLA match to the recipient, usually a parent

Autologous ("auto"): The donor and recipient are the same person, as with allogeneic there are multiple types of this transplant. Transplant is really a misnomer since the process involves delivery of high dose chemotherapy that is ablative to the bone marrow, requiring an infusion of stem cells to allow marrow recovery. As such, is more correctly called a rescue. Rescue is most commonly used for metastatic disease involving the hematopoietic system.

Allo HSCT results in a much greater degree of immunosuppression than auto because of the need to allow the new immune system to chimerize with the recipient's body. Immune reconstitution commonly takes more than a year for patients who receive allo HSCT, and patients remain at high risk for invasive infections until that has occurred.

Pre-Transplant Imaging in HSCT:

This imaging generally takes place within 30 days of transplant, and involves a reassessment of the patient's disease status as well as infectious disease clearance.

- For oncology indications, imaging listed in eviCore Guidelines under restaging, end of therapy, or treatment response can be approved as pre-transplant imaging, including PET imaging.
- PET should not be approved for transplant in diseases in which eviCore Guidelines do not support the use of PET imaging during initial workup and treatment (such as myeloma**)

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- Myeloma PET requests should be forwarded for Medical Director Review

- CT of the sinuses, neck, chest, and/or abdomen/pelvis (contrast as requested) is commonly requested in the immediate pre-transplant period and should be approved as requested. These studies are necessary within 30 days of transplant, and frequently have to be repeated if the transplant is delayed for any reason.
- Nuclear renal function study (CPT® 78708 or CPT® 78709) to ensure adequate renal function
- Echocardiogram (CPT® 93306, CPT® 93307 or CPT® 93308) is routinely indicated to ensure adequate cardiac function to proceed with transplant. MUGA scan (CPT® 78472) may be indicated in specific circumstances. See: **PEDONC-1.2** and **CD-3.5: MUGA Study – Oncologic Indications** for more details.

Post-Transplant Imaging in HSCT:

There are many common complications from HSCT, including infection, graft versus host disease, hepatic sinusoidal obstruction syndrome, restrictive lung disease, among others. Site-specific imaging requests to evaluate known or suspected HSCT complications should generally be approved.

Disease response generally takes place at ~Day +30 (autos and some allos) or ~Day +100 (allos) post-transplant.

- For oncology indications, imaging listed in disease-specific guidelines under restaging, end of therapy, or treatment response can be approved as post-transplant imaging, including PET imaging.
  - PET should not be approved in diseases where eviCore Guidelines do not support the use of PET imaging during initial workup and treatment (such as myeloma**)
  - If PET is negative at Day +30, repeat PET at Day +100 is not indicated unless conventional imaging is inconclusive.
- Patients receiving tandem auto transplants (2 to 4 autos back-to-back, spaced 6-8 weeks apart) can have this imaging completed following each separate transplant
- Myeloma PET requests should be forwarded for Medical Director Review
- Imaging after disease response has been completed (~Day +100 for allos and ~Day +30 for autos) should follow eviCore surveillance guidelines for the specific disease unless the patient is receiving ongoing anticancer therapy.

**PET can be considered in myeloma patients who are non-secretors of immunoglobulin proteins (non-secretory disease is rare and accounts for less than 5% of myeloma cases)

- CT Chest without contrast (CPT® 71250) is indicated for patients with bronchiolitis obliterans with organizing pneumonia (BOOP) for surveillance and evaluation of acute changes

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ONC-30: Medical Conditions with Cancer in the Differential Diagnosis

ONC-30.1: Fever of Unknown Origin (FUO)	**172**
ONC-30.2: Unexplained Weight Loss	**173**
ONC-30.3: Paraneoplastic Syndromes	**174**

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ONC-30.1: Fever of Unknown Origin (FUO)

Indication	Imaging Study
In addition to physical examination, based on suspicion location, one can consider:	◆ Chest x-ray, Echocardiogram (CPT® 93306), Abdominal ultrasound (CPT® 76700) and /or MRI Brain without and with contrast (CPT® 70553)
Above studies (including PE/ENT exam, pelvic exam, and DRE with laboratory studies) have failed to demonstrate site of infection	◆ CT Chest (CPT® 71260) and Abdomen/Pelvis (CPT® 74177) with contrast ◆ Radiopharmaceutical Nuclear Imaging scan (CPT® 78805, CPT® 78806, or CPT® 78807)
"B" symptoms	◆ See **ONC-27: Non Hodgkin Lymphomas**
Any CNS sign/symptom accompanied by fever	◆ MRI Brain without and with contrast (CPT® 70553)
All patients	◆ PET is not indicated in the work-up of patients with FUO

NOTE: FUO is defined as a persistent fever ≥ 101ºF and ≥ 3 weeks with unidentified cause.

While fever is a classic "B" symptom of advanced lymphoma, a cancer- related fever presenting in isolation without any other signs or symptoms of neoplastic disease is rare.

Careful head and neck and pelvic examination, to include digital rectal exam, must be performed. These areas can harbor occult sources of fever and are frequently overlooked when multiple specialists become involved in a patient's care.

Chest X-ray and repeated battery of laboratory tests listed in most medical textbooks are the initial diagnostic procedures of choice. Any abnormalities found on these studies may focus appropriate imaging decisions, such as:

- Echocardiogram may reveal cardiac valve vegetations;
- Abdominal ultrasound (CPT® 76700) should be performed to evaluate pancreas, liver, spleen, and gallbladder;
- If all tests listed above remain non-contributory, then CT scans outlined above may be considered.

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ONC-30.2: Unexplained Weight Loss

Indeterminate Findings	Imaging Study
Evaluations listed below do not identify cause of weight loss (for smokers, see below)	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis (CPT® 74177) with contrast

Potential causes of weight loss to consider
Unexplained weight loss from neoplastic disease is very common in end-stage cancer; however, cancer-related weight loss presenting as the sole symptom without any other signs or symptoms related to the cancer is exceedingly rare.
Careful attention to symptoms related to dysphagia, early satiety, and food intake may indicate a problem with the upper GI system. Endoscopy and/or barium swallow, and a detailed examination of the oral cavity, pharynx, and upper esophagus should be performed.
Panhypopituitarism or hyperthyroidism may give rise to weight loss. A thorough endocrine evaluation, including tests for TSH and ACTH, is indicated.
Any abnormality of pituitary hormones may indicate a need for MRI of the sella turcica without and with contrast (CPT® 70553).
Elevated thyroglobulin level may indicate a need for nuclear thyroid scan or thyroid ultrasound (CPT® 76536).
Renal, hepatic, and cardiac pathologies must be carefully ruled out using lab tests and imaging studies such as echocardiogram (CPT® 93306) and abdominal ultrasound (CPT® 76700).
Weight loss associated with anemia may suggest occult GI bleeding and/or hypogonadism. Serial tests for heme in stools and endocrine evaluations for gonadal function may be helpful.
Depression and early dementia may be causes of weight loss. Detailed neurological examination should be performed. When considering such etiologies, care must be taken to consider that the weight loss may be intentional but not disclosed for reasons of secondary gain.
Unintentional weight loss may be an infrequent side effect of commonly prescribed medications and over-the-counter medications. Careful history taking is recommended.
For non-smokers, chest X-ray should be performed. For smokers, CT Chest with contrast (CPT® 71260) can be approved.
PET is not appropriate in the work-up of patients with unexplained weight loss.

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ONC-30.3: Paraneoplastic Syndromes

General Considerations

Paraneoplastic syndromes are metabolic and neuromuscular disturbances. These syndromes are not directly related to a tumor or to metastatic disease. Patients with a paraneoplastic syndrome should be evaluated initially with chest X-ray and complete metabolic panel.

There may be a lead time between initial finding of a possible paraneoplastic syndrome and appearance of the cancer with imaging. Limited studies suggest annual imaging for 2 years after diagnosis of possible paraneoplastic syndrome may detect cancer, however benefit after 2 years is not well documented.

Almost any tumor can give rise to these syndromes, but they are most commonly associated with lung cancer (especially small cell lung cancer). The following are the most common symptoms of paraneoplastic syndromes known to arise from various malignancies, but especially found in patients with lung cancer:

- Hypertrophic Pulmonary Osteoarthropathy: Often presents as a constellation of rheumatoid-like polyarthritis, periostitis of long bones, and clubbing of fingers and toes
- Amyloidosis
- Hypercalcemia
- Hypophosphatemia
- Cushing's Syndrome
- Somatostatinoma syndrome (vomiting, abdominal pain, diarrhea, cholelithiasis)
- Syndrome of inappropriate antidiuretic hormone secretion (SIADH)
- Polymyositis/dermatomyositis
- Opsoclonus
- Paraneoplastic sensory neuropathy
- Subacute cerebellar degeneration
- Eaton-Lambert syndrome (a myasthenia-like syndrome)
- Second event of unprovoked thrombosis
- Disseminated Intravascular Coagulation
- Migratory thrombophlebitis
- Polycythemia
- Chronic leukocytosis and/or thrombocytosis

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Imaging for malignancy is not indicated for first episode of unprovoked DVT/VTE but may be considered after a second unprovoked DVT/PE in the setting of a negative workup for inherited thrombophilia and antiphospholipid syndrome.

For elevated tumor markers noted on laboratory testing in a patient with no history of cancer, follow the guidelines for paraneoplastic syndrome.

See also: **PN-6: Muscle Disorders** in the Peripheral Nerve Disorders Guidelines

See also: **ONC-25: Multiple Myeloma and Plasmacytomas** for evaluation of possible multiple myeloma.

Indication	Imaging Study
Smoker, past or present	◆ CT Chest with contrast (CPT® 71260) ◆ Abdominal (CPT® 76700) and pelvic (CPT® 76856) ultrasound ◆ Mammogram and pelvic exam with transvaginal US (CPT® 76830) in women
Non-smokers	◆ Chest X-ray ◆ Abdominal (CPT® 76700) and pelvic (CPT® 76536) ultrasound ◆ Mammogram and pelvic exam with transvaginal US (CPT® 76830) in women
If above evaluations are negative	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis (CPT® 74177) with contrast ◆ CT may be repeated annually for 2 years post initial imaging for diagnosis of paraneoplastic syndrome
Any of the following: ◆ Abnormality on conventional imaging difficult to biopsy ◆ Inconclusive conventional imaging	◆ PET/CT (CPT® 78815 or CPT® 78816)
In addition thyroid US is recommended for elevated CEA, and upper/lower endoscopy is recommended for elevated CEA or CA 19-9.	

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ONC-31: Metastatic Cancer, Carcinoma of Unknown Primary Site, and Other Types of Cancer

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- Guideline sections **ONC-31.1: Lung Metastases -ONC-31.5: Bone (including Vertebral) Metastatses** should only be used for patients with metastatic cancer in the following circumstances:
  - The primary diagnosis section does not address a particular metastatic site that is addressed in these sections
  - The cancer type is rare and does not have its own diagnosis-specific imaging guidelines

ONC-31.1: Lung Metastases

Site of Metastases	Imaging Study
New or worsening signs or symptoms suggestive of metastatic lung involvement or new or worsening chest X-ray abnormality	◆ CT Chest with contrast (CPT® 71260) ◆ CT Chest without contrast (CPT® 71250) can be approved if there is a contraindication to CT contrast or only parenchymal lesions are being evaluated
Chest wall or brachial plexus involvement	◆ MRI Chest without and with contrast (CPT® 71552)
One of the following and **no diagnosis-specific guideline regarding PET imaging**: ◆ Lung nodule(s) ≥ 8 mm ◆ Confirm solitary metastasis amenable to resection on conventional imaging	◆ PET/CT (CPT® 78815) ◆ When primary cancer known, PET request should be reviewed by primary cancer guideline
Previous or current malignancy and pulmonary nodule(s) that would reasonably metastasize to the lungs	◆ CT Chest with contrast (CPT® 71260) at 3, 6, 12 and 24 months from the first study

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ONC-31.2: Liver Metastases

Ablation of liver metastases or primary HCC may be performed utilizing chemical, chemotherapeutic, radiofrequency, or radioactive isotope methods. **Regardless of the modality of ablation, PET is not indicated for assessing response to this mode of therapy.**

Site of Metastases	Imaging Study
New or worsening signs or symptoms suggestive of metastatic liver involvement or new elevation in LFTs.	◆ CT Abdomen with (CPT® 74160) or without and with contrast (CPT® 74170)
Any of the following: ◆ Considering limited resection ◆ Confirm first site of metastatic failure ◆ Inconclusive CT findings	◆ MRI Abdomen without and with contrast (CPT® 74183)
One of the following and **no diagnosis-specific guideline regarding PET imaging:** ◆ Confirm solitary metastasis amenable to resection on conventional imaging ◆ LFT's and/or tumor markers continue to rise and CT and MRI are negative	◆ PET/CT (CPT® 78815) ■ When primary cancer known, PET request should be reviewed by primary cancer guideline
Monitoring of liver metastases that have been surgically resected	◆ Review according to primary cancer guideline
Monitoring of ablated liver metastases or primary tumors	One of the following, immediately prior to ablation, 1 month post-ablation, then every 3 months for 2 years, and then annually ◆ CT Abdomen without and with contrast (CPT® 74170). ◆ MRI Abdomen without and with contrast (CPT® 74183). ◆ CTA Abdomen (CPT® 74175) can be approved immediately prior to embolization Evaluation of hepatic artery catheters for chemotherapy infusion or Chemoembolization with radioactive spheres (TheraSphere or SIR Spheres): ◆ Nuclear medicine liver imaging (one of CPT® 78201, CPT® 78202, CPT® 78205, CPT® 78206, CPT® 78215, or CPT® 78216) ◆ PET is not indicated for evaluation of ablated liver lesions

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ONC-31.3: Brain Metastases

Site of Metastases	Imaging Study
Individual with cancer and signs or symptoms of CNS disease or known brain metastasis with new signs or symptoms.	◆ MRI Brain without and with contrast (CPT® 70553)
Assess candidacy for stereotactic radiosurgical approach for brain metastases	◆ MRI Brain without and with contrast (CPT® 70553) using thin slice cuts if not already done within 30 days ◆ If thin slice MRI done within 30 days and MRI needed for SRS treatment planning, planning code CPT® 76498 can be approved.
Monitoring of brain metastases treated with surgery or radiation therapy	Post-treatment, then every 3 months for 1 year and every 6 months thereafter: ◆ MRI Brain without and with contrast (CPT® 70553) PET Metabolic Brain (CPT® 78608) and MR Spectroscopy (CPT® 76390) are considered investigational and experimental for evaluation of metastatic brain cancer
Any of the following: ◆ Solitary brain metastasis suspected in patient with prior diagnosis of cancer and **no diagnosis-specific guideline regarding PET imaging** ◆ Brain metastases and no known primary tumor	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis (CPT® 74177) with contrast ◆ Mammography for female patients ◆ PET/CT (CPT® 78815 or CPT® 78816) is indicated for any of the following: ■ Inconclusive conventional imaging ■ Confirm either stable systemic disease or absence of other metastatic disease ■ When primary cancer known, PET request should be reviewed by primary cancer guideline
Primary brain tumors	See: **ONC-2: Primary Central Nervous System Tumors**

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ONC-31.4: Adrenal Gland Metastases

Site of Metastases	Imaging Study
Differentiate benign adrenal adenoma from metastatic disease	◆ See **AB-16: Adrenal Cortical Lesions**
All of the following and **no diagnosis-specific guideline regarding PET imaging** ◆ Solitary adrenal metastasis and ◆ Primary tumor site controlled and surgical resection or radiotherapy of an adrenal metastasis is potentially curative	◆ CT-directed needle biopsy (CPT® 77012) or ◆ MRI Abdomen without (CPT® 74181) or without and with contrast (CPT® 74183) ◆ PET/CT (CPT® 78815) to confirm isolated lesion if conventional imaging (CT/MRI/bone scan) does not reveal other metastatic disease ◆ When primary cancer known, PET request should be reviewed by primary cancer guideline ◆ See also **AB-16.1: Adrenal Cortical Lesions**

ONC-31.5: Bone (including Vertebral) Metastases

Patients with Stage IV cancer with new onset back pain can forgo a bone scan (and plain films) in lieu of an MRI with and without contrast of the spine.

Site of Metastases	Imaging Study
Any of the following in a patient with a current or prior malignancy: ◆ Bone pain ◆ Rising tumor markers ◆ Elevated alkaline phosphatase.	◆ Bone scan (see **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**) supplemented by plain x-rays is the initial diagnostic imaging study of choice
Any of the following: ◆ Any patient with stage IV cancer with new onset back pain ◆ Bone scan is not feasible or readily available ◆ Continued suspicion despite inconclusive or negative bone scan or other imaging modalities ◆ Neurological compromise ◆ Soft tissue component suggested on other imaging modalities or physical exam ◆ Differentiate neoplastic disease from Paget's disease of bone ◆ Suspected leptomeningeal involvement	Any of the following may be approved: ◆ MRI Cervical (CPT® 72156), Thoracic (CPT® 72157), and Lumbar spine (CPT® 72158) without and with contrast ◆ CT Cervical (CPT® 72127), Thoracic (CPT® 72130), and Lumbar spine (CPT® 72133) without and with contrast can be approved **if MRI is contraindicated or not readily available** ◆ CT without contrast can be approved if there is a contraindication to CT contrast

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Site of Metastases	Imaging Study
Monitoring untreated spinal metastases	◆ MRI without and with contrast or CT without and with contrast of the involved spinal level every 3 months for 1 year. **Imaging beyond 1 year is based on any new clinical signs/symptoms
Monitoring metastases within the spine treated with surgery and/or radiation therapy	◆ MRI without and with contrast or CT without and with contrast of the involved spinal level once within 3 months post treatment and then every 3 months for 1 year. **Imaging beyond 1 year is based on any new clinical signs/symptoms
Leptomeningeal involvement with cancer	On active treatment: ◆ MRI Brain without and with contrast (CPT® 70553) ◆ MRI Cervical (CPT® 72156), Thoracic (CPT® 72157), and Lumbar spine (CPT® 72158) without and with contrast every 2 cycles Once treatment completed: ◆ Routine advanced imaging not indicated for surveillance in asymptomatic individuals
Bone pain when both bone scan and either CT or MRI are inconclusive	◆ ^{18}F-FDG-PET/CT (CPT® 78815 or CPT® 78816) on a case-by-case basis **NOTE:** ^{18}F-NaF PET imaging (sodium fluoride, or "PET bone scan") is investigational. See: **ONC-1.1: Key Principles**
Suspected metastatic bone disease and negative work up for myeloma	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis (CPT® 74177) with contrast
No prior cancer history with suspected pathologic fracture on plain x-ray	◆ See **ONC-31.7: Carcinoma of Unknown Primary Site**
Signs/symptoms concerning for spinal cord compression	◆ See **ONC-31.6: Spinal Cord Compression**

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ONC-31.6: Spinal Cord Compression

Site of Metastases	Imaging Study
Any of the following in a current or former cancer patient: ◆ Any patient with stage IV cancer with new onset back pain ◆ New back pain persisting over two weeks ◆ Back pain that is rapidly progressive or refractory to aggressive pain management ◆ Signs or symptoms of neurological compromise at the spinal cord level ◆ Unexpected, sudden loss of bowel or bladder control ◆ Sudden loss of ability to ambulate ◆ Complete loss of pinprick sensation corresponding to a specific vertebral level ◆ Loss of pain at a site that had previously been refractory to pain management	Any or all of the following may be approved: ◆ MRI Cervical (CPT® 72156), Thoracic (CPT®72157), and Lumbar spine (CPT® 72158) without and with contrast ◆ Post myelogram CT of the Cervical (CPT®72126), Thoracic (CPT® 72129), and Lumbar spine (CPT® 72132)
Any current or former cancer patient with radicular symptoms suggestive of nerve root involvement but not consistent with cord compression and one of the following: ◆ Unilateral weakness ◆ Unilateral change of reflexes ◆ Pain unrelieved by change in position ◆ Age > 70 years ◆ Unintentional weight loss ◆ Night pain	Any one of the following: ◆ MRI without and with contrast of involved spinal level ◆ MRI without contrast of the involved spinal level ◆ CT without contrast of the involved spinal level if MRI contraindicated

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ONC-31.7: Carcinoma of Unknown Primary Site

General Considerations

- Defined as carcinoma found in a lymph node or in an organ known not to be the primary for that cell type (e.g., adenocarcinoma arising in the brain or in a neck lymph node).
- This guideline also applies to metastatic melanoma when a detailed skin and mucosal surface examination has failed to find a primary site of disease.
- This guideline also applies to a pathologic fracture that is clearly due to metastatic neoplastic disease in a patient without a previous cancer history.
- Detailed history and physical examination including pelvic and rectal exams and laboratory tests to be performed before advanced imaging.
- Patients presenting with a thoracic squamous cell carcinoma described as metastatic appearing on chest imaging, or in lymph nodes above the clavicle, should undergo a detailed head and neck examination by a clinician skilled in laryngeal and pharyngeal examinations, especially in smokers.
- Patients with suspected unknown primary carcinomas based on only suspicious lytic bone lesions should be considered for serum protein electrophoresis (SPEP); urine protein electrophoresis (UPEP) and serum free light chains prior to consideration of extensive imaging

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Site of Metastases	Imaging Study
Carcinoma found in a lymph node or in an organ known not to be primary	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ CT Neck with contrast (CPT® 70491) if cervical or supraclavicular involvement ◆ CT with contrast or MRI without and with contrast of any other symptomatic site ◆ For female patients: ■ Diagnostic (not screening) mammogram and full pelvic exam ■ MRI Bilateral Breasts (CPT® 77059) if pathology consistent with breast primary and mammogram is inconclusive
Sebaceous carcinoma of the skin (can be associated with underlying primary malignancy)	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis with contrast (CPT®74177) ◆ CT Neck with contrast (CPT® 70491) if cervical or supraclavicular involvement ◆ CT with contrast or MRI without and with contrast of any other symptomatic site
Axillary adenocarcinoma	◆ CT Neck (CPT® 70491), CT Chest (CPT® 71260), and CT Abdomen with contrast (CPT® 74160) ◆ CT with contrast or MRI without and with contrast of any other symptomatic site ◆ For female patients: ■ Diagnostic (not screening) mammogram and full pelvic exam ■ MRI Bilateral Breasts (CPT® 77059) if pathology consistent with breast primary and mammogram is inconclusive
Above studies have failed demonstrate site of primary	◆ PET/CT (CPT® 78815 or CPT® 78816)

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ONC-31.8: Extrathoracic Small Cell Carcinoma

All poorly-differentiated or high-grade, small cell neuroendocrine tumors arising outside the lungs or of unknown primary origin are imaged according to these guidelines.

Indication	Imaging Study
Initial staging	Any or all of the following are indicated: ◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ MRI Brain without and with contrast (CPT® 70553) should be performed for symptoms of CNS involvement and for poorly differentiated neuroendocrine cancers of the neck or extrapulmonary thorax. ◆ PET/CT (CPT® 78815) if no evidence of metastatic disease or conventional imaging is inconclusive for determining localized vs. distant metastatic disease
Restaging during treatment	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis (CPT® 74177) and any known sites of disease with contrast every 2 cycles
Suspected Recurrence	Any or all of the following are indicated: ◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ MRI brain without and with contrast (CPT® 70553) ◆ Bone scan (See **ONC-1.3: Nuclear Medicine (NM) Imaging in Oncology**) ◆ **PET imaging is generally not indicated** but can be considered for rare circumstances. These requests should be forwarded for Medical Director review.
Surveillance	◆ CT Chest (CPT® 71260) and Abdomen/Pelvis with contrast (CPT® 74177) every 3 months for 1 year, then every 6 months for 4 additional years and then annually

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ONC-31.9: Primary Peritoneal Mesothelioma

Indication	Imaging Study
Initial staging	◆ CT Chest (CPT® 71260) and CT Abdomen/Pelvis with contrast (CPT® 74177) ◆ PET/CT (CPT® 78815) if there is no evidence of metastatic disease or conventional imaging is inconclusive
Recurrence/Restaging	◆ If there is known prior disease, CT Chest (CPT® 71260) and Abdomen/Pelvis with contrast (CPT® 74177) ◆ PET for inconclusive finding on conventional imaging
Surveillance	◆ CT Abdomen/Pelvis with contrast (CPT® 74177) every 3 months for 2 years, then every year of life

ONC-31.10: Kaposi's Sarcoma

Indication	Imaging Study
Kaposi's Sarcoma	◆ Advanced imaging is not generally indicated since disease is generally localized to skin. ◆ CT Chest (CPT® 71260) and Abdomen/Pelvis with contrast (CPT® 74177) can be approved at initial diagnosis. If initial scans are negative then future imaging would be based on signs or symptoms.

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ONC-31.11: Castleman's disease (unicentric and multicentric)

Indication	Imaging Study
Initial staging	◆ Either CT Chest (CPT® 71260) and CT Abdomen/Pelvis with contrast (CPT® 74177) **or** PET/CT (CPT® 78815) ◆ CT Neck with contrast (CPT® 70491) if cervical or supraclavicular involvement ◆ If CT scans were utilized initially and suggested unicentric disease, and surgical resection is being considered, PET/CT (CPT® 78815) can be approved to confirm unicentric disease. ◆ If unicentric disease is surgically removed, proceed to Surveillance section.
Restaging: Multicentric disease or surgically unresected unicentric disease on chemotherapy	Any one of the following every 2 cycles: ◆ CT Chest (CPT® 71260) and Abdomen/Pelvis with contrast (CPT® 74177) ◆ PET/CT (CPT® 78815)
Any of the following: ◆ Suspected recurrence ◆ Recurrent B symptoms ◆ Rising LDH/IL-6/VEGF levels	Any one of the following: ◆ CT Chest (CPT® 71260) and Abdomen/Pelvis with contrast (CPT® 74177) ◆ PET/CT (CPT® 78815)
Surveillance	◆ CT with contrast of involved areas no more than every 6 months up to 5 years

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ONC-32: Medicare Coverage Policies for PET

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ONC-32.1: Oncologic FDG PET

The complete coverage policy is found in the Medicare National Coverage Determinations (NCD) Manual, Section 220.6.17: (see: http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/ncd103c1_Part4.pdf)

220.6.17 – Positron Emission Tomography (FDG PET) for Oncologic Conditions

General

FDG (^{2}-[F^{18}] fluoro-2-deoxy-D-glucose) PET is a minimally invasive diagnostic imaging procedure used to evaluate glucose metabolism in normal tissue, as well as in diseased tissues, in conditions such as cancer, ischemic heart disease, and some neurologic disorders. FDG is an injected radionuclide (or radiopharmaceutical that emits sub-atomic particles, known as positrons, as it decays. FDG PET uses a positron camera (tomograph) to measure the decay of FDG. The rate of FDG decay provides biochemical information on glucose metabolism in the tissue being studied. As malignancies can cause abnormalities of metabolism and blood flow, FDG PET evaluation may indicate the probable presence or absence of a majority based upon observed differences in biologic activity compared to adjacent tissues.

The Centers for Medicare and Medicaid Services (CMS) was asked by the National Oncologic PET Registry (NOPR) to reconsider section 220.6 of the National Coverage Determination (NCD) Manual to end the prospective data collection requirements under Coverage with Evidence Development (CED) across all oncologic indications of FDG PET imaging. The CMS received public input indicating that the current framework of prospective data collection under CED be ended for all oncologic uses of FDG PET imaging

1. Framework

Effective for claims with dates of service on and after June 11, 2013, CMS is adopting a coverage framework that ends the prospective data collection requirements by NOPR under CED for all oncologic uses of FDG PET imaging. CMS is making this change for all NCDs that address coverage of FDG PET for oncologic uses addressed in this decision. This decision does not change coverage for any use of PET imaging using radiopharmaceuticals NaF-^{18} (fluorine-^{18} labeled sodium fluoride), ammonia N-^{13}, or rubidium-^{82} (Rb-^{82}).

2. Initial Anti-Tumor Treatment Strategy

CMS continues to believe that the evidence is adequate to determine that the results of FDG PET imaging are useful in determining the appropriate initial anti-tumor treatment strategy for beneficiaries with suspected cancer and improve health outcomes and thus

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are reasonable and necessary under §1862(a)(1)(A) of the Social Security Act (the "Act").

Therefore, CMS continues to nationally cover **ONE** FDG PET study for beneficiaries who have cancers that are biopsy proven or strongly suspected based on other diagnostic testing when the beneficiary's treating physician determines that the FDG PET study is needed to determine the location and/or extent of the tumor for the following therapeutic purposes related to the initial anti-tumor treatment strategy:

- To determine whether or not the beneficiary is an appropriate candidate for an invasive diagnostic or therapeutic procedure; or
- To determine the optimal anatomic location for an invasive procedure; or
- To determine the anatomic extent of tumor when the recommended anti-tumor treatment reasonably depends on the extent of the tumor.

See the table at the end of this section for a synopsis of all nationally covered and non- covered oncologic uses of FDG PET imaging.

Initial Anti-Tumor Treatment Strategy Nationally Covered Indication

Effective: June 11, 2013

- CMS continues to nationally cover FDG PET imaging for the initial anti-tumor treatment strategy for male and female breast cancer only when used in staging distant metastasis.
- CMS continues to nationally cover FDG PET to determine initial anti-tumor treatment strategy for melanoma other than for the evaluation of regional lymph nodes.
- CMS continues to nationally cover FDG PET imaging biopsy proven cervical cancer for the detection of pre-treatment metastasis (i.e., staging) in newly diagnosed cervical cancers

Initial Anti-Tumor Treatment Strategy Nationally Non-Covered Indication

Effective: June 11, 2013

- CMS continues to nationally non-cover initial anti-tumor treatment strategy in Medicare beneficiaries who have adenocarcinoma of the prostate.
- CMS continues to nationally non-cover FDG PET imaging for diagnosis of breast cancer and initial staging of axillary nodes.
- CMS continues to nationally non-cover FDG PET imaging for initial anti-tumor treatment strategy for the evaluation of regional lymph nodes in melanoma.
- CMS continues to nationally non-cover FDG PET imaging for the diagnosis (no biopsy result) of cervical cancer related to initial anti-tumor treatment strategy.

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3. Subsequent Anti-Tumor Treatment Strategy

Subsequent Anti-Tumor Treatment Strategy Nationally Covered Indication, Effective: June 11, 2013

THREE FDG PET scans are nationally covered when used to guide subsequent management of anti-tumor treatment strategy after completion of initial anti-tumor therapy. Coverage of more than three FDG PET scans to guide subsequent management of anti-tumor treatment strategy after completion of initial anti-tumor therapy shall be determined by the local Medicare Administrative Contractors.

4. Synopsis of Coverage of FDGPET for Oncologic Conditions,

Effective: June 11, 2013

Effective for claims with dates of service on and after June 11, 2013, the chart below summarizes national FDG PET coverage for oncologic conditions. Additional details may be obtained at https://www.cms.gov/medicare/coverage/determinationprocess/downloads/petforsolidtumorsoncologicdxcodesattachment_NCD220_6_17.pdf

FDG PET for Solid Tumors and Myeloma Tumor Type	Initial Treatment Strategy (formerly "diagnosis" & "staging")	Subsequent Treatment Strategy (formerly "restaging" & "monitoring
Colorectal	Cover	Cover
Esophagus	Cover	Cover
Head and Neck (not thyroid or CNS)	Cover	Cover
Lymphoma	Cover	Cover
Non-small cell lung	Cover	Cover
Ovary	Cover	Cover
Brain	Cover	Cover
Cervix	Cover with exceptions	Cover
Small cell lung	Cover	Cover
Soft tissue sarcoma	Cover	Cover
Pancreas	Cover	Cover
Testes	Cover	Cover
Prostate	**Non-cover**	Cover
Thyroid	Cover	Cover

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Breast (male and female)	Cover with exceptions	Cover
Melanoma	Cover with exceptions	Cover
All other solid tumors	Cover	Cover
Myeloma	Cover	Cover
All other cancers not listed	Cover	Cover

Invasive Breast Cancer:

- Prior to surgical lymph node sampling: **NOT indicated** (unless planning neoadjuvant therapy)
- Metastatic disease or suspicious lesions seen on CT and/or bone scan: **Indicated**
- After completion of surgical lymph node sampling in place of CT scans: **Indicated**

Melanoma: Nationally non-covered for initial staging of regional lymph nodes. All other indications for initial anti-tumor treatment strategy for melanoma are nationally covered.

- Prior to surgical lymph node sampling: **NOT indicated**
- Metastatic disease or suspicious lesions seen on CT and/or bone scan: **Indicated**
- After completion of surgical lymph node sampling in place of CT scans: **Indicated**

Cervix: Nationally non-covered for the initial diagnosis (before biopsy) of cervical cancer related to initial antitumor treatment strategy. All other indications for initial anti-tumor treatment strategy for cervical cancer are nationally covered.

5. CPT codes for FDG-PET scan for Oncologic Conditions

The decision whether to use skull base to mid-femur (“eyes to thighs”: procedure code for PET (CPT® 78812 or CPT® 78815) or whole body PET(CPT® 78813 or CPT® 78816) is addressed in the diagnosis-specific guideline sections. Requests requiring CPT® code redirection should be forwarded to Medical Director for review.

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ONC-32.2: Oncologic Non-FDG PET

PET/CT Scan using non-FDG Radiotracers:

Medicare National Coverage Determination for PET (NCD 220.6.17) has recently included coverage of PET-CT scans with three new Non-FDG radiotracers, with specific requirements for oncologic scans performed using FDG, ^{68}Gallium DOTATATE, ^{18}F-Fluciclovine, ^{11}C Choline, F-^{18} sodium fluoride as well as cardiac imaging with radiopharmaceuticals Ammonia N-^{13} and Rb-^{82}. Local Medicare contractors have the authority to make coverage decisions about oncologic studies performed with other agents.

PET/CT scan using these radiotracers is reported with the same CPT codes (CPT® 78812 and CPT® 78816) and is subject to coverage for ONE non-FDG PET/CT scan for initial anti-tumor strategy (except for newly diagnosed prostate cancer as noted above) and THREE additional non-FDG PET/CT scans for subsequent anti-tumor treatment strategy. Coverage of more than three non-FDG PET/CT scans to guide subsequent management of anti-tumor treatment strategy after completion of initial anti-tumor therapy shall be determined by the local Medicare Administrative Contractors.

^{11}C Choline for Prostate cancer

- COVERED FOR:
  - Subsequent treatment strategy for patients with prostate cancer who have a rising PSA and have previously been treated with prostatectomy and/or radiation therapy
- NOT COVERED FOR:
  - Initial treatment strategy for newly diagnosed prostate cancer
  - Surveillance of patients with localized/advanced prostate cancer, who have completed definitive therapy or are receiving maintenance therapy

^{18}F-Fluciclovine (AXUMIN®) for Prostate cancer

- COVERED FOR:
  - Subsequent treatment strategy for patients with prostate cancer who have a rising PSA and have previously been treated with prostatectomy and/or radiation therapy
- NOT COVERED FOR:
  - Initial treatment strategy for newly diagnosed prostate cancer
  - Surveillance of patients with localized/advanced prostate cancer, who have completed definitive therapy or are receiving maintenance therapy

^{68}Gallium DOTATATE (NETSPOT®) for Neuroendocrine tumors

- COVERED FOR:
  - Initial treatment strategy for newly diagnosed low-grade neuroendocrine tumors
  - Subsequent treatment strategy for low-grade neuroendocrine tumors

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- NOT COVERED FOR:
  - Surveillance of patients with localized/advanced low-grade neuroendocrine tumors, who have completed definitive therapy or are receiving maintenance therapy

NaF-18 PET for Bone Metastases:

- PET/CT using F-18 sodium fluoride (NaF-18) is advocated as being effective at identifying bone metastases.
- Medicare does not cover these studies under the NCD, but may be reimbursed under Coverage with Evidence Development (CED).
- In February 2011, NaF-18 PET studies were added to the National Oncologic Positron Emission Tomography Registry (NOPR) and CMS has accepted this registry as a qualifying clinical study for CED.
  - Providers should report these PET studies using the standard CPT® code set (78812-78816).
  - It is not appropriate to bill NaF-18 PET/CT using nuclear medicine bone scan codes (e.g., CPT® 78320) as these codes do not accurately describe the nature of the imaging service.
  - The rendering facility should report the NaF-18 radiopharmaceutical with HCPCS code A9580.
  - CMS issued a decision memo December 15, 2015, extending CED eligibility for NaF-18 PET for an additional 24 months.

Coverage with Evidence Development (CED):

- CED is a program designed to make PET/CT available to Medicare beneficiaries while at the same time gathering data regarding PET's effectiveness.
- Under CED, Medicare will reimburse the claim if the beneficiary is enrolled in, and the PET provider is participating in, a qualifying prospective clinical trial or registry.
- Full details regarding qualifying clinical trials, including the list of required scientific integrity standards and relevance to the Medicare population are available in the Medicare NCD Manual, Section 220.6.17.
- Qualifying research trials must be registered on the www.ClinicalTrials.gov website by the principal sponsor/investigator, prior to the enrollment of the first study subject.

National Oncologic PET Registry (NOPR):

- Providers can meet Medicare's requirements for CED by submitting PET data to the National Oncologic PET Registry (NOPR).
- A participating hospital or imaging center must submit information to the NOPR for all Medicare PET that falls under CED. This information includes pre- and post-study forms completed by the referring provider, as well as the final radiology report.
- Providers cannot bill Medicare for the services until the NOPR notifies the facility that all required information has been received.

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- Imaging facilities cannot submit data to the NOPR for studies performed for covered indications.
- For more information about the NOPR, see the registry website: www.cancerpetregistry.org

ONC-32.3: Brain PET

- CPT® 78608 is used to report FDG PET metabolic brain studies for dementia, seizure disorders, and dedicated PET tumor imaging studies of the brain. See **ONC-2.2: Low Grade Gliomas** and **ONC-2.3: High Grade Gliomas** for indications of this study.
- CPT® 78609 is used to report PET brain perfusion studies that are not performed with FDG. These scans are nationally noncovered by Medicare.
- CPT® 78811 (Limited PET) or CPT® 78814 (Limited PET/CT hybrid) are used to report Amyloid PET brain studies (these are not metabolic studies).
- **Amyloid-beta(Aβ) PET Brain Studies:**
  - Medicare will reimburse for brain PET, performed with the radiopharmaceuticals that detect levels of amyloid in the human brain, only through CED.
  - Examples of these radiopharmaceuticals include Amyvid™ (florbetapir F^{18}), Neuraceq™ (florbetaben F^{18}) and Vizamyl™ (flutemetamol F^{18}).
  - CMS will cover one PET Aβ scan per patient through CED
  - For CMS, approval with Coverage with Evidence Development (CED) is available for patients enrolled in clinical trials approved by CMS. See the following link for a list of the CMS approved clinical trials: https://www.cms.gov/Medicare/Coverage/Coverage-with-Evidence-Development/Amyloid-PET.html
- **FDG PET for Dementia and Neurodegenerative Diseases**
  - Medicare covers FDG PET for individuals with a recent diagnosis of dementia and documented cognitive decline of at least six months who meet diagnostic criteria for both Alzheimer's disease (AD) and Fronto-temporal dementia (FTD).
  - The individual must have been evaluated for specific alternate neurodegenerative diseases or other causative factors, but the etiology of the symptoms remains unclear.
  - Other conditions must also be met. For the complete coverage policy, see the Medicare National Coverage Determinations (NCD) Manual, Section **220.6.13**.*
  - Medicare also covers FDG PET for individuals with mild cognitive impairment or early dementia when the study is performed in the context of a CMS-approved clinical trial. Requirements are detailed in Section **220.6.13** of the NCD Manual*.
  - All other uses of FDG PET for patients with a presumptive diagnosis of dementia-causing neurodegenerative disease for which CMS has not specifically indicated coverage continue to be noncovered. Examples of noncovered indications described in the NCD include: possible or probable AD, clinically typical FTD, dementia of Lewy bodies, and Creutzfield-Jacob disease.
    *http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/ncd103c1_Part4.pdf

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- **FDG PET for Refractory Seizures**
  - Medicare covers FDG PET for pre-surgical evaluation for the purpose of localizing a focus of refractory seizure activity.
  - The complete coverage policy is found in the Medicare National Coverage Determinations (NCD) Manual, Section 220.6.9: http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/ncd103c1_Part4.pdf

ONC-32.4: Cardiac PET

- **PET Myocardial Perfusion**
  - Medicare covers PET for myocardial perfusion with rubidium ($Rb-^{82}$) or ammonia ($N-^{13}$) when one of the following conditions is met:
    - PET is performed in place of, but not in addition to, a SPECT, or
    - An individual has had an inconclusive SPECT. In these cases, the PET must be considered necessary in order to determine what medical or surgical intervention is required to treat the individual
  - PET myocardial perfusion is reported with either CPT®78491 or CPT®78492.
  - The complete coverage policy is found in the Medicare National Coverage Determinations (NCD) Manual, Section 220.6.1: http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/ncd103c1_Part4.pdf
- **PET Myocardial Viability**
  - Medicare covers FDG PET for myocardial viability as a primary or initial diagnostic study prior to revascularization surgery, or following an inconclusive SPECT scan.
    - The study must be performed on a full or partial ring PET scanner.
    - When PET is performed following an inconclusive SPECT, Medicare will not cover a follow-up SPECT exam if the results of the PET are inconclusive.
    - PET myocardial viability is reported with CPT®78459.
    - The complete coverage policy is found in the Medicare National Coverage Determinations (NCD) Manual, Section 220.6.8: http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/ncd103c1_Part4.pdf

ONC-32.5: PET for Infection and Inflammation

- Medicare does not cover FDG PET for the following indications:
  - chronic osteomyelitis
  - infection of hip arthroplasty
  - fever of unknown origin
  - The complete coverage policy is found in the Medicare National Coverage Determinations (NCD) Manual, Section 220.6.16: http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/ncd103c1_Part4.pdf

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ONC-32.6: Breast Cancer PET Criteria

Medicare Breast Cancer Criteria: Nationally non-covered for initial diagnosis and/or staging of axillary lymph nodes. Nationally covered for initial staging of known or suspected metastatic disease. All other indications for initial anti-tumor treatment strategy for breast cancer are nationally covered.

Medicare PET criteria for **Invasive Breast Cancer:**

- Prior to surgical lymph node sampling: **NOT indicated** (unless planning neoadjuvant therapy)
- Metastatic disease or suspicious lesions seen on CT and/or bone scan: **Indicated**
- After completion of surgical lymph node sampling in place of CT: **Indicated**

ONC-32.7: Melanoma PET Criteria

Medicare Melanoma Criteria: Nationally non-covered for initial staging of regional lymph nodes. All other indications for initial anti-tumor treatment strategy for melanoma are nationally covered.

Medicare PET criteria for **Melanoma:**

- Prior to surgical lymph node sampling: **NOT indicated**
- Metastatic disease or suspicious lesions seen on CT and/or bone scan: **Indicated**
- After completion of surgical lymph node sampling in place of CT: **Indicated**

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