Clinical Policy Title: Single photon emission computed tomography scans

Clinical Policy Number: 18.01.03

Effective Date: January 1, 2016
Initial Review Date: September 16, 2015
Most Recent Review Date: January 11, 2018
Next Review Date: January 2019

Related policies:
None.

ABOUT THIS POLICY: Prestige Health Choice has developed clinical policies to assist with making coverage determinations. Prestige Health Choice’s clinical policies are based on guidelines from established industry sources, such as the Centers for Medicare & Medicaid Services (CMS), state regulatory agencies, the American Medical Association (AMA), medical specialty professional societies, and peer-reviewed professional literature. These clinical policies along with other sources, such as plan benefits and state and federal laws and regulatory requirements, including any state- or plan-specific definition of “medically necessary,” and the specific facts of the particular situation are considered by Prestige Health Choice when making coverage determinations. In the event of conflict between this clinical policy and plan benefits and/or state or federal laws and/or regulatory requirements, the plan benefits and/or state and federal laws and/or regulatory requirements shall control. Prestige Health Choice’s clinical policies are for informational purposes only and not intended as medical advice or to direct treatment. Physicians and other health care providers are solely responsible for the treatment decisions for their patients. Prestige Health Choice’s clinical policies are reflective of evidence-based medicine at the time of review. As medical science evolves, Prestige Health Choice will update its clinical policies as necessary. Prestige Health Choice’s clinical policies are not guarantees of payment.

Coverage policy

Prestige Health Choice considers the use of single photon emission computed tomography (SPECT scan) scans to be clinically proven and, therefore, medically necessary when the following criteria are met (ACR, 2017; ACR-SPR, 2016; Godbe, 1992; Hess, 2016; Marwick, 1992; Patel, 2006; Schillaci, 1999; SNM, 2006; Suwijn, 2015; Toney, 2017; Treglia, 2016):

- Bone and joint conditions (e.g., stress fracture, osteoid osteoma, spondylosis, infection [e.g., discitis]).
  - Assessment of osteomyelitis, to distinguish bone from soft tissue infection.
  - Distinguishing spinal benign lesions from malignant lesions (e.g., SPECT scan to demonstrate a focal area of increased uptake at the site of the lesion and differentiate between a metabolically active or “hot” lesion and an inactive lesion).
- Assessment of the brain and cerebrovascular conditions:
Brain tumors, to differentiate between lymphomas and infections such as toxoplasmosis, particularly in the immunosuppressed, or recurrent tumor versus radiation changes when positron emission tomography (PET) is not available. Cardiovascular imaging, including:

- Cerebrovascular disease.
- Corroboration of brain death (using SPECT or planar technique).
- Diagnosing encephalitis.
- Improving accuracy of diagnosing Parkinson’s disease, using dopamine transmitter SPECT (DAT SPECT).
- Evaluation of suspected dementia, after recent performance of a brain CT or MRI and all three of the following: thyroid study, B12 assay, and Mini Mental Status Exam.
- Evaluation of suspected trauma.
- Human immunodeficiency virus (HIV) encephalopathy, for the detection of altered brain perfusion using SPECT brain perfusion imaging.
- Mapping of brain perfusion during interventions.
- Localizing epileptic foci preoperatively (in place of positron emission tomography).
- Assessment of acute neurological changes or deficits not explained by a recent brain CT or MRI, in patients with a history of cerebral vascular incident or stroke.
- Evaluation of cerebrovascular disease in complications of acute stroke, if CT and/or MRI have already been performed.
- Evaluation of cerebrovascular reserve, for planning endovascular intervention or neurovascular surgical approach.

- Cerebral spinal fluid (CSF) flow, when routine dynamic planar imaging alone is insufficient:
  - Evaluation of hydrocephalus, after a recent CT or MRI has been compared to previous scans.
  - Detection of recent CSF leak after recent trauma or surgery.
  - Evaluation of CSF shunt function, after recent radiographic evaluation of shunt catheter, and recent CT or MRI compared to previous exams.

- Cardiovascular imaging, including:
  - Myocardial perfusion imaging for the diagnosis and management of coronary artery disease (such as detection of coronary artery disease, determination of myocardial viability, and assessment of efficacy of therapy).
  - Myocardial infarction, to detect and localize necrosis.
  - Vascular spasm following subarachnoid hemorrhage.

- Renal imaging, if need is supported by presentation and findings, including
  - Evaluation of renal function, and renal infections, including renal dimercaptosuccinic acid (DMSA) scan to assess the status of kidney for scarring and function, and discrimination of pyelonephritis from cortical scarring.
  - Evaluation of renal, ureteral, and urinary tract surgery or trauma.
• Diagnosis of reno-vascular hypertension, acute tubular necrosis, or renal transplant complications.
• Detection and assessment of obstruction of renal collecting system.

• Liver and spleen:
  • Evaluation of suspected hepatic hemangioma, using labeled red blood cells to further define lesions identified by other imaging modalities.
  • Evaluation of placement of hepatic artery catheter.
  • Detection of asplenia or accessory splenic tissue.
  • Evaluation of suspected focal nodular hyperplasia.
  • Evaluation of suspected rupture or hematoma of liver or spleen, or of size, shape, and position of liver or spleen, when abdominal CT and MRI are contraindicated.
  • Detection of space-occupying lesions (abscesses, cysts, or primary tumors) when abdominal CT and MRI are contraindicated.
  • Evaluation of primary or metastatic hepatic tumors, pre- and post-treatment.

• Localization of abscess/infection/inflammation in soft tissues or cases of fever of unknown origin.
• Neuroendocrine tumors (e.g., adenomas, carcinoid, pheochromocytomas, neuroblastoma, vasoactive intestinal peptide secreting tumors, thyroid carcinoma, adrenal gland tumors), using a monoclonal antibody (OctreoScan™ [Covidien, Hazelwood, MO]) or I-131 metaiodobenzyl-guanidine (MIBG).
• Parathyroid imaging.
• Gastro-enteropancreatic lesions.
• Diagnosing pulmonary embolism (by means of SPECT scan ventilation/perfusion scintigraphy).

Limitations:

Coverage determinations are subject to benefit limitations and exclusions as delineated by the state Medicaid authority. The Florida Medicaid website may be accessed at http://ahca.myflorida.com/Medicaid/.

All other uses of SPECT scans are not medically necessary and are considered investigational for the following conditions (ACR-SPR, 2016; ACR, 2017; Archer, 2015; Chen, 2016; Chiou, 2003; Ledonio, 2017):

• Attention deficit disorder, autism, and hyperactivity disorder.
• Chronic fatigue syndrome.
• Colorectal carcinoma (e.g., used with the monoclonal antibody or IMMU-4 and CEA-Scan® [Immunomedics Inc., Morris Plains, New Jersey]).
• Frontaltemporal dementia.
• Malignancies other than those for which SPECT scans are listed as medically necessary.
• Neuropsychiatric disorders without evidence of cerebrovascular disease.
- Pervasive development disorders (PDD).
- Prostate carcinoma (e.g., used with the monoclonal antibody ProstaScint® [EUSA Pharma, Langhorne, PA], with or without fusion imaging with computed tomography or magnetic resonance imaging).
- Scintimammography for breast cancer.
- SPECT/SISCOM for the preoperative evaluation of individuals with intractable focal epilepsy to identify and localize area(s) of epileptiform activity when other techniques designed to localize a focus have indeterminate results.
- Preoperative imaging of suspected nonfunctioning pituitary adenomas.
- Pediatric lumbar spondylolysis.

**Frequency limitations:**

Medicare administrative contractor discretion.

In the case of myocardial viability, a PET scan with the tracer fluorodeoxyglucose (FDG) may be used following a SPECT scan that was inconclusive. However, SPECT scans may not be used following an inconclusive FDG PET performed to evaluate myocardial viability.

**Alternative covered services:**

Approved radiologic studies appropriate for the member’s condition.

**Background**

Single photon emission computed tomography (SPECT) scan is a nuclear medicine tomographic imaging technique using gamma rays. It is very similar to conventional nuclear medicine planar imaging using a gamma camera. However, it is able to provide true 3D information. This information is typically presented as cross-sectional slices through the patient, but can be freely reformatted or manipulated, as required.

Stress echo and SPECT myocardial perfusion imaging (MPI) are considered equivalent diagnostic tests. However, in addition to myocardial ischemia, stress echo can provide additional information that is not obtainable with MPI, such as valve function, assessment of pulmonary pressure, and assessment of dynamic obstruction. The most commonly performed myocardial perfusion imaging tests are single (at rest or stress, CPT code 78451) and multiple (at rest and stress, CPT code 78452) tomographic SPECT scan studies. Evaluation of the individual’s left ventricular wall motion and ejection fractions are routinely performed during SPECT MPI and are included in the code’s definition. Attenuation correction, when performed, is included in the MPI service. SPECT myocardial perfusion imaging has been found to have similar diagnostic accuracy in both women and men (Iskandar, 2013).
SPECT scans can provide information about the level of chemical or cellular activity within an organ or system, as well as provide structural information. This process may show areas of increased activity, such as the inflammation in an abscess. Patterns of distribution of the radiotracer can be correlated with various diseases. SPECT scans have been useful in early detection in brain and bone disorders, as well as some types of malignancies. The selection of a radiotracer and imaging protocol is specific to the disease process being investigated. SPECT scans may be repeated to follow the course of a disease.

SPECT scans are typically performed without the need for a hospital stay. The individual is given a dose of a radiotracer, which circulates in the bloodstream and binds to specific target cells. The emitted radiation from the radiotracer travels through body with little interference and is imaged. SPECT scan cameras can image large areas of the body, or the entire body.

Information acquired by SPECT scans frequently adds or confirms observations obtained by other testing. SPECT scans may also provide information not obtainable by means other than PET, which is a newer technology and may provide additional information in some settings. The images obtained through PET are generally of higher quality than those provided by SPECT scans; however, the availability, sensitivity, specificity, and impact on clinical outcomes when using PET vary by clinical condition. For many conditions, SPECT scans have been found as useful as PET, and it is generally more available.

Both PET and SPECT scans may diagnose disease before any clinical symptoms or structural expressions of disease by providing information about the level of functioning within a body system. CT, MRI, and planar scintigraphy are alternatives for providing structural information. However, these techniques provide no information about functionality and are often inadequate to diagnose or evaluate disease.

Dopamine transporter imaging with single photon emission computed tomography (DAT-SPECT) scan is being evaluated to improve the differential diagnosis of dementia with Lewy bodies (DLB) from Alzheimer’s disease. Most of the available literature is from Europe, where a ligand has been available for over a decade. In terms of technical performance, the ligand is specific for the striatal dopamine transporter, and studies indicate reliability in assessment of the images when performed by experienced readers.

For diagnosing Parkinson’s disease in patients with parkinsonian symptoms, studies of diagnostic accuracy report good specificity for confirming nigrostriatal degeneration, with less sensitivity for ruling out disease. These findings are dependent, however, on a reference standard (clinical diagnosis) which may be flawed, and it is unknown whether DAT-SPECT scans would show greater sensitivity when compared with the criterion standard of histopathological diagnosis. Evidence on clinical utility scans includes a randomized controlled trial that showed more patients evaluated with DAT-SPECT have changes in diagnosis and management compared to controls without imaging; however, no improvement in quality of life was observed within the one-year follow-up. In other studies, DAT-SPECT scans findings are consistent with about 90 percent of diagnoses made by specialists in movement
disorders and that in a relatively small proportion of patients, the diagnosis has been altered based on DAT-SPECT scans.

For discriminating between dementia with Lewy bodies and Alzheimer’s disease, the sensitivity and specificity of DAT-SPECT scans is somewhat lower than for PS, although the comparison standard used in the available studies may be flawed. One retrospective community-based study suggests DAT-SPECT scans may influence the clinical diagnosis and management of a large proportion of patients with possible dementia with Lewy bodies. Overall, the evidence available at this time is insufficient to determine with certainty the effect of this technology on health outcomes. Therefore, DAT-SPECT scans are considered investigational.

**Searches**

Prestige Health Choice searched PubMed and the databases of:

- UK National Health Services Centre for Reviews and Dissemination.
- Agency for Healthcare Research and Quality’s National Guideline Clearinghouse and other evidence-based practice centers.
- The Centers for Medicare & Medicaid Services (CMS).

We conducted searches on October 24, 2017. Search terms were: “SPECT/CT for imaging of adult and pediatric patients, nuclear medicine.”

We included:

- **Systematic reviews**, which pool results from multiple studies to achieve larger sample sizes and greater precision of effect estimation than in smaller primary studies. Systematic reviews use predetermined transparent methods to minimize bias, effectively treating the review as a scientific endeavor, and are thus rated highest in evidence-grading hierarchies.
- **Guidelines based on systematic reviews**.
- **Economic analyses**, such as cost-effectiveness, and benefit or utility studies (but not simple cost studies), reporting both costs and outcomes — sometimes referred to as efficiency studies — which also rank near the top of evidence hierarchies.

**Findings**

Data suggest SPECT scan is a relatively safe and effective technique for assessing myocardial viability in patients with coronary artery disease (CAD) and left ventricular (LV) dysfunction and may be as accurate as dobutamine stress echocardiography (DbE) and, depending on the SPECT scan protocol, as accurate or less accurate than PET in this setting. However, accuracy varies with SPECT scan protocol. It is unacceptably low for frontaltemporal dementia (regional cerebral blood flow single photon emission computed tomography, or rCBF SPECT) (Archer, 2015).
Per the Society of Nuclear Medicine (2006), SPECT scan and CT are proven diagnostic procedures. The integration of these two procedures into a single device has resulted in the development of this technology. Indications for SPECT/CT include imaging of skeletal disorders and tumors.

Integrated breath-hold single-photon emission tomography and computed tomography images allow the accurate prediction of postoperative pulmonary function but without statistical superiority over the simple segment-counting technique (Sudoh, 2006). Further study of the usefulness of single-photon emission tomography and computed tomography in patients with severe emphysema and borderline lung function is anticipated to prove valuable because the segment-counting technique underestimates pulmonary functional reserve in these patients.

The American College of Radiology (ACR) and the Society for Pediatric Radiology (SPR) collaboratively revised the practice parameter’s goal of SPECT brain perfusion imaging to detect abnormalities in regional cerebral perfusion by producing images of diagnostic quality (ACR-PCR, 2016). This Practice Parameter states that SPECT brain perfusion imaging using lipophilic radiopharmaceuticals that cross the blood-brain barrier and localize in normal brain tissue is a proven and useful procedure to define the regional distribution of brain perfusion, evaluate a variety of brain abnormalities, and corroborate the clinical impression of brain death in appropriate situations.

**Policy updates:**

2016 – We added new information in findings section related to brain perfusion imaging. Added another indication for SPECT under coverage policy.

2017 – We added the following:

**New indications:**

- Gastro-enteropancreatic lesions.
- Suspected dementia.
- Diagnosing encephalitis.
- Vascular spasm following subarachnoid hemorrhage.
- Mapping brain perfusion during interventions.
- Cerebrovascular disease.
- Predicting the prognosis of patients with cerebrovascular accidents.
- Corroborating a clinical impression of brain death (can be performed with SPECT or planar technique).
- Improving accuracy of diagnosing Parkinson’s disease, using dopamine transmitter SPECT (DAT SPECT).
- Evaluation of suspected dementia, after recent performance of a brain CT or MRI and all three of the following: thyroid study, B12 assay, and Mini Mental Status Exam.
- Evaluation of suspected trauma.
• Human immunodeficiency virus (HIV) encephalopathy, for the detection of altered brain perfusion using SPECT brain perfusion imaging.
• Mapping of brain perfusion during interventions
  o Assessment of acute neurological changes or deficits not explained by a recent brain CT or MRI, in evaluation of cerebrovascular reserve, for planning endovascular intervention or neurovascular surgical approach.
• Cerebral spinal fluid (CSF) flow, when routine dynamic planar imaging alone is insufficient, for:
  o Evaluation of hydrocephalus, after a recent CT or MRI has been compared to previous scans.
  o Detection of recent CSF leak after recent trauma or surgery.
• Evaluation of CSF shunt function, after recent radiographic evaluation of shunt catheter, patients with a history of cerebral vascular incident or stroke.
• Evaluation of cerebrovascular disease in complications of acute stroke, if CT and/or MRI have already been performed.
  o Vascular spasm following subarachnoid hemorrhage.
• Renal imaging, if need is supported by presentation and findings, including:
  o Evaluation of renal function, and renal infections, including renal dimercaptosuccinic acid (DMSA) scan to assess the status of kidney for scarring and function, and discrimination of pyelonephritis from cortical scarring.
  o Evaluation of renal, ureteral, and urinary tract surgery or trauma.
  o Diagnosis of reno-vascular hypertension, acute tubular necrosis, or renal transplant complications.
  o Detection and assessment of obstruction of renal collecting system.
• Liver and spleen:
  o Evaluation of placement of hepatic artery catheter.
  o Detection of asplenia or accessory splenic tissue.
  o Evaluation of suspected focal nodular hyperplasia.
  o Evaluation of suspected rupture or hematoma of liver or spleen, or of size, shape, and position of liver or spleen, when abdominal CT and MRI are contraindicated.
  o Detection of space-occupying lesions (abcesses, cysts, or primary tumors) when abdominal CT and MRI are contraindicated.
  o Evaluation of primary or metastatic hepatic tumors, pre- and post-treatment.

New limitations:
• Frontal pretemporal dementia.
• Preoperative imaging of suspected nonfunctioning pituitary adenomas.
• Pediatric lumbar spondylolysis.

We added additional indications included in ACR-SPR (2016).
New references: We added six new references to the Summary of Clinical Evidence, three sources to the guideline reference list, and 11 references to the peer-reviewed reference list.

**Summary of clinical evidence:**

<table>
<thead>
<tr>
<th>Citation</th>
<th>Content, Methods, Recommendations</th>
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<tbody>
<tr>
<td><strong>Key points:</strong></td>
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</table>
| ACR-SPR (2016) ACR-SPR Practice Parameter for the Performance of Single Photon Emission Computed Tomography (SPECT) brain perfusion imaging | Clinical indications for use of SPECT brain perfusion imaging include, but are not limited to:  
- Suspected dementia.  
- Preoperative localization of epileptic foci.  
- Diagnosing encephalitis.  
- Vascular spasm following subarachnoid hemorrhage.  
- Mapping brain perfusion during interventions.  
- Cerebrovascular disease.  
- Predicting the prognosis of patients with cerebrovascular accidents.  
- Corroborating a clinical impression of brain death (can be performed with SPECT or planar technique).  
- For other indications, such as neuropsychiatric disorders and chronic fatigue syndrome, the findings of SPECT brain perfusion imaging have not been fully characterized.  
- For human immunodeficiency virus (HIV) encephalopathy, SPECT brain perfusion imaging can detect altered brain perfusion. |
| Chen (2016) Systematic Review and Evidence-Based Guideline on Preoperative Imaging Assessment of Patients With Suspected Nonfunctioning Pituitary Adenomas | Based on a review of 122 articles, the Congress of Neurological Surgeons made the following recommendations:  
- High-resolution magnetic resonance imaging (level II) is recommended as the standard for preoperative assessment of nonfunctioning pituitary adenomas. This may be supplemented with CT (level III) and fluoroscopy (level III).  
- While the utility of magnetic resonance spectroscopy, magnetic resonance perfusion, positron emission tomography, and single-photon emission computed tomography show promise, there is currently insufficient evidence to recommend them for this condition. |
| Patel (2006) Prognostic role of SPECT scan imaging in myocardial viability | SPECT-based myocardial viability testing is an important diagnostic modality due to widespread availability and reasonably good sensitivity and specificity for detecting viable myocardium and predicting clinical and functional responses to revascularization.  
- In the future, single-photon emission computed tomography viability techniques may have a prognostic role in predicting responses to cardiac resynchronization therapy and evaluating myocardial stem-cell transplantation. |
<p>| Schillaci (1999) Single photon emission computed tomography procedure improves | Somatostatin receptor scintigraphy with In-111 pentetreotide has proved to be useful in detecting gastro-enteropancreatic tumors; however, the role of abdominal single photon emission computed tomography has not yet been definitively established. |</p>
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<tr>
<th>Citation</th>
<th>Content, Methods, Recommendations</th>
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| accuracy of somatostatin receptor scintigraphy in gastro-entero pancreatic tumors | - In-111 pentetreotide single photon emission computed tomography was the only imaging method able to localize tumoral lesions in 13 patients; all these localizations were then histologically verified.  
- The scintigraphic positivity did not depend on the site or on the presence of hormonal hypersecretions. Results indicate that single photon emission computed tomography is more sensitive than planar images and computed tomography/magnetic resonance imaging in detecting abdominal gastro-enteropancreatic tumors and their metastases; it is able to increase both the number of visualized lesions and that of patients with positive findings.  
- SPECT is particularly useful in patients in whom tumoral lesions have not been already localized; it should be the first imaging modality in patients with gastro-enteropancreatic tumors: its initial use will result in more information and proper management. |
| Godbe (1992) | Key points:  
- Prior studies from our institution have shown that SPECT is sensitive (100%) in predicting patients at risk for serious arrhythmias. However, the positive predictive value is low (15% to 20%).  
- The purpose of this study was to determine if quantitative analysis of SPECT defects could improve predictive value. One hundred seventy-five patients with positive SPECT scans were studied. One hundred two patients developed arrhythmias, 42 of which were ventricular. Arrhythmias were associated with all defect loci and all defect sizes.  
- The incidence of arrhythmias did increase with increasing size. Patients were at risk for arrhythmias up to 72 hours after trauma. The value of single photon emission computed tomography is its ability to predict patients at risk for arrhythmias. This study shows that any single photon emission computed tomographic defect, regardless of location or size, is a significant predictor of arrhythmias. |
| Marwick (1992) | Key points:  
- Current techniques for the detection of recurrent coronary stenosis following bypass grafting have shown disappointing diagnostic accuracy. This study used the same dipyridamole-handgrip stress to compare the accuracy of rubidium-82 PET and thallium-201 SPECT, in 50 consecutive post-bypass patients undergoing coronary arteriography at a mean interval of 6.5 years after surgery. Significant stenosis in native coronary vessels (greater than 50% diameter) or grafts (greater than 70% diameter) were defined by quantitative angiography.  
- Four patients were fully revascularized, without significant recurrent coronary disease; normal perfusion was present in three (75%) by PET, and four (100%) by SPECT. |

References

Professional society guidelines/other:

American College of Radiology (ACR). ACR Appropriateness Criteria®. Available at:  


Food and Drug Administration (FDA) [website]. Drugs @ FDA. FDA Approved Drug Products. Updated February 23, 2007. Available at: 


Society of Nuclear Medicine (SNM) procedure guideline for SPEC/CT Imaging. May 2006. Available at: 

Peer-reviewed references:


**CMS National Coverage Determinations (NCDs):**


**Local Coverage Determinations (LCDs):**

No LCDs identified as of the writing of this policy.

**Commonly submitted codes**

Below are the most commonly submitted codes for the service(s)/item(s) subject to this policy. This is not an exhaustive list of codes. Providers are expected to consult the appropriate coding manuals and bill accordingly.
<table>
<thead>
<tr>
<th>CPT Code</th>
<th>Description</th>
<th>Comment</th>
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<tbody>
<tr>
<td>78071</td>
<td>Parathyroid planar imaging, tomographic (SPECT)</td>
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<tr>
<td>78072</td>
<td>Parathyroid planar imaging, tomographic (SPECT) with concurrent CT</td>
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<td>78205</td>
<td>Liver imaging, SPECT</td>
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<tr>
<td>78320</td>
<td>Bone and/or joint imaging; tomographic (SPECT)</td>
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<td>78469</td>
<td>Myocardial imaging, tomographic (SPECT)</td>
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<td>78494</td>
<td>Cardiac pool imaging, gaited equilibrium (SPECT)</td>
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<td>78607</td>
<td>Brain scan, tomographic (SPECT)</td>
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<td>Cerebrospinal fluid, tomographic (SPECT)</td>
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<td>78710</td>
<td>Kidney imaging, tomographic (SPECT)</td>
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<td>78803</td>
<td>Radiopharmaceutical location of tumor (SPECT)</td>
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<tr>
<td>78807</td>
<td>Radiopharmaceutical location of inflammatory area (SPECT)</td>
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<thead>
<tr>
<th>ICD-10 Code</th>
<th>Description</th>
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<tr>
<td>C16.0-C16.9</td>
<td>Malignant neoplasm of stomach [carcinoid or neuroendocrine tumors]</td>
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<td>C25.0-C25.9</td>
<td>Malignant neoplasm of pancreas [VIPoma, Islet cell tumors]</td>
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<td>C33</td>
<td>Malignant neoplasm of trachea</td>
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<td>C41.2</td>
<td>Neoplasm, malignant, spine</td>
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<td>C41.9</td>
<td>Bone, neoplasm, malignant</td>
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<td>Malignant neoplasm of cerebral meninges [meningioma]</td>
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<td>Malignant neoplasm of brain [differentiation of necrotic tissue from tumor]</td>
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<td>Malignant neoplasm of parathyroid gland, pituitary gland and craniopharyngeal duct</td>
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<td>C75.5</td>
<td>Malignant neoplasm of aortic body and other paraganglia</td>
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<td>C7A.00-C7B.8</td>
<td>Malignant neuroendocrine tumors</td>
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<td>Benign neoplasm of endocrine pancreas [gastrinomas, glucagonomas, Islet cell tumors]</td>
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<tr>
<td>ICD-10 Code</td>
<td>Description</td>
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<td>D35.6</td>
<td>Benign neoplasm of aortic body and other paraganglia</td>
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<td>D37.8-D37.9</td>
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<td>Parkinson's disease</td>
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<tr>
<td>I21.3</td>
<td>Myocardial infarction</td>
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<tr>
<td>I25.9</td>
<td>Coronary artery disease</td>
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<tr>
<td>I26.01-I26.99</td>
<td>Pulmonary embolism</td>
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<td>L02.01-L02.211, L02.219, L02.31, L02.411-L02.419, L02.51-L02.59, L02.611-L02.619, L02.811-L02.818, L02.91</td>
<td>Other cutaneous abscess [localization for suspected or known localized infection or inflammatory process]</td>
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<td>L03.111-L03.119, L03.121 - L03.129, L03.211 - L03.213, L03.221 - L03.222, L03.311 - L03.319, L03.321 - L03.329, L03.818, L03.891 - L03.898, L03.90 - L03.91</td>
<td>Other cellulitis [localization for suspected or known localized infection or inflammatory process]</td>
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<tr>
<td>M46.20-M46.28</td>
<td>Osteomyelitis of vertebra [to distinguish bone from soft tissue infection]</td>
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<tr>
<td>M46.30-M46.39</td>
<td>Infection of intervertebral disc (pyogenic) [to distinguish bone from soft tissue infection]</td>
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<tr>
<td>M46.40</td>
<td>Discitis</td>
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<tr>
<td>M47.9</td>
<td>Spondylitis, spine</td>
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<tr>
<td>M48.40x+ - M48.48x+, M84.30x+ - M84.38x+, M84.361+-M84.369+, M84.374+-M84.379+</td>
<td>Stress fractures</td>
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<tr>
<td>M86.011-M86.9</td>
<td>Osteomyelitis, periostitis, and other infections involving bone [to distinguish bone from soft tissue infection]</td>
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<tr>
<td>Q76.2</td>
<td>Congenital spondylolisthesis</td>
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<tr>
<td>N28.9</td>
<td>Disorder, kidney</td>
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<tr>
<td>HCPCS Level II Code</td>
<td>Description</td>
<td>Comment</td>
</tr>
<tr>
<td>---------------------</td>
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<tr>
<td>N/A</td>
<td>Not Applicable</td>
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