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

NECK IMAGING GUIDELINES
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## Neck Imaging Guidelines

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<tr>
<td>ALS</td>
<td>amyotrophic lateral sclerosis</td>
</tr>
<tr>
<td>CT</td>
<td>computed tomography</td>
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<tr>
<td>ENT</td>
<td>Ear, Nose, Throat</td>
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<td>FNA</td>
<td>fine needle aspiration</td>
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<td>GERD</td>
<td>gastroesophageal reflux disease</td>
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<tr>
<td>GI</td>
<td>gastrointestinal</td>
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<tr>
<td>HIV</td>
<td>human immunodeficiency virus</td>
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<td>MRI</td>
<td>magnetic resonance imaging</td>
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A current clinical evaluation (within 60 days), which includes a relevant history and physical examination and appropriate laboratory studies and non advanced imaging modalities, such as plain x-ray or ultrasound, are required prior to considering advanced imaging. Other meaningful contact (telephone call, electronic mail or messaging) by an established patient can substitute for a face-to-face clinical evaluation.

Advanced imaging of the neck covers the following areas:
- Skull base, nasopharynx, and upper oral cavity to the head of the clavicle
- Parotid glands and the supraclavicular region
- Skull base; thus a separate CPT® code for head imaging in order to visualize the skull base is not necessary.

Ultrasound of the soft tissues of the neck including thyroid, parathyroid, parotid and other salivary glands, lymph nodes, cysts, etc. is coded as CPT® 76536. This can be helpful in more ill-defined masses or fullness and differentiating adenopathy from mass or cyst, to define further advanced imaging.

Neck CT
- A neck CT is usually obtained with contrast only (CPT® 70491).
  - Little significant information is added by performing a neck CT without and with contrast (CPT® 70492), and there is the risk of added radiation exposure, especially to the thyroid.
    - Neck CT without contrast (CPT® 70490) can be difficult to interpret due to difficulty identifying the blood vessels
  - Exception:
    - Contrast is not generally used when evaluating either the trachea or thyroid gland with CT.
    - Contrast may cause intense and prolonged enhancement of the gland which interferes with radioactive iodine nuclear medicine studies.
    - Evaluate salivary duct stones in the appropriate clinical circumstance where intravenous contrast may obscure high attenuation stones

Neck MRI

Neck MRI is used less frequently than neck CT.
- Neck MRI without and with contrast (CPT® 70543) is appropriate if CT suggests the need for further imaging or if ultrasound or CT suggests any of the following:
  - Neurogenic tumor (schwannoma, neurofibroma, glomus tumor, etc.),
  - Vascular malformations
  - Deep neck masses
  - Angiofibromas
See these related topics in the Head Imaging Guidelines:

**HD-1.5 CT and MR Angiography**

**HD-12~Aneurysm and AVM**

**HD-21~General Stroke/TIA**

**HD-23~Dizziness, Vertigo and Syncope**

**HD-22~Cerebral Vasculitis**

**HD-32~Eye Disorder-Horner’s Syndrome**

**HD-31~Tinnitus**

See **PVD-3~Cerebrovascular and Carotid Disease** in Peripheral Vascular Disease Imaging Guidelines.
NECK-3 ~ DYSPHAGIA

NECK-3.1 Imaging

✓ Esophagram (Barium swallow) evaluation is considered the initial study in the evaluation of dysphagia. These results can then lead to further evaluation with:

- Endoscopy is usually performed next
- Neck CT with contrast (CPT® 70491) and/or chest CT with contrast (CPT® 71260) and/or abdominal CT with contrast (CPT® 74160) (if requested)
- Chest MRI without contrast, or chest MRI without and with contrast (CPT® 71552), can be performed if vascular ring is suspected
  - Chest MRA and cardiac MRI should not be necessary to establish the diagnosis of vascular ring.

Practice Notes

A detailed history of the dysphagia symptoms is important to distinguish neurogenic, pharyngeal and esophageal disorders.

Dysphagia (difficulty swallowing) can be caused by a wide range of benign and malignant causes that affects the body’s ability to move food or liquid from the mouth to the pharynx and into the esophagus.

A short duration (weeks to months) of rapidly progressive esophageal dysphagia with associated weight loss is highly suggestive of esophageal cancer.
(See ONC-9 ~ Esophageal Cancer in the Oncology Imaging Guidelines).

References

Neck-4.1 Imaging

✔ Neck, Chest and/or Abdomen CT all with contrast (CPT® 70491, CPT® 71260 and/or CPT® 74160) can be performed to evaluate any of the following:
  - GERD, sliding or paraesophageal hiatal hernias: preoperative planning, (chest and/or abdomen CT)
  - Hiatal hernia surgery: for GI Specialist or surgeon treatment/pre-operative planning or signs/symptoms of a potential complication, (chest and abdomen CT)
  - Mallory Weiss tear: suspected after endoscopy, (chest and abdomen CT)
  - Esophageal cancer: biopsy proven
    See: ONC-9~Esophageal Cancer in the Oncology Imaging Guidelines
  - Esophageal perforation: suspected (Neck and/or Chest and/or Abdomen CT)
  - Esophageal diverticulum: Depending on location, any of the CT studies above can be used

✔ Neck and/or chest CT or MRI (CPT® 70543 and/or CPT® 71552) AND endoscopic ultrasound (CPT® 76975) can be used for leiomyoma, depending on the location

✔ Suspected foreign body obstructing the esophagus should be evaluated with x-ray. If x-ray is negative, use contrast study such as esophagram. A location appropriate CT can be used for further evaluation

✔ Any type of esophageal stricture (radiation, peptic, lye, neoplastic, postoperative, drug-induced, Crohn’s disease, Schatzki’s ring, esophageal web) should be evaluated with esophagram (barium swallow) and endoscopy prior to CT. If esophagram findings are negative, use CT of appropriate location.

✔ Advanced imaging is not usually needed for motility disorders such as reflux-related, achalasia, diffuse spasm, nutcracker esophagus, myasthenia gravis, and scleroderma should be evaluated by esophagram (barium swallow) and manometry.

Practice Notes

- A variety of mechanical and motility lesions occur in the esophagus.
- Dysphagia is difficulty swallowing; odynophagia is painful swallowing.

References

Neck-5.1 Imaging

✓ Ultrasound (CPT®76536) can be considered for any of the following:
  o Inflammatory, infective or reactive adenopathy is suspected after failure of a 2 week trial of treatment or observation (including antibiotics if appropriate)
  o To further evaluate an ill-defined mass

✓ Ultrasound (CPT®76536) can be considered when non-malignant adenopathy is suspected after failing a 2 weeks trial of antibiotics (if appropriate) or to define whether further findings, such as a mass is present.

✓ Neck CT with contrast (CPT®70491) can be considered if:
  o Determining an association of an identified lesion(s) with underlying structures;
  o Determining the full extent of identified lesions;
  o Identifying other pathologic lymph nodes.

✓ Chest x-ray should be performed to identify primary lung disease, involvement of mediastinal lymph nodes or lung or other metastases.

✓ Chest CT with contrast (CPT®71260) if chest x-ray findings are abnormal (indicating cancer) or are unclear according to disease specific guidelines
  o See ONC-3~Squamous Cell Carcinomas - Head & Neck
  o See ONC-27~Lymphoma
  o See CH-2~Lymphadenopathy

Practice Notes

Chest x-ray is helpful to identify primary lung disease, involvement of mediastinal lymph nodes or other metastases.

Inflammatory neck adenopathy is often associated with upper respiratory infection, pharyngitis, dental infection. Occasionally, it is associated with sarcoidosis, toxoplasmosis and HIV.

Most common causes of neoplastic adenopathy are metastasis from head and neck tumors and lymphoma.

CT is the preferred initial modality in neck mass in adults.

References


NECK IMAGING GUIDELINES

NECK-6~NECK MASSES

See Pediatric Neck Imaging Guidelines if under age 20.

Neck-6.1 Imaging

✓ Ultrasound (CPT®76536) is the initial study for:
  o Anterior neck masses
  o Lateral or posterior neck masses that are tender and have been observed for 2
    weeks under physician care and reassessed (generally an acute, infections, or
    inflammatory mass)

✓ Neck CT with contrast (CPT®70491) is supported for:
  o Lateral or posterior neck masses that are nontender and discrete in the adult
  o History of malignancy
  o Suspected peritonsillar, retropharyngeal or other head and neck abscesses
  o If sarcoidosis is suspected the Neck CT with contrast (CPT®70491) should be
    followed by biopsy
  o Preoperative evaluations of any neck mass

✓ Neck MRI without and with contrast (CPT®70543) if:
  o CT suggests the need for further imaging
  o Ultrasound or CT suggests neurogenic tumor (schwannoma, neurofibroma, glomus
    tumor, etc.), vascular malformations, deep neck masses and angiofibromas.

✓ Uncomplicated Pharyngitis or Tonsillitis should undergo conservative therapy
  including antibiotics, if appropriate. Advanced imaging is not indicated.

✓ Salivary Gland Stones:
  o For, suspected salivary duct or gland stone, CT of the neck without contrast
    (CPT®70490)
  o For obstructing calculus and inflammatory disease, CT of the neck without and
    with contrast (CPT®70492)
  o Sialography (contrast dye injection) under fluoroscopy, may be performed to rule
    out a stone, with post sialography CT (CPT®70486), or post sialography MRI
    (CPT®70540).

✓ Parotid Mass
  o Neck CT with contrast (CPT®70491)
  o If salivary gland stone is suspected, CT of the maxillofacial area without and with
    contrast (usually CPT®70488) or neck MRI without and with contrast
    (CPT®70543) can be considered in place of neck CT.
**Practice Notes**

Although CT is considered the preferred initial modality in neck mass in adults, the use of US is steadily increasing and should be considered when malignancy is not obvious. Most lateral neck masses are enlarged lymph nodes. Malignancy is a greater possibility in adults that are heavy drinkers and smokers. ENT evaluation can be helpful in determining the need for advanced imaging. Although CT and MRI can have characteristic appearances for certain entities, biopsy and histological diagnosis are the only way to obtain a definitive diagnosis.

**References**

1. American College of Radiology ACR Appropriateness Criteria® Clinical Condition: Neck Mass/Adenopathy
NECK IMAGING GUIDELINES

NECK-7~Malignancies Involving the Neck

See the following in the **Oncology Imaging Guidelines**:

- **ONC-3~Squamous Cell Carcinomas - Head and Neck**
- **ONC-4~Salivary Gland Cancers**
- **ONC-6~Thyroid Cancer**
- **ONC-9~Esophageal Cancer**
- **ONC-27~Lymphoma**

NECK-8~Recurrent Laryngeal Palsy

See **HD-7~Recurrent Laryngeal Palsy** in the **Head Imaging Guidelines**
Neck-9.1 Imaging

✓ Initial evaluation of Thyroid Nodule should include:

1. History identifying factors predicting malignancy and physical focusing on neck;
2. Distinctly palpable or incidentally radiographic;
3. Serum Thyroid Stimulating Hormone (TSH)
4. Nuclear medicine thyroid scan if Low TSH (hyperthyroid and toxic nodule treated with Radio Iodine)
5. Ultrasound (CPT®76536) if:
   - Normal or High TSH, or Low TSH nuclear scan shows non-functioning nodule
   - Incidentally found on PET/CT with focal activity *
6. Fine needle aspiration (FNA) is next if dominant mass on ultrasound.
   - Repeat FNA if the first one is not diagnostic
   - If FNA results are repeatedly non-diagnostic, close observation or surgical excision should be performed

Neck CT without contrast (CPT®70490) or Neck MRI without and with contrast
✓ (CPT®70543) after FNA has been performed for:
   - Known thyroid mass and cervical lymphadenopathy
   - Preoperative planning

Contrast may cause intense and prolonged enhancement of the gland which interferes with radioactive iodine nuclear medicine studies.

✓ Neck and Chest CT without contrast (CPT®70490 and CPT®71250)
   - If Substernal Goiter is confirmed upon initial neck ultrasound (CPT®76536) or radionuclide study, in order to evaluate the extent of disease and for pre-operative planning in symptomatic patients.

✓ Follow-up of benign thyroid nodules:
   - Ultrasound (CPT®76536) 6 to 18 months after the initial FNA
   - If nodule size is stable, follow-up ultrasound exam (CPT®76536) can be performed every 3 to 5 years.
   - If there is evidence for nodule growth, FNA with ultrasound guidance (CPT®76942) should be repeated
   - There is insufficient evidence supporting the use of PET to distinguish indeterminate thyroid nodules that are benign from those that are malignant.
   - MRI and CT are not indicated for routine thyroid nodule evaluation.
✓ Parathyroid suspected
  o Sestamibi nuclear medicine study and Ultrasound (CPT®76536) are the preferred initial imaging study in those suspected with parathyroid disease (high serum calcium and high serum parathyroid hormone level).
  o Chest CT with contrast may be indicated in rare circumstances in the evaluation of ectopic mediastinal parathyroid adenomas
  o CT or MRI neck without and with contrast (CPT®70492 or CPT®70543):
    • Very high calcium (>=13) suggesting parathyroid carcinoma
    • When requested for preoperative localization
    • Recurrent or persistent hyperparathyroidism following neck exploration (MR preferred)

Practice Notes
A thyroid nodule is distinct either on palpation or radiologically (incidentaloma). Nonpalpable nodules have the same risk of cancer as palpable. Nodules > 1cm are evaluated, while smaller nodules are generally evaluated if suspicious, associated with adenopathy or a history of radiation or cancer exists.

Ultrasound is not used to screen: 1) the general population, 2) patients with normal thyroid on palpation with a low risk of thyroid cancer, 3) patients with hyperthyroidism, 4) patients with hypothyroidism or 5) patients with thyroiditis. Conversely, US can be considered in patients who have no symptoms but are high risk as a result of: history of head and neck irradiation, family history, MEN, medullary or papillary thyroid cancer.

Radionuclide thyroid scan can be considered to evaluate nodules when hyperthyroidism is present, for surveillance of thyroid cancer, or to detect non-palpable nodules. This scan is not useful for other nodules since hyper functioning nodules rarely harbor malignancy. Thyroid nodules >4 cm may be considered for thyroid lobectomy due to a high incidence of both false negative FNA biopsies and malignancy (26%).

FNA may be repeated after an initial non-diagnostic cytology result, because repeat FNA with US guidance will yield a diagnostic cytology specimen in 75% of solid nodules and 50% of cystic nodules. However, up to 7% of nodules continue to yield non-diagnostic cytology results despite repeated biopsies and may be malignant at the time of surgery.

Thyroid nodules may be stratified as to risk of thyroid cancer based on sonographic findings of microcalcification, hypervascularity on Doppler ultrasound, solid or cystic nature of mass and margins of mass.
References


Neck-10.1 Imaging

✓ Plain x-rays of the neck and chest and bronchoscopy are the initial imaging studies for evaluating patients with suspected tracheal pathology. Bronchoscopy can further evaluate the distal (endo) bronchial tree.
   ○ Suspected tracheal disease can be identified by inspiratory stridor and a characteristic flow-volume loop of PFTs.

✓ Neck CT with contrast (CPT® 70491) or without contrast (CPT® 70490) and/or chest CT with contrast (CPT® 71260) or without contrast (CPT® 71250) can be performed to further evaluate abnormalities of the trachea seen on other imaging studies based on the physician’s preference.

✓ Expiratory HRCT (CPT® 71250) is indicated in patients with obstructive physiology tracheomalacia and can also be useful in the evaluation of interstitial lung disease.

References

NECK IMAGING GUIDELINES

NECK-11~Torticollis and Dystonia

See also: SP-7~Myelopathy and SP-3~Neck Pain and Cervical Radiculopathy

Newborn Infant:
- Ultrasound of the Neck is the initial study to determine if congenital muscular torticollis
  - Positive ➔ No further imaging is needed since diagnosis is defined
  - Negative ➔ CT Neck with contrast or MRI Neck with contrast to try to identify other cause

Older Child (beyond infancy) or Adult
- For trauma, CT Neck with contrast and/or CT Cervical Spine without contrast is the initial study to identify fracture or mal-alignment
- For no trauma, CT Neck with contrast, and/or MRI Cervical Spine without contrast, or CT Cervical Spine without contrast is the initial study to locate a soft tissue or neurological cause
  - Positive ➔ Further advanced imaging is not required if CT Neck or CT Cervical Spine has identified local cause
  - Negative ➔ MRI Brain without and with contrast to exclude CNS cause

Practice Notes
Torticollis or cervical dystonia is an abnormal twisting of the neck with head rotated or twisted. Its causes are many and may be congenital or acquired and caused by trauma, infection/inflammation, neoplasm and those less defined and idiopathic. It occurs more frequently in children and on the right side (75%).

Retropharyngeal space abscess could be associated with torticollis because child would not move neck freely.

References

**NECK-12~NUCLEAR MEDICINE**

✓ Nuclear Medicine
  o Nuclear medicine studies may be used in some clinical situations to evaluate neck masses as well as thyroid and parathyroid disease following initial studies with anatomic imaging, such as ultrasound, CT, or MRI:
    ▪ See **PEDNECK-2~NECK MASSES (PEDIATRIC)** and **PEDNECK-6~THYROID AND PARATHYROID** for imaging guidelines
    ▪ Salivary Gland Nuclear Imaging (one of CPT® 78230, 78231, or 78232) is indicated for the following:
      • Evaluation of salivary gland function in patients with dry mouth (xerostomia) and one of the following:
        o Sjögren’s syndrome
        o Sialadenitis
        o History of head or neck radiation therapy
      • Evaluation of children with cerebral palsy

✓ Salivary Gland Nuclear Imaging (one of CPT® 78230, 78231, or 78232) is indicated for evaluation of parotid masses to allow preoperative diagnosis of Warthin’s tumor

✓ Esophageal motility study (CPT® 78258) is indicated for any of the following:
  ▪ Dysphagia associated with chest pain and difficulty swallowing both solids and liquids
  ▪ Gastroesophageal reflux

✓ For patients with documented hyperthyroidism, thyroid uptake nuclear imaging (either CPT® 78012 or 78014) is indicated

✓ For patients with documented congenital hypothyroidism, thyroid uptake nuclear imaging (either CPT® 78014) is indicated
Either ultrasound (CPT® 76536) or sestamibi parathyroid nuclear imaging (one of CPT® 78070, 78071, or 78072) is indicated for initial evaluation of hyperparathyroidism, generally indicated by one of the following:
  - Serum calcium (>1 mg/dL over upper limit of normal)
  - Elevated serum calcium and elevated serum parathyroid hormone (PTH)