

NECK GUIDELINES
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MedSolutions, Inc. Clinical Decision Support Tool
for Advanced Diagnostic Imaging

Common symptoms and symptom complexes are addressed by this tool. Imaging requests for patients with atypical symptoms or clinical presentations that are not specifically addressed will require physician review. Consultation with the referring physician may provide additional insight.

This version incorporates MSI accepted revisions prior to 11/30/08

ABBREVIATIONS for NECK GUIDELINES

ALS	Amyotrophic lateral sclerosis
CT	computed tomography
ENT	Ear, Nose, Throat
FNA	fine needle aspiration
GERD	gastroesophageal reflux disease
GI	gastrointestinal
HIV	human immunodeficiency virus
MRI	magnetic resonance imaging

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NECK IMAGING GUIDELINES

NECK-1~GENERAL GUIDELINES

- Advanced imaging of the neck covers the area from the skull base, nasopharynx, and upper oral cavity to the head of the clavicle.
 - Neck imaging includes the parotid glands and the supraclavicular region.
 - Neck imaging includes the skull base; thus a separate CPT code for head imaging in order to visualize the skull base is not necessary.
- 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 the thyroid gland with CT scan, since contrast may cause intense and prolonged enhancement of the gland which interferes with radioactive iodine nuclear medicine studies
- Neck CT is indicated in the majority of cases to evaluate pathology in the neck when advanced imaging is appropriate. Indications for neck MRI are much less common.
 - MRI neck without and/or with contrast is also appropriate when there are concerns about CT contrast as in renal insufficiency or contrast allergy.

NECK-2~CEREBROVASCULAR AND CAROTID DISEASE

- See in Head guidelines:
 - HD-3 CT and MR Angiography
 - HD-17 Hyperacute Headache/Berry Aneurysm/Subarachnoid Hemorrhage
 - HD-30 General Stroke/TIA
 - HD-31 Special Stroke/TIA
 - HD-32 Syncope
 - HD-33 Cerebral Vasculitis
 - HD-34 Vertigo
 - HD-38 Horner's Syndrome
 - HD-47 Tinnitus
- See PVD-3 Cerebrovascular and Carotid Disease in Peripheral Vascular Disease guidelines

NECK-3~DYSPHAGIA

- Dysphagia (difficulty swallowing) can be caused by anything that affects the body's ability to move food, liquid, or saliva from the mouth to the pharynx and into the esophagus.
- A wide range of etiologies, including weak tongue or cheek muscles, neurological disability from stroke, ALS, neuromuscular disease, or Alzheimer's disease, medication side-effects, decreased function of the esophageal sphincter due to advanced age, esophageal spasm, benign strictures, or cancer, can cause dysphagia.
- A detailed history of the dysphagia symptoms is important to distinguish neurogenic, pharyngeal and esophageal disorders. The most common cause of dysphagia is stroke. Neurogenic causes of dysphagia frequently cause oropharyngeal dysphagia.
- A short duration (weeks to months) of rapidly progressive esophageal dysphagia with associated weight loss is highly suggestive of esophageal cancer. See *ONC-8 Esophageal Cancer* in the Oncology guidelines.
- Barium swallow, endoscopy, and/or esophageal manometry should be the initial imaging studies obtained to evaluate dysphagia.
- Abnormalities seen on the above studies can be further evaluated with CT or less commonly, MRI.
- GI, ENT, Neurology or Thoracic surgery specialist consultation is helpful in determining the appropriate imaging pathway.
- **Reference:**
 - *British Journal of Nursing* 2006;13(10):558-561
 - *Cook IJ. Diagnostic evaluation of dysphagia. From Nature Clinical Practice Gastroenterology & Hepatology. Medscape General Surgery, June 12, 2008. <http://www.medscape.com/viewarticle/575754>. Accessed November 10, 2008*

NECK-4~ESOPHAGUS

- Symptoms of dysphagia, odynophagia (painful swallowing), or regurgitation should be evaluated initially with barium swallow, endoscopy, and/or esophageal manometry.
- Patients who present with hematemesis (including hematemesis from suspected Mallory-Weiss tear in the distal esophagus caused by severe vomiting) should be evaluated initially with endoscopy.
- Advanced imaging is not routinely indicated to evaluate patients with hiatal hernia.
 - **Exception:** chest CT with contrast (CPT 71260) and abdominal CT with contrast (CPT 74160) can be obtained for preoperative planning in patients with large hiatal hernias or paraesophageal hernias.
 - Postoperative advanced imaging is not routinely indicated unless the patient has signs/symptoms of a potential complication from surgery.

- Advanced imaging is not routinely indicated to evaluate patients with gastroesophageal reflux disease (GERD) unless requested as a preoperative study in patients undergoing Nissen fundoplication or other surgical treatment for the reflux.
 - Postoperative advanced imaging is not routinely indicated unless the patient has signs/symptoms of a potential complication from surgery.
 - Advanced imaging in patients with Barrett's esophagus is not indicated unless biopsy shows frank malignancy.
- Suspected foreign body obstructing the esophagus should be evaluated with x-ray, contrast study such as barium or Gastrografin study, and endoscopy.
- Suspected esophageal stricture due to any cause (e.g. radiation, peptic stricture from reflux, lye stricture, neoplastic, postoperative, drug-induced, Crohn's disease, Schatzki's ring at the squamocolumnar junction, esophageal web) should be evaluated initially with barium swallow and endoscopy.
- **Esophageal perforation:**
 - Associated with high morbidity and mortality
 - Esophageal endoscopy accounts for the vast majority of esophageal perforations.
 - Esophageal perforations occur most commonly at the distal esophagus and in the posterior wall of the cervical esophagus.
 - Chest x-ray should be obtained initially and can show subcutaneous emphysema, pneumomediastinum, or prevertebral air.
 - Contrast study using water-soluble contrast such as Gastrografin should be performed. If no perforation is seen, repeat contrast study using barium should be done.
 - Neck CT and/or chest CT with contrast (CPT 70491 and 71260) can be performed to evaluate for abscess.
- **Motility Disorders:**
 - Suspected motility disorders such as aperistalsis, achalasia, diffuse spasm, nutcracker esophagus, myasthenia gravis, and scleroderma should be evaluated by barium swallow and manometry. Advanced imaging is not routinely indicated.
- **Esophageal Diverticulum:**
 - Pulsion and traction diverticula can occur.
 - Midesophageal diverticula are usually traction in origin (contain both mucosal and muscular layer).
 - Zenker's (pharyngoesophageal) and epiphrenic diverticula are usually pulsion (mucosa only).
 - Initial evaluation includes barium swallow, endoscopy, and manometry studies.
 - CT scan of the neck and/or chest (contrast as requested) can be performed for further evaluation if needed.
- **Leiomyoma:**
 - Most common benign esophageal neoplasm.
 - 60% of leiomyomas occur in the distal third of the esophagus, 30% in the middle third, 10% in the upper third.

- Usually solitary, but multiple leiomyomas can occur.
- Appears as a filling defect on barium swallow, but mucosa is normal on endoscopy since the leiomyoma is a submucosal lesion.
- Neck CT and/or chest CT with contrast (CPT 70491 and/or 71260) or MRI (CPT 70543 and/or 71552), and endoscopic ultrasound are helpful in evaluating this lesion and for preoperative planning.
- Other esophageal masses should undergo evaluation with barium swallow, endoscopy, and biopsy prior to considering advanced imaging.
- Esophageal Carcinoma—See *ONC-8 Esophageal Cancer in the Oncology guidelines.*
- **Reference:**
 - Ho CS, *Imaging*. In Pearson FG, Deslauriers J, Ginsberg RJ, et al. (Eds.). *Esophageal Surgery*. New York, Churchill Livingstone, Inc., 1995, pp.71-104

NECK-5~CERVICAL LYMPHADENOPATHY

- Causes of cervical lymphadenopathy can be divided into two categories:
 - a) Inflammatory
 - b) Neoplastic
- **Inflammatory**
 - Inflammatory lymph nodes from acute lymphadenitis are usually painful, tender and mobile, frequently associated with upper respiratory infection, pharyngitis or dental infection.
 - Occasionally, sarcoidosis or toxoplasmosis and HIV can cause inflammatory lymphadenopathy.
 - Painful acute lymphadenopathy and other painful neck masses (including neck “swelling”) should be treated with a trial of conservative therapy, including antibiotics if appropriate.
 - If there is Improvement with conservative treatment, advanced imaging is not indicated.
 - Ultrasound can be helpful in determining whether a distinct mass/abnormality is present
- **Neoplastic lymphadenopathy**
 - Most common causes are metastasis from head and neck tumors and lymphoma.
 - Neoplasm should be suspected in patients over age 40 with painless, enlarged firm and fixed lymph nodes.
 - ENT evaluation and/or a thorough head and neck examination including laryngoscopy, if indicated, should be performed initially.
 - CT neck with contrast (CPT 70491) is helpful in determining an association with underlying structures, determining the full extent of the lesions, and to identify other pathologic lymph nodes.
 - Chest x-ray should be performed to identify primary lung disease, involvement of mediastinal lymph nodes or other metastases.
 - CT chest with contrast (CPT 71260) or without contrast (CPT 71250) may be appropriate if x-ray findings are abnormal or unclear.

- Left supraclavicular enlarged lymph nodes are worrisome for metastasis from a chest, abdominal, or pelvic primary. Biopsy is helpful to determine the primary source of a metastatic lymph node in this region.
- **References:**
 - Randolph GW. *Anatomy of the neck, examination of the head and neck and evaluation of neck masses.* In Wilson WR, Nadol JB, Randolph GW. *The Clinical Handbook of Ear, Nose and Throat Disorders.* New York, Parthenon Publishing Group, 2002, pp. 244-264
 - *Am Fam Physician* 1998 Oct;58:6

NECK-6~NECK MASSES

- The age of a patient with a neck mass can narrow the diagnostic possibilities:
 - **Patients under age 20:** higher incidence of congenital lesions.
 - **Patients over age 40:** malignancy is a greater possibility, especially in heavy drinkers and smokers.
- Location of the neck mass is important.
 - Anterior portion of the neck is associated with thyroid and parathyroid disorders.
 - Neck masses that are located on the anterior neck should have ultrasound performed as the initial imaging study.
 - Lateral portions of the neck are associated with lymphadenopathy, branchial cleft cysts, and deep neck abscess.
 - If the neck mass is located on the lateral or posterior neck and is described as a definite, nontender, discrete mass on physical examination, neck CT with contrast (CPT 70491) can be performed.
- **Reference:**
 - *Neck Mass: Assessment of a Neck Mass.* ACS Surgery Online WebMD, June 7, 2006, <http://www.acssurgery.com>. Accessed October 9, 2007
- Patients who present with symptoms such as significant dyspnea, stridor, or dysphagia should be referred to the Emergency Department for immediate evaluation and treatment.
- Advanced imaging is not indicated in patients who present with uncomplicated pharyngitis or tonsillitis. These patients should have a trial of conservative therapy including antibiotics, if appropriate.
 - ENT evaluation can be helpful in determining the need for advanced imaging.
- Patients who present with suspected peritonsillar, retropharyngeal, or other head and neck abscesses should have neck CT with contrast (CPT 70491).
- For possible neck masses or fullness of the neck that is not well described on physical examination, ultrasound or ENT evaluation can be helpful in making decisions regarding the need for advanced imaging.
- Patients with a history of malignancy who present with a neck mass should have neck CT with contrast (CPT 70491) as the initial imaging study.
- CT of the neck without contrast (CPT 70490) is typically indicated in the setting of

suspected salivary duct or gland stone. 80% of these stones occur in the submandibular glands.

- CT of the neck with and without contrast (CPT 70492) may be useful if obstructing calculus and inflammatory disease is suspected.
- Sialogram (contrast dye injection) under fluoroscopy, CT sialogram (CPT 70486), or MR sialogram (CPT 70540), may be performed to rule out a stone.
- In patients with a suspected parotid gland mass, ENT evaluation can be very helpful in determining the most appropriate diagnostic algorithm, including the use of advanced imaging.
 - CT scan (usually CPT 70487 or 70488 if stone is also being ruled out; some ENT's prefer CPT 70492) or MRI (CPT 70543) may be useful in determining a diagnosis.
- MRI of the neck without and with contrast (CPT 70543) is indicated when ultrasound or CT scan suggests neurogenic tumor (schwannoma, neurofibroma, glomus tumor, etc.), or if CT scan suggests the need for further imaging. MRI is also useful in evaluating vascular malformations and angiofibromas.
- Although CT and MRI scan can have characteristic appearances for certain entities, biopsy and histological diagnosis are the only way to obtain a definitive diagnosis.

NECK-7~MALIGNANCIES INVOLVING THE NECK

- See in Oncology guidelines:
 - ONC-2 Squamous Cell Carcinomas of the Head and Neck
 - ONC-3 Salivary Gland Cancers
 - ONC-6 Thyroid Cancer
 - ONC-8 Esophageal Cancer
 - ONC-26 Lymphomas

NECK-8~RECURRENT LARYNGEAL PALSY

- See HD-10 Recurrent Laryngeal Palsy in the Head guidelines

NECK-9~THYROID AND PARATHYROID

- All requests for advanced imaging in patients with thyroid or parathyroid disease should be sent for Medical Director review.
- Ultrasound and nuclear medicine scan are the preferred initial imaging studies for suspected thyroid masses. If ultrasound shows a dominant mass, fine needle aspiration (FNA) should be the next diagnostic study.
 - Repeat FNA with ultrasound guidance should be done for non-diagnostic results on initial biopsy, as there is up to a 10% false negative rate, especially for very small, very large (> 3 cm), and cystic masses.
 - Thyroid nodules >4 cm should undergo thyroid lobectomy with complete

removal due to high incidence of false negative FNA biopsies and the high incidence of malignancy (26%).*

*Surgery 2007 Dec;142(6): pp 837-844

- Neck CT (CPT 70490 or 70491) can be obtained as a preoperative study in patients in whom resection is planned.
 - Contrast is not generally used when evaluating the thyroid gland with CT scan since contrast may cause intense and prolonged enhancement of the gland which interferes with radioactive iodine nuclear medicine studies.
- Incidental thyroid nodules found on imaging (ultrasound, CT, or MRI) can be followed by ultrasound. FNA is indicated if there is concern for malignancy.
- Nuclear medicine Sestamibi study of the parathyroid gland is the preferred initial imaging study in patients with suspected parathyroid disease (high serum calcium and high serum parathyroid hormone level).
 - MRI has good sensitivity and positive predictive value for imaging non-ectopic and ectopic abnormal parathyroid glands and is generally used in patients with recurrent or persistent hyperparathyroidism following neck exploration.*
*Magn Reson Imaging Clin N Am 2000 Feb;8(1):163-182
- CT or MRI is useful in patients with very high calcium (greater than or equal to 13) suggesting parathyroid carcinoma.
- Neck and chest CT without contrast (CPT 70490 and 71250) are sufficient to evaluate a suspected substernal goiter (i.e. a major portion of the goiter lies within the mediastinum). The vast majority of these goiters can be resected through a cervical incision.

NECK-10~TRACHEA

- The initial imaging studies for evaluating patients with suspected tracheal pathology include plain x-ray and bronchoscopy.
- Neck CT with contrast (CPT 70491) or without contrast (CPT 70490) and chest CT with contrast (CPT 71260) or without contrast (CPT 71250) can be performed to further evaluate abnormalities seen on other imaging studies.
- CT is often not helpful in making the diagnosis of tracheomalacia, and cineradiography and bronchoscopy are the imaging studies of choice.*
*Maddaus M and Pearson FG, Tracheomalacia. In Pearson FG, Deslauriers J, Ginsberg RJ, et al. (eds.) Thoracic Surgery. New York, Churchill Livingstone, Inc., 1995, pp.273-274

EVIDENCE BASED CLINICAL SUPPORT

Evidence Based Clinical Support NECK- 6~NECK MASSES

- Most lateral neck masses are enlarged lymph nodes.
- Other entities in the differential diagnosis include branchial cleft cyst, abscess, laryngocele, lipoma, neurinoma, glomus tumor, paraganglioma, and fibroma.
- Adults over age 40 presenting with a cystic neck mass can have cystic metastases from occult squamous cell primaries. Neck CT scan, FNA, and panendoscopy of the head and neck should be performed.
- 25%-45% of extracranial schwannomas occur in the head and neck and usually present as asymptomatic solitary neck lesions.
- The most common ENT manifestations of sarcoidosis are neck masses, parotid masses, and facial nerve palsy. Cervical adenopathy is usually bilateral with mobile, nontender lymph nodes. Neck CT scan and biopsy are needed for diagnosis.

NECK GUIDELINE REFERENCES

NECK GUIDELINE REFERENCES

NECK-3~Dysphagia

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NECK-4~Esophagus

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NECK-5~Cervical Lymphadenopathy

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- Ferrer R. Lymphadenopathy: differential diagnosis and evaluation. *Am Fam Physician*1998 Oct; 58:6.

NECK-6~Neck Masses

- *Neck Mass: Assessment of a Neck Mass*. ACS Surgery Online WebMD, June 7, 2006, <http://www.acssurgery.com>. Accessed October 9, 2007.
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NECK-9~Thyroid and Parathyroid

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- Thyroid and parathyroid glands: Imaging, treatment and beyond. In Loeyner, LA (Ed.) *Neuroimaging Clinics* 2008 Aug;18(3):445-562.
- McCoy KL, Jabbour N, Ogilvie JB, et al. The incidence of cancer and rate of false negative cytology in thyroid nodules greater than or equal to 4 cm in size. *Surgery* 2007 Dec;142(6): pp 837-844.

NECK-10~Trachea

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