

Cigna Medical Coverage Policies – Radiology Neck Imaging Guidelines

Effective February 1, 2021



Instructions for use

The following coverage policy applies to health benefit plans administered by Cigna. Coverage policies are intended to provide guidance in interpreting certain standard Cigna benefit plans and are used by medical directors and other health care professionals in making medical necessity and other coverage determinations. Please note the terms of a customer's particular benefit plan document may differ significantly from the standard benefit plans upon which these coverage policies are based. For example, a customer's benefit plan document may contain a specific exclusion related to a topic addressed in a coverage policy.

In the event of a conflict, a customer's benefit plan document always supersedes the information in the coverage policy. In the absence of federal or state coverage mandates, benefits are ultimately determined by the terms of the applicable benefit plan document. Coverage determinations in each specific instance require consideration of:

1. The terms of the applicable benefit plan document in effect on the date of service
2. Any applicable laws and regulations
3. Any relevant collateral source materials including coverage policies
4. The specific facts of the particular situation

Coverage policies relate exclusively to the administration of health benefit plans. Coverage policies are not recommendations for treatment and should never be used as treatment guidelines.

This evidence-based medical coverage policy has been developed by eviCore, Inc. Some information in this coverage policy may not apply to all benefit plans administered by Cigna.

These guidelines include procedures eviCore does not review for Cigna. Please refer to the [Cigna CPT code list](#) for the current list of high-tech imaging procedures that eviCore reviews for Cigna.

CPT® (Current Procedural Terminology) is a registered trademark of the American Medical Association (AMA). CPT® five digit codes, nomenclature and other data are copyright 2020 American Medical Association. All Rights Reserved. No fee schedules, basic units, relative values or related listings are included in the CPT® book. AMA does not directly or indirectly practice medicine or dispense medical services. AMA assumes no liability for the data contained herein or not contained herein.

Neck Imaging Guidelines	
Abbreviations For Neck Imaging Guidelines	3
Neck-1: General	4
Neck-2: Cerebrovascular and Carotid Disease	7
Neck-3: Dysphagia and Esophageal Disorders	8
Neck-4: Cervical Lymphadenopathy	12
Neck-5: Neck Masses	14
Neck-6: Malignancies Involving the Neck	17
Neck-7: Recurrent Laryngeal Palsy	18
Neck-8: Thyroid and Parathyroid	19
Neck-9: Trachea and Bronchus	28
Neck-10: Neck Pain	30
Neck-11: Salivary Gland Disorders	32
Neck-12: Sore Throat, Odynophagia, and Hoarseness	33

Abbreviations For Neck Imaging 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

Neck-1: General

Neck-1.0: General Guidelines

5

Neck-1.0: General Guidelines

- 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 individual can substitute for a face-to-face clinical evaluation
- Advanced imaging of the neck covers the following areas:
 - ◆ Skull base (thus a separate CPT® code for head imaging in order to visualize the skull base is not necessary).
 - ◆ Nasopharynx
 - ◆ Upper oral cavity to the head of the clavicle
 - ◆ Parotid glands and the supraclavicular region
- 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.
- CT Neck
 - ◆ CT Neck is usually obtained with contrast only (CPT® 70491).
 - Little significant information is added by performing a CT Neck without and with contrast (CPT® 70492), and there is the risk of added radiation exposure, especially to the thyroid.
 - CT Neck 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 trachea with CT. Evaluate salivary duct stones in the appropriate clinical circumstance where intravenous contrast may obscure high attenuation stones
 - Contrast enhanced CT is helpful in the assessment of cervical adenopathy and preoperative planning in the setting of thyroid carcinomas
 - Contrast is recommended as an adjunct to US for individuals with clinical suspicion for advanced disease, including invasive primary tumor, or clinically apparent multiple or bulky lymph node involvement
 - Contrast may cause intense and prolonged enhancement of the thyroid gland which interferes with radioactive iodine nuclear medicine studies.
 - Use of IV contrast is an important adjunct because it helps to delineate the anatomic relationship between the primary tumor and metastatic disease. Iodine is generally cleared within four to eight weeks in most individuals, so concern about iodine burden from IV contrast causing a clinically significant delay in subsequent whole-body scans (WBSs) or radioactive iodine (RAI) treatment after the imaging followed by surgery is generally unfounded. The benefit gained from improved anatomic imaging generally outweighs any potential risk of a several week delay in RAI imaging or therapy. Where there is concern, a urinary iodine to creatinine ratio can be measured.

➤ MRI Neck

- ◆ MRI Neck is used less frequently than CT Neck.
- ◆ MRI Neck 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

Reference

1. Haugen BR, Alexander EK, Bible KC, et al. 2015 American Thyroid Association Management Guidelines for adult patients with thyroid nodules and differentiated thyroid cancer: The American Thyroid Association Guidelines Task Force on Thyroid Nodules and Differentiated Thyroid Cancer. *Thyroid*. 2016 Jan;26(1):1-133.

Neck-2: Cerebrovascular and Carotid Disease

- See these related topics in the Head Imaging Guidelines:
 - ◆ **HD-1.5: General Guidelines – CT and MR Angiography: (CTA and MRA)**
 - ◆ **HD-12: Aneurysm and AVM**
 - ◆ **HD-21: Stroke/TIA**
 - ◆ **HD-22: Cerebral Vasculitis**
 - ◆ **HD-23: Dizziness, Vertigo and Syncope**
 - ◆ **HD-27: Hearing Loss and Tinnitus**
 - ◆ **HD-32: Eye Disorders and Visual Loss**
- See **PVD-3: Cerebrovascular and Carotid Disease** in Peripheral Vascular Disease Imaging Guidelines.

Neck-3: Dysphagia and Esophageal Disorders

Neck-3.1: Dysphagia and Esophageal Disorders

9

Neck-3.1: Dysphagia and Esophageal Disorders

- Gastroesophageal Reflux Disease (GERD)⁵
 - ◆ Non-cardiac chest pain suspected of being GERD should be evaluated first to exclude cardiac and other etiologies. See **CH-4.1: Non-Cardiac Chest Pain-Imaging** in the Chest Imaging Guidelines and **EGD-1: Indications for EGD** the Gastrointestinal Endoscopic Procedure Guidelines.
 - ◆ Gastric emptying study (CPT® 78264) for individuals with refractory GERD symptoms, and gastroparesis is being considered.
- Suspected foreign body impaction and ingested foreign bodies:¹⁻³
 - ◆ Plain x-rays initial imaging.
 - ◆ If imaging is negative, or there is suspicion of a radiolucent foreign body (such as fish or chicken bones, wood, plastic, thin metal objects, aluminum can pop-ups, etc.):
 - CT Neck and/or Chest with or without contrast.
 - 3-D reconstruction (CPT® 76377) can be approved in this setting.
 - ◆ The use of oral contrast is discouraged (to avoid the aspiration of contrast material) for acute dysphagia or foreign body impaction, as the contrast may not pass, may be aspirated, and can interfere with subsequent endoscopic intervention.
- Oropharyngeal or esophageal dysphagia^{4,6,12,13}
 - ◆ Oropharyngeal (difficulty in transferring food from the mouth to the pharynx)
 - Suspected neurologic causes: See appropriate sections in **Head Imaging Guidelines**
 - Video fluoroscopic swallowing study
 - ◆ Esophageal dysphagia (difficulty in transferring food down the esophagus in the retrosternal region, e.g. food sticking in the chest)
 - Initial barium esophagram or upper gastrointestinal endoscopy
 - Esophageal manometry if indicated
 - Structural lesions identified on esophagram or endoscopy requiring further evaluation (e.g. tumors, extrinsic compression):
 - CT Neck (CPT® 70491), CT Chest (CPT® 71260) and/or CT Abdomen (CPT® 74160) depending on the level of the lesion
- Suspected perforation, abscess, or fistula
 - ◆ CT Neck, Chest, and/or Abdomen, preferably with contrast, as requested, depending on location
- Evaluation of structural abnormalities demonstrated on barium esophagram or endoscopy (e.g., external compression, tumor, stricture, diverticulum, etc.)
 - ◆ CT Chest (CPT® 71260), CT Neck (CPT® 70491), and/or CT Abdomen (CPT® 74160) depending on location
- Hiatal hernia
 - ◆ See **AB-12.3: Hiatal Hernia** in the Abdomen Imaging Guidelines

- Globus Sensation⁷⁻⁹
 - ◆ If red flag symptoms are present (dysphagia, weight loss, odynophagia, throat pain, hoarseness, and lateralization of symptoms)
 - Laryngoscopy and upper endoscopy should be performed prior to advanced imaging
 - CT Neck with contrast (CPT[®] 70491) for ANY of the following:
 - Negative or equivocal findings on laryngoscopy and upper endoscopy
 - Known history of upper aerodigestive or esophageal malignancy
 - Known history of lymphoma
 - History of previous neck, esophageal, or gastric surgery
 - Palpable abnormality on physical examination
- Suspected Vascular Ring^{10,11,14,15}
 - ◆ CTA Chest with contrast (CPT[®] 71275) can be used in the evaluation of suspected vascular ring
 - ◆ MRI Chest without contrast, or MRI Chest without and with contrast (CPT[®] 71550 or CPT[®] 71552), can be performed if vascular ring is suspected
- Post-operative dysphagia
 - ◆ Dysphagia following surgery on the oropharynx, soft tissues of the neck, cervical spine, esophagus, or stomach:
 - In the immediate post-operative period the concern is for fluid collections, anastomotic leaks, perforations, and abscess. In the delayed post-operative period (>1 month) the concern is recurrent disease or a late post-operative fluid collection.
 - CT Neck with contrast (CPT[®] 70491) and, if requested CT Chest with contrast (CPT[®] 71260) (IV contrast better defines the anatomic structures than a non-contrast study as soft-tissue and blood vessel enhancement are better delineated from post-operative fluid collections, such as hematomas and abscesses – Note: CT without and with contrast offers little additional benefit compared to a CT with contrast alone¹⁰)

Background and Supporting Information

- 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.
- Advanced imaging for individuals presenting with isolated globus rarely impacts clinical management. In a study of 148 neck CTs and 104 barium esophagrams done for the evaluation of globus sensation, there were no malignancies detected.
- Advanced imaging is generally not indicated for the evaluation of GERD, the diagnosis of which is usually made on the basis of clinical history, in conjunction with endoscopy, pH monitoring, and occasionally manometry.

- Globus sensation is a feeling of a lump or foreign body in the throat. In general, laryngoscopy, endoscopy, and physical examination will rule out malignant causes and advanced imaging is usually not needed for evaluation.

References

1. Guelfguat M. Clinical Guideline for Imaging and Reporting Ingested Foreign Bodies. *American Journal of Roentgenology*, 2014, 203;37-53.
2. Takada, M. et. al. 3D-CT diagnosis for ingested foreign bodies. *Am J. Emerg Med* 2000;18:192-3.
3. ASGE Guideline: Management of Ingested Foreign Bodies and Food Impactions. 2011. *Gastrointestinal Endoscopy* Vol. 73, No 6.
4. ASGE Guideline: The Role of Endoscopy in the Evaluation and Management of Dysphagia. *Gastrointestinal Endoscopy* Vol. 79, No 2. 2014.
5. Katz PO, Gerson LB, Vela MF. Guidelines for the Diagnosis and Management of Gastroesophageal Reflux Disease. 2013. *Amer. J. Gastroenterology*; 108:308-328.
6. Liu LWC, Andrews CN, Armstrong D, et al. Clinical Practice Guidelines for the Assessment of Uninvestigated Esophageal Dysphagia. *Canadian Association of Gastroenterology. Journal of the Canadian Association of Gastroenterology*. Vol. 1. Issue 1, 13 April 2018.
7. Lee BE. Globus pharyngeus: A review of its etiology, diagnosis and treatment. *World Journal of Gastroenterology*. 2012;18(20):2462. doi:10.3748/wjg.v18.i20.2462.
8. ACR Appropriateness Criteria Nontraumatic Aortic Disease. Rev. 2013
9. ACR Appropriateness Criteria Known or Suspected Congenital Heart Disease in Adults. Rev. 2016
10. ACR Appropriateness Criteria Dysphagia. Rev. 2018
11. Pasha SF, Acosta RD, Chandrasekhara V, et al. The role of endoscopy in the evaluation and management of dysphagia. *Gastrointest Endoscopy*. 2014 Feb;79(2):191-201.
12. Poletto E, Mallon MG, Stevens RM, Avitabile CM. Imaging Review of Aortic Vascular Rings and Pulmonary Sling. *J Am Osteopath Coll Radiol*. 2017;6(2):5-14.
13. Hellinger JC, Daubert M, Lee EY, Epelman M. Congenital Thoracic Vascular Anomalies: Evaluation with State-of-the-Art MR Imaging and MDCT. *Radiologic Clinics of North America*. 2011;49(5):969-996. doi:10.1016/j.rcl.2011.06.013.

Neck-4: Cervical Lymphadenopathy

Neck-4.1: Imaging

13

Neck-4.1: Imaging

See: **Neck-5.1: Neck Masses – Imaging**

Neck-5: Neck Masses

Neck-5.1: Imaging

15

Neck-5.1: Imaging

- Cervical lymphadenitis is common and follows most viral or bacterial infections of the ears, nose and throat. Painful acute lymphadenopathy should be treated with a trial of conservative therapy for 2 weeks, including antibiotics if appropriate. If there is improvement with conservative treatment, advanced imaging is not indicated but if the adenopathy persists it may be imaged as per below.^{1,2,4}
- Ultrasound (CPT® 76536) can be considered for ANY of the following:^{1,2,4}
 - ◆ Anterior neck masses²
 - ◆ Cervical adenopathy/lymphadenitis or an inflammatory, infective, or reactive mass that has failed a 2 week trial of treatment or observation (including antibiotics if appropriate)^{1,2}
 - ◆ Any ill-defined mass, fullness or asymmetry²
 - ◆ High suspicion of malignancy^{2,4}
- CT Neck with contrast (CPT® 70491) can be considered if:^{2,4}
 - ◆ Neck mass with any ONE of the following:
 - Non-tender neck masses⁴
 - Size $\geq 1.5\text{cm}^4$
 - Firm texture or fixation of the mass⁴
 - Absence of infectious etiology⁴
 - 2 or more weeks duration⁴
 - Cervical adenopathy/lymphadenitis or an inflammatory, infective, or reactive mass that has failed a 2 week trial of treatment or observation (including antibiotics if appropriate)^{2,4}
 - Ear pain ipsilateral to the neck mass⁴
 - Associated onset of persistent hoarseness, tonsil asymmetry, oral or oropharyngeal ulceration, or ulceration of skin overlying the neck mass⁴
 - History of malignancy that would be primary or metastatic to the neck⁴
 - Prior ultrasound results are suspicious or indeterminate for malignancy²
 - ◆ Carcinoma found in a lymph node or other neck mass²
 - ◆ Suspected peritonsillar, retropharyngeal or other deep neck space abscess²
 - ◆ Suspected or known sarcoidosis⁵
 - ◆ Preoperative evaluation of any neck mass²
- MRI Neck without and with contrast (CPT® 70543) is supported if:²
 - ◆ CT suggests the need for further imaging²
 - ◆ Ultrasound or CT suggests neurogenic tumor (schwannoma, neurofibroma, glomus tumor, etc.), vascular malformations, deep neck masses, or angiofibroma.²

Background and Supporting Information

- Painful acute lymphadenopathy associated with uncomplicated pharyngitis, URI or tonsillitis should undergo conservative therapy for two weeks including antibiotics, if appropriate. If there is improvement with conservative treatment, advanced imaging is not indicated if:^{3,4,5}
 - ◆ Inflammatory neck adenopathy is often associated with upper respiratory infection, pharyngitis, dental infection, HIV, and toxoplasmosis. Occasionally it is associated with sarcoidosis, and tuberculosis.
- Malignancy is a greater possibility in adults that are heavy drinkers and smokers, but HPV associated disease is on the rise and there can be a high suspicion for malignancy even without these traditional risk factors.
- 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. The preferred initial method of biopsy is FNA or Ultrasound guided FNA of the mass.⁵
- The most common causes of neoplastic adenopathy are metastasis from head and neck tumors and lymphoma.

References

1. Ferrer R. Lymphadenopathy: differential diagnosis and evaluation. *Am Fam Physician*. 1998 Oct;58(6):1313-1320.
2. Wippold II F, Cornelius RS, Berger KL, et al. ACR Appropriateness Criteria® Neck mass/adenopathy. *American College of Radiology (ACR)*. Date or origin: 2009. Last review date: 2018.
3. Shulman ST, Bisno AL, Clegg HW, et al. Clinical Practice Guideline for the Diagnosis and Management of Group A Streptococcal Pharyngitis: 2012 Update by the Infectious Diseases Society of America. *Clinical Infectious Diseases*. 2012;55(10). doi:10.1093/cid/cis629.
4. Pynnonen MA, Gillespie MB, Roman B, et al. Clinical Practice Guideline: Evaluation of the Neck Mass in Adults Executive Summary. *Otolaryngology–Head and Neck Surgery*. 2017;157(3):355-371. doi:10.1177/0194599817723609.
5. Chapman MN, Fujita A, Sung EK, et al. Sarcoidosis in the Head and Neck: An Illustrative Review of Clinical Presentations and Imaging Findings. *American Journal of Roentgenology*. 2017;208(1):66-75. doi:10.2214/ajr.16.16058.

Neck-6: Malignancies Involving the Neck

- See the following in the Oncology Imaging Guidelines:
 - ◆ **ONC-3: Squamous Cell Carcinomas of the Head and Neck**
 - ◆ **ONC-4: Salivary Gland Cancers**
 - ◆ **ONC-6: Thyroid Cancer**
 - ◆ **ONC-9: Esophageal Cancer**
 - ◆ **ONC-27: Non-Hodgkin Lymphomas**
 - ◆ **ONC-28: Hodgkin Lymphomas**

Neck-7: Recurrent Laryngeal Palsy

- See **HD-7: Recurrent Laryngeal Palsy** in the Head Imaging Guidelines

Neck-8: Thyroid and Parathyroid

Neck-8.1: Thyroid Nodule	20
Neck-8.2: This section intentionally left blank	22
Neck-8.3: Parathyroid Imaging	23

Neck-8.1: Thyroid Nodule

- Serum thyrotropin (TSH) should be measured in the initial evaluation of thyroid nodule/mass/asymmetry/goiter.
- Nuclear scan (CPT® 78013 or CPT® 78014) should be performed as the initial imaging study if the serum TSH is subnormal and ANY of the following:
 - ◆ Single or multiple thyroid nodules^{3,6}
 - ◆ Suspicion of ectopic thyroid tissue³
 - ◆ Presence of thyroid nodule in the setting of Grave's disease (to rule out cold nodule).³
 - ◆ Non-diagnostic or indeterminate FNA of thyroid nodule, (e.g. follicular lesion of undetermined significance) to see if hot (functioning) nodule that may be benign vs. cold nodule.
- Ultrasound (US) Neck (CPT® 76536) is the appropriate initial study for evaluation of suspected thyroid abnormalities, including goiter and thyroid mass(es) in the following clinical scenarios^{2,3,6} (See **Neck-5.1: Imaging** regarding nonthyroidal anterior neck masses):
 - ◆ Normal or High serum thyrotropin (TSH)^{1,3,6}
 - ◆ Thyroid nodule(s) being monitored with imaging: US is the indicated imaging modality rather than CT or MRI
 - ◆ Nodules ≤1 cm with very low suspicion US pattern including spongiform pattern and pure cysts do not require repeat US.⁶
 - ◆ For more suspicious or larger nodules, if Fine Needle Aspiration (FNA) is not performed or was not diagnostic for malignancy, US can be repeated:
 - If US features are highly suspicious: repeat US every 6 months for up to 24 months.
 - If US features are of low to intermediate suspicion: repeat US at 12 and 24 months.
 - If nodule is stable after 24 months, follow-up ultrasound exams (CPT® 76536) can be performed every 3 to 5 years for interval surveillance.¹²
- Fine-Needle Aspiration (FNA) is indicated for suspicious and/or large thyroid nodules prior to CT or MRI imaging.⁶

Sonographic Patterns, Estimated Risk of Malignancy, and FNA Guidance for Thyroid nodules*			
Sonographic Pattern	US features	Estimated risk of malignancy, %	FNA size cutoff (largest dimensions)
High Suspicion	Solid hypoechoic nodule or solid hypoechoic component of a partially cystic nodule with one or more of the following features: irregular margins (infiltrative, microlobulated), microcalcifications, taller than wide shape, rim calcifications with small extrusive soft tissue component, evidence of extrathyroidal extension	>70-90	Recommend FNA at ≥ 1 cm
Intermediate suspicion	Hypoechoic solid nodule with smooth margins without microcalcifications, extrathyroidal extension, or taller than wide shape	10-20	Recommend FNA at ≥ 1 cm
Low suspicion	Isoechoic or hyperechoic solid nodule, or partially cystic nodule with eccentric solid areas without microcalcifications, irregular margin, extrathyroidal extension, or taller than wide shape	5-10	Recommend FNA at ≥ 1.5 cm
Very low suspicion	Spongiform or partially cystic nodules without any of the sonographic features described in low, intermediate, or high suspicion patterns	<3	Consider FNA at ≥ 2 cm Observation without FNA is also a reasonable option
Benign	Purely cystic nodules (no solid component)	<1	No biopsy

* 2015 American Thyroid Management Guideline for Adult Patients with Thyroid Nodules and Differentiated Thyroid Cancer

- CT Neck with contrast (CPT® 70491) or CT Neck without contrast (CPT® 70490), or MRI Neck without and with contrast (CPT® 70543). CT is preferred since there is less respiratory motion artifact, unless contraindicated. MRI and CT **are not** indicated for routine thyroid nodule evaluation and should only be considered after US for:
 - ◆ Evaluation of extent of known substernal goiter³
 - ◆ Airway compression³
 - ◆ Presence of pathologic lymph nodes in cervical regions not visualized on ultrasound³
 - ◆ Clinically suspected advanced disease confirmed by FNA, including invasive primary tumor^{3,6}
 - ◆ Preoperative planning for any thyroid disease

- A thyroid nodule detected for the first time during pregnancy should be managed in the same way as in non-pregnant individuals, except for avoiding the use of radioactive agents for diagnostic and therapeutic purposes³

Background and Supporting Information

- The basis of thyroid nodule management is the use of ultrasonography (US), and/or nuclear medicine imaging, thyrotropin (TSH, formerly thyroid-stimulating hormone) assay, and FNA biopsy, together with clinical findings prior to CT or MRI imaging.
- A thyroid nodule is distinct either on palpation or radiologically (incidentaloma). Nonpalpable nodules have the same risk of cancer as palpable. Nodules >1 cm 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) individuals with normal thyroid on palpation with a low risk of thyroid cancer, 3) individuals with hyperthyroidism, 4) individuals with hypothyroidism or 5) individuals with thyroiditis. Conversely, US can be considered in individuals who have no symptoms but are high risk as a result of: history of head and neck irradiation, total body irradiation for bone marrow transplant, exposure to fallout from radiation during childhood or adolescence, family history, thyroid cancer syndromes such as MEN2, medullary or papillary thyroid cancer, Cowden's disease, familial adenomatous polyposis, Carney complex, Werner syndrome/progeria.
- There is insufficient evidence supporting the use of PET to distinguish indeterminate thyroid nodules that are benign from those that are malignant.
- ¹⁸F-FDG-PET imaging is not routinely recommended for the evaluation of thyroid nodules with indeterminate cytology. Routine preoperative ¹⁸F-FDG-PET scanning is not recommended.
- Incidental focal FDG-PET uptake often corresponds to a clinically relevant thyroid nodule and ultrasound is recommended; incidentally noted diffuse thyroid FDG-PET uptake most often corresponds to inflammatory uptake, however, ultrasound should be done to ensure that there is no evidence of clinically relevant nodularity.
- Elastography provides information about nodule stiffness that is complementary to gray scale ultrasound findings in nodules with indeterminate cytology or ultrasound findings. It should not be used as a substitute for gray scale ultrasound.
- Use of ultrasound contrast medium is not recommended for the diagnostic evaluation of thyroid nodules and its current use is restricted to definition of size and limits of necrotic zones after minimally invasive nodule ablation techniques.

Neck-8.2: This section intentionally left blank

Neck-8.3: Parathyroid Imaging

- Classic primary hyperparathyroidism
 - ◆ Parathyroid Planar Imaging (CPT® 78070), Parathyroid Planar Imaging with SPECT (CPT® 78071), or Parathyroid Planar Imaging with SPECT and CT (preferred study) (CPT® 78072)^{2,3,5} AND/OR Ultrasound (CPT® 76536)^{1,2} initial imaging if ALL of the following conditions are met^{1,2,3}:
 - Both PTH and Calcium levels are elevated above the reference range for lab testing facility (See Background and Supporting Information).
 - Individual is a surgical candidate (See Background and Supporting Information)
 - Intention of the study is preoperative localization

Note: Ultrasound (CPT® 76536) may be ordered independently to evaluate the thyroid per criteria in **Neck-8.1: Thyroid Nodule**

- ◆ Additional imaging may be ordered by an Endocrinologist, Parathyroid surgeon or Radiologist or any provider in consultation with one of these specialists^{1,3}.
 - 4D CT Neck without and with contrast (CPT® 70492)⁸⁻¹³.
 - MRI Neck without and with contrast (CPT® 70543) for cases of re-operation, difficult localization or ionizing radiation contraindication^{1,6}.
 - CT Chest with contrast (CPT® 71260) in rare circumstances in the evaluation of ectopic mediastinal parathyroid adenomas¹⁴.
- ◆ Repeat imaging in cases of recurrent or persistent hyperparathyroidism if reimaging is being ordered by a surgeon or any provider after consultation with a surgeon with expertise in parathyroidectomy¹.
- ◆ Choline PET/CT (CPT® 78815 or CPT® 78816) is considered experimental and investigational for preoperative localization in cases of primary hyperparathyroidism. Send these requests to Medical Director Review¹⁵⁻¹⁷.
- Primary hyperparathyroidism variants
 - ◆ Primary hyperparathyroidism with non-elevated serum calcium. (Serum Calcium level within and PTH elevated above the reference range for the lab testing facility).
 - Confirmatory study is elevated ionized calcium, elevated albumin corrected calcium or elevated historic calcium levels.^{1,4}
 - ◆ Hypercalcemia with inappropriately non-suppressed PTH (Calcium level elevated above and PTH within the reference range for the lab testing facility).
 - No current consensus exists on the degree of PTH non-suppression for confirmation of primary hyperparathyroidism however PTH level ≥ 25 pg/mL is a reasonable cutoff^{1,7}.
 - See Background and Supporting Information for more information
 - ◆ Intention of parathyroid imaging should also be for pre-operative localization rather than diagnostic¹.
 - ◆ Proceed with the same imaging pathway as in “classic” primary hyperparathyroidism.

For the following Primary Hyperparathyroidism variants, follow the standard imaging pathway:

	Calcium	PTH	Confirms/strongly suggests primary hyperparathyroidism
Classic primary hyperparathyroidism	High	High	Yes
Primary hyperparathyroidism with non-elevated serum calcium	Normal	High	Elevated ionized albumin corrected or historic calcium levels*
Hypercalcemia with inappropriately non-suppressed PTH	High	Normal	PTH \geq 25 pg/ml

- Normocalcemic hyperparathyroidism
 - ◆ Serum calcium levels (including ionized calcium levels) are always normal and PTH levels are above the reference range for the lab testing facility.
 - ◆ Secondary causes of PTH elevation are excluded. See Practice Notes for differential diagnosis of secondary hyperparathyroidism.
 - ◆ Calcium, PTH and clinical status should be monitored annually.
 - In the event of laboratory progression to hypercalcemia, follow the standard imaging pathway¹⁸.
 - In the event of clinical progression (decline in bone mineral density or new fracture/renal stone/nephrocalcinosis), any of the imaging studies listed in the imaging pathway for classic primary hyperparathyroidism may be approved if imaging is being requested by or after consultation with a parathyroid surgeon¹⁸.
- Secondary renal hyperparathyroidism
 - ◆ Serum calcium levels are below or within the reference range for the lab testing facility (but may also be elevated in more advanced disease).
 - ◆ Any of the imaging studies listed in the imaging pathway for classic primary hyperparathyroidism may be approved if all of the following are met:
 - Individuals has stage 3a-stage 5 chronic kidney disease (GFR<60).
 - PTH level is >9x upper limit of normal reference range for the lab testing facility (~585 pg/mL) despite standard medical or pharmacologic therapy (calcimimetics, calcitriol and/or vitamin D analogs)¹⁹.
 - Imaging is being requested by or after consultation with a parathyroid surgeon for preoperative localization.
- Tertiary hyperparathyroidism
 - ◆ Serum calcium and PTH levels are above the reference range for the lab testing facility as a result of long standing secondary hyperparathyroidism in individuals on renal replacement therapy or after renal transplant.
 - ◆ Any of the imaging studies listed in the imaging pathway for classic primary hyperparathyroidism may be approved if imaging is being requested by or after consultation with a parathyroid surgeon for preoperative localization.

For the following Hyperparathyroidism subtypes, imaging is being requested by or after consultation with a Parathyroid Surgeon:

	Calcium	PTH	Clinical Hallmarks
Normocalcemic Hyperparathyroidism	Normal	High	Calcium never elevated
Secondary renal Hyperparathyroidism	Low/Normal/High	Very High	Stage 3a-5 CKD, PTH >9x ULN
Tertiary Hyperparathyroidism	High	High	ESRD/renal transplant

Background and Supporting Information

- Hypercalcemia may be determined by elevated serum calcium, elevated serum ionized calcium, or elevated serum calcium level corrected for albumin. A comparison of serial measurements of calcium may also be helpful in determining the presence of true hypercalcemia as calcium levels may be variable over time in primary hyperparathyroidism.
- Parathyroidectomy candidacy should be determined by the provider, however national guidelines recognize the following criteria for Surgery^{1,4}
 - ◆ All individuals <50 years of age, regardless of whether objective features are present or absent.
 - ◆ All symptomatic individuals, including those with kidney stones, hypercalcemic crises, pathologic fractures or other associated symptoms.
 - ◆ Individuals with findings concerning for parathyroid cancer (very high calcium >13).
 - ◆ All asymptomatic individuals with the following:
 - Serum calcium >1.0 mg/dl (0.25 mmol/l) above the normal range
 - BMD by DEXA: T-score ≤2.5 at the lumbar spine, total hip femoral neck or distal 1/3 radius
 - Vertebral fracture by x-ray, CT, MRI and vertebral fracture assessment
 - Estimated glomerular filtration rate of less than 60 ml/min
 - Urinary calcium excretion >400 mg in 24 hours
 - Nephrolithiasis or nephrocalcinosis by x-ray, ultrasound or CT
 - ◆ Asymptomatic individuals who cannot participate in appropriate medical surveillance
 - ◆ Asymptomatic individuals desiring definitive surgical management
- For cases of “normocalcemic hyperparathyroidism” in which primary hyperparathyroidism is not confirmed, additional investigation for secondary/tertiary causes of hyperparathyroidism (renal insufficiency, hypercalciuria as a primary renal abnormality, vitamin D deficiency and gastrointestinal malabsorption problems such as short gut syndrome, celiac disease, Crohn's disease or a prior Roux-en-Y bypass surgery) is indicated^{1,18}.
- For cases of hypercalcemia in which primary hyperparathyroidism is not confirmed, additional consideration for other causes of hypercalcemia (malignancy including PTH-RP mediated and myeloma, granulomatous disease, FHH, medications

including thiazide diuretics, excessive calcium/D supplementation and the history of or present lithium use) is indicated¹.

References

Thyroid

1. Cooper DS, Doherty GM, Haugen BR et al. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid*. 2009 November;19(11):1167-1214.
2. Hoang JK, Langer JE, Middleton WD, et al. Managing incidental thyroid nodules detected on imaging: white paper of the ACR incidental thyroid findings committee. *J Am Coll Radiol*. 2015 Feb;12(2):143-150.
3. Gharib H, Papini E, Garber JR, et al. American Association Of Clinical Endocrinologists, American College Of Endocrinology, And Associazione Medici Endocrinologi medical guidelines for clinical practice for the diagnosis and management of thyroid nodules--2016 update. *Endocr Pract*. 2016 May;22(Supp 1):1-60.
4. Burch H, Cooper D, Garber J, et al. Hyperthyroidism and other causes of thyrotoxicosis: management guidelines of the American Thyroid Association and American Association of Clinical Endocrinologists. *Endocr Pract*. 2011 May-Jun;17(3):456-520.
5. Guidelines and Protocols Advisory Committee, approved by the British Columbia Medical Association, and adopted by the Medical Services Commission. Thyroid function tests in the diagnoses and monitoring of adults. Effective January 1, 2010.
6. Haugen BR, Alexander EK, Bible KC, et al. 2015 American Thyroid Association Management Guidelines for adult patients with thyroid nodules and differentiated thyroid cancer: The American Thyroid Association Guidelines Task Force on Thyroid Nodules and Differentiated Thyroid Cancer. *Thyroid*. 2016 Jan;26(1):1-133.
7. Donangelo I and Suh SY. Subclinical hyperthyroidism: when to consider treatment. *Am Fam Physician*. 2017 Jun;95(11):710-716.
8. Hoang JK, Oldan JD, Mandel SJ, et al. ACR Appropriateness Criteria® Thyroid Disease. *Journal of the American College of Radiology*. 2019;16(5). doi:10.1016/j.jacr.2019.02.004.
9. Ross DS, Burch HB, Cooper DS, et al. 2016 American Thyroid Association Guidelines for Diagnosis and Management of Hyperthyroidism and Other Causes of Thyrotoxicosis. *Thyroid*. 2016;26(10):1343-1421. doi:10.1089/thy.2016.0229.

Parathyroid

1. Wilhelm SM, Wang TS, Ruan DT, et al. The American Association of Endocrine Surgeons Guidelines for Definitive Management of Primary Hyperparathyroidism. *JAMA Surgery*. 2016;151(10):959. doi:10.1001/jamasurg.2016.2310.
2. Bilezikian JP, Brandi ML, Eastell R, et al. Guidelines for the Management of Asymptomatic Primary Hyperparathyroidism: Summary Statement from the Fourth International Workshop. *The Journal of Clinical Endocrinology & Metabolism*. 2014;99(10):3561-3569. doi:10.1210/jc.2014-1413.
3. Udelsman R, Åkerström G, Biagini C, et al. The Surgical Management of Asymptomatic Primary Hyperparathyroidism: Proceedings of the Fourth International Workshop. *The Journal of Clinical Endocrinology & Metabolism*. 2014;99(10):3595-3606. doi:10.1210/jc.2014-2000.
4. Parnell KE, Oltmann SC. The surgical management of primary hyperparathyroidism: an updated review. *International Journal of Endocrine Oncology*. 2018;5(1). doi:10.2217/ije-2017-0019.
5. ACR–SPR PRACTICE PARAMETER FOR THE PERFORMANCE OF PARATHYROID SCINTIGRAPHY—White paper, revised 2019.
6. Kunstman JW, Kirsch JD, Mahajan A, Udelsman R. Parathyroid Localization and Implications for Clinical Management. *The Journal of Clinical Endocrinology & Metabolism*. 2013;98(3):902-912. doi:10.1210/jc.2012-3168.
7. Orr LE, Mckenzie TJ, Thompson GB, Farley DR, Wermers RA, Lyden ML. Surgery for Primary Hyperparathyroidism with Normal Non-suppressed Parathyroid Hormone can be Both Challenging and Successful. *World Journal of Surgery*. 2017;42(2):409-414. doi:10.1007/s00268-017-4323-x.
8. Bahl M. Preoperative Parathyroid Imaging. *Journal of Computer Assisted Tomography*. 2019;43(2):264-268. doi:10.1097/rct.0000000000000821.
9. Kukar M, Platz TA, Schaffner TJ, et al. The Use of Modified Four-Dimensional Computed Tomography in Patients with Primary Hyperparathyroidism: An Argument for the Abandonment of Routine Sestamibi Single-Positron Emission Computed Tomography (SPECT). *Annals of Surgical Oncology*. 2014;22(1):139-145. doi:10.1245/s10434-014-3940-y.
10. Kelly H, Hamberg L, Hunter G. 4D-CT for Preoperative Localization of Abnormal Parathyroid Glands in Patients with Hyperparathyroidism: Accuracy and Ability to Stratify Patients by Unilateral versus Bilateral Disease in Surgery-Naïve and Re-Exploration Patients. *American Journal of Neuroradiology*. 2013;35(1):176-181. doi:10.3174/ajnr.a3615.
11. Solorzano CC, Carneiro-Pla D. Minimizing Cost and Maximizing Success in the Preoperative Localization Strategy for Primary Hyperparathyroidism. *Surgical Clinics of North America*. 2014;94(3):587-605. doi:10.1016/j.suc.2014.02.006.
12. Wang TS, Cheung K, Farrokhyar F, Roman SA, Sosa JA. Would scan, but which scan? A cost-utility analysis to optimize preoperative imaging for primary hyperparathyroidism. *Surgery*. 2011;150(6):1286-1294. doi:10.1016/j.surg.2011.09.016.
13. Lubitz CC, Stephen AE, Hodin RA, Pandharipande P. Preoperative Localization Strategies for Primary Hyperparathyroidism: An Economic Analysis. *Annals of Surgical Oncology*. 2012;19(13):4202-4209. doi:10.1245/s10434-012-2512-2.
14. Mortenson MM, Evans DB, Lee JE, et al. Parathyroid Exploration in the Reoperative Neck: Improved Preoperative Localization with 4D-Computed Tomography. *Journal of the American College of Surgeons*. 2008;206(5):888-895. doi:10.1016/j.jamcollsurg.2007.12.044.
15. Boccalatte LA, Higuera F, Gómez NL, et al. Usefulness of 18F-Fluorocholine Positron Emission Tomography–Computed Tomography in Locating Lesions in Hyperparathyroidism. *JAMA Otolaryngology–Head & Neck Surgery*. 2019;145(8):743. doi:10.1001/jamaoto.2019.0574.
16. Broos WA, Zant FMVD, Knol RJ, Wondergem M. Choline PET/CT in parathyroid imaging. *Nuclear Medicine Communications*. 2019;40(2):96-105. doi:10.1097/mnm.0000000000000952.
17. Parvinian A, Martin-Macintosh EL, Goenka AH, et al. 11C-Choline PET/CT for Detection and Localization of Parathyroid Adenomas. *American Journal of Roentgenology*. 2018;210(2):418-422. doi:10.2214/ajr.17.18312.
18. Cusano NE, Silverberg SJ, Bilezikian JP. Normocalcemic Primary Hyperparathyroidism. *Journal of Clinical Densitometry*. 2013;16(1):33-39. doi:10.1016/j.jocd.2012.12.001.
Kidney Disease: Improving Global Outcomes (KDIGO) CKD-MBD Update Work Group. KDIGO 2017 Clinical Practice Guideline Update for the Diagnosis, Evaluation, Prevention, and Treatment of Chronic Kidney Disease–Mineral and Bone Disorder (CKD-MBD). *Kidney Int Suppl*. 2017;7:1–59. *Kidney International Supplements*. 2017;7(3). doi:10.1016/j.kisu.2017.10.001.

Neck-9: Trachea and Bronchus

Neck-9.1: Imaging

29

Neck-9.1: Imaging

- Plain x-rays neck and chest and bronchoscopy are the initial imaging studies for evaluating individuals with suspected tracheal and visualized bronchial 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.¹
- CT Neck with contrast (CPT® 70491) or without contrast (CPT® 70490) and/or CT Chest with contrast (CPT® 71260) or without contrast (CPT® 71250) can be performed to further evaluate abnormalities, which include tracheal or bronchial tumor, foreign bodies, or persistent segmental or lobar lung collapse seen on other imaging studies.^{1,2}
- Expiratory HRCT (CPT® 71250) is indicated in individuals with obstructive physiology tracheomalacia.¹
- Trachea or bronchial “inspissation” without an abnormality described above, is not a risk for malignancy.³

References

1. Dyer DS, Mohammed T-LH, Kirsch J, et al. ACR Appropriateness Criteria® Chronic dyspnea: suspected pulmonary origin. *Am Coll Radiol (ACR)*. Date of origin: 1995. Last review date: 2012.
2. Obusez EC, Jamjoom L, Kirsch J, et al. Computed tomography correlation of airway disease with bronchoscopy: part I--nonneoplastic large airway diseases. *Curr Probl Diagn Radiol*. 2014 Sep-Oct;43(5):268-277.
3. Gould MK, Donington J, Lynch WR, et al. Evaluation of individuals with pulmonary nodules: when is it lung cancer? Diagnosis and management of lung cancer, 3rd ed: American College of Chest Physicians evidence-based clinical practice guidelines. *Chest*. 2013 May;143(5):e93S-e120S.
4. American College of Radiology ACR Appropriateness Criteria® Chronic Dyspnea-Noncardiovascular Origin. Revised 2018. <https://acsearch.acr.org/docs/69448/Narrative/>.

Neck-10: Neck Pain

Neck-10.1: Neck Pain (Cervical)	31
Neck-10.2: Torticollis and Dystonia	31

Neck-10.1: Neck Pain (Cervical)

- Neck pain is usually related to a specific process including pharyngitis, radiculopathy, adenopathy, mass, carotid dissection and torticollis, and therefore found elsewhere in these guidelines.¹
- For the evaluation of neck pain or other symptoms which may involve the cervical spine, including myelopathy and cervical radiculopathy¹ See **Spine Imaging Guidelines**

Neck-10.2: Torticollis and Dystonia

- See **PEDNECK-4: Dystonia/Torticollis** in the Pediatric Neck Imaging Guidelines

References

1. ACR Appropriateness Criteria® Cervical Neck Pain or Cervical Radiculopathy. *Am Coll Radiol (ACR)*. Date of origin: 1998. Last review date: 2018.
2. Haque S, Shafi BBB, Kaleem M. Imaging of torticollis in children. *Radiographics*, 2012;32(2):557-571.
3. Boyko N, Eppinger MA, Straka-DeMarco D, Mazzola CA. Imaging of congenital torticollis in infants: a retrospective study of an institutional protocol. *Journal of Neurosurgery*, 2017;20(2):111-212.

Neck-11: Salivary Gland Disorders

- Salivary Gland Stones:¹
 - ◆ CT Neck with contrast (CPT® 70491) and/or CT Maxillofacial area with contrast (CPT® 70487) or MRI Neck without and with contrast (CPT® 70543) for suspected salivary duct or gland stone.
 - ◆ 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 or Salivary Gland Mass
 - ◆ The following can be approved:²
 - MRI Orbits/Face/Neck without and with contrast (CPT® 70543) or
 - CT Neck with contrast (CPT® 70491) and/or CT Maxillofacial area with contrast (CPT® 70487)

References

1. Wilson KF, Meier JD, and Ward PD. Salivary gland disorders. *Am Fam Physician*. 2014 Jun;89(11):882-888.
2. ACR Appropriateness Criteria® Neck mass/adenopathy. *American College of Radiology (ACR)*. Date or origin: 2009. Last review date: 2018.

Neck-12: Sore Throat, Odynophagia, and Hoarseness

Neck-12.0: Definitions	34
Neck-12.1: Sore Throat/Throat Pain/Odynophagia	34
Neck-12.2: Hoarseness	34

Neck-12.0: Definitions

- Hoarseness – A symptoms of altered voice quality reported by the individual
- Dysphagia – Disordered or impaired swallowing (See **Neck-3: Dysphagia and Esophageal Disorders**)
- Odynophagia – Pain upon swallowing

Neck-12.1: Sore Throat/Throat Pain/Odynophagia

See **Neck-3.1: Dysphagia and Esophageal Disorders** for dysphagia

- Sore Throat/Throat Pain/Odynophagia
 - ◆ Imaging studies are not indicated for uncomplicated viral or streptococcal pharyngitis with sore throat³
 - See **Neck-5: Neck Masses** for suspected complicated pharyngitis/deep neck abscesses
 - ◆ Persistent sore throat/throat pain/odynophagia:
 - Initial evaluation is barium esophogram and laryngoscopy
 - CT Neck with contrast (CPT[®] 70491) or MRI Neck without and with contrast (CPT[®] 70543) if initial barium esophogram and laryngoscopy are negative and there is a suspicion of submucosal tumor/lesion^{2,4}
 - ◆ Alarm symptoms of persistent unilateral throat pain or odynophagia with ipsilateral referred otalgia is especially suspicious for a submucosal tumor
 - Initial evaluation is laryngoscopy
 - CT Neck with contrast (CPT[®] 70491) or MRI Neck without and with contrast (CPT[®] 70543) if initial laryngoscopy negative
 - ◆ CT Neck with contrast (CPT[®] 70491) for postoperative throat pain or odynophagia after head and neck procedure with suspected complication of procedure.⁴

Background and Supporting Information

- Persistent unilateral throat pain or odynophagia with ipsilateral referred otalgia is especially suspicious for a submucosal tumor and advanced imaging is appropriate when initial evaluation is negative.

Neck-12.2: Hoarseness

- Laryngoscopy is the primary diagnostic modality for evaluating individuals with hoarseness. Imaging studies, including CT and MRI, are unnecessary in most individuals with hoarseness because most hoarseness is self-limited or caused by pathology that can be identified by laryngoscopy alone. The need for advanced imaging is based upon abnormal findings upon laryngoscopy.¹

References

1. Stachler RJ, Francis DO, Schwartz SR, et al. Clinical Practice Guideline: Hoarseness (Dysphonia) (Update). *Otolaryngology–Head and Neck Surgery*. 2018;158(1_suppl). doi:10.1177/0194599817751030.
2. Pynnonen MA, Gillespie MB, Roman B, et al. Clinical Practice Guideline: Evaluation of the Neck Mass in Adults. *Otolaryngology–Head and Neck Surgery*. 2017;157(2_suppl). doi:10.1177/0194599817722550.
3. Shulman ST, Bisno AL, Clegg HW, et al. Clinical Practice Guideline for the Diagnosis and Management of Group A Streptococcal Pharyngitis: 2012 Update by the Infectious Diseases Society of America. *Clinical Infectious Diseases*. 2012;55(10). doi:10.1093/cid/cis629.
4. ACR Appropriateness Criteria Dysphagia. Rev. 2013. <https://acsearch.acr.org/docs/69471/Narrative/>.