



CLINICAL GUIDELINES

Pediatric Neck Imaging Policy

Version 19.0 | Effective May 22nd, 2017



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

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PEDIATRIC NECK IMAGING GUIDELINES

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PEDIATRIC NECK IMAGING GUIDELINES

PEDNECK-1~GENERAL GUIDELINES

Procedure Codes Associated with Neck Imaging	
MRI	CPT®
Orbit, Face, Neck MRI without contrast	70540
Orbit, Face, Neck MRI with contrast (rarely used)	70542
Orbit, Face, Neck MRI without and with contrast	70543
Temporomandibular Joint (TMJ) MRI	70336
Unlisted MRI procedure (for radiation planning or surgical software)	76498
MRA	CPT®
Neck MRA without contrast	70547
Neck MRA with contrast	70548
Neck MRA without and with contrast	70549
CT	CPT®
Maxillofacial CT without contrast (includes sinuses, jaw, and mandible)	70486
Maxillofacial CT with contrast (includes sinuses, jaw, and mandible)	70487
Maxillofacial CT without and with contrast (includes sinuses, jaw, and mandible)	70488
Neck CT without contrast (includes jaw, and mandible)	70490
Neck CT with contrast (includes jaw, and mandible)	70491
Neck CT without and with contrast (includes jaw, and mandible)	70492
CT Guidance for Placement of Radiation Therapy Fields	77014
Unlisted CT procedure (for radiation planning or surgical software)	76497
CTA	CPT®
Neck CTA	70498
Nuclear Medicine	CPT®
PET Imaging; limited area (this code not used in pediatrics)	78811
PET Imaging; skull base to mid-thigh (this code not used in pediatrics)	78812
PET Imaging; whole body (this code not used in pediatrics)	78813
PET with concurrently acquired CT; limited area (this code rarely used in pediatrics)	78814
PET with concurrently acquired CT; skull base to mid-thigh	78815

PET with concurrently acquired CT; whole body	78816
Thyroid Uptake, Single or Multiple Quantitative Measurement(s) (Including Stimulation, Suppression, or Discharge, When Performed)	78012
Thyroid Imaging (Including Vascular Flow, When Performed)	78013
Thyroid Imaging (Including Vascular Flow, When Performed); with Single or Multiple Uptake(s) Quantitative Measurement(s) (Including Stimulation, Suppression, or Discharge, When Performed)	78014
Thyroid Carcinoma Metastases Imaging Limited Area	78015
Thyroid Carcinoma Metastases Imaging with Additional Studies	78016
Thyroid Carcinoma Metastases Imaging Whole Body	78018
Thyroid Carcinoma Metastases Uptake (Add-on Code)	78020
Parathyroid Planar Imaging (Including Subtraction, When Performed)	78070
Parathyroid Planar Imaging (Including Subtraction, When Performed); with Tomographic (SPECT)	78071
Parathyroid Planar Imaging (Including Subtraction, When Performed); with Tomographic (SPECT), and Concurrently Acquired Computed Tomography (CT) for Anatomical Localization	78072
Salivary Gland Nuclear Imaging	78230
Salivary Gland Nuclear Imaging with Serial Imaging	78231
Salivary Gland Function Study	78232
Esophageal Motility Study	78258
Radiopharmaceutical Imaging of Inflammatory Process Limited Area	78805
Radiopharmaceutical Imaging of Inflammatory Process Whole Body	78806
Radiopharmaceutical Imaging of Inflammatory Process SPECT	78807
Ultrasound	CPT[®]
Soft tissues of head and neck Ultrasound (thyroid, parathyroid, parotid, etc.)	76536
Duplex scan of extracranial arteries; complete bilateral study	93880
Duplex scan of extracranial arteries; unilateral or limited study	93882
Non-invasive physiologic studies of extracranial arteries, complete bilateral study	93875
Ultrasound guidance for needle placement	76942

PEDIATRIC NECK IMAGING GUIDELINES

PEDNECK-1~GENERAL GUIDELINES

PEDNECK-1.1 Pediatric Neck Imaging Age Considerations

Many conditions affecting the neck in the pediatric population are different diagnoses than those occurring in the adult population. For those diseases which occur in both pediatric and adult populations, minor differences may exist in management due to patient age, comorbidities, and differences in disease natural history between children and adults.

- ✓ Patients age <18 years old should be imaged according to the Pediatric Neck Imaging Guidelines, and patients age ≥18 years should be imaged according to the Neck Imaging Guidelines, except where directed otherwise by a specific guideline section.

PEDNECK-1.2 Pediatric Neck Imaging Appropriate Clinical Evaluation

- ✓ A recent (within 60 days) face-to-face evaluation including a detailed history, physical examination, and appropriate laboratory studies should be performed prior to considering advanced imaging, unless the patient is undergoing guideline-supported scheduled follow-up imaging evaluation.
- ✓ Unless otherwise stated in a specific guideline section, the use of advanced imaging to screen asymptomatic patients for disorders involving the neck is not supported. Advanced imaging of the neck should only be approved in patients who have documented active clinical signs or symptoms of disease involving the neck.
- ✓ Unless otherwise stated in a specific guideline section, repeat imaging studies of the neck are not necessary unless there is evidence for progression of disease, new onset of disease, and/or documentation of how repeat imaging will affect patient management or treatment decisions.

PEDNECK-1.3 Pediatric Neck Imaging Modality General Considerations

- ✓ MRI
 - MRI Neck is generally performed without and with contrast (CPT® 70543) unless the patient has a documented contraindication to gadolinium or otherwise stated in a specific guideline section.
 - Due to the length of time for image acquisition and the need for stillness, anesthesia is required for almost all infants and young children (age <7 years), as well as older children with delays in development or maturity. In this patient population, MRI imaging sessions should be planned with a goal of avoiding a short-interval repeat anesthesia exposure due to insufficient information using the following considerations:

- MRI should always be performed without and with contrast unless there is a specific contraindication to gadolinium use since the patient already has intravenous access for anesthesia.
- If multiple body areas are supported by eviCore guidelines for the clinical condition being evaluated, MRI of all necessary body areas should be obtained concurrently in the same anesthesia session.
- The presence of surgical hardware or implanted devices may preclude MRI.
- The selection of best examination may require coordination between the provider and the imaging service.

✓ CT

- CT Neck typically extends from the base of the skull to the upper thorax.
 - A separate CPT[®] code for head imaging in order to visualize the skull base is not necessary.
 - In some cases, especially in follow-up of a known finding, it may be appropriate to limit the exam to the region of concern to reduce radiation exposure.
- CT Neck is generally performed with contrast (CPT[®] 70491) unless the patient has a documented contraindication to CT contrast or otherwise stated in a specific guideline section.
- CT Neck may be indicated for further evaluation of abnormalities suggested on prior US or MRI Procedures.
- In general, CT Neck is appropriate when evaluating trauma, malignancy, and for preoperative planning.
- CTA Neck (CPT[®] 70498) is indicated for evaluation of the vessels of the neck, especially with concern for dissection.
- CT should not be used to replace MRI in an attempt to avoid sedation unless listed as a recommended study in a specific guideline section.
- The selection of best examination may require coordination between the provider and the imaging service.

✓ Ultrasound

- Ultrasound of the soft tissues of the neck (CPT[®] 76536) is indicated as an initial study for evaluating adenopathy, ill-defined mass or swelling, thyroid, parathyroid, parotid and other salivary glands, and cysts.
- For those patients who do require advanced imaging, ultrasound can be very beneficial in selecting the proper modality, body area, image sequences, and contrast level that will provide the most definitive information for the patient.

✓ Nuclear Medicine

- Nuclear medicine studies of the neck in pediatric patients are most commonly used to evaluate neck masses, or 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, CPT[®] 78231, or CPT[®] 78232) is indicated for the following:
 - Evaluation of salivary gland function in patients with dry mouth (xerostomia) and one of the following:
 - Sjögren's syndrome
 - Sialadenitis
 - History of head or neck radiation therapy
 - Evaluation of children with cerebral palsy.

The guidelines listed in this section for certain specific indications are not intended to be all-inclusive; clinical judgment remains paramount and variance from these guidelines may be appropriate and warranted for specific clinical situations.

References

1. ACR–SPR Practice Parameter For the Performance and Interpretation of Pediatric Magnetic Resonance Imaging (MRI) Amended 2014, available at:
http://www.acr.org/~media/ACR/Documents/PGTS/guidelines/MRI_Pediatric.pdf
2. ACR–ASER–SCBT–MR–SPR Practice Parameter for the Performance of Pediatric Computed Tomography (CT) Revised 2014, available at:
http://www.acr.org/~media/ACR/Documents/PGTS/guidelines/CT_Pediatric.pdf
3. Ing C, DiMaggio C, Whitehouse A et al, Long-term Differences in Language and Cognitive Function After Childhood Exposure to Anesthesia, *Pediatrics* 2012;130:e476-e485.
4. Monteleone M, Khandji A, Cappell J et al, Anesthesia in Children: Perspectives From Nonsurgical Pediatric Specialists, *J Neurosurg Anesthesiol* 2014;26:396-398.
5. DiMaggio C, Sun LS, and Li G, Early Childhood Exposure to Anesthesia and Risk of Developmental and Behavioral Disorders in a Sibling Birth Cohort, *Anesth Analg* 2011; 113:1143-1151.
6. MacDonald A and S Burrell, Infrequently performed studies in nuclear medicine: part 2*, *J Nucl Med Technol* 2009; 37:1-13.

PEDIATRIC NECK IMAGING GUIDELINES

PEDNECK-2~NECK MASSES (PEDIATRIC)

Evaluation of neck masses in pediatric patients involves careful consideration of clinical history and accurate physical examination. The patient's age and knowledge of the anatomy and embryology of the neck are very important in narrowing the differential diagnosis.

- ✓ Ultrasound (CPT[®] 76536) is indicated as the initial imaging study of choice. Ultrasound helps define the size and extent of localized superficial masses and helps confirm whether they are cystic or solid. Color Doppler ultrasound (CPT[®] 93880 bilateral study or carotid arteries or CPT[®] 93882 unilateral study) can evaluate the vasculature.
- ✓ Neck MRI without and with contrast (CPT[®] 70543) or Neck CT with contrast (CPT[®] 70491) can be approved if ultrasound is inconclusive or to further characterize abnormalities seen on ultrasound.
- ✓ Cervical lymphadenitis is common in children and follows most viral or bacterial infections of the ears, nose, and throat. No advanced imaging is necessary in the absence of persistent lymph node enlargement. When lymphadenopathy persists for more than 4 weeks of treatment, see **PEDNECK-3~CERVICAL LYMPHADENOPATHY**.
- ✓ Congenital cervical cysts frequently present in children and include thyroglossal duct cyst (55% of cases), cystic hygroma (25%), branchial cleft cysts (16%), bronchogenic cyst (0.91%), and thymic cyst (0.3%).
 - Barium swallow and neck MRI without and with contrast (CPT[®] 70543) or Neck CT with contrast (CPT[®] 70491) are indicated for diagnosis of fourth branchial pouch cysts.
 - Imaging is not indicated for diagnosis of the other cysts, however MRI without and with contrast (CPT[®] 70543) or Neck CT with contrast (CPT[®] 70491) may be indicated for preoperative planning.
- ✓ Salivary Gland Nuclear Imaging (one of CPT[®] 78230, CPT[®] 78231, or CPT[®] 78232) is indicated for evaluation of parotid masses to allow preoperative diagnosis of Warthin's tumor.

Practice Notes

- ✓ The most common malignant ENT tumors in children are lymphoma and rhabdomyosarcoma.

Differential diagnosis of neck lesions by anatomic region:

- ✓ Subcutaneous tissues:
 - Teratoma (includes dermoid cysts)
 - Vascular malformations
 - Lipoma
 - Cellulitis
 - Plexiform neurofibromas
 - Keloid
 - Scar
 - Subcutaneous fat fibrosis (in neonates)
- ✓ Retropharyngeal space:
 - Abscess, cellulitis, adenitis
 - Usually involves children under age 6
 - Patients have history of upper respiratory tract infection followed by high fever, dysphagia, and neck pain.
 - Lymphadenopathy
 - Extension of goiter
 - Extension of pharyngeal tumor
- ✓ Retrovisceral space (posterior to the cervical esophagus):
 - Gastrointestinal duplication cysts (usually are diagnosed in first year of life)
- ✓ Pretracheal space (contains trachea, larynx, cervical esophagus, recurrent laryngeal nerves, and thyroid and parathyroid glands):
 - Thyroglossal duct cyst
 - Thyroglossal duct cyst is most common before the age of 20, 75% present as a midline mass and 43% of patients present with an infected mass.
 - Usually presents as an enlarging, painless midline mass.
 - Thyroid carcinoma occurs in 1% of thyroglossal duct cysts.
 - Goiter
 - Laryngocele
 - Lymphadenopathy
 - Abscess
- ✓ Danger space (closed space lying between the skull base and the posterior mediastinum and between the alar and prevertebral fasciae in a sagittal plane):
 - Cellulitis
 - Abscess
- ✓ Prevertebral space:
 - Neuroenteric cyst

- Cellulitis
- Abscess
- Spondylodiskitis
- Lymphadenopathy
- Cellulitis
- Abscess
- Paraganglioma
- ✓ Carotid sheath space:
 - Jugular vein thrombosis or phlebitis
 - Lymphadenopathy
 - Cellulitis
 - Abscess
 - Paraganglioma
- ✓ Parotid gland space:
 - Parotid lymphadenopathy
 - Retromandibular vein thrombosis
 - Parotiditis
 - Sialodochitis (inflammation of the salivary gland duct)
 - Salivary duct stone
- ✓ Submandibular and sublingual spaces:
 - Thyroglossal duct cyst
 - Branchial cleft cyst
 - 90% of branchial abnormalities arise from the second branchial apparatus.
 - Second branchial cleft cysts are the most common branchial cleft cyst and usually present in young adults as painless fluctuant masses.
 - A history of repeated infections in the region of the mandible suggests the diagnosis.
 - Most second branchial cleft cysts are located in the submandibular space, at the anteromedial border of the sternocleidomastoid muscle, lateral to the carotid space, or posterior to the submandibular gland.
- ✓ Masticator space (includes masseter and pterygoid muscles):
 - Venous or lymphatic malformation
 - Cellulitis
 - Abscess
 - Rhabdomyosarcoma
- ✓ Parapharyngeal space:
 - Cellulitis
 - Abscess

- Rhabdomyosarcoma
- Extension of lymphoma
- ✓ Paravertebral space:
 - Cervical dermal sinus (epithelium-lines dural tubes that connect the skin with the central nervous system or its covering)
 - Meningocele
 - Rhabdomyosarcoma
 - Extension of lymphoma
 - Cervical neuroblastoma
- ✓ Posterior cervical space:
 - Lymphadenopathy
 - Lymphatic malformation

References

1. Meuwly JY, Lepori D, Theumann N, et al, Multimodality imaging evaluation of the pediatric neck: techniques and spectrum of findings. *Radiographics* 2005; 25:931-948.
2. Geddes G, Butterfly MM, Patel SM, and Marra S, Pediatric Neck Masses, *Pediatr Rev* 2013; 34:115-125.
3. Ludwig BJ, Wang J, Nadgir RN et al, Imaging of Cervical Lymphadenopathy in Children and Young Adults, *Am J Roentgenol* 2012;199:1105-1113.
4. Kelly TG, Faulkes SV, Pierre SK et al, Imaging submandibular pathology in the paediatric patient, *Clin Radiol* 2015;70:774-786.
5. Collins B, Stoner JA, and Digoy GP, Benefits of ultrasound vs. computed tomography in the diagnosis of pediatric lateral neck abscesses, *Int J Pediatr Otorhinolaryngol* 2014;78:423-426.
6. MacDonald A and S Burrell., Infrequently performed studies in nuclear medicine: part 2*, *J Nucl Med Technol* 2009; 37:1-13.

PEDIATRIC NECK IMAGING GUIDELINES

PEDNECK-3~CERVICAL LYMPHADENOPATHY

Causes of cervical lymphadenopathy can be divided into two categories:

- 1) Inflammatory
- 2) Neoplastic

PEDNECK-3.1 Imaging

- ✓ Painful acute lymphadenopathy and other painful neck masses (including neck “swelling”) should be treated with a trial of conservative therapy for at least 4 weeks, including antibiotics if appropriate.
 - If there is improvement with conservative treatment, advanced imaging is not indicated.
- ✓ Ultrasound (CPT[®] 76536) is indicated as an initial evaluation if lymphadenopathy persists for more than 4 weeks.
- ✓ MRI Neck without and with contrast (CPT[®] 70543) or CT Neck with contrast (CPT[®] 70491) can be approved if ultrasound is inconclusive or to further characterize abnormalities seen on ultrasound.
- ✓ If systemic symptoms or other clinical findings suggest malignancy see **PEDONC-5~PEDIATRIC LYMPHOMA**.

Practice Notes

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 Human immunodeficiency virus (HIV) can cause inflammatory lymphadenopathy as well.

References

1. Ludwig BJ, Wang J, Nadgir RN et al, Imaging of Cervical Lymphadenopathy in Children and Young Adults, *Am J Roentgenol* 2012;199:1105-1113.
2. 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.

PEDIATRIC NECK IMAGING GUIDELINES

PEDNECK-4~DYSTONIA/TORTICOLLIS

Infants under 12 Months of Age (Congenital Muscular Torticollis)

- ✓ Ultrasound Neck (CPT[®] 76536) is indicated as the initial study to evaluate suspected congenital muscular torticollis, also called fibromatosis coli.
 - Positive→ No further imaging is needed since diagnosis is defined.
 - Negative→ CT Neck with contrast (CPT[®] 70491) or MRI Neck without and with contrast (CPT[®] 70543) can be approved to evaluate for other structural causes.

Children and Adults (Acquired Torticollis)

- ✓ If there has been recent trauma, plain radiographs of the cervical spine should be obtained as an initial evaluation CT Neck with contrast (CPT[®] 70491) and/or CT Cervical spine without contrast (CPT[®] 72125) is indicated as the initial study to identify fracture or malalignment.
- ✓ In the absence of trauma, CT Neck with contrast (CPT[®] 70491), CT Cervical spine without contrast (CPT[®] 72125), MRI Cervical spine without contrast (CPT[®] 72141), MRI Neck without and with contrast (CPT[®] 70543), or MRA Neck without and with contrast (CPT[®] 70549) can be approved to identify underlying bony, muscular, vascular, or neurologic causes.
 - Positive→ Further advanced imaging is not required if a local cause has been identified.
 - Negative→ MRI of the brain without and with contrast (CPT[®] 70553) to exclude CNS cause.

Practice Note

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

References

1. Dudkiewicz I, Ganel A, and Blankstein A, Congenital Muscular Torticollis in Infants: Ultrasound-Assisted Diagnosis and Evaluation, *J Pediatr Orthop* 2005; 25:812-814.
2. Suhr MC and Oledzka M, Considerations and intervention in congenital muscular torticollis, *Curr Opin Pediatr* 2015;27:75-81.
3. Haque S, Shafi BBB, and Kaleem M, Imaging of Torticollis in Children, *Radiographics* 2012; 32:557-571.
4. Macias CG and Gan V, Congenital muscular torticollis: Clinical features and diagnosis, *UpToDate*[®] 2015.

5. Macias CG and Gan V, Acquired torticollis in children *UpToDate*® 2015.

PEDIATRIC NECK IMAGING GUIDELINES

PEDNECK-5~DYSPHAGIA

- ✓ Dysphagia imaging indications in pediatric patients are very similar to those for adult patients. See **NECK-3~DYSPHAGIA** for imaging guidelines.
- ✓ Pediatric-specific imaging considerations include the following:
 - X-rays of the neck and chest may be appropriate as the initial imaging study when concerned for foreign body ingestion as cause of dysphagia.
 - 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

Reference

1. Kakodkar K and Schroeder JW, Pediatric dysphagia, *Pediatr Clin N Am* 2013; 60:969-977.

PEDIATRIC NECK IMAGING GUIDELINES

PEDNECK-6~THYROID AND PARATHYROID

PEDNECK-6.1 Thyroid Masses or Nodules

- ✓ Ultrasound (CPT[®] 76536) is the recommended initial study for evaluation of thyroid masses or nodules in pediatric patients.
 - If TSH normal or elevated, fine needle aspiration (FNA) under ultrasound guidance (CPT[®] 76942) is indicated.
 - If TSH is low, nuclear thyroid scintigraphy (either CPT[®] 78013 or CPT[®] 78014), is indicated.
 - Hyperfunctioning nodules should be resected surgically.
 - Hypofunctioning nodules should undergo FNA under ultrasound guidance (CPT[®] 76942).
- ✓ CT Neck without (CPT[®] 70490) or with (CPT[®] 70491) contrast, or MRI Neck without and with contrast (CPT[®] 70543) is indicated for preoperative planning in patients with large or fixed masses, vocal cord paralysis, or bulky cervical or supraclavicular adenopathy.
 - CT Chest without (CPT[®] 71250) or with (CPT[®] 71260) contrast is also indicated for patients with substernal extension of the thyroid, pulmonary symptoms, or abnormalities on recent chest x-ray.
- ✓ If any biopsy reveals thyroid carcinoma, see **ONC-6~Thyroid Cancers** for further imaging guidelines.
- ✓ If the biopsy shows indeterminate findings, repeat ultrasound (CPT[®] 76536) and/or FNA (CPT[®] 76942) is indicated 3 months following initial biopsy.
 - If the nodule is stable and/or FNA is benign, repeat ultrasound (CPT[®] 76536) is indicated in 6 months.
 - If the nodule is growing or the FNA is not benign, the nodule should be resected surgically.
- ✓ If the initial biopsy shows benign findings, repeat ultrasound (CPT[®] 76536) is indicated 6 months following initial biopsy.
 - If the nodule is stable, repeat ultrasound (CPT[®] 76536) is indicated annually.
 - If the nodule is growing or concerning new findings are present, the nodule should undergo repeat FNA (CPT[®] 76942) or be resected surgically.

- ✓ Benign nodules that have been surgically resected do not require routine imaging follow up in the absence of clinical or laboratory changes suggesting recurrence.

PEDNECK-6.2 Hyperthyroidism

- ✓ Ultrasound (CPT[®] 76536) is the recommended initial study for evaluation of hyperthyroidism.
 - If a nodule or mass is discovered on ultrasound, the patient should be imaged according to **PEDNECK-6.1 Thyroid Masses or Nodules.**
- ✓ For all other patients with documented hyperthyroidism, thyroid uptake nuclear imaging (either CPT[®] 78012 or CPT[®] 78014) is indicated.

PEDNECK-6.3 Hypothyroidism

- ✓ Ultrasound (CPT[®] 76536) is the recommended initial study for evaluation of hypothyroidism.
 - If a nodule or mass is discovered on ultrasound, the patient should be imaged according to **PEDNECK-6.1 Thyroid Masses or Nodules.**
- ✓ For patients with documented congenital hypothyroidism, thyroid uptake nuclear imaging (either CPT[®] 78014) is indicated.

PEDNECK-6.4 Parathyroid Imaging

- ✓ Either ultrasound (CPT[®] 76536) or sestamibi parathyroid nuclear imaging (one of CPT[®] 78070, CPT[®] 78071, or CPT[®] 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)
- ✓ CT Neck without and with contrast (CPT[®] 70492) or MRI Neck without and with contrast (CPT[®] 70543) is indicated for any of the following:
 - Preoperative planning for localization
 - Serum calcium (>1 mg/dL over upper limit of normal)
 - Recurrent or persistent hyperparathyroidism following neck exploration (MRI preferred unless contraindicated)

References

1. LaFranchi S, Disorders of the Thyroid Gland, *Nelson Textbook of Pediatrics*, eds. Kliegman RM, Stanton BF, Schor NF, St. Geme JW III, and Behrman RE, 19th edition 2011, pp 1894-1916.
2. Doyle DA, Disorders of the Parathyroid Gland, *Nelson Textbook of Pediatrics*, eds. Kliegman RM, Stanton BF, Schor NF, St. Geme JW III, and Behrman RE, 19th edition 2011, pp 1916-1923.
3. Francis GL, Waguespack SG, Bauer AJ et al, Management Guidelines for Children with Thyroid Nodules and Differentiated Thyroid Cancer, *Thyroid* 2015;25:716-759.

4. Papendieck P, Gruniero-Papendieck L, Venara M et al, Differentiated Thyroid Cancer in Children: Prevalence and Predictors in a Large Cohort with Thyroid Nodules Followed Prospectively, *J Pediatr* 2015;167:199-201.
5. Geddes G, Butterfly MM, Patel SM, and Marra S, Pediatric Neck Masses, *Pediatr Rev* 2013;34:115-125.
6. Bahn RS, Burch HB, Cooper DS, et al, Hyperthyroidism and other causes of thyrotoxicosis: Management guidelines of the American Thyroid Association and American Association of Clinical Endocrinologists, *Endocr Pract* 2011;17:456-520.
7. Guidelines and Protocols Advisory Committee, Medical Services Commission, British Columbia Medical Services Commission, function tests: diagnoses and monitoring of thyroid function disorders in adults. <http://www.guideline.gov/content.aspx?id=38907&search=hyperthyroidism>.
8. Surks MI, Ortiz E, Daniels GFH, et al. Subclinical thyroid disease: scientific review and guidelines for diagnosis and management, *JAMA* 2004; 291:228-238.
9. American Association of Clinical Endocrinologists Thyroid Task Force. Medical guidelines for clinical practice for the evaluation and treatment of hyperthyroidism and hypothyroidism, *Endocr Pract* 2002; 8:457-469.
10. Donangelo I, and Braunstein GD, Update on subclinical hyperthyroidism, *Am Fam Physician* 2011; 83:933-938.
11. American Association of Clinical Endocrinologists, Associazione Medici Endocrinologi, and European Thyroid Association. Medical guidelines for clinical practice for the diagnosis and management of thyroid nodules, *Endocr Pract* 2010; 16(Suppl 1); 1-43.
12. American Academy of Pediatrics Section on Endocrinology and Committee on Genetics, American Thyroid Association and Lawson Wilkins Pediatric Endocrine Society. Update on newborn screening and therapy for congenital hypothyroidism, *Pediatrics* 2006; 117:2290-2303.
13. Balon HR, Silberstein EB, Meier, DA, et al. Society of Nuclear Medicine Procedure guideline for thyroid uptake measurement, Version 3.0, approved September 5, 2006, available at <http://interactive.snm.org/docs/Thyroid%20Uptake%20Measure%20v3%200.pdf>.
14. Kukora JS, Zeiger MA, Clark OH, et al. American Association of Clinical Endocrinologists and the American Association of Endocrine Surgeons position statement of the diagnosis and management of primary hyperparathyroidism, *Endocr Pract* 2005;11:49-54.
15. Gao P, Scheibel S, D'Amour P, et al. Development of a novel immunoradiometric assay exclusively for biologically active whole parathyroid hormone 1-84: implication for improvement of accurate assessment of parathyroid function, *J Bone Miner Res* 2001; 16:605-614.
16. Bilezikian JP, Silverberg SJ. Asymptomatic primary hyperparathyroidism, *N Engl J Med* 2004; 350:1746-1751.
17. Bilezikian JP, Khan AA, and Potts JT on behalf of the Third International Workshop on the Management of Asymptomatic Primary Hyperparathyroidism. , Guidelines for the Management of Asymptomatic Primary Hyperparathyroidism: Summary Statement from the Third International Workshop, *J Clin Endocrinol Metab* 2009; 94:335-339.
18. Greenspan BS, Dillehay GL, Intenzo C. SNM practice guideline for parathyroid scintigraphy 4.0*. http://interactive.snm.org/docs/Parathyroid_Scintigraphy_V4_0_FINAL.pdf.

PEDIATRIC NECK IMAGING GUIDELINES

PEDNECK-7~ESOPHAGUS

- ✓ Esophagus imaging indications in pediatric patients are very similar to those for adult patients. See **NECK-4~ESOPHAGUS** for imaging guidelines.
- ✓ Pediatric-specific imaging considerations include the following:
 - Esophagram is the study of choice for evaluating congenital atresia or tracheoesophageal fistula.
 - Neck CT with contrast (CPT[®] 70491) and Chest CT with contrast (CPT[®] 71260) are indicated for evaluation of suspected congenital malformations if x-rays are inconclusive.
 - 3D rendering on a dedicated workstation may be approvable for preoperative planning in complex cases.

References

1. Lee, Edward Y., et al “Lower large airway disease (Chapter 52)” in Caffey’s Pediatric Diagnostic Imaging, 12th edition Brian Coley editor, Elsevier Saunders, Philadelphia PA, 2013.
2. Seekins, Jayne M. et al “Esophagus Congenital and Neonatal Abnormalities (Chapter 97)” in Caffey’s Pediatric Diagnostic Imaging, 12th edition Brian Coley editor, Elsevier Saunders, Philadelphia PA, 2013.

PEDIATRIC NECK IMAGING GUIDELINES

PEDNECK-8~TRACHEA

- ✓ Trachea imaging indications in pediatric patients are very similar to those for adult patients. See **NECK-10~TRACHEA** for imaging guidelines.
- ✓ Pediatric-specific imaging considerations include the following:
 - Neck CT with contrast (CPT[®] 70491) and Chest CT with contrast (CPT[®] 71260) are indicated for evaluation of suspected congenital malformations if x-rays are inconclusive.
 - 3D rendering on a dedicated workstation may be approvable for preoperative planning in complex cases.

References

1. Lee EY, Restrepo R, Dillman JR et al, Imaging Evaluation of Pediatric Trachea and Bronchi: Systematic Review and Updates, *Semin Roentgenol* 2012;47:182-196.
2. Lee, Edward Y., et al “Lower large airway disease (Chapter 52)” in Caffey’s Pediatric Diagnostic Imaging, 12th edition Brian Coley editor, Elsevier Saunders, Philadelphia PA, 2013.