CIGNA MEDICAL COVERAGE POLICIES - RADIOLOGY

Pediatric Peripheral Nerve and Neuromuscular Disorders (PNND) Imaging Guidelines

Effective Date: February 1, 2025

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.

Table of Contents

General Guidelines (PEDPN-1)

Guideline Page

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

Procedure Codes Associated with Peripheral Nerve Disorders (PND) Imaging

PNP.GG.ProcedureCodes.C
v1.0.2025

MRI	CPT®
MRI Neck without contrast	70540
MRI Neck without and with contrast	70543
MRI Cervical without contrast	72141
MRI Cervical without and with contrast	72156
MRI Brachial Plexus without contrast (unilateral)	73218
MRI Brachial Plexus without and with contrast (unilateral)	73220
MRI Brachial Plexus without contrast (bilateral)	71550
MRI Brachial Plexus without and with contrast (bilateral)	71552
MRI Chest without contrast	71550
MRI Chest without and with contrast	71552
MRI Thoracic without contrast	72146
MRI Thoracic without and with contrast	72157
MRI Lumbar without contrast	72148
MRI Lumbar without and with contrast	72158
MRI Abdomen without contrast	74181

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

MRI	CPT®
MRI Abdomen without and with contrast	74183
MRI Pelvis without contrast	72195
MRI Pelvis without and with contrast	72197
MRI Upper Extremity Other Than Joint without contrast	73218
MRI Upper Extremity Other Than Joint with contrast (rarely used)	73219
MRI Upper Extremity Other Than Joint without and with contrast	73220
MRI Upper Extremity Joint without contrast	73221
MRI Upper Extremity Joint with contrast (rarely used)	73222
MRI Upper Extremity Joint without and with contrast	73223
MRI Lower Extremity Other Than Joint without contrast	73718
MRI Lower Extremity Other Than Joint with contrast (rarely used)	73719
MRI Lower Extremity Other Than Joint without and with contrast	73720
MRI Lower Extremity Joint without contrast	73721
MRI Lower Extremity Joint with contrast (rarely used)	73722
MRI Lower Extremity Joint without and with contrast	73723
Unlisted MRI procedure (for radiation planning or surgical software)	76498

MRA	CPT®
MRA Upper Extremity	73225
MRA Lower Extremity	73725

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

General Guidelines (PEDPN-1.0)

PNP.GG.0001.0.A

v1.0.2025

- A pertinent clinical evaluation including a detailed history, physical examination since the onset or change in symptoms with a thorough neurologic examination, appropriate laboratory studies, and basic imaging such as plain radiography or ultrasound should be performed prior to considering advanced imaging (CT, MRI, Nuclear Medicine), unless the individual is undergoing guideline-supported scheduled imaging evaluation. A meaningful technological contact (telehealth visit, telephone call, electronic mail or messaging) since the onset or change in symptoms can serve as a pertinent clinical evaluation.
  - EMG may not be of clinical utility or obtainable in infants or individuals with severe developmental delay
  - EMG/NCS results may not be abnormal until 10 days after injury.
- Unless otherwise stated in a specific guideline section, the use of advanced imaging to screen asymptomatic individuals for disorders involving the peripheral nervous system is not supported. Advanced imaging of the peripheral nervous system is only appropriate in individuals who have documented active clinical signs or symptoms of disease involving the peripheral nervous system.
- Unless otherwise stated in a specific guideline section, repeat imaging studies of the peripheral nervous system are not necessary unless there is evidence for progression of disease, new onset of disease, and/or documentation of how repeat imaging will affect individual management or treatment decisions.

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

Age Considerations (PEDPN-1.1)

PNP.GG.0001.1.A

v1.0.2025

- Many conditions affecting the peripheral nervous system in the pediatric population are different diagnoses than those occurring in the adult population. For those diseases that occur in both pediatric and adult populations, minor differences may exist in management due to individual age, comorbidities, and differences in disease natural history between children and adults.
- Individuals who are 18 years old or younger[11] should be imaged according to the Pediatric Peripheral Nerve Disorders Imaging Guidelines if discussed. Any conditions not specifically discussed in the Pediatric Peripheral Nerve Disorder Imaging Guidelines should be imaged according to the General Peripheral Nerve Disorder Imaging Guidelines. Individuals who are >18 years old should be imaged according to the General Peripheral Nerve Disorders Imaging Guidelines, except where directed otherwise by a specific guideline section.

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

Modality General Considerations (PEDPN-1.3)

PNP.GG.0001.3.C
v1.0.2025

- MRI
  - MRI without and with contrast is the preferred modality for pediatric peripheral nerve imaging unless otherwise stated in a specific guideline section.
  - Due to the length of time required for MRI acquisition and the need to minimize individual movement, anesthesia is usually required for almost all infants (except neonates) and young children (age <7 years) as well as older children with delays in development or maturity. This anesthesia may be administered via oral or intravenous routes. In this individual population, MRI sessions should be planned with a goal of minimizing anesthesia exposure by adhering to the following considerations:
    - MRI procedures can be performed without and/or with contrast as supported by these condition-based guidelines. If intravenous access will already be present for anesthesia administration and there is no contraindication for using contrast, imaging without and with contrast may be appropriate if requested. By doing so, the requesting provider may avoid repetitive anesthesia administration to perform an MRI with contrast if the initial study without contrast is inconclusive.
      - Recent evidence based literature demonstrates the potential for gadolinium deposition in various organs including the brain after the use of MRI contrast.
      - The U.S. Food and Drug Administration (FDA) has noted that there is currently no evidence to suggest that gadolinium retention in the brain is harmful and restricting gadolinium-based contrast agents (GBCAs) use is not warranted at this time. It has been recommended that GBCA use should be limited to circumstances in which additional information provided by the contrast agent is necessary and the necessity of repetitive MRIs with GBCAs should be assessed.
    - If multiple body areas are supported by the guidelines for the clinical condition being evaluated, MRI of all necessary body areas should be obtained concurrently in the same anesthesia session.
- CT
  - CT is rarely used in the evaluation of pediatric peripheral nerve disorders. See specific guideline sections for indications.
- Ultrasound
  - Ultrasound is rarely used in the evaluation of pediatric peripheral nerve disorders. See specific guideline sections for indications.

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

- 3D Rendering
  - 3D Rendering indications in pediatric PND imaging are identical to those in the general imaging guidelines. See **3D Rendering (Preface-4.1)** in the Preface Imaging Guidelines.
- 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

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

References (PEDPND-1)

v1.0.2025

1. Bowen BC. Magnetic resonance imaging of the peripheral nervous system. In: Latchaw RE, Kucharczyk J, Moseley ME, et al., eds. *Imaging of the Nervous System.* Philadelphia, PA. Elsevier. 2005:1479-1497.
2. Reighard C, Junaid S, Jackson WM, et al. Anesthetic Exposure During Childhood and Neurodevelopmental Outcomes. *JAMA Netw Open*. 2022;5(6):e2217427. doi:10.1001/jamanetworkopen.2022.17427.
3. Fraum TJ, Ludwig DR, Bashir MR, Fowler KJ. Gadolinium-based contrast agents: A comprehensive risk assessment. *J Magn Reson Imaging*. 2017;46(2):338-353. doi: 10.1002/jmri.25625.
4. Update on FDA approach to safety issue of gadolinium retention after administration of gadolinium-based contrast agents. Available at: https://www.fda.gov/media/116492/download. September 20, 2018.
5. Blumfield E, Swenson DW, Iyer RS, Stanescu AL. Gadolinium-based contrast agents — review of recent literature on magnetic resonance imaging signal intensity changes and tissue deposits, with emphasis on pediatric patients. *Pediatr Radiol*. 2019;49(4):448-457. doi: 10.1007/s00247-018-4304-8.
6. Raybaud C and Barkovich AJ. Chapter 6: The Phakomatoses. In: *Pediatric Neuroimaging*. 5th ed. Philadelphia. Wolters Kluwer. 2012:569-636.
7. Soderlund KA, Smith AB, Rushing EJ, Smirniotopolous JG. Radiologic-Pathologic Correlation of Pediatric and Adolescent Spinal Neoplasms: Part 2, Intradural Extramedullary Spinal Neoplasms. *AJR Am J Roentgenol*. 2012;198(1):44-51. doi: 10.2214/ajr.11.7121.
8. Kang PB, McMillan HJ, Kuntz NL, et al. Utility and practice of electrodiagnostic testing in the pediatric population: An AANEM consensus statement. *Muscle Nerve*. 2020;61(2):143-155. doi: 10.1002/mus.26752.
9. Orozco V, et al. A Systematic Review of the Electrodiagnostic Assessment of Neonatal Brachial Plexus. *Neurol Neurobiol (Tallinn)*. 2020;3(2). doi: 10.31487/j.nnb.2020.02.12.
10. Artunduaga M, Liou CA, Morin CE, et al. Safety challenges related to the use of sedation and general anesthesia in pediatric patients undergoing magnetic resonance imaging examinations. *Pediatr Radiol*. 2021;51(5):724-735. doi: 10.1007/s00247-021-05044-5
11. Implementation Guide: Medicaid State Plan Eligibility Eligibility Groups Mandatory Coverage Infants and Children under Age 19. Available at: https://www.hhs.gov/guidance/document/implementation-guide-medicaid-state-plan-eligibility-eligibility-groups-aeu-mandatory-2. Issue date July 14, 2017.

Neurofibromatosis (PEDPN-2)

Guideline Page

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

Neurofibromatosis – General Information (PEDPN-2.0)

PNP.NF.0002.0.A

v1.0.2025

- This guideline section includes imaging indications for individuals with neurofibromatosis and known benign lesions.
- For cancer screening guidelines, see **Neurofibromatosis 1 and 2 (NF1 and NF2) (PEDONC-2.3)** in the Pediatric Oncology Imaging Guidelines.
- For Peripheral Nerve Sheath Tumors, see **Peripheral Nerve Sheath Tumors (PNST) (PND-9.1)** in the Peripheral Nerve and Neuromuscular Disorders (PND) Imaging Guidelines.
- For guidelines related to known malignancies in individuals with NF1, see the appropriate imaging guideline for the specific cancer type.

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

Neurofibromatosis 1 (PEDPN-2.1)

PNP.NF.0002.1.A

v1.0.2025

- See **Neurofibromatosis 1 and 2 (NF1 and NF2) (PEDONC-2.3)** in the Pediatric Oncology Imaging Guidelines.
- For Peripheral Nerve Sheath Tumors, see **Peripheral Nerve Sheath Tumors (PNST) (PND-9.1)** in the Peripheral Nerve Disorders and Neuromuscular (PND) Imaging Guidelines.
- For guidelines related to known malignancies in individuals with NF1, see the appropriate imaging guideline for the specific cancer type.

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

Neurofibromatosis 2 (PEDPN-2.2)

PNP.NF.0002.2.A

v1.0.2025

- See **Neurofibromatosis 1 and 2 (NF1 and NF2) (PEDONC-2.3)** in the Pediatric Oncology Imaging Guidelines.
- Individuals with NF2 and known meningioma should be imaged according to guidelines in **Meningiomas (Intracranial and Intraspinal) (ONC-2.8)** in the Oncology Imaging Guidelines.
- Individuals with NF2 and known ependymoma should be imaged according to guidelines in **Ependymoma (PEDONC-4.8)** in the Pediatric Oncology Imaging Guidelines.

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

Brachial Plexus (PEDPN-3)

Guideline Page

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

Brachial Plexus (PEDPN-3.1)

PNP.BP.0003.1.A
v1.0.2025

Disorders of the brachial plexus can generally be identified and distinguished from lesions in other locations by clinical and electromyography/nerve conduction (EMG/NCV) examination. If the diagnosis remains unclear, advanced imaging can be helpful as a pre-operative study to evaluate the anatomy of brachial plexus lesions that should have already been defined by clinical examination.

- MRI is the preferred modality for imaging the brachial plexus. The goal of imaging is to visualize the entire course of the neural network from the preganglionic to the postganglionic segments.
  - CT is not often useful and should not be used as a substitute for MRI.
  - MRI Upper Extremity Other Than Joint without contrast (CPT® 73218) or without and with contrast (CPT® 73220) is indicated for unilateral brachial plexus.
  - MRI Chest without contrast (CPT® 71550) or without and with contrast (CPT® 71552) is indicated for bilateral brachial plexus studies. MRI Neck without contrast (CPT® 70540) is indicated for upper trunk lesions.
  - It is rare for more than one CPT® code to be necessary to adequately image the brachial plexus area of interest.
  - MRI Shoulder without contrast (CPT® 73221) or without and with contrast (CPT® 73223) is indicated in infants with brachial plexopathy due to birth trauma if requested for preoperative planning. These individuals often have glenohumeral dysplasia and require shoulder surgery.
  - Ultrasound also may be indicated in infants with brachial plexus injury to show the glenoid dysplasia and associated shoulder subluxation
  - MRI Cervical Spine without contrast (CPT® 72141) is indicated if there is clinical suspicion for cervical nerve root avulsion.
  - PET/CT skull base to mid-thigh (CPT® 78815) is appropriate if there is a contraindication to MRI in individuals with a known malignancy or post-treatment syndrome.

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

References (PEDPND-3)

v1.0.2025

1. Expert Panel on Neurological and Musculoskeletal Imaging, Boulter DJ, Job J, et al. ACR Appropriateness Criteria® Plexopathy: 2021 Update. *J Am Coll Radiol*. 2021;18(11S):S423-S441. doi: 10.1016/j.jacr.2021.08.014.
2. Gunes A, Bulut E, Uzumcugil A, Oguz KK. Brachial Plexus Ultrasound and MRI in Children with Brachial Plexus Birth Injury. *AJNR Am J Neuroradiol*. 2018;39(9):1745-1750. doi: 10.3174/ajnr.A5749.
3. Menashe SJ, Tse R, Nixon JN, et al. Brachial Plexus Birth Palsy: Multimodality Imaging of Spine and Shoulder Abnormalities in Children. *AJR Am J Roentgenol*. 2015;204(2):W199-W206. doi: 10.2214/ajr.14.12862.
4. Somashekar DK, Di Pietro MA, Joseph JR, Yang LJS, Parmar HA. Utility of ultrasound in noninvasive preoperative workup of neonatal brachial plexus palsy. *Pediatr Radiol*. 2015;46(5):695-703. doi: 10.1007/s00247-015-3524-4.
5. Fuzari HKB, Dornelas de Andrade A, Vilar CF, et al. Diagnostic accuracy of magnetic resonance imaging in post-traumatic brachial plexus injuries: A systematic review.*Clin Neurol Neurosurg*. 2018;164:5-10. doi:10.1016/j.clineuro.2017.11.003
6. Gilcrease-Garcia BM, Deshmukh SD, Parsons MS. Anatomy, Imaging, and Pathologic Conditions of the Brachial Plexus.*Radiographics*. 2020;40(6):1686-1714. doi:10.1148/rg.2020200012
7. Griffith JF, Lalam RK. Top-Ten Tips for Imaging the Brachial Plexus with Ultrasound and MRI.*Semin Musculoskelet Radiol*. 2019;23(4):405-418. doi:10.1055/s-0039-1694753
8. Kim HHR, Ngo AV, Maloney E, et al. Contemporary imaging of the pediatric shoulder: pearls and pitfalls.*Pediatr Radiol*. 2021;51(3):338-352. doi:10.1007/s00247-021-04963-7

Gaucher Disease (PEDPN-4)

Guideline Page

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

Gaucher Disease (PEDPN-4.1)

PNP.GD.0004.1.A
v1.0.2025

- Gaucher Disease imaging indications in pediatric individuals are very similar to those for adult individuals. See **Gaucher Disease (Storage Disorders) (PN-6.3)** in the Peripheral Nerve and Neuromuscular Disorders(PND) Imaging Guidelines.

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

Spinal Muscular Atrophy (PEDPN -5)

Guideline Page

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

Spinal Muscular Atrophy (PEDPN-5.1)

PNP.SA.0005.1.A
v1.0.2025

- Spinal Muscular Atrophy
  - Molecular genetic testing is the standard tool for diagnosis for the early consideration in any infant with weakness or hypotonia
    - MRI is usually not indicated
  - See **Developmental Motor Delay (PEDHD-19.3)** in the Pediatric Head Imaging Guidelines for presentation of weakness or a loss of skills.

400 Buckwalter Place Boulevard, Bluffton, SC 29910 (800) 918-8924

References (PEDPND-5)

v1.0.2025

1. Nance JR. Spinal Muscular Atrophy. *Continuum (Minneap Minn)*. 2020;26(5, Peripheral Nerve And Motor Neuron Disorders):1348–1368.
2. Glascock J, et al. Treatment Algorithm for Infants Diagnosed with Spinal Muscular Atrophy through Newborn Screening. Research Report 8. *J Neuromuscul Dis*. 2018;5(2):145–158. doi: 10.3233/JND-180304.
3. Prior TW, Leach ME and Finanger E. Spinal Muscular Atrophy. *GeneReviews®*. Created: February 24, 2000; Updated: 2020 Dec 3. Copyright © 1993-2020, University of Washington, Seattle. GeneReviews is a registered trademark of the University of Washington, Seattle. All rights reserved.