



# CLINICAL GUIDELINES

---

## PND Imaging Policy

Version 1.0.2019

Effective February 15, 2019



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.

CPT® (Current Procedural Terminology) is a registered trademark of the American Medical Association (AMA). CPT® five digit codes, nomenclature and other data are copyright 2017 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.

## Peripheral Nerve Disorders (PND) Imaging Guidelines

<b>Abbreviations for Peripheral Nerve Disorders Imaging Guidelines</b>	<b>3</b>
<b>PN-1: General Guidelines</b>	<b>4</b>
<b>PN-2: Focal Neuropathy</b>	<b>5</b>
<b>PN-3: Polyneuropathy</b>	<b>7</b>
<b>PN-4: Brachial Plexus</b>	<b>9</b>
<b>PN-5: Lumbar and Lumbosacral Plexus</b>	<b>10</b>
<b>PN-6: Muscle Disorders</b>	<b>11</b>
<b>PN-7: Newer Imaging Techniques</b>	<b>14</b>
<b>PN-8: Amyotrophic Lateral Sclerosis (ALS)</b>	<b>15</b>
<b>PN-9: Peripheral Nerve Sheath Tumors (PNST)</b>	<b>16</b>
<b>PN-10: Nuclear Imaging</b>	<b>17</b>

## Abbreviations for Peripheral Nerve Disorders Imaging Guidelines

<b>AIDS</b>	Acquired Immunodeficiency Syndrome
<b>ALS</b>	Amyotrophic Lateral Sclerosis
<b>CIDP</b>	Chronic Inflammatory Demyelinating Polyneuropathy
<b>CNS</b>	central nervous system
<b>CPK</b>	creatinine phosphokinase
<b>CT</b>	computed tomography
<b>EMG</b>	electromyogram
<b>LEMS</b>	Lambert-Eaton Myasthenic Syndrome
<b>MG</b>	myasthenia gravis
<b>MRI</b>	magnetic resonance imaging
<b>MRN</b>	magnetic resonance neurography
<b>MRS</b>	magnetic resonance spectroscopy
<b>NCV</b>	nerve conduction velocity
<b>PET</b>	positron emission tomography
<b>PNS</b>	peripheral nervous system
<b>PNST</b>	Peripheral Nerve Sheath Tumor
<b>POEMS</b>	Polyneuropathy, Organomegaly, Endocrinopathy, M-protein, Skin changes
<b>TOS</b>	Thoracic Outlet Syndrome

## PN-1: General Guidelines

A current clinical evaluation (within 60 days) is required before advanced imaging can be considered. The clinical evaluation may include a relevant history and physical examination, including a neurological examination, appropriate laboratory studies, non-advanced imaging modalities, electromyography and nerve conduction (EMG/NCV) studies. Other meaningful contact (telephone call, electronic mail or messaging) by an established patient can substitute for a face-to-face clinical evaluation.

- MRI is, most often, preferable to CT.

### References

1. Bowen BC, Maravilla KR, Saraf-Lavi. Magnetic Resonance Imaging of the Peripheral Nervous System. In Latchaw RE, Kucharczyk J, Moseley ME. *Imaging of the Nervous System. Diagnostic and Therapeutic Applications*. Vol 2, Mosby, Philadelphia, 2005, pp.1479-1497.
2. Walker WO. Ultrasonography in peripheral nervous system diagnosis. *Continuum*. 2017 Oct; 23 (5, Peripheral Nerve and Motor Neuron Disorders):1276-1294. Accessed November 21, 2017. <https://insights.ovid.com/crossref?an=00132979-201710000-00009> Systematic Review.
3. Ohana M, Moser T, Moussaoui A, et al. Current and future imaging of the peripheral nervous system. *Diagnostic and Interventional Imaging*. 2014; 95 (1):17-26. Accessed November 21, 2017. <http://www.sciencedirect.com/science/article/pii/S2211568413001976>
4. Stoll G, Bendszus M, Perez J, et al. Magnetic resonance imaging of the peripheral nervous system. *J Neurol*. 2009 Jul; 256(7):1043-51. Accessed November 21, 2017. <https://link.springer.com/article/10.1007/s00415-009-5064-z> Systematic Review.
5. Stoll G, Wilder-Smith E, and Bendszus M. Imaging of the peripheral nervous system. *Handb Clin Neurol*. 2013; 115: 137-153. Accessed November 21, 2017. <http://www.sciencedirect.com/science/article/pii/B9780444529022000084> Systematic Review.
6. Kim S, Choi J-Y, Huh Y-M, et al. Role of magnetic resonance imaging in entrapment and compressive neuropathy—what, where, and how to see the peripheral nerves on the musculoskeletal magnetic resonance image: part 1. Overview and lower extremity. *Eur Radiol*. 2007 Jan; 17(1):139-149. Accessed November 21, 2017. <https://link.springer.com/article/10.1007%2Fs00330-006-0179-4> Systematic Review.

## PN-2: Focal Neuropathy

Focal Disorder	EMG/NCV Initially?	Advanced Imaging
Carpal Tunnel Syndrome	YES	<ul style="list-style-type: none"> <li>➤ No established role for advanced imaging.</li> <li>➤ Ultrasound of the wrist to estimate size of the carpal tunnel and diameter of the median nerve may be helpful in the evaluation and confirmation of carpal tunnel syndrome pre-operatively when EMG findings are equivocal and clinical findings are uncertain.</li> <li>➤ See <b><u>MS-21: Wrist</u></b> and <b><u>SP-3: Neck (Cervical Spine) Pain Without/With Neurological Features and Trauma.</u></b></li> </ul>
Ulnar Neuropathy	YES	Ultrasound for evaluation when clinical findings and EMG/NCV findings are uncertain. MRI of the elbow without contrast (CPT® 73221) or MRI of the upper arm forearm without contrast (CPT® 73218) for complex cases when diagnosis remains uncertain after EMG and US or for pre-op planning.
Radial Neuropathy	YES	<ul style="list-style-type: none"> <li>➤ MRI of the upper arm or forearm without contrast (CPT® 73218) in severe cases when surgery is being considered.</li> <li>➤ MRI of the upper arm or forearm without and with contrast (CPT® 73220) if there is a suspicion of a nerve tumor such as a neuroma.</li> </ul>
<p><b>Radial Neuropathy Notes:</b> Leads to wrist drop with common sites of entrapment the inferior aspect of the humerus (Saturday night palsy) or the forearm (Posterior Interosseus Syndrome). Trauma or fractures of the humerus, radius, or ulna can damage the radial nerve.</p>		
Sciatic Neuropathy	YES	CT pelvis with contrast (CPT® 72193) or MRI pelvis without contrast (CPT® 72195) should be performed in the evaluation of these entities. CT pelvis without contrast is not indicated due to lack of soft tissue contrast. It should only be performed in the rare circumstance of contrast allergy and contraindication to MRI such as pacemaking device.
<p><b>Sciatic Neuropathy Notes:</b> Trauma to the gluteal area with hematoma, injection palsy, hip or pelvic fractures, or hip replacement (arthroplasty) and rarely Piriformis Syndrome involves entrapment of the sciatic nerve at the sciatic notch in the pelvis by a tight piriformis muscle band.</p>		
Femoral Neuropathy	NO	CT pelvis with contrast (CPT® 72193) or MRI pelvis without contrast (CPT® 72195) should be performed in the evaluation of these entities.
<p><b>Femoral Neuropathy Notes:</b> as a complication of pelvic surgery in women or those on anticoagulants with retroperitoneal bleeding.</p>		



























## PN-10: Nuclear Imaging

- Nuclear Medicine
  - ◆ Nuclear medicine studies are not generally indicated in the evaluation of peripheral nerve disorders. See **PEDPN-2: Neurofibromatosis** for specific imaging guidelines regarding PET/CT in evaluation of peripheral nerve tumors.