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| **Parkinsons Disease Symptoms** |
| **Protocol Id** | 130201 |
| **Description of Protocol** | The Charcot-Marie-Tooth Neuropathy Score is a nine-item clinical examination that measures sensory symptoms, motor symptoms, arm and leg strength, and nerve conduction velocities. |
| **Specific Instructions** | This protocol must be administered by a neurologist or physician with relevant training. |
| **Protocol Text** | 1. Sensory Symptoms 0 [ ] None 1 [ ] Limited to toes 2 [ ] Extend up to and may include ankle 3 [ ] Extend up to and may include knee 4 [ ] Extends above knees 2. Motor Symptoms: Legs 0 [ ] None 1 [ ] Trips, catches toes, slaps feet 2 [ ] AFO on at least 1 leg or ankle support 3 [ ] Cane, walker, ankle surgery 4 [ ] Wheelchair most of the time 3. Motor Symptoms: Arms 0 [ ] None  1 [ ] Difficulty with buttons/zippers 2 [ ] Unable to do buttons or zippers but can write 3 [ ] Can not write or use keyboard 4 [ ] Proximal arms 4. Pin sensibility 0 [ ] Normal 1 [ ] Reduced in fingers/toes 2 [ ] Reduced up to and may include wrist/ankle 3 [ ] Reduced up to and may include elbow/knee 4 [ ] Reduced above elbow/knee 5. Vibration 0 [ ] Normal 1 [ ] Reduced at fingers/toes 2 [ ] Reduced at wrist/ankle 3 [ ] Reduced at elbow/knee 4 [ ] Reduced above elbow/knee 6. Strength: Legs 0 [ ] Normal  1 [ ] 4+, 4, or 4- on foot dorsiflexion 2 [ ] =3 Foot dorsiflexion 3 [ ] =3 Dorsiflexion and plantar flexion 4 [ ] Proximal weakness 7. Strength: Arms 0 [ ] Normal 1 [ ] 4+, 4, or 4- on intrinsics or finger extensors 2 [ ] =3 Intrinsics or finger extensors 3 [ ] <5 Wrist extensors 4 [ ] Weak above elbow 8.Ulnar CMAP 0 [ ] > 6 mV  1 [ ] 4.0-5.9 mV 2 [ ] 2.0-3.9 mV 3 [ ] 0.1-1.9 mV 4 [ ] Absent 9. Ulnar CMAP: (Median) 0 [ ] (>4 mV) 1 [ ] (2.8-3.9) 2 [ ] (1.2-2.7) 3 [ ] (0.1-1.1) 4 [ ] (Absent) 10. Ulnar SNAP 0 [ ] > 9 uV 1 [ ] 6.0 - 8.9 uV 2 [ ] 3.0-5.9 uV 3 [ ] 0.1-2.9 uV 4 [ ] Absent 11. Ulnar SNAP: (Median) 0 [ ] (>22 uV) 1 [ ] (14.0-21.9) 2 [ ] (7.0-13.9) 3 [ ] (0.1-6.9) 4 [ ] (Absent)AFO = ankle-foot orthosisCMAP = compound muscle action potentialSNAP = sensory nerve action potential**Scoring Instructions**Sum scores on all items. Maximum score is 36.1-10 mildly affected11-20 moderately affected21-36 severely affected |
| **Selection Rationale** | The Charcot-Marie-Tooth Neuropathy Score was vetted against similar protocols and chosen because it is a relatively short, validated protocol that focuses more on motor function and weakness over the sensory symptoms that characterize toxic and diabetic neuropathies. |
| **Source** | Shy, M., Blake, J., Krajewski, K., Fuerst, D., Laura, M., Hahn, A., Li, J., Lewis, R., & Reilly, M. (2005). Reliability and validity of the CMT Neuropathy Score as a measure of disability. *Neurology,* *64*(7), 1209-1214. |
| **Language** | English |
| **Participant** | Adult, aged 18 or older |
| **Personnel and Training Required** | This Charcot-Marie-Tooth Neuropathy Score protocol must be completed by a trained neurologist or by an experienced peripheral nerve clinician. |
| **Equipment Needs** | Specialized equipment is necessary to assess the peroneal compound muscle action potential (CMAP) and sural sensory nerve action potential (SNAP). |
| **Standards** |

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| **Standard** | **Name** | **ID** | **Source** |
| Common Data Element (CDE) | Person Clinical Neuropathy Assessment Score | 3076102 | [CDE Browser](https://cdebrowser.nci.nih.gov/CDEBrowser/search?elementDetails=9&FirstTimer=0&PageId=ElementDetailsGroup&publicId=3076102&version=1.0) |
| Logical Observation Identifiers Names and Codes (LOINC) | Clinical neuropathy proto | 62759-6 | [LOINC](http://s.details.loinc.org/LOINC/62759-6.html?sections=Web) |

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| **General References** | Murphy, S. M., Herrmann, D. N., McDermott M. P., Scherer, S. S., Shy, M. E., Reilly, M. M., & Pareyson, D. (2011). Reliability of the CMT Neuropathy Score (second version) in Charcot-Marie-Tooth disease. *Journal of the Peripheral Nervous Syst*em, *16*(3), 191-198. |
| **Protocol Type** | Physical Examination |
| **Derived Variables** | None |
| **Requirements** |

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| **Requirement Category** | **Required** |
| Average time of greater than 15 minutes in an unaffected individualAverage time of greater than 15 minutes in an unaffected individual | Yes |
| Major equipmentThis measure requires a specialized measurement device that may not be readily available in every setting where genome wide association studies are being conducted. Examples of specialized equipment are DEXA, Echocardiography, and Spirometry | Yes |
| Specialized requirements for biospecimen collectionThis protocol requires that blood, urine, etc. be collected from the study participants. | No |
| Specialized trainingThis measure requires staff training in the protocol methodology and/or in the conduct of the data analysis. | No |

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