

DPNCheck®

Developing a targeted peripheral neuropathy screening program



Key points in developing a targeted peripheral neuropathy screening program

- Given the ~30% prevalence of peripheral neuropathy in the elderly, any MA screening criteria will generate a high rate of positive tests
- Published peripheral neuropathy prevalence estimates are generally underestimated because nerve conduction was not used
 - DPNCheck utilizes nerve conduction so the positive test rate should meet or exceed prevalence estimates
- Targeting criteria can be based on
 - Demographic, anthropometric and SDoH factors
 - History and symptoms
 - Comorbid medical conditions

Demographic, anthropometric and SDoH factors associated with a high prevalence of peripheral neuropathy in elderly patients

Demographics

- Age
 - 75-79 years (30%) ← Estimated peripheral neuropathy prevalence
 - ≥ 80 years (42%)
- Male sex (48%)
- Black race (39%)

Anthropometrics

- BMI ≥ 30 (41%)
- Height in 4th quartile (45%)
 - Men > 5'11" Women > 5'6"

SODH

- Less than high school education (43%)

Source: Hicks et al. Prevalence of peripheral neuropathy defined by monofilament insensitivity in middle-aged and older adults in two US cohorts. Scientific Reports, 2021 (Estimates based on ARIC cohort in study).

History and symptoms associated with a high prevalence of peripheral neuropathy in elderly

- Fall in past several years (>40%)
- Diabetic foot ulcer (>80%)
- Neuropathic pain (>80%)
- Chemotherapy (30 – 68%)

Source: Richardson and Hurvitz. J Gerontol, 1995. Cheng et al. J Clin Nurs, 2002. Erlandson et al. J Acquir Immune Defic Syndr, 2019. Riskowski et al. Journal of Foot and Ankle Research, 2012. Sloan et al. Pathogenesis, diagnosis and clinical management of diabetic sensorimotor peripheral neuropathy Nature Reviews Endocrinology, 2021. Seretny et al. Incidence, prevalence, and predictors of chemotherapy-induced peripheral neuropathy: A systematic review and meta-analysis. Pain, 2014.

Health conditions associated with a high prevalence of peripheral neuropathy in elderly

- Diabetes
 - <10 years (37%)
 - ≥10 years (43%)
 - Chronic kidney disease (38%)
 - Peripheral arterial disease (44%)
 - Cancer (38%)
 - Chronic alcoholism (25 – 66%)
 - Thyroid disease (>40%)
 - Rheumatoid arthritis (up to 85%)
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- Additional conditions: metabolic syndrome, B12 deficiency, HIV infection, COPD, OSA, paraproteinemia

Sources: Hicks et al. Prevalence of peripheral neuropathy defined by monofilament insensitivity in middle-aged and older adults in two US cohorts. Scientific Reports, 2021 (Estimates based on ARIC cohort in study). Doughty and Seyedsadjadi. The American J. of Medicine, 2018. Oaklander et al. Neurol Neuroimmunol Neuroinflamm, 2022. Hanewinkel et al. Journal of Neurology, Neurosurgery & Psychiatry, 2016. Lehmann et al. Neurological Research and Practice, 2020. Dziewas et al. J Neurol Neurosurg Psychiatry, 2007. Barnes PJ, Celli BR. Systemic manifestations and comorbidities of COPD. Eur Respir J. 2009;33(5):1165–85. Beghi et al. Hypothyroidism and polyneuropathy. J. Neurology, Neurosurgery, and Psychiatry, 1989. Duyff et al. Neuromuscular findings in thyroid dysfunction: a prospective clinical and electrodiagnostic study. J Neurology, Neurosurgery, and Psychiatry, 2000. Chopra and Tiwari. Alcoholic neuropathy: possible mechanisms and future treatment possibilities. British Journal of Clinical Pharmacology, 2011. Agarwal et al. A clinical, electrophysiological, and pathological study of neuropathy in rheumatoid arthritis. Clin Rheumatol, 2008.