

Diabetic Neuropathy

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Presentation Objectives

- Understand the clinical impact of DPN
- Distinguish between “symptoms” and “signs” DPN
- Describe the proposed etiology of diabetic neuropathy

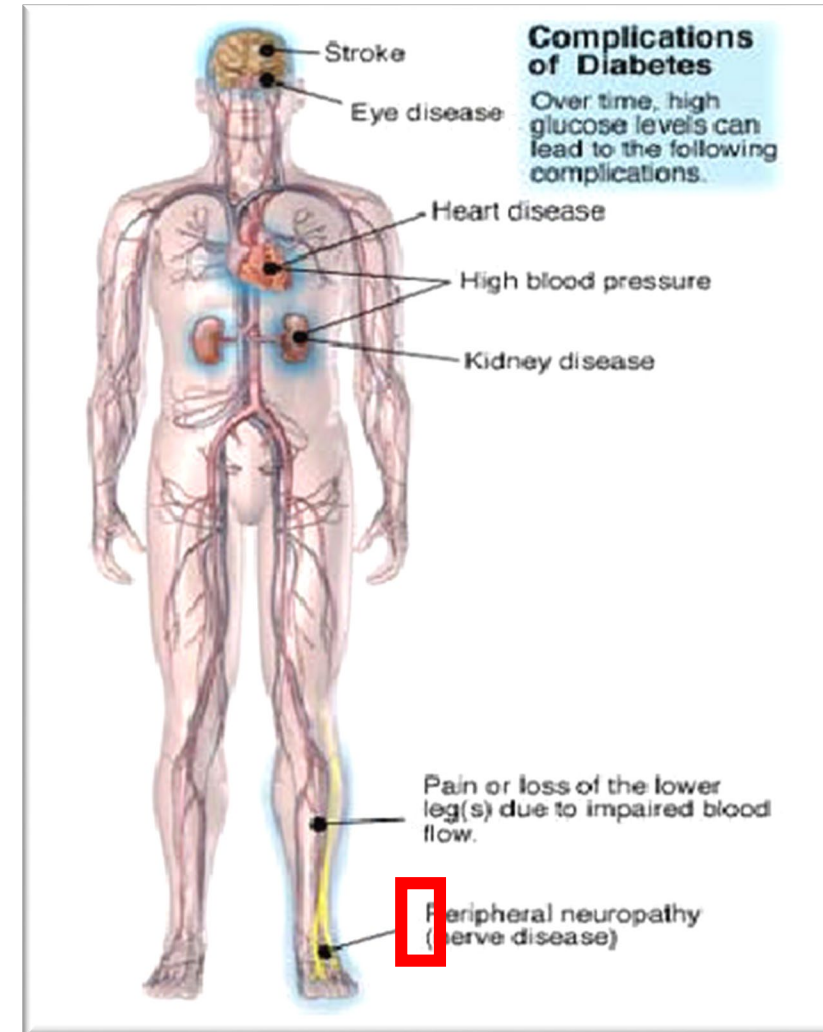
Chronic Diabetes Complications

- **Stroke**
- **Retinopathy**
- **Cardiovascular Disease (CVD)**
- **Hypertension**
- **Nephropathy**
- **Peripheral Vascular Disease (PVD)**
- **Peripheral Neuropathy**



most common complication

50% to 90% of diabetes patients depending upon criteria used for diagnosis



Diabetes Statistics...Did you know...?



Up to 70% of those with diabetes will lose sensation in their feet

Peripheral sensory neuropathy is the leading factor to diabetic foot ulcerations



Approximately 25% of those with diabetes will develop a foot ulcer

More than half of all foot ulcers will become infected, requiring hospitalization and 1 in 5 will require an amputation



After a major amputation, 30% of patients will have their other limb amputated within 3 years

5-year mortality rate after limb amputation is reported as high as 74%, when compared to cancer- it is greater than colorectal, breast, and prostate cancer

Definition of Diabetic Neuropathy

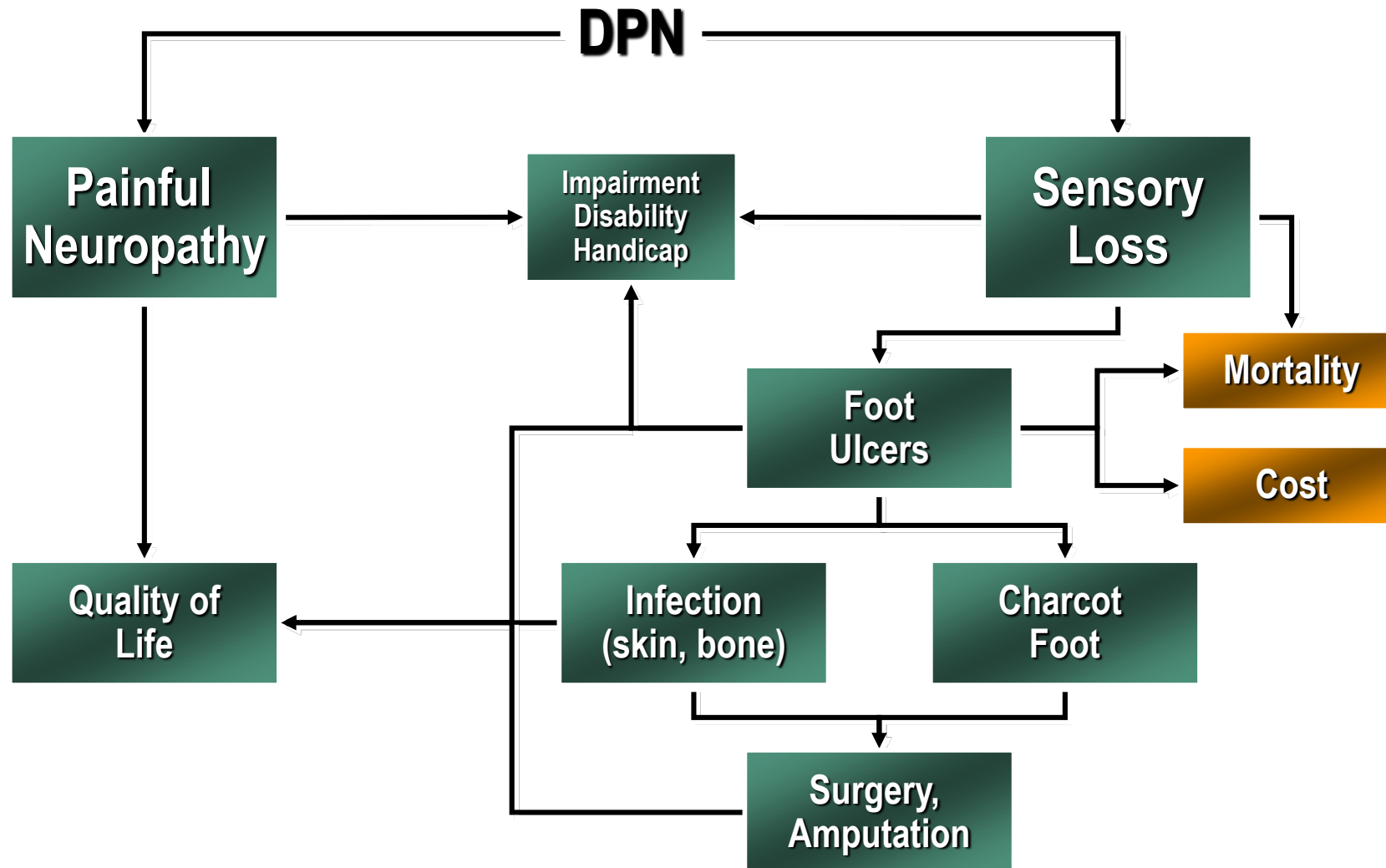
- Nerve damage and dysfunction secondary to diabetes mellitus type 1 or 2
- Consensus definition: “the presence of symptoms and/or signs of peripheral nerve dysfunction in people with diabetes after exclusion of other causes”

San Antonio Consensus Statement, 1988

Classification of DN

Somatic		Autonomic
Poly-neuropathies	Mono-neuropathies	
Sensorimotor	Isolated	Cardiovascular
Proximal motor	Cranial	Gastrointestinal
Truncal	Truncal	Genitourinary
	Multiple	Miscellaneous

Clinical Impact of DPN TOTAL Symptoms

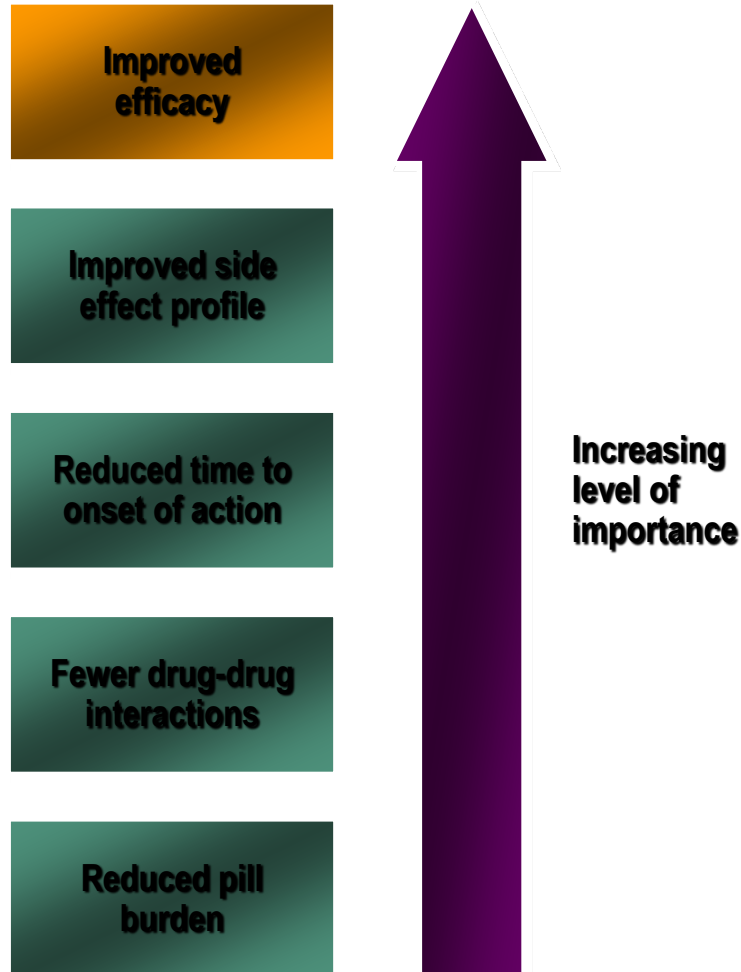


Impact of Diabetic Neuropathy

- 60-70% of foot ulcers are preceded by neuropathy
- 85% of diabetes related lower limb amputations are preceded by a foot ulcer
- Most Common Proximate, Nontraumatic Cause of Amputations
- Largest number of diabetes related hospital bed-days

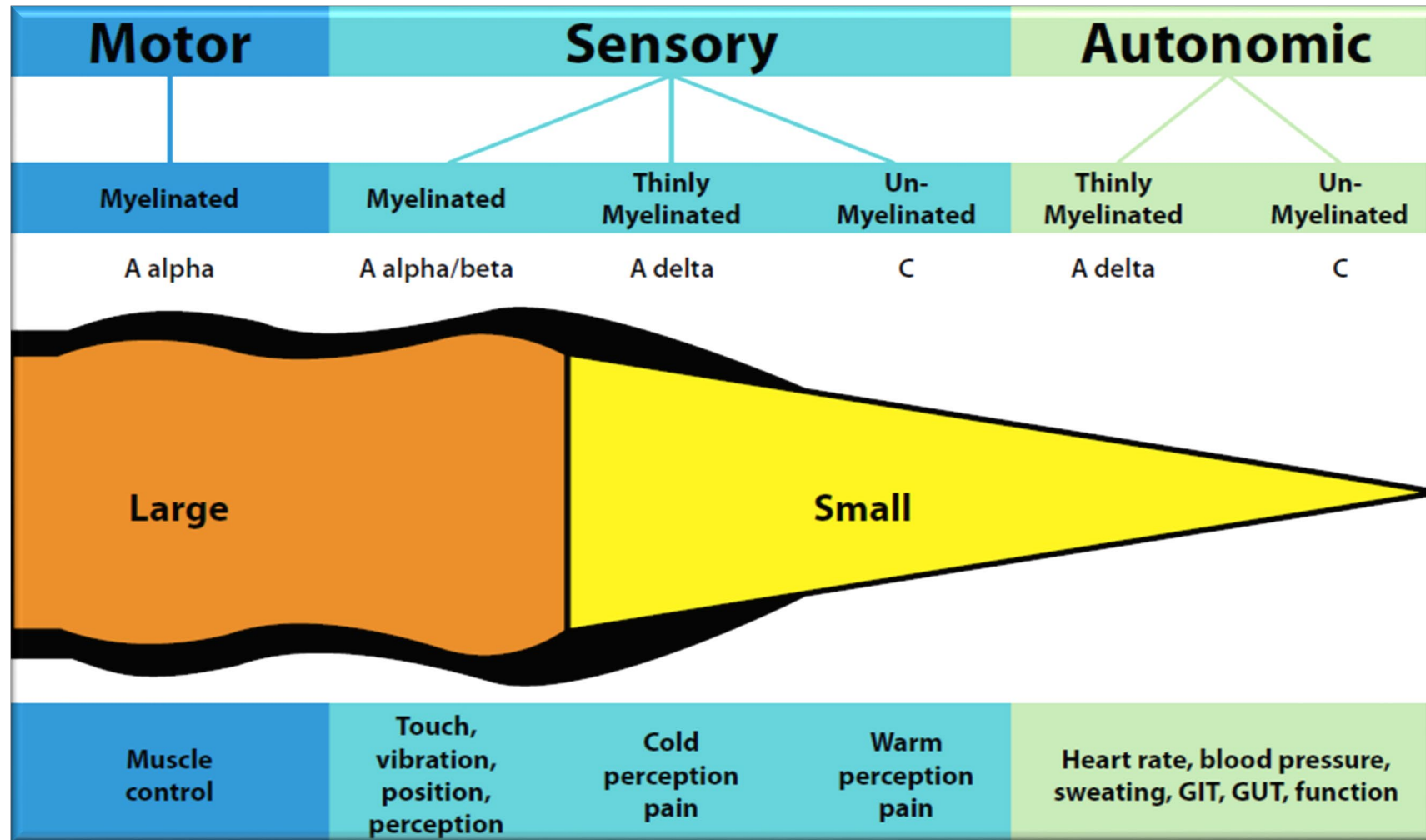


Clinical Unmet Needs in DPN



- There are a wide range of treatments available for neuropathic pain
- This prescribing pattern suggests that there is no one treatment that addresses all the factors
- Despite a spectrum of drugs available with different modes of action, many patients remain inadequately treated in several aspects of the disease

Peripheral Nervous System





Symptoms Suggestive of Polyneuropathy

- Distal and symmetric
- Involve lower more than upper limbs
- Include:
 - Numbness (diminished or loss of sensation)
 - Paresthesias (tingling, prickling)
 - Dysesthesias (pain, burning, aching, tenderness)
 - Weakness (possibly present)

Treatment Goals in Neuropathy

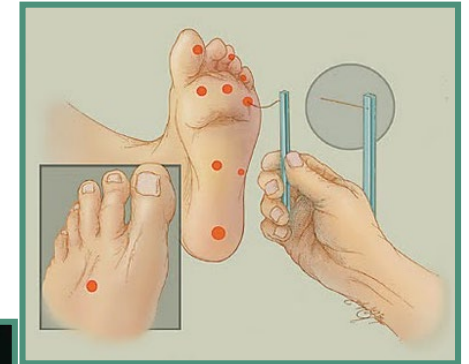
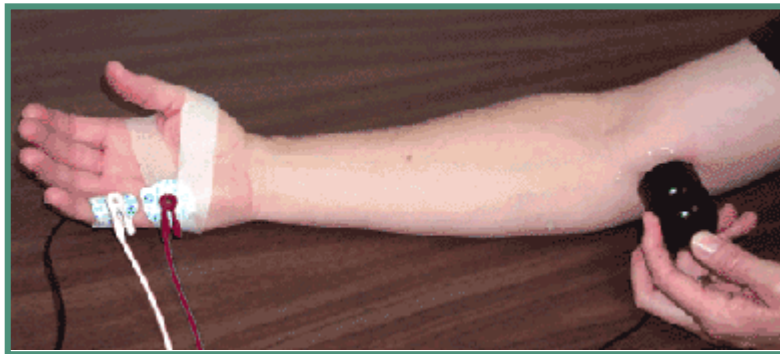
- Halt progressive nerve fiber loss
- Early intervention
- Good glycemic control

Large Fiber Neuropathies

- Clinical presentation
 - Impaired vibration perception
 - Pain is deep-seated gnawing
 - Numbness, Ataxia
 - Wasting of small muscles of hands and feet
 - Weakness
 - Increased Blood flow, the hot foot
- Risk Charcot Neuropathy

Diagnostic Tools for DPN: Large Fiber

- 5.07 Semmes-Weinstein Monofilament
- Biosthesiometer[®]
- Calibrated Tuning Fork
- Nerve Conduction Velocity



Quatrini C, Boulton A, et al. *Diabetologia*. 2008;51(6):1046-1050.
Boulton AJ, et al. *Diabetes Care*. 2004;27(6):1458-1486.
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Barber MA, et al. *J Am Podiatr Med Assoc*. 2001;91(10):508-514.
Kiso T, et al. *Journ of Pharmaco and Experi Therap*. 2001;297(1):352-356.

Clinical Presentation of Small Fiber Neuropathies

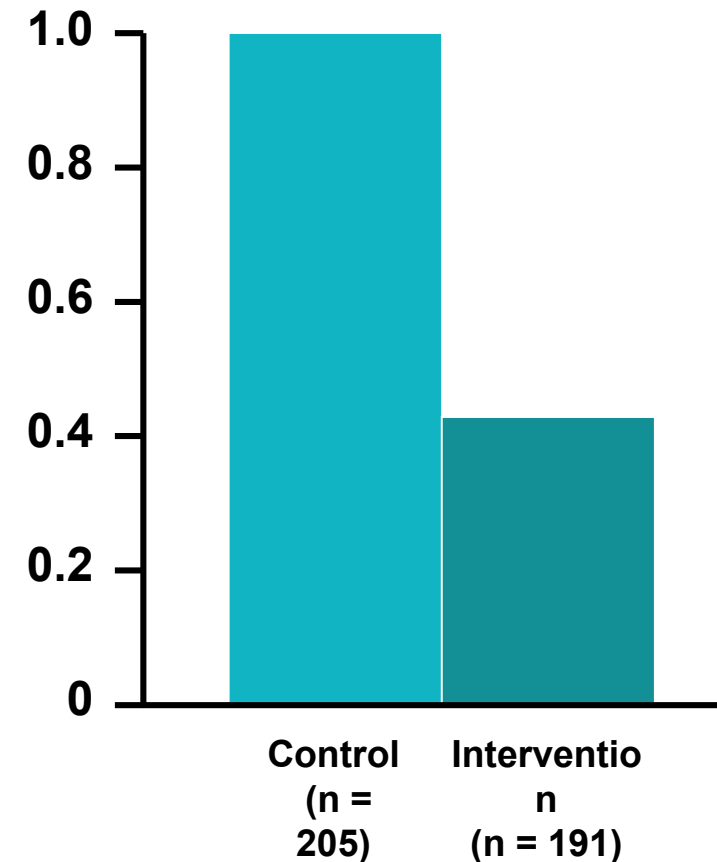
- Pain is burning, superficial, allodynia
- Early hyperesthesia and hyperalgesia, late hypo-
- Impaired warm thermal and pain thresholds
- Decreased sweating
- Normal strength, reflexes and EMG!!!
- Abnormal QST and skin biopsy
- The cold foot
- Risk foot ulceration, gangrene and amputation
 - 85,000 amputations in the US each year, 1 every 10 minutes, 87% contribution is small fiber neuropathy

Small Fiber Neuropathies

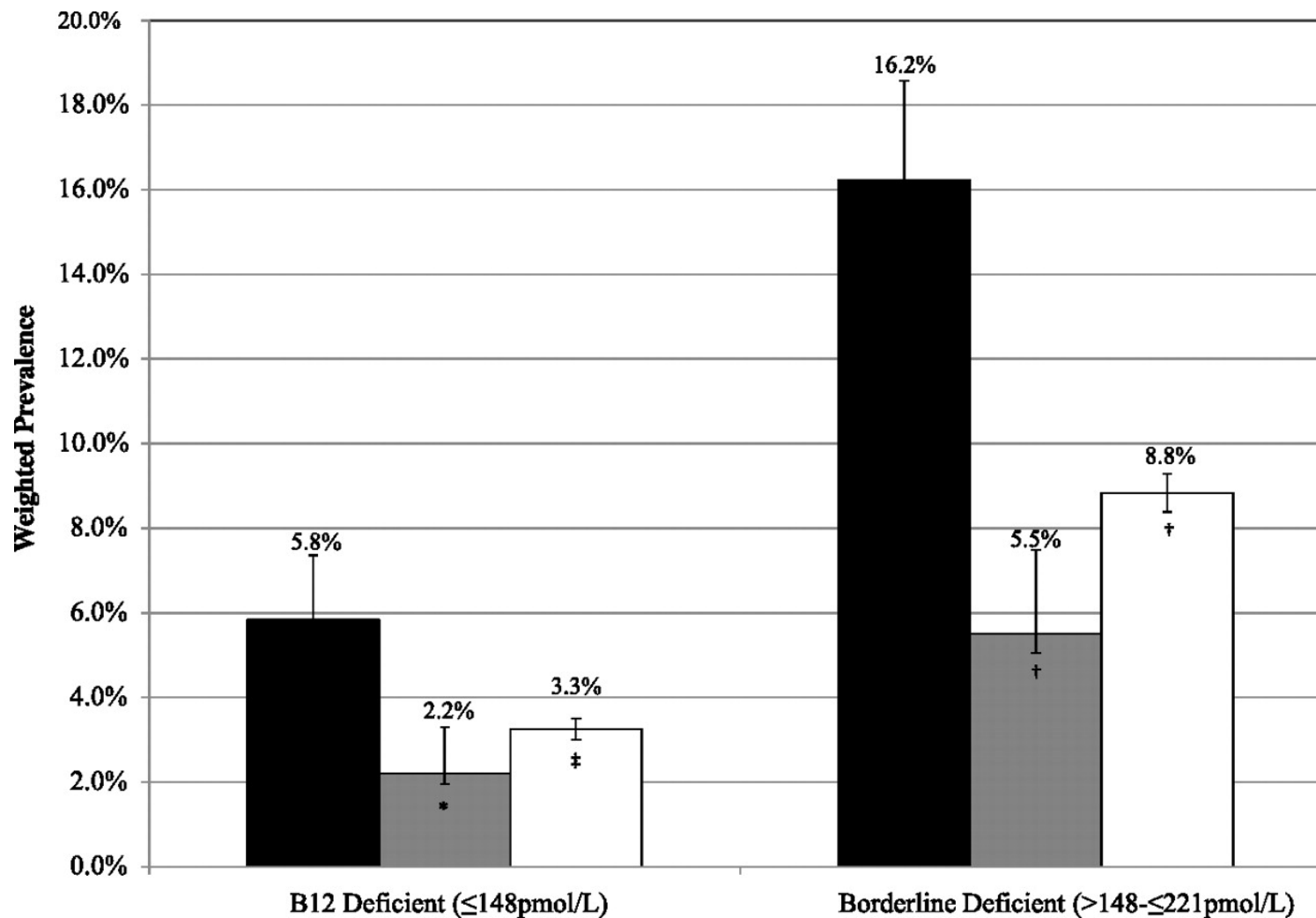
- Management
 - Education
 - Padded socks
 - Appropriate shoes with adequate support
 - Regular shoe and foot inspection-give the patient a monofilament and a mirror on the floor of the bathroom
 - Care with exposure to heat injury
 - Emollients to avoid dryness of sympathetic dysfunction

Simple Intervention Reduces Serious Foot Lesions in Type 2 Patients

- Educate patient on foot care
- No patient enters a clinic with shoes on
- Examine patient's feet and their shoes
- Provide written information about foot care, a mirror on the bathroom floor and a monofilament to take home



Weighted prevalence of biochemical B12 deficiency and borderline deficiency adjusted for age, race, and sex in U.S. adults ≥ 50 years of age: NHANES 1999–2006.



Reinstatler L et al. Dia Care 2012;35:327-333

DPN Treatment Options

