Assessment of Painful Diabetic Peripheral Neuropathy (pDPN):
An Essential Part of the Diabetic Foot Exam

Pfizer Medical Affairs

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Objectives

• Review the epidemiology, burden, pathophysiology, and clinical features of DPN and pDPN
• Review components of the comprehensive foot examination for patients with diabetes
• Review risk classification based on the comprehensive foot examination
• Review current guidelines for the screening, diagnosis, and management of DPN and pDPN
• Provide patient education for appropriate diabetic foot care
Prevalence of Diabetes in the United States

- Diabetes affects 30.3 million people in the US (9.4% of the population)\(^1\)
- Prevalence of diabetes by age group\(^{1,2}\):
  - 18-44 years: 4.6 million (4.0%)
  - 45-64 years: 14.3 million (17.0%)
  - ≥65 years: 12.0 million (25.2%)
- Diabetes was the 7\(^{th}\) leading cause of death in the US in 2015\(^1\)
- Diabetes is the leading cause of kidney failure, lower-limb amputations, and adult-onset blindness in the US\(^2\)
- A major cause of heart disease and stroke\(^2\)

Diabetes and Associated pDPN Are Prevalent\textsuperscript{1,2}

~30.3 million Americans have diabetes\textsuperscript{1}

Up to 15.2 million of these have DPN\textsuperscript{2}

~6.1 million of these have pDPN\textsuperscript{2}

Up to 50\% of patients with diabetes have DPN\textsuperscript{2}

~20\% of patients with diabetes have pDPN\textsuperscript{2}

DPN = diabetic peripheral neuropathy  
pDPN = painful diabetic peripheral neuropathy


Scope of the Problem
The Diabetic Foot

• Foot ulceration is the most frequently recognized lower extremity complication of diabetes\(^1\)
  – 15 to 25% of people with diabetes will develop a lower extremity ulcer during the course of their disease\(^1\)
  – Foot ulceration is the precursor to approximately 85% of lower extremity amputations (LEAs) in people with diabetes\(^2\)
  – 7% to 20% of patients with foot ulcers will subsequently require amputation\(^3\)

• Diabetes is the main initiating factor for foot ulceration and the most common cause of nontraumatic LEA in the Western world\(^3\)
  – Approximately 45% to 60% of all diabetic ulcerations are purely neuropathic

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The Diabetic Foot

- Patients who have chronic neuropathic pain associated with DPN are also at risk for foot ulcers and subsequent infections.
- Ritzwoller and colleagues demonstrated a higher prevalence of limb complications in pDPN patients compared to matched diabetes controls:
  - >2 times as many limb infections ($P<.001$)
  - A nearly 10-fold increase in limb amputations ($P<.001$)
- Mean diabetic foot ulcer-related annual medical costs were $5,285 and $9,590 in Medicare and privately insured patients, respectively.
  - Total annual medical cost of diabetic foot ulcers ranges from $9-13 billion in addition to the costs associated with diabetes
- Direct and indirect costs of LEA range from $20,000 to $40,000 per event

pDPN Impacts Physical and Mental Health Status

SF-12v2 Scores for Study Subjects and Normative Groups (N=255)

- General US Population
- Patients with Diabetes
- pDPN Patients

Mean Score

- Physical Functioning
- Role Physical
- Bodily Pain
- General Health
- Vitality
- Social Functioning
- Role Emotional
- Mental Health

SF-12v2 = Short Form Version 2 health form. Higher scores correlate to better health status.


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Relationship Between Pain Severity and Impact of pDPN on Daily Function

- **Percent "A Lot" or "Somewhat" Affected**

  - **Sleep**
    - Mild Pain (n = 50): 57%
    - Moderate Pain (n = 149): 26%
    - Severe Pain (n = 194): 12%

  - **Walk**
    - Mild Pain (n = 50): 82%†
    - Moderate Pain (n = 149): 50%*
    - Severe Pain (n = 194): 28%*

  - **Drive**
    - Mild Pain (n = 50): 57%
    - Moderate Pain (n = 149): 28%*
    - Severe Pain (n = 194): 12%

  - **Exercise**
    - Mild Pain (n = 50): 34%
    - Moderate Pain (n = 149): 52%*
    - Severe Pain (n = 194): 79%†

  - **Work**
    - Mild Pain (n = 50): 42%*
    - Moderate Pain (n = 149): 20%
    - Severe Pain (n = 194): 20%

  - **Perform Daily Activities**
    - Mild Pain (n = 50): 42%*
    - Moderate Pain (n = 149): 26%
    - Severe Pain (n = 194): 16%

*P ≤ 0.05 versus mild; †P ≤ 0.05 versus mild and moderate.

Patients with pDPN were selected from 2 different administrative databases of health care claims and matched to control subjects with a diagnosis of diabetes but no pDPN. Multivariate regression analyses were used to estimate the differences in health care costs between cases and control subjects.

Economic Burden of pDPN Increases With Greater Pain Severity


* Average annualized total direct cost per pDPN subject was significantly different by pain severity (P < 0.0001). Direct costs include physician visits, other healthcare provider visits, prescription medications, TENS device, outpatient tests/procedures, emergency room visits, hospital outpatient visits, hospitalizations, direct medical costs to subjects, and direct non-medical (child care, help with house and/or yard work, and help with activities of daily living) due to pDPN

** Average annualized total indirect cost per pDPN subject was significantly different by pain severity (P = 0.0003). Total indirect costs include overall work impairment, activity impairment, disability, unemployment, early retirement, and reduced work schedule due to pDPN

Scores on the BPI Pain Severity Index were used to classify average pain severity as mild, moderate, or severe.

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Health Care Costs in Patients with pDPN

Mean direct medical costs for the 12-month period after diagnosis for the subset of patients with claims data in the Optum DataMart database. Dollar values represent charges rather than actual costs to patients. Patients with DPN had a pain score of ≥1 for current pain that was obtained within 15 days (before or after) the DPN diagnosis; patients with severe DPN had pain scores of 7 to 10. DPN, painful DPN, and severe DPN cohorts were compared against diabetes-only cohort—all comparisons were statistically significant.

Overview of pDPN
Diabetic Peripheral Neuropathy

- A symmetrical, length-dependent sensorimotor polyneuropathy attributable to metabolic and microvessel alterations as a result of chronic hyperglycemia exposure and cardiovascular risk covariates.
  - The most common presentation of neuropathy in diabetes.
  - Insidious in onset. May be present in at least 10-15% of newly diagnosed patients with type 2 diabetes.
  - Up to half of patients may be asymptomatic, with the diagnosis made during a routine neurological exam or when the patient presents with a painless foot ulcer.

References:
Pathophysiology of DPN

- DPN involves both small and large nerve fibers. Symptoms vary according to the class of sensory fibers involved.¹

**Large fibers (Aα/β)²,³**
- Results in loss of:
  - Light touch
  - Pressure sensation
  - Vibration sensation
  - Proprioception
- Abnormal deep tendon reflexes
- Gnawing or aching pain
- Wasting of small muscles in feet/hands

**Small fibers (Aδ and C)²-⁴**
- Neuropathic pain
  - Burning, shooting, electric shock-like, stabbing, prickling
- Allodynia
- Hyperalgesia
- Loss of pain and temperature sensation
- Impaired autonomic function
  - Decreased sweating, dry skin, poor blood flow, cold feet

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Pathophysiology of DPN

- DPN involves both small and large nerve fibers. Symptoms vary according to the class of sensory fibers involved.¹,²

**Diabetic peripheral neuropathy can present as either painful, with or without sensory deficit, or pain-free and mainly characterized by sensory loss.⁵**

**Large fibers (Aα/β)³³**
- Vibration sensation
- Proprioception

**Small fibers (Aδ and C)³³**
- Allodynia
- Hyperalgesia
- Loss of pain and temperature sensation
- Impaired autonomic function
  - Decreased sweating, dry skin, poor blood flow, cold feet

Duration of Diabetes and Poor Glycemic Control Increase Risk for DPN

Severity of DPN correlates with duration of diabetes

Prevalence of DPN is related to glycemic control

SD = standard deviation


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Duration of Diabetes and Poor Glycemic Control Increase Risk for DPN

Severity of DPN correlates with duration of diabetes\textsuperscript{1}

Prevalence of DPN is related to glycemic control\textsuperscript{2}

Although poor glycemic control is a risk factor for pDPN, patients who have good glycemic control are still at risk for developing pDPN\textsuperscript{2}

SD = standard deviation


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Odds Ratios for Key Risk Factors for Development of DPN

Clinical Presentation pDPN

- Up to 50% of patients with DPN experience painful symptoms

- Burning
- Sharp pain
- Electric shocks
- Shooting
- Stabbing
- Deep aching
- Prickling
- Tingling
- Pins and needles
- Dysesthesias
- Discomfort on walking
- Sensations of heat/cold in feet
- Allodynia
- Hyperalgesia

Clinical Presentation of pDPN

- First affects the feet and lower limbs, with the hands affected later\(^1,2\)
- Symptoms occur symmetrically in a “stocking and glove” pattern\(^1,2\)
- Symptoms tend to be worse at night and often result in sleep disturbance\(^2,3\)
- Pain may be constant or intermittent\(^4\)
- Patients often find it difficult to describe the symptoms, which may differ from the pain they've previously experienced\(^3\)

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Clinical Presentation of pDPN

- The majority of patients report their pain as moderate or severe\textsuperscript{1-3}

- Limited data on the natural history of pDPN\textsuperscript{4}
  - Some studies report no appreciable occurrence of remission or improvement in pain severity over time
  - Other studies suggest painful symptoms may improve with the worsening of sensory loss

- There is no correlation between the intensity of pain symptoms and the severity of sensory loss\textsuperscript{5}

The Comprehensive Foot Exam
• All patients should be assessed *annually* for DPN using medical history and simple clinical tests:
  – Patients with type 1 diabetes for five or more years
  – All patients with type 2 diabetes

• Perform a comprehensive foot evaluation *at least annually* to identify risk factors for ulcers and amputations

• Consider more frequent foot assessments in patients with histories of ulcers or amputations, foot deformities, insensate feet, and peripheral arterial disease

• All patients with diabetes should have their feet inspected at every visit

Key Components of the Foot Exam\textsuperscript{1,2}

- Patient History
  - Includes assessment for neuropathic pain symptoms
- General Inspection
  - Dermatologic
  - Musculoskeletal
- Vascular Assessment
- Neurological Assessment

**Patient History\(^1,2\)**

### Past History
- Ulceration
- Amputation
- Charcot foot
- Angioplasty or Vascular surgery
- Cigarette smoking
- Foot care practices

### Vascular Symptoms
- Claudication
- Leg fatigue
- Rest pain
- Decreased walking speed
- Nonhealing ulcer

### Neuropathic Symptoms
- Positive (e.g., burning or shooting pain, electrical or sharp sensations etc.)
- Negative (e.g., numbness, feet feel dead)

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### Other Diabetic Complications
- Renal disease
- Retinopathy (visual impairment)

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General Inspection

- Careful inspection of skin integrity and musculoskeletal deformities performed in a well-lit room with shoes and socks removed
- Inappropriate footwear and foot deformities are common contributory factors in the development of foot ulceration
  - Inspect the shoes. “Are these shoes appropriate for these feet?”

**Dermatologic**
- Skin status: color, thickness, dryness, cracking
- Sweating
- Infection: check between toes for fungal infection
- Ulceration
- Calluses (particularly with hemorrhage), blistering, abnormal erythema

**Musculoskeletal**
- Deformity (e.g., claw toes, prominent metatarsal heads, Charcot foot)
- Muscle wasting (guttering between metatarsals)
Vascular Assessment\textsuperscript{1,2}

- Peripheral arterial disease (PAD) is a component cause in approximately 1/3 of foot ulcers and is often a significant risk factor associated with recurrent wounds.

- Assessment of PAD is important in defining overall lower extremity risk status.

- Assess for symptoms of vascular disease: claudication, rest pain, leg fatigue, decreased walking speed, nonhealing ulcers.

- Vascular examination should include:
  - Palpation of the posterior tibial and dorsalis pedis pulses.
  - Ankle-brachial index testing in patients with signs or symptoms of PAD.

Loss of Protective Sensation

- Simple clinical tests available
- At least two of these should be regularly performed during the exam
  - Ideally the 10-g monofilament and at least one other test
- One or more abnormal tests would suggest LOPS
- At least 2 normal tests (and no abnormal test) rules out LOPS

Clinical Tests

- 10-g monofilament $^*$
- Pinprick sensation $^†$
- Temperature sensation $^†$
- Ankle reflexes $^*$
- Vibration sensation $^*$
  - 128-Hz tuning fork
  - Vibration Perception Threshold (VPT) testing with a biothesiometer

LOPS = Loss of Protective Sensation

$^*$ Large-fiber function $^3$
$^†$ Small-fiber function $^3$

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# ADA Risk Classification Based on the Comprehensive Foot Exam

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Definition</th>
<th>Treatment Recommendations</th>
<th>Suggested Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No LOPS, no PAD, no deformity</td>
<td>• Patient education including advice on appropriate footwear</td>
<td>Annually (by generalist and/or specialist)</td>
</tr>
</tbody>
</table>
| 1             | LOPS ± deformity | • Consider prescriptive or accommodative footwear  
• Consider prophylactic surgery if deformity is not able to be safely accommodated in shoes. Continue patient education | Every 3–6 months (by generalist or specialist) |
| 2             | PAD ± LOPS | • Consider prescriptive or accommodative footwear  
• Consider vascular consultation for combined follow-up | Every 2–3 months (by specialist) |
| 3             | History of ulcer or amputation | • Same as category 1  
• Consider vascular consultation for combined follow-up if PAD present | Every 1–2 months (by specialist) |

LOPS = Loss of Protective Sensation

American Society of Pain Educators Consensus Guidelines: Key Elements in the Diagnosis of pDPN¹

- Establish presence of neuropathy
  - Use validated questionnaires to identify painful symptoms
  - Perform neurological assessment (10-g monofilament, 128-Hz tuning fork)
- Assess pain characteristics
  - Distal, symmetrical
  - Numbness, tingling vs. burning, aching, throbbing pain
  - Spontaneous pain (continuous or intermittent) vs stimulus-evoked pain
- Rule out nondiabetic causes for neuropathy and/or pain

American Society of Pain Educators Consensus Guidelines: Key Elements in the Diagnosis of pDPN

- Establish presence of neuropathy
  - Use validated questionnaires to identify painful symptoms
  - Perform neurological assessment (10-g monofilament)

There is no correlation between the intensity of pain symptoms and the severity of sensory deficit

- Numbness, tingling vs. burning, aching, throbbing pain
- Spontaneous pain (continuous or intermittent) vs stimulus-evoked pain

- Rule out nondiabetic causes for neuropathy and/or pain


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Validated Questionnaires to Identify Neuropathic Pain

• The diagnosis of pDPN in practice is a clinical one, relying on the patient’s description of pain\(^1\)
• Patients often find it difficult to describe the symptoms of pDPN as they are different than the pain they have previously experienced\(^1,2\)
• Use of validated questionnaires that can distinguish neuropathic from non-neuropathic pain is recommended in routine clinical practice\(^1-3\)
• Examples of validated questionnaires:\(^4\)
  – ID Pain
  – Leeds Assessment of Neuropathic Symptoms and Signs\(^\text{©}\) (LANSS and S-LANSS)
  – Neuropathic Pain Questionnaire\(^\text{©}\) (NPQ and NPQ-SF)
  – Neuropathic Pain Diagnostic Questionnaire\(^\text{©}\) (DN4 and DN4-Interview)

ID Pain: Patient-Reported Screener

- A 6-item validated screening tool that accurately indicates the presence of a neuropathic component of pain
- Validated using data from 2 independent multicenter study samples and a statistical and psychometric methodology informed by expert clinician review
- Self-administered or administered by staff
- Scores range from -1 to 5 with a higher score indicative of pain that contains a neuropathic component

ID Pain: Patient-Reported Screener
Neuropathic vs Nociceptive Pain

Mark “Yes” to the following items that describe your pain over the past week and “No” to the ones that do not.

<table>
<thead>
<tr>
<th>Question</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Did the pain feel like pins and needles?</td>
<td>1</td>
</tr>
<tr>
<td>2. Did the pain feel hot/burning?</td>
<td>1</td>
</tr>
<tr>
<td>3. Did the pain feel numb?</td>
<td>1</td>
</tr>
<tr>
<td>4. Did the pain feel like electrical shocks?</td>
<td>1</td>
</tr>
<tr>
<td>5. Is the pain made worse with the touch of clothing or bed sheets?</td>
<td>1</td>
</tr>
<tr>
<td>6. Is the pain limited to your joints?</td>
<td>-1</td>
</tr>
</tbody>
</table>

A score of 3, 4, or 5 (indicating the likely presence of a neuropathic component) may justify a more detailed evaluation.

Electronic Chronic Pain Questions (eCPQ)*

- **CHRONIC PAIN?**
  - Have you had pain most days in the past 3 months? (Y/N)
  - Yes
  - No = Exit

- **PAIN INTENSITY & LOCATION**
  - What was your average pain over the last week? (0–10 NRS Scale)
  - Where is your pain? (Diagram)

- **IMPACT ON FUNCTION, SLEEP, & MOOD**
  - Thinking of the past week...
  - How much did pain interfere with your usual activities?
  - How much did pain interfere with your sleep?
  - How much did pain interfere with your mood?
  - (0–10 NRS Scale for each item)

- **PAIN QUALITY & TYPE**
  - **ID PAIN® Screener**
    - Did the pain feel like pins and needles? (Y/N)
    - Did the pain feel hot/burning? (Y/N)
    - Did the pain feel numb? (Y/N)
    - Did the pain feel like electrical shocks? (Y/N)
    - Is the pain made worse with the touch of clothing or bed sheets? (Y/N)
    - Is the pain limited to your joints? (Y/N)
  - Score: < 3
    - Consider Nociceptive Pain
  - Score: ≥ 3
    - Consider Neuropathic Pain
  - **“Sensory Hypersensitivity” or Fibromyalgia-like Pain**
    - Did you have trouble thinking or remembering in the past week?
    - Were you sensitive to bright lights, loud noises, or smells in the past week?
    - (0–10 NRS Scale for each item)

Other information to help diagnose sensory hypersensitivity can be derived from medical history and other eCPQ questions. It includes:
- Widespread pain from body map image / locations? (Y/N)
- Marked impairment of mood, sleep, and function? (Y/N)
- Medical history of ≥1 other sensory hypersensitivity condition? (Y/N)

- Consider Sensory Hypersensitivity
  - “Mostly Yes”

*For the purposes of this presentation, the eCPQ questions have been paraphrased.

NRS = numeric rating scale

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## Diabetic Foot-Related Quality Measures in the Quality Payment Program

<table>
<thead>
<tr>
<th>Quality Measure Name (Quality ID #)</th>
<th>Measure Type</th>
<th>Submission Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes Mellitus: Diabetic Foot and Ankle Care, Peripheral Neuropathy – Neurological Evaluation (#126)</td>
<td>Process</td>
<td>Registry</td>
</tr>
<tr>
<td>Percentage of patients aged 18 years and older with a diagnosis of diabetes mellitus who had a neurological examination of their lower extremities within 12 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 10-g monofilament plus testing any one of the following: vibration using 128-Hz tuning fork, pinprick sensation, ankle reflexes, or vibration perception threshold</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes Mellitus: Diabetic Foot and Ankle Care, Ulcer Prevention – Evaluation of Footwear (#127)</td>
<td>Process</td>
<td>Registry</td>
</tr>
<tr>
<td>Percentage of patients aged 18 years and older with a diagnosis of diabetes mellitus who were evaluated for proper footwear and sizing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Includes a foot examination documenting the vascular, neurological, dermatological, and structural/biomechanical findings. The foot should be measured using a standard measuring device, and counseling on appropriate footwear should be based on risk categorization.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes: Foot Exam (#163)</td>
<td>Process</td>
<td>EHR</td>
</tr>
<tr>
<td>The percentage of patients 18-75 years of age with diabetes (type 1 and type 2) who received a foot exam (visual inspection and sensory exam with monofilament and a pulse exam) during the measurement year</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Management of pDPN
ADA Standards of Medical Care in Diabetes: Foot Care and Treatment for DPN

1. Optimize glucose control to prevent or delay neuropathy in type 1 diabetes and to slow neuropathy progression in type 2 diabetes

2. Therapeutic strategies for the relief of pDPN can potentially reduce pain and improve quality of life

3. Assess and treat patients with a tailored and stepwise pharmacologic strategy with careful attention to symptom improvement, medication adherence, and side effects

4. Provide general foot self-care education to all patients with diabetes

5. Refer patients who smoke, have prior lower-extremity complications, loss of protective sensation, structural abnormalities, or PAD to foot care specialists for ongoing preventive care and life-long surveillance

6. Multidisciplinary approach recommended for those with foot ulcers and high-risk feet

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## American Society of Pain Educators Consensus Guidelines: pDPN Treatment Goals

<table>
<thead>
<tr>
<th>Goal</th>
<th>Recommendation</th>
</tr>
</thead>
</table>
| Primary: Zero pain                        | • Be realistic  
• Many patients only achieve 30% to 50% pain reduction  
• Aggressive pursuit of maximum relief is recommended |
| Secondary: Restoration or improvement in functional measures and quality of life | • Pain relief may translate to an ability to return to work or social activities and improved quality of life and mood  
• Hopefully, improved function will follow pain relief  
• If improved function does not follow, take measures to help patients optimize function in the presence of residual pain |

Management of Pain Associated with pDPN

Treatment Approaches

1. Pharmacotherapy
2. Interventional Regional Anesthesia
3. Neurostimulatory
4. Complementary/Alternative
5. Physical Rehabilitation
6. Psychologic
7. Lifestyle


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Commonly Prescribed Classes of Medications for the Management of pDPN\textsuperscript{1,2}

- Anticonvulsants\textsuperscript{*}
- Serotonin-norepinephrine reuptake inhibitors\textsuperscript{*}
- Tricyclic antidepressants
- Opioid analgesics\textsuperscript{*}
- Dermal and topical treatments

\textsuperscript{*}FDA-approved treatment available within these classes.

# ADA Guidelines: Pharmacologic Management of pDPN

## Treatment recommendations for painful DPN

<table>
<thead>
<tr>
<th>Recommended for first- or second-line use*(^\dagger)</th>
<th>Recommended with caution(^\dagger)</th>
<th>Not recommended for first- or second-line use(^\dagger)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticonvulsants</td>
<td>Tricyclic antidepressants</td>
<td>Opioids</td>
</tr>
<tr>
<td>Antidepressants</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Ratings vary dependent of anticonvulsants/antidepressant agent. Rating level A; based on large, well-designed clinical trials or well-done meta-analyses.\(^2\)

\(^\dagger\)Rating level B; based on supportive evidence from well-conducted cohort studies or well-conducted case-control study.\(^2\)

\(^\ddagger\)Opioid use is associated with high risk of addiction, abuse, sedation, and other complications and psychosocial issues. The ADA does not recommend opioids for the treatment of painful DPN before a trial of other agents that do not have these associated conditions. Rating level E; based on expert consensus or clinical experience.\(^2\)

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American Academy of Neurology Evidence-Based Guideline: Treatment of pDPN

- Objective: To develop a scientifically sound and clinically relevant evidence-based guideline for the treatment of pDPN
- Addresses the efficacy of pharmacologic and nonpharmacologic treatments to reduce pain and improve physical function and quality of life in patients with pDPN
- Classified studies according to the AAN classification of evidence scheme for a therapeutic article. Recommendations were linked to the strength of evidence
Impact of pDPN on Diabetes Care

• Regular exercise is an important part of the diabetes management plan\textsuperscript{1,2}:
  – Improves blood glucose control
  – Reduces cardiovascular risk factors
  – Contributes to weight loss
  – Improves well-being

• “The inclusion of an exercise program or other means of increasing overall physical activity is critical for optimal health in individuals with type 2 diabetes.”\textsuperscript{2}

  – \textit{American College of Sports Medicine and American Diabetes Association 2010 Joint Position Statement on Exercise and Type 2 Diabetes}

• pDPN negatively impacts exercise and walking ability\textsuperscript{3}

• Guidelines recommend aerobic exercise (e.g., brisk walking) as part of the diabetes management plan\textsuperscript{1,2}

Painful DPN May Affect Treatment Goals

Painful DPN may make it difficult to engage in appropriate exercise regimens, a critical component of diabetes management. DPN pain may interrupt regular exercise routines, which have a beneficial effect on glucose levels. Poor sleep quality may lead to reduced levels of activity.

The risk of DPN increases with rising A1c levels and longer duration of diabetes. Even patients with good glycemic control are at risk for developing DPN due to other risk factors such as smoking, hypertension, and cardiovascular disease.

Sleep loss has a negative impact on glucose homeostasis. Painful DPN may impact sleep, leading to sleep loss. In a cross-sectional survey (N=255), sleep problems increased with the severity of painful DPN—with 64% of patients reporting suboptimal sleep.


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Patient Education
Management of the Diabetic Foot: Patient Education

- Control your diabetes
- Check your feet every day
- Wash your feet every day
- Smooth corns and calluses gently
- Keep skin soft and smooth
- Trim your toenails straight across

- Wear shoes and socks at all times
- Protect your feet from hot and cold
- Keep blood flowing to your feet
- Get a foot check at every health care visit

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Management of the Diabetic Foot: Footwear Assessment

• Examine the inside of the shoes
• Look at the type of footwear
• Look at the fit of the footwear
• Avoid pointed-toe and open-toe shoes, high heels, thongs and sandals
• Shoes should accommodate any deformities
• Should corrective shoes or inserts be prescribed?

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Summary

- pDPN is a prevalent chronic complication of diabetes that is associated with significant health and economic burden\(^1\)
- According to the ADA, an annual comprehensive foot exam and assessment for DPN are standards of medical care for patients with diabetes\(^2\)
- The American Society of Pain Educators recommends the use of validated questionnaires to identify and assess neuropathic pain in patients with diabetes\(^3\)
- The ADA recommends both pharmacologic and non pharmacologic therapies to help patients manage and treat symptoms of pDPN\(^1,2\)