



## Focus on Foot Care

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The feet of patients with diabetes become high risk for wounds, infection or even amputation once numbness and/or poor circulation develop. This need not occur, as those conditions are considered the most preventable of all diabetes complications. The American Diabetes Association recommends a comprehensive foot exam at least annually. Any practitioner with questions can always contact the ANMC Podiatrist through the "telepodiatry" line of their telemedicine carts. A brief history and photographs are helpful for the podiatrist to provide a complete and accurate assessment.

### Basic Foot Care Education for all Patients

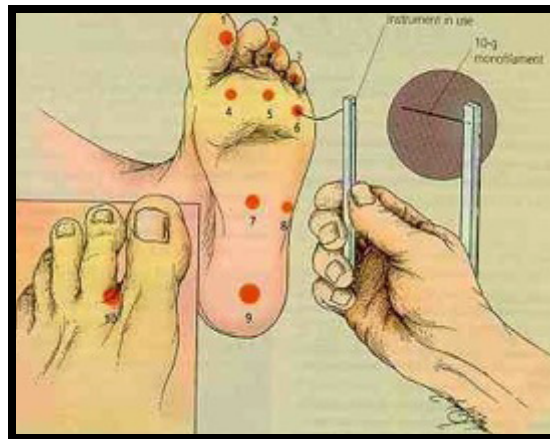
- Never self-treat corns or calluses.
- Wear clean, white, dry socks everyday. Never go barefoot.
- Wash feet daily with mild soap and dry carefully, especially between the toes.
- Moisturize feet to prevent dryness and cracking that could lead to infection.
- Inspect feet daily and check for cuts, redness, or sores. Use a mirror to look underneath if mobility is impaired or ask a family member for help.
- Cut nails straight across to prevent infection from ingrown toenails.
- Wear shoes that match the shape of the foot. Make sure there is plenty of room at the ball of the foot.

Reference: Pupp, G. "Reassessing the Impact of Diabetic Footwear." *Podiatry Today*. 17.3 (2004) 36-43.

## The 30 Second Foot Exam

There may not be time at every visit for a full diabetic foot exam, but there are a couple of key checks to ensure that no major problems have developed before you send your patient on their way. If nothing else, check your patient for a palpable pedal pulse and use a 10-gram

(5.07 gauge) monofilament to check for sensitivity at the base of the first, third, and fifth toes (points one, two, and three on the graphic). These tests can be done in 30 seconds or less and can ensure that patients' feet are perfused and sensitive.



### Objectives

- 1) Understand basic patient education and the risk classification for diabetes foot care
- 2) Compare treatments for diabetic neuropathy
- 3) Explain ways to reduce GI side effects in metformin

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## Focus on Foot Care, Continued

To determine the extent of individual foot care needed for a particular patient, the following risk level classification can be used :

<i>Risk Classification</i>	<i>Description</i>	<i>Foot Care Recommendations</i>
<i>Grade 0</i>	<i>Sensation &amp; circulation are intact; no ulceration or deformity</i>	<i>Educate patient on foot care and proper footwear; follow up with normal annual foot exam</i>
<i>Grade 1</i>	<i>Sensation absent, but no obvious deformity</i>	<i>Educate patient on foot care and proper footwear, assess their shoes and/or liners, address importance of tight glycemic control; Foot exam every 6 months</i>
<i>Grade 2</i>	<i>Much higher risk of serious complications. Sensation absent &amp; deformity present (thick toenail, bunions, callus, hammertoe)</i>	<i>Custom shoes are appropriate at this stage, patient education; Foot exam every 2 months</i>
<i>Grade 3</i>	<i>Active ulcer, but no infection; may have signs of more gross deformity (i.e. Charcot syndrome)</i>	<i>Foot exam every week</i>
<i>Grade 4</i>	<i>Active infected ulcer</i>	<i>Hospitalized or foot exam daily</i>
<i>Grade 5</i>	<i>Gas gangrene</i>	<i>Hospitalization required</i>

## Diabetic Peripheral Neuropathy

Diabetic peripheral neuropathy will lead to foot ulcers in 15% of patients and is the number one cause of non-traumatic amputations worldwide. It will affect up to 50% of diabetes patients, possibly causing such symptoms as: numbness, tingling, or loss of temperature sensitivity in extremities (particularly feet), muscular weakness, gait abnormalities, sensitivity to touch, sharp pains worsening at night, issues with balance, and developing foot problems. The best way to avoid this serious complication or slow its progression is to

maintain tight control of blood glucose and manage the risk factors listed here. Male patients, older patients, and those who have had diabetes for a longer time are at increased risk. With careful management, the risk of developing neuropathy can be reduced by 60%, but there are also multiple options available for symptomatic treatment. For pain, traditional pain relievers and NSAIDs are rarely very effective. Antidepressants, anticonvulsants, and other classes of medication may be more appropriate.

### **Modifiable Risk Factors for Neuropathy:**

- *Poor glycemic control*
- *Hypertension*
- *Hyperlipidemia (especially triglycerides)*
- *Smoking*
- *Obesity*
- *Alcohol use*

# Management of Diabetic Peripheral Neuropathy with Medication Therapy

## 1<sup>st</sup> line therapies

Class	Drug	Dosing	Adverse effects	Special considerations
<b>Tricyclic antidepressants</b>	Amitriptyline	10-25 mg HS, then titrate up 10-25 mg/week to max 300 mg/day	Sedation, orthostatic hypotension, anticholinergic effects, prolonged QT interval	Less tolerated than SNRIs, CI in older patients and those with CV problems
	Nortriptyline	10-25 mg HS, then titrate up 10-25 mg/week to max 300 mg/day	Anticholinergic effects	Less tolerated than SNRIs
	Imipramine (Tofranil)	10-25 mg HS, then titrate up 10-25 mg/week to max 300 mg/day	Sedation, orthostatic hypotension, anticholinergic effects	Less tolerated than SNRIs
<b>GABA analogs</b>	Pregabalin (Lyrica)	50 mg TID, then up to 100 mg TID over 1 week	Peripheral edema, weight gain	FDA-approved for DPN, renal dosing required
<b>Topical products</b>	Topical lidocaine	Up to 3 patches daily for 12 hours	Skin irritation	Hepatic dose adjustment
<b>Serotonin-norepinephrine reuptake inhibitor</b>	Duloxetine (Cymbalta)	60 mg daily	Suicidal ideation reported	FDA-approved for DPN, do not use in hepatic insufficiency, narrow angle glaucoma, CrCl<30 ml/min, or dialysis
	Venlafaxine (Effexor)	37.5-75 mg daily, titrate up every 4 days to max 225 mg/day	Cardiac dysrhythmias, hypertension	Renal & hepatic dosing

## 2<sup>nd</sup> line therapies

Class	Drugs	Dosing	Adverse effects	Special considerations
<b>Opioids</b>	Tramadol	50-100 mg every 4-6 hours, max 400 mg/day	Drowsiness, anticholinergic effects	Renal & hepatic dosing adjustments

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## 3<sup>rd</sup> line therapies

Class	Drugs	Dosing	Adverse effects	Special considerations
<b>Other anticonvulsants</b>	Gabapentin (Neurontin)	300 mg on 1st day, BID on 2 <sup>nd</sup> day, TID on 3 <sup>rd</sup> day, increase by 100 mg every 3 days PRN to max 3600 mg/day	Peripheral edema, muscle aches, mood swings, drowsiness	Renal dosing required
	Lamotrigine (Lacmictal)	50 mg daily for 2 weeks, then 50 mg BID for 2 weeks, titrate up by 100 mg/week to max 700 mg/day	Life-threatening rash, headache	Renal & hepatic dosing required
	Carbamazepine (Tegretol)	100 mg daily or BID, increase by 100 mg/week to max dose 1200 mg/day	Hypertension, hypotension, dizziness	CI in acute liver disease, bone marrow suppression. Need baseline LFT & CBC.
<b>Topical products</b>	Capsaicin cream	Apply 0.025-0.075% topically TID-QID	Burning, stinging	Do not apply to broken skin
<b>Antiarrhythmic</b>	Mexiletine (Mexitil)	Variable, ~10 mg/kg/day up to 1200 mg/kg/day	Hypotension, ataxia, tremor, dizziness	Renal & hepatic dosing required, monitor LFT, CBC
<b>Selective Serotonin Reuptake Inhibitors</b>	Paroxetine	20 mg daily, titrate up by 10 mg/week to 40 mg daily	GI symptoms, sleep disturbance, sexual dysfunction	Renal & liver dosing required

References: Micromedex, - Bajwa, Z. "Treatment Options for Neuropathic Pain." *Neuroscience*, 2007.—Parman, C. "Off-Label Indications for SSRIs." *American Academy of Family Physicians*. 2003;68:498-504.—Russel, D. "Diabetic Peripheral Neuropathy." *U.S. Pharmacist*. 27:11. 2002.

## Reducing Gastrointestinal Adverse Effects of Metformin

Gastrointestinal side effects are reported in 30% of patients treated with metformin. These effects are usually temporary and resolve with continued therapy. But if patients are unable to tolerate treatment, gastrointestinal side effects may be dose limiting and prevent patients from receiving the full benefit of metformin therapy. To optimize GI tolerance of metformin, appropriate dose titration should be used and extended-release formulation may be recommended.

Appropriate metformin titration:

1. Start with 500 mg once or twice daily with meals
2. Wait one week and assess GI effects. If able, increase to 850-1000 mg twice daily with meals
3. If intolerable GI effects develop, decrease dose and wait to rechallenge
4. Continue to increase to maximum recommended dose of 2000 mg daily depending on patient response and adverse effects

Comparison of Gastrointestinal Side Effects in Metformin Regular Release and Extended Release Tablets		
	<b>Metformin Regular Release</b>	<b>Metformin Extended Release</b>
Diarrhea	<b>53.2%</b>	<b>9.6%</b>
Nausea/Vomiting	<b>25.5%</b>	<b>6.5%</b>

References: 1. Buse, J. et al. "Management of Hyperglycemia in Type 2 Diabetes: A Consensus Algorithm for the Initiation and Adjustment of Therapy." *Diabetes Care*. 29.2 (2006) 1963-1972. 2. Micromedex. "Metformin."

## Continuing Education Quiz

Diabetes Dispatch: Fall 2008

- 1) How often are foot exams recommended for a patient in the grade two risk level?
  - a. Every week
  - b. Every 2 months
  - c. Every 3 months
  - d. Every 6 months
  
- 2) Daily self exams for cuts, sores, and redness should be completed by patients:
  - a. With grade one risk level
  - b. With grade three risk level
  - c. With grade five risk level
  - d. All patients with diabetes
  
- 3) True or False - The most basic foot exam to be done at every visit with a health care professional should include a 10 g monofilament test for sensitivity and a palpable pedal pulse exam for circulation.
  
- 4) Which of the following factors increases risk of neuropathy?
  - a. Smoking
  - b. Obesity
  - c. Hypertension
  - d. All of the above
  
- 5) Peripheral edema may be associated with which of the following treatments for diabetic peripheral neuropathy?
  - a. Pregabalin
  - b. Gabapentin
  - c. Imipramine
  - d. A & B
  - e. All of the above
  
- 6) Which of the following drugs is a first line agent for diabetic peripheral neuropathy?
  - a. Capsaicin cream
  - b. Tramadol
  - c. Amitriptyline
  - d. Gabapentin

- 7) Which of the following drugs for diabetic peripheral neuropathy may need to be adjusted in a patient with a decreased renal function?
  - a. Topical lidocaine
  - b. Carbamazepine
  - c. Venlafaxine
  - d. Imipramine
  
- 8) What is the maximum effective dose of metformin?
  - a. 1000 mg daily
  - b. 1500 mg daily
  - c. 2000 mg daily
  - d. 2500 mg daily
  
- 9) Which of the following are appropriate ways to decrease gastrointestinal side effects associated with metformin therapy?
  - a. Take with meals
  - b. Use an extended-release formulation
  - c. Titrate slowly
  - d. All of the above
  
- 10) True or False: Nausea and vomiting are more common in extended-release tablets.



### LESSON EVALUATIONS

To obtain CPE credit for this lesson you must answer the questions on the quiz (70% correct required) and return the quiz. Should you score less than 70%, you will be asked to repeat the quiz. In May and November of each year we will mail a statement of credit, unless otherwise arranged with the AkPhA office.

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1) Relevance of topic to practice	1	2	3	4 5
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4) Appropriateness of topic	1	2	3	4 5

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