A Practical Update to Comprehensive Screening in the High-Risk Diabetic Foot

This exam gives you the most accurate assessment of this limb-threatening condition.

BY NICHOLAS A. GIOVINCO DPM AND JOHN D. MILLER BS

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Following this article, an answer sheet and full set of instructions are provided (pg. 140).—Editor

The lifetime risk of a person with diabetes developing a diabetic foot ulcer (DFU) is as high as 25%,1 a diagnosis that preceded 84% of all non-traumatic diabetic lower extremity amputations.2 In 2001 alone, diabetes-related foot ulcers and amputations cost the U.S. healthcare system an estimated $11 billion,3 a cost that has risen to over $17 billion in 2013.4 DFUs are among the most common complications of diabetes, with an-
The article is designed to be a self-study review for podiatric physicians interested in wound healing and care of diabetic feet. The text below outlines the standard management strategies in the assessment of diabetic feet with updates, including newer modalities for neuropathic testing and wound classifications.

Components of the Comprehensive Exam

Past Pertinent History

A review of the essential past relevant history is outlined in Table 1. Understanding this history is crucial for ulcerative recurrence requiring hospital admission.

Diabetic (from page 129)

Annual recurrence rates reportedly as high as 34%, 61%, and 70% at 1, 3, and 5 years, respectively.10,11 DFUs are closely associated with decreased quality of life, and are an independent predictor of early mortality. Costs to treat diabetic patients with active ulcerations are 1.5 to 2.4 times that of those without an ulcer.7 These costs inflate with the presence of peripheral arterial disease to nearly 4 times the cost of purely neuropathic wounds.8 The addition of co-morbidities such as poor vascular status, poor nutritional status, and non-compliance to preventative therapies not only increases the cost of care and likelihood for hospital admission, but also greatly increases the likelihood of new-onset infection (37%), charges (38%), length of stay (23%), and severe aggregate outcomes—including amputation, sepsis, and death (49%).7 Therefore, preventing the initiation and recurrence of primary ulcerations through consistent and comprehensive lower extremity screening platforms should continue to be a significant priority to the healthcare community.10,11

This article is designed to be a self-study review for podiatric physicians interested in wound healing and care of diabetic feet. The text below outlines the standard management strategies in the assessment of diabetic feet with updates, including newer modalities for neuropathic testing and wound classifications.

2013 Costs to treat diabetes related foot ulcers and amputations in the U.S. healthcare system cost approximately $17 billion dollars.

TABLE 1:
A Review of the Essential Past Relevant History

<table>
<thead>
<tr>
<th>Review of Pertinent Podiatric History12,13</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>History of</strong></td>
</tr>
<tr>
<td>▪ Ulceration, amputation, vascular surgery, or angioplasty</td>
</tr>
<tr>
<td>▪ Cigarette smoking, poor medical management, suboptimal living conditions</td>
</tr>
<tr>
<td>▪ Effectiveness of past therapeutic attempts</td>
</tr>
<tr>
<td><strong>Neuropathic Considerations</strong></td>
</tr>
<tr>
<td>▪ Subjective: burning, shooting pain, electrical or sharp sensation</td>
</tr>
<tr>
<td>▪ Objective: loss of protective sensation (LOPS)</td>
</tr>
<tr>
<td><strong>Vascular Considerations</strong></td>
</tr>
<tr>
<td>▪ Claudication, rest pain, non-healing ulcer</td>
</tr>
<tr>
<td><strong>Medical Comorbidities</strong></td>
</tr>
<tr>
<td>▪ End-stage renal disease, kidney dialysis or transplant</td>
</tr>
<tr>
<td>▪ Visual blurring or impairment</td>
</tr>
<tr>
<td>▪ Cardiovascular disease risk factors</td>
</tr>
<tr>
<td>—hypertension, hyperlipidemia, angina, myocardial infarction, strokes, peripheral vascular disease (PVD)</td>
</tr>
</tbody>
</table>

Vibratory perception threshold testing via a biothesiometer is considered to be the gold standard for neurologic sensation testing. A VPT > 25 is abnormal.

Continued on page 131
TABLE 2:
Essential Elements of the Dermatologic Inspection of the Lower Extremity

Dermatological Inspection\textsuperscript{12,13}

- Skin: color, thickness, dryness, cracking
- Sweating: hyperhidrosis may contribute to increased skin breakdown
- Infection: check between toes for fungal infection
- Ulceration or minor lesions
- Corns, calluses, or blisters which may indicate dangerously high pressures

TABLE 3:
Essential Components of the Biomechanical Assessment of the Lower Extremity

Biomechanical Assessment\textsuperscript{12,13}

Global inspection

- Gross deformities, biomechanical limitations
- Claw toes, hammer toes, severe bunions
- Charcot Neuroarthropathy

Musculoskeletal Assessment

- Ankle range of motion, great toe dorsiflexion and plantarflexion
- Observe patient’s ambulation

4 sites per foot are tested per foot in the Ipswich Touch Test exam using a physician’s index finger.

Diabetic (from page 130)

Elements of the history include a review of diabetes history, quality of glycemic control, loss of protective sensation (LOPS), neuropathic pain, and a history of previous ulceration, foot infection, or amputation.\textsuperscript{13} Relevant foot-specific historical discussion must include a review of foot gear, callus formation, presence of foot deformities, and other factors leading to the initiation of the active wound.\textsuperscript{12} Other important medical risk factors to review include peripheral vascular complications, cigarette smoking, impaired vision, symptoms of neuropathy or claudication, and co-morbidities such as end-stage renal disease, kidney dialysis, hypertension, angina, and peripheral vascular disease (PVD).\textsuperscript{12,14}

General Inspection

Table 2 outlines the essential elements of the dermatologic inspection of the lower extremity. Careful inspection of the feet should be conducted at every patient visit, particularly in patients with a previous history of diabetes. Ill-fitting shoes, particularly those that are too small, are the leading cause of ulcerations in patients with DM.\textsuperscript{13} It is therefore imperative that all patients have their most common footwear inspected at every visitation to ensure proper fit.\textsuperscript{15} Shoes should be inspected respective to the patient’s feet, with examples of inappropriate footwear including those that are excessively worn, sized too small (including those that may be too narrow, short, or have too low of toe box),\textsuperscript{12} resulting in erythema, blister and callus from the rubbing.
ical limitations. Deformities such as metatarsal phalangeal joint hyperextension with interphalangeal flexion (claw toes) or distal phalangeal extension (hammertoes) are commonly encountered forefoot deformities known to increase pressures on the plantar tissue.14,15,16 These are often associated with advanced skin break-down leading to ulceration. Additionally, prominent metatarsal heads, protruding bones, or severely adducted hallux valgus deformities may increase acute shear forces on tissues increasing skin disturbance and wound development.

Assessment of joint mobility and range of motion around the joints should also be assessed, primarily plantarflexion and dorsiflexion of the ankles and great toes. It is also important to observe a patient’s ambulation, as contributory factors such as decreased vision, gait imbalances, or knee and hip joint issues may demonstrate a need for assistive devices unperceivable from the lower extremity assessment alone. Additionally, assessing a patient’s ability to see and reach their own feet is an important aspect to consider in the treatment plan.

Patients with diabetes should also be screened for Charcot arthropathy, typically presenting as a unilaterally red, hot, and swollen foot with a profound collapse of the midfoot.16 Charcot arthropathies commonly lead to a rocker-bottom deformity of the midfoot, causing excessive peak plantar pressures, and drastically increasing the risk for ulceration.14,15

Neurological Assessment

Essential elements of the neurologic assessment of the lower extremity are outlined in Table 4.

Vibration Sensation

**Tuning Fork**

A 128-Hz tuning fork is widely used in clinical practices for its inexpensive and rapid assessment of vibratory sensation. Intact sensation is tested over the dorsal tip of the hallux bilaterally, and is determined to be abnormal when the patient is unable to detect the vibratory sensation despite its perception by the physician administering the exam.13

**Biothesiometer**

Biothesiometry provides objective and reproducible assessments of vibration perception thresholds (VPT) at the dorsal hallux, and is regarded as the gold standard for assessing peripheral neuropathy in the clinic setting. This process should be repeated three times per site, with the mean of the three readings documented in the patient history. A VPT > 25 V is regarded as abnormal and is one of the best predictors of long-term lower extremity complications.20–22

Touch Sensation

**Pinprick**

The inability of a patient to perceive a sharp pinprick sensation is a direct parallel to the dangers present in one’s daily environment. If a patient is unable to recognize sharp stimuli simulated in the office

Continued on page 133
Incompressible calf or ankle arteries (ABI > 1.3) should be re-tested using either digital arterial systolic pressure (toe pressure) or transcutaneous oxygen tension readings.

**TABLE 5:**

**Essential Assessments of Vascular Status**

<table>
<thead>
<tr>
<th>Vascular Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palpation of Dorsalis Pedis and Posterior Tibial arteries</td>
</tr>
<tr>
<td>— Rated as either ‘Present’ or ‘Absent’ bilaterally</td>
</tr>
<tr>
<td>Doppler ultrasound</td>
</tr>
<tr>
<td>Ankle brachial index (ABI) pressure tests</td>
</tr>
<tr>
<td>— ABI &lt; 0.90 have findings consistent with symptoms of PAD</td>
</tr>
<tr>
<td>— Incompressible or calcified arteries (ABI &gt; 1.3) should be tested with other methods</td>
</tr>
<tr>
<td>— To be repeated at least once every 5 years (for ADA risk classification tier 1)</td>
</tr>
</tbody>
</table>

is associated with loss of large-fiber nerve function. Proper selection of a monofilament is vital to this test’s accuracy, as many commercially available have been determined to be imprecise.

It is recommended that at least four sites be tested on each foot, corresponding to the 1st, 3rd, and 5th metatarsal heads, and plantar surface of the distal hallux. Patients are asked to close their eyes during testing, indicating a ‘yes’ or ‘no’ when asked whether the monofilament is being applied to the particular site. Physicians should document the areas where sensation is absent, examination one step further, formalizing a simple, quick, and easily taught procedure known as the Ipswich Touch Test (IpTT). The IpTT involves the physician lightly resting the tip of their index finger for one to two seconds on the tips of the first, third and fifth toes and the dorsum of the hallux. It is important that examiners not push, prod, or poke the skin, as this would elicit a perceptible sensation other than light touch. In this way, the IpTT has been found to have a similar sensitivity, specificity, and operating characteristic as the monofilament test, and direct comparison of the IpTT and monofilament showed near perfect concordance in results.

The IpTT is simple, reliable, and quick, requiring no special instruments, is easily sterilized by hand-washing, necessitates little training and can be undertaken by nearly any healthcare staff member.

Diabetic (from page 132)

setting, it is equally likely that this patient will be unable to detect offending and injurious objects in the external setting. Inability to identify pinprick sensations over either hallux indicates that patients are at a heightened risk of silent injury and should be regarded as an abnormal test result.

**Monofilament**

10-gram monofilaments, also referred to as Semmes-Weinstein monofilaments, are well demonstrated to demonstrate a loss of pressure sensation, and to be predictive of ensuing ulceration. Loss of the ability to detect 10 grams of force perpendicular to the plantar tissue being sure to avoid hypertrophic skin or areas of callus to ensure accurate pressure perception.

**Ipswich Touch Test**

In the absence of neurological instruments, many physicians resort to touching the feet with cotton swabs or their fingers to simulate the effect of a monofilament test. Researchers at the Ipswich hospital service in Suffolk UK took this approach one step further, formalizing a simple, quick, and easily taught procedure known as the Ipswich Touch Test (IpTT). The IpTT involves the physician lightly resting the tip of their index finger for one to two seconds on the tips of the first, third and fifth toes and the dorsum of the hallux. It is important that examiners not push, prod, or poke the skin, as this would elicit a perceptible sensation other than light touch. In this way, the IpTT has been found to have a similar sensitivity, specificity, and operating characteristic as the monofilament test, and direct comparison of the IpTT and monofilament showed near perfect concordance in results.

The IpTT is simple, reliable, and quick, requiring no special instruments, is easily sterilized by hand-washing, necessitates little training and can be undertaken by nearly any healthcare staff member.

Ankle Reflexes

Absence of intact ankle reflexes is an additional risk-factor for foot ulceration. Ankle reflexes are to be tested with a reflex hammer, with the patient seated on the clinical table. The patient’s foot should be dorsiflexed to a neutral position, stretching the Achilles tendon. In the event of an absent response, the test should be repeated, with the patient performing a Jendrassik maneuver by interlocking cupped hands in front of the chest and attempting to pull them apart.

By removing all common barriers to testing, widespread implementation of the IpTT could drastically increase screening rates, particularly in community screening applications where funding, time, and equipment may be limited.

**Vascular Assessment**

Essential assessments of vascular...
status are shown in Table 5 (page 133). Peripheral arterial disease (PAD) is an ever-growing concern, currently affecting around 8.5 million Americans and a component of approximately one-third of foot ulcers.12,29 PAD is a significant risk factor for recurrent wounds; therefore, the assessment of PAD is critical to the global evaluation of lower-extremity risk.10

Palpation of the posterior tibial and dorsalis pedis pulses are necessary, with descriptions as either ‘present or absent’ noted as such in the patient documentation.11 Patients with signs or symptoms of vascular compromise in the lower extremity should be referred to vascular specialists for more in-depth inspection, specifically by ankle brachial pressure index (ABI) pressure testing and Doppler ultrasonic probing.12 Current ADA consensus panel guidelines recommend measurement of ABIs in all patients with diabetes over the age of 50, at least every five years;12 however, annual ABI testing may be a beneficial component of the annual comprehensive foot exam in patients with a history of PAD or other ‘high-risk’ factors.

Patients with absent pulses or an ABI < 0.90 have findings consistent with symptoms of PAD. It is important to note that in patients with significant calcinosis, ABI readings may be misleading as incompressible arteries result in falsely elevated or supra-systolic ankle brachial pressures. Therefore, incompressible calf or ankle arteries (ABI > 1.3) should be re-tested using either digital arterial systolic pressure (toe pressure) or transcutaneous oxygen tension readings.12

Laboratory Screening Tests

Hemoglobin A1C

Although a universal standard for all patients with diabetes mellitus may not be possible, current ADA guidelines recommend that all diabetic adults maintain an A1C level below 7%.13 While there is little concrete evidence linking A1C levels to wound healing, rigorous maintenance of A1C levels to approximately 7% can reduce the risk of microvascular complications.14,15

Rigorous maintenance of A1C levels to approximately 7% can reduce the risk of microvascular complications.

Nutritional Status

Patients at risk for DFUs should be assessed for nutritional status, as a poor diet and vitamin deficiency may decrease wound healing outcomes.36 Prealbumin and/or albumin levels are a reasonable test to evaluate protein deficiency, and may provide additional nutritional information. Thyroid hormones continue to be linked to decreased metabolism, immune reactivity, and general health status.37 Patients with thyroid dysregulation could be at an increased risk of recalcitrant or chronic wounds and should be evaluated for effective healing.

Many diabetic patients may have a previous history of, or may be at risk for, cardiovascular diseases, dyslipidemias and/or hypertension.38 Therefore, a lipid profile (HDL, LDL, and cholesterol) is important in evaluating a patient’s comprehensive potential for wound healing.

Vitamin D deficiency may play a role in the development of type 2 diabetes mellitus, peripheral neuropathy symptoms, and incident cardiovascular disease.39-41 Additionally, patients with diabetes are also more likely to be both vitamin D deficient and have poorer bone quality, increasing their risk of injury during falls.40,42 Combined vitamin D and calcium supplementation may be beneficial in optimizing glucose metabolism and reduce fractures in the high-risk patient.43,44

Neuropathic Contributions

A thorough differential diagnosis of LOPS should include the consideration of many conditions,
The WIFI risk classification system is based on the severities of ischemia, size/depth, and infection.

Risk Classification and Referral Priority
Table 6 (page 136) presents a review of the risk stratification system, with suggested treatment recommendations and follow-up schedules as defined by the American Diabetes Association (ADA). The goal of screening and assessing the risk status of the diabetic patient is to generate an appropriate treatment plan based on the risk factors present. Categories of risk are defined by the American Diabetes Association (ADA) to direct referral priority and subsequent therapies.

Wound Ischemia and Foot Infection (WIFI) Protocol
First reported in 1982, critical limb ischemia was defined as an ankle pressure < 40 mm Hg in the presence of rest pain, and < 60 mm Hg in the presence of tissue necrosis. However, improved understanding of the underlying disease states has proven that these hard values are no longer diagnostic for the majority of patients; rather, varying degrees of ‘ischemia’ are often present depending on other external factors governing the overall health of the limb. The concept of a critically ischemic limb preventing wound healing is therefore dependent on not only the degree of ischemia present, but also the depth of a wound and presence of infection.

The wound, ischemia, and foot infection (WIFI) classification system was created to merge existing classification systems focused on diabetic foot wounds with ischemic models focused on lower extremity perfusion. The WIFI classification system grades each of these two risk factors and the severity of infection on a scale from 0 to 3, where 0 represents absent, 1 mild, 2 moderate, and 3 severe. In basing risk stratification on the three major factors that impact amputation risk and clinical management of the diabetic wound, the WIFI classification system best informs physicians on the risks of amputation and need for revascularization in their patients by stratifying them into one of four stages of patient risk.

Current ADA guidelines recommend that all patients over the age of 50 in the 1st risk category receive ABIs every 5 years.

Diet, Lifestyle, and Socio-Mechanics
Patients should be questioned about unintentional weight changes greater than 10 pounds over the past six months, recurrent diarrhea, alcohol, or tobacco intake, use of dietary supplements or over-the-counter vitamins, consistent access to nutritious meals, and morning glucose levels. These questions may reveal dangerous

Continued on page 136
lifestyle behaviors which, if avoided, may lead to better healing rates. Additionally, research continues to explore the positive effects of physical activity in decreasing all-cause mortality, and continued active exercise should be widely advocated.47-49

Patient Education

Patient education is central to decreasing the number of diabetic amputations globally; thus, its importance in the overall treatment process should be reflected during patient care.50 Consistent and repeated patient education may increase patient adherence to suggested home care behaviors, and has significantly improved patient outcomes in large-scale, randomized controlled trials.51,52 A lack of patient disease understanding and the benefits of consistent self-care are common barriers to wound treatment.53 Absence of appropriate education regarding diabetes management was found to be a factor in over 90% of ulcer recurrence, emphasizing the necessity for repeated and continual education for the at-risk patient.54,55 Additionally, reliance on home care may not always be implemented reliably. Patients in the high-risk patient subpopulation often experience additional cognitive impairment, visual loss, larger body sizes, or other co-morbidities, limiting their ability to assess the condition of their own feet.56 In tandem with a lack of adequate patient disease education, this creates an extremely dangerous home situation with numerous obstacles preventing adequate wound healing. During the comprehensive examination into a patient’s risk for injury and likelihood for wound healing, it is important to consider a patient’s living situation, insurance access, daily activities, and family support.57

Conclusion

It cannot be stated enough that the complications secondary to diabetes mellitus are common, com-

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**Patient education is central to decreasing the number of diabetic amputations globally.**

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**TABLE 6:**

A Review of the Risk Stratification System, with Suggested Treatment Recommendations and Follow-up Schedules as Defined by the American Diabetes Association (ADA)

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Definition</th>
<th>Treatment Recommendations</th>
<th>Suggested Follow-up</th>
</tr>
</thead>
</table>
| 3             | History of ulcer or amputation | Same as category 1  
Consider vascular consultation for combined follow-up if PAD present | Every 1-2 months |
| 2             | PAD +/- LOPS | Consider prescriptive or accommodative footwear  
Consider vascular consultation for follow-up | Every 2-3 months |
| 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 |
| 0             | No LOPS, PAD, or deformity | Patient education including advice on appropriate footwear | Annually at minimum |

Figure Legend: Peripheral arterial disease (PAD), loss of protective sensation (LOPS)
plex, and costly, requiring overwhelming resources from healthcare systems to manage. While the examination as described above may appear exhaustive and difficult to enact in the setting of a 15-minute patient exam, it should be noted that many of these screening tests happen simultaneously, with the most severe risk factors perceived within minutes of initiating patient interaction. It is only through systematic examination, appropriate risk-assessment with timely referral, and significant effort towards patient disease education that prompt reduction in morbidity of this high-risk patient population may be enacted. PM

References


A 75 year old female with a history of diabetes, LOPS, and an absent dorsalis pedis pulse would fall into ADA Category 2.

It is only through systematic examination, appropriate risk-assessment with timely referral, and significant effort towards patient disease education that prompt reduction in morbidity of this high-risk patient population may be enacted.
Diabetic (from page 137)


Hazenberg C, Bus S, Kottink A. Telematic home-monitoring of diabetic foot disease using photographic foot imaging—a feasibility study. of telemedicine and... 2012. Available at: http://jtt.sagepub.com/content/18/1/32.short.

1) What is considered to be the gold standard for neurologic sensation testing?
   A) Vibratory perception threshold testing via a biothesiometer
   B) 128-Hz Tuning fork
   C) Pinprick Testing
   D) Ipswich Touch Test

2) At what level is a VPT finding abnormal?
   A) VPT > 5 is abnormal
   B) VPT > 10 is abnormal
   C) VPT > 18 is abnormal
   D) VPT > 25 is abnormal

3) How many specific points are tested per foot in the Ipswich Touch Test exam?
   A) 2 sites per foot
   B) 4 sites per foot
   C) 6 sites per foot
   D) 8 sites per foot

4) Conducting an Ipswich Touch Test requires which of the following equipment?
   A) Tuning Fork
   B) Biothesiometer
   C) 10-g Semmes-Weinstein monofilament
   D) Physician’s index finger

5) In the event of an initially absent Achilles tendon reflex, which maneuver should be attempted to verify the results upon re-test?
   A) Trendelenburg maneuver
   B) Jendrassik maneuver
   C) Romberg’s maneuver
   D) Kocher maneuver

6) 2013 costs to treat diabetes-related foot ulcers and amputations in the U.S. healthcare system cost approximately _______.

7) As part of the foot ulcer examination, healthcare teams should___________.
   A) Assess dermatologic changes in the skin and musculoskeletal deformities
   B) Assess for co-morbidities such as end-stage renal disease, visual blurring, or impairment, and cardiovascular risk factors such as hypertension or angina
   C) Assess for vascular patency by grading the posterior tibial and dorsalis pedis arteries
   D) All of the above

8) Which of the following Ankle Brachial Index (ABI) value falls within an expected normal range?
   A) 1.4
   B) 1.1
   C) 0.8
   D) 0.4

9) Which of the following is closest to the ADA recommended adult hemoglobin A1c levels?
   A) 9%
   B) 8.5%
   C) 7%
   D) 5.5%

10) Which of the following may contribute to the development of LOPS (loss of protective sensation)?
    A) Hypothyroidism
    B) Vitamin B12 deficiency
    C) Thiamine Deficiency
    D) All of the Above

11) According to ADA guidelines, a patient with the following symptoms would occupy which Risk Category?: “75 year old female with a history of diabetes, LOPS, and an absent dorsalis pedis pulse.”
    A) 0
    B) 1
    C) 2
    D) 3

12) The WIFI risk classification system is based on the severities of which three risk criteria?
    A) ischemia, size/depth, infection
    B) infection, size/depth, duration of wound persistence
    C) size/depth, wound odor, ischemia
    D) infection, duration of wound persistence, odor

13) Current ADA guidelines recommend that all patients over the age of 50 in the 1st risk category receive ABIs at minimum intervals of how many years?
    A) 1
    B) 5
    C) 7
    D) 10

14) Which of the following are benefits of using the Ipswich Touch Test to assess sensation perception?
    A) Requires no additional equipment
    B) Is rapidly administered
    C) Is constantly available
    D) All of the above

15) Classic characteristics of a Charcot neuroarthropathy include_______.
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A) Bilateral presentation
B) Cool, cyanotic skin
C) Achilles tendon laxity
D) Red, warm, edematous midfoot

16) Which of the following are necessary components of a comprehensive biomechanical assessment?
   A) Gross deformities and biomechanical limitations
   B) Claw toes, hammertoes, and painful bunions
   C) Active Charcot neuroarthropathy
   D) All of the above

17) Which of the following is suggested, as a frequency of vibration sensation testing?
   A) 64-Hz tuning fork
   B) 128-Hz tuning fork
   C) 192-Hz tuning fork
   D) 256-Hz tuning fork

18) Which of the following statements is true?
   A) The lifetime risk of a person with diabetes developing a foot ulcer is as high as 25%.
   B) Diabetic foot ulcers precede ~ 84% of all non-traumatic diabetic lower extremity amputations.
   C) Costs to treat diabetic patients with active ulcerations are 1.5 to 2.4 times that of those without an active ulceration.
   D) All of the above

19) Examples of inappropriate footwear for the at-risk diabetic patient include ___.
   A) Shoes that are too small in size
   B) Shoes that are overly narrow
   C) Shoes with a small toe box
   D) All of the above

20) Factors increasing risk of vascular compromise include ____.
   A) Claudication or rest pain
   B) Smoking
   C) ABI values > 1.3
   D) All of the above
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There is no charge for the mail-in service if you have already enrolled in the annual exam CME program, and we receive this exam during your current enrollment period. If you are not enrolled, please send $25.00 per exam, or $195 to cover all 10 exams (thus saving $55 over the cost of 10 individual exam fees).

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To receive your CME certificate, complete all information and fax 24 hours a day to 1-631-563-1907. Your CME certificate will be dated and mailed within 48 hours. This service is available for $2.50 per exam if you are currently enrolled in the annual 10-exam CME program (and this exam falls within your enrollment period), and can be charged to your Visa, MasterCard, or American Express.

If you are not enrolled in the annual 10-exam CME program, the fee is $25 per exam.

**Phone-In Grading**

You may also complete your exam by using the toll-free service. Call 1-800-232-4422 from 10 a.m. to 5 p.m. EST, Monday through Friday. Your CME certificate will be dated the same day you call and mailed within 48 hours. There is a $2.50 charge for this service if you are currently enrolled in the annual 10-exam CME program (and this exam falls within your enrollment period), and this fee can be charged to your Visa, MasterCard, American Express, or Discover. If you are not currently enrolled, the fee is $25 per exam. When you call, please have ready:

1. Program number (Month and Year)
2. The answers to the test
3. Your social security number
4. Credit card information

In the event you require additional CME information, please contact PMS, Inc., at 1-631-563-1604.

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**ENROLLMENT FORM & ANSWER SHEET**

Please print clearly...Certificate will be issued from information below.

Name _______________________________________________________________________ Soc. Sec. #______________________________

Please Print:                    FIRST                                     MI                                     Last

Address _______________________________________________________________________________________________________________

City__________________________________________________ State_______________________ Zip________________________________

Charge to: _____Visa   _____ Mastercard   _____ american Express

Card #________________________________________________Exp. Date____________________

Note: Credit card is the only method of payment. Checks are no longer accepted.

Signature__________________________________ Soc. Sec.#______________________ Daytime Phone_____________________________

State License(s)___________________________ Is this a new address? Yes________ No________

Check one:  _____ I am currently enrolled. (If faxing or phoning in your answer form please note that $2.50 will be charged to your credit card.)

_____ I am not enrolled. Enclosed is my credit card information. Please charge my credit card $25.00 for each exam submitted. (plus $2.50 for each exam if submitting by fax or phone).

_____ I am not enrolled and I wish to enroll for 10 courses at $195.00 (thus saving me $55 over the cost of 10 individual exam fees). I understand there will be an additional fee of $2.50 for any exam I wish to submit via fax or phone.

www.podiatrym.com
### Medical Education Lesson Evaluation

|--------------------|------------|-------------|--------------|-----------------------|

1) This CME lesson was helpful to my practice _____

2) The educational objectives were accomplished _____

3) I will apply the knowledge I learned from this lesson _____

4) I will make changes in my practice behavior based on this lesson _____

5) This lesson presented quality information with adequate current references _____

6) What overall grade would you assign this lesson?
   - A
   - B
   - C
   - D

How long did it take you to complete this lesson?

   _____ hour _____ minutes

What topics would you like to see in future CME lessons?

Please list:

__________________________________________________
__________________________________________________
__________________________________________________
__________________________________________________
__________________________________________________
__________________________________________________

### EXAM #2/15

**A Practical Update to Comprehensive Screening in the High-Risk Diabetic Foot**

(Giovinco and Miller)

Circle:

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D
6. A B C D
7. A B C D
8. A B C D
9. A B C D
10. A B C D
11. A B C D
12. A B C D
13. A B C D
14. A B C D
15. A B C D
16. A B C D
17. A B C D
18. A B C D
19. A B C D
20. A B C D