Body System: Neurologic

Session Topic: Peripheral Neuropathy

Educational Format		Faculty Expertise Required
REQUIRED	Interactive Lecture	Expertise in the field of study. Experience teaching in the field of study is desired. Preferred experience with audience response systems (ARS). Utilizing polling questions and engaging the learners in Q&A during the final 15 minutes of the session are required.
OPTIONAL	Problem-Based Learning (PBL)	Expertise teaching highly interactive, small group learning environments. Case-based, with experience developing and teaching case scenarios for simulation labs preferred. Other workshop-oriented designs may be accommodated. A typical PBL room is set for 50-100 participants, with 7-8 each per round table. Please describe your interest and plan for teaching a PBL on your proposal form.

Professional Practice Gap	Learning Objective(s) that will close the gap and meet the need	Outcome Being Measured
• A competency gap exists to be able to differentiate peripheral neuropathy from other conditions with similar symptoms. • A competency gap exists in diagnosing and managing peripheral neuropathic pain associated with diabetes and undiagnosed diabetes. • A knowledge gap exists to be able counsel patients about making healthy behavior changes to decrease their risk for developing neuropathies. • A competency gap exists to accurately determine the etiology of neuropathies, whether they be neurologic or musculoskeletal in nature, are chronic, acute or hereditary, and result from systemic disease, trauma or infection.	1. Perform evidence-based differential diagnosis to differentiate peripheral neuropathy from other conditions with similar symptoms. 2. Screen patients with type 2 diabetes, those suspected of having diabetes, and patients presenting with symptoms of distal numbness, tingling and pain, or weakness for peripheral neuropathy. 3. Counsel patients on how to make healthy behavior changes, including adopting a healthy diet, engaging in regular exercising, limiting heavy alcohol consumption and avoiding exposure to toxic substances. 4. Develop an evidence-based treatment plan, including pharmacologic and non-pharmacologic options, for patients with neuropathic pain.	Learners will submit written commitment to change statements on the session evaluation, indicating how they plan to implement presented practice recommendations.

ACGME Core Competencies Addressed (select all that apply)

X	Medical Knowledge		Patient Care
	Interpersonal and Communication Skills		Practice-Based Learning and Improvement
	Professionalism		Systems-Based Practice

Faculty Instructional Goals

Faculty play a vital role in assisting the AAFP to achieve its mission by providing high-quality, innovative education for physicians, residents and medical students that will encompass the art, science, evidence and socio-economics of family medicine and to support the pursuit of lifelong learning. By achieving the instructional goals provided, faculty will facilitate the application of new knowledge and skills gained by learners to practice, so that they may optimize care provided to their patients.

- Provide up to 3 evidence-based recommended practice changes that can be immediately implemented, at the conclusion of the session; including SORT taxonomy & reference citations
- Facilitate learner engagement during the session
- Address related practice barriers to foster optimal patient management
- Provide recommended journal resources and tools, during the session, from the American Family Physician (AFP), Family Practice Management (FPM), and Familydoctor.org patient resources; those listed in the References section below are a good place to start
    - Visit http://www.aafp.org/journals for additional resources
    - Visit http://familydoctor.org for patient education and resources
- Provide recommendations for performing evidence-based differential diagnosis to differentiate peripheral neuropathy from other conditions with similar symptoms.
- Provide recommendations for screening patients with type 2 diabetes, those suspected of having diabetes, and patients presenting with symptoms of distal numbness, tingling and pain, or weakness for peripheral neuropathy.
- Provide strategies for counseling patients on how to make healthy behavior changes, including adopting a healthy diet, engaging in regular exercising, limiting heavy alcohol consumption and avoiding exposure to toxic substances.
- Provide recommendations for developing an evidence-based treatment plan, including pharmacologic and non-pharmacologic options, for patients with neuropathic pain.
- Provide recommendations regarding guidelines for Medicare reimbursement.
- Provide recommendations to maximize office efficiency and guideline adherence to the diagnosis and management of neuropathic pain.
- Provide an overview of newly available treatments, including efficacy, safety, contraindications, and cost/benefit relative to existing treatments.

Needs Assessment

Neuropathies are relatively common neurologic disorders; it is estimated that as many as 20 million Americans are affected by some form of neuropathy. They can be acute, chronic or hereditary, all of which signify nerve damage indicative of a systemic disease, physical trauma or infection. In some cases, several nerves are involved, distinguishing the disorder as polyneuropathy. One specific type is distal symmetric polyneuropathy (DSP), which is the most common neurological manifestation in HIV-infected patients. Altogether, more than 100 types of neuropathies have been identified, each with its own characteristic set of symptoms, pattern of development and prognosis. Therefore, diagnosing peripheral neuropathy is often difficult

because the symptoms are highly variable, and many patients go un- or under-diagnosed because of the difficulty in evaluating the disorder.[1-3]

CME outcomes data from 2013 American Academy of Family Physicians (AAFP) Assembly (now FMX): *Peripheral Neuropathy* sessions, suggest that physicians have knowledge and practice gaps with regard to differential diagnosis for neuropathy; checking vibration and proprioception with diabetic foot exams; evaluation of peripheral neuropathy; awareness of currently available treatment options; and resolving challenging therapeutic dilemmas.[4]

Diagnosis of peripheral neuropathy can be time-consuming and costly. Other causes of generalized weakness include motor neuron disease, disorders of the neuromuscular junction and myopathy. Myelopathy, syringomyelia or dorsal column disorders also can mimic peripheral neuropathy, and hysterical symptoms sometimes can mimic a neuropathy. Therefore, it is important for family physicians to be able to differentiate actual neuropathy from other disorders, and keep up to date on current clinical recommendations for practice:[5]

- Initial evaluation of a patient with peripheral neuropathy should include a complete blood count, comprehensive metabolic profile, and measurement of erythrocyte sedimentation rate and fasting blood glucose, vitamin B12, HIV infection, RPR, heavy metals, and thyroid-stimulating hormone levels.
- Electrodiagnostic studies are recommended if symptoms persist and if the diagnosis remains unclear after initial diagnostic testing and a careful history and physical examination.
- Options for symptomatic treatment of peripheral neuropathy include ant seizure medications, tricyclic antidepressants, and topical medications.

Family physicians should be familiar with available algorithms for diagnosing patients with suspected peripheral neuropathy.[5,6]

Longstanding neuropathy can result in trophic changes including kyphoscoliosis, loss of hair in affected areas or ulceration; trophic changes are most prominent in diabetes, amyloid neuropathy, leprosy, hereditary motor sensory neuropathy (HSMN) with prominent sensory involvement and hereditary sensory neuropathy. X-rays of limbs may show loss of bone density, thinning of phalanges, pathologic fractures or neuropathic arthopathy. Nerve thickening can be palpated in leprosy, HMSN type 1 and amyloid neuropathy. The most useful laboratory studies are electromyography and nerve conduction studies, which can confirm the presence of a neuropathy and provide information regarding type of fibers involved, pathophysiology and pattern of involvement. Performance of subsequent tests and studies (e.g, neurologic consultation, blood tests, lumbar puncture) will be determined by the most likely diagnosis.[6]

While many forms of peripheral neuropathy cannot be prevented or cured, research indicates that the best prevention against any type of peripheral neuropathy is for patients to engage in or maintain a healthy lifestyle. Adopting a healthy diet, engaging in regular exercise, avoiding heavy alcohol consumption and avoiding exposure to toxins can significantly reduce the physical and emotional effects of peripheral neuropathy. Additionally, many patients experience extreme pain associated with different types of neuropathies, and look to their physician(s) to help them manage it with prescription painkillers or other medications that may control some symptoms.

Pain associated with diabetic peripheral neuropathy is present in 10 to 20 percent of patients with diabetes mellitus and affects functionality, mood, and sleep patterns.[7] Family physicians should be knowledgeable of pharmacologic and complementary and alternative medicine therapies to prescribe effective pain treatment therapies for patients with diabetic peripheral neuropathic pain. Clinical treatment recommendations include:[7,8]

- First-line treatment of diabetic peripheral neuropathic pain includes tricyclic antidepressants (e.g., amitriptyline, nortriptyline). If these agents are contraindicated, newer anticonvulsants (e.g., gabapentin, pregabalin) should be considered.
- Serotonin-norepinephrine reuptake inhibitors (e.g., venlafaxine, duloxetine) or opiates and opiate analogs (e.g., morphine, tramadol) may be used if first-line treatments are unsuccessful.
- Topical treatments (e.g., capsaicin cream, lidocaine 5% patches) may be added to systemic treatments at any time.

A summary of recommendations for pharmacologic and non-pharmacologic treatments for painful diabetic neuropathy are as follows:[8]

Effective

- Pregabalin (Lyrica), 300 to 600 mg per day

Probably effective

- Amitriptyline, 25 to 100 mg per day
- Capsaicin (Zostrix), 0.075% four times per day
- Dextromethorphan, 400 mg per day
- Duloxetine (Cymbalta), 60 to 120 mg per day
- Electrical stimulation, percutaneous nerve stimulation for three to four weeks
- Gabapentin (Neurontin), 900 to 3,600 mg per day
- Isosorbide dinitrate spray
- Morphine sulfate, titrated to 120 mg per day
- Oxycodone (Oxycontin), mean: 37 mg per day, maximal: 120 mg per day
- Sodium valproate, 500 to 1,200 mg per day
- Tramadol (Ultram), 210 mg per day
- Venlafaxine (Effexor), 75 to 225 mg per day

Not recommended

- Clonidine (Catapres)
- Lacosamide (Vimpat)
- Lamotrigine (Lamictal)
- Low-intensity laser therapy
- Magnetic field treatment
- Mexiletine
- Oxcarbazepine (Trileptal)
- Pentoxifylline (Trental)
- Reiki therapy

Physicians should also be kept up to date on new treatment therapies, changes to therapies, or warnings associated with existing therapies. Provide recommendations regarding new FDA approved medications for the management of neuropathic pain; including safety, efficacy,

tolerance, and cost considerations relative to currently available options. Examples include, but are not limited to the following:[9]

- Lyrica (pregabalin); Pfizer; For the treatment of neuropathic pain associated with spinal cord injury, Approved June 2012. For the treatment of pain associated with diabetic peripheral neuropathy and postherpetic neuralgia, Approved December 2004.
- Qutenza (capsaicin); NeurogesX; For the treatment of neuropathic pain associated with postherpetic neuralgia, Approved November 2009.

Physicians can improve patient satisfaction with the referral process by using readily available strategies and tools such as, improving internal office communication, engaging patients in scheduling, facilitating the appointment, tracking referral results, analyzing data for improvement opportunities, and gathering patient feedback.[10,11]

These recommendations are provided only as assistance for physicians making clinical decisions regarding the care of their patients. As such, they cannot substitute for the individual judgment brought to each clinical situation by the patient's family physician. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication, but they should be used with the clear understanding that continued research may result in new knowledge and recommendations. These recommendations are only one element in the complex process of improving the health of America. To be effective, the recommendations must be implemented. As such, physicians require continuing medical education to assist them with making decisions about specific clinical considerations.

Resources: Evidence-Based Practice Recommendations/Guidelines/Performance Measures

- Peripheral neuropathy: differential diagnosis and management[5]
- Treating diabetic peripheral neuropathic pain[7]
- Adding health education specialists to your practice[12]
- Envisioning new roles for medical assistants: strategies from patient-centered medical homes[13]
- The benefits of using care coordinators in primary care: a case study[14]
- Engaging Patients in Collaborative Care Plans[15]
- The Use of Symptom Diaries in Outpatient Care[16]
- Health Coaching: Teaching Patients to Fish[17]
- Medication adherence: we didn't ask and they didn't tell[18]
- Encouraging patients to change unhealthy behaviors with motivational interviewing[19]
- Integrating a behavioral health specialist into your practice[20]
- Simple tools to increase patient satisfaction with the referral process[10]
- FamilyDoctor.org. Diabetic Neuropathy | Overview (patient resource)[21]

References:

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3. England JD, Gronseth GS, Franklin G, et al. Practice parameter: the evaluation of distal symmetric polyneuropathy: the role of autonomic testing, nerve biopsy, and skin biopsy (an evidence-based review). Report of the American Academy of Neurology, the American Association of Neuromuscular and Electrodiagnostic Medicine, and the American Academy of Physical Medicine and Rehabilitation. *PM & R : the journal of injury, function, and rehabilitation.* Jan 2009;1(1):14-22.
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