



Indian Health Service

**Division of Diabetes
Treatment and Prevention**



Diabetic Foot Care Strategies for Primary Care

Part I: Complete Foot Evaluation

Presented by

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Objectives

1. Identify factors and findings that increase risk of diabetic foot complications
2. Accurately perform a complete diabetic foot examination
3. Implement strategies to prevent diabetic foot complications in the primary care setting



Diabetic Foot Ulcers



Lifetime risk of foot ulcer is

- 19-34%



Foot ulcers are recurring conditions:

- 40% at 1 year
- 65% at 5 years



In 2017, the estimated cost of diabetes complications in the US was over 300 billion and it has risen annually:

- Historically, 33% of direct costs have been attributed to DFU



Diabetic Foot Ulcer Complications

- In people with new DFU, 17% experience a minor amputation and 5% experience a major amputation in 1 year.
- Since 2014, increasing rate of lower extremity amputation are observed among younger adults.

Mortality rates increased following DFU

- 13.1% at 1 year, 49.1% at 5 years, and 76.9% at 10 years
- CVD and infection leading cause of death.



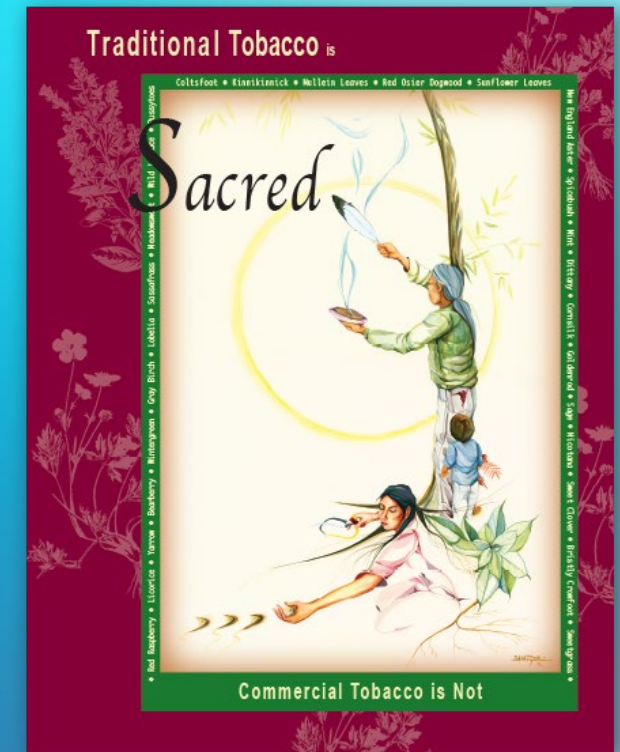
Foot Care: Why is it important to people with diabetes?

- A diabetic foot ulcer (DFU) may lead to lower extremity amputation and disability
 - Decrease quality of life for patients and families
 - Greater self-care needs
 - Reduce daily physical activities
 - Increase dependence on others
 - Creates financial burden
- Developing foot disease is a harbinger of severe diabetes complications affecting other organ systems
- Preventing foot disease is the best option



Identifying people at risk for DFU

- History of previous foot ulcer and/or amputation
- Peripheral artery disease
- Peripheral neuropathy
- Visual impairment
- Dialysis
- Commercial tobacco use (non ceremonial use)



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(Boulton, 2018)



Identifying people at risk: vascular symptoms

- Peripheral Artery Disease (PAD)
 - Classic symptoms of intermittent claudication: leg muscle pain, cramping and fatigue brought on by ambulation/exercise; relieved with rest
 - Majority of patients have atypical or no symptoms.
 - Common patient complaints:
 - Pain (discomfort) and/or cramping in hips, thighs, or calves
 - Lower extremity fatigue, weakness, or pressure
 - Cold or discolored feet
 - Burning or aching pain in the feet or toes



Identifying people at risk: neuropathy symptoms

- Peripheral Neuropathy
 - Sensory:
 - Burning, numbness, or tingling in feet, especially at night
 - Stocking-glove distribution of complaint
 - Sensorimotor dysfunction:
 - Foot deformity, callus
 - Difficulties with ambulation-tightness, aching, tripping
 - Loss of balance-falls
 - Accompanied by signs and symptoms of generalized neuropathy such as impotence in men, resting tachycardia, or muscle weakness
 - May be asymptomatic in up to 50% of people



Identifying people at risk: physical findings

- Vascular findings
 - Discolored (pallor) skin and loss of hair in toes and legs
 - Diminished or absent pedal pulses
- Sensory findings
 - Absent monofilament test: Loss of protective sensation (LOPS)
 - Decreased or absent vibration sense
 - Loss of temperature sensation
 - Inability to detect position sense (proprioception)
 - Decreased or absent ankle reflex



Identifying people at risk: physical findings

(continued)

- Skin changes
 - Calluses, corns
 - Fungal infection e.g. athlete's foot
 - Dry, cracked, fissured skin
- Nail abnormalities
 - Long or ingrown nails, onychomycosis (fungal nails)
- Foot deformity
 - Bunion, hammer toe(s), claw toe(s), Charcot
- Limited joint mobility



Evaluate Pedal Pulses

- Assess dorsalis pedis and posterior tibial pulses in both feet
- Absent pulses indicate PAD



Dorsalis Pedis Artery



Red = Arterial
Blue = Venous

(sebastian kaulitzki/science photo library/Alamy Stock Photo)



Posterior Tibial Artery



Ankle Brachial Index (ABI): additional assessment for PAD

- Use Doppler and blood pressure cuff to:
 - Measure systolic BP in brachial artery in each arm
 - Measure systolic BP in the posterior tibial and dorsalis pedis arteries
- Calculate ABI:
$$\text{ABI} = \frac{\text{highest Ankle Systolic BP}}{\text{highest Brachial Systolic BP}}$$
- Results:
 - <0.90 indicates PAD
 - >1.3 suggests arterial stiffness from calcified vessels



Monofilament Test



Use 10g (5.07) Semmes-Weinstein monofilament to assess for loss of protective sensation (LOPS):

- Press perpendicular to point of bending, hold 1 second and release. (Demonstrate on hand.)
- Instruct patient to close their eyes, and acknowledge sensation of pressure with a “yes”.
- Test both feet, at least 5 sites each:
 - Great toe, 1st, 3rd & 5th metatarsal heads
 - Dorsum of metatarsals between 1st and 2nd toes

Monofilament test is abnormal if sensation is absent in one or more areas.



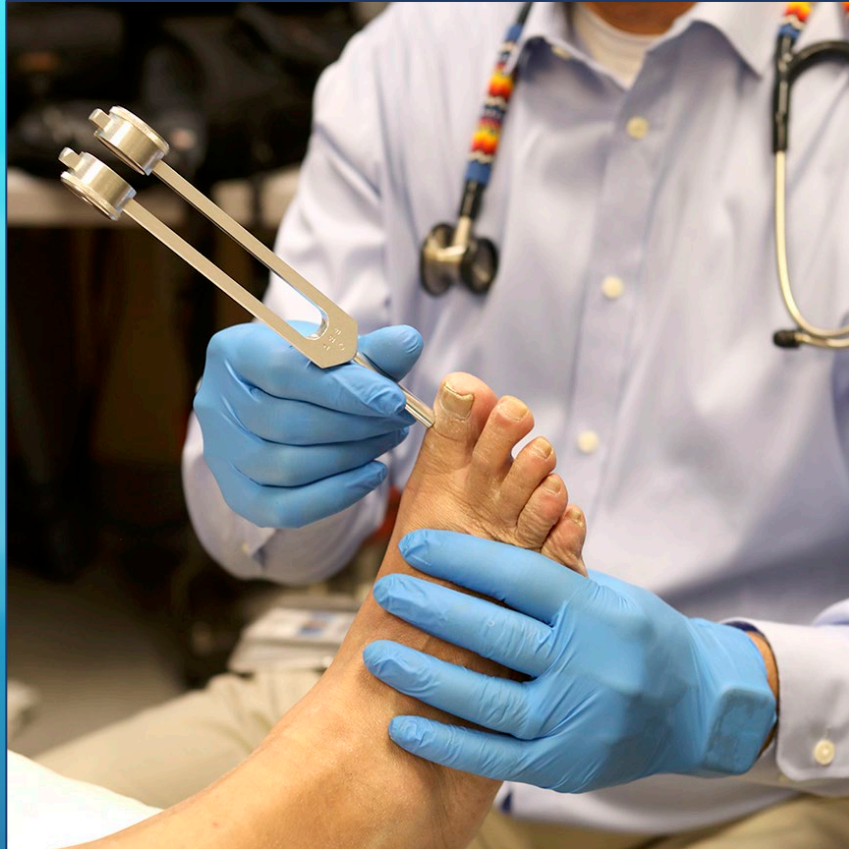
Ipswich (Light) Touch Test



- Ask the patient to close their eyes.
- Use index finger to lightly touch the tips of the first, third and fifth toes for 1-2 seconds. Ask the patient to identify when the toe is touched.
- Reduced foot sensation is defined as ≥ 2 insensate areas.
- Abnormal test indicates loss of protective sensation (LOPS).



Vibration Test – 128 Hz tuning fork



- Strike the tuning fork on the palm of your hand.
- Place the vibrating tuning fork on the bony prominence of the great toe, proximal to the nail, bilaterally.
- An abnormal response is noted when the patient can no longer feel vibratory sensation and the examiner still perceives it.



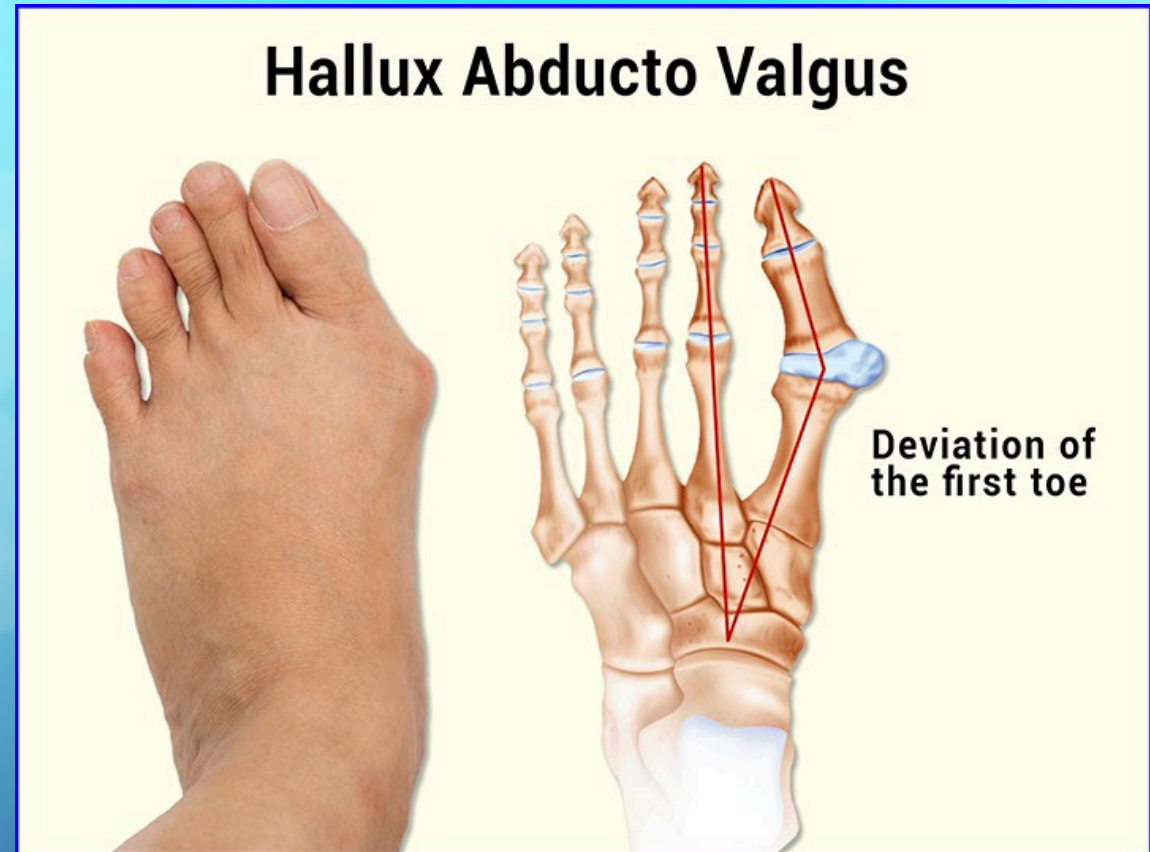
Foot Deformities

- Result of diabetic neuropathy and sensorimotor dysfunction
- Associated with increased risk of DFU and amputation
- Common deformities are:
 - Claw or hammer toe(s)
 - Hallux valgus
 - Charcot Foot



Foot Deformities

Hallux Abducto Valgus (Bunion)



NaiyanaDonraman / istock photos.com

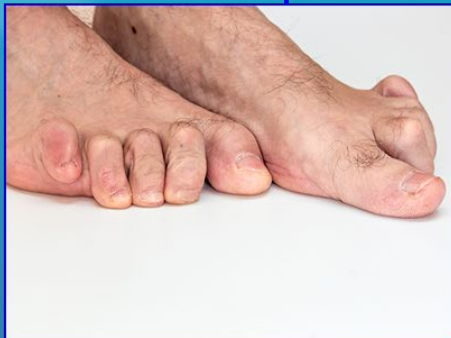
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Foot Deformities: Flexor-Extensor Imbalance



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Foot Deformities:

Charcot Neuroarthropathy

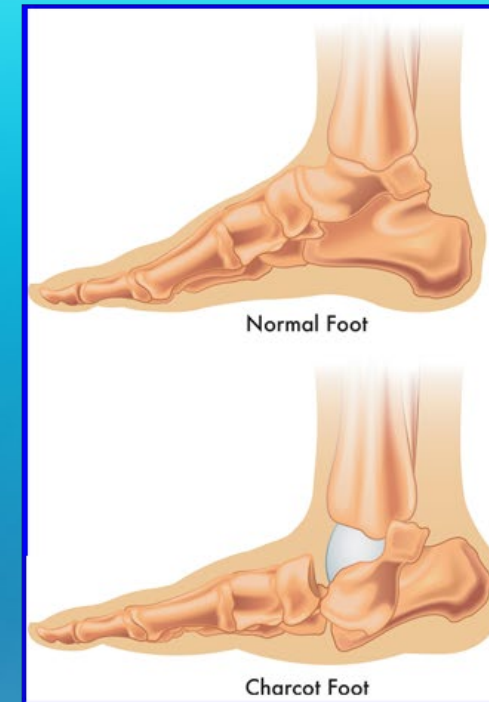


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Charcot Foot



Peter Porrini / Shutterstock.com



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A COMPLETE DIABETIC FOOT EXAMINATION DEMONSTRATION VIDEO

A complete diabetic foot examination should be performed at diabetes diagnosis and at least annually thereafter to identify people at risk for foot ulcers and amputation.



Protecting the Patient from Foot Complications: Strategies for Primary Care Clinicians

- Screening for High-Risk Patients
- Practical Interventions
- Implementation into Practice
 - Education
 - Resources



Risk Assessment and Follow up Care

	Complete foot exam	Primary Care visit & foot check	Podiatry/Foot Clinic	Footwear
Very Low (No abnormal findings)	Annual	6-12 months	within 1-3 months, and at least annually	Preventive
Low (LOPS +/- deformities and skin changes)	Annual	3-4 months	within 1 month, and every 4-6 months	Preventive or protective
Moderate (Prior and risk history and/or PAD +/- LOPS)	Annual	2-3 months or more often as needed	within 1-3 weeks, and every 2-3 months	Protective and/or custom footwear
High and/or Active Ulcer	Annual	1-2 months or more often as needed	next available/ Immediate	Protective and/or custom footwear



ADA foot care recommendations:

- Refer patients with the following risk factors to podiatry and/or foot clinic
 - Diabetic Foot Ulcer
 - Absent Monofilament sensation: Loss of Protective Sensation (LOPS)
 - Absent DP or PT pulses: Significant peripheral arterial disease (PAD), may require vascular surgeon consultation
 - Structural foot abnormalities
 - Current cigarette smoking
 - History of prior amputation or ulcer

Note: Referral to the specialist should be individualized in a patient-centered approach after evaluating the above risk factors and considering access to resources.



Practical Interventions

- Optimize glycemic control
- Optimize blood pressure control
- Provide foot injury education to all patients with diabetes



Practical Interventions: Patients with Neuropathy

Neuropathic Findings	Strategies
Sensory: loss of protective sensation	Clear walking space, use nightlights, obtain protective footwear
Motor: muscle wasting, foot deformity, callus	Accommodative footwear, regular removal of callus
Autonomic: decreased sweating - dry skin, edema	Moisturize skin, diabetic socks
Autonomic: abnormal blood flow - edema	Reduce edema with medication and/or positioning



Practical Interventions: Patients with Vascular Disease

Strategies for Peripheral Artery Disease

Treat hypertension and hyperlipidemia

Encourage smoking cessation

Refer to specialist for additional vascular assessment

Consult for revascularization or continue medical management of limb ischemia



Foot Care Education for All Patients with Diabetes

- Check your feet daily or have a family member/caregiver help you.
- Get help early if a foot problem is identified.
- Quit using commercial tobacco or never start.
- Wear shoes indoors and outdoors.
- Protect feet from hot and cold.
- Don't soak feet, dry thoroughly after bathing.
- Learn about proper shoe selection and fit, proper care, and maintenance.
- Work to keep your blood sugar in target range.



Foot Care Education Resource from IHS Division of Diabetes Treatment and Prevention

Diabetes Information for You and Your Family
Keeping Your Feet Healthy

Healthy feet help us to take care of ourselves and our families. We depend on them daily. Many people also use them to walk familiar trails and to take part in traditions, such as dances and ceremonies. For people with diabetes, controlling blood sugars is important to keep feet healthy. Here are three things you can do to take care of your feet:

1. Check your feet every day.

- Look at your feet for cuts, sores, red or swollen areas, and blisters.
- Check for infected or ingrown toenails.
- If you need help checking your feet, use a mirror or ask a family member to help you.

2. Get help if you find a foot problem.

- If you find any problems during your daily foot checks, contact your health care team right away.
- Getting help early can keep small problems from becoming bigger problems.

3. Quit using commercial tobacco or never start.

- Tobacco use reduces blood flow to your feet.
- Ask your health care team about things you can do to quit using commercial tobacco.
- Call 1-800-QUIT-NOW (1-800-784-8669) for free help.
- Avoid being around others who are smoking, including in the car.

Check your feet every day.
Dorria Cardoza, Santo Domingo Pueblo, NM



At each clinic visit, take off your shoes and socks.

Ask a member of your health care team to:

- Check your feet.
- Show you how to care for your feet.
- Trim your toenails or take care of corns and calluses, if needed.
- Suggest special shoes or inserts to help protect your feet.

What are other ways you can keep your feet healthy?

Wear shoes indoors and outdoors. Do not go barefoot.

- Wear comfortable shoes that fit well and protect your feet.
- Shoes should have round toes and low heels.
- Avoid shoes that are open at either the toe or the heel.

Produced by the IHS Division of Diabetes Treatment and Prevention
For more diabetes information and materials, visit www.ihs.gov/diabetes
3/2017

Keeping Your Feet Healthy

Report foot problems early.
It is important to get foot problems checked and treated right away. Ask your health care provider about treatment options. They may refer you to a foot or wound care specialist, if needed.

Protect your feet from hot and cold.

- Keep your feet away from heaters, open fires, and heating pads. You may burn your feet and not know it.
- Wear socks at night if your feet get cold.

Wash your feet often.

- Avoid using water that is too hot.
- Dry your feet well, including between your toes.


Put lotion on your feet daily.

- Apply lotion on the tops and bottoms of your feet, but not between your toes.
- Moisture between the toes can make the skin soften and break down, which can lead to infection.

Trim your toenails or ask for help.

- Trim your toenails straight across using toenail clippers.
- Do not use knives or sharp tools to cut the skin close to your toenails, or anywhere else on your feet.
- Ask for help trimming your toenails from a family member or health care team if you:
 - Cannot see well.
 - Have poor feeling in your feet.
 - Cannot reach your feet.
 - Have thick toenails.

Partner with your health care team.
*Mary Schaiderson, RN
Walter LeBlanc, Bay Mills Tribe, MI*



I will take these steps to take care of my feet:

Produced by the IHS Division of Diabetes Treatment and Prevention
For more diabetes information and materials, visit www.ihs.gov/diabetes
3/2017



Look at Your Feet EVERY DAY

Use a mirror if needed to see bottom of foot



Check

- Skin
- Nails
- Area between toes
- Heels
- Area under metatarsal heads (ball of foot)
- Dorsal surfaces of toes, especially if clawed or hammered



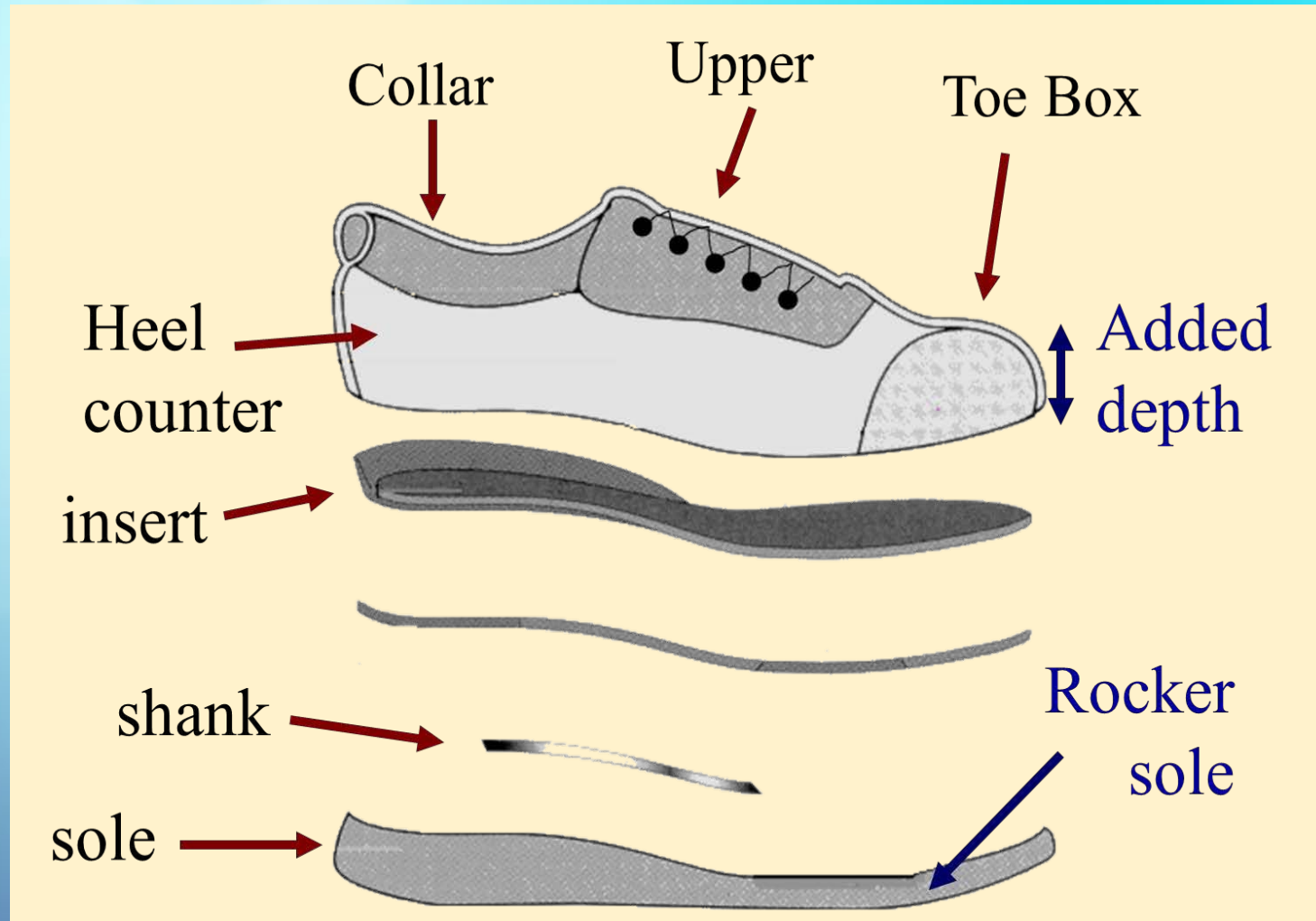
Footwear Resources:

Preventive and Protective Footwear

- Normal feet: standard, well fitting, shoes
- Insensate feet: quality walking shoe or added depth shoe
 - Adjustable upper
 - Firm heel counter
 - Padded insert and collar
 - Broad sole
- Insensate feet and minor deformity: added depth shoes with custom insert
- Major deformities: custom molded shoes



Footwear Structure



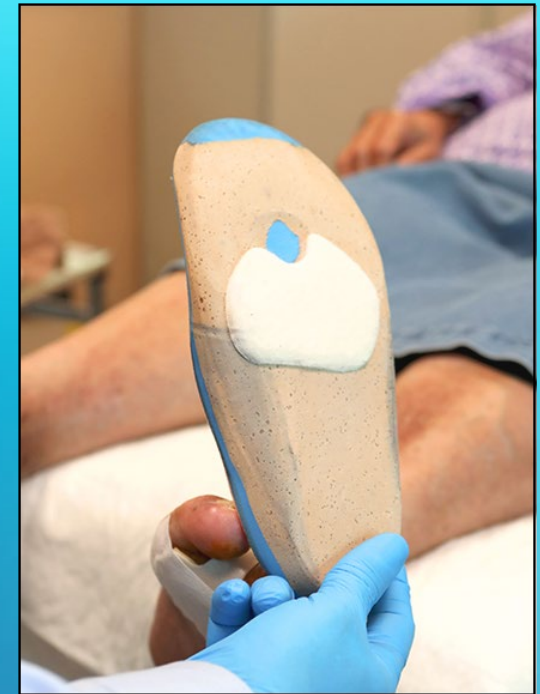
Referrals for Therapeutic Footwear



Custom-Molded Inserts and Extra Depth Shoes



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Footwear and Prevention of Foot Complications

- Reduced Peak Plantar Pressures > 50%
- Reduced callus formation > 30%
- Ulcer recurrence rates reduced > 50%
- Lower extremity amputation rate reduced > 70%
- Effectiveness is associated with adherence to footwear use.



Medicare Therapeutic Footwear Benefit

- Physician Certification for Therapeutic Footwear (MD, DO)
 - Certification that patient has diabetes and one or more of the following:
 - History of partial or complete amputation of the foot
 - History of previous foot ulceration
 - History of pre-ulcerative callus
 - Peripheral neuropathy with evidence of callus formation
 - Foot deformity
 - Poor circulation
 - Attestation that patient is receiving care for diabetes, and that they need special shoes because of their diabetes
- Footwear Prescription (usually a Podiatrist)
- Fitting and Dispensing (usually a Pedorthist)



Revised Medicare Policy: Therapeutic Shoes for Persons with Diabetes

- Medicare Policy article A52501 (11/2020): Nurse Practitioner (NP) and Physician Assistant (PA) providing ancillary services as auxiliary personnel could meet the “incident to” requirement in their provision of therapeutic shoes to beneficiaries with diabetes if all of the following criteria are met:
 - Supervising physician has documented in the medical record that patient has diabetes and continues to provide comprehensive care; and
 - NP or PA certifies that the provision of the shoes are part of comprehensive treatment plan for the patients; and
 - Supervising physician must review and verify (sign and date) all of the NP or PA notes pertaining to the provision of the therapeutic shoes acknowledging agreement with NP or PA.



Chronic Care Model for Diabetes Foot Care

Delivery System Design	Self-Management Support	Decision Support	Information Systems	Community Resources	Health System Organization
<ul style="list-style-type: none">• Proactive visits for foot screening and clinical care• Regular visits and interactions with Foot Care Team	<ul style="list-style-type: none">• Self-help education and materials for patients and families• Patient-identified priorities for care	<ul style="list-style-type: none">• Evidence-based care and referral guidelines• Training and education• Foot care evaluation and provider feedback	<ul style="list-style-type: none">• Risk-stratified diabetes registries• Audits for tracking appointments and reminders• Summarize data from encounters	<ul style="list-style-type: none">• Resources for clinical care• Coordinate participation• Address SDOH needs	<ul style="list-style-type: none">• Foot care quality• Leadership support• Attainable targets and evidence-based guidelines



Fewer Foot Ulcers and Amputations



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(ADA Standards of Care, 2023; Reiber, 2005; Rith-Najarian, 1998; Rith-Najarian, 2000)



In Summary:

We have:

1. Identified factors and findings that increase risk of diabetic foot complications.
2. Demonstrated how to perform a complete diabetic foot examination.
3. Introduced strategies to prevent diabetic foot complications in the primary care setting.

We can:

1. Improve our rate of performing diabetic foot exams.
2. Improve performance in form of GPRA (government performance results act).
3. Improve Medicare MIPS (merit-based incentive payment system).
4. SAVE a Limb and SAVE a Life.



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