



**Alberta Health
Services**

Diabetes Foot Care Clinical Pathway Healthcare Provider's Guide

Diabetes, Obesity & Nutrition Strategic Clinical Network™



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Acknowledgement

*This healthcare provider's guide has been adapted from the New Brunswick
Diabetes Foot Care Clinical Pathway*

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Introduction

People with diabetes should be assessed for their risk of developing a diabetes foot ulcer when they are first diagnosed with diabetes and at least once a year thereafter. Patients at higher risk should be assessed more frequently. Completing a foot screen, coupled with ongoing re-assessments and timely appropriate interventions can greatly improve the patient's overall quality of life.

Early detection of risk factors and ongoing patient follow-up has been found to reduce the development of foot ulceration and subsequently reduce amputations. The majority of amputations related to diabetes are preceded by a diabetes foot ulcer; of which, up to 85% are preventable.

The Diabetes Foot Care Clinical Pathway (DFCCP) has been developed to enhance early detection and timely treatment of diabetes related foot problems. The DFCCP resources are intended to support healthcare providers in performing diabetes foot screening exams, using the Diabetes Foot Screening Tool and referring patients to the most appropriate healthcare provider(s) within the recommended time frames.



The Diabetes Foot Care Clinical Pathway Resources

- **Diabetes Foot Screening Tool** – Guides you in assessing the foot, identifying risks of ulceration and classifying the level of patient risk
- **Diabetes Foot Risk Assessment Triage Referral Form** – Available for communities that can refer to a High Risk Foot Team; helps direct the patient to the correct service in a specified time frame contingent on the assessed level of risk
- **Diabetes Foot Care Clinical Pathway Healthcare Provider's Guide** (this resource) – Provides supplemental information to assist the assessor in completing the foot screening sections and identify level of risk
- **Referral Process Guideline** - High level overview of the referral and follow-up guidelines
- **Foot Care for People with Diabetes: Low, Moderate and High Risk Care Recommendations Booklet** – A patient education booklet which describes the various risk levels, how to take care of their feet and prevent progressing to a higher level of risk
- **Low, Moderate and High Risk Diabetic Foot Patient Information Sheets** – A condensed, single-page, patient handout based on each respective level of risk

Overview of the Diabetes Foot Screening Tool

The Diabetes Foot Screening Tool is designed to help you thoroughly examine a patient's foot and determine the level of risk. There are 6 screening components and 4 levels of risks: **low**, **moderate**, **high**, and **urgent**. The form also includes an area to record your findings for each foot (right and left).

- Low risk findings indicate a normal foot assessment with no significant skin, nail, anatomical, vascular or sensory abnormalities and require a foot assessment annually
- Moderate risk findings include skin, nail, anatomical or sensory abnormality with no skin breakdown/ulcer and/or inadequate footwear. Patients with moderate risk findings need to be addressed within one month of assessment and follow-up every 4 to 6 months
- High risk findings are characterized by skin breakdown/ulcer, and/or impaired circulation with no signs of infection or cellulitis. Patients with any high risk finding need care within 2 weeks of assessment and follow-up every 1 to 4 weeks
- Urgent findings such as cellulitis, draining ulcer, acute Charcot joint collapse, gangrene, cold white painful foot or part thereof require immediate assessment and treatment (within 24 hours)

The Foot Screening Process

There are several steps in the Diabetes Foot Care Clinical Pathway:

- Examination and assessment of the patient's feet
 - Identify state of skin and nails, deformities, arterial compromise, and neuropathy
 - Identify state of their shoes (inside and out)
- Complete the two pathway forms (screening and triage)
- Make appropriate and timely referrals
- Provide patient education and follow-up
 1. Have the patient remove their shoes. It is important to assess both feet and footwear
 2. Complete the **Diabetes Foot Screening Tool**. Assess and record your findings for each foot
 3. Determine the patient's **Level of Risk** (the overall risk is determined by the highest level assessed for either foot)
 4. Identify what referrals are needed to address the patient's assessed needs and complete the **Diabetes Foot Risk Assessment Triage Referral Form**
 5. Refer the patient to appropriate service(s)
 6. If referring to a High Risk Foot Team (HRFT), include a copy of both DFCCP forms with your referral (Diabetes Foot Screening Tool & Diabetes Foot Risk Assessment Triage Referral Form)
 7. Provide the patient with education, self-management strategies and resource handout(s) **"Foot Care for People with Diabetes: Low, Moderate and High Risk Care Recommendations"**
 8. Provide the patient with a follow-up appointment



Note:

You can go to <https://www.albertahealthservices.ca/scns/Page13331.aspx> to identify if there is a High Risk Foot Team in your area. If your area does not have a HRFT, refer your patient to the most appropriate local healthcare provider to address the patient's identified needs (e.g. podiatry, foot care nurse, vascular surgeon, infectious disease, dermatology, etc.)

Foot Screening Tool



Patient Label

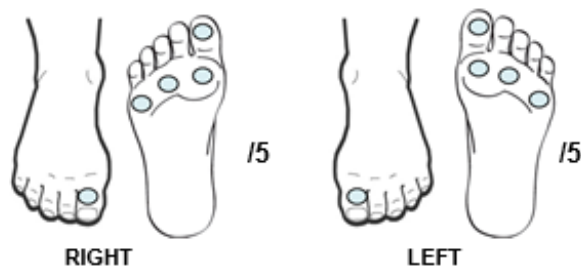
Diabetes Foot Screening Tool

EXAM	FINDINGS	R	L	RISK
SKIN	Normal intact skin – healthy or dry *check in between toes			LOW
	Callus/Corn/Fissure/Crack not bleeding or draining			MODERATE
	Prior history of Diabetic Foot Ulcer(s) ulcer in remission			
	Blister = B or Hemorrhagic callus = HC			HIGH
	Fissure or Crack Bleeding or draining = F			
	Diabetic Foot Ulcer – Not infected and/or with intact dry black eschar = U			
	Infected Diabetic Foot Ulcer or wet gangrene			URGENT
NAILS	Normal well-kept with minimal discoloration			LOW
	Missing, sharp, unkept, thickened, long or deformed			MODERATE
	Infected ingrown nail			
STRUCTURE ANATOMY	Normal no noted visual abnormalities			LOW
	Decreased range of motion at ankle or toe joint			
	Deformities Bunion/Hammer or claw toes/overlapping toes			MODERATE
	Structure Fallen Arch/ Rocker bottom foot/stable Charcot foot			
	Previous amputation X over location or draw/describe on diagram			
	Redness over any structural deformities pressure related			HIGH
	Red, hot painful joint or acute Charcot foot			URGENT
SENSATION Testing for LOPS	Normal sensation using 10 g monofilament at the 5 predetermined sites			LOW
	Sensation of numbness/tingling/throbbing/burning			MODERATE
	Absent or altered sensation at one or more of the five sites			
	Acute onset of pain in a previously insensate foot			URGENT
VASCULAR Testing for Arterial Compromise	Normal pulses normal capillary refill			LOW
	Signs of Ischemia (PAD)			
	Cool skin with pallor, cyanosis or mottling, and/or dependent rubor			HIGH
	One or more pulses not palpable or audible (Doppler)			
	Absent pedal pulses with cold white painful foot or toes			URGENT
FOOTWEAR	Appropriate accommodates foot shape			LOW
	Inadequate Footwear			MODERATE
	Inappropriate Footwear causing pressure/skin breakdown			HIGH

Instructions: Refer to Health Provider's Guide to Diabetes Foot Screening

Mark ulceration location (U). Mark other areas of specific concern: blister (B), draining fissure/crack (F), hemorrhagic callus (HC), and previous amputation (X).

Sensation Testing (monofilament)



Fill in if no sensation ●

Leave blank if sensation present ○

Identify any wounds and location on the foot or toe(s)

Date: _____

Signature: _____






Primary Care Site _____

Comments: _____

Adapted from New Brunswick Diabetes Foot Care Clinical Pathway






Performing the Foot Screening Exam

Skin Assessment

Findings	Risk & Action Plan	Screening Tips
<p>Normal skin (intact and healthy)</p> 	<p>LOW RISK</p> <ul style="list-style-type: none"> Normal intact skin or, Skin may be dry or too moist <p>Intervention</p> <ul style="list-style-type: none"> Dry skin - requires a moisturizer Excessive moisture between toes (maceration) - may require a wicking or drying agent <p>Education</p> <ul style="list-style-type: none"> Provide low risk diabetes foot information <p>Follow-up</p> <ul style="list-style-type: none"> Foot exam/screen required annually 	<ul style="list-style-type: none"> Inspect top & bottom of both feet Check in-between toes for skin breakdown or excess moisture Check skin temperature (run back of your hand down front of shin from knee to toes); compare both feet; ↑ temperature in one limb is often the first sign of inflammation/infection Moisturizers should be medical grade Consider recommending patient purchases Diabetes Socks
<p>Callus or corn</p> 	<p>MODERATE RISK With or without LOPS</p> <p>If assessment indicates only LOPS and no other findings the Primary Provider can address the identified patient's risk factors</p> <p>With LOPS PLUS any of the following, a referral to the High Risk Foot Team (HRFT) may be warranted</p> <p>Assessment</p> <ul style="list-style-type: none"> Assess footwear Look for and identify any pressure areas, redness, bruising, abrasions or cuts Identify corns, calluses, cracks or fissures Identify any dermatological concerns (e.g. yeast/fungus) Ascertain if any past ulcerations have occurred (ulcer in remission) <p>Intervention</p> <ul style="list-style-type: none"> Fissures require topical treatment to support closure Treat any skin conditions/open areas Refer to an AADL authorizer for therapeutic footwear if required <p>Education</p> <ul style="list-style-type: none"> Provide moderate risk diabetes foot information 	<ul style="list-style-type: none"> Loss of Protective Sensation (LOPS) is the leading predictor of foot ulceration. It is a crucial turning point for the patient in regards to their risk and need for additional interventions such as <ul style="list-style-type: none"> Professional nail care Corns and calluses should be managed by a medically trained foot care provider * Appropriate offloading footwear An increased need for monitoring and follow-up <p>*Foot care providers: podiatrist, foot care nurse or other medically trained professional competent in providing skin & nail care. These services may have a fee and a referral is likely required</p> <ul style="list-style-type: none"> Footwear is the #1 cause of foot trauma and contributes to skin difficulties Alberta Aids to Daily Living (AADL) authorizers are part of HRFT's Re-ulceration is a lifelong risk; the tensile strength of damaged tissue is only 80% of its former strength
<p>Fissure or crack (no bleeding or draining)</p> 	<p>Assessment</p> <ul style="list-style-type: none"> Assess footwear Look for and identify any pressure areas, redness, bruising, abrasions or cuts Identify corns, calluses, cracks or fissures Identify any dermatological concerns (e.g. yeast/fungus) Ascertain if any past ulcerations have occurred (ulcer in remission) <p>Intervention</p> <ul style="list-style-type: none"> Fissures require topical treatment to support closure Treat any skin conditions/open areas Refer to an AADL authorizer for therapeutic footwear if required <p>Education</p> <ul style="list-style-type: none"> Provide moderate risk diabetes foot information 	<p>*Foot care providers: podiatrist, foot care nurse or other medically trained professional competent in providing skin & nail care. These services may have a fee and a referral is likely required</p> <ul style="list-style-type: none"> Footwear is the #1 cause of foot trauma and contributes to skin difficulties Alberta Aids to Daily Living (AADL) authorizers are part of HRFT's Re-ulceration is a lifelong risk; the tensile strength of damaged tissue is only 80% of its former strength
<p>Fungus</p> 	<p>Assessment</p> <ul style="list-style-type: none"> Assess footwear Look for and identify any pressure areas, redness, bruising, abrasions or cuts Identify corns, calluses, cracks or fissures Identify any dermatological concerns (e.g. yeast/fungus) Ascertain if any past ulcerations have occurred (ulcer in remission) <p>Intervention</p> <ul style="list-style-type: none"> Fissures require topical treatment to support closure Treat any skin conditions/open areas Refer to an AADL authorizer for therapeutic footwear if required <p>Education</p> <ul style="list-style-type: none"> Provide moderate risk diabetes foot information 	<p>*Foot care providers: podiatrist, foot care nurse or other medically trained professional competent in providing skin & nail care. These services may have a fee and a referral is likely required</p> <ul style="list-style-type: none"> Footwear is the #1 cause of foot trauma and contributes to skin difficulties Alberta Aids to Daily Living (AADL) authorizers are part of HRFT's Re-ulceration is a lifelong risk; the tensile strength of damaged tissue is only 80% of its former strength
<p>Prior history of foot ulcer</p> 	<p>Assessment</p> <ul style="list-style-type: none"> Assess footwear Look for and identify any pressure areas, redness, bruising, abrasions or cuts Identify corns, calluses, cracks or fissures Identify any dermatological concerns (e.g. yeast/fungus) Ascertain if any past ulcerations have occurred (ulcer in remission) <p>Intervention</p> <ul style="list-style-type: none"> Fissures require topical treatment to support closure Treat any skin conditions/open areas Refer to an AADL authorizer for therapeutic footwear if required <p>Education</p> <ul style="list-style-type: none"> Provide moderate risk diabetes foot information 	<p>*Foot care providers: podiatrist, foot care nurse or other medically trained professional competent in providing skin & nail care. These services may have a fee and a referral is likely required</p> <ul style="list-style-type: none"> Footwear is the #1 cause of foot trauma and contributes to skin difficulties Alberta Aids to Daily Living (AADL) authorizers are part of HRFT's Re-ulceration is a lifelong risk; the tensile strength of damaged tissue is only 80% of its former strength



Findings	Risk & Action Plan	Screening Tips
	Follow-up every 4-6 months	

Skin Assessment continued

Findings	Risk & Action Plan	Screening Tips	
Blister 	<p style="text-align: center;">HIGH RISK</p> <p>Any high risk findings should be referred to the HRFT or local specialist with an appointment to be seen within 1-2 weeks</p> <p>Assess for</p> <ul style="list-style-type: none"> • Blister(s) • Hemorrhagic callus • Bleeding draining fissure or crack • Diabetes foot ulcer • Redness over structural deformity • Signs of arterial insufficiency • One or more pedal pulses not palpable or audible • Footwear causing pressure or skin breakdown <p>Intervention</p> <ul style="list-style-type: none"> • Diabetes Foot Ulcer <ul style="list-style-type: none"> ○ Initiate appropriate wound dressing protocol until patient can be seen by the HRFT or local specialist ○ Treat infection ○ Consider offloading affected foot <p>Education</p> <ul style="list-style-type: none"> • Provide high risk diabetes foot information <p>Follow-up</p> <ul style="list-style-type: none"> • Foot assessment every 1-4 weeks 	Signs of inflammation or infection include: <ul style="list-style-type: none"> • ↑ skin temperature • Swelling • Redness • Increased exudate • Odor • Pain where there was no pain before • Unexplained increase in blood glucose • Increase in wound size <p>*Antibiotic Therapy: Guided by Diabetic Foot Infection Guidelines in BUGS & DRUGS or alternate resource</p> <p>A dry black eschar should be left intact if eschar is not boggy, no exudate, and no pain or redness</p> <p>Any debridement of eschar should only be completed after a lower leg assessment has been completed by a trained health care professional – requires a referral to most appropriate health care provider</p> <p>Walking on thick calluses can damage the healthy skin underneath. This may lead to an accumulation of blood or an ulcer beneath the callus</p> <p>In a neuropathic foot, a callus is 11 times more likely to ulcerate than a site without a callus</p>	
Hemorrhagic callus (bleeding beneath)  			
Fissure or crack (bleeding or draining) 			
Non infected ulcer/ Dry black eschar 			

Findings	Risk & Action Plan	Screening Tips
<p data-bbox="154 201 472 296">Mild/superficial wound infection NOT requiring hospital admission</p> 		

Skin Assessment continued

Findings	Risk & Action Plan	Screening Tips
<p>Infected, draining ulcer</p> 	<p style="text-align: center;">URGENT RISK</p> <p>Triage for immediate treatment if any of the following are present</p> <ul style="list-style-type: none"> • Infection - draining diabetes foot ulcer or wet gangrene • Red, hot, swollen foot • Acute Charcot foot • Acute pain in a previously insensate foot • Absent pedal pulses with cold, white, painful foot or toes <p>Intervention</p> <ul style="list-style-type: none"> • Antibiotic therapy required guided by Diabetic Foot Infection Guidelines in BUGS & DRUGS or alternate resource • Consult Infectious Disease (ID) if appropriate • Total offloading/non-weight bearing of foot (Charcot, ulcer) • May require hospital admission • Requires close medical monitoring 	<ul style="list-style-type: none"> • These situations often require a hospital admission • Wet gangrene or non-intact eschar presents as necrosis of tissue with excessive moisture; often indicates infection • In the presence of advancing cellulitis, consider sepsis • Osteomyelitis is assumed (89%) in any person with diabetes whose wound probes to bone. This situation requires IV antibiotic intervention • Offloading the foot decreases the risk of further trauma • Neuropathy can impact a patient's ability to feel pain. When pain occurs in an insensate foot this is an indicator of an urgent situation • Pain often accompanies these conditions and should be addressed at time of visit • A referral to the High Risk Foot Team is recommended once the patient situation has stabilized
<p>Red, hot, swollen foot or cellulitis</p> 		

Helpful education hints for skin care




- The skin is the first barrier to infection and any skin breakdown can lead to limb-threatening consequences for people with diabetes
- Encourage patients to wash their feet daily and to make sure that they dry between toes
 - Do not moisturize in-between toes
 - Do not soak feet as part of foot care regime
- Review patient handouts to highlight recommendations for patient self-care and management

Treating foot ulcers can be complex and requires the care of several disciplines and sites of service to manage:







- Glycemic control
- Pressure relief or offloading (therapeutic footwear)
- Infection control
- Identify lower extremity vascular status – completing a lower limb assessment which includes ABPI (ankle brachial pressure index) **and** PPG (photoplethysmography) toe pressures
- Local wound care – best achieved with an interdisciplinary approach from professionals with expertise in chronic ulcer care

Offloading is used to re-distribute plantar pressure to the foot. Most foot ulcers occur at areas of increased pressure. To heal an ulcer, this pressure must be minimized or avoided. Several devices can be used for offloading. **The HRFT or Specialty Wound Care Team** can assess the patient's plantar pressures and recommend the best offloading approach (e.g. crutches for non-weight bearing, Darco shoes, custom orthotics, removable cast boots (AFO) or total contact casting). These devices are to be worn whenever the patient is on their feet. Compliance is often an issue therefore patient understanding is key to encouraging adherence.

Nail Assessment

Findings	Risk & Action Plan	Screening Tips
<p>Normal nails, well-kept minimal discoloration</p> 	<p style="text-align: center;">LOW RISK</p> <p>Education</p> <ul style="list-style-type: none"> • Provide low risk diabetes foot information <p>Follow-up</p> <ul style="list-style-type: none"> • Foot exam/screen required annually 	<ul style="list-style-type: none"> • Inspect the toenails • Support self-care strategies through education • Increased patient understanding of the importance of proper nail care has shown to improve adherence and reduces risk factors
<p>Missing, sharp, unkept, thickened, long or deformed</p> 	<p style="text-align: center;">MODERATE RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> • Check if sharp or unkept nails are causing cuts or wounds <p>Intervention</p> <ul style="list-style-type: none"> • Refer patient for nail care by a professional foot care provider* • Patient should be seen within 1 month of assessment <p>Education</p> <ul style="list-style-type: none"> • Provide moderate risk diabetes foot information <p>Follow-Up</p> <ul style="list-style-type: none"> • Foot assessment every 4-6 months 	<ul style="list-style-type: none"> • Thickened nails may indicate vascular or fungal infections • Patients with difficulty reaching their toes and/or with sensory abnormalities may need assistance with nail care • Nail care can be performed by a competent family member. If no family member is available or is difficult, then nail care should be done by a trained foot care provider* <p>*Foot care providers: podiatrist, foot care nurse or other medically trained providers competent in providing skin and nail care to people with diabetes. These services may have a fee and a referral is likely required</p> <ul style="list-style-type: none"> • Routine skin & nail care is not often provided by the High Risk Foot Team
<p>Infected Ingrown toenail</p> 	<p>Assessment</p> <ul style="list-style-type: none"> • Identify type of infection <p>Intervention</p> <ul style="list-style-type: none"> • Treat infection • Refer for advanced intervention if deemed warranted (e.g. removal of nail or advanced nail care) <p>Education</p> <ul style="list-style-type: none"> • Provide moderate risk diabetes foot information <p>Follow-up</p> <ul style="list-style-type: none"> • Foot assessment every 4-6 months 	<ul style="list-style-type: none"> • Ingrown toenails can quickly lead to serious foot complications • Systemic antibiotics should be initiated prior to referral if indicated • Recommend antibiotic therapy guided by Diabetic Foot Infection Guidelines in BUGS & DRUGS or alternate resource. Consider Infectious Disease (ID) consult • Referrals may include: <ul style="list-style-type: none"> ○ Surgical intervention for removal of deformed or ingrown nail ○ Dermatology ○ Podiatry ○ Foot Care Nurse



Structure/Anatomy Assessment

Findings	Risk & Action Plan	Screening Tips		
<p>Normal (no noted visual abnormalities)</p> 	<p>LOW RISK</p> <p>Education</p> <ul style="list-style-type: none"> • Provide low risk diabetes foot information <p>Follow-up</p> <ul style="list-style-type: none"> • Foot exam/screen required annually 	<ul style="list-style-type: none"> • Inspect the general shape of both feet 		
<p>Bunions</p> 	<p>MODERATE RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> • Identify decreased range of motion in ankle or toe joint • Identify structural abnormalities/deformities • Identify changes in structure (e.g. Charcot foot) • Identify previous amputations <p>Intervention: Referrals</p> <ul style="list-style-type: none"> • High Risk Foot Team, AADL authorizer, other local healthcare providers such as an Orthotist, Podiatry • Patient should be seen within 1 month of assessment <p>Education</p> <ul style="list-style-type: none"> • Provide moderate risk diabetes foot information <p>Follow-up</p> <ul style="list-style-type: none"> • Foot assessment every 4-6 months 	<ul style="list-style-type: none"> • Most structural abnormalities are related to autonomic & motor neuropathy and further complicated by sensory neuropathy • Abnormal foot shape and prominent bony abnormalities can create pressure points that can lead to skin breakdown • All patients should be instructed in proper footwear to alleviate pressure on bony deformities & reduce skin breakdown (see Wounds Canada website for a handout on proper shoe fit: https://www.woundscanada.ca/about-dhfy) • With loss of protective sensation (LOPS) patients may require therapeutic footwear and total contact inserts through Alberta Aids to Daily Living (AADL), see AADL website for current referral criteria: https://www.alberta.ca/alberta-aids-to-daily-living.aspx • Some insurance plans also offer assistance with payment if a prescription is provided • People with diabetes should inspect their footwear (look and feel) prior to putting shoes on • Appropriate footwear to be worn at all times, even in the house • Redistribution of pressure & modification of footwear is essential • Persistent corns and calluses due to structural deformities may warrant a surgical opinion regarding deformity correction • A chronic, stable Charcot foot follows an acute Charcot. The foot is no longer hot and structural deformities are stable 		
<p>Claw or hammer toes</p> 				
<p>Overlapping digits</p> 				
<p>Reduced range of motion at the ankle or toe joints</p> 				
<p>Arch deformities (high arch, fallen arch, rocker bottom, Charcot foot, etc.)</p> 				

Structure/Anatomy Assessment continued

Findings	Risk & Action Plan	Screening Tips
<p>Partial or complete amputations of toes or foot</p> 	<p>MODERATE RISK CONTINUED</p> <p>Assessment</p> <ul style="list-style-type: none"> • Check footwear • Identify any open areas, red areas, corns or calluses <p>Intervention</p> <ul style="list-style-type: none"> • Refer to HRFT or local specialist if there are open areas and LOPS and/or new footwear is required • Patient should be seen within 1 month of assessment 	<ul style="list-style-type: none"> • Footwear is often prescribed after amputation. The footwear may be wearing out. It is important to look at both the inside and outside of the footwear as offloading becomes very important when the foot anatomy has been altered
<p>Structural abnormalities with redness on pressure areas (not infected)</p> 	<p>HIGH RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> • Redness over any structural deformities - pressure related <p>Intervention</p> <ul style="list-style-type: none"> • Refer to HRFT or local specialist • Patient should be seen within 1-2 weeks of assessment <p>Education</p> <ul style="list-style-type: none"> • Provide high risk diabetes foot information <p>Follow-up</p> <ul style="list-style-type: none"> • Foot assessment every 1-4 weeks 	<ul style="list-style-type: none"> • Reddened areas may progress to development of skin breakdown, wound(s) and/or infection in a short period of time. Note that early signs of infection are often subtle • Pressure redistribution of plantar foot pressure & modification of offending footwear is essential
<p>Red, hot, painful joint</p> <p>or</p> <p>Acute Charcot joint “collapse”</p> 	<p>URGENT RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> • Red, hot, painful joint or acute Charcot foot <p>Intervention</p> <ul style="list-style-type: none"> • Antibiotic therapy • Pain management, total offloading/non-weight bearing of foot is essential • Refer for immediate treatment within 24 hours • Referrals may include Orthopaedic Specialist, Infectious Disease (ID) Specialist • May require hospital admission; if no admission required, needs close medical monitoring 	<ul style="list-style-type: none"> • Treatment of acute Charcot foot requires immobilization of the foot, typically for several months & up to one year in a removable walker device or total contact cast (until excessive foot temperatures return to normal) • Patient to completely offload pressure on affected foot. Damage done by walking on an acute Charcot foot is permanent • Patient safety: if the patient is unable to safely offload the foot then provide appropriate aids such as a wheelchair • Antibiotic therapy required guided by Diabetic Foot Infection Guidelines in BUGS & DRUGS or alternate resource

Sensation Testing

Findings	Risk & Action Plan	Screening Tips
<p>Normal sensation to 10g monofilament exam</p> 	<p style="text-align: center;">LOW RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> Assess for sensation using the 10 g Semmes-Weinstein 5.07 monofilament <p>Education</p> <ul style="list-style-type: none"> Provide low risk diabetes foot information <p>Follow-up</p> <ul style="list-style-type: none"> Foot exam/screen required annually 	<ul style="list-style-type: none"> Sensory neuropathy or loss of protective sensation is a progressive problem affecting 40-50% of people with diabetes within 10 years of their diagnosis Diabetes neuropathic pain is estimated to affect 20-24% of people with diabetes. This may be difficult to medically manage; however, there are many prescription medications that have been shown to reduce neuropathic pain
<p>Patient sensation of the following: Numbness/tingling/crawling or burning</p> <p>Other patient descriptors to describe peripheral diabetes neuropathic pain may include:</p> <ul style="list-style-type: none"> Painful cold Electric shocks Pins and Needles Itching 	<p style="text-align: center;">MODERATE RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> Ask the patient to describe any sensation or feeling they have in their legs/feet Complete monofilament testing <p>Intervention</p> <ul style="list-style-type: none"> Intact sensation, refer to appropriate foot care provider if patient cannot perform self-foot care Loss of sensation at one or more sites, refer to HRFT or local specialist Patient to be seen within 1 month of referral <p>Education</p> <ul style="list-style-type: none"> Provide patient with moderate risk information <p>Follow-up</p> <ul style="list-style-type: none"> Foot assessment every 4-6 months 	<ul style="list-style-type: none"> Loss of the ability to detect pain and temperature poses tremendous risk for puncture, pressure, friction, chemical and thermal injuries For guidance on completing a monofilament test see next page
<p>Absent sensation using 10 g monofilament at 1 or more sites</p>	<p style="text-align: center;">URGENT RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> Acute onset of pain in a previously insensate foot; may present with edema <p>Intervention</p> <ul style="list-style-type: none"> Total offloading/non-weight bearing of foot is essential Refer for immediate treatment within 24 hours <p>Consult if appropriate</p> <ul style="list-style-type: none"> Infectious Disease (ID) Orthopaedic Specialist 	<ul style="list-style-type: none"> Pain or inflammation may be related to infection, septic arthritis or an acute Charcot foot. This must be appropriately diagnosed and medically managed. Antibiotic therapy required guided by Diabetic Foot Infection Guidelines in BUGS & DRUGS or alternate resource Needs close medical monitoring May require hospital admission
<p>Pain or inflammation in a previously insensate foot</p> 	<p style="text-align: center;">URGENT RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> Acute onset of pain in a previously insensate foot; may present with edema <p>Intervention</p> <ul style="list-style-type: none"> Total offloading/non-weight bearing of foot is essential Refer for immediate treatment within 24 hours <p>Consult if appropriate</p> <ul style="list-style-type: none"> Infectious Disease (ID) Orthopaedic Specialist 	<ul style="list-style-type: none"> Pain or inflammation may be related to infection, septic arthritis or an acute Charcot foot. This must be appropriately diagnosed and medically managed. Antibiotic therapy required guided by Diabetic Foot Infection Guidelines in BUGS & DRUGS or alternate resource Needs close medical monitoring May require hospital admission

Sensation Testing continued

Monofilament testing is an inexpensive, easy-to-use, and portable test for assessing the loss of protective sensation, and it is recommended by several practice guidelines to detect peripheral neuropathy in otherwise normal feet.

Points of Emphasis for Monofilament Testing

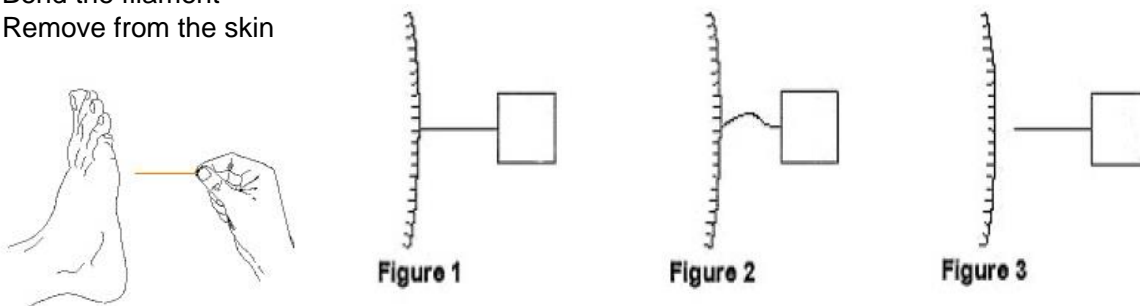
- Use a 10-g Semmes-Weinstein 5.07 monofilament
- Should be done at least once a year as part of an overall foot screening and assessment
- Test both feet
- Conducted with patients who have any of the following:
 - Diabetes
 - Diabetes foot ulcer
 - Feelings of numbness, tingling, burning or a “crawling” sensation in one or both feet
- Screens for the presence or absence of neuropathy (sensation)
- Identifies Loss of Protective Sensation (LOPS)
 - LOPS is a major risk factor for developing diabetes foot ulcers which can lead to amputation
 - A positive screen is when sensation is absent at one or more of the 5 test sites
 - Feet may be falsely insensate when cold, edematous or heavily calloused
- Apply the monofilament to the skin and hold steady for several seconds
 - Approach, skin contact and departure of the filament should be approximately 1½ - 2 seconds duration
- Do not use a pen cap or pin for monofilament testing

How to Perform Monofilament Testing

1. Provide a quiet and relaxed setting
2. Have patient remove shoes and socks on both feet – assist as necessary
3. Explain the procedure & show the patient the monofilament – understanding can enhance test results
4. Wash hands and apply gloves if needed – clean gloves are to be worn if there is an open area, discharge or a rash on the foot or ankle area
5. Touch the monofilament to the arm or hand so patient knows what to expect – what it feels like
6. Have the client close their eyes and indicate when they feel the monofilament touch by responding with a “yes” – also ask where they feel the monofilament
7. Hold the monofilament perpendicular to the foot and with a smooth, steady motion, touch the skin until the monofilament bends approximately 1 cm, applying sufficient force to bend it to a “C.” Hold it against the skin for approximately 2 seconds
8. Randomly test 5 sites on each foot – see diagram for site selection
9. Avoid any ulcers, calluses, sores, or scars – If an ulcer, callus or scar is on the foot, apply the monofilament on an area adjacent to rather than directly over the affected area
10. Revisit any sites where the patient did not respond to touch to confirm loss of sensation
11. Share the results of the test with the patient – provides a “teachable moment” to reinforce the concept and value of self-care

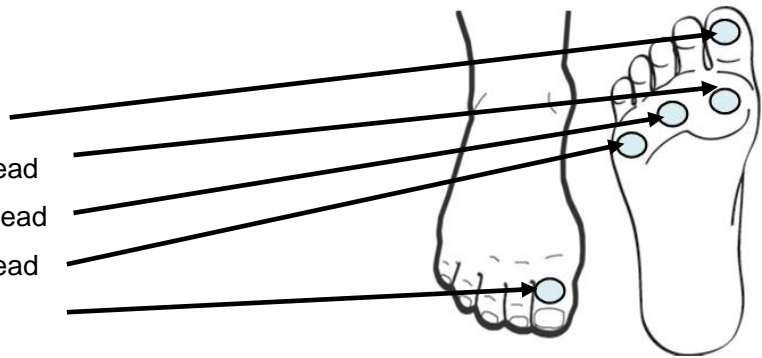
Hold the filament perpendicular to the skin and use a smooth motion when testing. Use a 3 step sequence that includes:

- Touch the skin
- Bend the filament
- Remove from the skin



5-Site Monofilament Testing

1. Plantar surface of the great toe
2. Plantar surface of the first metatarsal head
3. Plantar surface of the third metatarsal head
4. Plantar surface of the fifth metatarsal head
5. Dorsum of big toe (not on the toenail)



Interpretation of Results

- If the patient feels all 5 sites tested then the score is 0/5 and the patient has sensation
- If the monofilament is not felt in a tested area on the foot, this indicates loss of protective sensation (LOPS) in that area and should prompt a referral to a High Risk Foot Team or other appropriate community resource

Frequency of Testing

- Repeat testing should be done at least once a year and,
- When a foot ulcer occurs

Caring for the Monofilament






- Clean the filament as per the manufacturer's suggestions
- Ensure it is dry before storing
- Replace the monofilament if bowed, kinked, or twisted




Note:

For the purposes of the Diabetes Foot Screening Tool, a 5-site monofilament test has been adopted. This combines recommendations by the Canadian Diabetes Association and the Registered Nurses' Association of Ontario. A 10-site assessment may also be used; however the literature indicates that the benefit of a 10 point test compared to a 5 point test is insignificant in predicting foot ulcer development.

Vascular Assessment – Identify PAD (Peripheral Arterial Disease)

Findings	Risk & Action Plan	Screening Tips
<p>Normal pulses Normal capillary refill</p>  <p>Posterior Tibialis</p>  <p>Dorsalis Pedis</p>	<p style="text-align: center;">LOW RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> • Palpate dorsalis pedis & posterior tibial pulses (You can use a hand held Doppler to listen to pulses if available) • Check capillary refill • Check temperature of the skin on lower legs and feet <p>Education</p> <ul style="list-style-type: none"> • Provide low risk diabetes foot information <p>Follow-up</p> <ul style="list-style-type: none"> • Foot exam/screen required annually 	<ul style="list-style-type: none"> • Pulses may be difficult to palpate in the presence of edema or if the feet are cold • Check capillary refill by pressing against end of patient's toe until skin pales, then release. If color takes longer than 3-4 seconds to return, refill is delayed suggestive of arterial compromise
<p>Signs of peripheral arterial disease</p>  <p>Cool skin with pallor, cyanosis or mottling (at rest or with leg elevation)</p>  <p>Dependent Rubor</p>  <p>One or more pulses not palpable (dorsalis pedis & post-tibialis)</p>	<p style="text-align: center;">HIGH RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> • Assess the limbs for signs of ischemia • Are one or both limbs cool? Have their legs and feet always been cool or is this a new condition? • Does the limb blanch when elevated and become dark purple when dependent? <p>Intervention</p> <ul style="list-style-type: none"> • Refer to HRFT or local provider that can perform lower limb assessments • Patient should be seen within 1-2 weeks of assessment • Pressure redistribution of plantar foot pressure & modification of offending footwear is essential <p>Education</p> <ul style="list-style-type: none"> • Provide high risk diabetes foot information <p>Follow-up</p> <ul style="list-style-type: none"> • Foot assessment every 1-4 weeks 	<ul style="list-style-type: none"> • Decreased Skin Temperature – May indicate arterial compromise especially if one foot is cooler than the other • Ask what patient's normal over their lifetime has been. If cold outside, allow feet to warm up before your assessment • Pallor on elevation of leg(s) above the level of the heart indicates that arterial perfusion is impaired • Other signs of peripheral arterial disease include: <ul style="list-style-type: none"> ○ Thin, fragile, shiny skin ○ Loss of hair growth on lower leg (inadequate blood supply results in hair root death) • Dependent Rubor – Skin has a purple color when leg is down • Dependent rubor occurs when the leg is brought down below the level of the heart and blood rushes to the leg with the assistance of gravity. It is an indicator of poor arterial circulation • Pulses – If edema prevents palpation of pulses, a Doppler could be used to assess presence or absence by auscultation. If there is no Doppler, referral for a lower limb assessment is needed

Vascular Assessment continued

Findings	Risk & Action Plan	Screening Tips
 <p>Absent pedal pulses with cold, white, painful foot or toes</p>	<p style="text-align: center;">URGENT RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> • Determine cause if possible • Assess pain <p>Intervention</p> <ul style="list-style-type: none"> • Provide pain management • Refer for immediate treatment within 24 hours • Acute Care – may require hospital admission • Vascular Surgeon 	<ul style="list-style-type: none"> • Critical ischemia or significant loss of arterial perfusion to leg can be extremely painful even at rest • Patient may be a candidate for urgent revascularization • If not hospitalized, patient needs close medical monitoring • Pressure redistribution is important to prevent alterations of the skin related to pressure, friction and/or shearing. Healing is often difficult or may not occur at all in the presence of PAD; pending the degree of compromise. Prevention is key

★ Additional Information

- Assessment of peripheral arterial circulation and identification of PAD is important in developing a comprehensive and holistic client centered health management plan
- Become familiar with signs of PAD (see Wounds Canada website: <https://www.woundscanada.ca/>)
- Clinical assessment includes identifying the presence of pedal pulses and claudication
 - Intermittent claudication can be an early warning sign of the presence of PAD and is progressive over time. Claudication can present as:
 - Leg muscle pain
 - Fatigue with walking (relieved by rest in minutes)
 - Pain at night when legs elevated
 - Assessment of pedal pulses with a Doppler (if available) is helpful if pedal pulses cannot be palpated; the screening team must have the skillset & equipment to perform this exam
- Advanced vascular assessment requires a referral: High Risk Foot Team, Lower Limb Clinic or Vascular Surgeon
- Lower Limb Assessment (LLA)
 - It is not expected that ?healthcare providers will complete this assessment
 - LLA requires training and skillset in order to make the clinical decisions in planning care
 - An Ankle Brachial Pressure Index (ABPI) is only one part of a lower limb assessment and decisions based solely on the ABPI value are not always clinically sufficient
- The Ankle Brachial Pressure Index (ABPI)
 - Non-invasive comparison of systolic pressures between the arm and the ankle identifying degree of arterial compromise is usually tested by a HRFT
 - Used as a screening tool to determine degree of arterial insufficiency and to identify individuals who require additional assessment/evaluation
 - It is important to recognize that:
 - Persons with diabetes may have a “false high” ankle brachial pressure index due to calcification of the vessels (greater than 1.3 mmHg: CDA, 2008)
 - ABPI is not useful for individuals with non-compressible vessels due to calcification or those patients with significant edema
 - Toe pressures using a PPG is recommended in these cases

Vascular Assessment continued



- It is recommended that individuals with diabetes undergo additional assessment such as toe pressures (PPG/photoplethysmography) or toe brachial index (TBI) to give additional information regarding peripheral arterial perfusion.
 - PPGs and TBIs are based on measurement of small vessel perfusion to the toes
- If edema is present, the history and cause of edema must be determined.
 - ***It is important that assessment of peripheral arterial circulation is completed prior to implementing an edema management plan, such as compression***

Ankle Brachial Pressure Index (ABPI)	Toe Pressure (PPG)	Toe Brachial Pressure Index	Ankle Doppler Wave Form	Diagnosis
≥0.8-1.3 mm Hg	≥50 mm Hg	≥0.7 mm Hg	Biphasic or Triphasic (Normal)	No significant arterial disease
≥0.6- 0.8 mm Hg	≥40 mm Hg	≥0.4-0.7 mm Hg	Biphasic / Monophasic	Arterial disease
≥0.4-0.6 mm Hg	<40 mm Hg	< 0.4 mm Hg	Monophasic	Significant arterial disease
< 0.4 mm Hg	≤25 mm Hg	≤ 0.2 mm Hg	Monophasic	High risk of critical limb ischemia

Note:

- These values may not be universally accepted as marginal variations exist within the current literature
- Accessibility to testing and interpretation of results may be limited to certain areas of specialty

Footwear Assessment

Findings	Risk & Action Plan	Screening Tips
<p>Footwear is appropriate and accommodates foot shape</p> 	<p>LOW RISK</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Visually and manually examine footwear inside and out at each screening visit • Inspect feet for reddened areas that may indicate pressure points created by poorly fitted footwear • Inspect socks for signs of blood or other discharge <p>Intervention</p> <ul style="list-style-type: none"> • Encourage patient to purchase “Diabetes Socks” • Encourage the patient to be professionally fitted for appropriate footwear <p>Education</p> <ul style="list-style-type: none"> • At each visit, teach how to inspect footwear • Shoes should be worn all the time when walking, even in the house • Bare feet should be avoided <p>Follow-up</p> <ul style="list-style-type: none"> • Foot exam/screen required annually 	<ul style="list-style-type: none"> • Footwear is the number one cause of trauma to the foot in people with diabetes • Due to developing neuropathy, many patients are unable to feel shoes that are too small or too tight and will purchase shoes with poor fit • Remember to ask patient how old their shoes are, what their regular footwear is and how often they wear their shoes (e.g. only outside or all of the time, even in the house) • Seams in socks can cause pressure. Diabetes Socks have no seams and minimizes pressure areas on the feet • Ask if the patient regularly wears socks • Is footwear inappropriate (e.g. worn out, too tight, does not accommodate the foot shape) • Cross reference with LOPS. If the patient has intact sensation refer to appropriate foot care provider • If LOPS is present the patient may require therapeutic footwear
<p>Inappropriate footwear</p> 	<p>MODERATE RISK</p> <p>Assessment</p> <p>Check to see if shoes:</p> <ul style="list-style-type: none"> • Are too small, tight or loose • Accommodate foot deformities • Are worn-out • Are “over the counter” or professionally fitted shoes • Have rough seams or foreign objects inside the shoe • Have abnormal wear patterns <p>Remove and inspect insoles</p> <p>Intervention</p> <ul style="list-style-type: none"> • Requires new footwear • If sensation is intact, refer to an Orthotist for custom orthotics • Refer to AADL authorizer for therapeutic footwear if no sensation (LOPS) 	<ul style="list-style-type: none"> • Pressure redistribution of plantar foot pressure & modification of offending footwear is essential

Footwear Assessment continued

	<p>Education</p> <ul style="list-style-type: none"> Importance of appropriate footwear and self-assessment of feet <p>Follow-up</p> <ul style="list-style-type: none"> Foot assessment every 4-6 months 	
<p>Footwear causing pressure or skin breakdown</p>	<p style="text-align: center;">HIGH RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> Inspect foot including toes and heel for red areas or open skin/wounds Refer to sensation testing findings <p>Intervention</p> <ul style="list-style-type: none"> Refer to HRFT or local specialist for AADL Therapeutic Footwear Patient should be seen within 1-2 weeks of assessment <p>Education</p> <ul style="list-style-type: none"> Provide high risk diabetes foot information <p>Follow-up</p> <ul style="list-style-type: none"> Frequent foot assessments should occur once appropriate foot wear has been obtained 	<ul style="list-style-type: none"> With loss of sensation at one or more sites the patient may require therapeutic footwear Off the shelf orthotics are not sufficient to meet the needs of patients who are high risk for developing a foot ulcer related to pressure from footwear AADL will provide footwear for persons with diabetes with a cost sharing component. See AADL website for most current criteria https://www.alberta.ca/alberta-aids-to-daily-living.aspx

Helpful Hints

- Consider referring the patient for professionally fitted footwear if “off the shelf” options do not accommodate foot challenges or support the offloading of pressure areas.
- It is important once the patient has LOPS that footwear be professionally fitted**
- Finding the Proper Shoe Fit: <https://www.woundscanada.ca/diabetes-healthy-feet-and-you/steps-for-healthy-feet>

Proper Foot Care

Causes of diabetes foot problems and ulcerations include poor foot hygiene, inability to perform self-care, infrequent/improper inspection of feet and inappropriate or poorly fitting footwear.


Healthcare providers play a key role as patient advocates, enabling patient accessibility to proper foot care and footwear.

Along with proper footwear, it is essential that the patient appreciates the importance of proper foot care. A patient education booklet has been developed to support patient self-management and to help recognize when they should see their healthcare provider. This booklet is called “**Foot Care for People with Diabetes: Low, Moderate and High Risk Care Recommendations**” and can be found on the MyHealthAlberta website at <https://myhealth.alberta.ca/Alberta/Pages/foot-care-for-people-with-diabetes.aspx>

Feel free to provide the patient with this resource.

The findings below are not part of the screening however, it provides healthcare providers an opportunity to review the patient resource material

Proper Foot Care continued

Findings	Risk & Action Plan	Screening Tips
<p>Adequate foot care (healthy skin, nails)</p> 	<p>LOW RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> Inspect the feet for signs of poor foot hygiene (dirty, long or poorly shaped nails, calloused or cracked skin) <p>Intervention</p> <ul style="list-style-type: none"> Reinforce need for proper foot care and assess for potential barriers to proper foot care <p>Follow-up</p> <ul style="list-style-type: none"> Foot exam/screen required annually 	<ul style="list-style-type: none"> Ask if foot care assistance is required for hygiene and for performing daily foot inspections If assistance is required, determine what assistance is needed (poor vision, range of motion, self-care, mobility, etc.) Toenail care must be done properly to prevent injury to the toenail and/or toe Discuss and arrange assistance for foot care as needed (family, friend, foot care provider) Identify foot care providers in the area and their costs, and provide the patient with a list
<p>Inadequate foot care</p> 	<p>MODERATE RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> Discuss the need for professional nail care May require information on moisturizers <p>Intervention</p> <ul style="list-style-type: none"> Provide a list of foot care providers and potential costs Recommend nail care to be done within 1 month <p>Follow-up</p> <ul style="list-style-type: none"> Foot assessment every 4-6 months 	<ul style="list-style-type: none"> A moderate risk patient should be receiving professional nail care Patients with dry skin and poor foot hygiene will require medical grade moisturizers Identify any barriers to foot and nail care The patient can be shown how to inspect their feet with a mirror
<p>Grossly abnormal skin or nails, specialty care</p> 	<p>HIGH RISK</p> <p>Assessment</p> <ul style="list-style-type: none"> Identify the abnormal condition <p>Intervention</p> <ul style="list-style-type: none"> Refer to HRFT or local provider (e.g. Podiatrist) Provide high risk diabetes foot information <p>Follow Up</p> <ul style="list-style-type: none"> Foot assessment every 1-4 weeks 	<ul style="list-style-type: none"> Determine if the patient has been inspecting their feet Identify any over the counter treatment they may have been doing to address the abnormal condition Reinforce the need for daily foot inspections and when it would be appropriate to see their physician for foot and nail related changes

