



Diabetes Foot: Risk Assessment Education Program

Participant's Package



Developed by a working group of the Diabetes Nursing Interest Group
Alwyn Moyer, Lillian Delmas, Margaret Little, Denise Williams



Registered Nurses Association of Ontario

Based on the Registered
Nurses Association of Ontario
Best Practice Guideline:

*Reducing Foot Complications
for People with Diabetes*

March 2004

Acknowledgement

The Registered Nurses Association of Ontario (RNAO) and the Nursing Best Practice Guidelines Program would like to acknowledge the following individuals and organizations for their contributions to the development of the *Diabetes Foot: Risk Assessment Education Program*.

The Diabetes Nursing Interest Group (DNIG) is an interest group of the RNAO, and membership is open to all Registered Nurses and nursing students interested in diabetes education and care. As part of their mandate, the DNIG supports continuing nursing education relevant to diabetes education. Within this framework, a Working Group of the Diabetes Nursing Interest Group facilitated the development of this education program.

The RNAO also acknowledges the guideline development panel for the best practice guideline *Reducing Foot Complications for People with Diabetes*. This best practice guideline is a foundation document for the content of the education program. This program has been developed to support the educational needs of nurses in the implementation of this best practice guideline. Two members of the DNIG Working Group, Alwyn Moyer, RN, MSc(A), PhD and Lillian Delmas, RN, BScN, CRRN, are also members of the guideline development panel, and have provided a strong link between these two groups.

In addition, the RNAO wishes to acknowledge the following organizations in Sudbury, Ontario—Victorian Order of Nurses Sudbury Branch and Hôpital Régional Sudbury Regional Hospital—for their role in pilot testing the guideline and providing the initial outline for this educational resource.

The Best Practice Guidelines Program is funded by the Government of Ontario.

Table of Contents

- 1** Diabetes Foot: Risk Assessment – Pre-Test/Post-Test
- 2** Objectives and Critical Behaviours
- 3** Assessment of Five Key Risk Factors – Foot Risk Assessment Form
 - ▷ Presence/History of Foot Ulcers
 - ▷ Protective Sensation
 - ▷ Structural Abnormalities
 - ▷ Circulation
 - ▷ Self-care Knowledge and Behaviour
- 4** Diabetes Foot Assessment/Risk Screening Summary
- 5** Interventions
 - ▷ Communicate Risk Status
 - ▷ Teach/reinforce Diabetes Self-Care Knowledge and Behaviour
 - ⇒ Handout – Care Tips for the Feet
 - ▷ Refer to Diabetes Education/Care Resources
 - ▷ Documentation
- 6** Wrap-up
 - ▷ Pre-Test/Post-Test Answers
 - ▷ Tips for Client Education: Adult Learning Principles
 - ▷ Workshop Evaluation
- 7** Images – The Diabetic Foot

Diabetes Foot: Risk Assessment Pre-Test / Post-Test

1. Diabetes mellitus increases the risk of foot amputation by 20 fold.

True False

2. Trauma is one of the most common causes of skin ulceration in persons with diabetes.

True False

3. List the five key risk factors for foot ulcers in persons with diabetes.

4. Identify the most effective way to measure sensation in the foot of a person with diabetes.

5. Describe where you can palpate a pulse in your foot.

6. How often should a health provider reinforce the importance of diabetes foot care for persons at lower risk for the development of foot ulcers?

7. How frequently should a person with diabetes inspect his/her feet?

8. Identify two factors that might make it difficult for a person with diabetes to complete proper foot care.

9. What additional information is required to complete the following advice to a person with diabetes:
“Wash feet daily, dry thoroughly and apply cream to dry areas.”

10. A person with diabetes who develops a foot ulcer should be advised to see a doctor if it does not heal in three days.

- True False

Diabetes Foot: Risk Assessment Objectives and Critical Behaviours

At the end of this skills workshop, you will be able to:

Objectives

1. Conduct a foot assessment for clients with known diabetes in order to:
 - a. Identify the presence of foot ulceration or history of previous foot ulcers.
 - b. Assess sensation in the foot using a Semmes-Weinstein monofilament.
 - c. Observe the client's feet and assess for physical/structural abnormalities.
 - d. Assess recent history of intermittent claudication and palpate pedal pulses bilaterally.
 - e. Assess previous foot care education.
2. Provide basic education for the prevention of foot ulcers for all clients with diabetes.
3. Implement appropriate actions when clients are assessed at higher risk for foot ulcers and/or amputation.
4. Document a foot risk assessment and classify the level of risk.

Critical Behaviours

1. Identify the five key risk factors for foot ulceration and amputation in clients with diabetes.
2. Assess the client's foot for loss of sensation.
3. Assess the client's foot for structural abnormalities.
4. Palpate the dorsalis pedis and posterior tibial pulses.
5. Assess self-care ability to perform foot care.
6. Assess the appropriateness of foot wear.
7. Verbalize the key elements of appropriate foot care.
8. Verbalize instructions to the client on the importance of regular foot examination by a health care professional, based on level of risk.
9. Accurately record a foot assessment.

Assessment of Five Key Risk Factors Foot Risk Assessment Form

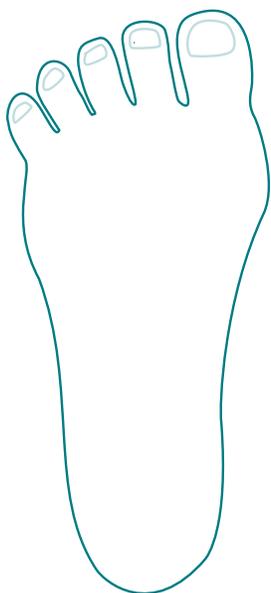
▷ Presence/History of Foot Ulcers

Examine both feet, without shoes.

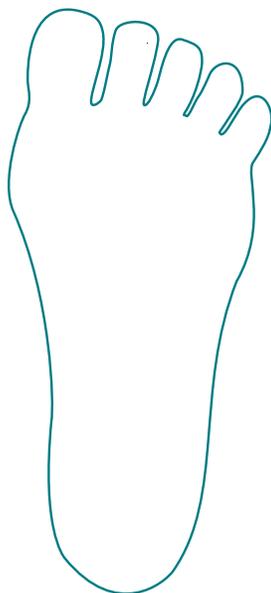
Sore(s) present? Yes / No

Ask: Have you ever had a sore on your foot that took more than two weeks to heal? Yes / No

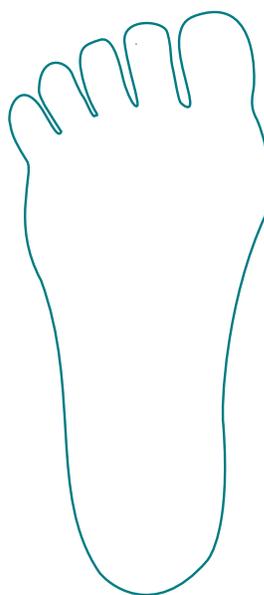
Chart any sores on the diagrams below.



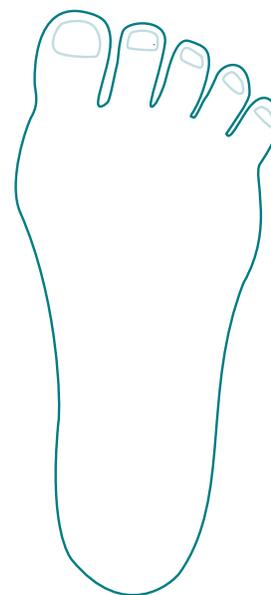
*Left Foot
Top*



*Left Foot
Bottom*



*Right Foot
Bottom*



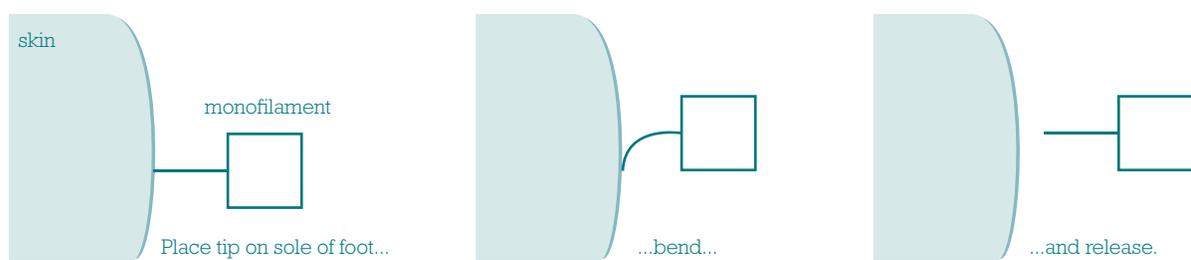
*Right Foot
Top*

▷ Protective Sensation

Assess using the Semmes-Weinstein Monofilament (10 gram, 5.07).

Instructions for use of Semmes-Weinstein Monofilament

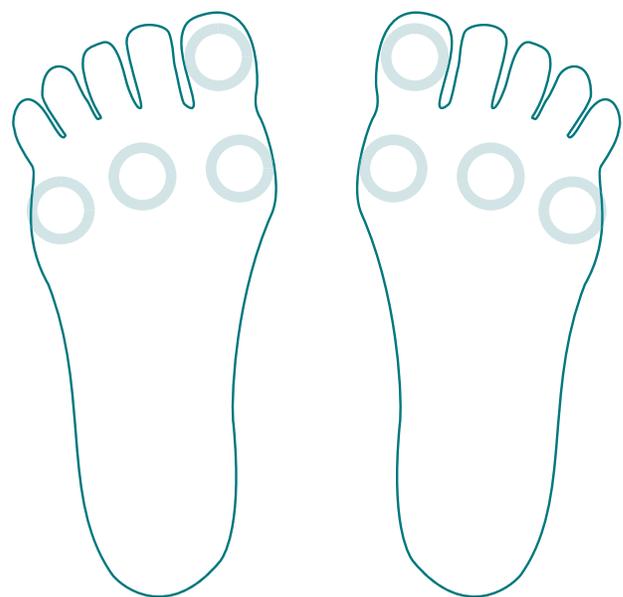
1. Show the monofilament to the patient. Place the end of the monofilament on his/her hand or arm to show that the testing procedure will not hurt.
2. Ask the patient to turn his/her head and close his/her eyes or look at the ceiling.
3. Hold the monofilament perpendicular to the skin.



4. Place the tip of the monofilament on the sole of the foot. Ask the patient to say 'yes' when he/she feels you touching his/her foot with the monofilament.
DO NOT ASK THE PATIENT 'did you feel that?'

If the patient does not say 'yes' when you touch a given testing site, continue on to another site. When you have completed the sequence, **RETEST** the area(s) where the patient did not feel the monofilament.

5. Push the monofilament until it bends, then hold for 1-3 seconds.
6. Lift the monofilament from the skin (Do not brush or slide along the skin).
7. Repeat the sequence randomly at each of the testing sites on each foot (see figure at right).
8. Clean the monofilament according to agency infection control protocols and store according to the manufacturer's instructions.



Right Foot
Bottom

Left Foot
Bottom

Mark the four, circled areas of the foot. Use a plus sign (+) if they can feel the monofilament and a minus sign (-) if they cannot.

▷ **Structural Abnormalities**

Examine both feet without socks and shoes, standing and sitting or lying down. Check all that apply.

Structural Abnormality	Yes
Toe deformities (e.g., claw or hammer toes)	
Blisters, Calluses, Fungal Infection (Please circle all that apply)	
Hallux valgus (Bunion)	
Amputation (Please specify: Right / Left Level: _____ Year: _____)	
Charcot's joint (foot warm, swollen, red, and painless)	
Footwear	
Uneven wear on soles of shoes	
A wide toe box (1/2" between the tip of the toe and the end of the shoe)	
Sufficient depth	
Good arch support	
Shoe fits without rubbing along any area of the foot	

See Images – The Diabetic Foot *for illustrations*

▷ **Circulation**

a) Assess for Intermittent Claudication

Ask: Do you have pain in the calf when walking or on exertion that is relieved by rest within 10 minutes?
Yes / No

b) Assess Pedal Pulses

Pedal Pulse	Present	Absent
Right posterior tibial		
Left posterior tibial		
Right dorsalis pedis		
Left dorsalis pedis		

Instructions for locating and palpating Pedal Pulses



Dorsalis Pedis

Place fingers just lateral to the extensor tendon of the great toe. (If you cannot feel a pulse, move fingers more laterally.)



Posterior Tibial

Place fingers behind and slightly below the medial malleolus of the ankle. (In an obese or edematous ankle, the pulse may be more difficult to feel.)

To enhance technique, assume a comfortable position for you and the client. Place hand in position and linger on the site. Varying pressure may assist in picking up a weak pulsation. Do not confuse client's pulse with your own pulsating fingertips. Use your carotid pulse for comparison, if needed.

▷ Self-care Knowledge and Behaviour

Observe and/or question the client to complete the assessment

Self-care Knowledge and Behaviour	Yes	No
Able to see and/or reach the bottom of feet or, has help from someone who has been taught to do daily foot care		
Able to do own skin and nail care		
Has received foot care education in the past year		
Has annual foot examination by a professional		
Checks condition of feet most days		
Knows to report foot problems to a health provider (e.g., would seek advice from health provider for a blister on foot)		
Wears well fitting footwear		
Takes steps to reduce risk of injury:		
<ul style="list-style-type: none"> • Avoids going barefoot outside or indoors 		
<ul style="list-style-type: none"> • Checks for foreign objects in shoes before wearing them; 		
<ul style="list-style-type: none"> • Checks water temperature before entering a bath, etc. (using thermometer or wrist, not feet) 		
Knows that having diabetes increases risk for foot problems		
Knows personal risk factors for foot complications		

Diabetes Foot Assessment/Risk Screening Summary

Use this guide to assess and/or document the presence of potential risk factors for foot ulceration and amputation. Examine both feet and inquire about client self-care practices. Tick the “yes” or “no” box next to an assessment element for each potential risk factor. Summarize the findings by circling the level of risk, and/or if a self-care knowledge deficit is identified.

Risk Factors	Yes	No
1. Foot ulcer (a wound that took > 2 weeks to heal) now or in the past		
2. Loss of sensation at any one site (determined after testing the 4 sites: great toe, first, third, and fifth metatarsal heads using the 10 gram/5.07 monofilament)		
3. Callus present on soles of feet or toes or abnormal foot shape (e.g., claw or hammer toes, bunion, obvious bony prominence, Charcot's foot or joint)		
4. Pedal pulses (dorsalis pedis or posterior tibial) not palpable by nurse and positive history of lower limb pain on exertion that is relieved with rest.		
5. Client unable to see the bottom of feet and/or unable to reach the bottom of feet and does not have someone who has been taught to perform appropriate foot care/inspection.		
6. Poor fitting footwear (shoes too narrow or short, no toe protection, rough or worn interior, uneven wear on sole or heel).		
7. Client has not received foot care education before.		
8. Client does not check condition of feet most days. <i>Ask</i> “How do you know if you have a reddened area or other problem with your feet?” or “How often do you check your feet?”		
9. Client does not report foot problems to health care provider. <i>Ask</i> “What would you do if you found a blister on your foot?”		
10. Client does not take steps to reduce risk of injury. <i>Ask</i> if client walks bare foot out or indoors, checks for foreign objects in shoes before wearing them, checks water temperature before entering a bath, etc.		
If the answer is NO to all items 1 – 4, the client is at		LOWER RISK
If the answer is YES to any items 1-4, the client is at		HIGHER RISK
If the answer is YES to any items 5 – 10, this indicates an opportunity to enhance self-care knowledge and behaviour.		SELF-CARE KNOWLEDGE DEFICIT

Adapted from: Sharon Brez, RN, BScN, MA(Ed), CDE, Advanced Practice Nurse, Endocrinology and Metabolism, The Ottawa Hospital, Ottawa, Ontario.

Interventions

- 1 Communicate Risk Status
- 2 Teach/Reinforce Diabetes Self-care Knowledge and Behaviour
- 3 Refer to Diabetes Education/Care Resources
- 4 Documentation

▷ Communicate Risk Status

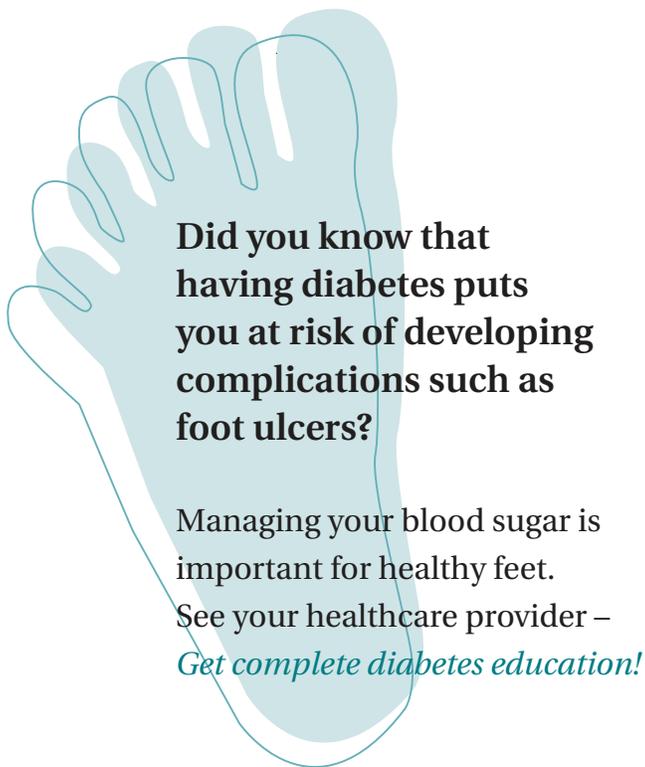
Explain the level of risk and provide information on how to reduce the risk through self-care and regular foot examination, paying particular attention to the gaps in self-care knowledge.

Risk Classification and Nursing Intervention Guide	
LOWER RISK	HIGHER RISK
Explain risk for foot complications related to diabetes.	Explain risk for foot complications related to diabetes. Inform client of personal risk factors identified in this nursing assessment.
Teach or reinforce basic foot care practices and strategies for foot injury prevention.	Teach or reinforce basic foot care practices and strategies for foot injury prevention.
Reinforce benefits of annual foot examination.	Reinforce benefits of regular professional foot exam and risk assessment (every 3-6 months). Refer patient to primary care provider or diabetes care/ education program for further assessment and follow-up.

▷ Teach or Reinforce Self-care Knowledge and Behaviour

Please refer to the resource “Care Tips for the Feet” on the next page.

Care Tips for the Feet



Did you know that having diabetes puts you at risk of developing complications such as foot ulcers?

Managing your blood sugar is important for healthy feet. See your healthcare provider – *Get complete diabetes education!*

YEARLY EXAM NEEDED!

Have a health professional examine your feet at least once a year.

Find out if you have lower or higher risk feet.

RISK FACTORS

- A previous foot ulcer
- Loss of normal feeling in your feet
- Abnormal shaped foot, including calluses and bunions
- Poor circulation to your feet

Protect your feet! Follow these simple guidelines:



1. **Check your feet daily**
 - Look for red areas, blisters or any open area. If you cannot do this yourself, have someone else check for you.
 - See your doctor or foot specialist right away if you find a problem!



2. **Protect your feet - always wear shoes!**
 - Wear shoes that fit well, support your foot and are not too tight. Do not wear shoes that cause reddened or sore areas.
 - See a specialist for footwear advice if you have a higher risk foot.
3. **Keep your skin clean and soft**
 - Wash your feet regularly, but do not soak them.
 - Dry well between your toes. Check that the water is not too hot before putting your feet in it.
 - Use unscented creams. Do not put cream between the toes.



4. **Don't hurt yourself with nail clippers or razors**
 - Cut your nails straight across. Get help to cut your nails, if needed.
 - Don't cut calluses. See a local foot care clinic. Many are covered by the Ontario Health Insurance Plan (OHIP).



▷ Referral

Refer as appropriate, depending on risk status.

Diabetes Education/Care Resources

Diabetes education may be available in a variety of settings, depending upon your local resources. The best source to readily identify what is available in your community would be the national office of the Canadian Diabetes Association. They maintain a national directory and will be able to provide you with contact information specific to your community. Then contact your local chapter of the Canadian Diabetes Association for direction to available diabetes education and care resources. It may be a hospital, Community Health Centre, Home Health Agency or other agency. Contacting any one of these agencies will then provide you with a list of potential referral points for Specialized Diabetes Foot Care and Education.

National Office, Canadian Diabetes Association
1-800-BANTING (226-8464) or www.diabetes.ca

Local Chapter of the Canadian Diabetes Association

Local Diabetes Education Resources
for those in Northern Ontario go directly to: www.ndhn.com

Local Diabetic Foot Care Specialists

▷ **Documentation**

Intervention	Yes	No
Explained risk for diabetes foot complications due to history of foot ulcers, impaired sensation, structural abnormalities or impaired circulation. (Tailor to individual risk and need.)		
Provided/reinforced diabetes foot self-care and injury prevention as outlined in handout <i>Care Tips for the Feet</i> .		
Gave handout to client/caregiver.		
Provided information and handout on local diabetes resources.		
Referred for further assessment and follow-up:		
Primary health care provider		
Diabetes education program		
Other (Please specify)		

Wrap-up

- 1 Pre-Test/Post-Test Answers
- 2 Tips for Client Education: Adult Learning Principles
- 3 Workshop Evaluation

▷ Pre-Test / Post-Test Answers

1. Diabetes mellitus increases the risk of foot amputation by 20 fold.

True. Up to 15% of patients with diabetes may develop foot ulcers in their lifetime (ADA, 1999; Palumbo & Melton, 1985; Pham et al., 2000).

In one study, a non healing foot ulcer preceded 84% of diabetic lower limb amputations (Pecoraro, Reiber, & Burgess, 1990; Reiber et al., 1999).

In Ontario, the evidence suggests that effective outpatient care for diabetic foot ulcers and infections is reducing minor amputation rates (Hux, Jacka, Fung, & Rothwell, 2002).

Three important actions to prevent peripheral vascular disease include:

- Stop smoking
- Improve blood glucose control
- Get regular foot care (Hux et al., 2002)

2. Trauma is one of the most common causes of skin ulceration in persons with diabetes

True. The most frequent component causes for lower extremity ulcers are trauma, neuropathy and deformity. Traumatic event can be the result of 1) low pressure and continuing stress, or 2) high pressure of short duration that results in a break in the skin or tissue damage (Reiber et al., 1999).

3. List the five key risk factors for foot ulcers in persons with diabetes.

Foot ulcer, now or in the past
Diminished sensation
Structural abnormalities

Impaired circulation
Lack of foot care education
(self-care knowledge deficit)

4. Identify the most effective way to measure sensation in the foot of a person with diabetes.

Semmes Weinstein monofilament (10 gram, 5.07).

5. Describe where you can palpate a pulse in the foot.

Dorsalis Pedis: dorsal aspect of foot, lateral to extensor tendon of big toe

Posterior Tibial: ankle, behind medial malleolus

A positive history of lower limb intermittent claudication combined with non-palpable pedal pulses bilaterally increases the likelihood of identifying PVD in diabetes (Boyko et al., 1997).

6. How often should a health provider reinforce the importance of diabetes foot care for persons at lower risk for the development of foot ulcers?

Each visit

7. How frequently should a person with diabetes inspect his/her feet?

Daily

8. Identify two factors that might make it difficult for a person with diabetes to complete proper foot care.

Poor vision
Decreased mobility

Lack of energy
(Reinforce importance of getting support)

9. What additional information is required to complete the following advice to a person with diabetes: "Wash feet daily, dry thoroughly and apply cream to dry areas."

... but do not apply cream between the toes because it will predispose to maceration and skin breakdown.

10. A person with diabetes who develops a foot ulcer should be advised to see a doctor if it does not heal in three days.

False. Should be advised to consult a doctor immediately.

▷ Tips for Client Education

Adult Learning Principles

Diabetes education should be interactive, solution focused and based on the experiences of the learner, as well as staged and tailored to meet individual needs and abilities. Group education and sustained long-term follow-up have both been shown to enhance knowledge, and produce positive outcomes (CDA, 2003).

Adult motivation to learn is driven by:

Success: Adults want to be successful learners.

Volition: Adults want to feel a sense of choice in their learning.

Value: Adults want to learn something they value.

Enjoyment: Adults want to experience the learning as pleasurable.

Skills and characteristics of good, motivating instructors:

Expertise: knowing the material and having mastery of the skills to be conveyed;

Empathy: realistically understanding the learner's needs and expectations and adapting the instruction to meet the learner's level of experience, skill and perspectives;

Enthusiasm: showing commitment and value in what is being taught and being able to convey this with appropriate degrees of emotion, animation and energy;

Clarity: organizing material and using language that can be understood and followed by most learners, and providing the learner with opportunity for repetition and clarification.

(Knowles, Holton and Swanson, 1998, pp. 149-150.)

▷ **Diabetes Foot: Risk Assessment Education Program**

Evaluation Form

Please circle the number which corresponds to your evaluation.

Strongly Disagree 1 2 3 4 5 *Strongly Agree* NA= *Not Applicable*

Presenter	Well informed	1	2	3	4	5	NA
	Spoke clearly	1	2	3	4	5	NA
	Managed time well	1	2	3	4	5	NA
	Answered questions	1	2	3	4	5	NA
	Encouraged participation	1	2	3	4	5	NA
Topic	Highly relevant	1	2	3	4	5	NA
Written resources	High quality, clear	1	2	3	4	5	NA
	Pertinent, facilitated understanding	1	2	3	4	5	NA
Enough time allocated	For questions	1	2	3	4	5	NA
	For practice session	1	2	3	4	5	NA
	For evaluation	1	2	3	4	5	NA
Objectives	Were clearly stated	1	2	3	4	5	NA
	Were adequately met	1	2	3	4	5	NA
Outcomes (resulting from this session)	I will change my practice	1	2	3	4	5	NA
	I plan to use the resources in my practice	1	2	3	4	5	NA
	I plan to obtain additional information on this topic	1	2	3	4	5	NA
Comments							

Please return this evaluation to the workshop facilitator.

Images – The Diabetic Foot

▷ Deformities



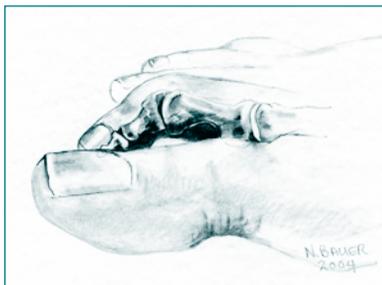
Mallet Toe

With a mallet toe, the joint nearest the tip of the toe is bent.



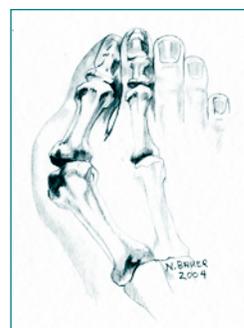
Hallux Valgus (Mild/Moderate)

A small bump (sometimes called a bunion) forms when the big toe turns in toward the second toe. The joint at the base of the big toe is pushed to the side.



Hammer Toe

With a hammer toe, the middle joint is bent.



Hallux Valgus (Severe)

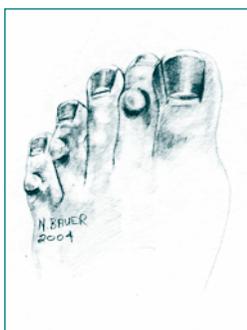
The angulation of the big toe is marked, forming a large bunion. The big toe may move under the second toe.



Claw Toe

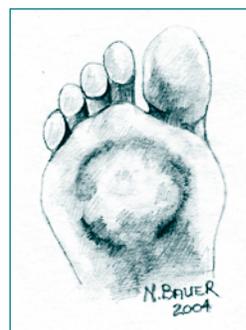
With a claw toe, the joint at the base of the toe is bent up. The middle joint is bent down.

▷ Pressure Related



Corns

A corn is a conical, horny induration and thickening of the skin caused by friction or pressure. Hard corns may develop on the tops or tips of the toes. Soft corns develop between the toes.



Calluses

A callus is a horny layer of skin caused by pressure or friction. It may spread across the ball of the foot or along the outer edge of the heel or big toe. A callus may develop a central core or plug of tissue where the pressure is greatest.

Published with permission Nancy A. Bauer, BA, Bus Admin., RN, ET

▷ Infections



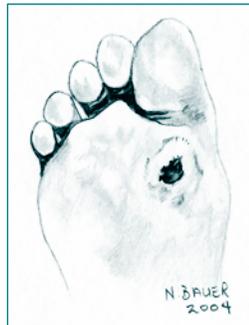
Hot Spots

Red “hot spots” on the feet are signs of pressure or friction. If pressure is not relieved, a hot spot may develop into a blister. Left untreated, a blister may turn into an open wound or a corn or callus.



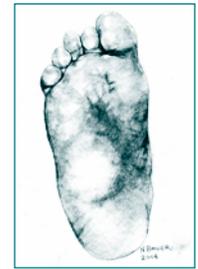
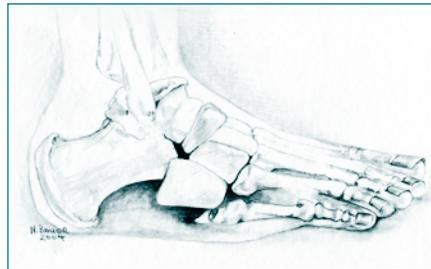
Fungal Nails

Fungal nails may be the result of fungal infections such as Athlete's Foot, the use of artificial nails or nail polish, or injury to the nail. Fungal nails may become thickened, inflamed, and sensitive and may turn unnatural colours.



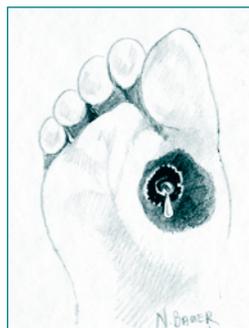
Ulcers

If corns or calluses press into the foot, they destroy underlying skin layers, and an ulcer results. Ulcers may lead to infection. In some cases, skin from a callus or corn may cover an open wound, making it difficult to assess.



Charcot Joint

Charcot joint is a form of neuroarthropathy that occurs most often in the foot. Nerve damage from diabetes causes decreased sensation, muscle atrophy and subsequent joint instability. Walking on an insensitve joint makes it worse. In the acute stage there is inflammation and bone reabsorption which weakens the bone. In later stages, the arch falls and the foot may develop a “rocker bottom” appearance. Early treatment can stop bone destruction and help healing.



Infected Ulcers

Infected ulcers may result in the death of healthy tissue. Symptoms of infection include white, yellow or green discharge, bleeding or odour.

Published with permission Nancy A. Bauer, BA, Bus Admin., RN, ET