

GREENLIGHT CLINICAL GUIDELINES

Diabetic Footcare

October 2018

Introduction

In the UK there are approximately 450,000 people with diabetes. Of this number, 1 in 10 suffer from lower limb ulceration at some point in their lives. There are over 7000 diabetes-related amputations per year in the UK.

A major contributing cause of morbidity in diabetes is lack of awareness of diabetes foot care requirements, poor foot care and potential complications. Foot problems are an increasing burden in acute health care services and *they are the main reason for diabetes-related hospital admissions*. Approximately a quarter of all those with diabetes will develop an ulcer in their lifetime. At any one time, 2-3% of those in the diabetes population have acute foot ulceration.

With this in mind, the physical and psychological effects of diabetes can be far flung with many of those suffering from foot disorders and amputations experiencing anxiety, severe depression and adjustment disorders.

How Diabetes affects the feet:

Diabetes can affect the feet in two main ways:

Blood supply/vascular supply:

- *Peripheral Vascular Disease (PVD):*

If diabetes is poorly controlled with extended periods of high blood sugar levels, over time plaques [comprised of cholesterol and fats] develop on the walls of the blood vessels, gradually blocking them up and reducing blood flow to certain areas of the body. In diabetes, the smallest blood vessels are affected first; blood vessels in the toes and feet are very small and often become blocked earliest.

Nerve damage/neurological supply:

- *Peripheral Neuropathy (PN):*

Peripheral Neuropathy occurs when the nerves in the feet are impaired in sending messages back to the central nervous system (brain and spine). Nerves help the body detect pain, heat, pressure and fine touch. The smallest nerves are usually affected first and these nerves are the ones primarily in the feet. Early signs of PN are numbness and tingling in the toes which gradually progress up the feet and legs.

If Diabetes affects the nerves, when someone damages their foot they may not be able to detect this damage and will continue to walk on a damaged foot (e.g. a foot with cuts/wounds or potentially even broken bones). If someone also has poor blood flow to the feet, any of this damage that has occurred will not heal as quickly or easily. The longer it takes for this damage to heal, the greater the chance of them developing issues such as infection, ulcers, multiple broken bones, gangrene and ultimately the need for amputation.

Risk factors for Diabetes-related foot complications:

- Extended periods of high blood sugar levels/poor blood sugar control
- Poor diet and minimal amounts of physical activity
- High Cholesterol and fat levels in the blood
- High Blood Pressure

Ways to identify vascular or nerve damage in the lower limbs:

Early signs of poor blood flow are:

- Discolouration of the feet (usually in the toes first); feet that are consistently white, blue or purple
- Consistently cold extremities
- Having shiny skin (this means the skin has potentially become thinner as a result of fewer nutrients being supplied to the skin)
- No hair growth beginning at the toes and progressing up the feet to the lower legs
- Dry skin
- Thickened toenails
- Weak or absent pulses in the feet

Early signs of poor nerve supply are:

- Numbness and/or tingling in the toes initially which can extend right up the legs in severe cases.
- Periods of sickness (cold, flu) can cause blood sugar levels to fluctuate and people with diabetes can often experience periods of intermittent numbness or tingling in the feet which won't cause long-term effects as long as blood sugar levels return back to normal over a short period of time (a few weeks)
- Absent reflexes in the feet
- Poor balance: people with more advanced nerve damage can become unsteady on their feet as they can't feel the ground properly and often feel like they're walking on pillows
- Unexplained cuts or grazes on the feet as people can't feel when damage occurs and can't explain why a cut or graze is there

How to take a Footcare History & Examination

Presenting Complaint:

- What problem does the service User currently have with their lower limbs?
- Ask about any symptoms the Service User may have - when asking about pain, you can use the acronym SOCRATES
-

S – Site – Where is the pain, has it moved or changed over recent weeks/months?

O – Onset – When did it begin?

C – Character – Can the Service User describe the pain – is it sharp, dull, stinging etc?

R – Radiation – does it move anywhere else – in the ankle/knee/calf?

A – Alleviating Factors – what makes it feel better?

T – Timing – is it present all day & night or specific times?

E – Exacerbating Factors – what makes it worse?

S – Severity – Has it gotten any better or worse in the previous weeks?

Past Medical History

- Does the Service User have any medical conditions that would contribute to poor footcare
- Have they previously had any foot/lower limb problems?

Drug History

- Is the Service User on any regular medications that would suggest contributing health problems – Diabetes etc?
- Do they use any substances that may affect their circulation – alcohol/smoking/illicit drugs?
- Any recent antibiotics?

Family History

- Does anyone in the Service User's family have any health conditions affecting the feet?

Social History

- What is the Service User's current sleeping situation?
- Are they able to change their sock & shoes regularly?
- How often do they wash their feet?

Inspection

- Remember to always inspect both feet even if only one is highlighted as symptomatic
- Inspection – looking for any colour changes, any ulceration, any dry or broken skin, any deformity
- Is the Service User's footwear appropriate to the conditions and is it overly worn?

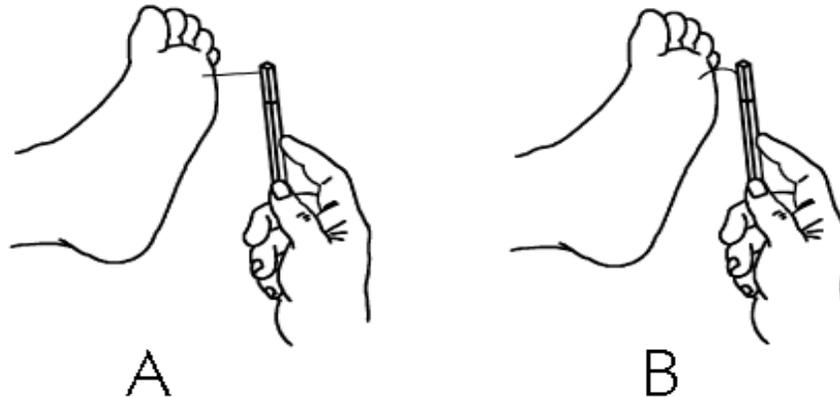
Examination – Sensation Assessment

- Remember to always examine both feet even if only one is highlighted as symptomatic

Using the Monofilament

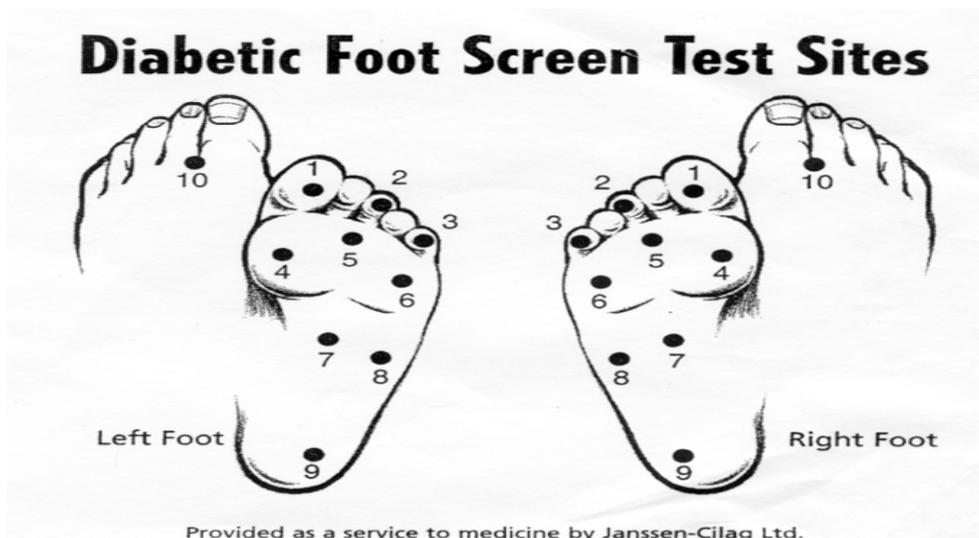
Step 1: The examination should be done in a quiet and relaxed setting with the Service User's consent and they should not be able to see if and where the Medic applies the filament.

Step 2: Apply the monofilament on the inner wrist so the Service User knows what to expect. This also serves to 'warm' the monofilament up. Apply sufficient force to cause the filament to bend or buckle (see diagram below, aiming for movement of about 1 cm).



Step 3: Apply the filament along the perimeter of the foot and NOT ON an ulcer site, callus, scar or necrotic tissue. Do not allow the filament to slide across the skin or make repetitive contact at the test site.

Step 4: Press the filament to the skin such that it buckles and ask the Service User to tell you when they feel the sensation of the Monofilament. Randomise the sequence of applying the filament throughout the examination. The site can be repeated to ensure accuracy. Repeat this across the 10 sites shown in the diagram below:



Step 5: The monofilament should be wiped with a detergent cloth after use.

Assessing Pulses in the Feet

Step 1: With the Service User's consent, remove shoes and clothing to expose the skin.

Step 2: Move, if not compromised by injury, the Service User's feet towards the normal anatomical position and compare both feet.

Step 3: Assess the Dorsalis Pedis pulse

- Using two fingers, begin on the skin on the top of the foot
- Follow the 1st metatarsal from the big toe
- Move the fingers slightly towards the outer edge of the foot (in a slim foot, you should be able to feel a slight groove as you move over the big toe extensor tendon)
- The DP pulse should be palpable (felt) in this position (see diagram below)

Step 4: Assess the Posterior Tibial pulse

- Using two fingers, begin directly over the Service User's ankle bone on the inner aspect of the ankle
- Slide the fingers back to just behind the tibia (ankle bone)
- The PT pulse should be palpable (felt) in this position (see diagram below)



NB – Pedal (foot) pulses can be difficult to palpate, particularly if the Service User has been in the cold and the extremities are vasoconstricted. If you are unsure and have concerns, advise the Service User to see their GP for further investigation or escalate this to the Medic On-Call.

Risk Categorisation

The findings of the history & foot examination will determine the Service User's risk (Individuals who are identified as "increased/high risk" require referral for a more comprehensive examination)

Risk Category	Findings	Action
Low Risk	Normal sensation & palpable pulses (All sites +ve)	Foot Education
Increased Risk	Neuropathy (>2 sites abnormal sensation) or absent pulses or other risk factors (poor diabetes control, poor footwear)	Refer to local GP/Podiatry Services & Diabetes Foot Education (see below)
High Risk	Neuropathy (>2 sites abnormal sensation) or absent pulses plus foot deformity or skin changes/thickening (erythema, callous/corn previous ulcer or amputation)	Refer to local GP/Podiatry Services & Diabetes Foot Education (see below)
Emergency	New Ulceration, Swelling Spreading Cellulitis discolouration	Follow Acute diabetic foot pathway

Loss of protective sensation = no feeling in 2 or more sites

Foot care advice for Diabetic Service Users:

- Make sure the diabetes is well controlled with blood sugar levels ideally not fluctuating beyond 4-9 in those with type II diabetes and 4-8,5 in those with type I diabetes (according to current NICE guidelines [these readings are dependent on the time of day when you test the blood sugar levels and are individual to each person]). NB – in someone with poorly controlled blood sugars, their range may be significantly outside of these ranges and rapid return to these ranges could cause significant illness – always encourage the Service User to consult with their GP or Specialty team to improve their general sugar control
- Regularly check the feet for any scratches, grazes, skin changes (such as colour change) or swelling. Advise those experiencing difficulty in bending down to use a mirror to examine the bottom of the feet
- Wash the feet daily in warm water and properly dry the feet, especially in between the toes
- Use a pumice stone or emery board to remove any bits of hard skin (corns and callouses)
- Apply moisturizer daily before going to sleep all over the feet, except for in between the toes to avoid infection developing
- Regularly cut the toenails straight across, not cutting down the sides of the toenails
- Wear comfortable shoes that aren't heavily worn
- Check the insides of the shoes every day for any foreign or sharp objects and do not walk barefoot or just in socks/dressings

- Keep the feet warm during winter by wearing socks
- Keep physically active: this encourages blood flow to the feet
- Always wear socks when wearing shoes to avoid rubbing of the shoes' stitching on the feet
- Wiggle the toes and feet regularly when sitting or lying down for long periods of time
- Stop smoking: Diabetes affects the small blood vessels. Smoking affects/obstructs the larger blood vessels. If small and big blood vessels are affected, the likelihood of large amputations occurring increases significantly.

NB All Greenlight Clinical Guidelines are based upon approved existing guidelines adapted for the specific use and demographic of service users seen on the medical van in the community.

References

HSCIC (2016) 'Clinical Audit and Registries Management Service'. National Diabetes Foot Care Audit report 2014-2015. Report, England and Wales.

Lim, J., Ng, N., & Thomas, C (2017) 'Prevention and treatment of diabetic foot ulcers'. *Journal of the Royal Society of Medicine*; 0(0): pp 1–6.

Armstrong, G., Wrobel, J., & Robbins, J. (2007) *International Wound Journal* Dec; 4(4): 286-7, (Diabetes Foot NICE NG19 Guidance)

Bahari, R (2015) 'The Psychological Impact of Diabetic Limb Problems'. *International Medical Journal Malaysia*: Volume 14(2); pp3-7.

Neeru, B., Gagandeen, K., Pal, AJ., Bajwa, SS., Harbandna, S., Rajesh, K (2015) 'Psychological, psychiatric and clinical implications of diabetic foot ulceration: A prospective analysis. *Journal Social Health Diabetes* :Vol 3: pp89-94.

Chapman, Z., Shuttleworth, CMJ., Huber, JW (2014) 'High levels of anxiety and depression in diabetic patients with Charcot foot'. *Journal of Foot and Ankle Research* (2014), 7:2: pp1-8.

Type 1 diabetes in adults: diagnosis and management. NICE guideline (NG17)

www.northdevonhealth.nhs.uk/wp-content/uploads/2014/06/how_to_use_a_10_monofilament.pdf