

A pathway for
treating a person with a:

Diabetic foot ulcer

New Zealand Version 1.0



An evidence-based step-by-step guide
developed by clinicians for clinicians

Developed by clinicians for clinicians

This pathway was developed with feedback and input from over 2200 health care professionals in the field of wound care. It offers a unique evidence-based approach to managing diabetic foot ulcers and lets you put the latest evidence in wound care to use in real life.

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Coloplast ANZ acknowledges the contributions of members of the Coloplast Wound Advisory Board and ANZ Subject Matter Experts in the localisation of this document.

Clinical references:

1. van Netten et al, Diabetes Metab Res Rev. 2020;36(S1):e3268.
2. Wounds UK (2021) Best Practice Statement: Addressing skin tone bias in wound care: assessing signs and symptoms in people with dark skin tones. Wounds UK, London. Available to download from: www.wounds-uk.com
3. Wounds Made Easy, Local Management of Diabetic Foot Ulcers, November 2017.
4. International Best Practice Guidelines: Wound Management in Diabetic Foot Ulcers. Wounds International, 2013. Available from: www.woundsinternational.com
5. IWGDF Wound Healing Interventions Guideline Recommendation #1.

Take a shorter way to wound healing

By following the steps in this pathway, you can provide an optimal healing environment for diabetic foot ulcers and reduce the risk of complications that could lead to delayed healing or worse.

Any advice included here needs to work in conjunction with your local protocols and your individual scope of practice.



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The guidance provided in this book, is best understood in combination with the detailed guidance available to you in [The Wound Care Pathway](#). Whenever the book icon appears you can look up further information there.



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Māori Strategy*



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*The Wound Care
Pathway*

What is a diabetic ulcer?

Diabetic foot ulcers are among the most common complications of patients diagnosed with diabetes mellitus. They are usually accompanied by neuropathy and/or peripheral arterial disease (PAD) in the lower extremity.¹ 

The most common causes

- The main predisposing factor for diabetic foot ulcers is peripheral neuropathy (presence of symptoms or signs of nerve dysfunction)
- Diabetic foot ulcers are typically caused by unrecognized trauma due to sensory neuropathy
- Injuries are more likely to occur if the foot is deformed, and the direction of bearing force changes
- Pressure points on the foot may lead to callus formation, increasing the risk of ulcer formation. A callus is an ulcer waiting to happen!
- The most typical aggravating factors are ischemia and infection

Be aware, that a person with diabetes may have all three types of peripheral neuropathy, and each can be a contributing factor to ulceration:

Sensory neuropathy – leading to unrecognized trauma (most common)

Motor neuropathy metatarsal – leading to foot deformities particularly the cocked-up toe deformity with met head prominence.

Autonomic neuropathy – leading to decreased sweating and skin fragility

Not all peripheral neuropathy is caused by diabetes. If the person with neuropathy does not have diabetes, they should be investigated for other causes (i.e. infection, cancers, nutrition or vitamin deficiencies, etc.).



Scan to access
the IWGDF
Guideline



Scan to learn more
about *the typical*
features of DFUs
according to aetiology

What does it look like?



A diabetic foot ulcer under the foot



A diabetic foot ulcer under the foot



A diabetic foot ulcer under the heel



A diabetic foot ulcer under the toe

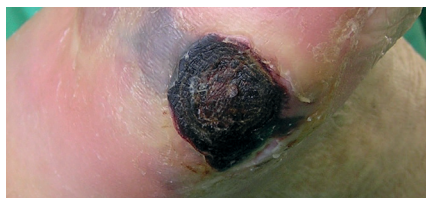
Step 1

How to **assess** a diabetic foot ulcer



- Always check for skin and nail changes as you begin your patient and wound assessment.
- When dealing with patients with dark skin tones, take extra care to ensure that eschar or necrosis are correctly diagnosed.
- Look out for potential infection, by comparing one foot with the other if possible and check for differences in warmth and texture.²



Infected diabetic foot ulcer on the foot



Infected diabetic foot ulcer with necrosis present

- Use a monofilament test to conduct a sensory assessment. If you don't have equipment at your disposal, use the Ipswich touch test : Ask your patient to close their eyes and apply fingertip.
 - For your vascular assessment locate pulse at multiple locations (leg, ankle and foot): femoral, popliteal, posterior tibial and pedal.
-  **Be aware!** If you find no pulse in either location on the foot, or other places, you should always refer to a specialist. In case you detect abnormalities, consider conducting a Buerger and finger pressure test, and immediately escalate to a specialist if abnormalities persist.






Scan for instructions on
the Ipswich Touch test
(page 28)



Pulse palpation on different locations



Be aware that due to the presence of arterial calcification in diabetic patients, toe pressure may be a more accurate indicator of peripheral arterial disease (PAD) than ABPI – which is otherwise the gold standard for diagnosing peripheral arterial disease.

- Assess for temperature differences between foot and calf or between right and left foot using the back of your fingers.
- For a musculoskeletal assessment, first identify the location of the ulcer.  Look for areas of pressure or deformity. Is the midfoot hot, red or swollen? Assess range of motion of joints, especially the ankle and the big toe. Then, assess for pain.
- Finally, use a validated assessment tool like the Triangle of Wound Assessment to make your wound assessment. 
 - Measure and document wound size and depth
 - Assess the wound bed
 - Assess the wound edge and periwound skin
 - Assess for signs of infection using the IWII Continuum and Management Guide 



Scan to learn more about musculoskeletal assessments (page 10)






Scan to access The Triangle of Wound Assessment



Scan to access The IWII Infection Continuum & Management Guide (page 56)

How to **diagnose** a diabetic foot ulcer

- First, classify the wound using a validated diabetic foot ulcer classification system like WiFi , TEXAS  or SINBAD  – and ensure that all members of the care team always use the same system including informal caregivers (i.e. family members).



Remember: when dealing with a diabetic foot ulcer, always conduct a holistic patient assessment that looks at the diabetic triad: lifestyle, nutrition, glycemic control.

- Then, determine if the wound is healable, non-healing, or non-healable.



Scan to access
the *WiFi*
classification
system



Scan to access
the *TEXAS*
classification
system



Scan to access
The SINBAD
classification
system (page 7)

Step 2

How to develop a **treatment & care plan**

- Always keep in mind, that the underlying cause(s) of diabetic foot ulcers can have a significant bearing on the clinical management and must be determined before a care plan is put in place.⁴
- Since several individual patient factors can directly affect the healing process of a diabetic foot ulcer, you must take these into consideration when you determine your treatment & care plan:
 - Patient's metabolic- and risk factor control
 - Lifestyle, work, family/social support and functional capacity
 - Socioeconomic level, cultural/religious/philosophic beliefs
 - Access to health system
 - Adherence to care plan
- Your treatment & care plan should reflect a holistic care team approach. Cooperation and communication among the diabetes care team allows for more timely removal of factors that negatively affect the healing of a diabetic foot.
- Since poor glycemic control is associated with poor wound healing, patients should be encouraged to maintain good glycemic control (HbA1c should be below 7.5% and as close to 6.5% as possible). However, tight glycemic control, may have adverse effects in older patients so it is important to work with the care team to determine the best glycemic control plan for each individual patient.

Step 3

How to **manage** a diabetic foot ulcer

- First, cleanse the wound using non-irritating cleansers such as potable water, normal saline or wound cleansers.
- Debride the wound of non-viable tissue, including peri-ulcer calluses or refer for debridement if outside your scope of practice.
- Choose sharp debridement to remove slough, necrotic tissue and surrounding callus of the diabetic foot ulcer – if it is preferable to other methods, when you take contra-indications such as pain or severe ischemia into account.⁵



Remember! Debridement should be done by trained HCP/consistent with scope of practice.



Debridement methods

- The key to healing a diabetic foot ulcer is to relieve pressure on the foot. That's why off-loading is key to healing.
- Encourage the use of specialised shoes, and let your patient know that a diabetic foot ulcer needs to be managed even after it is closed, requiring continued monitoring and life-long off-loading.




Scan to learn more about
local management of DFUs
(page 3)



Scan to learn more about
Off-loading

Step 4

How to choose dressing & additional therapy

- To ensure the optimal healing environment, choose a dressing that promotes healing by helping you manage moisture balance and bioburden in the wound while protecting the periwound skin .
- Make sure that the dressing you choose can conform to the wound. It should leave no gap between dressing and wound bed – either by itself or in combination – in order to effectively manage exudate and bacterial balance.



The dressing should conform to the wound bed leaving no gap between dressing and wound



A woundbed conforming dressing used on a heel



Gelling fiber dressing can be used to fill the cavity and close the gap



Be aware that choosing the right dressing is important, but it is only one part of the healing regime. When it comes to diabetic foot ulcers relieving pressure from the foot is key and focus must be on managing ischemia and infection.

- Reach out to your holistic care team if you see the need for additional therapies. A Gait analysis, endocrinology and a nutritional approach should be considered.




Scan to access
the Wound Management
Dressing Guide (page 17)

Step 5

How to **monitor** progression



Be aware that diabetic foot ulcers must be subject to ongoing review: Regularly by the patient and periodically by a professional.

- Monitor changes in wound size, as a lack of change may indicate that healing is stalled. A reduction in wound area of 10-15% per week or over 50% after four weeks of treatment predicts wound healing.³
- Regular foot inspections are critical. You should look for pre-ulcerist lesions and calluses. 
- Make your patients understand:
 - The risks involved
 - The lifestyle changes required
 - The optimal skin care
 - The need for offloading
- Educate the patient on self care and early warning signs.



Scan to access
The 3-minute diabetic foot exam
(page 5)

When to refer or contact a specialist

- ❗ When you suspect a diabetic foot ulcer and need a diagnosis (All diabetic foot ulcers must be referred to care team specialists).
- ❗ If you can see the underlying bone.
- ❗ If you suspect infection. (Remember that infected diabetic foot ulcers may not always show classical signs of infection – check for heat, swelling, pain and purulent or odorous discharge)
- ❗ If there is a lack of progression or any deterioration of the wound you are treating.
- ❗ If there is tunnelling or significant undermining in the wound.
- ❗ If patient reports pain in non-sensory foot.
- ❗ If heat, swelling or pain is present in foot.
- ❗ If ischemia is suspected, refer for full vascular assessment.
- ❗ If debridement is required and is outside your scope of practice.

Glossary of diabetic foot ulcer terms

Diabetes mellitus – a group of diseases that affect how the body uses blood sugar (glucose).

Peripheral arterial disease (PAD) – narrowing or blockage of the vessels that carry blood from the heart to the legs.

Ischemia – lack of blood supply to a certain part of the body, which may cause tissue damage due to lack of oxygen and nutrients.

Buerger test – a two stage test designed to assess the adequacy of the arterial supply to the leg. With the patient supine, elevate both legs to an angle of 45 degrees and hold for one to two minutes. Observe the colour of the feet. (Pallor indicates ischaemia) Then sit the patient up and ask them to hang their legs down over the side of the bed at an angle of 90 degrees. In an ischemic leg the skin at first becomes blue, as blood is deoxygenated in its passage through the ischaemic tissue, and then red, due to reactive hyperaemia from post-hypoxic vasodilatation.



For a glossary of general
wound care terms consult
The Wound Care Pathway



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