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The Diabetic Foot Assessment?

Dr. Matthew Malone

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Resources available for download

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 Institute Limb Preservation & Wound Research

Diabetic Foot Assessment?

Learning objectives

- Think about the resources available to you and if you use a formal approach
- How to perform a basic foot assessment
- Risk stratification – how and why

Practical Guidelines on the prevention and management of diabetic foot disease (IWGDF 2019 update)

Nicolaas C. Schaper¹ | Jaap J. van Netten^{2,3,4} | Jan Apelqvist⁵ | Sico A. Bleij⁶ | Robert J. Hinchliffe⁷ | Benjamin A. Lipsky^{7*} IWGDF Editorial Board[†]

Part of the 2019 IWGDF Guidelines on the Prevention and Management of Diabetic Foot Disease

4 CORNERSTONES OF FOOT ULCER PREVENTION

There are five key elements that underpin efforts to prevent foot ulcers:

1. Identifying the at-risk foot.
2. Regularly inspecting and examining the at-risk foot.
3. Educating the patient, family, and health care professionals.
4. Ensuring routine wearing of appropriate footwear.
5. Treating risk factors for ulceration.

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The NDSS is administrated by Diabetes Australia 



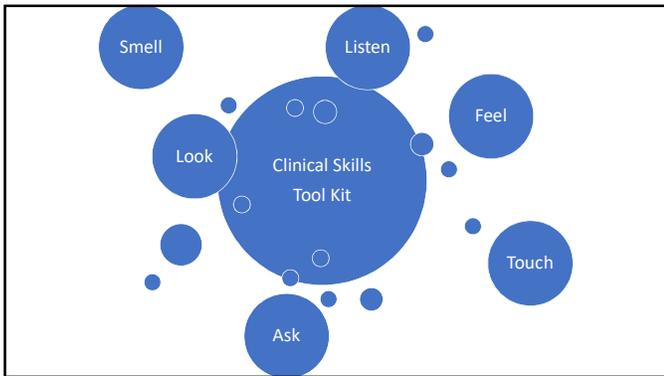
About FootForward

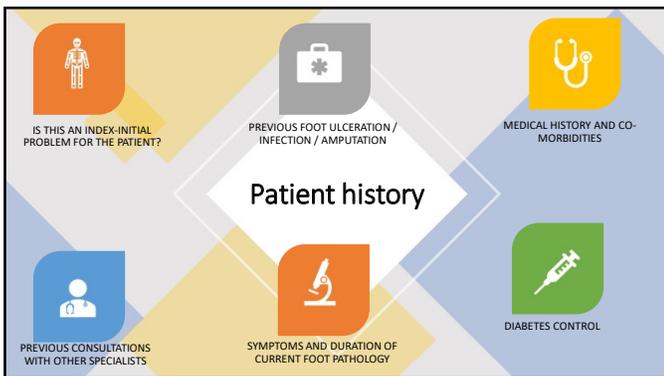
FootForward is a new program designed to help people with diabetes understand the importance of getting their feet checked. The program also supports training on foot checks and early detection of diabetes related problems.

Many Australians with diabetes miss out on regular diabetes foot checks. They might not be aware of how important they are, or they simply struggle to fit them in to their busy lives.

That's why FootForward has been developed - we want to make it easier for people to get their feet checked, and to avoid foot problems that can lead to amputation.

The Foot Forward program will officially launch in June, where we will have resources for both healthcare professionals and consumers, supporting education in the early identification of diabetic foot disease. In the meantime, you may sign up now to get updates on FootForward







Dermatological

- Skin quality – atrophic changes ?
- Interdigital pathologies - fungal
- Nail deformity – clubbing, thick nails, fungal
- Ulceration
- Callus
- Hair loss

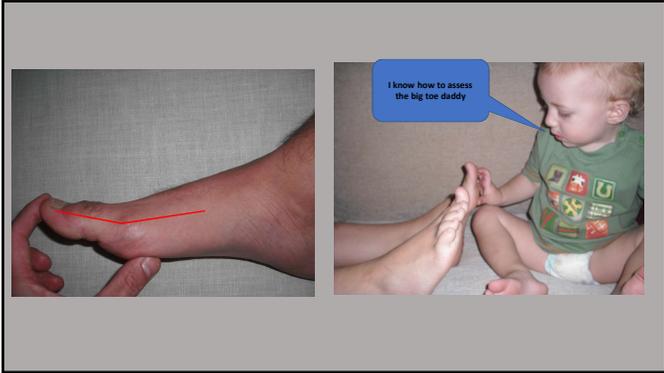


Musculoskeletal

- Deformity: claw toes, prominent metatarsal head, non-active Charcot, pes planus
- Muscle wasting: Intrinsic minus foot
- Range of motion – glycosylation, Soft tissue or bone



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Neurological examination

PAIN

"God's greatest gift to mankind, the gift no one wants"

- Dr Paul Brand

Pain?

Pain is a warning mechanism

It's the bodies way of saying:

"Hey dude something is wrong"

“Loss Of Protective Sensation”

 “the presence of symptoms and/or signs of peripheral nerve dysfunction in people with diabetes after the exclusion of other causes.”

 **Note:** Damage to the nerve fibres in people with diabetes can start prior to the diagnosis of DM!

Risk Factor - Peripheral Neuropathy (PN)

- PN is a loss/reduction of nerve sensation
 - Result in a loss of pain sensation
 - Pain is a protective sensation
 - Can often delay treatment and diagnosis of DFU's
- Damage to nerve fibers can start prior to diagnosis of DM
- PN is present in >80% of patients with DFUs. EURODIALE Study
- PN symptoms can include:
 - Numbness
 - Tingling, pins and needles in the feet
 - Burning in the feet and legs
 - reduced sweating, causing dry skin and fissure formation




Neurological Assessment

The America Diabetes Association and Diabetic Foot Australia recommends that all patients with diabetes should be screened annually for loss of protective sensation using simple clinical tests:

10 g Monofilament pressure sensation + testing any one of:

Pinprick sensation	Temperature sensation	VPTM (or tuning-fork 128 Hz) sensation	Ankle reflexes
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Combinations of more than one test have a sensitivity of > 87% in detecting loss of protective sensation

Neuropathy Disability Score (NDS)		Right
Vibration Perception Threshold 128-Hz tuning fork; apex of big toe; normal = can distinguish vibrating/ not vibrating	Normal = 0 Abnormal = 1	
Temperature Perception on Dorsum of the Foot Use tuning fork with beaker of ice/warm water		
Pin-Prick Apply pin proximal to big toe nail just enough to deform the skin; trial pair = sharp, blunt; normal = can distinguish sharp/not sharp	Present = 0 Present with reinforcement = 1 Absent = 2	
Achilles Reflex		
NDS Total out of 10		

Modified Neuropathy Disability Score

NDS of ≥ 6 an increased risk of insensate foot ulceration. Abbott et al 2012.

Figure 1. The Modified Neuropathy Disability Score

Diagnosis of Neuropathy

Light touch



Vibration Perception



Ankle Reflexes



Superficial pain



Temperature



VPBT



Visual test Neuropad - Sudomotor function

- Measures sweat production using a colour indicator – complex salt of anhydrous cobalt-II chloride
- Changes plaster colour – blue to pink

Abnormal





Normal

Zick R et al *Klinikerzt* 2003;32:192-94
Papanas N et al *Exp Clin Endocrinol Diabetes* 2005;113:195-98



Vibratip

- The Vibratip is a device comparable with the 10-g monofilament and therefore could be considered a useful tool for screening for peripheral sensory neuropathy in diabetes
- Analysis of the area under the receiver operating characteristic curves showed that the 10-g monofilament was significantly better than the 128-Hz tuning fork ($P = 0.0056$) and the Neurotip ($P = 0.0022$) but was no different from the Vibratip ($P = 0.3214$).




The Ipswich Touch Test
A simple and novel method to identify inpatients with diabetes at risk of foot ulceration

Clinical Area / Education / Nutrition / Psychological Research
14 10 2018 14:12:21

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DIABETES REVIEW AND REFLECTION 10th year, November 2018



Vascular assessment

Vascular Assessment

- Medical History
- Signs and Symptoms
- Palpate Pedal Pulses
- Doppler waveforms

Step 1

Step 2

Step 3

- Ankle Brachial Pressure Index
- Toe brachial Index/ Toe Pressure Index
- Transcutaneous Oxygen Measurement

- Formal Vascular studies:
 - Lower Extremity Duplex
 - CT / MR Angio

Diabetes/Metabolism
Research/and Reviews

SUPPLEMENT ARTICLE | [Free Access](#)

Guidelines on diagnosis, prognosis, and management of peripheral artery disease in patients with foot ulcers and diabetes (IWGDF 2019 update)

Robert J. Hinchliffe, Rachael O. Forsythe, Jan Apelqvist, Edward J. Boyko, Robert Fritzsche, Joon-Pio Hong, Konstantinos Katsanos, Joseph L. Mills, Sigrún Nikóli, Jim Reekers... [See all authors](#)

First published: 20 January 2020 | <https://doi.org/10.1002/dmrr.3276> | Citations: 9

International Working Group on the Diabetic Foot; www.iwgdguidelines.org

- Up to 50% of patients with diabetes and foot ulceration have concurrent PAD, which confers a significantly elevated risk of adverse limb events and cardiovascular disease.

IWGDF
recommendations

- Examine the feet of all patients with diabetes annually for the presence of peripheral artery disease (PAD) even in the absence of foot ulceration. At a minimum, this should include taking a relevant history and palpating foot pulses. (Strength of the recommendation: strong; quality of the evidence: low).
- A clinical examination does not reliably exclude PAD in most persons with diabetes and a foot ulcer - evaluate pedal pulses and doppler arterial waveforms in combination with;
- Ankle brachial index (ABI) or toe brachial index (TBI) measurement.
- No single modality has been shown to be optimal, and there is no definite threshold value above which PAD can reliably be excluded. However, PAD is a less likely diagnosis in the presence of ABI, 0.9-1.3; TBI, ≥0.75; and triphasic pedal Doppler waveforms. (Strong; low)

IWDGF recommendations

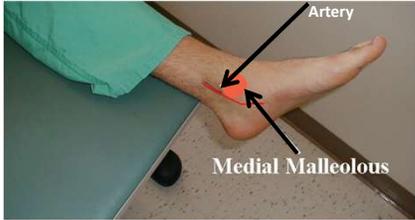
- Perform at least one of the following bedside tests in a patient with a diabetic foot ulcer and PAD, any of which increases the pre-test probability of healing by at least 25%: a skin perfusion pressure of ≥ 40 mmHg, a toe pressure of ≥ 30 mmHg, or a transcutaneous oxygen pressure (TcPO₂) of ≥ 25 mmHg. (Strong; moderate).
- Always consider urgent vascular imaging, and revascularization, in a patient with a diabetic foot ulcer and an ankle pressure of < 50 mmHg, ABI of < 0.5 , a toe pressure of < 30 mmHg, or a TcPO₂ of < 25 mmHg. (Strong; low)
- Use any of the following modalities to obtain anatomical information when considering revascularizing a patient's lower extremity:
 - colour duplex ultrasound
 - computed tomographic angiography
 - magnetic resonance angiography

History and visual clues

- Four times more prevalent in individuals with diabetes than non-diabetes
- Commonly affects the crural vessels (tibial, peroneal, dorsalis pedis arteries)
- Signs and symptoms include:
 - Absent pulses
 - Shiny or thin skin
 - Absence of hair on lower leg or foot
 - Thickened nails
 - Pallor when foot is elevated
 - Claudication
 - Pain in the arch/forefoot during the night
 - Cramping in the leg at night or during walking

Dorsalis Pedis

Posterior Tibial Artery





Doppler waveforms

ABI – TBI – Toe pressures in WiFi

Ischemia Grade	Ankle-Brachial Index	Ankle systolic pressure (mmHg)	Toe Pressure, Transcutaneous oxygen pressure (mmHg)
0	≥ 0.90	>100	≥60
1	0.6-0.79	70-100	40-59
2	0.4-0.59	50-70	30-39
3	<0.39	<50	<30



Vascular summary

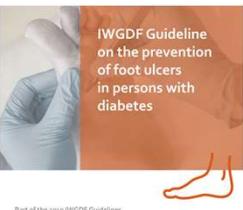
- Unlike neuropathy which is constant, vascular disease can be a dynamic process.
- The Australian Diabetes Society and IWGDF recommends that vascular screening in people with diabetes be performed annually for early diagnosis of peripheral arterial disease to enable risk reduction strategies to be implemented



Table 1. The IWGDF 2019 Risk Stratification System and corresponding foot screening frequency

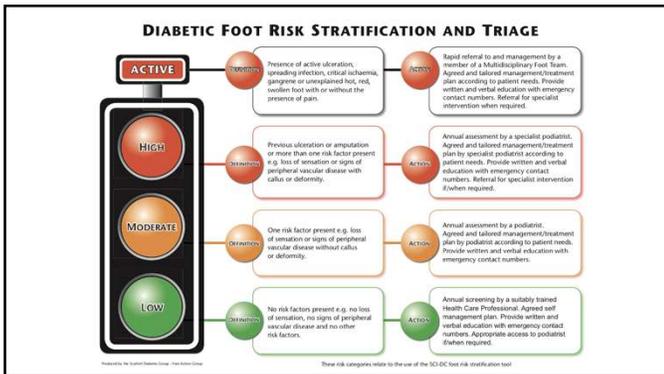
Category	Ulcer Risk	Characteristics	Frequency*
0	Very low	No LDM or PAD	Once a year
1	Low	LDM or PAD	Once every 6-12 months
2	Moderate	LDM + PAD, or LDM + foot deformity, or PAD + foot deformity	Once every 3-6 months
3	High	LDM or PAD, and one or more of the following: - history of a foot ulcer - a lower extremity amputation (prior or recent) - and/or leg/renal disease	Once every 1-3 months

Abbreviations: LDM, loss of protective sensation; PAD, peripheral artery disease.
* Screening frequency is based on expert opinion, since there is no published evidence to support these intervals.



Part of the 2019 IWGDF Guidelines on the Prevention and Management of Diabetic Foot Disease







Resources available for download

 Three resource thumbnails are displayed:

- Diabetic Foot Assessment?**: A slide with a blue and yellow background.
- Infection Management Pathway**: A flowchart titled "Infection Management Pathway" with "Right Treatment, Right Time".
- Infection Management Pathway**: Another flowchart titled "Infection Management Pathway" with "Right Treatment, Right Time".

Reminder...

- Please help us by completing a short survey at the end of this webinar, if you are accessing the webinar on demand please click on yellow provide feedback icon.

- You will receive your participation certificate upon survey completion via email.

Stay tuned for S+N Closer to Zero Podcast !

To receive your participation certificate via email please complete our short survey

If you have any questions contact us at ProfEd.ANZ@smith-nephew.com



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