

WHASA consensus document on the management of the diabetic foot

Liezl Naude (RN), Hiske Smart (RN), Lynne Tudhope (MD), Gerda Janse van Rensburg (Pod), Howard Alexander (Pod), Talib Abdool-Carrim (MD), Daniela Chrysostomou (RN), Neford Ongaru (MD), Hazem Al Dabbas, Monique Walker, Alison Lingard, Emma Trenholm, Marla Naidoo, Nonhlanhla Zikalala, Marla Naidoo Thuli Langa

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Introduction

The management of the diabetic foot is often a costly endeavour due to the magnitude of foot complications that can arise when not managed within the multi-disciplinary team. The International Working Group on the Diabetic Foot (IWGDF 2011) states that: "A strategy that includes prevention, patient and staff education, multidisciplinary treatment of foot ulcers, and close monitoring can reduce amputation rates by 49-85%".¹ This document is based on the work done by the IWGDF and fully endorses International Consensus Document on the Management and Prevention of the Diabetic foot (2011).¹ Other Guidelines that play a predominant role in adapting the International Guidelines to the South African and also African context are comprehensively detailed in the SEMDSA guidelines (2012),² NICE guidelines (2008),² Wound Bed Preparation Guidelines (2011),³ SIGN guidelines (2010)⁴ and the International Best Practice Guidelines: Wound Management in Diabetic Foot Ulcers (2103).⁵ Wound Care for the Diabetic Foot poses unique challenges due to the predisposing risk factors as well as the psychological impact on both the patient, family and care givers. It is also noted that a Diabetic Foot Ulcer (DFU) is a pivotal event in the life of a person with diabetes and is seen as a clear marker of serious underlying disease. Rapid wound deterioration is inevitable if wound care interventions are not done early to avoid ultimate amputation.^{3,5} The purpose of this document is to describe the basic principles in managing the diabetic foot by focussing on both prevention and ulcer treatment within the African context.

Method

An expert collaboration group from all walks of clinical care assembled for two days in Gauteng, South Africa to discuss and formulate a consensus document on the Management of the Diabetic Foot. Teams were selected for clinical expertise and background in Vascular surgery, Vascular assessment & management, Orthopaedic management, Wound management, Reconstructive Surgery, Product application and Managed Health Care. Societies who brought their expertise to this endeavour to create collaboration and unified approach are

It has been estimated that every 20 seconds a lower limb is amputated due to complications of diabetes.

WHASA, Case Manager Association of South Africa, South African Stomalthery Association, Pan African Diabetic Foot Study Group and the Society of Private Nurse Practitioners of South Africa.

The Diabetic Foot team consisted of members of whom 73.9% had more than 15 years of experience and 50% of them specialists (medicine, nursing and podiatry). They have reviewed the current literature pertaining to their area of expertise and present their findings during the meeting in a structure based on the Wound Bed Preparation Paradigm³. The purpose was not to reinvent the wheel but rather to put forward the South African voice and experience by means of recommendations. On day 2 to the full audience took part in a Modified Delphi method to generate an eighty percent immediate consensus for each recommendation.

As verification of this, an online-based modified Delphi method was used where each team member voted independently to verify the initially reached recommendation strength. Thereafter it was verified by an independent second panel consisting of national and international experts who were not part of the panel. A 4-point Likert scale (strongly agree, partially agree, partially disagree, strongly disagree) was used with space for individual comments. Each item to be included in this document has achieved eighty percent agreement (either strongly agree or partially agree) by all panels. This process took 24 months to complete.

Contributors

Clinical expert panel members:

Liezl Naude (RN Wound Management Specialist), **Howard Alexander** (Podiatrist), **Lynne Tudhope** (Vascular Surgeon), **Talib Abdool-Carrim** (Vascular Surgeon), **Gerda Van Rensburg** (Podiatrist), **Daniela Chrysostomou** (RN Wound Management Specialist), **Neford Ongaru** (Orthopaedic Surgeon)

Industry representative panel members:

Hazem Al Dabbas (Molnlycke Healthcare), **Monique Walker** (Discovery Managed Healthcare), **Alison Lingard** (KCI-Medical), **Emma Trenholm** (Smith and Nephew), **Nonhlanhla Zikalala** (Coloplast), **Marla Naidoo** (Smith and Nephew), **Thuli Langa** (Coloplast)

Results

Assess patient ability to heal and treat the cause

Recommendation 1 Agreement: 100%

All patients with diabetes should be examined at least once a year for potential foot problems with elements screened to include:

- Peripheral arterial disease
- Peripheral neuropathy – loss of protective sensation
- History of amputation
- History of foot ulceration/active ulceration
- Visual/mobility disability
- Callus and sensory loss
- Foot deformity and sensory loss

All patients with diabetes should be screened to assess their risk for foot ulceration using the 60 second risk screen tool (addendum A)

All patients with diabetes should be examined at least once a year for potential foot problems. If any risk factors are demonstrated during first examination, a follow up assessment should proceed every 1-6 months depending on the severity. Risk factors are summarized in Table 1.

Table 1: Risk factors for ulceration

Risk factors for ulceration^{1,4-6}

- Peripheral arterial disease
- Peripheral neuropathy – loss of protective sensation
- History of amputation
- History of foot ulceration/active ulceration
- Visual/mobility disability
- Callus and sensory loss
- Foot deformity and sensory loss

The stratification system described in Table 3 according to SIGN (2010) supports and the use of the 60 second risk screen tool (Addendum A).

ABPI in the diabetic patient can be inaccurate or falsely elevated due to the calcification of arteries.

Table 2: Stratification of risk for utilising the 60 second screening tool

Category	Risk	Description
Cat 0	Low risk	• Low risk: no risk factors present – no loss of sensation, no signs of PAD, and no other risks
Cat 1	Moderate risk	• One risk factor present – loss of protective sensation or signs of PAD without callus formation or deformity
Cat 2	High risk	• Previous ulceration or amputation or more than one risk factor present – loss of protective sensation or signs of PAD with callus or deformity
Cat 3	Active foot disease	• Presence of active ulceration, spreading infection, critical ischaemia, gangrene or unexplained hot, red swollen foot.

Table 3: Test Methods for risk screening

Test methods for screening^{1-5,7}

Description	Test	Method
Loss of protective sensation (LOPS) ¹⁻⁵	Semmes-Weinstein monofilament 10g	See Addendum B for procedure 3 applications per foot , one incorrect response indicates LOPS, other recommended sites are indicated in the 60 second screening tool
	Standard 128Hz tuning fork	Neuropathy is demonstrated by the inability to sense vibration
Peripheral arterial disease (PAD) ²⁻⁵	Palpation of pedal pulses	Manual palpation of dorsalis pedis, posterior tibialis, if unable to palpate both these pulses refer to next level of care (vascular unit)
	Signs of chronic ischaemic changes	Delayed discoloration (rubor) or venous refilling greater than 5 seconds on dependency
	History of intermittent claudication and rest pain*	Patient experiencing pain in leg muscles – usually exercise induced
	ABPI**	Highest systolic ankle reading over the highest systolic brachial reading (no arterial insufficiency >0.8)
	Presence of femoral bruit	

*Symptoms may be absent in people with diabetes

**May be falsely elevated in people with diabetes due to incompressibility of arteries and severity of PAD

Recommendation 2 Agreement: 100%

Manual palpation of dorsalis pedis and posterior tibial arteries is the first level of vascular supply screening

Do a thorough clinical assessment

Clinical assessment is key in enabling the practitioner to make the correct diagnosis and implement an appropriate individualized treatment plan. A holistic patient assessment should include:

Patient medical history

- Present symptoms
- Glycaemic control (HbA1C)
- Cardiovascular disease and risk factors for CVD
- Blood pressure control
- History Peripheral Arterial Disease (PAD)
- Microvascular complications of Diabetes Mellitus which includes; Retinopathy, chronic kidney disease (GFR<=60 ml/minute<60), Peripheral Neuropathy)
- Previous amputation
- Nutritional status
- Immune status
- Oedema of the lower limb

DO A THOROUGH VASCULAR CLINICAL EXAMINATION OF BOTH FEET UTILISING THE PEDIS CLASSIFICATION SYSTEM

Patient with acute limb ischaemia is characterised by the six P's: Pulselessness, Pain, Pallor, Perishing cold, Paraesthesia and Paralysis^{5,26}

Clinical examination of both feet

Vascular

- Skin
- Surface temperature
- Pulses
- Capillary filling
- ABPI
- Vascular supply assessment according to the PEDIS grading (Table 4):

Table 4: Adapted PEDIS grading^{5,45}

Grading of the diabetic foot adapted from PEDIS

GRADE 1

No symptoms or signs of PAD in the infected foot in combination with:

- Palpable dorsalis pedis and posterior tibial arteries or
- Ankle brachial index 0.9 to 1.3 or
- Toe brachial index >0.6 or 55mmHg pressure
- TcPO₂ >40mmHg

GRADE 2

Symptoms or signs of PAD but not of critical limb ischemia:

- Presence of intermittent claudication (if present additional non-invasive assessment is necessary)
- Ankle brachial index < 0.9 but the ankle pressure is >50mmHg or
- Toe brachial index <0.6 but systolic toe blood pressure >30mmHg or
- TcPO₂ 30-60mmHg or
- Other abnormalities on non-invasive testing, compatible with PAD (but not with CLI)

GRADE 3

Critical limb ischemia as defined by:

- No palpable pulses (TTASC document) or
- Systolic ankle blood pressure <50mmHg or
- Systolic toe blood pressure <30mmHg or
- TcPO₂ <30mmHg

Recommendation 3 Agreement: 100%

Ankle-brachial-pressure indices may be falsely elevated in people with diabetes due to incompressibility of arteries and severity of PAD

Recommendation 4 Agreement: 100%

Both feet should be investigated in a diabetic foot assessment even if one foot has no problems verbalized by the patient.

Neurological –determining protective sensation and risk for ulceration

- 5.07 monofilament
- 128Hz Tuning fork
- Cotton ball (Ipswich touch test)

Musculoskeletal

- Foot deformity
- Muscle atrophy
- Prior amputation
- Limited joint mobility
- Neuro- arthropathy (Charcot foot)

Skin

- Callous formation
- Fissures
- Infection
- Nail conditions
- Blisters
- Signs of trauma
- Oedema of the lower leg (distinguish between bilateral or unilateral oedema)

Oedema of the lower leg

No diagnosis or final clinical decision should be made until oedema has subsided, unless frank gangrene and systemic sepsis is present.

Assess and support individualized patient centred concerns according to the following:

Pain

- Diagnose and treat according to the cause:
 - Neuropathic pain
 - Neuro-ischemic pain
 - Wound related pain Nociceptive pain
 - Inflammatory pain (arthropathy, connective tissue disorders)

Recommendation 5 Agreement: 91.3%

The patient with diabetic neuropathy may experience moderate to severe pain.

Activities of daily living and psychosocial well being

- Evaluate activities of daily living by considering the following aspects:
 - Physical (pain, treatment related, work, self-care, gross and fine motor dependency, sexuality)
 - Social (family, friends, interdisciplinary team, finances, leisure activities, religion)
 - Psychological (anger, fear, anxiety, depression, stress, embarrassment)

Appropriate support should be provided according to the identified needs an if possible referral to the relevant speciality.^{8,9}

Smoking

- Offering patients strategies that may be either psychosocial and/or pharmacological to aid in cessation of smoking and improve tissue oxygenation and healing

Access to care & financial limitations

- Using local resources and do the most with what is available. Health care professionals should advocate for required patient resources. Most appropriate for health care worker and patient according to the resources they have.¹

Develop an individualized plan of care

Develop an individualised plan of care according to your patient assessment

Interdisciplinary team

- Inter-professional, individualized patient-centred care with the patient involved in the care has to be part of the process.
- The patient needs to be the centre of the Interdisciplinary team
- Team member may differ depending on resources and skills available.
- Communication amongst all team members is crucial for positive

Optimize blood glucose (HbA1c)

Recommendation 6 Agreement: 100%

HbA1c in a patient with a diabetic foot ulcer is often elevated above 10%. Once treatment is started with an interdisciplinary approach, a 3 month period should be given by managed healthcare for the team involved with the management of the patient to reach an optimal HbA1c of <8%.

Identify and address the cause related to specific wound aetiology and diagnosis

Recommendation 7 Agreement: 100%

In diabetic foot management the underlying cause is either related to vascular supply problems, infection, pressure or a combination of the above

With diabetic foot ulcers (DFU) it is important to address the cause by utilising the acronym vip.³

Table 5 shows the typical features of DFUs according to their aetiology and should be used as a clinical guide to identify and treat the cause.⁵

V = Vascular supply

I = Infection

P = Plantar pressure distribution

Identify and address systemic and co factors that may impair healing peripheral arterial disease (PAD)

In patients without clinical signs of ischemia or with perfusion measurements suggesting adequate blood flow, the effect of optimal wound care should be evaluated after 4-6 weeks.

Revascularisation should always be considered whenever a major amputation in patients with persistent ischemic rest pain or in patients with a low probability of wound healing.

High plantar pressures - offloading to prevent and heal foot ulcers

Recommendation 8 Agreement: 100%

Footwear and off-loading techniques to prevent and heal DFU are recommended and the choice of technique depends on the presence and severity of co-factors (PAD, infection, mobility, ability, age, diabetes control, quality of life and should be applied with the patient's consent. Non adherence to treatment will affect the effectiveness of all devices.

Recommendation 9 Agreement: 100%

Early detection of Charcot foot is essential in preventing further damage, it is recommended to evaluate the surface temperature on both feet to determine inflammatory changes.

Table 5: typical feature of DFUs according to aetiology adapted from best practice guideline 2013⁵

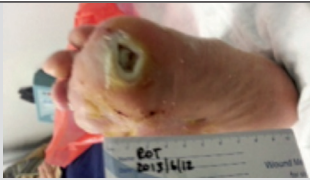


Feature	Neuropathic	Ischaemic	Neuroischaemic
			
Sensation	Sensory loss	Painful	Degree of sensory loss
Callus/necrosis	Callus present and often thick	Necrosis common	Minimal callus Prone to necrosis
Wound bed	Pink and granulating surrounded by callous	Pale and sloughy with poor granulation	Poor granulation
Foot temperature and pulses	Warm with bounding pulses	Cool with absent pulses	Cool with absent pulses
Other	Dry skin and fissuring	Delayed healing	High risk of infection
Typical location	Weight-bearing areas of the foot such as metatarsal heads the heel and over the dorsum of clawed toes	Tips of toes, nails edges and between the toes an lateral borders of the foot	Margins of the foot and toes
Prevalence based on (10)	35%	15%	50%

Table 6: Ulcer prevention adapted from best practice guidelines⁵

Ulcer prevention	
Type	Key points
Therapeutic shoes	<ul style="list-style-type: none"> Valuable in preventing pressure points Made specifically for the diabetic foot
Custom orthotics	<ul style="list-style-type: none"> Individualised off-loading preventing pressure points
Surgical intervention	<ul style="list-style-type: none"> Adapting the mechanics of the foot via orthopaedic surgery to prevent pressure points

Table 7: Ulcer treatment adapted from best practice guidelines⁵

Ulcer treatment	
Type	Key points
Tcc –total contact cast	<ul style="list-style-type: none"> Gold standard can reduce healing time by around six weeks Removable cast or non-removable cast with fibre glass or plaster-of-paris Requires clinical experience and training
Removable cast walkers	<ul style="list-style-type: none"> Similar pressure reduction to tcc More acceptable to patients, but reduced healing rate compared with tccs Easy to use
Healing shoes/sandals	<ul style="list-style-type: none"> Half shoes designed to redistribute metatarsal head pressures Can increase risk of falling for patients with poor balance Can be modified individually
Crutches, walkers and wheelchairs	<ul style="list-style-type: none"> Proved complete offloading of the foot Patients need good upper body strength for crutches Patients need to understand the purpose of using the device and be motivated to use the devices Wheelchairs can be difficult in unmodified homes.
Felt & foams	<ul style="list-style-type: none"> Customised use for specific offloading points by a trained health professional
Surgery	<ul style="list-style-type: none"> Orthopaedic intervention in stabilising the foot or redistributing pressure points.

Table 8: Key features of the recommended classification systems adapted from international best practice

Classification system	Key points	Pros/cons	References
University of texas (Armstrong)	Assesses ulcer depth, presence of infection and presence of signs of lower-extremity ischaemia using a matrix of four grades combined with four stages	Well established Describes the presence of infection and ischaemia better than wagner and may help in predicting the outcome of the DFU.	Lavery et al 1996 ¹¹ Armstrong et al 1998
Pedis	Assesses perfusion, extent (size), depth (tissue loss), infection and sensation (neuropathy) using four grades ¹⁻⁴	Developed by IWGDF User-friendly (clear definitions, few categories) for practitioners with a lower level of experience with diabetic foot management.	Lipsky et al 2012 ¹¹

Use appropriate risk, ulcer and charcot classifications available

This panel recommends the use of the adapted PEDIS categorisation in table 4 to determine the level of risk as well as the University of Texas ulcer classification system to classify the depth and amount of tissue damage⁵ (addendum C). Early detection of Charcot foot is essential in preventing further damage, it is recommended to evaluate the surface temperature on both feet to determine inflammatory changes.

Recommendation 10 Agreement: 100%

Total contact casting is the gold standard for stabilization in the acute phase of Charcot foot management.

Local wound care

Recommendation 11 Agreement: 100%

The first step in local wound management is determination of healability (healable, non-healable or maintenance) depending on the correctability of the underlying cause.

Assess wound(s) location and description

- Location of the wound(s)
- Measure mnemonic³ (Addendum C)
- Classify wounds as healable, non-healable or maintenance wounds (table 5)

Recommendation 12 Agreement: 100%

The local wound care for healable diabetic foot ulcers is determined by best evidence, patient preference and clinician recommendation and may include moist interactive dressings.

Table 9: Healable, maintenance or non-healing wounds³

Type of wound	Description
Healable	<ul style="list-style-type: none"> • Adequate blood supply is present • Cause of the wound is corrected • Existing cofactors, conditions, or medications that could potentially delay healing are optimized or ideally corrected
Maintenance	<ul style="list-style-type: none"> • A wound that is healable but is being prevented from healing by healthcare system factors or patient related issues.
Non-healable	<ul style="list-style-type: none"> • A wound that does not have adequate blood supply • Cause cannot be corrected

Cleanse wounds with low toxicity solutions

Cleansing solution used should be chosen according to the clinical appearance of the wound and cytotoxic solutions should be avoided.³

- Wounds should be cleansed/irrigated with drinkable potable tap water/sterile water/saline.
- Do not irrigate wounds where you cannot see where the solution is going or cannot retrieve for aspirate or irrigation solution.

Recommendation 13 Agreement: 95.6%
 In wound cleansing, the use of foot soaks should be avoided due to the increase of spread of bacteria to other possible wound sites.

Recommendation 14 Agreement: 82.6%
For healable diabetic foot ulcers the gold standard technique for tissue management include regular, local, sharp debridement using scalpel, scissors and or forceps **by a suitably trained clinician.**

Clinical findings from the assessment will determine the best method of debridement. Healthy tissue should be debrided sparingly by a trained health care professional in a healable wound.^{1,3,5,13} Gold standard technique for tissue management in diabetic foot ulcers is regular, local, sharp debridement using scalpel, scissors and or forceps.^{1,3,5,6,13}

Methods of debridement available include:

- Surgical
- Sharp
- Autolytic
- Enzymatic
- Biological/larval
- Hydro surgical

Sharp debridement should be carried out by experienced practitioners (podiatrist or specialised nurse) with specialist training.

Parameters influencing the decision for debridement (EWMA2013)

1. Pain
2. Patient’s environment
3. Patient’s choice and consent
4. Biological age and comorbidities
5. Quality of life
6. Skill of the care giver
7. Resource of the care giver
8. Regulations
9. Guidelines

Assess and treat infection

The normal pathway of infection differs in the diabetic foot due to the underlying pathophysiology. Around 56% of diabetic foot ulcers become infected and overall about 20% of patients with an infected foot wound will undergo an amputation.^{5,14}

Risk factors for infection

- Positive probe-to-bone test
- Diabetic foot ulcer present for more than 30 days
- History of recurrent diabetic foot ulcers
- Traumatic foot wound
- Presence of PAD in the affected limb
- Previous lower extremity amputation
- Loss or protective sensation
- Presence of renal insufficiency
- History of walking barefoot

Deep tissue infection or osteomyelitis are high risk findings in diabetic foot management

Methods to determine infection

Diagnosis of infection depends on using clinical signs and symptoms, not only microbiological results.^{5,12,15}

- Wound swab using the Levine technique
- Tissue biopsy
- Probe to bone – all deep wounds should be probed to bone with a blunt sterile metal instrument
- X-ray of the affected foot

Table 6 provides a description of the different categories of inflammation and infection as well as the confirmation test to substantiate the diagnosis.

Recommendation 15 Agreement: 100%
 Aggressive referral to an all-inclusive interprofessional team should be done in diabetic foot conditions with deep tissue infection or osteomyelitis.

Recommendation 16 Agreement: 91.3%
 All deep wounds should be probed to bone with a blunt sterile metal instrument to determine the presence of underlying osteomyelitis.

Treatment for deep tissue infection (moderate to severe)^{4,5,12}

- Start patients quickly on broad-spectrum antibiotics
- Take deep tissue specimens or aspirates of purulent secretions for cultures at the start of treatment to identify specific

Table 10: Classification and severity of diabetic foot infections^{3,5,12}

Category	Clinical presentation	Confirmation tests	Grade/severity
No signs or symptoms of infection			Grade 1 /uninfected
Superficial critical colonization	Superficial tissue lesion with at least 2 of the following: <ul style="list-style-type: none"> • Local warmth • Erythema >0.5-2cm around ulcer • Local tenderness/pain • Local swelling/induration • Purulent discharge Other causes of inflammation of the skin must be excluded.	Clinical presentation Nerds criteria (3 or more)	Grade 2/ mild
Deep tissue infection	Erythema >2cm and one of the findings above or: <ul style="list-style-type: none"> • Infection involving structures beneath the skin/ subcutaneous tissues (e.g. deep abscess, lymphangitis, osteomyelitis, septic arthritis and fasciitis) 	Clinical presentation Stones criteria (3 or more) Wound swab Wound biopsy	Grade 3 / moderate
Osteomyelitis	Presence of systemic signs with at least two of the following: <ul style="list-style-type: none"> • Temperature >39°C or <36°C • Pulse >90bpm • Respiratory rate <32mmHg • Paco2 <32mmHg • White cell count 12 000mm³, <4000mm³ • 10% Immature leucocytes 	Probe to bone Bone biopsy X-rays MRI	Grade 4 / severe
Persistent inflammation		Clinical presentation	
Abnormal persistent inflammation		Clinical presentation	

organisms in the wound – do not wait for results before initiating therapy.

- Change to an alternate antibiotic if indicated by the microbiology result, or the signs of inflammation are not improving.
- Administer antibiotics parenteral for all severe and some moderate infections; switch to oral when the patient is systemically well and culture results available.
- Continue antibiotic therapy until the infection resolves, but not through to complete healing. In most cases 1-3 weeks of therapy is sufficient for soft tissue infections.
- Consider giving empiric therapy directed against mrsa in patients with a prior history of mrsa, when local prevalence of mrsa colonisation or infection is high or if the infection is clinically severe.

Biofilms and chronic persistent infection

Treatment should aim to:

- Disrupt the biofilm burden through regular repeated debridement and wound cleansing.
- Use active biofilm remover agents available that disrupts biofilm membranes through surfactant or antiseptic action.
- Prevent reformation and attachment of the biofilm by using antimicrobial dressings.

Recommendation 17 Agreement: 95.6%-100%

The following tests in conjunction with clinical judgement is needed to determine diabetic foot infection:

- Wound swab using the levine technique (95.6%)
- Tissue biopsy
- Probe to bone
- X-ray of the affected foot
- Skin surface temp difference >1.5°C warmer compared to opposing limb

Select appropriate dressing according to the wound pathophysiology

Choose dressing according to the modern classes of dressings utilising the international best practice guideline: best practice guidelines: wound management in diabetic foot ulcers.⁵

Table 11: factors influencing choice of dressings

- Healable wound
- Non-healable wound
- Maintenance wound
- Quality of life & patient economics
- Pain
- Resources
- Infection & severity thereof

Predict and review the rate of wound healing

Normal predictive value healing of a healable neuropathic ulcer may range from 6-8 weeks

Neuro-ischemic ulcer will heal more slowly and additional co-morbid factors need to be addressed such as:

- End stage renal disease
- HbA1c
- Vascular insufficiency
- Control of oedema
- Infection

Adjunctive therapy⁵

Recommendation 18	Agreement: 82.6% - 100%
The use of the following adjunctive therapies may be considered, if appropriate and available for stalled wounds where the cause can be corrected:	
<ul style="list-style-type: none"> • Negative wound pressure therapy (100%) • Biological dressing (100%) • Bioengineered skin equivalents (91.3%) • Hyperbaric oxygen therapy (100%) • Platelet rich plasma (86.9%) • Growth factors (82.6%) 	

Interdisciplinary team

Recommendation 19	Agreement: 100%
According to the IDFWG at least 3 levels of foot care management are needed and should include:	
<ul style="list-style-type: none"> • Prevention, • Secondary intervention and • Advanced intervention with a multidisciplinary team depending on the severity of the diabetic foot ulceration. 	

These proposed levels have been adapted within the south african and african context where there are often only one health care practitioner present. It is therefore the recommendation of the panel that the minimum team should comprise of a trained health care practitioner, with prevention and basic curative cost effective care as the aim.

Table 12: Proposed levels of care adapted from Bakker et al 2012¹

Level	Team members involved
Level 1: minimum	Trained dedicated health care professional in prevention and treatment of non-ulcerative foot pathologies
Level 2:	Doctor, podiatrist, wound care nurse, diabetes nurse, orthotist
Level 3: advanced	Specialized foot centre with a multidisciplinary team specialised in diabetes foot care.

Ideal multidisciplinary team in managing the diabetic foot ulcer

Communication between the team members is crucial to ensure best treatment options and outcomes

- Patient
- Family or care giver
- General practitioner
- Podiatrist
- Orthotist
- Diabetes educator
- Wound care practitioner
- Vascular surgeon
- Orthopaedic surgeon
- Plastic/reconstructive surgeon
- Radiologist
- Microbiologist
- Dietician
- Specialist physician/endocrinologist
- Managed health care
- Psychiatrist

Education

Recommendation 20	Agreement: 100%
Diabetic foot prevention programs should not be limited to education only but should consist of multiple continued and combined interventions to promote patient self-management.	

- All health care professionals should provide education be it individual or structured education programs(13).
- Utilize enablers available to promote foot care etc.
- Patients involvement is essential in treatment plan
- Education should be reinforced and repeated
- Identify the barriers to changing of behaviour
- Educators should ensure that active learning is taking place
- This consensus panel supports the views with regards to education of the NICE guidelines⁶

Conclusion

The aim of this document is to form a global wound care guideline adapted for the south african context. This document should not be used in isolation but together with the international guidelines that it supports.

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Addendum A: 60 second at risk foot screening tool

60 Second screen for the high risk diabetic foot

Name _____	If all responses circled no: re-screen in 1 year	If any circled response send patient to diabetic foot center
Phone # _____ Dob (dd/mm/yr) ____/____/____		
Years with diabetes _____		
Gender: M ___ F ____		
Date of exam (dd/mm/yr) ____/____/____		

History

1. Previous ulcer	No	Yes
2. Previous amputation	No	Yes

Physical exam

3. Deformity	No	Yes
4. Pedal pulses are absent (dorsalis pedis or posterior tibial)	No	Yes
5. Fixed joint (no movement)		
a) Ankle	No	Yes
b) Large toe	No	Yes

Foot lesions

6. Active ulcer	No	Yes
7. Ingrown toenail	No	Yes
8. Calluses (thick plantar skin)	No	Yes
9. Blisters	No	Yes
10. Fissure (linear crack)	No	Yes

(Remember to check 4th and 5th web spaces and nails for fungal infection)

Neuropathy

11. Monofilament exam (record negative reaction)		
A) right ____/10 negatives	No <4/10 Neg	Yes ≥4/10 Neg
B) left ____/10 negatives	No <4/10 Neg	Yes ≥4/10 Neg

Plan

A. At least 1 yes response refer to foot clinic (Increased risk of foot ulcer, infection, or amputation). Foot clinic appointment time:

B. All responses were no: re-screen in 1 year. Date for re-exam (dd/mm/yr) ____/____/____.

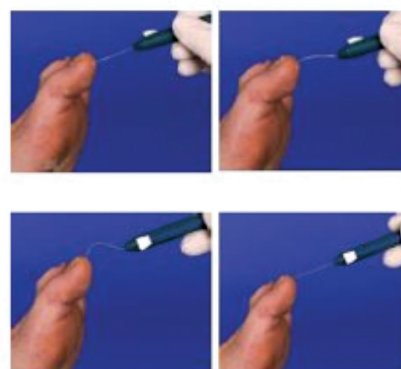
Risk screening tool adapted from rg sibbald 2010 recommended by whasa

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Addendum B: Monofilament application

The International Working Group on the Diabetic Foot (IWGDF) recommends the following procedure for carrying out the monofilament test.

- The sensory examination should be carried out in a quiet and relaxed setting
- The patient should close their eyes so as not to see whether or where the examiner applies the monofilament
- The patient should sit supine with both feet level
- First apply the monofilament on the patient's hands or on the inside of the arm so they know what to expect
- Apply the monofilament perpendicular to the skin surface with sufficient force to bend or buckle the monofilament
- Ask the patient:
 - Whether they feel the pressure applied (yes/no)
 - Where they feel the pressure (left foot/right foot)
- Apply the monofilament along the perimeter of (not on) the ulcer site
- Do not allow the monofilament to slide across the skin or make repetitive contact at the test site
- The total duration of the approach (skin contact and removal of the monofilament) should be around 2 seconds
- Apply the monofilament to each site three times, including at least one additional 'mock' application in which no filament is applied
- Encourage the patient during testing by giving positive feedback
 - Protective sensation is present at each site if the patient correctly answers two out of three applications
 - Protective sensation is absent with two out of three incorrect answers



Using a monofilament to test for neuropathy

Note: The monofilament should not be used on more than 10 patients without a recovery period of 24 hours

Procedure for performing a monofilament test as published in the international best practice guidelines: wound management in diabetic foot ulcers. Wounds international. 2013 Available from www.Woundsinternational.Com

Addendum C: University of Texas classification tool

The University of Texas Diabetic Foot Classification System

The University of Texas Diabetic Foot Classification System provides a detailed categorization of diabetic foot ulcers. Staging the ulcer for A to D is a predictor of amputation (Stage D is the highest risk) and grading it from 0 – III is an indicator of infection (grade III is at greatest risk).

STAGE	GRADE 0	GRADE I	GRADE II	GRADE III
A	Pre-ulcerative or post-ulcerative foot at risk for further ulceration	Superficial ulcer without tendon, capsule, or bone involvement	Ulcer penetrating to tendon or joint capsule	Ulcer penetrating to bone
B	Presence of infection	Presence of infection	Presence of infection	Presence of infection
C	Presence of ischaemia	Presence of ischaemia	Presence of ischaemia	Presence of ischaemia
D	Presence of infection and ischemia	Presence of infection and ischemia	Presence of infection and ischemia	Presence of infection and ischemia

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