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Disclaimer

Training Manual for Multidisciplinary Diabetes Foot Care is developed to be assistance to health care professionals by providing guidance and recommendations for particular areas of practice. This manual should not be considered inclusive of all approaches or methods, or exclusive of others. The manual is not intended to dictate the treatment of a particular patient. Treatment decisions must be made based on the independent judgment of health care providers and each patient's individual circumstances.

The Sri Lanka Diabetes and Cardiovascular Disease Initiative project makes no warranty, express or implied, regarding the manual and specifically excludes any warranties of merchantability and fitness for a particular use or purpose. The project shall not be liable for direct, indirect, special, incidental or consequential damages related to the use of the information contained herein.

Preface

Sri Lanka Diabetes and Cardiovascular Disease Initiative (SLDCI) is an island wide programme aimed at preventing non-communicable diseases and promoting health among people in Sri Lanka which is, funded by the World Diabetes Foundation. This project initiated under the leadership of the Ministry of Health, with the partnership of the Sri Lanka College of Endocrinologists and Sri Lanka Medical Association, also aims to uplift the care services for patients with diabetes in Sri Lanka and has special focus on gestational diabetes and diabetes foot disease.

This training program on diabetic foot is a product of D-Foot international, which is a non-profit independent foundation, founded in 1996. The main aim of the DFI is to create awareness of the diabetic foot disorder and to improve the management and prevention. The original training material has been edited by the SLDCI in keeping with the aims of the DFI to suite Sri Lankan health care setup. This training manual is focused on the basic foot care needs for patients with diabetes and strengthening the basic ulcer prevention services and treatment services. The program is aiming at building a solid base for a national diabetes foot care program led by the ministry of health, Sri Lanka, by training and empowering medical officers and nurses to provide good care for patients with diabetes foot disorder.

The Sri Lanka College of Surgeons are collaborating with the project and SLCE and this manual is a outcome of this collaboration. We hope that this programme will improve the diabetic foot care services in the country.

SLDC Team

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List of Abbreviations

IWGDF – International Working Group on the Diabetic Foot

DFI – D-Foot International

TOT – Training of Trainers

MRI - Magnetic Resonance Imaging

NICE - National Institute for Health and Care Excellence

PN – Peripheral Neuropathy

PVD – Peripheral Vascular Disease

NG – NICE Guideline

CLI – Critical Limb Ischemia

HCT – Hydrochlorothiazide

GTN – Glyceryl Trinitrate

O/E – On Examination

MF – Monofilament

SINBAD - Wound classification system

DFU – Diabetic Foot Ulcer

ABPI – Ankle Brachial Pressure Index

Introduction

1

Problem

Prevalence of Diabetes

10.3%	27.1%	20%
National prevalence of Diabetes	Colombo urban	Colombo suburb

Prevalence of CVD

25%	40%
National Prevalence of CVD (hypertension & dyslipidemia)	Colombo urban

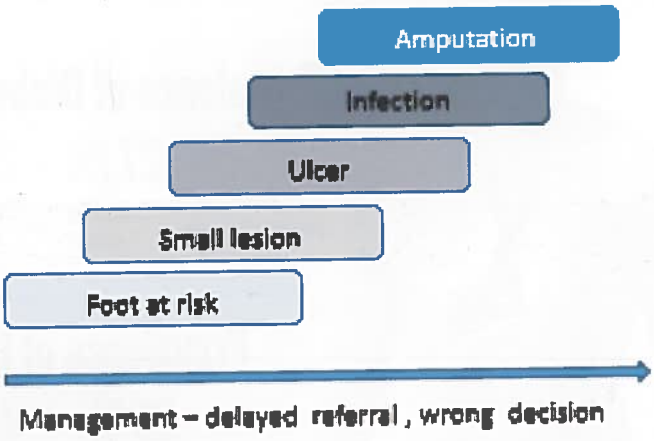
ST Graphics: Nalin Balasuriya

Why Foot care is important

- Diabetes is the Leading Cause of non-traumatic amputation and 80% of them start with an ulcer
- Globally major amputation happens once in every 20 seconds
- 10- 20% of patients with diabetes will develop Ulcers
- 50% of patients die within a year after major amputation
- 47% of Hospitalizations of patients with diabetes is due to foot problems

1. Fernando, D. (1996). The prevalence of neuropathic foot ulceration in Sri Lankan diabetic patients. *Ceylon Medical Journal*, *41* (3), 95-98.
2. Diabetes UK. Putting feet first: national minimum skills framework. Joint initiative from the Diabetes UK, F.F.F. (n.d.). *Diabetes UK*. From http://diabetes.org.uk/putting-feet- first. Accessed March 2013

Understanding the diabetic foot disease syndrome: Boxes Model



Capacity building through education is one way that we can avoid amputations

Ministry Of Health care, Nutrition and Indigenous Medicine

Technical Partners

D-FOOT International

SLDC
Sri lanka Diabetes & Cardiovascular Disease Initiative

SLCE
Sri Lanka College of Endocrinologists

se

avoid

igenous

SLDC

Sri lanka Diabetes & Cardiovascular Disease Initiative

2 Components

11 Objectives

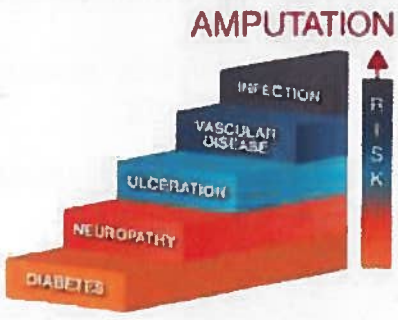
Diabetic Foot

PHC: Education of patients, early screening and prevention of ulcer

Guideline based care of ulcers: Training of doctors and nurses

Special footwear: P & O and private shoe makers

Special training programmes



Summary

Training: 1250 MOs & 1000 Nurses

PHC, MOH 350, Nurses 350, MO NCD 25, SPHM 25, PHMs 800, P&O 60, Foot care at 2ry and 3ry : 900, DENOs 300, HENOs 300, DM clinic MOs 100

HP settings: 5 Districts, 500000 contacts

School: Health clubs, 3 national competitions

Media Campaign

The organization of DF-International

- The International Working Group on the Diabetic Foot (IWGDF) was founded in 1996 by Karel Bakker of Netherlands and started a cooperation with International Federation on Diabetes in 2000 for implementation programmes
- www.iwgdf.org
- From 2017 the organisation was restructured and named as D-Foot International

Objectives of D-Foot International (IWGDF)

- The aim of the DFI is to create awareness of the disease and to improve the preventative services for Diabetic foot ulcers and also to improve care services for diabetic foot ulcers.

Objectives of DFI

- To inform people of the extent of diabetic foot problems worldwide
- To persuade them that action is both possible and affordable
- To create guidelines on the management and prevention of Diabetic foot ulcers
- To warn them of the consequences of not taking action

Activities of DFI

- Awareness
- International Diabetic Foot Conference
- Guidelines/ guidance/Consensus documents
- Courses
- Implementation programs
- Networking and public relations
- 10 countries in D foot network of 7 global regions

Specific Implementation programs of DFI

- Implementation programmes
  from step by step to TOT courses
- Diabetic Foot Care assistant programmes

Conclusion

- We invite you to use this learning package with the hope and idea
    - That you, your team-members and colleagues will acquire better knowledge and skills in diabetic foot ulcer prevention and management of early stage ulcers
    - That you will invite yourselves and other care providers to reconsider the model of diabetic foot care and underframes
    - That with all this effort the number of amputations related to Diabetes mellitus and morbidity as a consequence of foot disorders will diminish

What goes wrong with Diabetic Foot

2

Four great pathologies

All starts from hyperglycaemias

- Neuropathy
- Ischaemia
- Infection
- Deformity

Clinical presentation

- Neuropathic foot
- Neuro-ischemic foot
- Severe ischemic foot (Critical)
- Charcot foot

Early diagnosis is important

Natural history can be rapidly progressive leading to necrosis and amputation

Neuropathic foot

- 70% of people with diabetes have peripheral nerve damage
- They lose sensation and protection against external insults to the foot
- They may also have a
  - Motor causing deformity and
  - Autonomic neuropathy causing dryness of the skin
- This can change the shape and bio-mechanics of the foot

Impact of Neuropathy

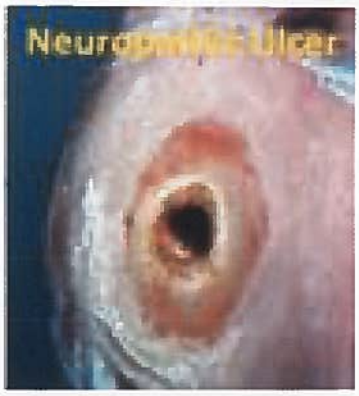
- Inability to respond appropriately to external stresses/ insult
- Physical trauma
- Bacterial invasion
- Callus and ulceration in high pressure points
- Fissuring due to dryness (Sweat and Sebaceous gland denervation)

n

s/ insult

ıd

Neuropathic foot



Treatment

- Wound care
- Offloading footwear
- Surgical offloading

Charcot neuroarthropathy and Diabetes

- 25% of diabetics with this pathology had wrong initial diagnosis
- i.e. infection, gout, arthritis, fracture, venous insufficiency, and tumor

Charcot neuroarthropathy and Diabetes

General characteristics include (six Ds mnemonic) [1]:

dense bones (subchondral sclerosis)
degeneration
destruction of articular cartilage
deformity (pencil-point deformity of metatarsal heads)
debris (loose bodies)
dislocation

MRI scan: can show changes in stage 0, thus enabling treatment to be started sooner

- **T1:** involved joints appear diffusely swollen, showing decreased signal intensity
- fat planes adjacent to ulcerated skin show decreased signal intensity
- if superinfected with a gas-producing organism, there will be a loss of signal intensity.

MRI offers the highest diagnostic accuracy - ligamentous disruption, concomitant joint deformity, and the center of signal enhancement within joints and subchondral bone (***In complex regional pain syndrome no changes occur***)

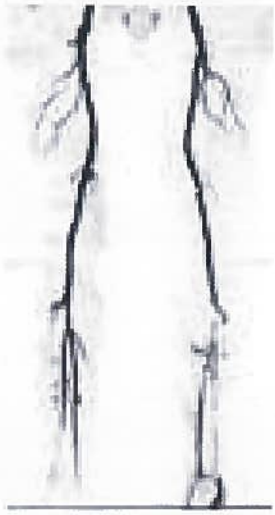
Charcot neuroarthropathy and Diabetes

TREATMENT

- Early presentation
  - IMMOBILIZATION- cast (8 to 12 weeks) later removable braces or a Charcot restraint orthotic walker (4-6 months)
  - BISPHOSPHONATES may help prevent bone resorption
- Late deformed foot
  - Footwear
  - Surgery

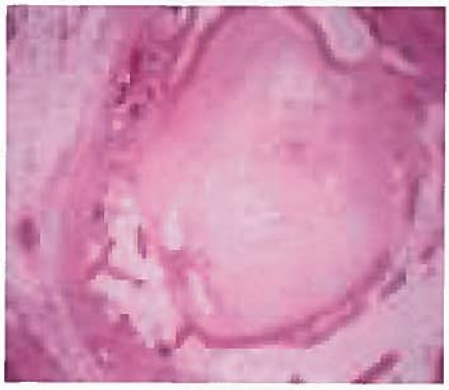
Ischaemia

- History taking - Intermittent claudication, Rest pain
- Weak/absent pulses- pedal/ popliteal/ femoral
- Skin observations
- Nail dystrophies and bad colour
- Colour and temperature
- Hair loss



Ischaemia

- Stenosis and occlusion of leg and foot arteries
- Calcific atherosclerosis
- Impaired foot perfusion
- Microangiopathy is non occlusive
- Susceptibility to ulceration
- Poor ulcer/ wound healing
- Tissue death in critical ischaemia



Neuro-ischaemic Foot Ulcer

- Physical trauma

- Neuro-ischaemic foot ulcer

Severe ischaemic foot (Critical)

- Intact ischaemic foot
- Pink painful foot
- Digital discolouration
- Digital necrosis

Response to bacterial invasion

- Swelling
- Redness
- Warmth
- Pain

However, because of neuropathy, diabetic foot infection do not always present with the classical signs of inflammation

They are often subtle at the beginning — Need vigilant examination to detect at early stage

Guided antibiotic therapy drainage and debridement

Infected ulcer

Neuropathic

Cellulitis

Septic vasculitis

Infective necrosis

Neuro-ischaemic

Summary

- Neuropathic foot
- Neuro-ischaemic foot
- Sever ischaemic foot (Critical)
- Charcot Foot

Early diagnosis is important

Natural history can be rapidly progressive quickly leading to necrosis and amputation

Foot Examination

3

Key messages

- Sensory neuropathy, foot deformity, impaired blood supply and history of previous foot ulceration are the most important risk factors for foot ulceration.
- The patients are often unaware of the problem regular foot screening is required to detect foot pathology, identify the patients at risk and to act accordingly.

Objectives

Elements of the foot examination

Skills

- How to recognize deformity, callus
- How to recognize fat pad atrophy
- Use of monofilaments/ tuning fork
- Checking the foot pulses
- Soft tissue vitality
- Record keeping

Assessment

- Simple inspection
- Palpation
- Sensory testing

General Inspection

- Neuropathy
- Ischemia
- Deformity
- Oedema
- Footwear

Features of Neuropathic Foot

Deformity

Infection

Callus

Ulceration

Sensory Loss

Dry skin

Fissures

UM

High pressure points

Nail dystrophies

Features of Ischaemic Foot

- Nail dystrophies
- ABPI's
- Cool
- Colour
- Thin callus
- Soft tissue atrophy
- Depression
- Pain
- Reduced pulses
- Gangrene

Heel fissures

Examine the footwear

Local inspection

- Pre ulcerative lesions
- Skin lesions
- Nail lesions
- Infection
- Necrosis
- Malignancy

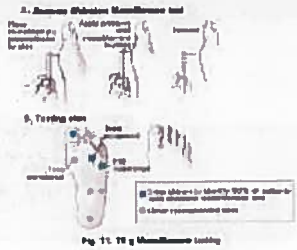
Neuropathy Testing

10-g Semmes-Weinstein Monofilament test

- Demonstrate on forearm or hand
- Place monofilament perpendicular to test site

– 1 second

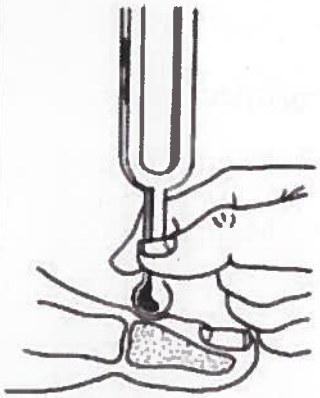
- Bow into C-shape for 1-2 second
- Avoid calluses, scars, and ulcers
- An abnormal response is the inability of the patient to recognize the perception of pressure by the monofilament.



Neuropathy Testing

Vibration using 128-Hz tuning fork test

- Test each great toe 3 times: pressure or vibration
- LOPS:2/3 incorrect response



Testing for Perfusion

Pedal pulse

Dorsalis pedis

Posterior Tibial

Assessment of Deformity

Claw Toe deformity

Hammer Toe deformity

Charcot deformity

Bunion & Overlapping toe

Assessment of Footwear

- Secure Closure System
- Less Seaming
- Extra Depth
- Stable Heel Counter
- Roomy Toe Box
- Hard outer sole

Correct fitting shoes

Last but least

- Listen to the patient/ talk to the patient/ empathy
- photography!!
- Prepare yourself properly

  hand disinfection

  jewellery

  finger nails

  hair

  clean uniforms

Key messages

- After examination of the foot each patient can be assigned to a risk category
- This categorization should guide individual patient check-up intervals and management

gned to a

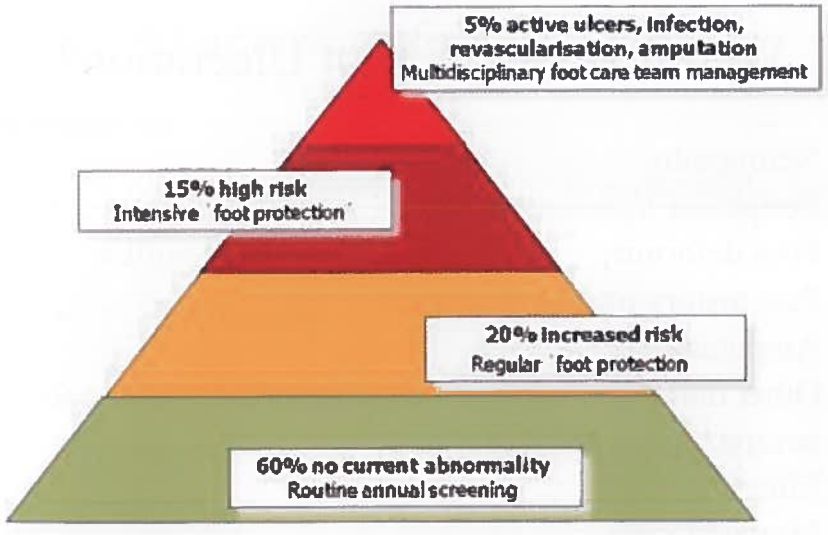
eck-up

Risk Assessment

4

Objectives

- To know the relevant conditions which are used for diabetic foot risk stratification
- To correctly apply the NICE guideline risk classification system on an individual patient and to be able to organize her/his prevention
- Management upon risk categorisation



Robert J. Young in: Boulton, Cavanagh, Rayman (Eds.)
The Foot in Diabetes, 4th Edition, 2006

Diabetic foot risk classification predicts outcomes

N= 1.666	Ulcer	Amputation	Hospitalization
0. No disease	2.0%	0	0
1. PN	4.5%	0	10.0%
2A. PN + deformity	3.0%	0.7%	5.1%
2B. PVD	13.8%	3.7%	15.9%
3A. Ulcer history	31.7%	2.2%	8.2%
3B amp history	32.2%	20.7%	50%

Who is at risk of Foot Ulceration?

- Neuropathy
- Peripheral Vascular Disease
- Foot deformity
- Past history of foot ulceration
- Amputation
- Other diabetic complications/ co-morbidities (especially neuropathy)
- Elderly
- Living alone

Elements of foot screening

Demographic data (ID, age, sex)
Medical history

- Previous foot ulcer/ amputation
- Symptoms of neuropathy
- Symptoms of ischaemia
- Smoking status

Elements of foot screening

Foot examination

- Colour and temperature of the skin, toe nails, hair, callus
- Foot deformity
- Open ulcer
- Sensory function: monofilament/tuning fork
- Arterial blood supply: foot pulses

Necessary skills

- Listen to the patient
- Foot examination
    - How to recognize claw/ hammer toes, callus
    - How to recognize fat pad atrophy
    - Use of monofilament/ tuning fork
    - Checking the foot pulses

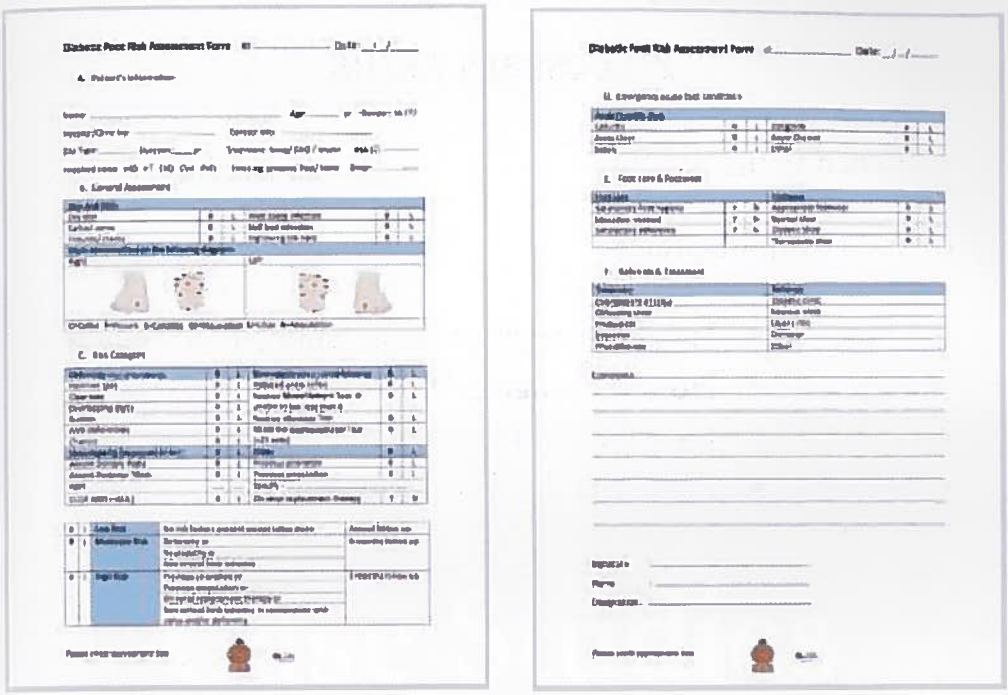
Foot risk classification

- After examination of the foot each patient can be assigned to a risk category
- Risk status classification is based on the presence/ absence of:
    - Loss of protective sensation
    - Foot deformity
    - Foot pulses
    - History foot ulceration/ amputation

, callus

ɜigned to a

bsence of:



Key Messages

- Sensory neuropathy, foot deformity, impaired blood supply and history of previous foot ulceration are the most important risk factors for foot ulceration.
- The patients are often unaware of the problem – regular foot screening is required to detect foot pathology, to identify the patients at risk and to act accordingly.

Case Studies related to Risk Stratification

5

Patient 1

Background

- 29 year old male
- Type 1 Diabetes Mellitus without periodic medical control
- Intensive insulin treatment with 4 injection/ day
- Smoker and 10-20 units alcohol/week
- Single ,fitness trainer, plays football three times a week

O/E

- 10g MF Test- positive (Felt <8 points)
- Vibration Test- positive (Unable to feel 128Hz vibration)
- All foot pulses palpable
- No deformity
- Good ROM all joints

Patient 1

Determine risk status

Give reasons for above

What are your interventions
Who do they involve?

Annual review
Education only
Initiate referral

Regular review 3-6 months
Initiate basic Podiatric care referral
Education

Frequent review -8 weeks
Intense podiatry

Urgent review 1-2 weeks
Asap foot clinic referral?

What are your interventions
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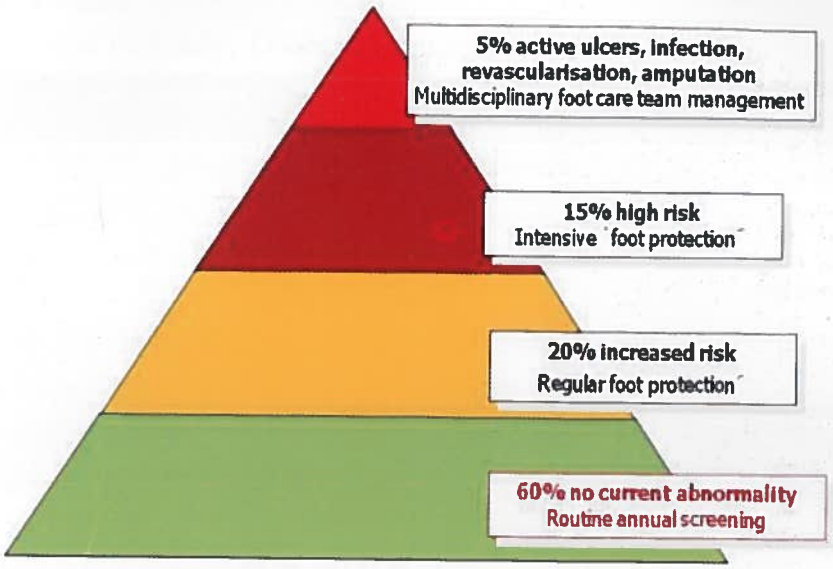
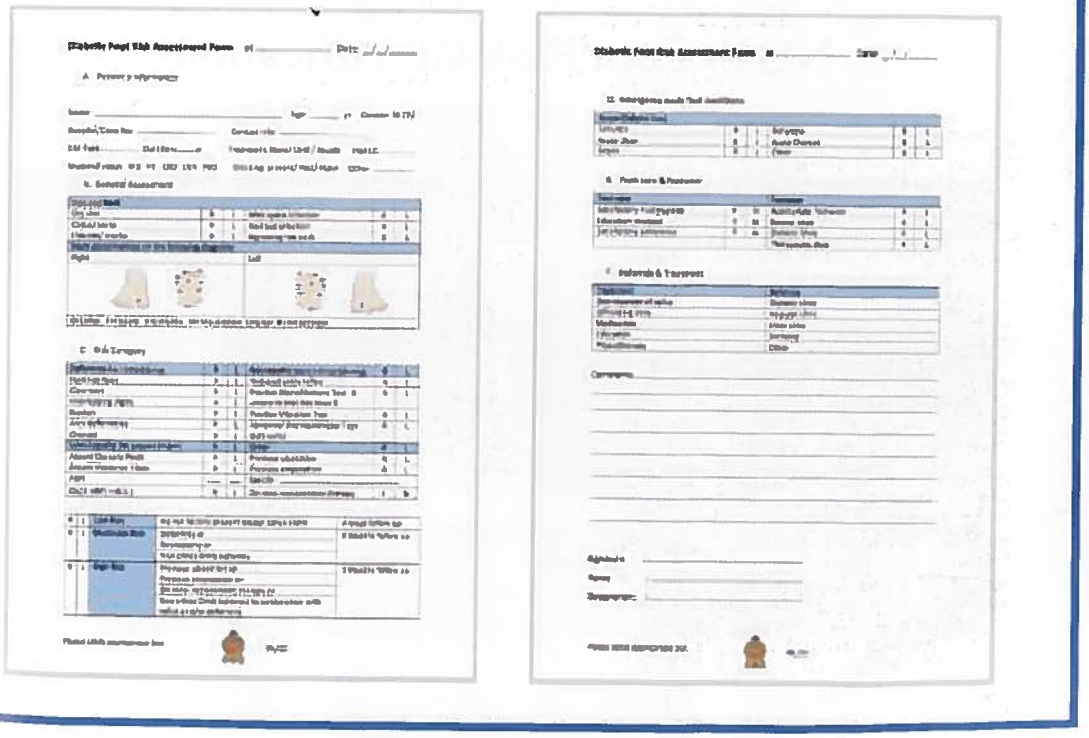

5% active ulcers, infection, revascularisation, amputation
Multidisciplinary foot care team management
15% high risk
Intensive foot protection
20% increased risk
Regular foot protection
60% no current abnormality
Routine annual screening



NG19 Foot Risk Classification

Category	Features	Follow up plan
Low risk	No Foot abnormality or only callus	Annual
Moderate risk	Neuropathy or Deformity or Non CLI	6 monthly
High Risk	Two or more risk factors, CLI, On dialysis	3 Monthly

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Low risk	No Foot abnormality or only callus	Annual
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Patient 2

Background

- 72 year old lady, Diabetes mellitus type 2
- Ischaemic heart disease, Hypertension
- Total hip replacement
- Systemic Lupus Erythematosis
- Metformin, Sulfonylurea, Prednisolone, HCT, GTN, Atenolol
- Loves gardening

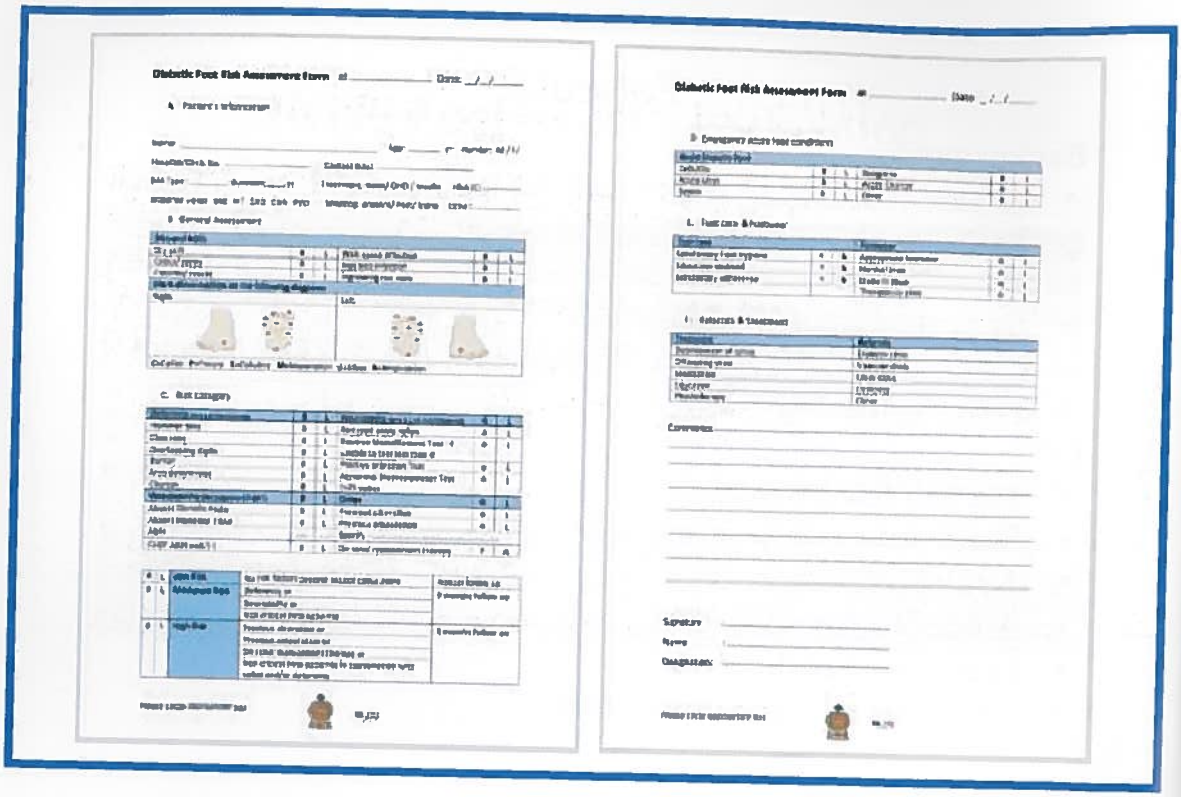
O/E

- 10g MF felt 5/8 sites
- Sharp sensation = unsure, vibration positive
- 1 pulse palpable in both feet
- Ankle pressure 240 mmHg (vessels calcified)
- Feet warm but dry skin
- Nail dystrophies, low arch feet

Patient 2

Determine Risk Status

Give reasons



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What are your interventions? Who do they involve?

Annual review
Education only
Initiate referral

Regular review 3-6 months
Initiate basic Podiatry care referral
Education

Frequent review 4-8 weeks
Intense podiatry

Urgent review 1-2 weeks
Foot clinic referral asap

Any other considerations?

- Is vascular evaluation enough?
- Without suspected vasculopathy, would it be also High Risk Foot?
- Can you give an example of a High Risk patient?

FOOT RISK CLASIFICATION DOES NOT ONLY INVOLVE FOOT

Age, way of life, job, other diseases...

Ulcer Classification

6

Objectives

- To know the basic relevant features of any diabetic foot classification system

- To understand and feel able to correctly apply SINBAD-Classification system on individual patients

Classification

There are two distinct types of diabetic foot syndrome with or without super added infection

- Neuropathic foot
- Neuro ischemic foot

Questions for Wound Classification

-key risk factors -

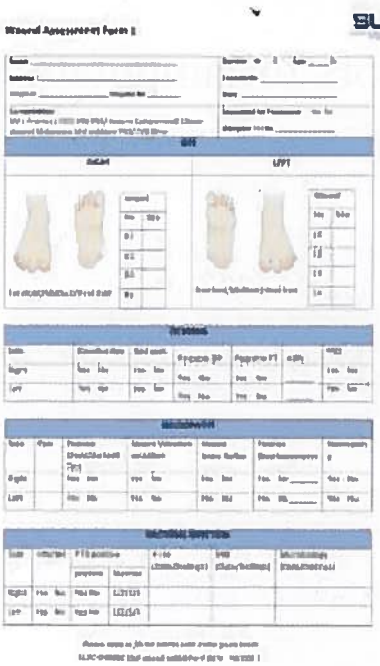
- ❖ Which part is involved (S- site)
- ❖ Is it ischemic? (I - Ischemia)
- ❖ Is it neuropathic? (N - Neuropathic)
- ❖ Is it infected? (B – Bacteria)
- ❖ How big is the wound. (A – Area)
- ❖ How deep it is? (D - Depth)

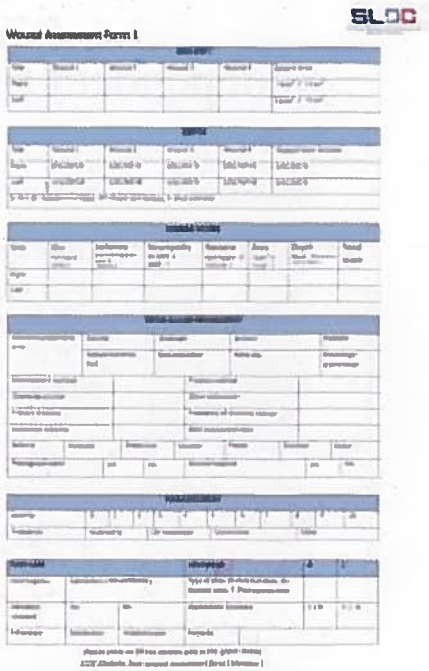
ıble 1—*The SINBAD system for classifying and scoring foot ulcers*

ıtegory	Definition	SINBAD score
te	Forefoot	0
	Midfoot and hindfoot	1
chemia	Pedal blood flow intact: at least one pulse palpable	0
	Clinical evidence of reduced pedal blood flow	1
europathy	Protective sensation intact	0
	Protective sensation lost	1
ıcterial infection	None	0
	Present	1
ea	Ulcer $<1cm^2$	0
	Ulcer $\geq 1cm^2$	1
epth	Ulcer confined to skin and subcutaneous tissue	0
	Ulcer reaching muscle, tendon or deeper	1
ıtal possible score		6

SINBAD Foot Wound Classification System

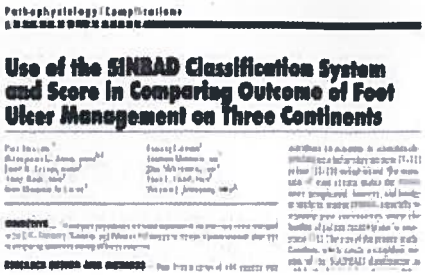
- Score ≥ 3 associated with prolong healing





Why SINBAD?

- Simple
- Represent main features of DF
- Based on Evidence
- Validated in 3 continents
- Do not require special equipment



Pathophysiology/Complications

Use of the SINBAD Classification System and Score in Comparing Outcome of Foot Ulcer Management on Three Continents

Independent risk factors for amputation

- Hind and mid foot ulcers
- Ischemia
- Infection
- Ares
- Depth

Example

SINBAD SCORE							
Side	Site Forefoot 0, other-1	Ischemia One or more palpable pulse -0 No pulse -1	Neuropathy No LOPS- 0 LOPS - 1	Bacteria No infection -0 Infected- 1	Area <1cm^2-0 >1cm^2-1	Depth Tendon / bone/joint only -0 Deep -1	Total score
Right							
Left	0	1	1	1	1	1	5/6

Ischemia

- One of the main independent predictor of amputation
- If no palpable pedal pulses or presence of gangrene refer immediately for vascular assessment.
- Delay cause tissue loss " Time is tissue"

Wound Depth

- Deep wounds are more likely to become infected and need longer time periods to heal
- Deep wounds carry an increased risk of osteomyelitis
- Risk of osteomyelitis 69 fold increase with tract to bone

Urgent revascularization and Debridement

B3

Key Message

1.For proper management it is essential to know whether you are dealing with a neuropathic or a neuro- ischemic foot lesion

2.Infrmation on ulcer depth , area as well as on presence of ischemia and infection are basic features of any proper diabetic foot classification

3.SINBAD classification can be used as tool to guide you to assess the urgency of the management of the diabetic foot and prevent unnecessary delays

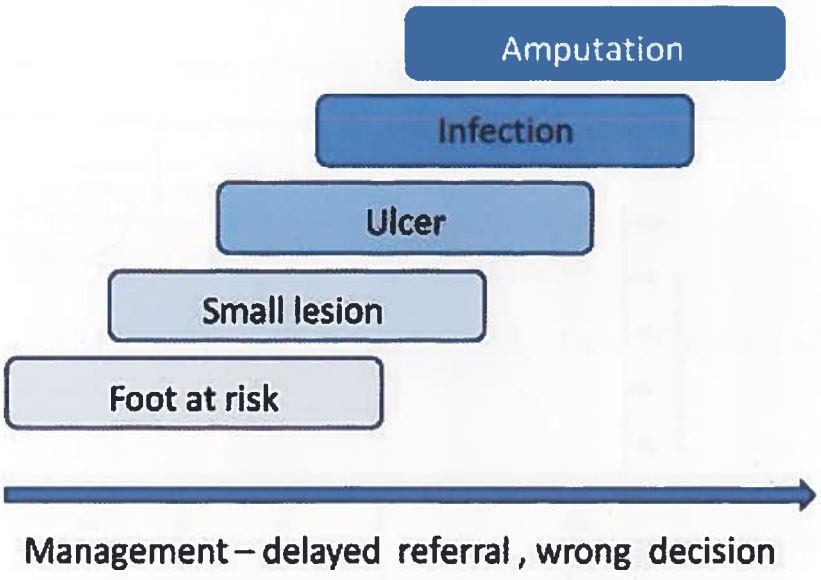
Basic wound-care treatment principals for simple ulcers

7

Aim

- The aim of this presentation is to give an overview of basic wound care principles for treating superficial diabetic foot ulcers.

DF care pathway

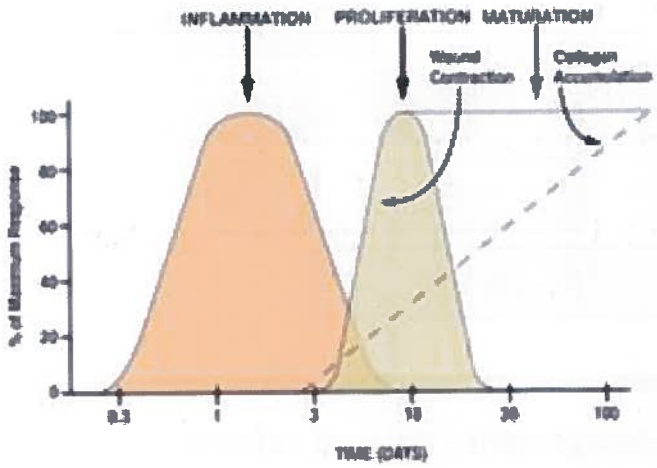


Objectives

1. To understand the underlying aetiologies of a superficial ulcer
2. To determine the cause and remove it
3. To evaluate the ulcer
4. To determine a management plan for each ulcer considering dressing types , duration of use and reviews
5. To record treatments and rationale

Healing process

Different steps to heal the wound



Examples of simple ulcers

Identifying underlying aetiologies

There are only 3 main reasons for a wound not healing or deteriorating:

1. Poor arterial supply
2. Infection
3. Trauma (pressure, foreign material..)

It is essential that these are been determined and if present address

Basic Concepts

- Identify the cause of the wound and remove it or consider how to prevent recurrence
- All superficial wounds **should show signs** of **healing within 3-5 days.**
- If no evidence of healing – refer immediately

Basic concepts

- Simple and regular dressings
- Only clean dirty wounds
- Arrange review appointments
- Give clear and simple patient advice/information

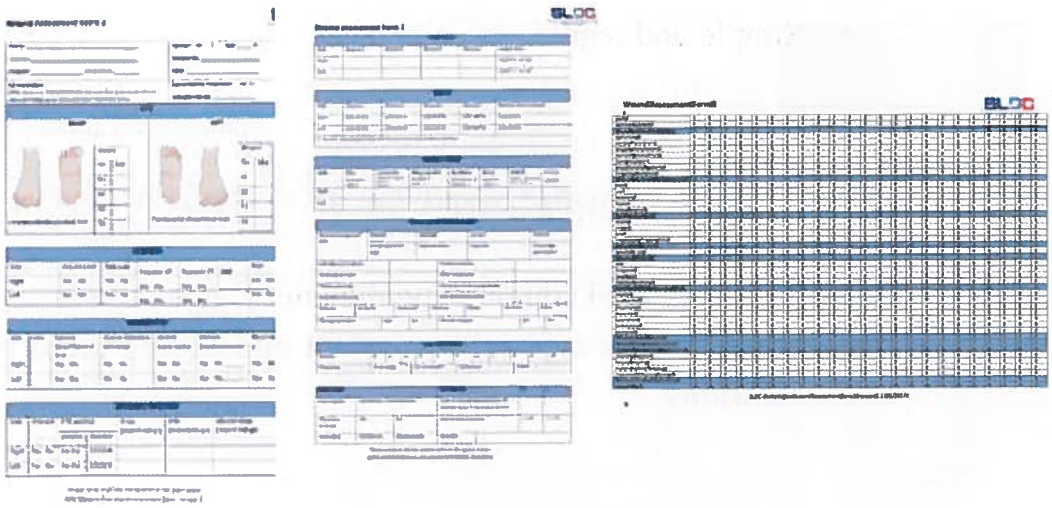
Checklist- basic review

- Arterial supply

Palpation of foot pulses, clinical signs of PVD

- Infection.
  - Look for classic signs of infection
  - sudden pain/discomfort in or around the wound,
  - increase in exudate,
  - unexpected raise in blood sugar levels,
  - unexplained wound deterioration

WOUND ASSESSMENT FORM



Basic dressing principles: simple superficial ulcers

- Simple absorbent dressings
- Easy to apply
- Not bulky
- Avoid semi/occlusive dressings
- Only use medicated dressing if suspect heavy contamination, or at high risk of infection (no local antibiotics in dressings)
- Easy and trauma free removal

Topical treatment

- Improve conditions of the wound
- Part of a multifactorial strategy to achieve healing
- Debride healable wounds, removing necrotic and nonviable tissue
- Select dressings for local moisture balance
- **Before using active agents, correct all underlying factors and conditions**

Other considerations to choose the dressing

Dressing choice depends on the wound stage and patient condition.

Antimicrobial efficacy Autolytic debridement capacities Exudate control Moist wound healing Protease modulating	⇐	**Wound**
Clinical evidence Cost effectiveness	⇐	**Efficacy/ cost**
Pain Comfort Frequency of change	⇐	**Patient QOL**

Characteristics of a healing ulcer

- Sloping edges
- Flat even base
- Granulating and epithelializing base
- Minimal exudate
- Evidence of wound contracture or superficial dry eschar
- Healthy appearance

Characteristics of a non healing ulcer

- Increase in size, depth, exudate, pain
- Edges of ulcer undermined or non sloping
- Presence of callus at margins
- Presence of slough, surrounding or spreading cellulitis
- Wound base granular in appearance
- Evidence of thrombosis in granulation tissue

Types of simple dressings

- Non adherence primary layers
- Low adherent woven gauze dressings
- Adhesive bordered
- Non adhesive
- Polyurethane foams - non adhesive
- Medicated viscose – Inadine

Remember…

- Dressing can be harmful if inappropriate or too bulky
- Don't forget that off loading is crucial, if not respected the most advanced wound dressings will not make a huge difference.

"Its not what you put on the wound, it's what you take off that is important"

Fixation methods

- Adhesive hypo-allergenic tape – be aware of thin devitalised skin (avoid skin- tape tears)
- Conforming bandages – not too tight but not too loose
- Remember, any wound dressing must be able to be fitted within patients footwear including what is worn at home

Overview of care

- Screen for PAD, Neuropathy, Infection
- Identify and remove cause of lesion
- Wound assessment and documentation
- Dressing choice and frequency
- Education/ advice – patient centred
- Pain control if appropriate
- Review, review and… review
- If no improvement – refer immediately

Footwear Basic Concepts

8

Key objectives

- Footwear needs to be fit for purpose and can be therapeutic or accommodative
- To discuss the criteria of a "good" shoe
- Correctly fitting shoes are only good if they are worn, they have to fit the feet but also the head!!!
- Understand basic features of an off-loading footwear

Footwear

- Ulcer recurrence rates 83% - own shoes, 26% special shoes
- Similar studies show a reduction in ulcer recurrence of between 60-85%
- "The diabetic who complains that their shoes are killing them is probably right"

Criteria of a good fitting shoe

What are the main functions of diabetic footwear?

- Protection from external trauma
- Accommodate foot without shoe trauma
- Protection from accidental damage
- To provide a support for insoles
- To alter time/ force intervals
- To compensate for poor foot function

What criteria are required for a good shoe?

- Robust construction
- Suitable to local climate and conditions
- Allows normal everyday activity
- Acceptable to the patient
- Acceptable and repairable
- Adaptable

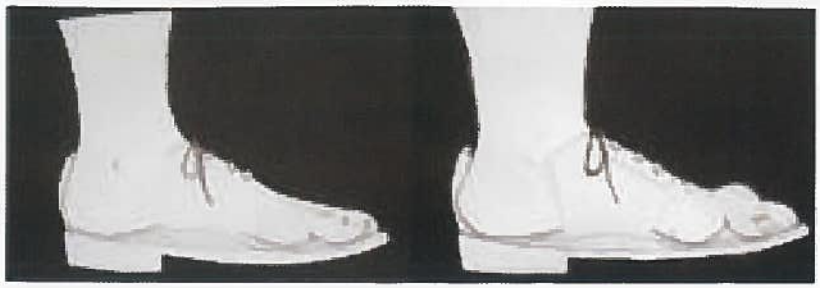
Features of an ideal shoe

- Length, width, depth
- Shape
- Fastening mechanism and position
- Heel height, width
- Upper material
- Sole unit
- Lining- no seams, stitching joins
- Must be able to accomadate foot

Please look at the photos of shoes and indicate what are the good and bad features of each with rationale

Please look at the photos of shoes and indicate what are the good and bad features of each with rationale

Footwear- for Off-loading



Considerations for "off-loading"

Right soles	Rocker soles(position)	Lateral floats
Extra depth/ width	Wedge sole unit	Heel height
Lace no of eyelets	Velcro	Shoe v's Boot

Hind foot and Forefoot off loader

RemovableCast Walker(RCW)

Adjustable Peg insole

Summary

- "good shoe" for a patient with diabetes
- Footwear needs to be fit for purpose and can be
  - therapeutic or
  - accommodative

Basic Foot Care Education

9

Key Objectives

- To understand the concepts behind foot care education
- To explore how this information can be delivered to the patients
- To explore the barriers and hurdles in communication of this information with in the cultural back ground
- Develop effective strategies to make a positive health behavioural change in an individual.

Your precious feet

- Help you to move around and see the beauty of the world.
- Diabetes could take off your limb forever
- Amputation happens once in every 20 seconds in the world.

By caring for your feet, the same way that you care for your face will keep your legs with you for a life time.

What happens to your feet in diabetes?

- Diabetes is known to cause
  - nerve damage,
  - foot deformity,
  - poor blood flow to the feet and
  - Immune dysfunction.

- They could lead to ulceration, poor healing, infections and subsequent limb loss.

Damage to the nerves can cause

- Abnormal sensations, pain and discomfort
- Loss of protective sensation predisposes to trauma and development of wounds.
- Feet may become dry and skin may peel off or crack. Which may again leads to infections.

Deformity

Which is changing the shape of the feet leads to formation of calluses and ulcers.

Poor blood flow to the feet can cause

Poor healing of ulcers, rest pain and gangrene of toes and foot.

Can we prevent amputations?

- Most of the diabetic foot problems can be prevented by taking care of them and early detection of acute foot problems.

Do's

- Wash with soap and water daily
- Dry well including in-between toes
- Apply moisturizer but avoid in between toes
- Cut nails straight and correctly
- Use correct shoes and check inside for foreign bodies before wearing.

Do's

- Feel and inspect daily
- Get periodic foot examination
- Take care of your sugar level
- Do regular exercise

Don'ts

- Never walk bare foot
- Don't smoke
- Never use hot water to wash your feet
- Don't moisturize in –between toes
- Never treat corns and calluses by your self
- Don't curve toe nails, no toe rings
- Never use pointed shoes

When should you see a doctor?

- Skin breach
- Redness
- Callus
- Swelling
- Warm feet
- Nail infection
- Web space skin maceration

Foot wear

- Buy shoes in the latter part of the day
- Secure Closure System
- Less Seaming
- Extra Depth
- Stable Heel Counter
- Roomy Toe Box
- Firm Midsole
- Thick Sole
- Therapeutic shoe wear may be needed for some individual and always use under medical supervision.

Correct fitting shoes

Summary

- Amputations are preventable
- Need good care of your feet like you do to your face
- Need regular assessment of your feet by a trained health care worker
- Seek medical attention without a delay, If there is any danger signs

Basic Scalpel Techniques

10

Key Messages

- Skills obtained using a scalpel to safe and effectively remove callus forms the foundation of sharp wound debridement
- The presence of plantar callus on a neuropathic foot increase ulcer risk 77 times
- The basics skill forms the corner stone virtually all diabetic foot ulcer management and its prevention
- Nursing officers in Sri Lanka not legally allowed to use the scalpel independently
- Need to train podiatry nurses or Podiatry assistants

Key Objectives

- To introduce the concept of sharp callus removal and wound debridement
- To explore how this form of clinical practice can be incorporated into local care
- To explore the barriers and hurdles that may hinder implication

Rationale for scalpel use: callus reduction

Rationale for scalpel use: Debridement

Seating position

- Sit with the patients feet at your chest level
- Avoid bending forwards or stooping
- Try to keep your back fairly straight
- Make sure there's adequate light
- Try to keep your elbow in
- The cutting movement should come from your wrist or fingers not your arms

How to hold the scalpel

- For general callus removal place the scalpel handle so that the end rests in between the base of your little fingers.
- You lightly grip the scalpel neck between your thumb and forefinger.

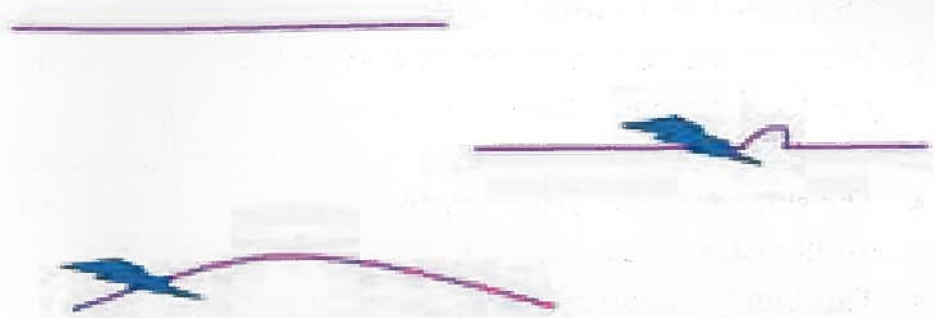
Your other hand

- This does a lot of work!
- Use your thumb and forefinger to stretch the area of skin you are debriding a tightly as you can
- The skin tension is maintained throughout the debridement
- The skin tension is extremely important as this allows you to cut callus or dead tissue more safely and easily.
- This highly important when debriding patients with ischaemic!

Cutting action for callus

- The scalpel blade is honed with a cutting edge, thus the blade should be drawn across the skin surface
- Use very little pressure
- Do not push with the scalpel
- Work from one edge across to the other
- The blade should be held at approx. 5 degree angle to skin surface

Skin Tension



Slough Removal

- Follow the same principles
- Skin tension obtain using forceps ideally locking
- Work from wound margins at junction of live and dead tissue
- Aim to separate dead from live with minimal trauma to live tissue
- Do not push with the scalpel or press into wound bed

Prevention and Management of foot problems in Diabetes

Summary Guidance

Introduction

In this 'Summary Guidance for Daily Practice' we describe the basic principles of prevention and management and of foot problems in persons with diabetes. This summary is based on the International Working Group on the Diabetic Foot (IWGDF) Guidance 2015, consisting of evidence-based international consensus guidance documents on:

- Prevention of foot ulcers in at-risk patients with diabetes (1)
- Footwear and offloading to prevent and heal foot ulcers in diabetes (2)
- Diagnosis, prognosis and management of peripheral artery disease in patients with foot ulcers in diabetes (3)
- Diagnosis and management of foot infections in persons with diabetes (4)
- Interventions to enhance healing of chronic ulcers of the foot in diabetes (5)

In addition, the authors, as members of the Editorial Board of the IWGDF, provide some advice in this summary that is based on expert opinion, in areas for which the guidance documents were not able to provide evidence based recommendations.

Depending on local circumstances, the principles outlined in the original summary have been modified with the permission of D Foot International who is partner of this SLDC project. For more details and information on treatment by specialists in foot care, we refer the reader to the five evidence-based global consensus Guidance documents (1-5).

Foot problems in diabetes

Foot problems in diabetes are among the most serious complications of diabetes mellitus. Foot problems are a source of major suffering and costs for the patient, and they also place a considerable financial burden on healthcare and society in general. A strategy that includes prevention, patient and staff education, multi-disciplinary treatment of foot ulcers, and close monitoring of people's feet as described in this document can reduce foot problems and their sequelae.

Pathophysiology

Although the prevalence and spectrum of foot problems varies in different regions of the world, the pathways to ulceration are probably very similar in most patients. Diabetic foot lesions frequently result from a patient simultaneously having two or more risk factors, with diabetic peripheral neuropathy playing a central role.

This neuropathy leads to an insensitive and sometimes deformed foot, often causing an abnormal walking pattern. In people with neuropathy, minor trauma (e.g., from ill- fitting shoes, walking barefoot or an acute injury) can precipitate ulceration of the foot. Loss of

sensation, foot deformities, and limited joint mobility can result in\ abnormal biomechanical loading of the foot. This produces high pressure in some areas, to which the body responds with thickened skin (callus). This leads to a further increase of the abnormal loading, often with subcutaneous haemorrhage and eventually ulceration.

Whatever the primary cause, if the patient continues walking on the insensitive foot it impairs wound healing (see Figure 1).

Peripheral artery disease (PAD), generally caused by accelerated atherosclerosis, is present in up to 50% of patients with a diabetic foot ulcer. PAD is an important risk factor for impaired wound healing and lower extremity amputation. A minority of foot ulcers are purely ischemic; these are usually painful and caused by minor trauma.

The majority of foot ulcers are neuro-ischemic, i.e., caused by combined neuropathy and ischemia. In these patients symptoms may be absent because of the neuropathy, despite severe pedal ischemia.

Diabetic microangiopathy (so-called "small vessel disease") is not likely to be the primary cause of an ulcer or poor wound healing.

***Figure 1:** Illustration of ulcer due to repetitive stress*

Cornerstones of prevention

There are five key elements that underpin prevention of foot problems:

1. Identification of the at-risk foot
2. Regular inspection and examination of the at-risk foot
3. Education of patient, family and healthcare providers
4. Routine wearing of appropriate footwear
5. Treatment of pre-ulcerative signs

1. Identification of the at-risk foot

To identify a person with diabetes who is at risk for foot ulceration, examine the feet annually to seek evidence of signs or symptoms of peripheral neuropathy or peripheral

artery disease. If a patient with diabetes has peripheral neuropathy, screen for: a history of foot ulceration or lower-extremity amputation; foot deformity; pre-ulcerative signs on the foot; poor foot hygiene; and, ill-fitting or inadequate footwear.

Following examination of the foot, each patient can be assigned to a risk category that should guide subsequent preventative management. The NG 19 NICE guide lines of diabetic foot risk classification can be found in Table 1. Areas most at-risk are shown in Figure 2.

Figure 2: *Areas at risk for foot ulceration*

Table 1: *Risk Classification according to the NICE guidelines (NG 19)(6)*

Low Risk
No risk factors present except callus alone
Moderate Risk
Deformity or
Neuropathy or
Non critical limb ischemia
High Risk
Previous ulceration or
Previous amputation or
On renal replacement therapy or
Neuropathy in combination with callus and/or deformity or
Non critical limb ischemia in combination with callus and/or deformity
Active diabetic foot problems
Ulceration or
Spreading infection or
Critical limb ischemia or
Gangrene or
Suspicion of an acute charcot arthropathy, or an unexplained hot, red, swollen foot with or without pain

Recommendations on frequency of follow up

- Low risk – once a year
- Medium risk – 6 months
- High risk – 3 months
- Active Diabetic foot problems – immediate attention

2. Regular inspection and examination

All people with diabetes should have their feet examined at least once a year to identify those at risk for foot ulceration. Patients found to have a risk factor should be examined more often, based on their risk classification (Table 1).

The absence of symptoms in a person with diabetes does not exclude foot disorders; they may have asymptomatic neuropathy, peripheral artery disease, pre-ulcerative signs or even an ulcer. The clinician should examine the feet with the patient both lying down and standing up, and should also inspect their shoes and socks. Inspection and examination should minimally consist of:

History and foot examination

- History – previous ulcer/amputation, end stage renal disease, previous foot education, social isolation, poor assess to health care, bare foot walking
- Vascular states: history of claudication, rest pain, palpation of pedal pulses
- Skin: callus, colour, temperature, oedema
- Bone/joints: deformities (claw hands, hammer toes)or bony prominence, limited joint mobility
- Footwear/socks(worn when at home or when at outside): assessment of their inside and outside

Assessment of neuropathy, using the following techniques:

- Symptoms such as tingling or pain in the lower limb, especially at night
- Pressure perception: semmens Weinstein monoflitaments
- Vibration perception: 128Hz tuning fork
- Discrimination: pin prick (dorsum of foot, without penetration the skin)
- Tactile sensation: Cotton wool(dorsum of foot) or by lightly touching the tips of the toes of the patients and tips of the index finger of the examiner for 1-2 seconds
- Reflexes: Achilles tendon reflexes

3. Education of patients, family and healthcare providers about foot care

Education, presented in a structured, organized and repeated manner, plays an important role in the prevention of foot problems. The aim is to improve patients' foot care knowledge, awareness, and self-protective behaviour, and to enhance motivation and skills in order to facilitate adherence to this behaviour.
People with diabetes should learn how to recognize potential foot problems and be aware of the steps they need to take when problems arise.
The educator must demonstrate the skills, such as how to cut nails appropriately.
A member of the health care team should provide education (see examples of instructions below) in several sessions over time, and preferably using a mixture of methods. It is essential to evaluate whether the person with diabetes (and, optimally, any close family member or carer) has understood the messages, is motivated to act and adhere to the advice, and has sufficient self-care skills. Furthermore, healthcare professionals providing these instructions should receive periodic education to improve their skills in care for patients at high-risk for foot ulceration.

Items that should be covered when instructing the patient at-risk for foot ulceration:

- Determine if the person with diabetes is able to perform a daily foot inspection.
- If not, discuss who can assist the person in this task. A substantially visually impaired person cannot adequately do the inspection perform daily foot inspection, including areas between the toes.
- Notify the appropriate healthcare provider at once if foot temperature is markedly increased or if a blister, cut, scratch or ulcer has developed.
- Avoid walking barefoot, in socks without footwear, in thin soled standard slippers, whether at home or outside.
- Do not wear shoes that are too tight, have rough edges or uneven seams.
- Inspect and feel inside all shoes before you put them on.
- Wear socks/stocking without seams (or with the seams inside out), do not wear tight or knee-high socks, and change socks daily.
- Wash feet daily (with water temperature always below 37°C), and dry them carefully, especially between the toes.
- Do not use any kind of heater or a hot-water bottle to warm feet.
- Do not use chemical agents or plasters to remove corns and calluses; see the appropriate healthcare provider for these problems.
- Use emollients to lubricate dry skin, but not between the toes.
- Cut toenails straight across (see Figure 3)
- Have your feet examined regularly by a healthcare provider.

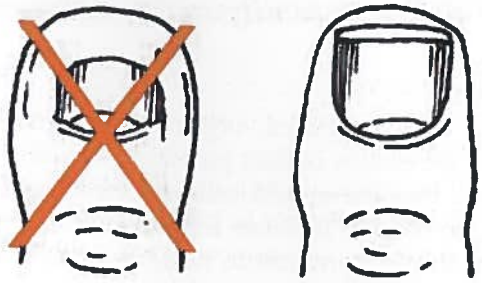


Figure 3: how to cut your nails

4. Routine wearing of appropriate footwear

Inappropriate footwear and walking barefoot with insensitive feet are major causes of foot ulceration. Patients with loss of protective sensation should have access to appropriate footwear without fi nancial restraints and should be encouraged to wear this footwear at all times, both indoors and outdoors. All footwear should be adapted to conform to altered biomechanics and deformities affecting the patient's foot. Patients without peripheral neuropathy can select off-the-shelf footwear, but should ensure that they fit properly. Patients with neuropathy must take extra care when selecting or being fitted with footwear; this is most important when they also have foot deformities or have had a previous ulcer/amputation history.

The shoe should not be either too tight or too loose (see Figure 4). The inside of the shoe should be 1-2 cm longer than the foot. The internal width should equal the width of the foot at the metatarsal phalangeal joints (or the widest part of the foot), and the height should allow enough room for all the toes. Evaluate the fi t with the patient in the standing position, preferably at the end of the day. If the fi t is poor due to foot deformities, or if there are signs of abnormal loading of the foot (e.g., hyperaemia, callus, ulceration), refer the patient for special\ footwear (advice and/or construction), including insoles and orthoses. If possible, demonstrate that there is reduced plantar pressure of this special footwear to prevent a recurrent plantar foot ulcer.

Figure 4: Internal width of the shoe

5. Treatment of pre-ulcerative signs

In a patient with diabetes treat any pre-ulcerative sign on the foot. This includes: removing abundant callus; protecting blisters, or draining them if necessary; treating ingrown or thickened nails; and, prescribing antifungal treatment for fungal infections. This treatment should be repeated until the pre-ulcerative sign resolves and does not recur over time, and should preferably be performed by a trained foot care specialist. If possible, treat foot deformities non-surgically (e.g., with an orthosis).

Foot ulcers

Health care providers should follow a standardized and consistent strategy for evaluating a foot wound, as this will guide further evaluation and therapy. The following items must be addressed:

Type

By history and clinical examination, classify the ulcer as neuropathic, neuro-ischemic or 'purely' ischemic.

Evaluate all patients for the presence of PAD by taking a symptom-directed history and palpating foot pulses. If possible, examine the arterial pedal wave forms and measure the ankle pressure and ankle brachial index (ABI), using a Doppler instrument. The presence of an ABI 0.9-1.3 and a triphasic pedal pulse waveform largely excludes PAD, as does a toe brachial index (TBI) $\geq$0.75. However, ankle pressure and ABI can be falsely elevated due to calcification of the arteries. In selected cases other tests, such as measurements of toe pressure or transcutaneous pressure of oxygen (TcpO2), are useful. No specific symptoms or signs of PAD reliably predict healing of the ulcer.

Cause

Ill-fitting shoes and walking barefoot with insensitive feet are the most frequent causes of ulceration, even in patients with purely ischemic ulcers. Therefore, meticulously examine shoes and footwear behaviour in all patients.

Site and depth

Neuropathic ulcers frequently occur on the plantar surface of the foot, or in areas overlying a bony deformity.

Ischemic and neuro-ischemic ulcers are more common on the tips of the toes or the lateral borders of the foot.

The depth of an ulcer can be difficult to determine, especially in the presence of overlying callus or necrotic tissue. To enable an adequate assessment of the ulcer debride neuropathic ulcers with callus and necrosis as soon as possible. This debridement should not be performed in non-infected ulcers with signs of severe ischemia. In neuropathic ulcers, debridement can usually be performed without any local anaesthetic.

Signs of infection

Infection of the foot in a person with diabetes presents a serious threat to the affected limb, and must be evaluated and treated promptly. Because all open wounds are colonised with potential pathogens, we diagnose infection by the presence of at least two signs or symptoms of inflammation (redness, warmth, induration, pain/ tenderness) or purulent secretions. Unfortunately, these signs may be blunted by neuropathy or ischemia, and systemic findings (e.g., fever, increased white blood count) are often absent. Infections should be classified as mild (superficial with minimal cellulitis), moderate (deeper or more extensive) or severe (accompanied by systemic signs of sepsis).

If not properly treated, infection can spread contiguously to underlying tissues, including bone (osteomyelitis).

Assess patients with a diabetic foot infection for the presence of osteomyelitis, especially if there is a longstanding or deep wound, a wound overlying bone, or if it is possible to touch bone with a sterile metal probe.
In addition to the clinical evaluation, plain radiographs suffice for screening for osteomyelitis in most patients.

Consider magnetic resonance imaging when more advanced imaging is needed.
For clinically infected wounds obtain a tissue specimen for culture (and Gram-stained smear, if available); avoid culturing superficial swab specimens. Mild (superficial and limited) infection is usually caused by aerobic gram-positive cocci, especially Staphylococcus aureus. Chronic and more severe infections are often polymicrobial, with aerobic gram-negative rods and anaerobes accompanying the gram-positive cocci.

Ulcer treatment

Foot ulcers will heal in the majority of patients if the clinician bases treatment on the principles outlined below.

However, even optimum wound care cannot compensate for continuing trauma to the wound bed, or for inadequately treated ischemia or infection. Patients with an ulcer deeper than the subcutaneous tissues often require intensive treatment, and, depending on their social situation, local resources and infrastructure, they may need to be hospitalized.

Principles of ulcer treatment

Relief of pressure and protection of the ulcer

This is a cornerstone in treating an ulcer associated with increased biomechanical stress:

- The preferred treatment for a neuropathic plantar ulcer is a non-removable knee-high offloading device; either total contact cast (TCC) or removable walker rendered irremovable
- When a non-removable TCC or walker is contra-indicated, use a removable device
- When these devices are contra-indicated, use footwear that best offloads the ulcer
- In non-plantar ulcers, consider offloading with shoe-modifications, temporary footwear, toe-spacers or orthoses
- If other forms of biomechanical relief are not available, consider felted foam, in combination with appropriate footwear
- Instruct the patient to limit standing and walking, and to use crutches if necessary

Restoration of skin perfusion

- In patients with either an ankle pressure <50mm Hg or ABI <0.5 consider urgent vascular imaging and, when appropriate, revascularisation. If the toe pressure is <30mmHg or TcpO2 is <25 mmHg a revascularization should also be considered.
- When an ulcer is not showing signs of healing within 6 weeks, despite optimal management, consider revascularisation, irrespective of the results of the tests described above
- If contemplating a major (i.e. above the ankle) amputation, first consider the option of revascularization
- The aim of revascularisation is to restore direct flow to at least one of the foot arteries, preferably the artery that supplies the anatomical region of the wound
- Select a revascularisation technique based on both individual factors (such as morphological distribution of PAD, availability of autogenous vein, patient co-morbidities) and local expertise
- Pharmacological treatments to improve perfusion have not been proven to be beneficial
- Emphasize efforts to reduce cardiovascular risk (cessation of smoking, control of hypertension and dyslipidemia, use of aspirin or clopidrogel)

Treatment of infection

Superficial ulcer with skin infection (mild infection):

- Cleanse, debride all necrotic tissue and surrounding call.
- Start empiric oral antibiotic therapy targeted at Staphylococcus aureus and streptococci (unless there are reasons to consider other likely pathogens)
- Deep (potentially limb-threatening) infection (moderate or severe infection):
- Urgently evaluate for need for surgical intervention to remove necrotic tissue, including infected bone, and drain abscesses
- Assess for PAD; if present consider urgent treatment, including revascularisation
- Initiate empiric, parenteral, broad-spectrum antibiotic therapy, aimed at common gram-positive and gram-negative bacteria, including anaerobes
- Adjust (constrain, if possible) the antibiotic regimen based on clinical response and culture and sensitivity results

Metabolic control and treatment of co-morbidity

- Optimise glycemic control, if necessary with insulin
- Treat oedema or malnutrition, if present

Local wound care

- Inspect the ulcer frequently
- Debride the ulcer (with scalpel), and repeat as needed
- Select dressings to control excess exudation and maintain moist environment
- Consider using negative pressure therapy to help heal post-operative wounds
- Consider systemic hyperbaric oxygen treatment in poorly healing wounds; this treatment may hasten wound healing
- The following treatments are not well-supported for routine wound management:
- Biologically active products (collagen, growth factors, bio- engineered tissue) in neuropathic ulcers
- Silver, or other anti-microbial agent, containing dressings

Note: *Do not use footbaths in which the feet are soaked, as they induce skin maceration.*

Education for patient and relatives

- Instruct patients (and relatives or carers) on appropriate self-care and how to recognize and report signs and symptoms of new or worsening infection (e.g., onset of fever, changes in local wound conditions, worsening hyperglycaemia)
- During a period of enforced bed rest, instruct on how to prevent an ulcer on the contra- lateral foot
- Prevention of recurrence

- Once the ulcer is healed, include the patient in an integrated foot-care programme with life-long observation, professional foot treatment, adequate footwear, and education
- The foot should never return in the same shoe that caused the ulcer

Organization

Successful efforts to prevent and treat foot complications depend upon a well-organised team, that uses a holistic approach in which the ulcer is seen as a sign of multi organ disease, and that integrates the various disciplines involved. Effective organisation requires systems and guidelines for education, screening, risk reduction, treatment, and auditing.

Local variations in resources and staffing often dictate how care is provided, but ideally a foot care programme should provide the following:

- Education for people with diabetes and their carers, for healthcare staff in hospitals and for primary healthcare providers
- A system to detect all people who are at risk, with annual foot examination of all persons with diabetes
- Measures to reduce risk of foot ulceration, such as podiatric maintenance care and appropriate footwear
- Prompt and effective treatment of any foot complication
- Auditing of all aspects of the service to identify problems and ensure that local practice meets accepted standards of care
- An overall structure designed to meet the needs of patients requiring chronic care, rather than simply responding to acute problems when they occur.

Many studies around the world have shown that setting up a multidisciplinary foot care team is associated with a drop in the number of diabetes related lower extremity amputations. If it is not possible to create a full team from the outset, aim to build one step-by-step, introducing the various disciplines as possible. This team must first and foremost be a team that acts with mutual respect and understanding, that works in both primary and secondary care settings, and that has at least a member available for consultation or patient assessment at all times.

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Addendum

Sensory foot examination

Neuropathy can be detected using the 10 g (5.07 Semmes-Weinstein) monofilament, tuning fork (128 Hz), and/or cotton wisp.

Semmes-Weinstein monofilament (Figures 5 and 6)

Figure 5: *Sites to be tested with the monofilament*

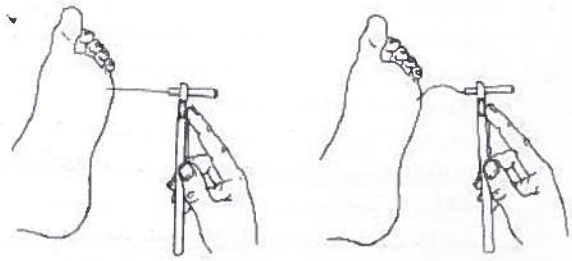

Figure 6: *Application of the monofilament*

- Sensory examination should be carried out in a quiet and relaxed setting. First apply the monofilament on the patient's hands (or elbow or forehead) so that he or she knows what to expect.
- The patient must not be able to see whether or where the examiner applies the fi lament. The three sites to be tested on both feet are indicated in Figure 5.
- Apply the monofilament perpendicular to the skin surface (Figure 6a).
- Apply sufficient force to cause the fi lament to bend or buckle (Figure 6b).
- The total duration of the approach - skin contact and removal of the fi lament - should be approximately 2 seconds.

- Apply the fi lament along the perimeter of, not on, an ulcer site, callus, scar or necrotic tissue.
- Do not allow the fi lament to slide across the skin or make repetitive contact at the test site.
- Press the fi lament to the skin and ask the patient whether they feel the pressure applied ('yes'/'no') and next where they feel the pressure ('left foot'/'right foot').
- Repeat this application twice at the same site, but alternate this with at least one 'mock' application in which no fi lament is applied (total three questions per site).
- 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 - the patient is then considered to be at risk of ulceration.
- Encourage the patients during testing by giving positive feedback.
- The healthcare provider should be aware of the possible loss of buckling force of the monofilament if used for too long a period of time.

Tuning fork

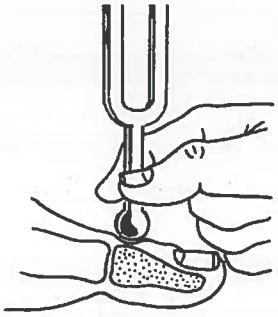

Figure 7: *How to use a tuning fork*

- The sensory exam should be carried out in a quiet and relaxed setting. First, apply the tuning fork on the patient's wrists (or elbow or clavicle) so that he or she knows what to expect.
- The patient must not be able to see whether or where the examiner applies the tuning fork. The tuning fork is applied on a bony part on the dorsal side of the distal phalanx of the first toe.
- The tuning fork should be applied perpendicularly with constant pressure (Figure 7).
- Repeat this application twice, but alternate this with at least one 'mock' application in which the tuning fork is not vibrating.
- The test is positive if the patient correctly answers at least two out of three applications, and negative ('at risk for ulceration') with two out of three incorrect answers.
- If the patient is unable to sense the vibrations on the big toe, the test is repeated more proximally (malleolus,
- tibial tuberosities).
- Encourage the patient during testing by giving positive feedback

Annexure

Diabetic Foot Risk Assessment Form at ..... Date: __/__/_____

A. Patient's information

Name: _____ Age: _____ yr Gender: (M) (F)

Hospital/Clinic No: _____ Contact info: _____

DM Type: _____ Duration: ____yr Treatment: None/ OHD / Insulin HbA1C: _____

Impaired vision IHD HT CKD CVA PVD Smoking: present/ Past/ None Other: _____

General Assessment

Skin and Nails					
Dry skin	R	L	Web space infection	R	L
Callus/ corns	R	L	Nail bed infection	R	L
Fissures/ cracks	R	L	Ingrowing toe nails	R	L
Mark on the following diagram					
Right			Left		
					
C=Callus F=Fissure E=Cellulitis M=Maceration U=Ulcer A=Amputation					

B. Risk Category

Deformity (Any 1 of the following)	R	L	Neuropathy (any ≥ 1 of the following)	R	L
Hammer toes	R	L	Reduced ankle reflex	R	L
Claw toes	R	L	Positive Monofilament Test -if	R	L
Overlapping digits	R	L	unable to feel less than 8 – (+)		
Bunion	R	L	Positive Vibration Test	R	L
Arch deformities	R	L	Abnormal Biothesiometer Test –	R	L
Charcot	R	L	loss of protective sensation		
Vasculopathy (No palpable DP &PT)	**R**	**L**	**Other**	**R**	**L**
Absent Dorsalis pedis	R	L	Previous ulceration	R	L
Absent Posterior tibial	R	L	Previous amputation	R	L
ABPI	.....	.....	Specify -		
CLI(IF ABPI =<0.5)	R	L	On renal replacement therapy	Y	N

R	L	Low Risk	No risk factors present except callus alone	Annual follow up
R	L	Moderate Risk	Deformity or	6 months follow up
			Neuropathy or	
			Non critical limb ischemia	
R	L	High Risk	Previous ulceration or	3 months follow up
			Previous amputation or	
			On renal replacement therapy or	
			Non critical limb ischemia in combination with callus and/or deformity	

Please circle appropriate box

Diabetic Foot Risk Assessment Form at ..... Date: __/__/_____

C. Emergency acute foot conditions

Acute Diabetic Foot					
Cellulitis	R	L	Gangrene	R	L
Acute Ulcer	R	L	Acute Charcot	R	L
Sepsis	R	L	Other	R	L

D. Foot care & Footwear

Foot care			Footwear		
Satisfactory Foot hygiene	Y	N	Appropriate footwear	R	L
Education received	Y	N	Normal shoe	R	L
Satisfactory adherence	Y	N	Diabetic Shoe	R	L
			Therapeutic shoe	R	L

E. Referrals & Treatment

Treatment	Referrals
Debridement of callus	Diabetic clinic
Offloading shoe	Vascular clinic
Medication	Ulcer clinic
Education	Orthotist
Physiotherapy	Other

Comments:.....

.....

.....

.....

.....

.....

.....

.....

.....

Signature :.....

Name : .....

Designation: :.....

Please circle appropriate box

Wound Assessment Form 1

Name: _____ Address : _____ Hospital: _____ Hospital No _____	Gender: M F Age: _____Yr Contact No: _____ Date: _____
Co morbidities DM / Anaemia / CKD/ IHD/ CVA/ Immune Compromised/ Chronic disease/ Malignancy/ Mal nutrition/ PVD/ CVI/ Other:	Consented for Treatment: Yes No Allergies: Yes No _____

SITE

RIGHT

Forefoot/Midfoot/Hind foot

Wound	
No	Site
R1	
R2	
R3	
R4	

LEFT

Forefoot/Midfoot/Hind foot

Wound	
No	Site
L1	
L2	
L3	
L4	

ISCHEMIA

Side	Claudication	Rest pain	Palpable DP	Palpable PT	ABPI	PVD
Right	Yes No	Yes No	Yes No	Yes No	_____	Yes No
Left	Yes No	Yes No	Yes No	Yes No	_____	Yes No

NEUROPATHY

Side	Pain	Positive Monofilament Test	Absent Vibration sensation	Absent Ankle Reflex	Positive Biosthesiometer	Neuropathy
Right		Yes No	Yes No	Yes No	Yes No _____	Yes No
Left		Yes No	Yes No	Yes No	Yes No_____	Yes No

BACTERIAL INFECTION

Side	Infected	PTB positive		X-ray (Date/findings)	MRI (Date/findings)	Microbiology (Date/findings)
		positive	Number			
Right	Yes No	Yes No	1/2/3/4			
Left	Yes No	Yes No	1/2/3/4			

Please circle or fill the entries with in the given boxes

SLDC-Diabetic foot wound assessment form Version 1

Wound Assessment Form 1

AREA (CM^2)					
Side	Wound 1	Wound 2	Wound 3	Wound 4	Largest Area
Right					$<1cm^2$ / $>1\ cm^2$
Left					$<1cm^2$ / $>1\ cm^2$

DEPTH					
Side	Wound 1	Wound 2	Wound 3	Wound 4	Deepest layer involved
Right	S/SC/MT/B	S/SC/MT/B	S/SC/MT/B	S/SC/MT/B	S/SC/MT/B
Left	S/SC/MT/B	S/SC/MT/B	S/SC/MT/B	S/SC/MT/B	S/SC/MT/B
S- Skin, SC- Subcutaneous tissue, MT- Muscle and tendons, B- Bone and Joints					

SINBAD SCORE							
Side	Site Forefoot 0; other 1	Ischemia One or more palpable pulse -0 No pulse 1	Neuropathy No LOPS- 0 LOPS - 1	Bacteria No infection- 0 Infected- 1	Area $<1cm^2$- 0 $>1cm^2$- 1	Depth Skin and Subcutaneous only- 0 Deep- 1	Total score
Right							
Left							

INITIAL WOUND MANAGEMENT				
Wound management aims	Debride	Deslough	protect	Hydrate
	Reduce bacterial load	Reduced odour	Keep dry	Encourage granulation

Debridement method		Fixation method	
Cleansing solution		Other instruction	
Primary dressing		Frequency of dressing change	
Secondary dressing		Next assessment date	

Referral	Orthotist	Endocrine	Vascular	Plastic	Dietician	Other

Photograph taken	yes	no	Wound mapped	yes	No

PAIN ASSESSMENT											
Severity	0	1	2	3	4	5	6	7	8	9	10
Frequency	At dressing			On movement		Continuous			Other		

FOOT CARE			FOOTWEAR	R	L
Foot hygiene	Satisfactory / Unsatisfactory		Type of shoe (N=Normal shoe, D= Diabetic shoe, T-Therapeutic shoe		
Education received	Yes	No	Appropriate footwear	Y / N	Y / N
Adherence	Satisfactory	Unsatisfactory .	Remarks		

Please circle or fill the entries with in the given boxes

SLDC-Diabetic foot wound assessment form1 Version 1

ඇවිද්ද පය දහස් වටී

ලොව අසිරිය දැකීමට ඔබට රැගෙන යන දෙපා ඔබට නොදන්වාම දියවැඩියාව විසින් අහිමි කරනු ඇත. ලොව කොතැනක හෝ සෑම තත්පර විස්සකට වරක්ම මෙය සිදුවන බව ඔබ දන්නවාද?

ඔබේ මුහුණ මෙන් දෙපා ද රැක බලාගන්න

SLDC

P-FOOT

ඔබ පළඳින පාවහන් යුගලය සම්බන්ධයෙන් සැලකිය යුතු කරුණු

- පාවහන් මිලදී ගෙ ගුරුතේ දවසේ සවස් කාලයෙදී බව මතක තබා ගන්න
- පාදය තෙදින් ආරක්ෂා වන පාවහන් පැලඳීම
- ඇතුලත වාට අඩු වම සහ වම වාට සිසිදුවට සාදා තිබීම
- අමතර ගැඹුරක් සහිත වමෙන් දෙපයට මනා ඉඩකඩක් ලැබීම
- වලුඹ ප්‍රදේශය මනා ලෙස තොසෙල් වී තබා ගැනීමට හැකිව තිබීම
- ඇඟිලි සඳහා මනා ඉඩක් සහිත වීම

- ශක්තිමත් නම්‍යශීලී මැද අඩියක් සහිත වමෙන් ඇවිදීමට පහසු වීම
- තද අඩියක් සහිත වම මගින් අඩිය පසාරු වීමෙන් වන තුවාල අවම කිරීම

සමහර අවස්ථා වලදී වෛද්‍ය උපදෙස් මත විශේෂ පාවහන් නිර්දේශ කරනු ලැබේ

වහාම වෛද්‍ය උපදෙස් ලබා ගත යුතු අවස්ථා

සමෙහි තුවාල

යටි පතුල් පැලීමක්

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සම රතු පැහැවීම සහ පාද වල අසාමාන්‍ය රස්නයක්

ගල් තැලුම්

දිය පටිටා

නියපොතු ආසාදන

ඇඟිලිසරු වණ වීම

SLDC

D-FOOT

දියවැඩියා රෝගයෙන් ඔබේ දෙපයට සිදු විය හැකි දේ

- පාදයේ ස්නායු ක්‍රියාකාරිත්වය අඩු වීම
- හැඩය විකෘති වීම
- රුධිර සැපයුම අඩාල වීම
- ප්‍රතිශක්තිමය ක්‍රියාදාමය දුර්වල වීම

මෙම ප්‍රතිඵලයක් ලෙස පාදයේ තුවාල හටගන්නා අතර ඒවා සුව වීම පමා වී අවසානයේදී පාදය අහිමි වීය හැකිය

පාදයේ ස්නායු ක්‍රියාකාරිත්වය අඩු වීමෙන් සිදු විය හැකි දේ

අසාමාන්‍යය වේදනාව

මිට වැටීම සහ දැනීම අඩුවීම නිසා අසාත්මිකව සිදුවීමෙන් තුවාල ඇති වීම

සම වියළීම හා පරිපාලනු රුධිරය නිසා අසාධ්‍ය අත්විඳීම

පාදයේ ස්වභාවික සහනය වෙනස් වීම නිසා තල් සෑදීම් ඇති වීම

පාදයේ රුධිර සැපයුම අඩාල වීමෙන් සිදු විය හැකි දේ

පාදයේ තද වේදනාව සහිත තුවාල ඇති වී සුව නොවී පැවතීම

පාදයේ කොටසක් හෝ ඇඟිලි හරස් ව දුර්වර්ණ වීම ඉෂ්කේමියා

පාද අහිමි වීම වළක්වාගන්නේ කෙසේද ?

පාදය හිසි ලෙස ආරක්ෂා කර ගැනීමෙන් සහ අවදානම් තත්ව කල් තබා හඳුනා ගැනීමෙන් පාද අහිමි වීම වළක්වාගත හැකිය.

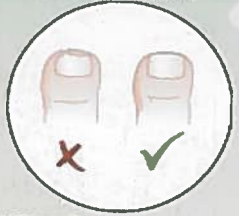
ඔබ කළ යුතු දේ

දිනපතා සහිත සහ රළුය කොටු පාද සහ අඟිලිතරය අතර කෝදා පිරිසිදු කර සෝදා

පාදය පිසදා කොදින් වේලා සෝදා විශේෂයෙන් අඟිලිතරය වියළිව තබා ගන්න

සම වියළීම වැළැක්වීමට සුදුසු ලිහිල් වර්ගයක් ආලේප කරන්න

දිනපතා කොදින් පරීක්ෂා කළ පාදයේ අවධානය අවශ්‍ය තල් සෑදීම් ඉවත්කිරීම සහ ආසන්නතම වෛද්‍ය ඇසි ඇසි දැනි නිරීක්ෂණය කරන්න මේ සඳහා ඔබට වෙනත් අයෙකුගේ ආධාරය ලබා ගත හැකිය



පාදවලට හරව පාවහන් නැහැ හිසිය හැකි ආසන්නතම දවස ඉවත් කරන්න

අතේකිය වටිනා වලු පාවහන් කොණ්ඩිය ගැටලිය හිර වී සඳහා දැන්ද් සහතය හෝ පාවහන් නොවිය යුතු

පාද පරීක්ෂා කරන්න වැඩුව ඉන්නවාරව පාවහන් වෙනස්

සමතුලිත ආහාර හිසි විවේකය සහ ප්‍රතිසාර ඔබේ ශරීරයේ හිසි පරිදි සම්පාදන ආහාර වේලවල් සෝදා ගන්න

ඔබ නොකළ යුතු දේ

දුම් බීම

පාවහන් රහිතව ඇවිදීම

හා හෙවිසිව දැනු වැලැ සහිත කිරීම

ඇඟිලිතරය අතර සිදු සෑදීම

හිස අත වළඳ කිරීම

තල් සෑදීම් සහ වේගයේ ඇඟිලි සඳහා පමණක් ප්‍රතිකාර කර යැවීමට උත්සාහ කිරීම

හා මුදු පෙළඹීම

රෝග තත්ත්ව පාවහන් පෙළඹීම