

QUICK REFERENCE  
FOR HEALTHCARE PROVIDERS

MANAGEMENT OF  
**DIABETIC FOOT**

(SECOND EDITION)



Ministry of Health  
Malaysia



Malaysian Orthopaedic  
Association



Malaysian Endocrine  
& Metabolic Society



Family Medicine  
Specialists  
Association of  
Malaysia



Academy of  
Medicine Malaysia

## KEY MESSAGES

1. Diabetic foot can be defined as infection, ulceration or destruction of tissues of the foot associated with neuropathy and/or peripheral arterial disease (PAD) of people with diabetes mellitus (DM).
2. Screening for diabetic peripheral neuropathy and PAD should be performed on all DM patients at diagnosis and repeated at least annually.
3. Patients with active diabetic foot problem should be referred urgently and seen within 24 hours in secondary/tertiary care.
4. University of Texas Classification is the preferred classification for diabetic foot.
5. Patient education should be an integral part in the management of diabetic foot; performed at least annually and more frequent in higher risk patients.
6. Prevention of Diabetic Foot Ulcer (DFU) consists of metabolic control, preventive footwear and preventive surgery.
7. Appropriate analgesia and antibiotics (as an adjunct) are important pharmacotherapy in DFU.
8. Appropriate wound dressing is done to maintain adequate moisture in addition to surgical debridement to remove dead tissue by trained healthcare providers in DFU.
9. Revascularisation should be offered in DM patients with PAD.
10. All patients with diabetic foot who has amputation should be referred for rehabilitation.

This Quick Reference provides key messages & a summary of the main recommendations in the Clinical Practice Guidelines (CPG) Management of Diabetic Foot (Second Edition).

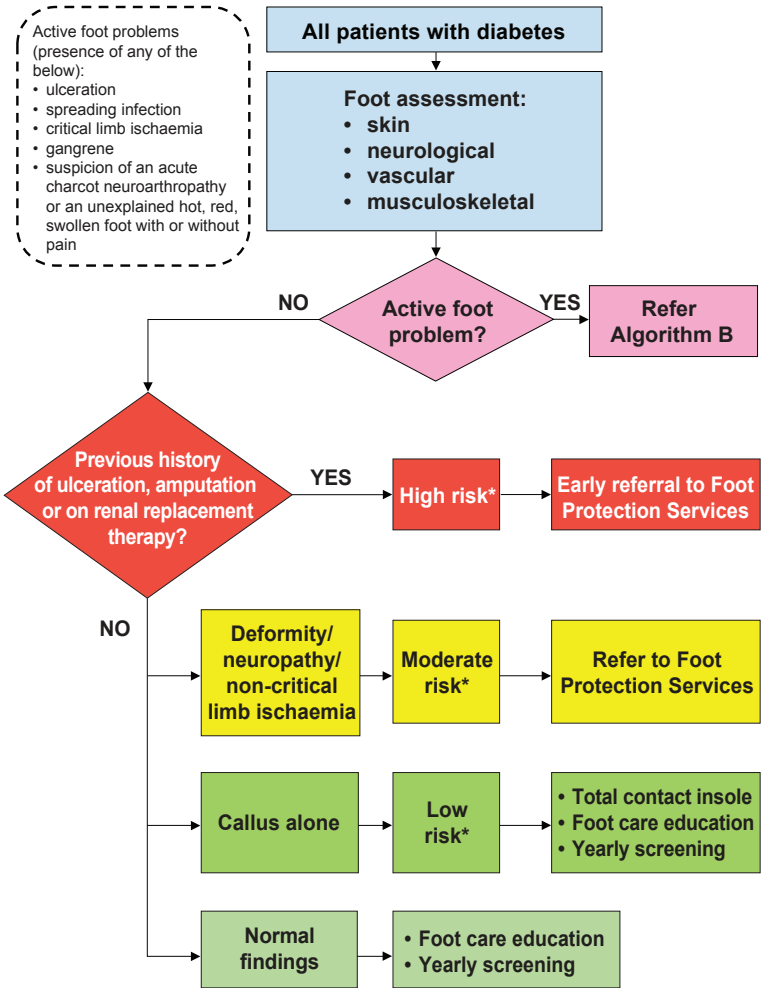
Details of the evidence supporting these recommendations can be found in the above CPG, available on the following websites:

Ministry of Health Malaysia : [www.moh.gov.my](http://www.moh.gov.my)  
Academy of Medicine Malaysia : [www.acadmed.org.my](http://www.acadmed.org.my)  
Malaysian Orthopaedics Association : <http://www.moa-home.com>  
Malaysian Endocrine and Metabolic Society : <http://www.mems.my>  
Family Medicine Specialists Association of Malaysia: <http://ffms-malaysia.org>  
Malaysian Association of Rehabilitation Physicians : <https://marp.online>

### CLINICAL PRACTICE GUIDELINES SECRETARIAT

Malaysian Health Technology Assessment Section (MaHTAS)  
Medical Development Division, Ministry of Health Malaysia  
Level 4, Block E1, Presint 1,  
Federal Government Administrative Centre 62590  
Putrajaya, Malaysia  
Tel: 603-88831229  
E-mail: [htamalaysia@moh.gov.my](mailto:htamalaysia@moh.gov.my)

## ALGORITHM A. SCREENING OF DIABETIC FOOT



### Foot Assessment

- Semmes-Weinstein monofilament examination should be combined with another modality (pin prick or 128-Hz tuning fork) in the screening of peripheral neuropathy.
- Palpation of foot pulses should be the initial screening method for PAD.

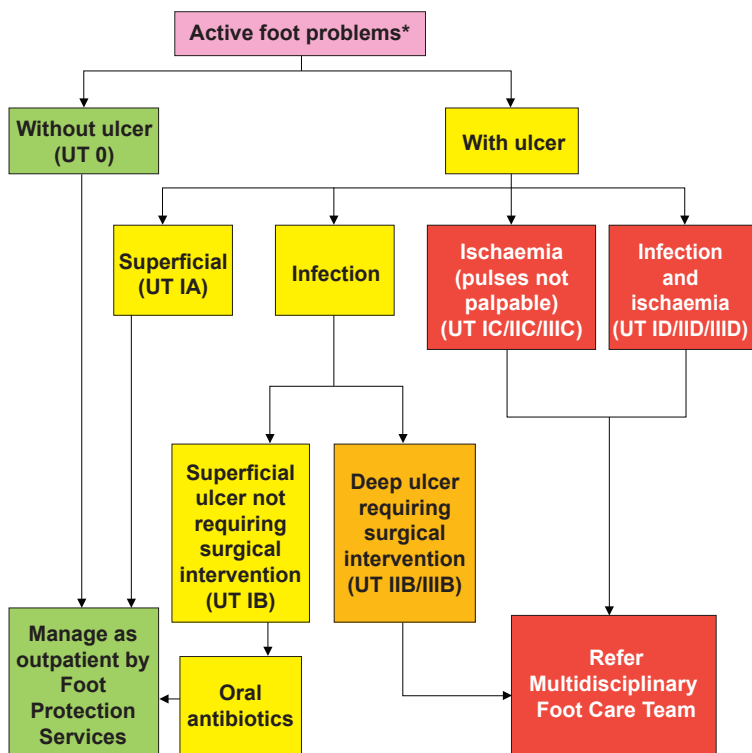
## DIABETIC FOOT RISK STRATIFICATION

| Diabetic foot risk                  | Findings  |
|-------------------------------------|---|
| <b>Normal</b>                       | No abnormalities  |
| <b>Low Risk</b>                     | Callus alone  |
| <b>Moderate Risk</b>                | Any of the following: <ul style="list-style-type: none"> <li>• deformity</li> <li>• neuropathy</li> <li>• non-critical limb ischaemia</li> </ul>  |
| <b>High Risk</b>                    | One of the following: <ul style="list-style-type: none"> <li>• previous ulceration</li> <li>• previous amputation</li> <li>• on renal replacement therapy</li> <li>• neuropathy and non-critical limb ischaemia</li> <li>• neuropathy with callus and/or deformity</li> <li>• non-critical limb ischaemia with callus and/or deformity</li> </ul> |
| <b>Active Diabetic Foot Problem</b> | Any of the following: <ul style="list-style-type: none"> <li>• ulceration</li> <li>• infection</li> <li>• critical limb ischaemia</li> <li>• gangrene</li> <li>• suspicion of an acute Charcot neuroarthropathy, or an unexplained hot, red, swollen foot with or without pain</li> </ul>   |

## RECOMMENDED REFERRAL SCHEDULE

| Risk                                | Referral  |
|-------------------------------------|---|
| <b>Normal/Low risk</b>              | No referral needed. Yearly review at primary care                   |
| <b>Moderate risk</b>                | Referral within three months to foot protection services            |
| <b>High risk</b>                    | Early referral within two weeks to foot protection services         |
| <b>Active diabetic foot problem</b> | Urgent referral within 24 hours to multidisciplinary foot care team |

## ALGORITHM B. ACTIVE FOOT PROBLEMS (WITH RISK STRATIFICATION)



\*Refer urgently for admission if patients present with general illness (e.g. sepsis or diabetic emergencies) irrespective of foot problems.

### University of Texas Classification of Diabetic Foot

|         | GRADE 0  | GRADE I  | GRADE II                               | GRADE III                          |
|---------|--|--|--|------------------------------------|
| STAGE A | Pre- or post-ulcerative lesion completely epithelialised | Superficial wound, not involving tendon, capsule or bone | Wound penetrating to tendon or capsule | Wound penetrating to bone or joint |
| STAGE B | With infection   | With infection   | With infection                         | With infection                     |
| STAGE C | With ischaemia   | With ischaemia   | With ischaemia                         | With ischaemia                     |
| STAGE D | With infection and ischaemia                             | With infection and ischaemia                             | With infection and ischaemia           | With infection and ischaemia       |

UT: University of Texas

## FOOT PROTECTION TEAM

- Foot protection team is led by a Family Medicine Specialist or physician with special training in diabetic foot problems and supported by podiatrists, diabetic team (including diabetic educators), wound care team and rehabilitation services.
- It provides services in prevention of diabetic foot problems for low, moderate and high risk feet and management of simple active diabetic foot problems in the community that do not require admission.

## MULTIDISCIPLINARY FOOT CARE TEAM

- The multidisciplinary foot care team in the hospital is led by the orthopaedic surgeon and/or physician and consists of other specialists in diabetes management e.g. vascular surgeons, rehabilitation physicians, occupational therapists, podiatrists, diabetes educators and wound care team.
- It manages active or complex diabetic foot problems.

## DIABETIC FOOT EDUCATION

Personal foot care should be emphasised which includes:

- checking that feet are in good order
- keeping feet clean
- providing skin care
- keeping toenails at a good length
- choosing and wearing good fitting footwear
- getting help if a problem is noticed

## FOOTWEAR ADVICE

| Risk status                  | Actions   |
|------------------------------|---|
| <b>All foot at-risk</b>      | <ul style="list-style-type: none"> <li>• Advise on using footwear that fits, protects and accommodates the shape of the feet (with socks).</li> </ul>   |
| <b>Moderate or high-risk</b> | <ul style="list-style-type: none"> <li>• Prescribe footwear with:               <ul style="list-style-type: none"> <li>◦ custom-made in-shoe orthoses or insoles for people with foot deformity or pre-ulcerative lesions</li> <li>◦ off-loading orthoses or insoles for people with healed plantar foot ulcer</li> </ul> </li> <li>• Review prescribed footwear periodically to ensure it still fits, protects, and supports the foot</li> <li>• Advise on wearing footwear at all times, both indoors and outdoors</li> </ul> |
| <b>Foot ulceration</b>       | <ul style="list-style-type: none"> <li>• Prescribe appropriate off-loading devices for ulcer healing</li> </ul>   |

## TYPES OF WOUND DRESSING IN DIABETIC FOOT

| No.                                  | Types of dressing   | Advantages   | Disadvantages  | Indications   | Contraindications  | Review intervals |
|--------------------------------------|---|--|--|---|--|------------------|
| <b>Basic wound contact dressings</b> |   |  |  |   |  |                  |
| 1.                                   | Gauze/basic absorbent with paraffin or similar (antiseptics or antibiotics) | <ul style="list-style-type: none"> <li>Reduces adherence of dressing to the wound</li> <li>Widely available</li> </ul>   | <ul style="list-style-type: none"> <li>Minimal exudate absorption</li> <li>Requires secondary dressing</li> </ul>                      | All wounds  | Allergy  | Daily            |
| <b>Advanced wound dressings</b>      |   |  |  |   |  |                  |
| 1.                                   | Hydrogel  | <ul style="list-style-type: none"> <li>Provides moist environment</li> <li>Acts as enzymatic debridement</li> <li>Promotes granulation</li> </ul>  | <ul style="list-style-type: none"> <li>Requires secondary dressing</li> </ul>  | <ul style="list-style-type: none"> <li>Sloughy wound</li> <li>Dry wounds</li> </ul>                                   | <ul style="list-style-type: none"> <li>Highly exudative wounds</li> <li>Allergy</li> </ul>                       | 1 - 2 days       |
| 2.                                   | Alginate  | <ul style="list-style-type: none"> <li>Forms gel on wound and maintain moisture</li> <li>Acts as cavity filler</li> <li>Absorbent in exudative wounds</li> <li>Promotes haemostasis</li> <li>Low allergenic</li> </ul> | <ul style="list-style-type: none"> <li>Requires secondary dressing</li> <li>Gel can be confused with slough or pus in wound</li> </ul> | <ul style="list-style-type: none"> <li>Moderately or highly exudative wounds</li> <li>Need for haemostasis</li> </ul> | <ul style="list-style-type: none"> <li>Dry wounds</li> <li>Allergy</li> </ul>                                    | 2 - 3 days       |
| 3.                                   | Hydrofibre  | <ul style="list-style-type: none"> <li>Maintains moisture</li> <li>Longer wear time</li> <li>Non-traumatic upon removal</li> <li>Reduces risk of maceration</li> <li>Can be used on infected wounds</li> </ul>         | <ul style="list-style-type: none"> <li>Not helpful for dry wounds</li> <li>Requires secondary dressings</li> </ul>                     | Moderately or highly exudative wounds   | Allergy  | 2 - 5 days       |
| 4.                                   | Foam  | <ul style="list-style-type: none"> <li>Maintains moisture</li> <li>Highly absorbent</li> <li>Cushioning property</li> </ul>  | Limited size   | Moderately or highly exudative wounds   | <ul style="list-style-type: none"> <li>Dry wounds</li> <li>Wounds that need frequent review</li> </ul>           | 2 - 3 days       |
| 5.                                   | Hydrocolloid  | <ul style="list-style-type: none"> <li>Maintains moisture</li> <li>Cleans and debrides by autolysis</li> <li>Easy to use</li> <li>Waterproof</li> </ul>  | Induces peri-wound maceration  | Mildly to moderately exudative wounds   | <ul style="list-style-type: none"> <li>Dry wounds</li> <li>Infection</li> <li>Highly exudative wounds</li> </ul> | 2 - 3 days       |
| 6.                                   | Silver  | <ul style="list-style-type: none"> <li>No known resistance</li> <li>Bactericidal</li> </ul>  | Some silver dressings discolour the wound  | Infective wounds  | Allergy  | 3 - 5 days       |
| 7.                                   | Others  | Not widely used - some may be used in specialised centres e.g. collagen, matrix and regenerative dressings (cultured epidermis, growth factors, stem cells, etc.)  |  |   |  |                  |

## ANTIBIOTICS

- In diabetic foot, antibiotics should be given:
  - only when there are local or systemic symptoms of infection (but not for prevention of infection)
  - based on the disease severity, care setting, patient's preference, clinical situation, medical history and the most recent culture and sensitivity (C&S) report
  - not more than 14 days for mild soft tissue infection in diabetic foot
- For moderate and severe infections in diabetic foot, broad spectrum antibiotics are used initially until C&S results are available.

\*Refer Appendix 9 on Types of Infections in Diabetic Foot and Suggestions of Treatment in the CPG.

## SURGICAL INTERVENTION

- **Revascularisation**
  - All DFU with absent lower limb pulses mandates revascularisation when feasible.
- **Debridement**
  - Infected and non-viable tissue must be debrided in DFU.
- **Reconstruction**
  - Skin grafting is an adjunct to standard care in the management of DFU.

## REHABILITATION

- **Ulcer Management**  
Off-loading is a key treatment strategy for the management of DFU. It can be done by using non-removable [e.g. total contact cast and instant total contact cast] or removable (e.g. removable cast walker, therapeutic footwear and padding) devices. Off-loading should be offered to patients with plantar DFU.
- **Post-amputation Rehabilitation**  
Rehabilitation of amputees encompasses pre-amputation, post-operative, pre-prosthetic and prosthetic stage, within which an amputee is provided with prosthesis. It also includes subsequent long-term monitoring and follow-up. Multidisciplinary approach is required to achieve successful re-integration of an amputee into the community.

## MONITORING AND FOLLOW-UP

Frequency of monitoring of patients with diabetic foot depends on risk stratification as shown below:

| Risk      | Low Risk | Moderate Risk | High Risk            |                   |
|-----------|----------|---------------|----------------------|-------------------|
|           |          |               | No immediate concern | Immediate concern |
| Frequency | Annually | 3 - 6 months  | 1 - 2 months         | 1 - 2 weeks       |