

# An Evidence-Based Policy Brief Improving Foot Care in Diabetic Patients: Reduces Amputations

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## Abstract

**Included:** • *Description of a health system problem;* • *Possible options for addressing this problem;* • *Strategies for implementing these options.* **Not included: recommendations** *This policy brief does not make recommendations regarding which policy to choose.* **Who is this policy brief for?** Policymakers, healthcare professionals, training institutions and other stakeholders that have an interest in the problem addressed in this evidence-based policy brief, Community leaders, non-governmental organizations. **Why was this policy brief prepared?** To inform discussions about health policies and programmes in relation to diabetic foot care by summarising relevant literature available on foot care in diabetic patients and possible solutions to reduce amputations. **What is an evidence-based policy brief?** Evidence based policy briefs bring together global research evidence (from systematic/literature reviews) and local evidence to inform discussions about health policies and programmes. **Systematic review:** A summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise the relevant research, and to collect and analyze data from this research. **Executive Summary:** The evidence presented in this executive summary is summarized from a full brief.

## Keywords

Diabetes, Diabetic Amputations, Diabetic Care, Diabetic Foot, Prevalence

## 1. Introduction

### 1.1. The Problem

**High prevalence of diabetic foot ulcers or amputations in diabetic patients in Malawi.**

There is an increase in the number of lower extremity amputations among

diabetic adult patients in Malawi. In 2010, 8% of diabetic patients had foot ulcers or amputations at Queen Elizabeth Central Hospital (QECH) in Blantyre. Diabetic complications due to chronic hyperglycemia may lead to foot ulcers and amputations. In most instances diabetic foot ulcers are poorly managed as a result of lack of awareness of foot care guidelines among patients and health care providers, as well as shortage of trained health care workers for general diabetes care or specialist treatment.

### 1.2. Policy Options

1) Integrating the treatment, screening, and education of patients into the existing diabetic (NCD) clinic structures; this option will involve regular foot screening and education by the same staff that treats patients at the clinic.

2) Diabetic screening, treatment, follow-up and subsequent referral to other facilities; this option will capture undiagnosed diabetes and link them for early treatment and management and prevent complications.

3) Development of multidisciplinary comprehensive step by step diabetic foot care guidelines for health providers and patients; this option will guide health providers of different domains to manage foot ulcers.

4) Health education and community awareness within community outreach clinics; this option will promote self-care to prevent diabetic foot complications

There is evidence that the options above will help reduce diabetic foot ulcers and minimize amputations. Diabetic foot complications have economic consequences to the patient, family and society.

### 1.3. Implementation Considerations

**A combination of strategies is important to effectively implement diabetic foot care among diabetic patients in Malawi.**

- Existing Non communicable disease (NCD) guidelines, availability of World health Organization package for essential non-communicable disease (WHO PEN) guidelines, well established clinic structures, community outreach programs and the inclusion of diabetes and other NCD in essential health package (EHP) are enablers for the implementation of the policy.
- Inadequate health workers, lack of diagnostic equipment, lack of trained health workers in foot care, and inadequate financial support to sustain the programme are some of the barriers that may hinder the effective implementation of the program and they need to be mitigated.

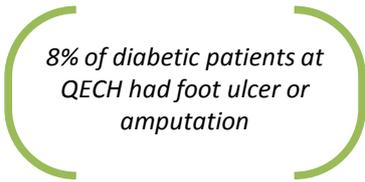
## 2. The Problem

**High prevalence of diabetic foot ulcers or amputations in diabetic patients in Malawi.**

Diabetes Mellitus (DM) has become a major public health problem and mostly affecting people in low and medium income countries and Malawi is inclusive. It is predicated to be the highest cause of morbidity and mortality by 2030. Un-

controlled diabetes leads to life threatening complications that may contribute to mortality, costs and poor quality of life.

There is limited evidence available on the burden of diabetic foot amputation in Malawi; the prevalence of diabetic complications including diabetic foot ulcers have not been described well in studies [1]. However there has been an increase in the number of patients with DFU that may lead to major amputations, toe amputation as and wound debridement among hospitalized diabetic patients in most. A study done at Queen Elizabeth Central Hospital (QECH) showed that 8% of patients had an amputation or had a current ulcer [2]. Patients with diabetes have an **increased** risk of limb amputation due to peripheral neuropathy, peripheral vascular disease, increased risk of infection and poor wound healing.



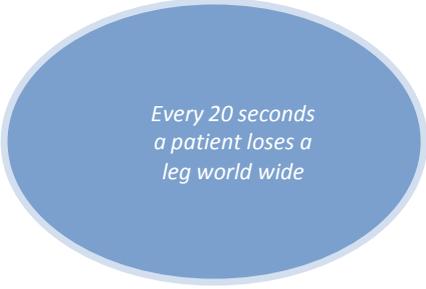
*8% of diabetic patients at QECH had foot ulcer or amputation*

## 2.1. Nature and Magnitude

The prevalence of diabetes in adults aged 24 - 65 was estimated at 5.6% which is high for the country [3]. Allain and colleague reported that 20 new cases of diabetes are registered every week at Queen Elizabeth Central Hospital [4]. Lifestyle transition, ageing population, HIV and low birth weight are some of the reasons for the increase in type 2 diabetes among rural and urban population in Malawi.

The high prevalence of diabetes leads to increased number of patients with diabetic foot disease, up to 8% of diabetic patients at QECH clinic had an amputation or a current ulcer [2]. According to theatre registers for three central hospitals fifty-six (56) cases of amputations were reported for 2017 (unpublished data from theatre registers for 2017). Although Kasiya and colleagues [1] in their study showed a decrease in the number of amputation at a QECH the from 18 in 2010 to 11 in 2016, the number of diabetic foot ulcers was still high. However the study showed high numbers of patient with DFU were lost to follow up. On the other hand patients with toe amputations were also reported in the same study. In another study at the same hospital 38 patients out of 480 (4.5%) participants had amputation or current ulcer [5]. From literature most studies in Malawi were done at QECH and there is need for further study to know the extent of DFU in the country.

Globally every 20 seconds a lower limb amputation is being done somewhere. WHO reports an increase in the lower limb amputations of 10 - 20 times more in diabetic populations than in non-diabetic population [6]. The prevalence of diabetes has increased to 8.5% and deaths from diabetic complications have also increased in the last decade. It is estimated that 50% of patients with foot ulcers and amputations die within 5 years.



*Every 20 seconds  
a patient loses a  
leg world wide*

## **2.2. Factors Underlying the Problem**

Several factors impact on the problem diabetic foot care in diabetic patients in Malawi.

### **2.2.1. Organization and Delivery Arrangements**

In most public, Christian Health Association (CHAM) hospitals and health centres diabetic treatment screening programmes are not available to let alone diabetic foot care. For so long the diabetic treatment has been seen as a specialised area of care and facilities do not have drugs, testing and screening equipment for diabetes leading to referral of diabetic patient and late diagnosis. This has led to most patients having complications as monitoring and control of blood sugar levels is a challenge. On the other hand diabetic treatment was not included in the essential health package (EHP) and hence the drug availability was erratic in these facilities. NCD is yet to be fully implemented in district and health centres and not integrated.

### **2.2.2. Patient and Providers**

Health care workers are not trained and mentored on diabetic care foot management and education. According to [1] health care providers at QECH diabetic clinic have been trained in foot care and management including other district hospitals and health centres in the south. This has improved diabetic foot care and reduced rate of amputations. However, due to shortage of health workers and huge number of patients emphasis is on control of glucose levels and treatment than foot care and education [7].

### **2.2.3. Financing Arrangement**

Funding mechanism can affect the implementation of diabetic foot care. Low funding may affect early diagnosis, treatment and prevention of complications.

## **3. Policy Options**

The policy options presented in this brief are not exhaustive, but represent diabetic foot care interventions that could be feasibly adapted for the local context supported by high quality research evidence. The three policy options can be adopted independently, or could complement one another. Diabetic foot complications and amputations can be reduced through proper screening, treatment and education, early diagnosis.

### **3.1. Integrating the Treatment, Screening, and Education of Patients into the Existing Diabetic (NCD) Clinic Structures**

This policy option will involve integrating diabetic foot screening care and education into the existing diabetic, or NCD and HIV services. All patients with diabetes and neuropathy shall have their feet examined regularly by health care providers to detect risks for foot complications. An integrated approach to foot care can reduce health care cost and reduce complications and amputation. Integration of care with regular screening and education of at risk patients has been identified as an intervention that can reduce health care expenses [8] [9].

Most patients with diabetes develop peripheral neuropathy (PN) and peripheral vascular disease (PVD) which are risk factors for diabetic foot disease [10]. On the other hand patients with HIV infection and on antiretroviral treatment (ART) may also develop peripheral neuropathy to which diabetes is a risk factor. However the study at QECH found insignificant association between HIV and peripheral neuropathy [5] and further study need to be done. Therefore NCD and HIV clinics can provide an opportunity for foot care management in diabetic, HIV and hypertensive patients. These three conditions require regular monitoring and reliable drug supply and are diagnosed through simple screening tests.

### **3.2. Diabetic Screening, Treatment, Follow-Up and Subsequent Referral to Other Facilities**

This option allows for the capture and identification of undiagnosed diabetes among people in community population and links them for early treatment and management. [1] reports that the prevalence of impaired blood glucose and diabetes is high (5.4%) in rural areas than in urban areas. This means that most people in the rural areas have undiagnosed diabetes and needs to be screened and referred early for treatment to prevent foot complications. Patients with diabetes in the rural area should be screened for foot ulcers and loss of sensation then be referred for management and foot care education. This option will allow for identification of undiagnosed diabetes with referral for early diabetic management to prevent complications [9].

There are limited studies in Malawi that show the prevalence of Diabetic foot disease and its complications, even though the 2009 STEPs survey indicates high prevalence of undiagnosed diabetes. According to [1] foot care clinics can improve diabetic foot complications and prevent amputations.

### **3.3. Development of Multidisciplinary Comprehensive Step by Step Diabetic Foot Care Guidelines for Health Providers and Patients**

This option will guide health providers of different health professions manage foot ulcers. Coordinated inputs from a range of health professionals are required for the effective treatment to reduce the risk of disability or fatal complications and its optimal management. The rate of amputations where multidisciplinary

approach in diabetic foot care was employed reduced from 30.1% to 23.7% [8]. Due to impaired mobility and loss of productivity diabetic foot leads to psychosocial problems to the patient family and community. Therefore there is need for multidisciplinary care to prevent these complications. A multidisciplinary team that comprise of, but not limited to orthopedic surgeon, general surgeon, Medical specialist, nurse, rehabilitation team, psychiatric team can provide comprehensive and integrated foot care. The experience at QECH shows that integrated multidisciplinary care reduces amputations and improves foot ulcers [1].

### **3.4. Health Education and Community Awareness within Community Outreach Clinics**

This option will promote self-care to prevent diabetic foot complications. Patients and providers need to be able to do screening of foot in order to detect foot risks and manage before severe complications. STEP's survey has indicated high prevalence of DM in rural areas and diabetic care is centralised this means that patients may not get thorough check up during clinic follow ups. A study that was done in a developing country with high rates of diabetes amputations on barriers to foot care indicated that glycemic control was one of the priorities for patients and providers than foot care [7]. Primary and secondary care programmes are very crucial in minimizing foot complications which are costly. Therefore integrated and multidisciplinary care should be employed. Primary health care (PHC) approach to diabetic and foot care treatment and screening are important to reduce financial social and psychological effects to patients, family and society [11].

## **4. Implementation Considerations**

Implementation strategies can capitalise on facilitating factors for the policy options to improve the screening and treatment of diabetic foot among diabetic, hypertension and HIV patients as well as addressing the barriers to implementation. Implementing any one of the policy options would necessitate changes in other areas of the health system which require careful examination and planning. Some of the key facilitating factors to improve diabetic foot screening and treatment include:

- Recognition of the burden of diabetic foot complications and amputations in developing countries;
- Existing STEP BY STEP guidelines for diabetic foot care;
- Availability of existing PHC system and well established clinics and community outreach programmes in all the districts in the country;
- Inclusion of NCDs in the essential Health package, national health policy and the national research agenda in Malawi;
- Recognition of foot care program at QECH and other district hospitals in the south can be taken as an enabler since training guides are already in place for foot management.

**Table 1.** Barriers and strategies for improving foot care.

Barriers to implementation	Strategies for addressing implementation barriers
Inadequate health workers	An increased supply and distribution of health care workers that are trained on foot care. Available staff should be provided with financial rewards, career development, continuing education, improved hospital infrastructure, resource availability, better hospital management and improved recognition of health professionals, help reduce on “brain-drain”. Emphasis on pre-school training on diabetes and foot care so that every provider should be knowledgeable Revision of existing diabetes guidelines to include management of diabetic foot ulcers to prevent complications
Limited financial resources to increase screening and treatment of diabetic foot complications	Increased funding support for EHP services Integrating diabetic foot care into already existing well-funded programme or EHP services provided in all health delivery points
Inadequate trained health workers to provide integrated diabetic foot care	In service (CPD) training and mentorship for health care workers on foot care, screening and management Integrated regular supervision, audit and feedback of diabetes and foot care in all existing programmes
Loss to follow up	All diabetic patients should receive comprehensive health education on foot care and sugar level control to prevent complications Emphasise on peer support programmes, proper foot ware, prevention of injuries

**Table 1** summarises the barriers and strategies for improving diabetic foot care among people with diabetes to reduce amputations

## 5. Next Steps

The aim of this policy brief is to foster dialogue and judgment that are informed by available evidence. The intention is not to advocate specific options or close off discussions. Actions will flow from the deliberations that the policy brief is intended to inform. These might include:

- Development of training guidelines and supervision checklist for screening, treatment and education on diabetic foot care;
- Need for further research on the policy options as limited research is available in Malawi on diabetes and foot care. The NCD unit at Ministry of Health is to coordinate all programmes and services to promote cost effective and efficient diabetic care.
- Further research to explore extent or prevalence of the problem in the country, do need assessment of the services required in the community and facility. There is also a need to do a baseline line survey of the foot ulcers and diabetic amputations for the country.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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