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# IDF Clinical Practice Recommendation on the Diabetic Foot: A guide for healthcare professionals <sup>☆</sup>

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## 1. Introduction

The IDF, represented by the Diabetic Foot Stream Committee, a group of diabetes experts dedicated to the care of people with diabetes and especially the prevention and treatment of the diabetic foot (DF), has produced a new guide entitled *Clinical Practice Recommendation on the Diabetic Foot*. The guide, which will be available in April 2017, has been created to help diabetes healthcare professionals better manage the threat of DF in diabetes patient populations. It has been estimated that up to 85% of the one million amputations occurring per year are preventable.

Diabetes is a systemic disease affecting nearly every part of the body, and often feet are the first to be impacted. Key to diabetes treatment is getting ahead of risks and complications to reduce and manage progression of the disease. As the diabetes pandemic progresses so do foot complications and ulcers which precede the majority of lower extremity amputations.

The objective of the *Clinical Practice Recommendation* is to inform healthcare professionals of the crisis related to diabetic foot disease worldwide, persuade them that action is both possible and affordable, and to warn them of the consequences of not taking action. Due to lack of training and other factors, it has been estimated that less than one third of physicians recognize the symptoms of diabetic peripheral neuropathy, the leading cause of DF, even when it is symptomatic.

The new guide will help educate healthcare professionals who may in turn help the millions of people worldwide who live with diabetic foot disease or who are at risk.

The number of adults with diabetes is estimated to be 415 million people worldwide, and low- and middle-income countries have experienced the fastest increases. Diabetes complications lead to heart attack, stroke, blindness, kidney failure and lower limb amputation. The rate of death from diabetes and its complications increased more than 15 percent between 2011 and 2015 despite medical advances, more practitioners working in the medical field and increased diabetes education, including national, regional and global conferences on diabetes at basic and advanced levels.

Diabetes and its complications are rapidly becoming the world's most significant cause of morbidity and mortality. According to data from IDF's Diabetes Atlas (2015), it is predicted that by 2040 there will be over 642 million people with diabetes in the world.

DF is one of the most common and debilitating complications of diabetes caused in part by poorly controlled diabetes or undiagnosed diabetes. With the lifetime incidence of foot ulcers occurring in up to 25% of all people living with the condition, currently it can be estimated that millions of people are or will be affected by DF. Consequently, DF contributes to the majority of diabetes-related hospitalizations and, therefore, accounts for a high percentage of the cost of diabetes worldwide. DF is considered the most common cause of non-traumatic lower limb amputation.

<sup>☆</sup> This article first appeared in the April 2017 issue of the International Diabetes Federation's magazine Diabetes Voice (<http://www.idf.org/diabetesvoice>).

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<http://dx.doi.org/10.1016/j.diabres.2017.04.013>

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The final result of delay in DF diagnosis and inadequately treated DF often leads to one form or another of amputation. DF's impact on the life of an individual, once amputation surgery is required as a lifesaving measure, is economically and socially devastating. If the amputation takes place as a complication of diabetes, morbidity and mortality rates are staggeringly high, and the 5-year mortality rate after an amputation is more than 45 percent. However, the majority of DF problems can be prevented through early detection of risk factors and early intervention of a skilled multidisciplinary foot care team.

As a result of this preventable complication, all diabetes healthcare providers need to unite efforts and exercise greater vigilance in examining the diabetic foot and complications that lead to DF, including neuropathy. Most critical to progress is shifting the treatment focus from acute care to prevention. It is essential that all healthcare practitioners treat people earlier in that 'window of presentation' between the moment when neuropathy presents but before an ulcer develops. More than 85% of amputations start with ulcers. If preventive measures are integrated into the treatment approach, DF and DF amputations will decrease.

According to the *Clinical Practice Recommendation*, it essential for healthcare professionals to concentrate efforts on the following:

1. Educate all persons with diabetes and their relatives to prevent DF: extensive awareness and education can achieve a very significant reduction with early detection and an appropriate timing approach.
2. Once a person with diabetes presents with DF or has any manifestation of DF, it is critical to work intensively with the person with diabetes and family to prevent any type of amputation.

## 2. Etiology and prevention

The etiologies of DF include Peripheral Neuropathy (PN), Peripheral arterial disease (PAD) and infection. Additional to any of these three factors, trauma could be added. The most common cause of trauma is the use of inappropriate shoes and/or insoles.

According to the etiology and natural history of DF, prevention must include the following:

### 2.1. Appropriate shoes and insoles

One of the first and most important preventive measures is to educate people with diabetes to use appropriate shoes which is a significant challenge to practitioners. It is not easy to define appropriate for a diverse worldwide population. However, as a consensus, the following types of shoe protection should be discussed, and usually enforced:

1. High and low temperature prevention.
2. Friction and attrition prevention.
3. Reduce plantar pressure.
4. Provide stability.

5. No foot compression.
6. Easy adjustment.
7. Must help on injury alert.
8. Light weight.
9. Orthotic friendly.
10. Impact absorption.

### 2.2. Early peripheral neuropathy (PN) detection

The second preventive measure is the early detection of PN. Neuropathy is the most frequently encountered complication of diabetes. Diabetic peripheral neuropathy is an impairment of the nerves throughout the body and can alter autonomic, motor, and sensory functions. The reported prevalence of diabetic peripheral neuropathy ranges from 16 percent to as high as 66 percent.

The most important result of the motor PN is the denervation of the foot intrinsic muscles (as a consequent of PN) which interrupts the normal balance between the toes flexors and extensors, resulting in the common diabetic foot deformity.

This deformity will increase the pressure in some points, leading to subcutaneous hematomas, calluses, and if not detected and treated, will produce ulcers.

In the sensitive PN, there are two types: Positive and Negative PN. In the first one the patient will feel specific symptoms including pain, cramp, and/or numbness and a need for specific drug treatment.

The negative PN is the absence of the protective feeling against pain, pressure, temperature and also the absence of the ability to recognize the foot position. In other words, the negative PN will block any protective effect in the feet, and therefore, the person does not feel any foreign body in footwear, lacerations, wounds, improper positioning of the feet or very narrow shoes. As a result of any of the above, lesions in people with negative PN are discovered at a late stage.

The importance of early detection of the PN is to classify people by risk category, and to organize a follow up strategy according to the category (may change from a monthly visit in a very high risk category to a yearly visit in a low risk category).

Educating patients on how to prevent injuries through very specific advice and recommendations is key for prevention. For example, educating a patient on: the correct way to cut toenails; the adequate temperature to wash feet; the application of humectant creams between toes; the threat of walking in bare feet (not even a home environment is safe); the adequate inspection of shoes before daily use searching for the possibility of a foreign body inside; and the use of non-compressive, clear color, cotton socks.

Classification in risk category gives guidelines for professionals on follow-up timing.

### 2.3. Peripheral arterial disease (PAD)

Up to half of all patients with diabetic ulcers have PAD. In people with diabetes, PAD has two specific characteristics:

1. Affects the proximal part of the **aorta, femoral vein** 10–15 years earlier compared with non-diabetic people.
2. The specific arterial lesion in persons with diabetes is the involvement of the distal mid-size arteries (below the knee), resulting in some type of arterial stenosis or obstruction.

The adequate regular peripheral vascular evaluation for all people with diabetes is essential and mandatory to achieve early detection of possible PAD, and this evaluation must include at least: pulse palpation, Ankle-Brachial Index (ABI), and Doppler.

One of the important measures to be assumed as prevention and/or treatment of PAD is exercise. It is clearly demonstrated that daily activity of 30 min walking, at least 5 times/week can increase the distal tissue oxygenation up to 30 percent (more than the usual use of any drug for the same purpose).

The key message to be able to treat diabetes and to prevent any possible complication, including DF, aside from adequately controlling blood glucose, is to inform and motivate multidisciplinary teams attending to DF to make prevention

a priority and after that, to take earlier treatment action for better outcomes and fewer amputations.

