

Fast-track pathway: an easy-to-use tool to reduce delayed referral and amputations in diabetic patients with foot ulceration

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Key words

- Diabetic foot ulcers
- Healthcare professionals
- Limb salvage
- Primary care
- Referral

Delayed patient referrals to specialised diabetic foot clinics lead to a greater risk of adverse clinical outcomes, such as delayed healing and increased risk of amputation. Such delay referrals are often a result of healthcare professionals' and patients' lack of education and knowledge about foot ulcers. This article describes the work of the International Diabetic Foot Care Group and D-Foot International to develop an easy-to-use tool to support primary healthcare professionals in the prompt referral and treatment of patients with diabetic foot ulcers. The fast-track pathway reflects recent International Working Group for the Diabetic Foot guidance and directs treatment based on the severity of a patient's ulcer and comorbidities. The pathway can be adapted to conform with legislation in different countries and has already been tailored for use in the UK, Spain and Germany.

Diabetic foot ulcers (DFUs) remain a considerable and extensive healthcare problem. Although there have been improvements in treatment in recent years, DFUs are still associated with a high risk of amputation and mortality (Armstrong et al, 2007; Morbach et al, 2012). Even though diabetic foot is considered a serious condition, poor outcomes are often associated with the absence of a specific treatment pathway for patients with DFUs. The aim of this article is to propose a specific fast-track pathway (FTP) for people with diabetes and foot ulcers. The FTP should support primary care clinicians and enable early referral to specialised diabetic foot clinics.

Gaps in knowledge

Although considerable efforts have been made to improve knowledge and awareness of the diabetic foot in professionals involved in DFU management,

gaps remain as a result of various factors, such as healthcare system restrictions, lack of patient education and the availability of dedicated facilities (Miller et al, 2014; Guest et al, 2017; Manu et al, 2018). Few clinicians are directly involved in diabetic foot care and healthcare professional knowledge in this field is very poor (Pankhurst et al, 2018). The worldwide lack of recognised podiatry facilities is well documented and it has been reported that only 35 countries have practicing podiatrists trained to treat the diabetic foot (Tulley et al, 2009). Moreover, although specific guidelines have been developed, adherence is low and often influenced by personal opinion (Garcia-Klepzig et al, 2018). A International Diabetic Foot Care Group (IDFCG) and D-Foot International survey, which investigated General Practitioners (GP) perceptions of DFUs in the UK, Spain, Germany and France, confirmed that guidelines and protocols are often not recognised or followed

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as required. In France and Germany, 30–40% of GPs thought that the management of DFUs was unclear due to the absence of a standard of care and specific management pathways for affected patients. Only 40% of Spanish GPs completely agreed with established guidelines. The same survey found that patients with DFUs usually see GPs about their foot problem, and yet 29–40% of the GPs interviewed reported that they are not sufficiently trained in the management of DFUs (Garcia-Klepzig et al, 2018).

There is considerable variation in the management of DFUs in different geographic areas. This heterogeneous approach extends to all aspects of diabetic foot care: offloading, vascular assessment, infection and referral. The Eurodiale study, which described the characteristics and management of a large set of newly-diagnosed DFU patients referred to 14 European centres, reported that offloading was prescribed in just 35% of patients with a plantar ulcer (range: 0–68%) and vascular assessment was performed in only 56% of patients with critical limb ischaemia (range: 14–86%) (Prompers et al, 2008). These findings were echoed in the IDFCG and D-Foot survey, which found that only 50% of GPs in France and the UK appear able to safely prescribe offloading (Garcia-Klepzig et al, 2018). The proportions able to prescribe offloading were better in Spain (63%) and Germany (80%), but still far from ideal. In the UK and France, 30–35% of GPs do not perform any vascular evaluation in patients with DFUs (Garcia-Klepzig et al 2018). In the UK, 4.5 million people are affected by diabetes and 64,000 of these will develop a foot ulcer during their life (National Diabetic Foot Care Audit, 2018). Recently, Guest et al (2018) analysed how patients in the UK with a new diagnosis of DFU were managed in primary care. They found that:

- 22% of patients were referred to specialist diabetic foot clinics
- 5% received offloading or a podiatry referral
- 45% received antibiotic therapy at the first evaluation, despite only 14% having documented infection
- 13% of patients received vascular evaluation.

It is also reported that the need for sharp debridement is frequently a cause of referral to hospital (Garcia-Klepzig et al, 2018). The increased availability of specialised diabetic foot services that

perform these procedures on an outpatient basis may reduce the rate of hospitalisation for DFU in future. Despite this, the organisation of different healthcare systems influences the availability and accessibility of dedicated diabetic foot services for patients. Furthermore, the financial resources available for treating diabetic foot disease vary by country and influence the availability of services, diabetic foot specialists, specific protocols and training courses (Pankhurst et al, 2018).

Reasons for developing a fast-track pathway

Over the years, some research has looked at how specific pathways between primary care and specialised diabetic foot units can be implemented. Despite this work, late referral remains a perennial topic and is a common cause of unfavourable outcomes. Faglia et al (2006) reported that late referral of patients with ischaemic and infected DFUs influences prognosis. Delayed surgical debridement results in a higher rate of amputation in comparison with early surgical debridement (Faglia et al, 2006). Healing is also affected by referral times: the England and Wales Diabetic Foot Care Audit found that patients evaluated within 2 weeks showed a higher rate of healing than patients who waited longer for their assessment (Wise, 2016). This finding was also reported in a retrospective cohort study, which found that wound healing was significantly influenced by time to referral: patients referred by GPs to diabetic foot specialists after 52 days had a reduced rate of healing (>58%) in comparison to those who had an earlier referral (Smith-Strøm et al, 2017).

Primary care professionals should provide the first intervention and instigate early referral to specialist care in accordance with the severity of individual cases. Previous research has shown that GPs often have poor instruction in the management of the diabetic foot and regular foot examinations in diabetic patients are uncommon (Miller et al, 2014). At the same time, the number of people with diabetes is increasing: it is estimated that by 2045, the worldwide prevalence of diabetes will rise to approximately 629 million people. (International Diabetes Federation, 2017). Furthermore, the demand for diabetic foot services is increasing (Guest et al, 2017).

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Box 1. Signs of infection.

- Local swelling or induration
- Erythema around the ulcer
- Local tenderness or pain
- Warmth
- Purulent discharge (thick, opaque to white or sanguineous secretion)

In a recent IDFCG and D-Foot International survey, it was reported that in 55–66% of cases, the duration of DFUs was unknown at the time of first consultation or the diagnosis was delayed by more than 3 weeks from the onset of the wound. Approximately 50% of patients were referred to a diabetic foot specialist after an unknown duration of time or more than 1 month after the onset of ulceration. Furthermore, only 40% of GPs could clearly identify the clinicians involved in diabetic foot management in their local facilities (Manu et al, 2018).

The results of the IDFCG and D-Foot International surveys highlight the need to educate healthcare professionals and increase awareness among patients of diabetic foot problems; the risk related to DFUs and the importance of early referral to specialised clinics is evident. Specific indications of care need to be respected and a standard referral pathway implemented to reduce delays in referral and adverse outcomes.

The fast-track pathway

Late referral can worsen clinical outcomes due to ischaemia, infection, greater wound depth and size. An easy and simple DFU referral pathway that can be followed by primary care clinicians may support GPs and reduce referral times. Based on this objective, young IDFCG academics from five European countries (UK, Spain, Italy, France and Germany) involved in diabetic foot care and senior members of the D-Foot International team collaborated to develop a FTP for patients with DFUs. In addition to developing the pathway, the collaboration provided a specific glossary of terms and a description of standard care to support the FTP.

Patients with DFUs are often very fragile and foot ulceration may be just part of a very complex clinical condition. Comorbidities — mainly heart and renal complications — significantly influence clinical outcomes in these patients (Meloni et al, 2018). A central tenet of the FTP is, therefore, full assessment of the DFU patient. This holistic approach should include a thorough medical history, clinical examination and blood tests, as well as integrating evaluation of the main comorbidities, such as active heart failure, end-stage renal disease and depression. Patients are fast-tracked into three

levels of care, according to the severity of their DFU and comorbidities (*Figure 1*).

Uncomplicated DFUs

Uncomplicated DFUs are defined as superficial, non-infected and non-ischaemic ulcers. The absence of infection should be confirmed by assessing patients for the typical clinical signs (*Box 1*). The presence of palpable dorsal pedal and posterior tibial artery indicates that patients do not have ischaemia (Shaper, 2004).

Uncomplicated DFUs can be monitored by primary healthcare professionals. Patients should be referred to specialised diabetic foot clinics in the absence of signs of healing (<30% reduction in ulcer area or the absence of granulation tissue or signs of re-epithelialisation) after 2 weeks of standard care.

Complicated DFUs

These are defined as ischaemic and/or infected and/or deep (bone, muscle or tendon exposure) ulcers and/or any kind of ulcer in patients with active heart failure or end-stage renal disease. Patients with complicated DFUs should be referred to specialised diabetic foot centres within 4 days of their initial assessment. After resolution of the acute phase, patients with complicated DFUs can be managed in primary care with the support of specialist foot care teams.

Severely complicated DFUs

DFUs are considered to be severely complicated if gangrene or an abscess is present or if the patient presents with fever or signs of sepsis. Severely complicated DFUs need urgent hospitalisation in a specialised diabetic foot centre within 24 hours of diagnosis.

Standard care

The FTP (*Figure 1*) includes a description of standard care that consists of well-established concepts proposed in the most recent International Working Group on the Diabetic Foot guidelines (2019), with some modification in the 'local care' section. In particular, it states that the use of dressings incorporating Lipido-Colloid Technology with Nano-Oligo Saccharide Factor (TLC-NOSF) should be considered to promote wound progression in neuro-ischaemic DFUs that are not on the heel



Figure 1: The general fast-track pathway for diabetic foot ulceration: working tool developed by the International Diabetic Foot Care Group in collaboration with D-Foot International.

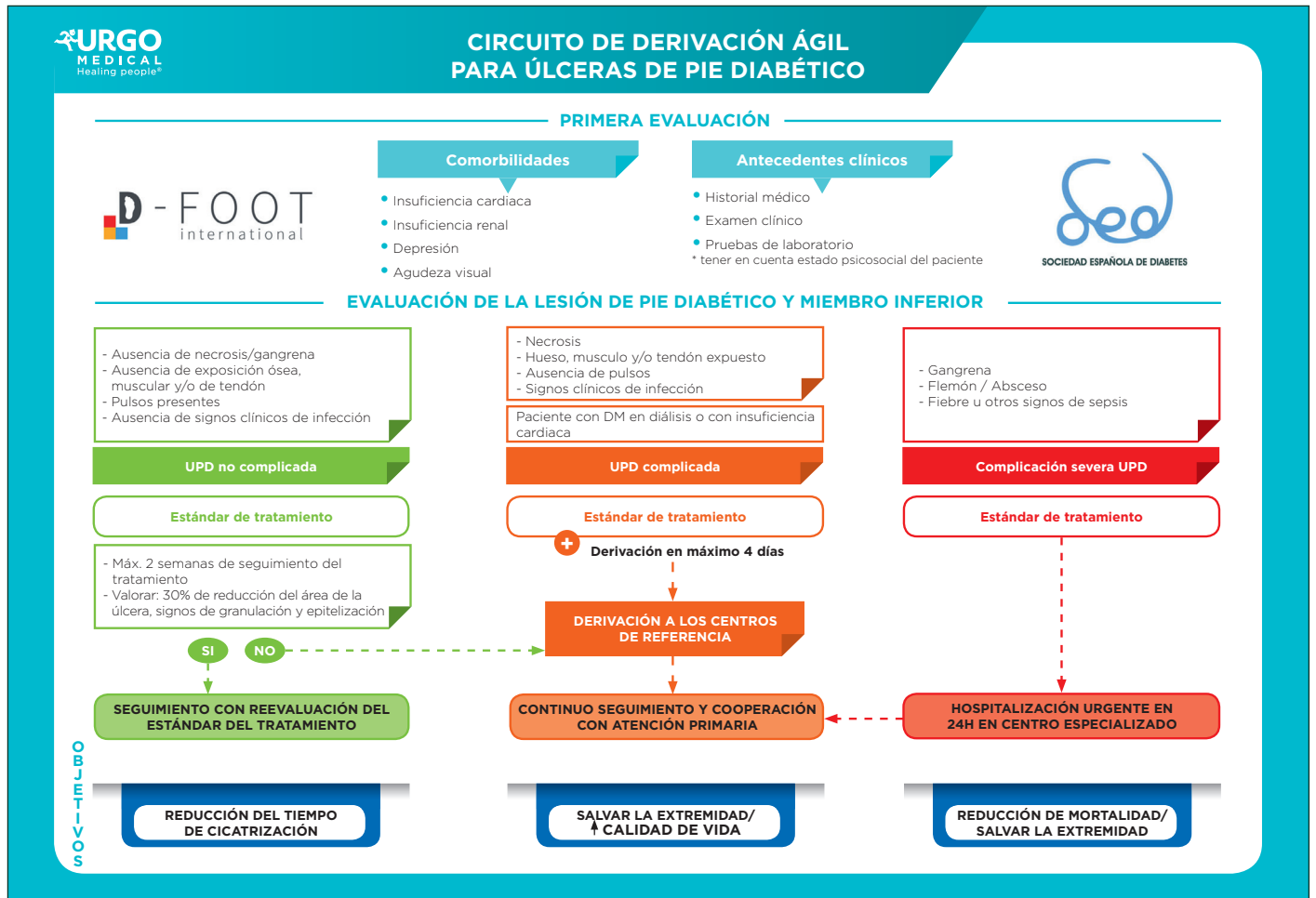


Figure 2: The Spanish fast-track pathway for diabetic foot ulceration.

and do not require vascular intervention (Game, 2018). This recommendation reflects the results of the recent Explorer Study (Edmonds et al, 2018).

The basic FTP can be followed in the majority of cases. It varies, however, in two specific cases:

- Patients with recurrent ulcers should immediately be referred to and managed by diabetic foot specialists
- To conform with legislation in specific countries; however, pathway adaptations should preserve the main concepts of the original FTP.

Outcomes and expectations

‘Time is tissue’ is a concept that is often voiced by diabetic foot specialists, as early referral increases the probability of healing and reduces the amputation rate (Smith-Strøm et al, 2017). Nevertheless, late referral to diabetic foot clinics is common worldwide and the risk of amputation is

still a reality. At the same time, there is a lack of awareness and knowledge about diabetic foot care among healthcare professionals, especially among GPs to whom patients with DFUs usually present. GPs show great heterogeneity in the assessment of some aspects of DFUs and in their diagnosis and management. Many of these differences could be related to clinical practice, the organisation of local healthcare providers, education about DFUs, financial resources and specific referral options. Furthermore, although there are recognised guidelines on the management of DFUs, GPs do not usually find them clear or easily accessible (Garcia-Klepzig et al, 2018). The on-going need to educate all healthcare professionals involved in the management of the diabetic foot is, therefore, evident.

A specific and simple DFU patient referral pathway needs to be defined and clear and specific

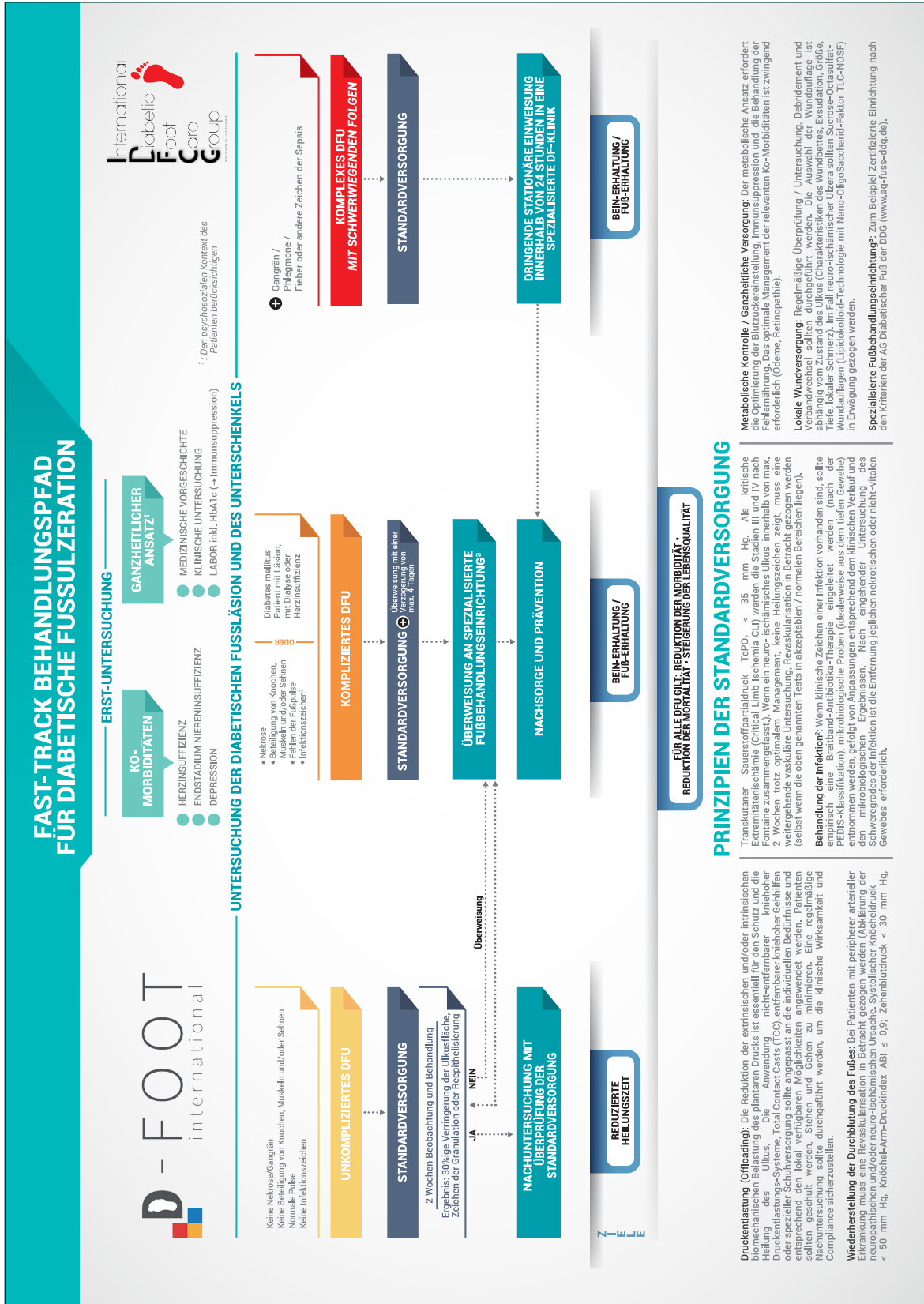


Figure 3: The German fast-track pathway for diabetic foot ulceration.

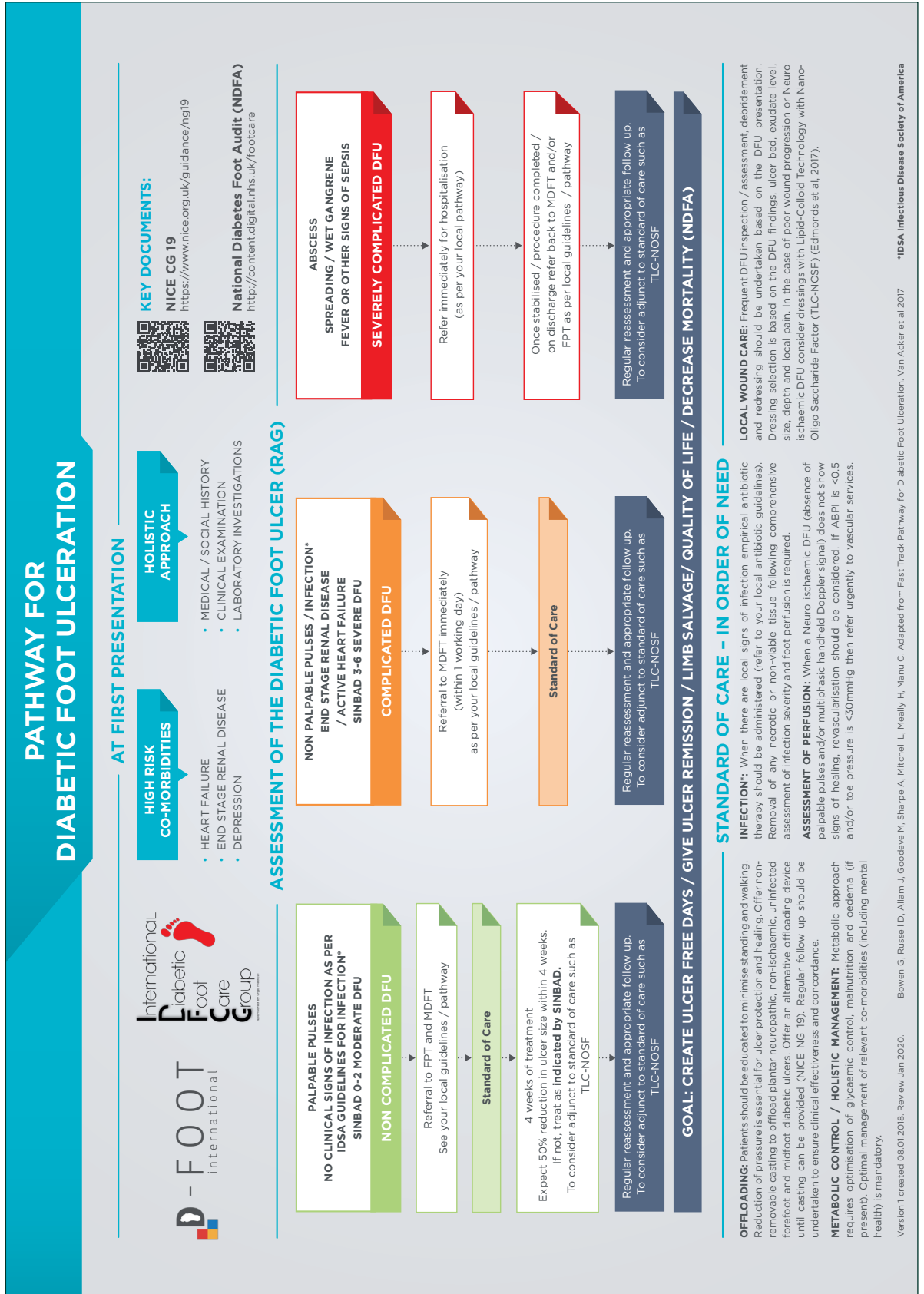


Figure 4: The fast-track pathway for diabetic foot ulceration in the UK.

competencies for different healthcare professionals need to be established. In our opinion, the proposed FTP is a simple tool that can easily be used in primary care to support clinicians in the assessment of patients with DFUs and can help to define the individual pathway according to the DFU severity. The authors have provided some clinical information and recommendations alongside the FTP that aim to:

- Reduce healing time
- Improve quality of life
- Increase the rate of limb salvage
- Decrease mortality due to DFUs
- Provide a common focus across different geographic areas and join healthcare professionals together as part of a stable foot care community.

The FTP proposes practical integrated treatment spanning primary care and dedicated diabetic foot services. As healthcare professional training, healthcare organisations and legislation differ between European countries, the original FTP should be adapted to local healthcare systems, respecting the main principles. It has already been adapted for use in Spain (see *Figure 2*), Germany (see *Figure 3*) and England (see *Figure 4*).

The IDFCG and D-Foot International aim to implement the FTP worldwide through the active involvement of healthcare professionals and local authorities. Good outcomes depend on the involvement of healthcare professionals across different care settings and institutions. Future studies are needed, however, to evaluate the effectiveness of this working tool and verify patient outcomes and the FTP applicability in different geographic areas. ■

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