



Podiatric physicians play a major role in this effort.

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The Center for Disease Control (CDC) reported in 2020 that 34.2 million people in the United States (10.5 percent of the population) had diabetes. A study reported in *Podiatry Management* (February 2022) indicated that among 29 percent of the patient-base of podiatric physicians, between 21 and 30 percent had diabetes.

People with diabetes and a history of foot ulcers are more likely to die than undergo amputation during six years of follow-up, registry data from Scotland show. In an analysis of real-world data comparing people with diabetes with and without foot ulcers, researchers also found amputation or death occurred for approximately one in two of those with a prior foot ulcer and one in five with no previous foot ulcer, with greater risk for people living in socially deprived areas or with mental illness.¹

Approximately one in four patients with diabetes will develop a foot ulcer in their lifetime.² Seventy

percent of diabetic foot ulcers (DFU) remain unhealed after 20 weeks of treatment³, 60% of them become infected, and of these, 20% end in different levels of amputation⁴. Avoiding unnecessary amputations has been the primary goal of managing diabet-

with diabetes^{7,8}. Survival is reduced by 40% in five years^{9,10}, although it is further reduced for patients with more severe lesions¹¹ or with ischemic versus non-ischemic lesions.¹² A hemoglobin A1c value of more than 7% has been identified as being a

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ic foot disease (DFD), and most interventions for managing these patients focus on the restoration of tissue perfusion and infection control.⁵

However, patients with diabetes with foot ulcers (DFU) have an increased risk of all-cause mortality, which is estimated to be more than double that of patients with diabetes without this complication⁶. On average, a person who develops a DFU has a three to five-year lower survival rate than a non-DFU counterpart

lesser predictor of mortality¹³. However, while understandable, little emphasis is included in the management of podiatric patients with diabetes on preventing mortality. Virtually all efforts by podiatric physicians have been on the importance of preventing DFUs and amputation.

Considering the growing prevalence of diabetes, much of which is due to the rapidly expanding population of people aged 65 years and

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older, the association of DFUs with mortality has received relatively little attention in podiatric medicine. The potential role of podiatric medicine in preventing mortality in patients who have or are at risk of having a DFU must be added to podiatric medical practice. Because of the growing prevalence of diabetes and its association with DFUs, the addition of mortality prevention needs to become part of

- Identifying and protecting areas of the foot susceptible to or with already-formed hyperkeratotic lesions and protecting these areas from weight-bearing or excessive pressure.

- Providing advice to patients with diabetes regarding appropriate footwear (i.e., shoes, sandals, etc.).

- Providing advice to all patients with or identified as potentially susceptible to developing diabetes to have podiatric medical examinations at least quarterly.

Apelqvist J., Bus S.A., Hinchliffe R.J., Lipsky B.A., IWGDF Editorial Board Practical Guidelines on the prevention and management of diabetic foot disease (IWGDF 2019 update) *Diabetes Metab. Res. Rev.* 2020;36: e3266. doi: 10.1002/dmrr.3266.

⁶ Saluja S., Anderson S.G., Hambleton I., Shoo H., Livingston M., Jude E.B., Lunt M., Dunn G., Heald A.H. Foot ulceration and its association with mortality in diabetes mellitus: A meta-analysis. *Diabet. Med.* 2020; 37:211–218. doi: 10.1111/dme.14151.

⁷ Brownrigg J.R., Griffin M., Hughes C.O., Jones K.G., Patel N., Thompson M.M., Hinchliffe R.J. Influence of foot ulceration on cause-specific mortality in patients with diabetes mellitus. *J. Vasc. Surg.* 2014; 60:982–986.e3. doi: 10.1016/j.jvs.2014.04.052.

⁸ Chammas N.K., Hill R.L., Edmonds M.E. Increased Mortality in Diabetic Foot Ulcer Patients: The Significance of Ulcer Type. *J. Diabetes Res.* 2016; 2016:2879809. doi: 10.1155/2016/2879809.

⁹ Jupiter D.C., Thorud J.C., Buckley C.J., Shibuya N. The impact of foot ulceration and amputation on mortality in diabetic patients. I: From ulceration to death, a systematic review. *Int. Wound J.* 2016; 13:892–903. doi: 10.1111/iwj.12404.

¹⁰ Walsh J.W., Hoffstad O.J., Sullivan M.O., Margolis D.J. Association of diabetic foot ulcer and death in a population-based cohort from the United Kingdom. *Diabet. Med.* 2016; 33:1493–1498. doi: 10.1111/dme.13054.

¹¹ Brennan M.B., Hess T.M., Bartle B., Cooper J.M., Kang J., Huang E.S., Smith M., Sohn M.W., Crnich C. Diabetic foot ulcer severity predicts mortality among veterans with type 2 diabetes. *J. Diabetes Complicat.* 2017; 31:556–561. doi: 10.1016/j.jdiacomp.2016.11.020.

¹² Moulik P.K., Mtonga R., Gill G.V. Amputation and mortality in new-onset diabetic foot ulcers stratified by etiology. *Diabetes Care.* 2003; 26:491–494. doi: 10.2337/diacare.26.2.491.

¹³ The Emerging Risk Factors Collaboration Diabetes mellitus, fasting glucose, and risk of cause-specific death. *N. Engl. J. Med.* 2011; 364:829–841. doi: 10.1056/NEJMoa1008862.



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the spectrum included in podiatric medical practice. One may say that mortality has little to do with the practice of podiatric medicine. But as physicians who have a high population of patients with diabetes or who are with patients at risk of acquiring the disease, the prevention of mortality due to DFUs is essential. Among the preventative measures that should be included in podiatric medical practice designed to avoid DFUs are:

- Screening with a random glucose determination (e.g., finger stick glucometer) of new patients and, at least every two months in those seen regularly including but not limited to those with a family history of diabetes., are age 40 years and older, already diagnosed with diabetes.

- Referring patients found to have elevated glucose levels to their internist or endocrinologist for further testing to determine or eliminate the presence of diabetes mellitus, or to determine if patients who are known diabetics are controlling their blood glucose levels.

- Identifying patients with diabetes who may have a neuropathy, using devices such as a tuning fork and the Semmes-Weinstein test.

- Identifying patients with biomechanical disorders and diabetes and providing treatment modalities designed to reduce excessive weight-bearing or pressure on parts of the foot.

While most of these measures are an integral part of many aspects of the so-called “routine podiatric medical examination”, among their collective objectives must be the prevention of mortality. Currently, there is very little mentioned in the literature of the role of podiatric medicine in mortality. The evidence is substantial that this must change, particularly because of the large and growing community of people with diabetes, the frequency they have in acquiring diabetic foot ulcers, and its major association with mortality. **PM**

References

¹ Chamberlain RC, et al. Diabetes Care. ‘Death is a greater risk’ than amputation after diabetic foot ulcer.2021; doi:10.2337/dc21-1596.

² Armstrong D.G., Boulton A.J.M., Bus S.A. Diabetic Foot Ulcers and Their Recurrence. *N. Engl. J. Med.* 2017; 376:2367–2375. doi: 10.1056/NEJMr1615439.

³ Margolis D.J., Kantor J., Santanna J., Strom B.L., Berlin J.A. Risk factors for delayed healing of neuropathic diabetic foot ulcers: A pooled analysis. *Arch. Dermatol.* 2000; 136:1531–1535. doi: 10.1001/archderm.136.12.1531.

⁴ Lipsky B.A., Peters E.J., Senneville E., Berendt A.R., Embil J.M., Lavery L.A., Urbančič-Rovan V., Jeffcoate W.J. Expert opinion on the management of infections in the diabetic foot. *Diabetes Metab. Res. Rev.* 2012;28(Suppl. 1):163–178. doi: 10.1002/dmrr.2248.

⁵ Schaper N.C., van Netten J.J.,