

ASSESSING THE SENSORY STATUS OF THE DIABETIC FOOT: BEST PRACTICE

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Sensory loss is a major contributory factor to foot ulceration in people with diabetes mellitus. Evidence suggests that ulcer risk is increased seven fold in the insensate foot (Buchman, 2005). Loss of the protective pain sensation can result in unnoticed trauma to the feet. For example, blisters from ill-fitting footwear can precede ulceration in the diabetic foot. This article will describe how to assess the sensory status of the feet in patients with diabetes.

Loss of protective pain sensation (peripheral neuropathy) is well recognised as a complication of diabetes mellitus that plays a major role in the development of foot ulceration (International Working Group on the Diabetic Foot, 1999). As many as 15% of people with diabetes will develop a foot ulcer during their lifetime (Plank et al, 2003); moreover, foot ulceration precedes amputation in approximately 85% of non-traumatic cases (Bird et al, 1999).

Figures suggest that 50% of patients attending diabetic foot clinics will have peripheral neuropathy (Baker et al, 2005); thus, it is imperative that individuals with diabetes receive regular assessment of foot sensation (neurological assessment). An annual neurological review will allow early identification of sensory loss and prompt intervention to prevent deterioration (International

Working Group on the Diabetic Foot, 1999; Department of Health, 2001; Scottish Intercollegiate Guidelines Network [SIGN], 2001; National Institute for Health and Clinical Excellence [NICE], 2004).

People with neuropathy should be offered foot health education, regular podiatry and, where required, protective footwear. The aim of this article is to offer guidance, derived from current best evidence, to facilitate health care professionals and practitioners in assessing the sensory status of the diabetic foot.

Sensory testing

The NICE guidelines suggest that all individuals with diabetes mellitus should receive an annual assessment by trained practitioners as part of ongoing diabetes care (NICE, 2004). Although there are several

methods available to the practitioner to detect peripheral neuropathy, NICE specifies that a basic foot examination should include testing the individual's ability to detect light touch with a 10g monofilament.

Monofilament

A monofilament is a short piece of nylon mounted on a wand that is used in health care to check the sensitivity of the nerves in the foot. The nylon is gently placed against the foot to determine whether the patient can feel light touch (*Figure 1*).

Monofilaments are considered a useful screening tool to detect sensory neuropathy because of their ease of use, the reproducibility and reliability of the test in practice and the ability to determine those patients at increased risk of foot ulceration (Booth and Young, 2000; Baker et al, 2005). If a patient is unable

to feel the monofilament then, as stated above, small recurrent traumas to the feet may go unnoticed and ulceration is more likely to occur (Booth and Young 2000).

The recommended procedure for testing light touch with a 10g monofilament, as advocated by the International Working Group on the Diabetic Foot (1999) and Baker et al (2005), is described below.

Stages of the monofilament procedure

1. Explain the test to the patient and check understanding
2. First, apply the monofilament on the patient's hand to show him or her what to expect. This simple measure will also reduce any residual stiffness of the monofilament before testing (*Figure 2*)
3. Ask the patient to close his or her eyes and say 'yes' every time he or she feels the monofilament touch the skin. It is important that the patient does not observe the examiner applying the monofilament on his or her feet. Place the monofilament at 90 degrees to the skin surface (*Figure 3*).
4. Now slowly place the monofilament onto the skin until it bends approximately 1 cm (*Figure 4*).
5. Hold in this position for 1–2 seconds and then slowly release the pressure on the monofilament until it straightens and then remove from the skin
6. Repeat this procedure on the testing sites on both feet, as indicated in *Figure 5*, and record findings. Ensure you conduct the test randomly; alter time intervals between



Figure 1. A monofilament in use.



Figure 2. The monofilament should be initially tested on the patient's hand.



Figure 3. Place the monofilament on the skin surface at a 90-degree angle.



Figure 4. Apply light pressure with the monofilament until it bends.

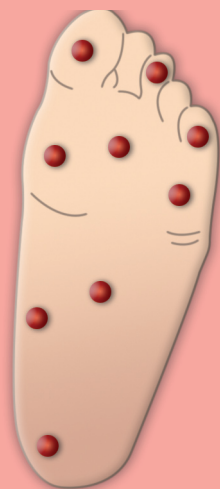


Figure 5. Recommended testing sites on the foot.

testing sites and vary the sites tested. If the pattern of testing becomes too predictable patients will anticipate the touch of the filament.

7. If peripheral neuropathy is suspected, the patient should be referred to the diabetes foot care multidisciplinary team for further investigation.

Testing sites

There is currently no consensus on which sites on the foot should be tested with the monofilament. However, as neuropathic

ulceration frequently occurs on the sole of the foot (plantar surface), particularly over the ball of the foot and the great toe, these sites are recommended for testing (Baker et al 2005).

Conclusion

People with diabetes are prone to developing peripheral neuropathy. Regular sensory assessment allows early identification of diminished sensation to the feet, which in turn allows the implementation of management strategies to reduce ulceration risk. **WE**

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