

# Global Guideline for Type 2 Diabetes

## Chapter 16: Nerve damage

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## Recommendations

### ■ Standard care

- NU1 Diagnose sensorimotor nerve damage by history and examination (monofilament with or without temperature, non-traumatic pin-prick, vibration (tuning fork), ankle reflexes), and/or simple quantitative testing (e.g. vibration perception).
- Use serum B<sub>12</sub>, thyroid function tests, creatinine/urea, and drug history to exclude other causes.
- NU2 Diagnose symptomatic (painful) diabetic neuropathy by excluding other possible causes of the symptoms.
- Manage by stabilizing blood glucose control, and treatment with tricyclic drugs if simple analgesia is not successful.
- Further treatment options include pregabalin/gabapentin and valproate, then tramadol, duloxetine, and oxycodone. Further management normally requires referral to a pain control team.
- Be aware of the psychological impact of continuing symptoms, particularly if sleep is disturbed.
- NU3 Diagnose erectile dysfunction by history (including drug history), exclusion of endocrine conditions (measure prolactin and testosterone), and a trial of a PDE5 inhibitor (where not contra-indicated by nitrate therapy).
- Consider other approaches such as intra-urethral or intracavernosal drugs and sexual and relationship counselling, where PDE5 inhibitors fail or cannot be used.
- NU4 Diagnose gastroparesis by history, trial of a prokinetic drug (metoclopramide, domperidone), and if troublesome by gastric emptying studies.
- NU5 Diagnose cardiovascular autonomic neuropathy by resting heart rate and heart rate response to provocation tests (lying-standing, Valsalva, deep breathing), and by lying and standing blood pressure.
- Advise anaesthetists when relevant where this is present.

## ■ Comprehensive care

NU<sub>C</sub>1 This would be as for *Standard care*, but screening and diagnostic testing could also include a programme of quantitative sensory testing (vibration and temperature), electrophysiology, and autonomic function tests.

## ■ Minimal care

NU<sub>M</sub>1 Screen and diagnose sensorimotor nerve damage by history of symptoms, and sensory assessment by 10-g monofilament or tuning fork with/without non-traumatic disposable pin-prick (as *Foot care*), and ankle reflexes.

NU<sub>M</sub>2 Manage symptomatic (painful) diabetic neuropathy by excluding other causes, stabilizing glycaemic control, and treatment with tricyclic drugs if simple analgesia is not successful. Opiate analgesia may be necessary as locally available.

NU<sub>M</sub>3 Assess erectile dysfunction by history and examination, to consider possible contributions of other medication or disease.

## Rationale

Neuropathy (nerve damage) is a common late complication of Type 2 diabetes. It contributes not only to foot problems (see *Foot care*) but also to a range of troublesome symptoms including pain/paraesthesiae and (where the autonomic nervous system is involved) gastro-intestinal, bladder and sexual problems. New therapeutic options have emerged in recent years.

## Evidence-base

Aspects of neuropathy which do not relate directly to foot care have received less attention in evidence-based guidelines [1-4], and some divergence in recommendations can be accounted for by recently emerging evidence on treatment options for painful neuropathy [5,6]. There is general agreement that stabilizing glycaemic control is important in the medium and longer term, and that tricyclic drugs should be used as first-line therapy for painful neuropathy, although side-effects are common.

Exclusion of non-diabetic causes of neuropathy is important because these may account for 10 % of cases of neuropathy in people with diabetes [7]. The range of tests available in clinical and research settings is detailed in two technical reviews [8,9].

Erectile dysfunction is addressed by three of the guidelines, which draw on evidence from Type 1 as well as Type 2

diabetes [1-3]. They conclude that the condition is rarely of simple causation, that it is important to consider the possible contribution of other medications and medical conditions, but that the expensive PDE5 inhibitors are worth a trial.

The evidence-base on some of the rarer aspects of autonomic neuropathy is weak, including that for gastroparesis, and cardiovascular parasympathetic autonomic neuropathy. In general, other guidelines have relied on conventional wisdom in making recommendations over the management of gastroparesis, orthostatic hypotension, bladder dysfunction, and nocturnal diarrhoea.

## Consideration

The costs of newer therapies were felt to argue against their use in situations where resources could be better directed to prevention by measures aimed at improving and stabilizing glycaemic control. A limited number of tests were felt to be appropriate in the clinical setting, but the practice generally recommended in this area simply follows established medical lines.

## Implementation

Appropriate protocols should be developed for sensory testing. Recommended drugs should be available according to level of resources. Medical teams need to remain trained in the diverse manifestations of autonomic neuropathy.

## Evaluation

Evidence should be available of records of regular surveillance for neuropathic symptoms, usually as part of direct questioning in programmed annual review. Where appropriate, record should also be available of direct questioning for erectile dysfunction. The availability of simple equipment for surveillance, and of drug supplies, can be evaluated.

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