

# Chronic spinal cord injury: management of patients in acute hospital settings

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Concise Guidance  
to Good Practice  
Series Editors:

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*Clin Med*  
2008;8:70-74

**ABSTRACT – Spinal cord injury (SCI) is a lifelong condition affecting over 40,000 people in the UK. When an individual with established SCI is admitted to hospital for a procedure or because of illness, hospital teams need to manage both the acute condition and the spinal cord injury. These guidelines aim to assist in their assessment and management to avoid the common problems of hospital-acquired morbidity in this potentially vulnerable group of people. Key steps are: gaining an understanding of the common patho-physiological consequences of SCI; listening to the person and their family who are often expert in managing the condition; and maintaining close contact with the individual's regular team/specialist spinal cord injury centre.**

## Introduction and aim of the guidelines

It is estimated that 40,000 individuals in the UK are living following traumatic spinal cord injury (SCI).<sup>1,2</sup> The prevalence of other conditions causing SCI, for example inflammatory, neoplastic and infective conditions is currently unknown.

When a patient with SCI is admitted to a general hospital setting for a procedure or intercurrent illness, hospital staff are required to manage both the acute illness and the SCI. They need to be aware that lack of pain or touch sensation below the level of the lesion in a person with complete SCI may confound diagnosis, but in addition many people with SCI:

- are maintained on finely tuned management routines, eg pressure sore prevention or bladder/bowel management which, if disturbed, can take weeks to re-establish.

- require an accessible environment, their usual equipment, eg wheelchair and/or nursing staff familiar with SCI to optimise their management during intercurrent illness.

Quality Requirement 11 of the National Service Framework for Long-term (Neurological) Conditions emphasises the importance of listening to the person and their family who are often expert in the management of the condition, and of maintaining close contact with the individual's regular team/specialist spinal injuries centres.<sup>3</sup>

These guidelines aim to assist in their assessment and management to avoid the common problems of hospital-acquired morbidity in this potentially vulnerable group of people. Details of the guideline development and methodology are given in the full guideline.<sup>4</sup>

## Pathophysiological consequences of spinal cord injury

Pathophysiological consequences of SCI that physicians should particularly be aware of are listed in Box 1. Autonomic dysreflexia is a relatively uncommon, but potentially life-threatening, problem for which people with SCI at the level of T6 and above are at risk. Its features are listed in Box 2 and a flow chart for management in Fig 1.

## Implications for implementation

The implications for implementation of these guidelines are primarily those of staff education and awareness. Telephone advice is available from SCI centres and local specialist neurorehabilitation can often offer useful practical support. More detailed guidance,

## New Title

### Chronic spinal cord injury: management of patients in acute hospital settings

Concise guidance to good practice series, No 9

The full guidance, including practical tools for management, will be published in February 2008. ISBN 978-1-86016-324-1.

For further information, please contact the Publications Department, Royal College of Physicians

\*This guidance was prepared on behalf of the multidisciplinary Guideline Development Group (GDG) convened by the British Society of Rehabilitation Medicine, the Multidisciplinary Association of Spinal Cord Injury Professionals and the British Association of Spinal Cord Injury Specialists in association with the Clinical Standards Department of the Royal College of Physicians. This guidance has been endorsed by the Spinal Injuries Association. For membership of the GDG, please see the end of the paper.

## The guidelines

Grade

### A Staff awareness and training

#### 1 The possibility of the following complications should be considered in any patient with established spinal cord injury (SCI) admitted to hospital: C

- respiratory problems – including respiratory failure and infection
- autonomic dysreflexia – in lesions at or above T6
- deep vein thrombosis (DVT)
- pressure sores
- inadequate nutrition
- neurological deterioration
- bowel problems including constipation and incontinence
- bladder problems including urinary retention, infection and calculi
- musculoskeletal problems including pain, injury and contractures
- depression, anxiety and other mood disturbance.

#### 2 Specific staff training

#### In particular, all nursing and medical staff should have specific training in the recognition of symptoms and management of: C

- secondary musculoskeletal pain, injury and contracture including prevention and management of spasticity
- autonomic dysreflexia (AD)
- bladder management techniques including
  - clean intermittent catheterisation
- bowel management techniques
  - appropriate use of suppositories, enemas and laxatives
  - digital stimulation and manual evacuation

**Staff should be aware that some patients are dependent on manual evacuation for their bowel care. Failure to provide this may result in constipation and risk of serious complications, including bowel obstruction and AD**
- emotional disturbance.

### B Assessment of patients with SCI

#### 1 Initial assessment of all patients on admission should include the following: C

- respiratory assessment: full history and examination including baseline:
  - pulse, respiratory rate, and temperature
  - oximetry
  - vital capacity (VC) and forced expiratory volume in 1 second (FEV1) (if possible).
- for perioperative patients, or other increased risk of chest pathology:
  - arterial blood gases and chest X-ray
- skin and pressure ulcer risk assessment:
  - with grading of any existing ulcers
- baseline calf and thigh measurements to allow early detection of DVT
- urinary assessment including:
  - review of voiding method and pattern
  - 24-hour voided volume chart
  - post-void residual volume (by catheter or bladder scan), if voiding on urge or by reflex
  - urinary microscopy and culture, if symptoms or signs of local or systemic infection

*continued*

## The guidelines – continued

Grade

- assessment of bowel care needs:
  - plan of management developed within 24 hours of admission
- nutritional assessment including:
  - dietary intake
  - weight and biochemistry (albumin, haemoglobin, haematinics)
- full neurological assessment as soon as possible to identify patient's baseline, thereby ensuring early detection of any deterioration
- musculoskeletal assessment including spasticity assessment, assessment of joint range of movement and pain
- psychiatric history including screening for depression. Use of at least two questions:
  - 'During the last month, have you often been bothered by feeling down, depressed or hopeless?'
  - 'During the last month, have you often been bothered by having little interest or pleasure in doing things?'

### 2 Regular assessments thereafter should include the following:

C

- daily assessment of:
  - calf and thigh measurements to allow early detection of DVT
  - skin and pressure areas.
- frequent assessment, as appropriate, of:
  - respiratory function including:
    - symptom check and examination
    - pulse, respiratory rate, temperature
    - oximetry, VC and FEV1 (if unstable or at risk).
  - bowel function, including:
    - stool consistency
    - frequency of bowel action and interventions
  - neurological impairments, if there is concern that this is changing.

## C Management of patients with SCI

### 1 All patients with SCI admitted to hospital should:

C

- be discussed (following their consent) with their SCI centre for information and advice as indicated
- have a written care plan which includes the following:
  - management of autonomic dysreflexia for patients at risk (T5–6 or above) (Fig 1)
  - respiratory management to prevent or treat chest complications, developed in conjunction with a chest or neurophysiotherapist. This may include:
    - clearing of airway secretions – assisted coughing, suctioning (be aware of the risk of bradycardia induced by suction)
    - re-expansion of affected lung including deep breathing, positioning, intermittent positive pressure ventilation, bi-phasic positive airway pressure, bronchoscopy with lavage and medications
  - commence thromboembolic prophylaxis if immobilised with bed rest or admitted for medical illness or surgery (as per hospital policy) including:
    - thromboembolism deterrent stockings unless contraindicated
    - low molecular weight heparin\*
  - preventative measures to avoid pressure sores, or full pressure relief in the presence of existing ulcers
  - adequate nutrition provided to meet their individual needs including calories, protein, micronutrients and fluids. Aggressive nutritional support if:
    - dietary intake is inadequate, or the individual is nutritionally compromised

continued

## The guidelines – continued

Grade

- continuation of normal bowel management programme, unless there is reason to change, including
  - diet, use of laxatives and bowel stimulants
  - digital stimulation and manual evacuation as required
- continuation of normal bladder management programme, unless there is reason to change. If an indwelling urethral catheter has been necessary during the admission it should be removed as soon as is possible and the patient's usual bladder care regimen re-established
- management of spasticity and avoidance of secondary musculoskeletal complications including:
  - splinting, stretching and passive movement, if appropriate
  - regular standing programme, if appropriate.

### 2 All patients with SCI admitted to hospital should have appropriate discharge planning involving: C

- the patient and their family
- relevant members of the multidisciplinary team
- direct contact with the community care team (eg general practitioner, district nurse, community rehabilitation professionals) before discharge.

The following should be in place prior to discharge:

- all required arrangements for transport, care and equipment needs etc
- full reports from all professionals involved with their care
- appropriate transport arrangements made for any future outpatient or review appointments.

\*Patients with established SCI do not require long-term thromboprophylaxis unless there is a history of thromboembolic disease. Therefore normal prophylaxis should be given for the illness/procedure, according to local policy and can be stopped as usual when medically well.

#### Box 1. Pathophysiological consequences of spinal cord injury.

<b>Respiratory</b>	<p>All patients with SCI involving the cervical and thoracic cord are at risk of respiratory problems:</p> <ul style="list-style-type: none"> <li>● paralysis of ventilatory muscles affecting breathing and coughing capability</li> <li>● relative broncho-constriction</li> <li>● excess secretions due to reduced sympathetic function in tetraplegics</li> <li>● ventilation/perfusion mismatch from reduced mobility that may exacerbate hypoxia during intercurrent illness.</li> </ul>
<b>Cardiovascular</b>	<p><b>Bradycardia and hypotension</b> – in high spinal cord lesions (above T7), hypotension (eg 80/50) and low or relatively low pulse rate (eg 40–50 bpm) can be physiologically 'normal':</p> <ul style="list-style-type: none"> <li>● hypotension from other causes needs to be distinguished carefully from this picture</li> <li>● overzealous fluid resuscitation or transfusion can cause pulmonary oedema and increased morbidity/mortality.</li> </ul> <p><b>Autonomic dysreflexia</b> – in SCI at or above T6 level:</p> <ul style="list-style-type: none"> <li>● excessive autonomic response to stimuli below the level of the SCI, such as a blocked catheter or faecal impaction (typical features listed in Box 2)</li> <li>● This is an acute, life-threatening condition of which all physicians should be aware.</li> </ul>
<b>Bladder</b>	<p>The great majority of individuals with SCI also have impairments in bladder function:</p> <ul style="list-style-type: none"> <li>● <b>detrusor-sphincter dyssynergia</b> – muscle incoordination which leads to the bladder voiding against a closed sphincter resulting in incomplete emptying. It can cause over filling and backpressure on the kidneys if not proactively managed</li> <li>● <b>urinary tract infections</b> – often undetected due to lack of typical symptoms.</li> </ul>
<b>Bowel</b>	<p>Sensory and motor control of the ano-rectum is impaired. Individuals are unable to feel the need to evacuate the bowel, or control the process of defaecation:</p> <ul style="list-style-type: none"> <li>● high risk of constipation, due to slow stool transit – especially where morphine or codeine-related drugs or anticholinergics are used</li> <li>● without intervention, individuals will be incontinent and chronically constipated, with secondary complications, including the risk of autonomic dysreflexia (T6 and above).</li> </ul>

**Box 2. Typical features of autonomic dysreflexia.**

Sudden uncontrolled rise in blood pressure, with other signs of sympathetic overactivity:

- systolic pressures reaching up to 250–300 mmHg
- diastolic pressures reaching up to 200–220 mmHg.

Other features of autonomic imbalance vary, but may include:

- pounding headache
- sweating or shivering
- feelings of anxiety
- chest tightness
- blurred vision
- nasal congestion
- blotchy skin rash or flushed above the level of their spinal injury (due to parasympathetic activity)
- cold with goosebumps ('cutis anserina') below the level of injury (due to the sympathetic activity).

including practical tools for management, are given in the full guideline.<sup>4</sup>

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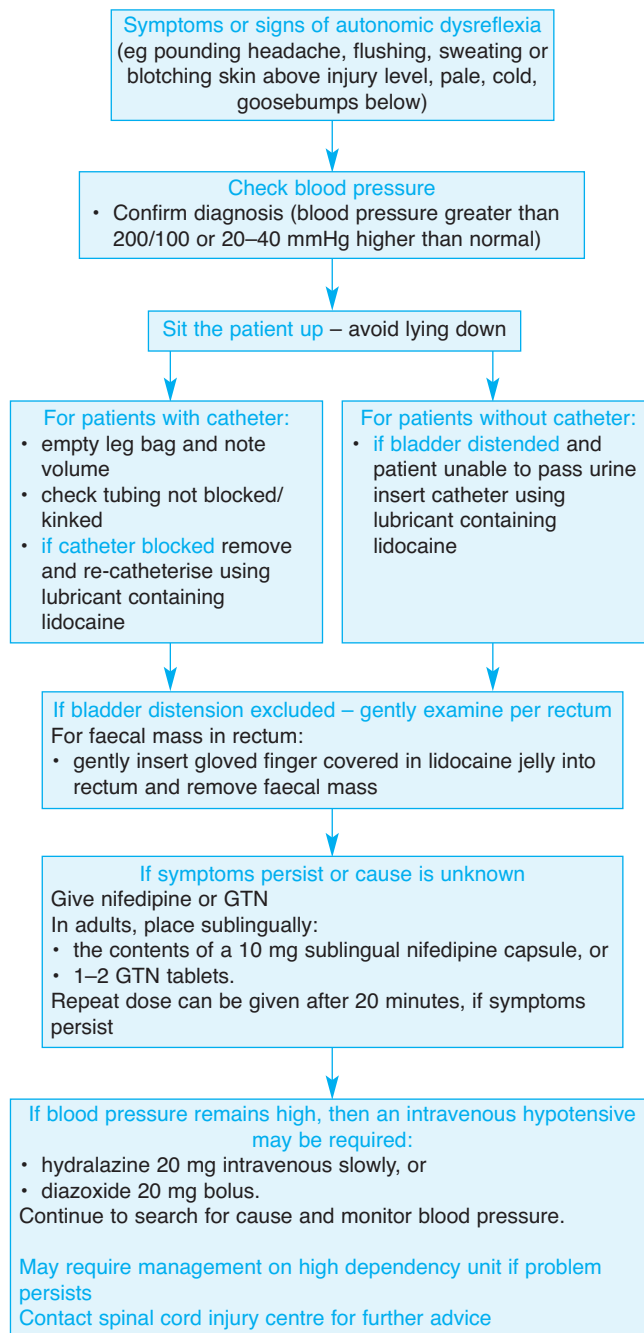
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**References**

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- 4 Royal College of Physicians. *Spinal cord injury: management of patients in acute hospital settings*. Concise guidance to good practice series, No 9. London: RCP, 2008.

**Other useful sources of information**

- British Association of Spinal Cord Injury Specialists. [www.bascis.pwp.blueyonder.co.uk](http://www.bascis.pwp.blueyonder.co.uk)
- British Society of Rehabilitation Medicine. [www.bsrm.co.uk](http://www.bsrm.co.uk)
- Multidisciplinary Association of Spinal Cord Injury Professionals. [www.mascip.co.uk](http://www.mascip.co.uk)
- Paralyzed Veterans of America. [www.pva.org/site/pageserver?pagename=pubs\\_main](http://www.pva.org/site/pageserver?pagename=pubs_main)
- Spinal Injuries Association. [www.spinal.co.uk](http://www.spinal.co.uk)



**Fig 1. Management of patients with autonomic dysreflexia.** GTN = glyceryl trinitrate.