

Metastatic spinal cord compression in adults: risk assessment, diagnosis and management

Clinical guideline

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Your responsibility

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

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This guideline is the basis of QS56.

This guideline should be read in conjunction with IPG12, TA265 and QS155.

Overview

This guideline covers detecting and managing metastatic spinal cord compression in adults with cancer that has spread to the spine. It aims to improve quality of life by promoting early detection and management, and reducing spinal cord damage and disability.

NICE has also produced guidance on [denosumab for the prevention of skeletal-related events in adults with bone metastases from solid tumours](#).

Who is it for?

- Healthcare professionals
- Adults with metastatic spinal cord compression, their families and carers

Introduction

Metastatic spinal cord compression (MSCC) is defined in this guideline as spinal cord or cauda equina compression by direct pressure and/or induction of vertebral collapse or instability by metastatic spread or direct extension of malignancy that threatens or causes neurological disability. The true incidence of MSCC in England and Wales is unknown because cases are not systematically recorded. However, evidence from an audit carried out in Scotland between 1997 and 1999^[1] and from a published study from Canada^[2], suggests that the incidence may be up to 80 cases per million people every year. This equates to approximately 4000 cases each year in England and Wales, or more than 100 cases per cancer network each year.

The Scottish audit showed that there were significant delays from the time when patients first develop symptoms to when general practitioners and hospital doctors recognise the possibility of MSCC and make an appropriate referral. The median times from the onset of back pain and nerve root pain to referral were 3 months and 9 weeks, respectively. Nearly half of all patients with MSCC were unable to walk at the time of diagnosis and of these, the majority (67%) had recovered no function after 1 month. Of those who could walk unaided at the time of diagnosis, 81% were able to walk (either alone or with aid) at 1 month. The ability to walk at diagnosis was also significantly related to overall survival.

At present, relatively few patients with MSCC in the UK receive surgery for the condition. However, research evidence suggests that early surgery may be more effective than radiotherapy at maintaining mobility in a selected subset of patients.

The guideline will assume that prescribers will use a drug's summary of product characteristics to inform their decisions for individual patients.

^[1] Levack P et al (2001) A prospective audit of the diagnosis, management and outcome of malignant cord compression (CRAG 97/08). Edinburgh: CRAG.

^[2] Loblaw DA, Laperriere NJ, Mackillop WJ (2003) A population-based study of malignant spinal cord compression in Ontario. *Clinical Oncology* 15 (4): 211–17.

Patient-centred care

This guideline offers best practice advice on the care of patients at risk of or with MSCC.

Treatment and care should take into account patients' needs and preferences. People with MSCC should have the opportunity to make informed decisions about their care and treatment, in partnership with their healthcare professionals. If patients do not have the capacity to make decisions, healthcare professionals should follow the [Department of Health's advice on consent](#) and the [code of practice that accompanies the Mental Capacity Act](#). In Wales, healthcare professionals should follow [advice on consent from the Welsh Government](#).

Good communication between healthcare professionals and patients is essential. It should be supported by evidence-based written information tailored to the patient's needs. Treatment and care, and the information patients are given about it, should be culturally appropriate. It should also be accessible to people with additional needs such as physical, sensory or learning disabilities, and to people who do not speak or read English.

If the patient agrees, families and carers should have the opportunity to be involved in decisions about treatment and care.

Families and carers should also be given the information and support they need.

Key priorities for implementation

Service configuration and urgency of treatment

- Every cancer network should ensure that appropriate services are commissioned and in place for the efficient and effective diagnosis, treatment, rehabilitation and ongoing care of patients with MSCC. These services should be monitored regularly through prospective audit of the care pathway.

Early detection

- Inform patients at high risk of developing bone metastases, patients with diagnosed bone metastases, or patients with cancer who present with spinal pain about the symptoms of MSCC. Offer information (for example, in the form of a leaflet) to patients and their families and carers which explains the symptoms of MSCC, and advises them (and their healthcare professionals) what to do if they develop these symptoms.
- Contact the MSCC coordinator urgently (within 24 hours) to discuss the care of patients with cancer and any of the following symptoms suggestive of spinal metastases:
 - pain in the middle (thoracic) or upper (cervical) spine
 - progressive lower (lumbar) spinal pain
 - severe unremitting lower spinal pain
 - spinal pain aggravated by straining (for example, at stool, or when coughing or sneezing)
 - localised spinal tenderness
 - nocturnal spinal pain preventing sleep.
- Contact the MSCC coordinator immediately to discuss the care of patients with cancer and symptoms suggestive of spinal metastases who have any of the following neurological symptoms or signs suggestive of MSCC, and view them as an oncological emergency:
 - neurological symptoms including radicular pain, any limb weakness, difficulty in walking, sensory loss or bladder or bowel dysfunction
 - neurological signs of spinal cord or cauda equina compression.

Imaging

- Perform MRI of the whole spine in patients with suspected MSCC, unless there is a specific contraindication. This should be done in time to allow definitive treatment to be planned within 1 week of the suspected diagnosis in the case of spinal pain suggestive of spinal metastases, and within 24 hours in the case of spinal pain suggestive of spinal metastases and neurological symptoms or signs suggestive of MSCC, and occasionally sooner if there is a pressing clinical need for emergency surgery.

Treatment of spinal metastases and MSCC

- Patients with severe mechanical pain suggestive of spinal instability, or any neurological symptoms or signs suggestive of MSCC, should be nursed flat with neutral spine alignment (including 'log rolling' or turning beds, with use of a slipper pan for toilet) until bony and neurological stability are ensured and cautious remobilisation may begin.
- Start definitive treatment, if appropriate, before any further neurological deterioration and ideally within 24 hours of the confirmed diagnosis of MSCC.
- Carefully plan surgery to maximise the probability of preserving spinal cord function without undue risk to the patient, taking into account their overall fitness, prognosis and preferences.
- Ensure urgent (within 24 hours) access to and availability of radiotherapy and simulator facilities in daytime sessions, 7 days a week for patients with MSCC requiring definitive treatment or who are unsuitable for surgery.

Supportive care and rehabilitation

- Discharge planning and ongoing care, including rehabilitation for patients with MSCC, should start on admission and be led by a named individual from within the responsible clinical team. It should involve the patient and their families and carers, their primary oncology site team, rehabilitation team and community support, including primary care and specialist palliative care, as required.

1 Guidance

The following guidance is based on the best available evidence. The [full guideline](#) gives details of the methods and the evidence used to develop the guidance.

1.1 *Service configuration and urgency of treatment*

- 1.1.1.1 Every cancer network should have a clear care pathway for the diagnosis, treatment, rehabilitation and ongoing care of patients with metastatic spinal cord compression (MSCC).
- 1.1.1.2 Every cancer network should ensure that appropriate services are commissioned and in place for the efficient and effective diagnosis, treatment, rehabilitation and ongoing care of patients with MSCC. These services should be monitored regularly through prospective audit of the care pathway.
- 1.1.1.3 Cancer networks should ensure that there is local access to urgent magnetic resonance imaging (MRI) within 24 hours for all patients with suspected MSCC. This service should be available outside normal working hours and with 24-hour capability in centres treating patients with MSCC.
- 1.1.1.4 Every cancer network should have a network site specific group for MSCC. The group should include representatives from primary, secondary and tertiary care and should have strong links to network site specific groups for primary tumours.
- 1.1.1.5 The cancer network should appoint a network lead for MSCC whose responsibilities include:
- advising the cancer network, commissioners and providers about the provision and organisation of relevant clinical services
 - ensuring that the local care pathway for diagnosis and management are documented, agreed and consistent across the network
 - ensuring that there are appropriate points of telephone contact for the role of an MSCC coordinator and senior clinical advisers
 - maintaining a network-wide audit of the incidence, timeliness of management, and

- outcomes of patients with MSCC using nationally agreed measures
- arranging and chairing twice-yearly meetings of the network site specific group for MSCC, at which patient outcomes will be reported and the local care pathway reviewed and amended if necessary.

1.1.1.6 Every secondary or tertiary care centre should have an identified lead healthcare professional for MSCC (who is usually, but not necessarily, medical) whose responsibilities include:

- representing the hospital at network level in the development of care pathways
- implementing the care pathway and disseminating information about the diagnosis and appropriate management of patients with known or suspected MSCC
- ensuring timely and effective communication between all relevant healthcare professionals involved in the care of patients with MSCC, including primary care and palliative care
- raising and maintaining the awareness and understanding of treatments for MSCC among all clinical staff across the locality
- contributing to regular network audits of the care of patients with MSCC
- attending and contributing to the twice-yearly network site specific group meeting.

1.1.1.7 Commissioners should establish a joint approach with councils responsible for local social services to ensure efficient provision of equipment and support, including nursing and rehabilitation services, to meet the individual needs of patients with MSCC and their families and carers.

1.1.2 MSCC coordinator and senior clinical adviser – roles and responsibilities

1.1.2.1 Each centre treating patients with MSCC should identify or appoint individuals responsible for performing the role of MSCC coordinator and ensure its availability at all times.

1.1.2.2 Each centre treating patients with MSCC should have a single point of contact to access the MSCC coordinator who should provide advice to clinicians and coordinate the care pathway at all times.

1.1.2.3 The MSCC coordinator should:

- provide the first point of contact for clinicians who suspect that a patient may be developing spinal metastases or MSCC
- perform an initial telephone triage by assessing requirement for, and urgency of, investigations, transfer, and treatment
- advise on the immediate care of the spinal cord and spine and seek senior clinical advice, as necessary
- gather baseline information to aid decision-making and collate data for audit purposes
- identify the appropriate place for timely investigations and admission if required
- liaise with the acute receiving team and organise admission and mode of transport.

1.1.2.4 The optimal care of patients with MSCC should be determined by senior clinical advisers (these include clinical oncologists, spinal surgeons and radiologists with experience and expertise in treating patients with MSCC), taking into account the patient's preferences and all aspects of their condition, with advice from primary tumour site clinicians or other experts, as required.

1.1.2.5 Every centre treating patients with MSCC should ensure 24-hour availability of senior clinical advisers to give advice and support to the MSCC coordinator and other clinicians, inform the decision-making process and undertake treatment where necessary.

1.2 *The patient's experience of MSCC*

1.2.1 Supporting patient decisions

1.2.1.1 Ensure that communication with patients with known or suspected MSCC is clear and consistent, and that the patients, their families and carers are fully informed and involved in all decisions about treatment.

1.2.2 Emotional and family support

1.2.2.1 Offer patients with MSCC and their families and carers specialist psychological and/or spiritual support appropriate to their needs at diagnosis, at other key points during treatment and on discharge from hospital.

1.2.2.2 Provide information to patients with MSCC in an appropriate language and format that explains how to access psychological and/or spiritual support services when needed.

1.2.2.3 Offer bereavement support services to patients' families based on the three component model outlined in 'Improving supportive and palliative care for adults with cancer' (NICE cancer service guidance CSGSP).

1.3 *Early detection*

1.3.1 **Communicating symptoms and risks**

1.3.1.1 Inform patients at high risk of developing bone metastases, patients with diagnosed bone metastases, or patients with cancer who present with spinal pain about the symptoms of MSCC. Offer information (for example, in the form of a leaflet) to patients and their families and carers which explains the symptoms of MSCC, and advises them (and their healthcare professionals) what to do if they develop these symptoms.

1.3.1.2 Ensure that patients with MSCC and their families and carers know who to contact if their symptoms progress while they are waiting for urgent investigation of suspected MSCC.

1.3.2 **Early symptoms and signs**

1.3.2.1 Contact the MSCC coordinator urgently (within 24 hours) to discuss the care of patients with cancer and any of the following symptoms suggestive of spinal metastases:

- pain in the middle (thoracic) or upper (cervical) spine
- progressive lower (lumbar) spinal pain
- severe unremitting lower spinal pain
- spinal pain aggravated by straining (for example, at stool, or when coughing or sneezing)
- localised spinal tenderness

- nocturnal spinal pain preventing sleep.

1.3.2.2 Contact the MSCC coordinator immediately to discuss the care of patients with cancer and symptoms suggestive of spinal metastases who have any of the following neurological symptoms or signs suggestive of MSCC, and view them as an oncological emergency:

- neurological symptoms including radicular pain, any limb weakness, difficulty in walking, sensory loss or bladder or bowel dysfunction
- neurological signs of spinal cord or cauda equina compression.

1.3.2.3 Perform frequent clinical reviews of patients with cancer who develop lower spinal pain that is clinically thought to be of non-specific origin (that is, it is not progressive, severe or aggravated by straining and has no accompanying neurological symptoms). In particular, look for:

- development of progressive pain or other symptoms suggestive of spinal metastases (contact the MSCC coordinator within 24 hours), or
- development of neurological symptoms or signs suggestive of MSCC (contact the MSCC coordinator immediately).

1.3.2.4 Perform frequent clinical reviews of patients without a prior diagnosis of cancer who develop suspicious spinal pain with or without neurological symptoms. Treat or refer patients with stable and mild symptoms by normal non-specific spinal pathways, or refer by cancer pathway if concerned. In particular, look for:

- development of progressive pain or other symptoms suggestive of spinal metastases (contact the MSCC coordinator within 24 hours), or
- development of neurological symptoms or signs suggestive of MSCC (contact the MSCC coordinator immediately).

1.4 *Imaging*

1.4.1 **Choice of imaging modality**

1.4.1.1 MRI of the spine in patients with suspected MSCC should be supervised and reported by a radiologist and should include sagittal T1 and/or short T1 inversion recovery (STIR) sequences of the whole spine, to prove or exclude the

presence of spinal metastases. Sagittal T2 weighted sequences should also be performed to show the level and degree of compression of the cord or cauda equina by a soft tissue mass and to detect lesions within the cord itself.

Supplementary axial imaging should be performed through any significant abnormality noted on the sagittal scan.

- 1.4.1.2 Contact the MSCC coordinator to determine the most appropriate method of imaging for patients with suspected MSCC in whom MRI is contraindicated and where this should be carried out.
- 1.4.1.3 Consider targeted computerised tomography (CT) scan with three-plane reconstruction to assess spinal stability and plan vertebroplasty, kyphoplasty or spinal surgery in patients with MSCC.
- 1.4.1.4 Consider myelography if other imaging modalities are contraindicated or inadequate. Myelography should only be undertaken at a neuroscience or spinal surgical centre because of the technical expertise required and because patients with MSCC may deteriorate following myelography and require urgent decompression.
- 1.4.1.5 Do not perform plain radiographs of the spine either to make or to exclude the diagnosis of spinal metastases or MSCC.

1.4.2 Routine MRI and early detection of MSCC

- 1.4.2.1 In patients with a previous diagnosis of malignancy, routine imaging of the spine is not recommended if they are asymptomatic.
- 1.4.2.2 Serial imaging of the spine in asymptomatic patients with cancer who are at high risk of developing spinal metastases should only be performed as part of a randomised controlled trial.

1.4.3 Timing of MRI assessment

- 1.4.3.1 Imaging departments should configure MRI lists to permit time for examination of patients with suspected MSCC at short notice during existing or extended sessions (by moving routine cases into ad hoc overtime or to alternative sessions, if overtime is not possible).

- 1.4.3.2 If MRI is not available at the referring hospital, transfer patients with suspected MSCC to a unit with 24-hour capability for MRI and definitive treatment of MSCC.
- 1.4.3.3 Perform MRI of the whole spine in patients with suspected MSCC, unless there is a specific contraindication. This should be done in time to allow definitive treatment to be planned within 1 week of the suspected diagnosis in the case of spinal pain suggestive of spinal metastases, and within 24 hours in the case of spinal pain suggestive of spinal metastases and neurological symptoms or signs suggestive of MSCC, and occasionally sooner if there is a pressing clinical need for emergency surgery.
- 1.4.3.4 Out of hours MRI should only be performed in clinical circumstances where there is an emergency need and intention to proceed immediately to treatment, if appropriate.

1.5 *Treatment of spinal metastases and MSCC*

1.5.1 Treatments for painful spinal metastases and prevention of MSCC

Analgesia

- 1.5.1.1 Offer conventional analgesia (including NSAIDs, non-opiate and opiate medication) as required to patients with painful spinal metastases in escalating doses as described by the WHO three-step pain relief ladder^[3].
- 1.5.1.2 Consider referral for specialist pain care including invasive procedures (such as epidural or intrathecal analgesia) and neurosurgical interventions for patients with intractable pain from spinal metastases.

Bisphosphonates

- 1.5.1.3 Offer patients with vertebral involvement from myeloma or breast cancer bisphosphonates to reduce pain and the risk of vertebral fracture/collapse.
- 1.5.1.4 Offer patients with vertebral metastases from prostate cancer bisphosphonates to reduce pain only if conventional analgesia fails to control pain.

- 1.5.1.5 Bisphosphonates should not be used to treat spinal pain in patients with vertebral involvement from tumour types other than myeloma, breast cancer or prostate cancer (if conventional analgesia fails) or with the intention of preventing MSCC, except as part of a randomised controlled trial.

Radiotherapy

- 1.5.1.6 Offer patients with spinal metastases causing non-mechanical spinal pain 8 Gy single fraction palliative radiotherapy even if they are completely paralysed.
- 1.5.1.7 Patients with asymptomatic spinal metastases should not be offered radiotherapy with the intention of preventing MSCC except as part of a randomised controlled trial.

Vertebroplasty and kyphoplasty

- 1.5.1.8 Consider vertebroplasty^[4] or kyphoplasty^[5] for patients who have vertebral metastases and no evidence of MSCC or spinal instability if they have:
- mechanical pain resistant to conventional analgesia, or
 - vertebral body collapse.
- 1.5.1.9 Vertebroplasty or kyphoplasty for spinal metastases should only be performed after agreement between appropriate specialists (including an oncologist, interventional radiologist, and spinal surgeon), with full involvement of the patient and in facilities where there is good access to spinal surgery.

Surgery

- 1.5.1.10 Urgently consider patients with spinal metastases and imaging evidence of structural spinal failure with spinal instability for surgery to stabilise the spine and prevent MSCC.
- 1.5.1.11 Consider patients with spinal metastases and mechanical pain resistant to conventional analgesia for spinal stabilisation surgery even if completely paralysed.
- 1.5.1.12 Consider patients with MSCC who have severe mechanical pain and/or imaging

evidence of spinal instability, but who are unsuitable for surgery, for external spinal support (for example, a halo vest or cervico-thoraco-lumbar orthosis).

- 1.5.1.13 Patients with spinal metastases without pain or instability should not be offered surgery with the intention of preventing MSCC except as part of a randomised controlled trial.

Treatment options

- 1.5.1.14 All decisions on the most appropriate combinations of treatment for pain or preventing paralysis caused by MSCC should be made by relevant spinal specialists in consultation with primary tumour site clinicians and with the full involvement of the patient.

1.5.2 Care of the threatened spinal cord in patients with MSCC

Mobilisation

- 1.5.2.1 Patients with severe mechanical pain suggestive of spinal instability, or any neurological symptoms or signs suggestive of MSCC, should be nursed flat with neutral spine alignment (including 'log rolling' or turning beds, with use of a slipper pan for toilet) until bony and neurological stability are ensured and cautious remobilisation may begin.
- 1.5.2.2 For patients with MSCC, once any spinal shock has settled and neurology is stable, carry out close monitoring and interval assessment during gradual sitting from supine to 60 degrees over a period of 3–4 hours.
- 1.5.2.3 When patients with MSCC begin gradual sitting, if their blood pressure remains stable and no significant increase in pain or neurological symptoms occurs, continue to unsupported sitting, transfers and mobilisation as symptoms allow.
- 1.5.2.4 If a significant increase in pain or neurological symptoms occurs when patients with MSCC begin gradual sitting and mobilisation, return them to a position where these changes reverse and reassess the stability of their spine.
- 1.5.2.5 After a full discussion of the risks, patients who are not suitable for definitive treatment should be helped to position themselves and mobilise as symptoms

permit with the aid of orthoses and/or specialist seating to stabilise the spine, if appropriate.

Corticosteroids

- 1.5.2.6 Unless contraindicated (including a significant suspicion of lymphoma) offer all patients with MSCC a loading dose of at least 16 mg of dexamethasone as soon as possible after assessment, followed by a short course of 16 mg dexamethasone daily while treatment is being planned.
- 1.5.2.7 Continue dexamethasone 16 mg daily in patients awaiting surgery or radiotherapy for MSCC. After surgery or the start of radiotherapy the dose should be reduced gradually over 5-7 days and stopped. If neurological function deteriorates at any time the dose should be increased temporarily.
- 1.5.2.8 Reduce gradually and stop dexamethasone 16 mg daily in patients with MSCC who do not proceed to surgery or radiotherapy after planning. If neurological function deteriorates at any time the dose should be reconsidered.
- 1.5.2.9 Monitor blood glucose levels in all patients receiving corticosteroids.

1.5.3 Case selection for definitive treatment of MSCC

- 1.5.3.1 Start definitive treatment, if appropriate, before any further neurological deterioration and ideally within 24 hours of the confirmed diagnosis of MSCC.

Nature of metastases

- 1.5.3.2 Attempt to establish the primary histology of spinal metastases (including by tumour biopsy, if necessary) when planning definitive treatment.
- 1.5.3.3 Stage the tumours of patients with MSCC to determine the number, anatomical sites and extent of spinal and visceral metastases when planning definitive treatment.

Functional ability, general fitness, previous treatments and fitness for anaesthesia

- 1.5.3.4 Take into account the preferences of patients with MSCC as well as their

neurological ability, functional status, general health and fitness, previous treatments, magnitude of surgery, likelihood of complications, fitness for general anaesthesia and overall prognosis when planning treatment.

- 1.5.3.5 Patients with suspected MSCC, a poor performance status and widespread metastatic disease should wherever possible be discussed with their primary tumour site clinician and spinal senior clinical adviser before any urgent imaging or hospital transfer.
- 1.5.3.6 Patients with suspected MSCC who have been completely paraplegic or tetraplegic for more than 24 hours should wherever possible be discussed urgently with their primary tumour site clinician and spinal senior clinical adviser before any imaging or hospital transfer.
- 1.5.3.7 Patients who are too frail or unfit for specialist treatment for MSCC should not be transferred unnecessarily.

Age

- 1.5.3.8 Patients with MSCC should not be denied either surgery (if fit enough) or radiotherapy on the basis of age alone.

The role of scoring systems

- 1.5.3.9 When deciding whether surgery is appropriate, and if so its type and extent, use recognised prognostic factors including the revised Tokuhashi scoring system^[6], and American Society of Anaesthetists (ASA) grading. Systematically record and take into account relevant comorbidities.
- 1.5.3.10 Only consider major surgical treatments for patients expected to survive longer than 3 months.

1.5.4 Surgery for the definitive treatment of MSCC

General principles

- 1.5.4.1 If surgery is appropriate in patients with MSCC, attempt to achieve both spinal cord decompression and durable spinal column stability.

Neurological ability

- 1.5.4.2 Patients with MSCC who are suitable for surgery should have surgery before they lose the ability to walk.
- 1.5.4.3 Patients with MSCC who have residual distal sensory or motor function and a good prognosis should be offered surgery in an attempt to recover useful function, regardless of their ability to walk.
- 1.5.4.4 Patients with MSCC who have been completely paraplegic or tetraplegic for more than 24 hours should only be offered surgery if spinal stabilisation is required for pain relief.

Timing

- 1.5.4.5 Consider the speed of onset, duration, degree and site of origin of neurological symptoms and signs (cord or cauda equina) when assessing the urgency of surgery.

Technical factors

- 1.5.4.6 Carefully plan surgery to maximise the probability of preserving spinal cord function without undue risk to the patient, taking into account their overall fitness, prognosis and preferences.
- 1.5.4.7 Posterior decompression alone should not be performed in patients with MSCC except in the rare circumstances of isolated epidural tumour or neural arch metastases without bony instability.
- 1.5.4.8 If spinal metastases involve the vertebral body or threaten spinal stability, posterior decompression should always be accompanied by internal fixation with or without bone grafting.
- 1.5.4.9 Consider vertebral body reinforcement with cement for patients with MSCC and vertebral body involvement who are suitable for instrumented decompression but are expected to survive for less than 1 year.
- 1.5.4.10 Consider vertebral body reconstruction with anterior bone graft for patients

with MSCC and vertebral body involvement who are suitable for instrumented decompression, are expected to survive for 1 year or longer and who are fit to undergo a more prolonged procedure.

- 1.5.4.11 En bloc excisional surgery with the objective of curing the cancer should not be attempted, except in very rare circumstances (for example, confirmed solitary renal or thyroid metastasis following complete staging).

1.5.5 Radiotherapy for the definitive treatment of MSCC

- 1.5.5.1 Ensure urgent (within 24 hours) access to and availability of radiotherapy and simulator facilities in daytime sessions, 7 days a week for patients with MSCC requiring definitive treatment or who are unsuitable for surgery.
- 1.5.5.2 Offer fractionated radiotherapy as the definitive treatment of choice to patients with epidural tumour without neurological impairment, mechanical pain or spinal instability.
- 1.5.5.3 Offer a fractionated rather than a single fraction regimen to patients with a good prognosis who are having radiotherapy as their first-line treatment.
- 1.5.5.4 Preoperative radiotherapy should not be carried out on patients with MSCC if surgery is planned.
- 1.5.5.5 Postoperative fractionated radiotherapy should be offered routinely to all patients with a satisfactory surgical outcome once the wound has healed.
- 1.5.5.6 Offer urgent radiotherapy (within 24 hours) to all patients with MSCC who are not suitable for spinal surgery unless:
- they have had complete tetraplegia or paraplegia for more than 24 hours and their pain is well controlled; or
 - their overall prognosis is judged to be too poor.

Selection of treatment following previous radiotherapy

- 1.5.5.7 Consider further radiotherapy or surgery for patients who have responded well to previous radiotherapy and develop recurrent symptoms after at least

3 months.

- 1.5.5.8 If patients have further radiotherapy, the total dose should be below a biologically equivalent dose of 100 Gy₂ where possible. Discuss the possible benefits and risks with the patient before agreeing a treatment plan.

1.6 *Supportive care and rehabilitation*

1.6.1 Interventions for thromboprophylaxis

- 1.6.1.1 Offer all patients who are on bed rest with suspected MSCC thigh-length graduated compression/anti-embolism stockings unless contraindicated, and/or intermittent pneumatic compression or foot impulse devices.
- 1.6.1.2 Offer patients with MSCC who are at high risk of venous thromboembolism (including those treated surgically and judged safe for anticoagulation) subcutaneous thromboprophylactic low molecular weight heparin in addition to mechanical thromboprophylaxis^[7].
- 1.6.1.3 For patients with MSCC, individually assess the duration of thromboprophylactic treatment, based on the presence of ongoing risk factors, overall clinical condition and return to mobility.

1.6.2 Management of pressure ulcers

- 1.6.2.1 Undertake and document a risk assessment for pressure ulcers (using a recognised assessment tool) at the beginning of an episode of care for patients with MSCC. Repeat this assessment every time the patient is turned while on bed rest and at least daily thereafter.
- 1.6.2.2 While patients with MSCC are on bed rest, turn them using a log rolling technique at least every 2-3 hours. Encourage patients who are not on bed rest to mobilise regularly (every few hours). Encourage and assist those who are unable to stand or walk to perform pressure relieving activities such as forward/sideways leaning at least hourly when they are sitting out.
- 1.6.2.3 Promptly provide pressure relieving devices to patients with MSCC appropriate to their pressure risk assessment score. Offer patients with restricted mobility or reduced sensation cushions and/or mattresses with very high-grade

pressure-relieving properties.

- 1.6.2.4 When caring for patients with MSCC, adhere to the pressure sore assessment, prevention and healing protocols recommended in 'The use of pressure-relieving devices for prevention of pressure ulcers' (NICE clinical guideline 7) and 'The management of pressure ulcers in primary and secondary care' (NICE clinical guideline 29).

1.6.3 Bladder and bowel continence management

- 1.6.3.1 Assess bowel and bladder function in all patients with MSCC on initial presentation and start a plan of care.
- 1.6.3.2 Monitor patients with MSCC who are continent and without urinary retention or disturbed bowel function at least daily for changes in bladder and bowel function.
- 1.6.3.3 Manage bladder dysfunction in patients with MSCC initially by a urinary catheter on free drainage. If long-term catheterisation is required, consider intermittent catheterisation or suprapubic catheters.
- 1.6.3.4 Offer a neurological bowel management programme to patients with MSCC and disturbed bowel habit as recommended in 'Faecal incontinence' (NICE clinical guideline 49). Take account of patient preferences when offering diet modification, faecal softeners, oral or rectal laxatives and/or constipating agents as required. Digital stimulation, manual evacuation, rectal irrigation and surgical treatment may be offered, as required.

1.6.4 Maintaining circulatory and respiratory functioning

- 1.6.4.1 Include heart rate and blood pressure measurement, respiratory rate and pulse oximetry in the initial assessment and routine monitoring of all patients with MSCC.
- 1.6.4.2 Symptomatic postural hypotension in patients with MSCC should be managed initially by patient positioning and devices to improve venous return (such as foot pumps and graduated compression/anti-embolism stockings). Avoid overhydration which can provoke pulmonary oedema.

1.6.4.3 Include clearing of lung secretions by breathing exercises, assisted coughing and suctioning as needed in the prophylactic respiratory management of patients with MSCC. Treat retained secretions and the consequences by deep breathing and positioning supplemented by bi-phasic positive airway pressure and intermittent positive pressure ventilation if necessary.

1.6.5 Access to specialist rehabilitation and transition to care at home

1.6.5.1 Ensure that all patients admitted to hospital with MSCC have access to a full range of healthcare professional support services for assessment, advice and rehabilitation.

1.6.5.2 Focus the rehabilitation of patients with MSCC on their goals and desired outcomes, which could include promoting functional independence, participation in normal activities of daily life and aspects related to their quality of life.

1.6.5.3 Offer admission to a specialist rehabilitation unit to those patients with MSCC who are most likely to benefit, for example, those with a good prognosis, a high activity tolerance and strong rehabilitation potential.

1.6.5.4 Discharge planning and ongoing care, including rehabilitation for patients with MSCC, should start on admission and be led by a named individual from within the responsible clinical team. It should involve the patient and their families and carers, their primary oncology site team, rehabilitation team and community support, including primary care and specialist palliative care, as required.

1.6.5.5 Ensure that community-based rehabilitation and supportive care services are available to people with MSCC following their return home, in order to maximise their quality of life and continued involvement in activities that they value.

1.6.5.6 Ensure that people with MSCC are provided with the equipment and care they require in a timely fashion to maximise their quality of life at home.

1.6.5.7 Offer the families and carers of patients with MSCC relevant support and training before discharge home.

1.6.5.8 Clear pathways should be established between hospitals and community-based healthcare and social services teams to ensure that equipment and support for people with MSCC returning home and their carers and families are arranged in an efficient and coordinated manner.

^[3] WHO three-step pain relief ladder.

^[4] 'Percutaneous vertebroplasty' (NICE interventional procedure guidance 12). The Medicines and Healthcare Products Regulatory Agency has issued safety notices relating to this procedure (reference MDA/2003/021).

^[5] 'Balloon kyphoplasty for vertebral compression fractures' (NICE interventional procedure guidance 166).

^[6] Tokuhashi Y et al (2005) A revised scoring system for preoperative evaluation of metastatic spine tumor prognosis. *Spine* 30 (19): 2186–91.

^[7] See 'Venous thromboembolism' (NICE clinical guideline 46) for information on reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in inpatients undergoing spinal surgery.

2 Notes on the scope of the guidance

NICE guidelines are developed in accordance with a scope that defines what the guideline will and will not cover. The scope of this guideline is [available](#).

Groups that will be covered:

- Adults with metastatic spinal disease at risk of developing metastatic spinal cord compression.
- Adults with suspected and diagnosed spinal cord and nerve root compression due to metastatic malignant disease.
- Adults with primary malignant tumours (for example, lung cancer, mesothelioma or plasmacytoma) and direct infiltration that threatens spinal cord function.

Groups that will not be covered:

- Adults with spinal cord compression due to primary tumours of the spinal cord and meninges.
- Adults with spinal cord compression due to non-malignant causes.
- Adults with nerve root tumours compressing the spinal cord.
- Children.

How this guideline was developed

NICE commissioned the National Collaborating Centre for Cancer to develop this guideline. The Centre established a Guideline Development Group (see appendix A), which reviewed the evidence and developed the recommendations. An independent Guideline Review Panel oversaw the development of the guideline (see appendix B).

There is more information about [how NICE clinical guidelines are developed](#) on the NICE website. A booklet, 'How NICE clinical guidelines are developed: an overview for stakeholders, the public and the NHS' is [available](#).

3 Implementation

The Healthcare Commission assesses how well NHS organisations meet core and developmental standards set by the Department of Health in 'Standards for better health' (available from www.dh.gov.uk). Implementation of clinical guidelines forms part of the developmental standard D2. Core standard C5 says that NHS organisations should take into account national agreed guidance when planning and delivering care.

NICE has developed tools to help organisations implement this guidance (listed below). These are available on our [website](#).

- Slides highlighting key messages for local discussion.
- Costing tools:
 - costing report to estimate the national savings and costs associated with implementation
 - costing template to estimate the local costs and savings involved.
- Implementation advice on how to put the guidance into practice and national initiatives that support this locally.
- Audit support for monitoring local practice.
- A local patient information template.

4 Research recommendations

The Guideline Development Group has made the following recommendations for research, based on its review of evidence, to improve NICE guidance and patient care in the future. The Guideline Development Group's full set of research recommendations is detailed in the full guideline (see section 5).

4.1 *Reasons for delayed presentation*

Further research should be undertaken into the reasons why patients with MSCC present late.

Although it is clear from the existing evidence that many patients with MSCC present late, often with established and irreversible neurological problems or a long preceding history of symptoms, the reasons for this are not understood.

4.2 *Use of radiotherapy in the prevention of MSCC*

The use of radiotherapy to prevent the development of MSCC in patients with identified spinal metastases but no pain should be investigated in prospective randomised controlled trials.

There is currently no reliable evidence to indicate whether the use of prophylactic radiotherapy can prevent the development of MSCC in patients with known metastases in the spine but no pain.

4.3 *Use of surgery in the prevention of MSCC*

The use of surgery to prevent the development of MSCC in patients with identified spinal metastases but no pain should be investigated in prospective randomised controlled trials.

There is currently no reliable evidence to indicate whether the use of prophylactic surgery can prevent the development of MSCC in patients with known metastases in the spine but no pain.

4.4 *Management of MSCC*

Further research should investigate what are the most clinically and cost-effective regimens of radiotherapy to treat patients with established MSCC and investigate the use of new techniques, such as intensity-modulated radiation therapy.

Currently there is insufficient high-quality evidence of effect of different regimens of radiotherapy

to treat patients with established MSCC. In order to evaluate the effects of different regimens of radiotherapy, more randomised controlled trials are required. There is no evidence that evaluates new techniques, such as intensity-modulated radiation therapy, in patients with MSCC.

4.5 *Use of vertebroplasty and kyphoplasty in preventing MSCC*

The use of vertebroplasty and kyphoplasty in preventing MSCC in patients with vertebral metastases should be investigated in prospective, comparative studies.

These procedures have been investigated in observational studies without comparators and largely in patients with osteoporotic vertebral collapse. There is limited evidence about their use in patients with MSCC.

5 Other versions of this guideline

5.1 *Full guideline*

The full guideline, 'Metastatic spinal cord compression: diagnosis and management of adults at risk of or with metastatic spinal cord compression' contains details of the methods and evidence used to develop the guideline. It is published by the National Collaborating Centre for Cancer, and is available from our [website](#).

5.2 *Information for the public*

NICE has produced [information for the public](#) explaining this guideline.

We encourage NHS and voluntary sector organisations to use text from this booklet information in their own information materials.

6 Related NICE guidance

Published

Faecal incontinence: the management of faecal incontinence in adults. [NICE clinical guideline 49](#) (2007).

Venous thromboembolism: reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in inpatients undergoing surgery. NICE clinical guideline 46 (2007).
[Replaced by [NICE clinical guideline 92](#)]

Improving outcomes for people with brain and other CNS tumours. [NICE cancer service guidance](#) (2006).

Improving outcomes for people with sarcoma. [NICE cancer service guidance](#) (2006).

The management of pressure ulcers in primary and secondary care. [NICE clinical guideline 29](#) (2005).

Referral guidelines for suspected cancer. [NICE clinical guideline 27](#) (2005).

Improving supportive and palliative care for adults with cancer. [NICE cancer service guidance](#) (2004).

The use of pressure-relieving devices (beds, mattresses and overlays) for the prevention of pressure ulcers in primary and secondary care. [NICE clinical guideline 7](#) (2003).

7 Updating the guideline

NICE clinical guidelines are updated as needed so that recommendations take into account important new information. We check for new evidence 2 and 4 years after publication, to decide whether all or part of the guideline should be updated. If important new evidence is published at other times, we may decide to do a more rapid update of some recommendations.

Appendix A: The Guideline Development Group

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Mr Alistair Stirling (Lead clinician)

Consultant Orthopaedic Spinal Surgeon, The Royal Orthopaedic Hospital, Birmingham

Margaret Berg

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Appendix B: The Guideline Review Panel

The Guideline Review Panel is an independent panel that oversees the development of the guideline and takes responsibility for monitoring adherence to NICE guideline development processes. In particular, the panel ensures that stakeholder comments have been adequately considered and responded to. The panel includes members from the following perspectives: primary care, secondary care, lay, public health and industry.

John Hyslop (Chair)

Consultant Radiologist, Royal Cornwall Hospital NHS Trust

Peter Gosling

Lay Member

Jonathan Hopper

Medical Director (Northern Europe), ConvaTec Ltd

Ash Paul

Deputy Medical Director, Health Commission Wales

Liam Smeeth

Professor of Clinical Epidemiology, London School of Hygiene and Tropical Medicine

Appendix C: The algorithms

The [full guideline](#) contains a care pathway and algorithms.

About this guideline

NICE clinical guidelines are recommendations about the treatment and care of people with specific diseases and conditions in the NHS in England and Wales.

The guideline was developed by the National Collaborating Centre for Cancer. The Collaborating Centre worked with a group of healthcare professionals (including consultants, GPs and nurses), patients and carers, and technical staff, who reviewed the evidence and drafted the recommendations. The recommendations were finalised after public consultation.

The methods and processes for developing NICE clinical guidelines are described in [The guidelines manual](#).

We have produced [information for the public](#) explaining this guideline. Tools to help you put the guideline into practice and information about the evidence it is based on are also [available](#).

Changes after publication

January 2012: minor maintenance

October 2013: Minor maintenance

Your responsibility

This guidance represents the view of NICE, which was arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer, and informed by the summary of product characteristics of any drugs they are considering.

Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.

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