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Metastic Spinal Cord Compression

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National Institute for
Health and Clinical Excellence

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Metastatic spinal cord compression

Diagnosis and management of adults at risk of and with metastatic spinal cord compression

NICE clinical guideline 75
Developed by the National Collaborating Centre for Cancer

NICE clinical guideline 75
Metastatic spinal cord compression: diagnosis and management of adults at risk of and with metastatic spinal cord compression

Ordering information

You can download the following documents from www.nice.org.uk/CG75

- The NICE guideline (this document) – all the recommendations.
- A quick reference guide – a summary of the recommendations for healthcare professionals.
- ‘Understanding NICE guidance’ – a summary for patients and carers.
- The full guideline – all the recommendations, details of how they were developed, and reviews of the evidence they were based on.

For printed copies of the quick reference guide or ‘Understanding NICE guidance’, phone NICE publications on 0845 003 7783 or email publications@nice.org.uk and quote:

- N1719 (quick reference guide)
- N1720 (‘Understanding NICE guidance’).

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

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.

National Institute for Health and Clinical Excellence

MidCity Place
71 High Holborn
London WC1V 6NA

www.nice.org.uk

Contents

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.

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[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 guidelines – 'Reference guide to consent for examination or treatment' (2001) (available from www.dh.gov.uk). Healthcare professionals should also follow the code of practice that accompanies the Mental Capacity Act (summary available from www.publicguardian.gov.uk).

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 (www.nice.org.uk/CG75FullGuideline) 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.

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[3] See www.who.int/cancer/palliative/painladder/en

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).

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[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).

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.

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

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 Gy_2 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.

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[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.

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.

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 from www.nice.org.uk/CG75

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 in the booklet: ‘The guideline development process: an overview for stakeholders, the public and the NHS’ (third edition, published April 2007), which is available from www.nice.org.uk/guidelinesprocess or from NICE publications (phone 0845 003 7783 or email publications@nice.org.uk and quote reference N1233).

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 (www.nice.org.uk/CG75).

- 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 www.wales.nhs.uk/sites3/home.cfm?orgid=432, our website (www.nice.org.uk/CG75fullguideline) and the National Library for Health (www.nlh.nhs.uk).

5.2 Quick reference guide

A quick reference guide for healthcare professionals is available from www.nice.org.uk/CG75quickrefguide

For printed copies, phone NICE publications on 0845 003 7783 or email publications@nice.org.uk (quote reference number N1719).

5.3 ‘Understanding NICE guidance’

A summary for patients and carers (‘Understanding NICE guidance’) is available from www.nice.org.uk/CG75publicinfo

For printed copies, phone NICE publications on 0845 003 7783 or email publications@nice.org.uk (quote reference number N1720).

We encourage NHS and voluntary sector organisations to use text from this booklet in their own information about metastatic spinal cord compression.

6 Related NICE guidance

Published

Faecal incontinence: the management of faecal incontinence in adults. NICE clinical guideline 49 (2007). Available from www.nice.org.uk/CG49

Venous thromboembolism: reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in inpatients undergoing surgery. NICE clinical guideline 46 (2007). Available from www.nice.org.uk/CG46

Improving outcomes for people with brain and other CNS tumours. NICE cancer service guidance (2006). Available from www.nice.org.uk/csgbraincns

Improving outcomes for people with sarcoma. NICE cancer service guidance (2006). Available from www.nice.org.uk/csgsarcoma

The management of pressure ulcers in primary and secondary care. NICE clinical guideline 29 (2005). Available from www.nice.org.uk/CG29

Referral guidelines for suspected cancer. NICE clinical guideline 27 (2005). Available from www.nice.org.uk/CG27

Improving supportive and palliative care for adults with cancer. NICE cancer service guidance (2004). Available from www.nice.org.uk/csgsp

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). Available from www.nice.org.uk/CG7

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

Mr Barrie White (Chair)

Neurosurgeon, Queen’s Medical Centre, Nottingham

Mr Alistair Stirling (Lead clinician)

Consultant Orthopaedic Spinal Surgeon, The Royal Orthopaedic Hospital, Birmingham

Margaret Berg

Patient/carer representative

Dr Bernard Brett

Divisional Director Emergency Division & Consultant Physician & Gastroenterologist, James Paget Healthcare NHS Trust, Norfolk

Dr Juliet Britton

Consultant Neuroradiologist, St George’s Hospital, London

Nicola Cornelius

Consultant Radiographer, Lincoln County Hospital

Dr Angela Gall

Consultant in Rehabilitation Medicine, Spinal Cord Injury Centre, Royal National Orthopaedic Hospital, Middlesex

Dr Linda Garvican

Public Heath Director & Quality Assurance Director, Sussex Cancer Network

Dr David Levy

Medical Director, North Trent Cancer Network, Sheffield

Dr Victoria Lidstone

Consultant in Palliative Medicine, North Glamorgan NHS Trust

Daniel Lowrie

Senior Occupational Therapist, Royal Marsden NHS Trust, London

Mr Robert Marshall

Consultant Orthopaedic Surgeon, Royal Berkshire Hospital, Reading

Dr Euan Patterson

General Practitioner & Macmillan GP Facilitator, Glasgow

Michael Scanes

Patient/carer representative, User Involvement Facilitator, Essex Cancer Network

Dr David Spooner

Consultant Clinical Oncologist, Queen Elizabeth Hospital, Birmingham

Helen Tyler

Clinical Lead Physiotherapist, Velindre Cancer Centre, Velindre NHS Trust, Cardiff

Christine Ward

Nurse Consultant for Adult Palliative Care, Hambleton & Richmondshire Primary Care Trust, North Yorkshire

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

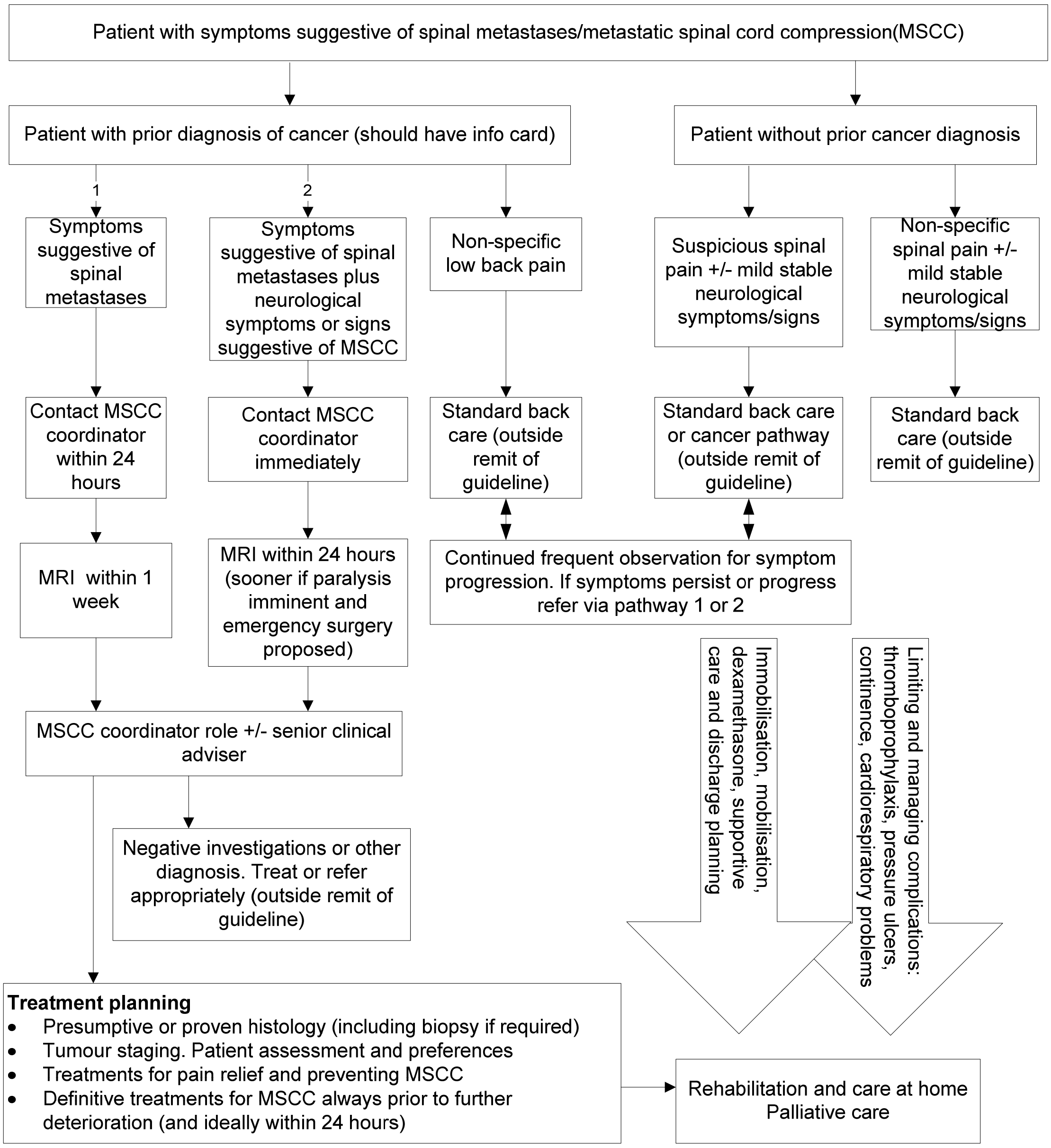
Peter Gosling
Lay Member

Jonathan Hopper
Medical Director (Northern Europe), ConvaTec Ltd

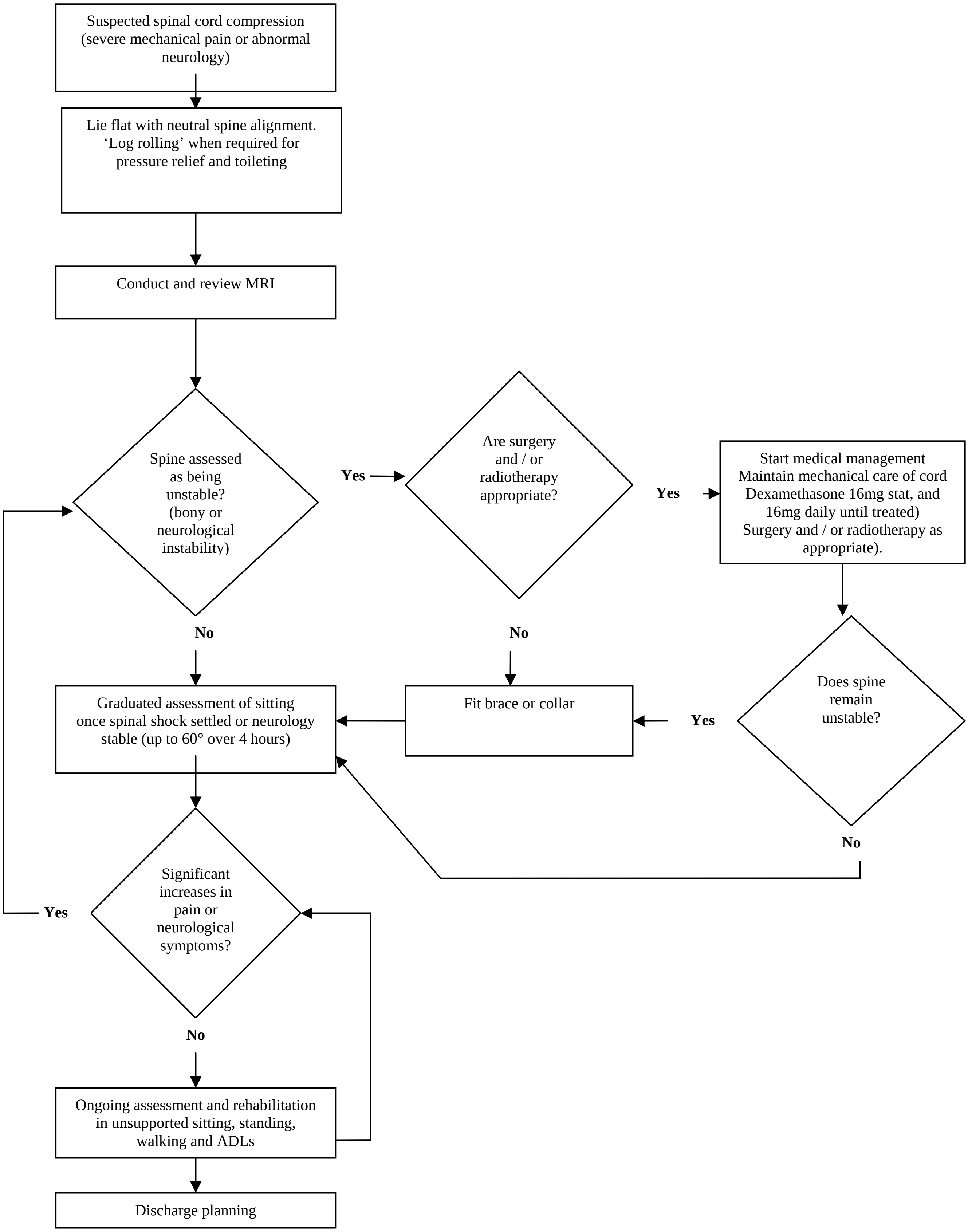
Ash Paul
Deputy Medical Director, Health Commission Wales

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

Appendix C: The algorithms



Flow chart for decisions about the timing and safety of mobilisation once MSCC suspected



NHS
National Institute for
Health and Clinical Excellence

Quick reference guide

Issue date: November 2008

Metastatic spinal cord compression

Diagnosis and management of adults at risk of and with metastatic spinal cord compression

NICE clinical guideline 75
Developed by the National Collaborating Centre for Cancer

About this booklet

This is a quick reference guide that summarises the recommendations NICE has made to the NHS about metastatic spinal cord compression (NICE clinical guideline 75).

Who should read this booklet?

This quick reference guide is for healthcare professionals and other staff who care for people with metastatic spinal cord compression.

Who wrote the guideline?

The guideline was developed by the National Collaborating Centre for Cancer, which is based at the Velindre NHS Trust in Cardiff. 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.

For more information on how NICE clinical guidelines are developed, go to www.nice.org.uk

Where can I get more information about the guideline?

The NICE website has the recommendations in full, reviews of the evidence they are based on, a summary of the guideline for patients and carers, and tools to support implementation (see the back cover for more details).

National Institute for
Health and Clinical Excellence
MidCity Place
71 High Holborn
London
WC1V 6NA

www.nice.org.uk

ISBN 1-84629-832-6

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

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.

Contents

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.
- It is important to recognise the impact of an MSCC diagnosis on people with MSCC and their families and carers, and understand their needs and the support required throughout their care.
- Some people with MSCC experience delays in their treatment and care and may, as a result, develop avoidable disability and die prematurely.
- This guideline will help to ensure that facilities are available for early diagnosis and that treatment is coordinated, follows best practice and whenever possible prevents paralysis from adversely affecting the quality of life of people living with cancer.

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.

continued

- 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.

Patient-centred care

Treatment and care should take into account patients' individual needs and preferences. Good communication is essential, supported by evidence-based information, to allow patients to reach informed decisions about their care. Follow Department of Health advice on seeking consent if needed. If the patient agrees, families and carers should have the opportunity to be involved in decisions about treatment and care.

Patient information

- Give patients with cancer and spinal pain, patients with bone metastases and patients at high risk of developing bone metastases information explaining what to do and who to contact if they develop symptoms of spinal metastases or MSCC or if their symptoms progress while waiting for investigation.

Symptoms

Symptoms suggestive of spinal metastases

- pain in the thoracic or cervical spine
- progressive lumbar spinal pain
- severe unremitting lumbar spinal pain
- spinal pain aggravated by straining
- localised spinal tenderness
- nocturnal spinal pain preventing sleep.

Neurological symptoms or signs suggestive of MSCC

- radicular pain
- limb weakness
- difficulty walking
- sensory loss
- bladder or bowel dysfunction
- signs of spinal cord or cauda equina compression.

- If patients with cancer have symptoms suggestive of spinal metastases, discuss with the MSCC coordinator within 24 hours.
- If patients with cancer and symptoms suggestive of spinal metastases have neurological symptoms or signs suggestive of MSCC, discuss with the MSCC coordinator immediately and view as an emergency.
- Review frequently patients with cancer who have non-specific lumbar spinal pain and patients without cancer who have suspicious spinal pain 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).
- Treat or refer patients without cancer who have stable and mild symptoms of suspicious spinal pain, with or without neurological symptoms, by normal non-specific spinal pathways. Refer by cancer pathway if concerned.
- If possible discuss patients with suspected MSCC, a poor performance status and widespread metastatic disease with their primary tumour site clinician and spinal senior clinical adviser before any urgent imaging or hospital transfer.
- If possible urgently discuss patients with suspected MSCC who have been completely paraplegic or tetraplegic for more than 24 hours with their primary tumour site clinician and spinal senior clinical adviser before any imaging or hospital transfer.
- Do not transfer unnecessarily patients with MSCC who are too frail or unfit for specialist treatment.

Imaging

Magnetic resonance imaging

- Perform magnetic resonance imaging (MRI) of the whole spine in patients with suspected MSCC, unless contraindicated.
- Include sagittal T1, short T1 inversion recovery and sagittal T2 weighted sequences.
- Perform supplementary axial imaging through any significant abnormality noted on the sagittal scan.
- Configure lists to allow MRI at short notice. Out-of-hours MRI should be available in emergency situations if immediate treatment is planned.
- If MRI is not available at the referring hospital, transfer patients with suspected MSCC to a unit with 24-hour capability.
- Perform MRI in time to plan definitive treatment:
  - within 1 week in patients with symptoms suggestive of spinal metastases
  - within 24 hours in patients with symptoms suggestive of spinal metastases and neurological symptoms or signs suggestive of MSCC
  - sooner (including out-of-hours) if emergency treatment is needed.

Other imaging options

- If MRI is contraindicated, contact the MSCC coordinator to determine the best imaging option.
- Consider myelography if other imaging options are contraindicated or inadequate. Undertake myelography only at a neuroscience or spinal surgery centre.
- Consider targeted computerised tomography to assess spinal stability and plan vertebroplasty, kyphoplasty or surgery.
- Do not use plain radiographs to diagnose or exclude spinal metastases or MSCC.
- Do not routinely image the spine if patients with malignancy are asymptomatic.
- Serial imaging of the spine in asymptomatic patients with cancer at high risk of developing spinal metastases should only be done as part of a randomised controlled trial.

Treatment and care

- The care of patients with MSCC should be determined by senior clinical advisers (clinical oncologists, spinal surgeons or radiologists with experience and expertise in treating patients with MSCC) in collaboration with primary tumour site clinicians as required, taking into account the patient's preferences and condition.

Mobilisation

- Nurse flat with spine in neutral alignment patients with severe mechanical pain suggestive of spinal instability or neurological symptoms or signs suggestive of MSCC until spinal and neurological stability are ensured. Use log rolling techniques or turning beds and a slipper pan.
- Once any spinal shock has settled and the spine and neurology are stable, monitor and assess during gradual sitting (to 60 degrees) over 3–4 hours.
- If blood pressure is stable and there is no significant increase in pain or neurological symptoms, continue to unsupported sitting and mobilisation.
- If pain or neurological symptoms worsen, return to a position where these changes reverse and reassess spinal stability.
- If patients are not suitable for definitive treatment they should be helped to position themselves and mobilise as symptoms permit after a discussion of the risks. Provide orthoses or specialist seating, if appropriate.

Corticosteroids

- Offer a loading dose of at least 16 mg of dexamethasone to patients with MSCC as soon as possible after assessment (unless contraindicated, including a significant suspicion of lymphoma). Follow with a short course of 16 mg dexamethasone daily while treatment is being planned.
- Continue dexamethasone 16 mg daily in patients awaiting surgery or radiotherapy for MSCC. After surgery or the start of radiotherapy, gradually reduce the dose of dexamethasone over 5–7 days and stop. If neurological function deteriorates, increase the dose temporarily.
- In patients with MSCC who do not proceed to surgery or radiotherapy after planning, gradually reduce the dose and stop dexamethasone. Reconsider the dose if neurological function deteriorates.
- Monitor blood glucose levels in all patients receiving corticosteroids.

Treatments for pain relief and to prevent MSCC

- Decisions on the most appropriate combinations of treatment to relieve pain or prevent paralysis caused by MSCC (see table 1) should be made by spinal specialists in consultation with primary tumour site clinicians, and with the full involvement of the patient.

Table 1 Treatment options for pain relief and to prevent MSCC

Conventional analgesia	● Offer to patients with painful spinal metastases as described in the WHO three-step pain relief ladder.
Specialist pain care	● Consider invasive procedures and neurosurgical interventions for patients with intractable pain from spinal metastases.
Bisphosphonates	● Offer to patients with vertebral involvement from myeloma or breast cancer, and patients with prostate cancer if conventional analgesia is inadequate. ● Do not offer to patients with other tumour types or to prevent MSCC except as part of a randomised controlled trial.
Palliative radiotherapy	● Offer 8 Gy single fraction to patients with spinal metastases causing non-mechanical vertebral pain, even if they are completely paralysed. ● Do not offer radiotherapy to prevent MSCC in patients with asymptomatic spinal metastases except as part of a randomised controlled trial.
Vertebroplasty[†] or kyphoplasty	● Consider for patients with spinal metastases and no evidence of MSCC or spinal instability if they have: – mechanical pain resistant to conventional analgesia, or – vertebral body collapse. ● Perform only after agreement between oncologist, interventional radiologist and spinal surgeon, in consultation with the patient.
Spinal stabilisation surgery	● Urgently consider for patients with spinal metastases and imaging evidence of structural spinal failure with spinal instability. ● Consider for patients with spinal metastases and mechanical pain resistant to conventional analgesia, even if they have been completely paralysed for more than 24 hours. ● Do not offer to prevent MSCC in patients with spinal metastases without pain or instability, except as part of a randomised controlled trial.
External spinal support	● Consider for patients with MSCC and severe mechanical pain and/or imaging evidence of spinal instability, who are unsuitable for surgery.

[†] The MHRA has issued safety notices relating to vertebroplasty (reference MDA/2003/021).

Definitive treatment for patients with MSCC

- Start definitive treatment before further neurological deterioration and ideally within 24 hours of an MSCC diagnosis.
- When planning definitive treatment:
  - attempt to establish the primary histology of spinal metastases (by tumour biopsy if necessary)
  - determine the number, anatomical sites, and extent of spinal and visceral metastases
  - take into account:
    - patient preferences
    - neurological ability
    - functional status
    - general health and fitness
    - previous treatments
    - magnitude of surgery
    - likelihood of complications
    - fitness for general anaesthesia
    - overall prognosis.
- Do not deny surgery or radiotherapy on the basis of age alone.

Surgery

Eligibility for surgery

- When deciding whether surgery is appropriate:
  - use recognised prognostic factors (including the revised Tokuhashi scoring system and American Society of Anaesthetists grading)
  - record and take into account relevant comorbidities.
- Consider speed of onset, duration, degree, and site of origin of neurological symptoms and signs when assessing urgency of surgery.
- Perform surgery before patients lose the ability to walk.
- Offer surgery, regardless of ability to walk, if patients have residual distal sensory or motor function and a good prognosis.
- Do not offer surgery to patients with MSCC who have been completely paraplegic or tetraplegic for more than 24 hours except for pain relief (see table 1).
- Only consider major surgical treatments for patients expected to survive longer than 3 months.

Type of surgery

- Offer surgery to achieve spinal cord decompression and durable spinal column stability and to maximise the probability of preserving spinal cord function without undue risk to the patient.
- Do not perform posterior decompression alone in patients with MSCC except for isolated epidural tumour or neural arch metastases without bony instability.
- Offer posterior decompression and internal fixation (with or without bone grafting) if spinal metastases involve the vertebral body or threaten spinal stability.
- 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.
- Consider vertebral body reconstruction with anterior bone graft for patients with MSCC and vertebral body involvement who are:
  - suitable for instrumented decompression,
  - expected to survive for 1 year or longer, and
  - fit to undergo a more prolonged procedure.
- Do not attempt en bloc excisional surgery except in rare circumstances, for example, if a solitary renal or thyroid metastasis is confirmed following complete staging.

Radiotherapy

- Offer fractionated radiotherapy as the definitive treatment of choice to patients with epidural tumour without neurological impairment, mechanical pain or spinal instability.
- Offer urgent fractionated radiotherapy (within 24 hours) to patients with MSCC who require definitive treatment but are unsuitable for surgery unless:
  - they have had complete paraplegia or tetraplegia for more than 24 hours and their pain is well controlled, or
  - their prognosis is too poor.
- Do not carry out preoperative radiotherapy.
- Offer postoperative fractionated radiotherapy to patients with a satisfactory outcome, once the wound has healed.
- If patients respond well to radiotherapy and symptoms recur after 3 months, consider surgery or further radiotherapy (keep the total dose below 100 Gy_2). Discuss the possible benefits and risks of further radiotherapy with the patient.

Supportive care

- Offer specialist psychological and spiritual support at diagnosis, during treatment and on discharge from hospital. Explain how to access these services.
- Offer bereavement support to families and carers[1].

Managing complications

Venous thromboembolism

- Offer thigh-length graduated compression/anti-embolism stockings (unless contraindicated) and/or intermittent pneumatic compression or foot impulse devices to patients with suspected MSCC on bed rest.
- Offer low molecular weight heparin to patients with MSCC who are at high risk of venous thromboembolism (including those treated surgically) and suitable for anticoagulation in addition to mechanical thromboprophylaxis[2].
- Individually assess the duration of thromboprophylaxis, based on risk factors, overall clinical condition and return to mobility.

Pressure ulcers

- Perform a risk assessment for pressure ulcers on initial presentation. Repeat every time the patient is turned while on bed rest, and then daily.
- Turn patients on bed rest every 2–3 hours using a log rolling technique.
- Encourage patients who are not on bed rest to mobilise regularly.
- Encourage and assist patients who are unable to stand or walk to perform pressure relieving activities at least every hour.
- Provide pressure relieving devices according to the pressure risk assessment score.
- Offer cushions and mattresses with high-grade pressure relieving properties to patients with restricted mobility or reduced sensation.
- Follow pressure sore assessment, prevention and healing protocols[3].

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[1] See ‘Improving supportive and palliative care for adults with cancer’ (NICE cancer service guidance).
[2] See 'Venous thromboembolism’ (NICE clinical guideline 46).
[3] See ‘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).

Bladder and bowel continence management

- Assess bowel and bladder function on initial presentation and start a plan of care.
- Monitor patients at least daily for changes in bladder and bowel function.
- Manage bladder dysfunction with a urinary catheter on free drainage. If long-term catheterisation is required, consider intermittent catheterisation or suprapubic catheters.
- Offer a neurological bowel management programme to patients with MSCC and disturbed bowel function[4].
- Take into account patient preferences, and offer as required:
  - diet modification
  - faecal softeners
  - laxatives
  - constipating agents
  - digital stimulation
  - manual evacuation
  - rectal irrigation
  - surgery.

Circulatory and respiratory functioning

- Assess and monitor heart rate, blood pressure, respiratory rate and pulse oximetry in patients with MSCC.
- Manage postural hypotension in patients with MSCC with patient positioning and devices to improve venous return.
- Avoid overhydration as it may cause pulmonary oedema.
- Clear lung secretions with breathing exercises, assisted coughing and suctioning.
- Treat retained lung secretions and the consequences with deep breathing and positioning, supplemented by bi-phasic positive airway pressure and intermittent positive pressure ventilation, if necessary.

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[4] See 'Faecal incontinence' (NICE clinical guideline 49).

Rehabilitation and care at home

- Offer support services for assessment, advice and rehabilitation.
- Start discharge planning on admission. This should be led by a named healthcare professional, and involve the patient, their family and carers, their primary oncology site team, rehabilitation team and community support, including primary care and specialist palliative care as required.
- Focus rehabilitation on the patient's goals and desired outcomes, including functional independence, participation in normal activities of daily life and quality of life.
- Offer admission to a specialist rehabilitation unit to people who are most likely to benefit.
- Ensure community-based rehabilitation and supportive care services are available to people with MSCC following their return home.
- Ensure that care and equipment is provided in a timely fashion.
- Offer families and carers support and training before the patient is discharged home.

Service organisation

- Cancer networks should:
  - have a clear care pathway for the diagnosis, treatment, rehabilitation and ongoing care of patients with MSCC
  - commission and monitor appropriate services throughout the care pathway
  - ensure that access to MRI is available within 24 hours for all patients with suspected MSCC and 24-hour availability of MRI at centres treating patients with MSCC
  - establish a network site specific group for MSCC, including representatives from primary, secondary and tertiary care. This group should have strong links to the network site specific groups for primary tumours
  - appoint a network lead for MSCC.
- The network lead for MSCC should:
  - advise the network, commissioners and providers about the provision and organisation of services
  - ensure that the local care pathway is documented, agreed and consistent
  - ensure that there are appropriate points of telephone contact to an MSCC coordinator and senior clinical advisers
  - maintain a network-wide audit of the care pathway and outcomes of patients
  - arrange and chair twice-yearly meetings of the network site specific group to discuss patient outcomes and review the care pathway.

- Secondary or tertiary care centres should have an identified lead healthcare professional for MSCC who:
  - represents the hospital at network level to develop the care pathway
  - implements the care pathway and disseminates information about the diagnosis and appropriate management of patients
  - ensures good communication between all healthcare professionals involved in the care of patients with MSCC
  - raises awareness of the treatment options
  - contributes to regular audits of the care pathway
  - attends and contributes to the twice-yearly network site specific group meeting.
- Every centre that treats patients with MSCC should:
  - identify or appoint individuals to the role of MSCC coordinator and ensure its availability at all times
  - have a single point of contact to access the MSCC coordinator to advise clinicians and coordinate the care pathway
  - ensure 24-hour availability of senior clinical advisers to advise and support the MSCC coordinator and other clinicians and undertake treatment where necessary.
- 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.
- Commissioners and councils should work jointly to provide equipment and support (including nursing and rehabilitation services) to people with MSCC and their carers and families when they return home.

Implementation tools

NICE has developed tools to help organisations implement this guidance (listed below). These are available on our website (www.nice.org.uk/CG75).

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

Further information

Ordering information

You can download the following documents from www.nice.org.uk/CG75

- The NICE guideline – all the recommendations.
- A quick reference guide (this document) – a summary of the recommendations for healthcare professionals.
- 'Understanding NICE guidance' – a summary for patients and carers.
- The full guideline – all the recommendations, details of how they were developed, and reviews of the evidence they were based on.

For printed copies of the quick reference guide or 'Understanding NICE guidance', phone NICE publications on 0845 003 7783 or email publications@nice.org.uk and quote:

- N1719 (quick reference guide)
- N1720 ('Understanding NICE guidance').

Related NICE guidance

For information about NICE guidance that has been issued or is in development, see www.nice.org.uk

Published

NICE has issued cancer service guidance on improving outcomes for people with brain and other CNS tumours, people with sarcoma and supportive and palliative care for adults with cancer, clinical guidelines on faecal incontinence (CG49), venous thromboembolism (CG46), the management of pressure ulcers (CG29), referral guidelines for suspected cancer (CG27) and pressure-relieving devices for the prevention of pressure ulcers (CG7) and interventional procedure guidance on vertebroplasty (IPG12) and kyphoplasty (IPG166).

Updating the guideline

This guideline will be updated as needed, and information about the progress of any update will be available at www.nice.org.uk/CG75

National Institute for
Health and Clinical Excellence
MidCity Place
71 High Holborn
London
WC1V 6NA

www.nice.org.uk

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NHS
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Health and Clinical Excellence

Understanding NICE guidance

Information for people who use NHS services

Metastatic spinal cord compression

NICE 'clinical guidelines' advise the NHS on caring for people with specific conditions or diseases and the treatments they should receive.

This booklet is about the care and treatment of people who have, or are at risk of developing, metastatic spinal cord compression (see page 4) in the NHS in England and Wales. It explains guidance (advice) from NICE (the National Institute for Health and Clinical Excellence). It is written for people who have, or are at risk of developing, metastatic spinal cord compression but it may also be useful for their families or carers or for anyone with an interest in the condition.

The booklet is to help you understand the care and treatment options that should be available in the NHS. It does not describe metastatic spinal cord compression or the tests or treatments for it in detail. Your specialist should discuss these with you. There are examples of questions you could ask throughout this booklet to help you with this. You can get more information from the organisations listed on the back page.

Information about NICE clinical guideline 75
Issue date: November 2008

Contents

The advice in the NICE guideline covers:

- adults who have, or are at risk of developing, metastatic spinal cord compression (see page 4) because they have cancer elsewhere in their body that has spread to their spine.

It does not specifically look at:

- children, or
- adults whose cancer started in the spine or who have compression of the spinal cord that is not caused by cancer.

Your care

Your treatment and care should take into account your personal needs and preferences, and you have the right to be fully informed and to make decisions in partnership with your healthcare team. To help with this, your healthcare team should give you information you can understand and that is relevant to your circumstances. All healthcare professionals should treat you with respect, sensitivity and understanding and explain metastatic spinal cord compression and the treatments for it simply and clearly.

The information you get from your healthcare team should include details of the possible benefits and risks of particular treatments. You can ask any questions you want to and can always change your mind as your treatment progresses or your condition or circumstances change. Your own preference for a particular treatment is important and your healthcare team should support your choice of treatment wherever possible.

Your treatment and care, and the information you are given about it, should take account of any religious, ethnic or cultural needs you may have. It should also take into account any additional factors, such as physical or learning disabilities, sight or hearing problems, or difficulties with reading or speaking English. Your healthcare team should be able to arrange an interpreter or an advocate (someone who supports you in putting across your views) if needed.

If you agree, your family and carers should have the chance to be involved in decisions about your care. Family members and carers also have the right to the information and support they need in their roles as carers.

If people are unable to understand a particular issue or are not able to make decisions for themselves, healthcare professionals should follow the advice that the Department of Health has produced about this. You can find this by going to the Department of Health website (www.dh.gov.uk/consent). Your healthcare professional should also follow the code of practice for the Mental Capacity Act. For more information about this, visit www.publicguardian.gov.uk

If you think that your care does not match what is described in this booklet, please talk to a member of your healthcare team.

Metastatic spinal cord compression

Metastatic spinal cord compression is a rare complication of cancer. People who have cancer are at risk of it spreading to other parts of their body including the liver, lungs or bones. When cancer spreads it is known as 'metastatic'.

Cancer that has spread to the spine is known as 'spinal metastases'. Spinal metastases can be painful and if not treated can lead to metastatic spinal cord compression. This booklet explains the NICE guidance on the care of people who have metastatic spinal cord compression – this is when the spinal metastases press on the nerves in the spine that carry messages between the brain and the rest of the body (these nerves are known as the spinal cord). If it isn't treated quickly, metastatic spinal cord compression can lead to serious disability, including permanent paralysis, and early death.

Diagnosing metastatic spinal cord compression

It's important that people who have cancer that may spread to the spine are aware of the symptoms of spinal metastases and metastatic spinal cord compression because diagnosing the disease quickly can help to prevent spinal cord damage and disability.

People who have cancer that has spread, or is at risk of spreading, to their bones should be given information that explains what to do and who to contact if they develop symptoms of spinal metastases or metastatic spinal cord compression. This information should also be given to people who have cancer and back pain so that they are aware of the symptoms.

Symptoms of spinal metastases

- Pain or tenderness in the middle or top of your back or neck.
- Severe pain in your lower back that is getting worse or doesn't go away.
- Pain in your back that is worse when you cough, sneeze or go to the toilet.
- Back pain that stops you from sleeping.

Symptoms of metastatic spinal cord compression

- A narrow band of pain down the arm or leg or around the body.
- Numbness, weakness or difficulty using your arms or legs.
- Bladder or bowel control problems.

Depending on your symptoms, you may be advised to go to hospital for a scan of your spine and possible treatment.

In your local area, there should be healthcare professionals with responsibility for coordinating the care of people with metastatic spinal cord compression.

Scans

If your healthcare team suspects you have spinal metastases or metastatic spinal cord compression, you should be offered a magnetic resonance imaging (MRI) scan within 1 week, or sooner depending on your symptoms. This will help them to see whether you have spinal metastases that are causing metastatic spinal cord compression, and if and how it should be treated.

If MRI is not appropriate for you, or if your healthcare team would like more detailed information about your cancer, or to help work out the best treatment for you, they may offer you other types of scans or tests.

Questions about scans

- Please give me more details about the scans I should have.
- What do these scans involve?
- How long will it take to get the results of these scans?

Treatments

If metastatic spinal cord compression is diagnosed, treatment should start as quickly as possible (ideally within 24 hours of being admitted to hospital).

When working out the most appropriate treatment for you, your healthcare team should take into account your own preferences as well as your general level of health and fitness for treatment, any previous treatments you have had, and the exact location and stage of your cancer.

Your healthcare professional should discuss your treatment options with you and you should be involved in all decisions about your treatment and care.

Treatments for metastatic spinal cord compression

These are the treatment options that are recommended in the NICE guideline, some of which may be appropriate for you. They may be offered to you in different combinations.

Analgesics: medicines that help to relieve the pain.

Bisphosphonates: medicines that help to relieve the pain and protect the bones in your spine.

Corticosteroids: medicines that help to reduce swelling and relieve the pressure of the cancer on your spinal cord.

Kyphoplasty and vertebroplasty: injections of a special bone cement into the spine to help ease pain and strengthen the spine.

Radiotherapy: radiation treatment directed at the spine to destroy cancer cells and relieve the pressure on your spinal cord.

Surgery: an operation to help relieve the pressure on your spinal cord and strengthen your spine.

Questions about treatment

- Please tell me why you have decided to offer me this treatment.
- Could you tell me about this treatment and the benefits and risks it might have?
- Please tell me what the treatment will involve.

Keeping your spine stable

Your healthcare team may ask you to lie flat to try to reduce the movement of your spine and protect your spinal cord. Once your healthcare professional is sure that your spine and spinal cord are not at risk from movement, you should be monitored when you first start to sit up to make sure your spine and spinal cord remain safe. When you are able to sit up safely on your own, you should be offered support to help you move around.

Support and care in hospital

While you are in hospital, you should have access to advice and support from your healthcare team who should work with you to help you retain as much of your independence as possible. They should focus on what is important to you, in terms of going about your daily life and your quality of life.

You and your family or carers should be offered information on how to access psychological and spiritual support if you need it.

Your healthcare team should also discuss with you the care and support you should receive on leaving hospital, including palliative care. Palliative care involves treatments for pain relief, and practical and emotional support to help manage your condition.

Other health problems

People who are in hospital with metastatic spinal cord compression are at risk of developing other health problems. Some of these are described below.

Blood clots

If you are having surgery for metastatic spinal cord compression, or if you are unable to move around, you are at risk of developing a blood clot. You should be offered devices that help stop the blood collecting in your leg veins, including compression stockings and foot pumps. You may also be offered medicines that help to reduce the risk of blood clotting (known as 'anticoagulants').

Pressure ulcers (also known as pressure sores or bed sores)

If you are unable to move around you are at risk of developing pressure ulcers. To prevent pressure ulcers, you should be encouraged to move around as much as possible, or if you cannot move around, you should be offered help to change position regularly. You may also be offered cushions or mattresses to help prevent pressure ulcers.

Bowel or bladder control problems

People with metastatic spinal cord compression are at risk of developing severe bowel or bladder problems. People unable to pass urine should be offered a catheter, and medicines may be offered to improve the bowel function of people with bowel problems.

Even if you do not have bowel or bladder problems, your healthcare team should check daily for any changes in your bladder or bowel function.

NICE has produced guidance on the care of people who are at risk of developing blood clots and pressure ulcers and guidance on the care of people with bowel control problems and women with bladder control problems – see the back page for details.

After you have been discharged

After hospital treatment most people will be advised to return home. However, some people may be offered specialist rehabilitation, where equipment and support is provided to improve their quality of life and regain as much of their independence as possible.

If you are returning home, you should be offered community-based support to help improve your quality of life. The NICE guideline says that you should be provided with equipment without delay to help you at home.

Families and carers should be offered support and training so that they feel confident in supporting people with metastatic spinal cord compression at home.

More information

The organisations below can provide more information and support for people with metastatic spinal cord compression. Please note that NICE is not responsible for the quality or accuracy of any information or advice provided by these organisations.

- Brain and Spine Foundation, 0808 808 1000 www.brainandspine.org.uk
- Macmillan Cancer Support, 0808 808 2020 www.macmillan.org.uk

NHS Choices (www.nhs.uk) may be a good place to find out more. Your local patient advice and liaison service (usually known as 'PALS') may also be able to give you further information and support.

NICE has also produced the following booklets explaining NICE guidance, which you may find useful. They are available at www.nice.org.uk or from NICE publications (phone 0845 003 7783 or email publications@nice.org.uk and quote the relevant reference number).

- 'Reducing the risk of a blood clot from surgery', available from www.nice.org.uk/CG46 (reference N1217)
- 'Pressure ulcers – prevention and treatment', available from www.nice.org.uk/CG29 (reference N0913)
- 'Faecal incontinence (bowel control problems)', available from www.nice.org.uk/CG49 (reference N1264)
- 'Urinary incontinence: the management of urinary incontinence in women', available from www.nice.org.uk/CG40 (reference N1129)

About NICE

NICE produces guidance (advice) for the NHS about preventing, diagnosing and treating different medical conditions. The guidance is written by independent experts including healthcare professionals and people representing patients and carers. They consider the evidence on the condition and treatments, the views of patients and carers and the experiences of doctors, nurses and other healthcare professionals. Staff working in the NHS are expected to follow this guidance.

To find out more about NICE, its work and how it reaches decisions, see www.nice.org.uk/aboutguidance

This booklet and other versions of this guideline aimed at healthcare professionals are available at www.nice.org.uk/CG75. The versions for healthcare professionals contain more detailed information on the care and treatment you should be offered.

You can order printed copies of this booklet from NICE publications (phone 0845 003 7783 or email publications@nice.org.uk and quote reference N1720).

We encourage NHS and voluntary sector organisations to use text from this booklet in their own information about metastatic spinal cord compression.

National Institute for Health and Clinical Excellence
MidCity Place, 71 High Holborn, London, WC1V 6NA; www.nice.org.uk

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NHS
National Institute for
Health and Clinical Excellence

Metastatic spinal cord compression

Costing report

Implementing NICE guidance

November 2008

NICE clinical guideline 75

Clinical Guideline Implementation Tools

This costing report accompanies the clinical guideline: Metastatic spinal cord compression: diagnosis and management of adults at risk of and with metastatic spinal cord compression (available online at www.nice.org.uk/CG75).

Issue date: November 2008

This guidance is written in the following context

This report represents the view of NICE, which was arrived at after careful consideration of the available data and through consulting healthcare professionals. It should be read in conjunction with the NICE guideline. The report and templates are implementation tools and focus on those areas that were considered to have significant impact on resource utilisation.

The cost and activity assessments in the reports are estimates based on a number of assumptions. They provide an indication of the likely impact of the principal recommendations and are not absolute figures. Assumptions used in the report are based on assessment of the national average. Local practice may be different from this, and the template can be amended to reflect local practice to estimate local impact.

National Institute for Health and Clinical Excellence
MidCity Place
71 High Holborn
London WC1V 6NA

www.nice.org.uk

Contents

Executive summary

This costing report looks at the resource impact of implementing the NICE guideline ‘Metastatic spinal cord compression: diagnosis and management of adults at risk of and with metastatic spinal cord compression’ in England. We have not considered recommendations relating to rehabilitation and palliative care that were included in previous NICE guidance ‘Improving supportive and palliative care for adults with cancer’.

The costing method adopted is outlined in appendix A; it uses the most accurate data available, was produced in conjunction with key clinicians, and reviewed by clinical and financial professionals.

Supporting implementation

The NICE clinical guideline on metastatic spinal cord compression (MSCC) is supported by a range of implementation tools available on our website www.nice.org.uk/CG75 and detailed in the main body of this report.

Significant resource-impact recommendations

Because of the breadth and complexity of the guideline, this report focuses on recommendations that are considered to have the greatest resource impact and therefore require the most additional resources to implement or can potentially generate savings. They are:

- surgical treatment of spinal metastases and MSCC
- early intervention preventing late crisis intervention and reducing the need for supportive care.

Total cost impact

The annual changes in revenue costs arising from fully implementing the guideline are summarised in table below.

Estimated recurrent costs/savings	**£000s**
Surgery for treatment and prevention of MSCC	14,023
Potential savings in supportive care and rehabilitation after discharge of patients	-17,513
Net resource impact of MSCC guidance	**-3,490**

The costs associated with surgery will fall within secondary care, and hence will fall within the scope of ‘Payment by results’. Depending on what care is delivered programme budgeting categories 202X – cancers and tumours or 215X – musculo skeletal system may be affected.

As surgery may be considered as part of a combination of treatment and may be adjuvant to radiotherapy and other treatment options, it is not anticipated that there will be any significant savings for reduced radiotherapy activity or reductions in other treatment options.

In addition to the areas that we have quantified, two areas were identified as potentially having resource consequences that needs to be investigated at a local level:

MSCC Coordinator

The recommendations identify this role as a single point of contact at each cancer network to operate the efficient and effective management of the patient care pathway. It was found that some cancer networks could nominate to this role within existing establishments given the number of cases per annum. However it was recognised that where patient numbers were high, and the potential increase in patient numbers following implementation of the guidance, that there may be local cost implications where this role could not be accommodated within current capacity.

24 Hour access to MRI services

Previous NICE guidance on Stroke (NICE clinical guideline 65) and Head injury (NICE clinical guideline 56) plus additional government funding on improving diagnostics established that capacity and accessibility to MRI had improved, although there were some variations in services regionally. It was therefore recognised that this needed to be considered locally.

Benefits and savings

Implementing the clinical guideline may bring the following benefits:

- Earlier diagnosis of MSCC is essential to prevent irreversible neurological damage; patients may become paraplegic if diagnosis is too late. Earlier diagnosis may therefore result in cost savings due to reduced hospital stay and less need for hospital resources. Cost savings may come from a reduced need for 24-hour nursing care either in hospital or in the community setting.
- Evidence suggests surgery has better outcomes for patients than radiotherapy for both life expectancy and for patients keeping the ability to walk. These better outcomes would result in potentially significant savings of up to £17.5 million as a result of reduced home care costs, community nursing, and out-of-ours access for GP and clinical services.

Local costing template

The costing template produced to support this guideline enables organisations in England, Wales and Northern Ireland to estimate the impact locally and replace variables with ones that depict the current local position. A sample calculation using this template showed that additional costs of £36,053 could be incurred for a population of 100,000 along with estimated savings of £45,027 per 100,000 population as a result of better patient outcomes. This leaves a net saving of £8,974 per 100,000 population.

1 Introduction

1.1 Supporting implementation

1.1.1 The NICE clinical guideline on MSCC is supported by the following implementation tools available on our website www.nice.org.uk/CG75:

- costing tools
  - a national costing report; this document
  - a local costing template; a simple spreadsheet that can be used to estimate the local cost of implementation.
- a slide set; key messages for local discussion
- implementation advice; practical suggestions on how to address potential barriers to implementation
- audit support
- a local patient information template.

1.1.2 A practical guide to implementation, 'How to put NICE guidance into practice: a guide to implementation for organisations', is also available to download from the NICE website. It includes advice on establishing organisational level implementation processes as well as detailed steps for people working to implement different types of guidance on the ground.

1.2 What is the aim of this report?

1.2.1 This report provides estimates of the national cost impact arising from implementation of guidance on MSCC in England. These estimates are based on assumptions made about current practice and predictions of how current practice might change following implementation.

1.2.2 This report aims to help organisations plan for the financial implications of implementing NICE guidance.

1.2.3 This report does not reproduce the NICE guideline on MSCC and should be read in conjunction with it (see www.nice.org.uk/CG75).

1.2.4 The costing template that accompanies this report is designed to help those assessing the resource impact at a local level in England, Wales or Northern Ireland. NICE clinical guidelines are developmental standards in the Department of Health’s document ‘Standards for better health’. The costing template may help inform local action plans demonstrating how implementation of the guideline will be achieved.

1.3 Epidemiology of MSCC

1.3.1 According to an audit carried out in Scotland, and a Canadian population-based study of malignant spinal cord compression, there are an estimated 80 cases per million adults of MSCC per year (Levack P et al. 2001, Loblaw DA et al. 2003)

1.3.2 This equates to around 3,112 cases for the adult population aged 18 years and older of England, or around 94 cases per cancer network per year.

1.3.3 The incidence of MSCC is increasing because of the rising cancer incidence and improved treatment. Around 5-10% of patients with cancer develop spinal metastases and around 10% of these develop cord compression (Klimo et al. 2003).

1.4 Models of care

1.4.1 MSCC is managed in secondary care. Patients identified could be managed either by the orthopaedic department of the neurosurgery department.

2 Costing methodology

2.1 Process

2.1.1 We use a structured approach for costing clinical guidelines (see appendix A).

2.1.2 Despite systematic reviews carried out in the preparation of the full guideline, little information is available on the management of patients with MSCC. This led to problems in building a comprehensive bottom-up model for costing (a costing methodology where the unit cost of individual elements and number of units are estimated and added together to provide a total cost). To overcome this limitation, we had to make assumptions in the costing model. We developed these assumptions and tested them for reasonableness with members of the Guideline Development Group (GDG) and key clinical practitioners in the NHS.

2.2 Scope of the cost-impact analysis

2.2.1 The guideline offers best practice advice on the care of adults who are suspected of having, or are diagnosed with MSCC.

2.2.2 We have not considered recommendations relating to rehabilitation and palliative care that were included in previous NICE guidance ‘Improving supportive and palliative care for adults with cancer’

2.2.3 The guideline does not cover children with MSCC as the condition is rare and their needs and management are very different from the care an adult might receive. Therefore, these issues are outside the scope of the costing work.

2.2.4 Due to the breadth and complexity of the guideline, we worked with the GDG and other professionals to identify the recommendations that would have the most significant resource-impact (see table 1). Costing work has focused on these recommendations.

Table 1 Recommendations with a significant resource impact

High-cost recommendations	Recommendation number	Key priority?
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	1.5.1.10	No
Consider patients with spinal metastases and mechanical pain resistant to conventional analgesia for spinal stabilisation surgery even if completely paralysed	1.5.1.11	No
If surgery is appropriate in patients with MSCC, attempt to achieve both spinal cord decompression and durable spinal column stability	1.5.4.1	No
Patients with MSCC who are suitable for surgery should have surgery before they lose their ability to walk	1.5.4.2	No
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	1.5.4.3	No
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	1.5.4.4	No
Only consider major surgical treatments for patients expected to survive longer than 3 months	1.5.3.10	No

2.2.5 None of the key priority recommendations were costed as they were not considered to have significant national resource implications. The reasons for this are described in the following paragraphs.

2.2.6 The service configuration and urgency of treatment priority recommendation provides that 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. The Calman Hine Report published in 1995 established the policy framework for commissioning cancer services. This put in place cancer networks which provide the service configuration needed to address this priority recommendation. It is therefore not anticipated there will be any additional significant costs associated with the recommendation.

2.2.7 A key priority recommendation was patients at high risk of developing bone metastases, patients with diagnosed bone metastases, or patients with cancer who present with spinal pain should be offered information about the symptoms of MSCC. The recommendation allows for high risk cases to be given the information they need to support early intervention. The patient information leaflet supporting the implementation tools will assist with the review of information that we assume is currently provided. Therefore additional costs are likely to be limited.

2.2.8 Two key priority recommendations related to immediate access to an MSCC coordinator. These recommendations ensure the timely communication and follow up with support services, and may not have significant incremental cost impact relating to timing of services. However it is recognised that where capacity for the role of an MSCC coordinator cannot be accommodated within current establishments, there may be the need in many networks for a specific coordinator role where patient numbers are high. It is also likely that patient numbers may increase as more cases should be identified after implementation of the guidance. The cost impact therefore needs to be assessed locally where it is considered that additional coordination capacity is required. Expert opinion gained suggests this role is equivalent to advanced nurse practitioner. An estimated cost of this as taken from the agenda for change salary figures July 2008 is for band 7, midpoint salary of £40,842 per annum for a full time employee. This includes employer’s pension and national insurance contributions.

2.2.9 One key priority recommendation related to who should supervise magnetic resonance imaging (MRI) of patients with suspected MSCC and the level of image detail required. The GDG consider this is a core requirement of the guidance and 24 hour provision is crucial in the care pathway for centres performing spinal surgery. Access to MRI services is improving following recent government funding. Previous NICE guidance on ‘Stroke: diagnosis and initial management of acute stroke and transient ischaemic attack’ (NICE clinical guideline 68) and ‘Head injury: triage, assessment, investigation and early management of head injury in infants, children and adults’ (NICE clinical guideline 56) also identified the need for 24 hour imaging. It is therefore assumed that significant additional national cost implications will not arise from the recommendation relating to MRI accessibility. However, it is recognised that there may be regional variations, particularly in non-urban settings. Flexibility has been provided in the costing template to allow for local cost estimates to be added.

2.2.10 The key priority recommendation relating to supportive care and rehabilitation is not expected to have significant additional resource impact nationally as it is consistent with previous NICE guidance on ‘Improving supportive and palliative care for adults with cancer’ 2004. Pressure Ulcer Management (NICE clinical guideline 29) 2005; Venous thromboembolism – surgical (NICE clinical guideline

46) 2007; Faecal incontinence (NICE clinical guideline 49) 2007 and Urinary incontinence (NICE clinical guideline 40) 2006. The DH has also identified specific ongoing additional funding in the ‘Planning & Funding specialist palliative care’ funding provision. There may however be some instances where additional capacity is needed for clinics. This may have local cost implications which need to be assessed locally.

2.2.11 Four key priority recommendations related to the treatment of spinal metastases and MSCC. These recommendations provide guidance on optimum procedures to follow with patients who have severe mechanical pain, when definitive treatment of MSCC should start, and the accessibility of radiotherapy services. This may result in a change in practice; however capacity and resources should already be in place, the main changes would be in the timing of services and a refocusing of care pathways may be needed to address this. It is not estimated there will be an additional significant cost nationally for changes in the timing of services.

2.2.12 We have limited the consideration of costs and savings to direct costs to the NHS that will arise from implementation. We have not included consequences for the individual, the private sector or the not-for-profit sector. Where applicable, any realisable cost savings arising from a change in practice have been offset against the cost of implementing the change.

2.3 General assumptions made

2.3.1 The model is based on annual incidence and population estimates as outlined in section 1.3 (see table 2).

Table 2 Incidence of MSCC in England

Total population England	50,542,505
Adult population aged 18 years or older	38,894,461
Estimated incidence of MSCC per million	80
Total annual cases of MSCC in adults	**3,112**

2.3.2 The site of the primary cancer has a bearing on the risk of MSCC with prostate, lung and breast cancer carrying the highest risk (Abrahm 2004, Cowap et al. 2000, Hicks et al. 1993, Byrne 1992). Most spinal metastases were found to be in the thoracic region (Loughrey et al. 2000, Hill et al.1993, Gilbert et al. 1978).

2.4 Basis of unit costs

2.4.1 The way the NHS is funded has undergone reform with the introduction of 'Payment by results', based on a national tariff. The national tariff will be applied to all activity for which Healthcare Resource Groups (HRGs) or other appropriate case-mix measures are available. Where a national tariff price or indicative price exists for an activity this has been used as the unit cost; this has then been inflated by the national average market forces factor.

2.4.2 Using these prices ensures that the costs in the report are the cost to the primary care trust (PCT) of commissioning predicted changes in activity at the tariff price, but may not represent the actual cost to individual trusts of delivering the activity.

2.4.3 Other costs relating to surgery are the cost of implants, hospital stay on an acute ward including post operative rehabilitation costs on a high dependency unit (HDU). These are based on the latest NHS reference costs inflated to 2008–09 prices.

3 Cost of significant resource-impact recommendations

3.1 Increased spinal surgery

Recommendations

3.1.1 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 (recommendation 1.5.1.10).

3.1.2 Consider patients with spinal metastases and mechanical pain resistant to conventional analgesia for spinal stabilisation surgery even if completely paralysed (recommendation 1.5.1.11).

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

3.1.4 Patients with MSCC who are suitable for surgery should have surgery before they lose the ability to walk (recommendation 1.5.4.2).

3.1.5 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 (recommendation 1.5.4.3).

3.1.6 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 (recommendation 1.5.4.4).

3.1.7 Only consider major surgical treatments for patients expected to survive longer than 3 months (recommendation 1.5.3.10).

Background

3.1.8 Despite new developments in surgery and medical oncology, radiotherapy remains the cornerstone in the treatment of spinal metastatic disease, with very few patients in England receiving surgery.

3.1.9 Recommendation 1.5.3.10 provides that all patients expected to survive longer than 3 months should be considered for surgical treatment. This attempts to overcome previous barriers of referral and recognition of when surgical treatment can have benefits, as previously, patients with metastatic cancer may not have been considered for surgery due to limited life expectancy.

3.1.10 The full guideline explored evidence from various patient studies and identified that significantly more patients are able to walk after surgery followed by radiotherapy compared with after radiotherapy alone. It was also estimated that around 85% of patients who can walk are discharged home. The time to paraplegia for patients who received surgery was also significantly longer (by approximately 5 months) than those treated with radiotherapy. The health economic work supporting the full guidance (appendix 4) provides more detail demonstrating the cost effectiveness of appropriate surgical intervention.

Assumptions made

3.1.11 Due to limited recorded information on MSCC, a number of assumptions have been made relating to current activity levels and likely activity levels for surgery. The assumptions are listed below.

Estimated number of patients eligible for major surgery

3.1.12 Surgery is recommended for all patients expected to survive longer than 3 months. Assumptions, based on Kaplan-Meier survival estimates from Ontario Health Insurance Plan data for 987 patients who underwent surgery for spinal metastases between 1991 and 1998, show a mean 90-day mortality percentage of 29% for all cancer types. This leaves approximately 70% patients who present with MSCC symptoms who would be expected to live for longer than 3 months.

3.1.13 It is recognised that this average will change according to the prevalence of cancer type which varies regionally. A table outlining the mortality rates of different cancer types from the Ontario Health Insurance Plan data is included in appendix D that will assist with local estimates. The 70% estimate applied in the template should be reviewed locally.

3.1.14 The percentage of patients not eligible for surgery as referred to in the guideline (1.5.5.1; 1.5.5.2 and 1.5.5.3) is estimated to be 30%. This assumption is based on expert opinion. Patients expected to survive longer than 3 months, who are not eligible for surgery or not opting to have surgery are likely to be those who are responding well to radiotherapy, those who have spinal metastases without pain or instability; those in whom general disease is too advanced for surgery to be a consideration or those in whom there is extensive disease making surgery not a possible treatment. Also patients may choose not to have surgery for other personal reasons.

Current and predicted levels of surgery following implementation of the guidance

3.1.15 Based on expert opinion, the current activity level of surgery for patients with MSCC is estimated to be 10% of all eligible patients. The predicted levels of surgery following implementation are not known, however the costing tool assumes an estimated increase of 75% based on improved early detection and referral.

3.1.16 The costing tool allows the additional costs arising from the switch in activity from less costly elective procedures, to an increase in activity on more costly non elective surgery to be calculated. This may also result in other costs where this causes capacity issues. The cost impact of this will need to be assessed locally as practice may vary.

Average time spent in High Dependency Unit (HDU).

3.1.17 It is assumed that there will be a rise in costs associated with post operative care in HDU that will not be included in the payment by results tariff for the surgical admission. Based on hospital activity statistics, the estimated average total stay is 7 days. After gaining expert opinion, it is estimated that 2 days of the total stay will be on an HDU.

Cost summary

3.1.18 National cost estimates are based on current practice for major surgery and the additional number of operations following implementation of the guidance. A national cost estimate assuming surgical activity increases to 85% as a result of implementing the guidance is £14 million. Table 3 below provides the national cost estimates associated with an increase in activity for surgery.

3.1.19 The cost of surgery has been taken from the 2008–09 admitted patient care tariff HRG code R02 and HRG code R03 which map to procedures for Decompression operations on thoracic spine. This cost has been weighted according to the incidence for each procedure taken from HES data. This produced an average unit cost of £7,550. In addition to this, there is the cost of implants which is estimated in the health economic work supporting the full guidance to be an average cost of £3,311 per patient. This cost is an average and may vary locally. The average cost of implants will therefore need to be reviewed locally.

3.1.20 The average cost per day on an HDU has been calculated from reference costs 2006–07. The service descriptions are HDU 0 organs supported and HDU 1 organ supported. These produced costs per day of £651 and £657, respectively. A mid-point of £654 was taken and inflated to 2008–09 prices. This gives a figure of £701 per day.

3.1.21 Table 3 Net cost of increase in surgery for MSCC

	Additional days[a]/patients per annum	Estimated cost per operation/hospital stay (days)[b] (£)	Current cost of patients receiving surgery activity @10% (£000s)	Predicted cost – patients receiving surgery activity @85% (£000s)	Change in cost (£000s)
Cost of increase in surgery	1,143	10,861	1656	14,075	+12,419
Post surgery acute care–HDU	2,287	1,402	214	1,817	+1,603
Total estimated incremental cost - surgery		**12,263**	**1,870**	**15,892**	**+14,022**

[a] Total average stay for decompression operations on thoracic spine is 7.4 days according to HES data 2006–07.

[b] National schedule of reference costs 2006–07 inflated to 2008–09 prices.

3.1.22 Other hospital stay is on an acute care ward, this cost is built into the HRG patient care tariff applied for surgery.

Other considerations

3.1.23 The postoperative rehabilitation time does not allow for complications which may arise following surgery. Recorded data from the Ontario Health Insurance Plan which provided information on 987 patients who underwent surgery for spinal metastases showed complication rates during the index hospital admission and all subsequent admissions was 39%, of which 27% had one major complication and 12% developed two or more complications postoperatively. NICE guidance on 'Surgical site infection: prevention and treatment of surgical site infection' (NICE clinical guideline 74) makes recommendations to reduce the risk of postoperative wound infection which is one of the major complications that could arise following surgery.

3.1.24 Other relevant guidance on postoperative complications includes ‘Venous thromboembolism: reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in inpatients undergoing surgery’ (NICE clinical guideline 46), ‘Faecal incontinence: the management of faecal incontinence in adults’ (NICE clinical guideline 49) and ‘Urinary incontinence: the management of urinary incontinence in women’ (NICE clinical guideline 40).

3.1.25 Different types of surgery can be undertaken depending on the location of cord compression and timeliness of surgical intervention. Early intervention may require less costly procedures such as Vertebroplasty for the prevention of spinal cord collapse and cord compression, this is cheaper means of maintaining mobility in patients caught early enough rather than the more invasive open reconstruction surgical procedures required for patients presenting at a later stage when the condition becomes more severe.

3.1.26 Pain relief techniques such as Vertebroplasty and Kyphoplasty currently practiced for vertebral compression fractures may increase as a result of the guidance. The safety and efficacy of these procedures have been covered in interventional procedure guidance on Percutaneous Vertebroplasty IPG012, 2003 and Balloon Kyphoplasty for vertebral compression fractures IPG166,2008. There may be local cost implications following implementation of the guidance which will need to be assessed locally.

3.2 Benefits and savings

3.2.1 Significant cost savings have been identified from the full guidance as a result of implementing recommendations 1.5.4.2 and 1.5.4.3. The savings are dependent on early detection (recommendations 1.3.1.1, 1.3.1.2) and service configuration (recommendations 1.1.1.1 to 1.1.1.7) and relate to whether or not patients are able to walk when they are discharged home after surgery, compared with patients who received radiotherapy alone.

3.2.2 The savings are estimated to be £17.5 million nationally and are based on the additional number of days patients keep the ability to walk after surgery. This is estimated from clinical trials to be 143 days per patient (Patchell 2005). When applied to the 816 patients expected to be discharged home this provides a total of 116,753 additional days of mobility nationally. The total cost savings associated with less dependency on community nurse services, fewer GP visits and less access needed to out-of-hours services is estimated to be £150 per day based on the health economic modelling from the full guidance. This produces potential national savings of £17.5 million associated with reduced rehabilitation in the community as opposed to acute care.

3.2.3 It is estimated that savings will offset additional incremental costs for major surgery at national level. The health economic modelling included in the full guidance also concluded that surgery in combination with radiotherapy significantly improves patient outcomes both in terms of increased survival time and quality of life.

3.2.4 There is uncertainty around this estimate as assumptions have been made on the type of care received. The full guidance indicates the total daily cost per patient cared for at home was £13 if the patient was able to walk and £193 if the patient was not able to walk. These figures assume care from social services. On this basis the difference in cost of £180 per day was adjusted by £30 (based on PSSRU 2006 for a home care worker inflated to 2008-09 prices) to derive the difference in cost to the NHS from which potential savings of £150 per day were calculated.

3.2.5 In the study by Patchell (Patchell 2005) on patients receiving surgery combined with radiotherapy compared with patients who

4 Sensitivity analysis

4.1 Methodology

4.1.1 There are a number of assumptions in the model for which no empirical evidence exists. Because of the limited data, the model developed is based mainly on discussions of typical values and predictions of how things might change as a result of implementing the guidance and is therefore subject to a degree of uncertainty.

4.1.2 As part of discussions with practitioners, we discussed possible minimum and maximum values of variables, and calculated their impact on costs across this range.

4.1.3 Wherever possible we have used the national tariff plus market forces factor to determine cost. We used the variation of costs for the 25th and 75th percentiles from reference costs compared with the reference cost national average as a guide to inform the maximum and minimum range of costs.

4.1.4 It is not possible to arrive at an overall range for total cost because the minimum or maximum of individual lines would not occur simultaneously. We undertook one-way simple sensitivity analysis, altering each variable independently to identify those that have greatest impact on the calculated total cost.

4.1.5 Appendix B contains a table detailing all variables modified and the key conclusions drawn are discussed below.

4.2 Impact of sensitivity analysis on costs

4.2.1 The assumptions where the sensitivity analysis produced changes with the most significant cost impact are identified below.

Predicted patients receiving surgery following implementation of the guidance

4.2.2 The baseline assumption of 85% (representing an additional 75%) was varied at a minimum of 50% (representing an additional 40%) and a maximum of 100% (representing an additional 90%). This produced surgical costs of £7.5 million and £16.8 million for the minimum and maximum values, respectively. The change of £9.3 million is significant nationally. However, it is not anticipated that a major increase in surgical activity will happen in the course of a year. It is more likely that surgical activity as a treatment for MSCC will increase steadily as a result of earlier detection and time needed to fully implement the guidance.

Estimated number of patients able to walk after surgery

4.2.3 The baseline for the estimated number of patients able to walk after surgery was taken from the full guideline (84%). This was applied to potential cost savings as a result of more patients being discharged home, and in need of less healthcare as a result of being able to walk for longer than if they were treated with radiotherapy alone. This produced the national estimated savings of £17.5 million.

4.2.4 This baseline was varied with a minimum value of 71.3% and a maximum value of 96.7% in accordance with published studies of patients treated surgically for spinal metastases followed by radiotherapy and or other forms of adjuvant therapy (see appendix C). Minimum potential savings are £14.8 million with maximum potential savings of £20.1 million (a difference of £5.3 million).

These savings are significant nationally, and would help to absorb any costs associated with the increase in surgical activity.

Estimated number of patients discharged home after surgery

4.2.5 The estimated number of patients discharged home after surgery is dependent on the number of patients able to walk after surgery. The baseline rate of 85% was taken from the full guideline. When the baseline is varied between a minimum of 75% discharged home to a maximum of 95% discharged home this produces minimum cost savings of £15.5 million and maximum cost savings of £19.5 million (a difference of £4 million). These savings are significant nationally, and would help to absorb any costs associated with the increase in surgical activity.

4.2.6 Estimated costs of surgery

4.2.7 The estimated costs of surgery were varied using HES activity data and data supplied by hospitals. This was based on HRG RO2 and RO3 and resulted in minimum costs of £9,703 and maximum costs of £14,952 both include the cost of implants and exclude market forces factor. When applied to the sensitivity analysis this produces minimum costs of £11.1 million and maximum costs of £17.1 million. The change in surgery costs of £6 million nationally is significant and reflects the differences in type of surgical procedure and the cost of implants needed.

Estimated savings per patient per day following surgery

4.2.8 This estimate is based on the assumption that patients who are able to walk are discharged home and keep the ability to walk until near to the time of death. The cost saving per day of £150 for patients who are able to walk was varied at a minimum value of £100 and a maximum value of £180. This produced national potential cost savings of £15.5 million and £21 million, respectively. The change in savings of £9.3 million indicates the baseline figure of £17.5 million nationally could vary significantly.

5 Impact of guidance for commissioners

5.1.1 The significant costs associated with implementing this guideline will mainly fall within secondary care. It has been assumed that the non elective spell tariff applies as patients would need urgent treatment following diagnosis. In addition the cost of implants needs to be added. This is estimated to be an average cost of £3,311 based on information in the full guidance. This figure would need to be reviewed locally. The guidance will have impact on cancer networks.

5.1.2 Other incremental costs are associated with postoperative care and have been derived from reference costs which currently do not fall within tariff.

5.1.3 Depending on what care is delivered programme budgeting categories 202X – cancers and tumours or 215X – musculo skeletal system may be affected.

6 Conclusion

6.1 Total national cost for England

6.1.1 Using the significant resource-impact recommendations shown in table 1 and assumptions specified in section 3 we have estimated the annual cost impact of fully implementing the guideline in England to be a potential net saving of £3.5 million. Table 4 shows the breakdown of cost of each significant resource-impact recommendation. There is clear alignment between the costs associated with increased activity for surgery as a treatment for MSCC and cost savings as a result of patients keeping the ability to walk for longer.

Table 4 – Estimated significant costs and savings following implementation

Estimated recurrent costs/savings	**£000s**
Surgery for treatment and prevention of MSCC	14,023
Potential savings in supportive care and rehabilitation after discharge of patients	17,513
Net resource impact of MSCC guidance	**-3,490**

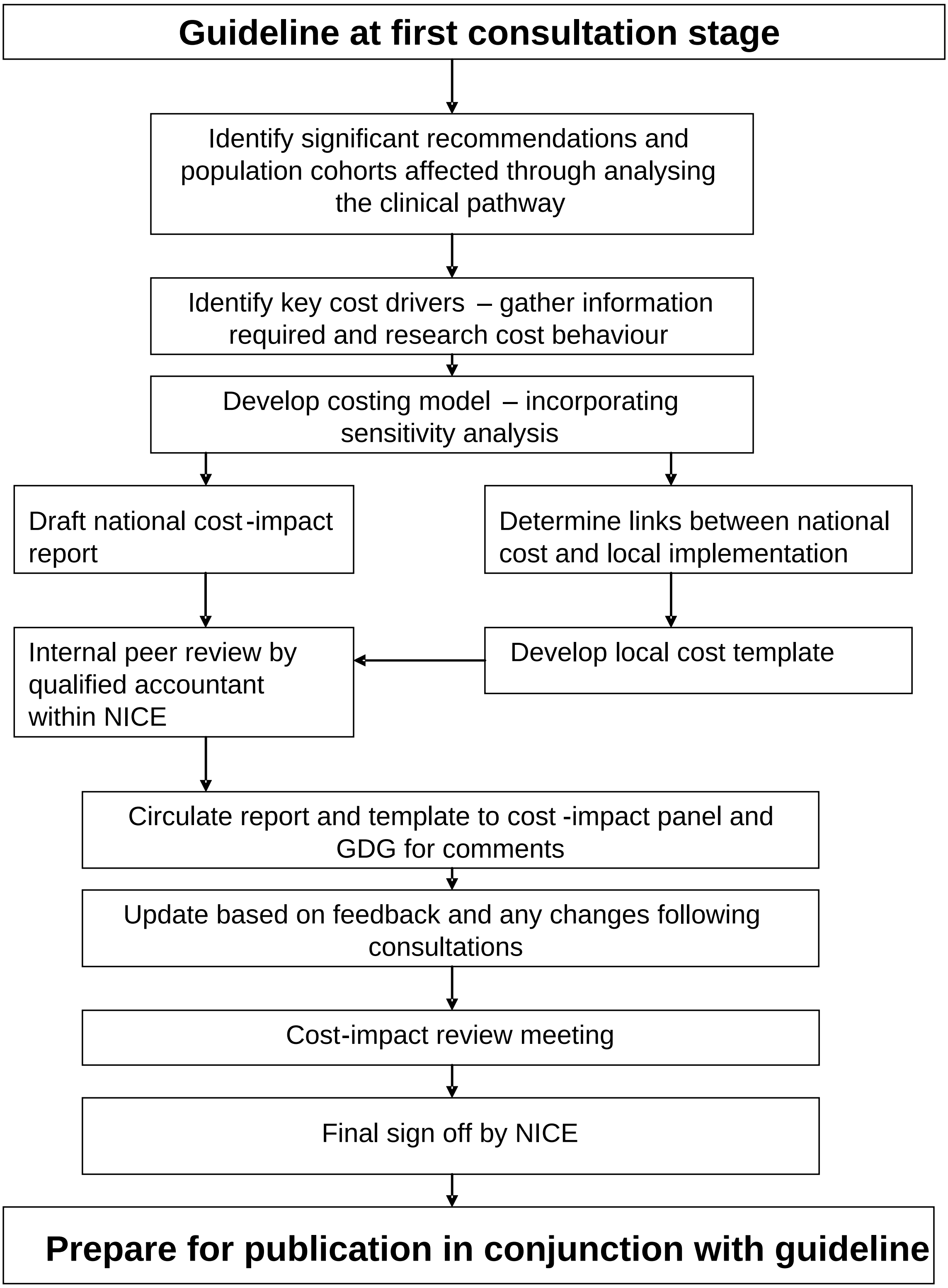
6.1.2 There may also be some local costs to provide network coordination of services and 24 hour access to MRI services that will need to be considered at a local level.

6.1.3 We applied reality tests against existing data wherever possible, but this was limited by the availability of detailed data. We consider this assessment to be reasonable, given the limited detailed data regarding diagnosis and treatment paths and the time available. However, the costs presented are estimates and should not be taken as the full cost of implementing the guideline.

6.2 Next steps

6.2.1 The local costing template produced to support this guideline enables organisations such as primary care trusts (PCTs) or health boards in Wales and Northern Ireland to estimate the impact locally and replace variables with ones that depict the current local position. A sample calculation using this template showed that a population of 100,000 could expect to incur additional costs of £36,053 with expected savings of £45,027, leaving a net saving per 100,000 population of £8,974. Use this template to calculate the cost of implementing this guidance in your area.

Appendix A. Approach to costing guidelines



Appendix B. Results of sensitivity analysis

Sensitivity analysis							
Assessment of sensitivity costs to a range of variables							
Parameter varied	Baseline value	Minimum value	Maximum value	Baseline costs (£000s)	Minimum costs (£000s)	Maximum costs (£000s)	Difference (£000s)
Vary all parameters including incidence, unit costs and activity assumptions							
Estimated % patients expected to survive > 3 months who are symptomatic	70%	60%	85%	14,023	12,019	17,028	5,009
Estimated % patients not eligible for surgery for other reasons	30%	20%	50%	14,023	10,016	16,026	6,010
Estimated % patients currently receiving surgery	10%	5%	25%	14,023	11,218	14,958	3,740
Predicted % patients receiving surgery following implementation of guidance	85%	50%	100%	14,023	7,478	16,827	9,349
Estimated total costs of surgery	12,263	9,703	14,952	12,263	11,095	17,098	6,003
Estimated savings per patient per day following surgery	150	100	180	(17,513)	(11,675)	(21,016)	(9341)
Estimated % patients able to walk post surgery	84%	71.3%	96.7%	(17,513)	(14,865)	(20,161)	(5296)
Estimated % patients discharged home post surgery	85%	75%	95%	(17,513)	(15,543)	(19,573)	(4,030)

Appendix C

Results of a selection of recent studies of patients treated surgically for spinal metastases followed by radiotherapy and/or other forms of adjuvant therapy

Author, year	Huang, 2006	Hirabashi, 2002	Holman, 2005	Villavicencio, 2005	North, 2005
Number of patients (m/f)	46 (28/18)	81 (58/23)	139 (85/54)	58	(34/27)
Neurological improvement	?[a]	49.4%	41%	60%	?
Neurological impairment	0%	1.2%	5%	3.4%	8.1%
Able to walk preoperatively	29.6%[b]	38.3%	71.9%	58.6%	85%
Able to walk postoperatively	76.1%	71.3%	90.6%	77.5%	96.7%
Preoperative pain; number (%)	?	63 (79%)	133 (96%)	53 (92%)	59 (97%)
Postoperative complete or partial relief of pain	?	77%	96%	92.9%	56%
Complications (major)[c]	19.5% (8.7%)	23.5% (12.3%)	32.4% (12.9%)	20.6% (10.3%)	11.4% (4.9%)
Survival	26.4 months (mean)	10.6 months (median)	14.8 months (median)	13 months (mean)	10 months (median)

[a] No discrimination had been made between patients that improved neurologically and those whose neurological situation did not change.

[b] These are patients with only Frankel grade E. Frankel grade D (ambulatory) was included in the group paraparetic or paraplegic patients.

[c] Major complications are pneumothorax, sepsis, wound infection, wound dehiscence, pulmonary embolism and hardware failure. Minor complications are urinary infection, pulmonary infection, and cerebrospinal fluid leaks treatable with cerebrospinal fluid leaks treatable with cerebrospinal fluid diversion. Disease progression or recurrence are not considered as complications.

The highlighted row of the table has been used to support the sensitivity analysis in relation to minimum and maximum % of patients who are able to walk postoperatively. These statistics affect the % of patients discharged home, which affects estimated savings in primary and secondary care.

Appendix D. Estimated percentage of patients who are symptomatic and expected to survive longer than 3 months

Kaplan–Meier survival estimates for 987 patients who underwent surgery for spinal metastases

	Number of patients	30-day mortality (%)	90-day mortality (%)	365-day mortality (%)	1095-day mortality (%)	Median survival (days)
Primary cancer type						
Lung	186	16	51	84	89	87
Prostate	137	8	23	60	79	223
Breast	123	9	20	52	81	346
Lymphoma	103	7	17	43	53	706
Myeloma	90	7	23	41	63	590.5
Kidney	84	12	19	76	94	187.5
Lower gastrointestinal	42	7	37	72	79	121
Upper gastrointestinal	15	13	60	93	93	56
Thyroid	15	0	13	27	63	587
Melanoma	28	14	57	79	87	69.5
Others	164	5	24	44	54	716
Total	**987**	**9**	**29**	**59**	**74**	**223**

Appendix E References

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