

1. Introduction and Who Guideline applies to

The guidelines have been developed by the East Midlands Acute Oncology Service Expert Clinical Advisory Group and relate to the initial assessment and immediate management of patients presenting with suspicion/confirmation of Metastatic Spinal Cord Compression.

The guidelines are for use any healthcare professionals who assess and/or manage acute patients at presentation, as applicable.

2. Guideline Standards and Procedures

These guidelines focus on the pathway from initial presentation through assessment and recognition of condition, to necessary discussion and treatment.

Patients should be referred to, or discussed with the MSCC Co-ordinator/Acute Oncology Team as soon as possible following suspicion of MSCC. The Acute Oncology team will provide further advice and on-going management guidance.

3. Education and Training None

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Audit and Annual Report	By LLR Cancer Centre Leads	P. Basu, Consultant/ R. Robinson MSCC Coordinator	Annually	Q&S Board

5. Supporting References

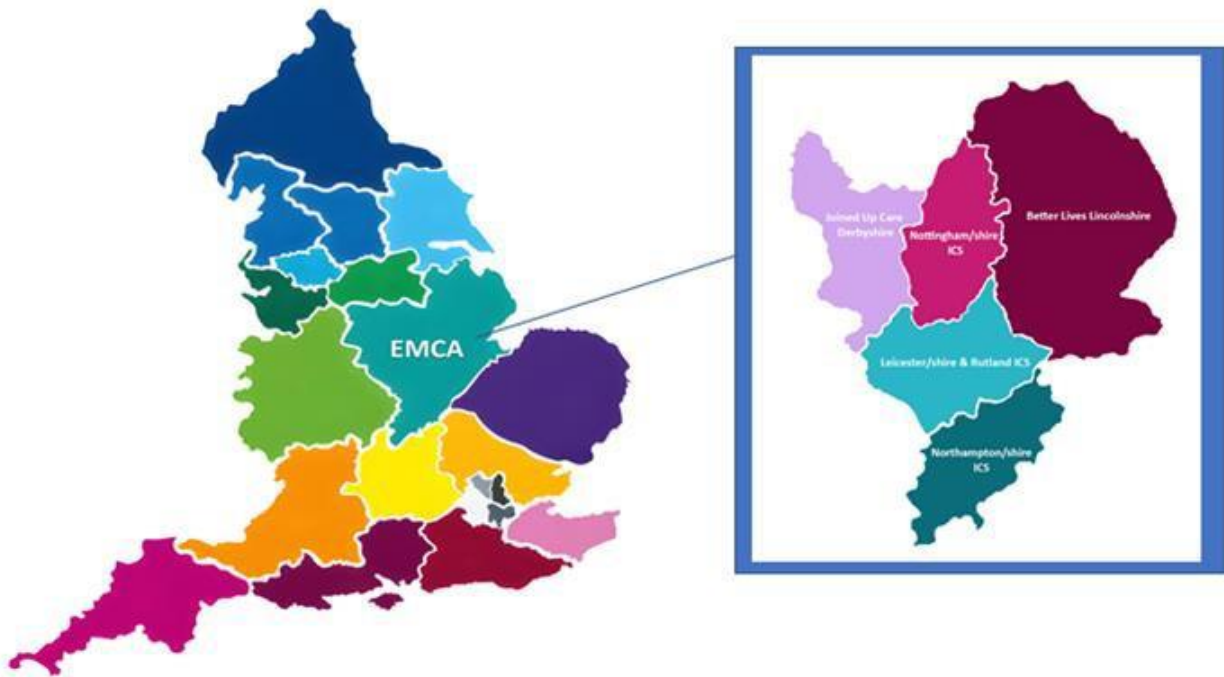
See Page 39-46.

6. Key Words

Acute Oncology; Metastatic Spinal Cord Compression, MSCC

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Details of Changes made during review: N/A – Version 1.	

EAST MIDLANDS ACUTE ONCOLOGY SERVICE EXPERT CLINICAL ADVISORY GROUP



METASTATIC SPINAL CORD COMPRESSION IN ADULTS PATHWAY GUIDANCE

Final DraftV0.15

Ratified: 3 September 2024 by MSCC Focus Group Members

Review Date: 2 September 2025

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1. BACKGROUND

THE EXPERT CLINICAL ADVISORY GROUP

The East Midlands AOS Expert Clinical Advisory Group (EM AOS ECAG) aims to improve outcomes and experience for cancer patients diagnosed with (or suspected) Metastatic Spinal Cord Compression (MSCC). The ECAG is a collaboration between provider and commissioner organisations which facilitates patient access to the provision of high-quality spinal care across the region, underpinned by best evidence and high-quality education to optimise clinical outcomes and standardise quality of care for patients across the East Midlands region.

ACUTE ONCOLOGY SERVICE

Acute oncology services provide a co-ordinated approach to the care of cancer patients attending emergency departments (EDs) or who are admitted to hospital non-electively.

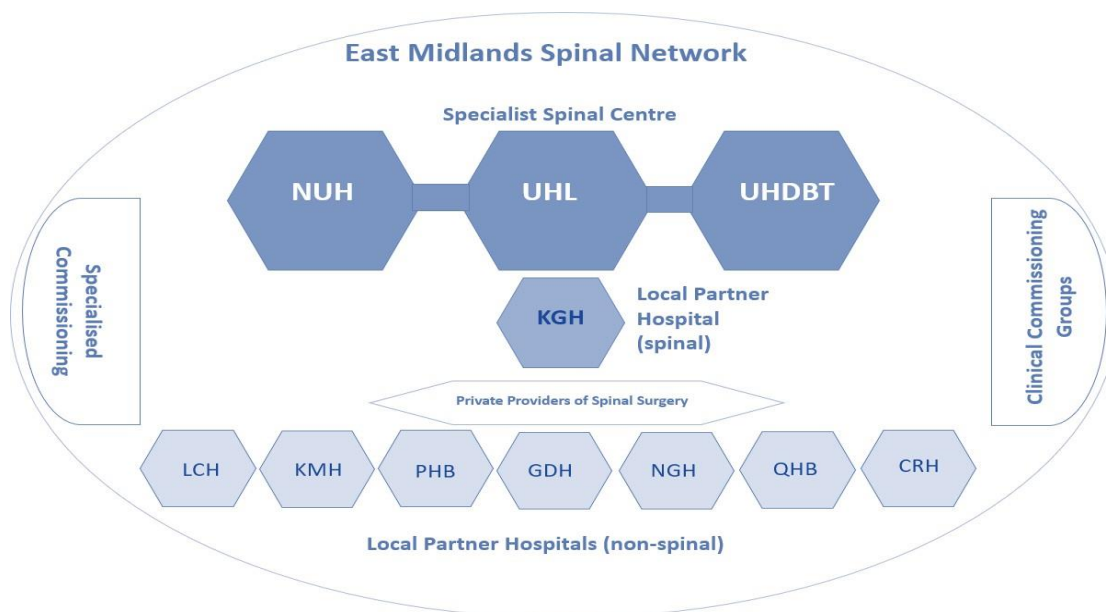
The complexity and urgency of metastatic spinal cord compression necessitates the involvement the acute oncology team.

The structure of the East Midlands Acute Oncology Network is shown in table 1 below and the functions of the regional centres in figure 1.

Trust	Hospital	Type of unit
Chesterfield Royal Hospital NHS Foundation Trust	Chesterfield Royal Hospital	Non-Spinal Partner
Kettering General Foundation Trust	Kettering General Hospital	Spinal Partner
Northampton General Foundation Trust	Northampton General Hospital	Non-Spinal Partner
Nottingham University Hospitals Trust	Queens Medical Centre Nottingham	Specialist Spinal Centre Hospital
Sherwood Forest Hospitals NHS Foundation Trust	Kings Mill Hospital	Non-Spinal Partner
United Lincolnshire Hospitals Trust	Lincoln County	Non-Spinal Partner
	Pilgrim Hospital Boston	Non-Spinal Partner
University Hospitals Derby and Burton Trust	Derby Royal Hospital	Specialist Spinal Centre Hospital
	Queens Hospital Burton	Non-Spinal Partner
University Hospitals of Leicester	Leicester General & Royal Infirmary	Specialist Spinal Centre Hospital

Table 1: East Midland AOS ECAG: Member organisations

Figure 1. Regional Spinal Network Model



2. METASTATIC SPINAL CORD COMPRESSION

NICE define Metastatic Spinal Cord Compression (MSCC) 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 (NICE, 2023)

MSCC is considered an oncological emergency and appropriate emergency management is vital to ensure the best possible outcome for the patient.

MSCC is sometimes the first presentation of cancer, so it is important that all health care professionals are aware of the signs and symptoms.

Rapid assessment, and treatment may prevent or limit irreversible neurological damage and morbidity.

RECOGNISING SPINAL METASTASES OR MSCC

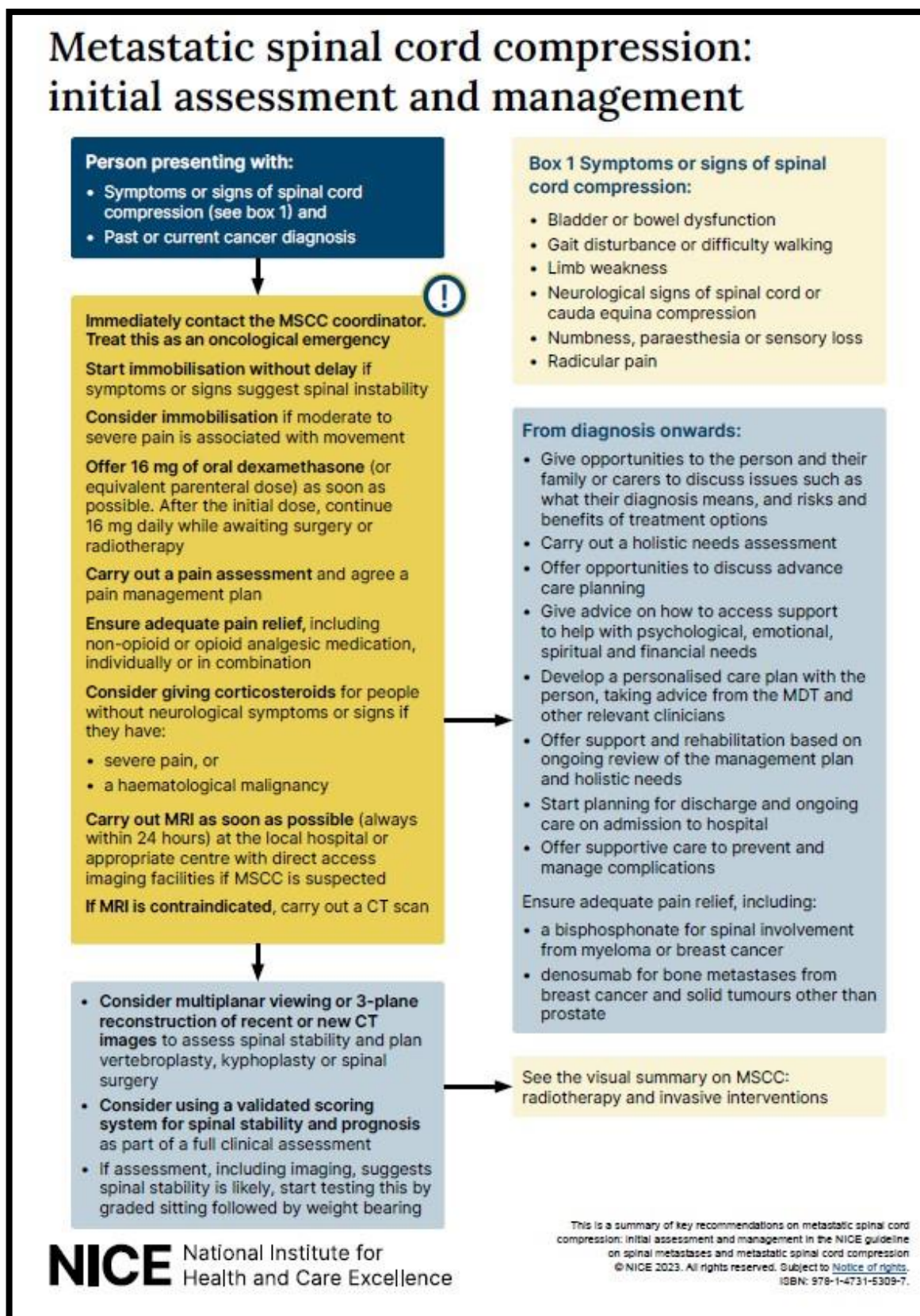
The NICE guidelines recommend that all centres treating patients with MSCC should have a named person (or persons) responsible for performing the role of MSCC coordinator who should provide advice to clinicians and coordinate the care pathway at all times. The roles and responsibilities of the coordinator are detailed in [appendix 4](#).

Immediately contact the MSCC Coordinator/ Coordinating Service or AOS coordinator if a person with a past or current diagnosis of cancer presents with the symptoms or signs of cord compression listed in box 1 within figure 2 below. Treat this as an oncological emergency. Details of MSCC co-ordinators across the East Midlands are detailed in [appendix 3](#).

Patients presenting with suspected spinal cord compression may be classified as either urgent or emergency referrals. The distinction is made based on the symptoms and signs

and subsequent imaging confirmation of the compression of the neural elements within the spine. Figure 2 below outlines the NICE recommendations for MSCC.

Figure 2: NICE Guidelines on initial assessment and management.



NICE National Institute for Health and Care Excellence

This is a summary of key recommendations on metastatic spinal cord compression: initial assessment and management in the NICE guideline on spinal metastases and metastatic spinal cord compression © NICE 2023. All rights reserved. Subject to [Notice of rights](#). ISBN: 978-1-4731-5309-7.

3. EARLY RECOGNITION OF SYMPTOMS

INFORMATION RESOURCE RECOMMENDED BY EAST MIDLANDS

The Macmillan Cancer Support MSCC (Malignant Spinal Cord Compression) Alert Card will be used throughout the East Midlands. The MSCC Alert card is a wallet sized 6-page leaflet that folds out ([link to Macmillan website](#)) and informs patients about red flag symptoms for MSCC. It advises patients with any of the red flag symptoms that they need to seek medical advice immediately. Each Cancer centre can sign post to the relevant out of hours contact number on the leaflet.

PATIENT GROUPS EXPECTED TO RECEIVE THE MSCC ALERT CARD

Within the East Midlands, for all high-risk cancer subtypes, it will be expected that they receive the Macmillan MSCC Alert Card.

1. Breast cancer diagnosis
2. CUP
3. Lung Cancer primary and metastatic disease
4. Lymphoma
5. Melanoma
6. Multiple Myeloma
7. Prostate cancer
8. Renal cell cancer
9. Sarcoma
10. Thyroid
11. Patients with confirmed bone metastatic disease

However, it would not be unexpected for all cancer patients to be educated on the presentation of MSCC.

Table 2. Primary cancers that more commonly metastasize to the spine

Oncological Cancers	Haematological Cancers
<ul style="list-style-type: none">•Breast•CUP•Lung•Melanoma•Prostate•Renal•Sarcoma•Thyroid	<ul style="list-style-type: none">•Lymphoma•Multiple Myeloma•CUP

Each local cancer centre depending on the local need will decide if there are additional cancer patient groups, they want to ensure receive the alert card early in their cancer pathway and at which point in the patient pathway they will give to patients.

PATIENT SUPPORT WHEN GIVING OUT THE MSCC ALERT CARD

When giving the MSCC Alert card to patients, it is seen as good practice for this to be explained to the patient and ensure that they understand the information it contains and why this has been given to them. It is expected that staff issuing the MSCC Alert card will have had training and support.

POINT IN CANCER PATHWAY TO GIVE OUT THE MSCC ALERT CARD

The MSCC Alert Card will be given to patients on the expected list of cancer subtypes as early as possible in their cancer pathway. It is advised that the MSCC Alert Card will be given out in the following times:

- **New Oncology Patients** - At the second Oncology appointment, this will ensure that the information is given at a less intense information giving appointment.
 - **Holistic needs assessment** – This has been identified as the most ideal point in the patients' pathway to give the MSCC Alert Card to patients.
1. **Cancer patients not having an oncology appointment such as Urology and Breast patients** These patients may not have regular face to face appointments, in some centres the patient may be under the urology team on hormone therapy and may not come back to clinic for a face-to-face appointment. It is expected that the Alert card in these situations is given out at the patient's diagnosis clinic appointment.
 2. **Patients that are for best supportive care at diagnosis** - Patients on the expected list of diagnoses to receive an MSCC Alert Card. It is recommended that the card will be given at the diagnosis/ giving bad news consultation. If it is deemed an unsuitable time to give the leaflet to the patient. The patients cancer specific hospital Key worker will be responsible for arranging the card to be given to the patient more appropriate such as the holistic needs assessment.

DISTRIBUTING THE MSCC ALERT CARD TO PROFESSIONAL TEAMS

The MSCC coordinators at each hospital trust should be responsible for ensuring that the MSCC Alert Card is available in all relevant clinical areas to ensure that it is readily available for health care professionals to give out to patients. It is anticipated that the cancer information centre in the relevant hospitals will assist in ensuring that there is a supply of MSCC alert cards.

Further details and training are detailed in [appendix 9](#)

4. URGENCY OF SYMPTOMS AND TRANSFER TO HOSPITAL

Patients identified with symptoms indicative of MSCC should immediately be discussed with the MSCC co-ordinator/ AOS or Oncologist on call for advice regarding further management of the patient.

AOS should be key in organising appropriate admission routes into the acute hospital setting. These may include direct admissions or admissions through ED with AOS support.

If there is a high suspicion of MSCC, patient should be started on dexamethasone 16mg stat, 8mg BD with PPI.

Patients who are too frail or unfit for specialist treatment for MSCC should not be transferred unnecessarily. If you require advice and support with decision making regarding this aspect, the acute oncology team/ oncologist on call should be contacted. Please ensure patients are included within this decision making process.

BEST SUPPORTIVE CARE

May be appropriate for patients who:

- Are unable to tolerate MRI or treatment.
- Have capacity and decline investigation or treatment (after thorough, documented conversation)
- They have had complete tetraplegia or paraplegia for 2 weeks or longer and their pain is well controlled (NICE 2023 p. 33)
- their overall prognosis is considered to be poor
- Are in the terminal phase of disease

TRANSFER TO HOSPITAL

Consider immobilisation for people with:

- suspected or confirmed MSCC and
- moderate to severe pain associated with movement. (NG234)

Nurse people who are immobilised in a supine position to minimise weight bearing by the spine (lying flat or with partial elevation). If they cannot tolerate the supine position, for example, because of pain or breathlessness, try adjusting their position to reduce these symptoms. [NG234]

For patients requiring transfer via EMAS, use the information in figure 3 (page 13) to expedite transfer

Figure 3 Transfer via EMAS

For Healthcare Professionals Requesting
EMERGENCY AMBULANCE ASSISTANCE

For A Suspected Metastatic Spinal Cord Compression (MSCC)

RING:

0115 967 5099 or 01522 781 891

FOR A CATEGORY 2 RESPONSE

What You Must Provide:

The address and telephone number of the patient

SAY:

“I am a healthcare professional requesting a Category 2 Response for a suspected Metastatic Spinal Cord Compression (MSCC)”

You will be asked 3 Questions:

1. Do you need OUR clinical help right now to deliver an immediate life-saving intervention/ or are you declaring an obstetric emergency?

Answer: No

2. Is there a threat to life, limb or sight requiring immediate emergency admission?

Answer: Yes

3. Is there a clinical reason as to why an emergency ambulance must be dispatched immediately?

Answer: Yes, Spinal Cord Compression

5. INITIAL ASSESSMENT

- Pain levels (VAS, 0 – 10) at rest and quality of pain (mechanical pain on mobilisation, occasional, or free from pain) should also be recorded ([Appendix 1](#))
- Full clinical history and detailed neurological examination (definitely Power/ Myotomes, 1 – 5, Appendix No. 1a)
- Record time of onset of symptoms and rate of deterioration. Rapid deterioration requires emergency intervention.
- Prompt treatment while the patient is still ambulant or even within 24 hours of the onset of neurological deficit is effective in maintaining the ability to walk and functional independence
- Record the patient's current ambulatory level i.e. patient can still walk (with or without help; unable to walk but still has some use of legs; or patient paralysed). Pre-treatment ambulatory status is a prognostic factor for local control and survival

NB - Pain assessment should include adequate pain relief to aid patient tolerance to undergo MRI.

MRI ASSESSMENT

Offer an MRI scan to people with suspected MSCC to be performed:

- As soon as possible (and always within 24 hours)

At the local hospital or appropriate centre with direct access to imaging facilities. (Transfer to a tertiary centre for MRI should only be undertaken if local MRI is not possible).

Offer an MRI scan to guide treatment options for people with clinical suspicion of spinal metastases but without suspicion of MSCC to be performed within 1 week at the local hospital, if presenting in a clinic environment.

Only offer overnight MRI in clinical circumstances in which urgent diagnosis is needed because patient deteriorating neurologically to enable treatment to start immediately. [NG234]

- Do not perform plain X-ray of the spine to diagnose or rule out spinal metastases or MSCC
- If MRI is contraindicated, CT spine to be carried out within 24 hours along with a staging CT (multi planar viewer or 3 plane reconstruction)

INFORMATION REQUIRED FOR IMAGING REQUEST

Include local spinal tenderness, information about a known cancer with specified metastases, a type of back pain (mechanical or non-mechanical). Please note that if the patient is performance status 3 – 4 further imaging will not be undertaken.

MRI safety questionnaire to be completed by patient (or by family if unable or by referring clinician & radiologist in best interest of patient if family not contactable)

Make sure the patient is able to tolerate 20-30 min. scanning (e.g. claustrophobia which require addressing, or pain control)

Swift communication with a radiologist on call about an urgent MRI

If the patient has any implantable devices all necessary attempts need to be done in order to clarify nature of them, the make, and whether they are MRI compatible (this is an obligation of a requesting MRI team)

MRI PROTOCOL

The MRI protocol should cover the whole spine and start with T1 and STIR sagittal images following by T1/T2 axial images through a level of compression. If it is available a T2 DIXON protocol (Appendix 4) could be used. The latter requires less acquisition time (20min versus 35min on average), but local radiologists need to be familiar with this protocol.

While reporting MRI, SINS and Bilsky (ESCC) score must be included in a report with spinal cord compression is considered as grade 2 or 3. Terms like encroaching, effacement or abutting are no longer to be used in isolation.

A report should be urgently relayed to a clinical team to include spinal stability wherever possible with a view to discussion with an oncologist on call and a spinal team.

6. TREATMENT PATHWAYS

Presentation of MSCC occurs via one of three distinct pathways. The ownership and onward referral of patients in these pathways differs and therefore algorithms have been created to determine who is responsible at each step of that pathway

- [Appendix 2A: Routine presentation of MSCC;](#)
- [Appendix 2B: MSCC presentation in cancer patients without visceral metastases](#)
- [Appendix 2c: MSCC presentation in cancer patients with visceral metastases](#)

7. STEROIDS

Corticosteroids are routinely given in patients with MSCC to reduce tumour bulk or spinal cord swelling in order to relieve spinal cord pressure and improve treatment outcomes.

A 16 mg stat dose of oral dexamethasone (or equivalent parenteral dose) should be given as soon as possible where indicated (NICE 2024)

Following the initial dose 8 mg Dexamethasone twice daily (or equivalent parenteral dose) should be prescribed 8mg in the morning and 8mg at lunchtime, with PPI cover (e.g. Omeprazole) to prevent gastrointestinal irritation.

If surgery or radiotherapy is delayed or symptoms permit, a different maintenance dose may be indicated, and will be advised by the consultant clinical oncologist or consultant neurosurgeon.

- If the patient has been taking high dose dexamethasone for <7 days, it can be stopped immediately.
- If the patient has been taking high dose dexamethasone for >7 days the dose should be weaned.

For patients with spinal metastases only or MSCC without effective treatment options, dexamethasone should be reduced gradually until stopped, normally by halving the total daily dose every other day.

- Aim to discontinue post radiotherapy as soon as symptoms allow.
- Whilst taking dexamethasone, the person should have glucose levels monitored and be offered proton pump inhibitor acid suppression.

Observe for worsening pain or neurological status. If this occurs, return to previous dose used which maintained the clinical situation.

High dose steroids is known to increase patients' blood sugars, if the patient is diabetic please ensure that regular blood sugars are complete.

If patient is not known to be diabetic, patient to contact GP to organize random blood sugars and to be educated on the symptoms of early onset diabetes.

STERIODS AND HAEMATOLOGY MALIGNANCY

Dexamethasone is advised for people who have MSCC with a confirmed Haematological malignancy even without neurological deficit.

After the initial dose, corticosteroid treatment and dose should be discussed with the Haematology multidisciplinary team / Haematologist on call. for advice due to the anti-tumour effect

SPINAL BIOPSIES.

As MSCC could be the initial manifestation of malignancy an early histological diagnosis is recommended for prognosis and further management particularly if surgery is not required or a haematological malignancy (such as lymphoma or myeloma) is suspected. Biopsy is often performed under image guidance by an interventional radiologist if available. Therefore, a decision about potential biopsy needs to be made as early as possible.

If it is anticipated, the following is required to expedite the process:

Inform a patient about a potential biopsy and a requirement to lie prone for 30-40min (a patient booklet is available here; [2380v3 CT Guided Bone Biopsy - Patient Information Leaflet.pdf \(eastmidlandscanceralliance.nhs.uk\)](https://www.eastmidlandscanceralliance.nhs.uk)) The majority of the spinal biopsies are performed under LA (with exception lesions in cervical spine); If this is not available, liaise with a spinal team about urgent transfer to a spinal centre; check coagulation status (as it is a high risk procedure anti-thrombotic medications are usually withheld [PowerPoint Presentation \(b-s-h.org.uk\)](https://www.b-s-h.org.uk));-arrange FBC and coagulation (unless it is done within the last 1 week);

Inform an interventional radiology team - complete a bone biopsy proforma (here's an example of bone proforma at NUH:

https://www.eastmidlandscanceralliance.nhs.uk/images/CT_biopsy_request_proforma_V7.doc

The provisional results of spinal biopsy could be available as early as 1-2 days (for lytic lesions) or 3-5 days (for mildly calcified samples).

8. SPINAL STABILITY

Consider using a validated spinal stability scoring system with good evidence of accuracy (for example, the Spinal Instability Neoplastic Score) alongside clinical assessment of risk of spinal instability to inform treatment decisions. (Appendix 5)

Bilsky score can aid with the determination of extent of spinal cord compression. ([Appendix 5](#))

Tokuhashi should also be used to give an indication of prognosis. ([Appendix 5](#))

People who present with neurological signs and symptoms of spinal instability should have interventions to reduce the spinal load (immobilisation) such as reclined support, either flat or elevated and guided by comfort and assistance because of the risk of damage to an unstable spine.

People with pain associated with movement may be at risk of spinal instability (see the section on tools for assessing spinal stability and prognosis) and should also be considered for immobilisation based on clinical assessment of their symptoms. However, NICE reports that some people are immobilised for longer than necessary, lying in a flat position, which has a detrimental impact on their physical and mental wellbeing.

Care of the spine needs to be balanced with the needs of the patient and the risk of complications from prolonged bedrest.

Immobilisation could involve lying in a supine position either flat or with partial elevation depending on the person's comfort and preferences. For some people, lying supine can be painful or affect their breathing. It was highlighted that the person's position might have to be adjusted to relieve symptoms and improve comfort without risking weight bearing onto the spine.

To avoid people being immobilised for too long, expert advice on spinal stability should be sought within 24 hours and assessment should be started to determine how long immobilisation may be necessary.

Mobilisation must be a multi-disciplinary and should be clearly documented:

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.

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.

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.

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.

Provision of anxiety, fatigue and non-pharmacological pain management techniques should be provided where required to support individuals' rehabilitation and/or management.

9. TIMING OF INVASIVE INTERVENTIONS

Before an invasive intervention is offered, make a treatment plan in discussion with the appropriate specialists (such as an oncologist and spinal surgeon) within the MSCC service multidisciplinary team. [NG234]

If the primary cancer has not been identified, carry out a radiologically guided biopsy if:

- Identifying the primary cancer may affect treatment decisions and there is no need for immediate treatment. [NG234]
- Offer surgical intervention intended to halt or reverse neurological decline as soon as possible after the onset of neurological symptoms or signs indicating MSCC. [NG234]
- Consider the speed of onset and rate of progression of neurological symptoms and signs when determining the urgency of surgical intervention. [NG234]
- Do not use a time limit after complete tetraplegia or paraplegia as the only factor to decide whether to offer surgical intervention to restore neurological function. [NG234]

10. SURGERY

For people with spinal metastases with MSCC, consider the following options:

- surgical decompression of the spinal cord
- surgical stabilisation of the spine. [2023]

Offer spinal stabilisation surgery, even if there is a severe neurological deficit that may be irreversible, if a person with MSCC: has suspected or confirmed spinal instability with mechanical pain that is not controlled by analgesia and is able to have surgery and it is suitable for them. [2023]

11. RADIOTHERAPY

1.10.4 Offer urgent radiotherapy (to be given as soon as possible and within 24 hours) to people with MSCC that is not suitable for spinal surgery, unless:

They have had complete tetraplegia or paraplegia for 2 weeks or longer and their pain is well controlled or

their overall prognosis is considered to be poor [NG234]

Use 8 Gy single fraction radiotherapy for people with MSCC having radiotherapy unless they are at high risk of side effects. [NG234]

Consider multiple fraction radiotherapy for people at high risk of side effects from radiation, for example, if they have:

- disease requiring a large treatment field or fields
- had previous radiotherapy treatments.

NICE guidelines are detailed in Appendix 10

12. REHABILITATION

Rehabilitation planning should commence at time of diagnosis. Onward referrals to relevant allied health professionals should be completed within 24 hours of diagnosis as appropriate (e.g. Physiotherapy, Occupational Therapy, Orthotics etc.)

The assessment/ communication form should be completed as soon as feasible

If a spinal brace has been provided to support immobilisation of the spine or reduction in pain. Clear advice regarding the wearing regime of a brace is to be provided. Patient's wishes and quality of life should be taken in to account. Appropriate training for donning/doffing the brace should be provided to the patient and/or carers who may be involved. A clear review date should be provided and explained to the patient (including if the brace is long term). Contact numbers for new pads or brace review are to be provided.

Rehab prescriptions should focus on short term, realistic goals with a goal of promoting functional independence, participation in ADL's and quality of life.

Discharge planning and ongoing care, including rehabilitation should start on admission and be led by a named individual from within the responsible clinical team. This should include the patient and their family and carers, primary oncology site team, rehab team (including Occupational Therapist), community support, including primary care, specialist palliative care and referral to Spinal Injuries Association (SIA) as required.

<https://spinal.co.uk/get-support/find-support-now/>

Rehabilitation is detailed in [appendix 11](#)

13. FOCUS OF CARE AND ADVANCE CARE PLANNING

It is vitally important to make early plans of care, detailing patient's wishes by ensuring the patient's Focus Of Care (FOC) is clearly documented, and the ReSPECT form also clearly defines this. Not only the patients' preferences on any escalation of treatment for spinal cord compression but also the clinical recommendation of treatment in the event of this e.g. comfort focussed care or whether radiotherapy or treatment is even feasible.

The discussion and documenting decision to decline usual care and remain at home should take place with the patient and anyone they wish who is important to them. They may need time to decide and should have capacity i.e. they can understand, retain, weigh up and communicate their decision. They need to be given all the treatment options. They must understand the benefits and harms of treatments and how they might affect them. They need to have enough information to make a choice. For declining usual care for metastatic cord compression, it is pertinent they understand the benefits and harms of deciding not to have treatment.

This must be documented in the care records but also detailed on the RESPECT FORM and
Advance care plan document.

14. APPENDICES

APPENDIX 1A: PRE-IMAGING ASSESSMENT (ASIA)

Patient Name _____
 Examiner Name _____ Date/Time of Exam _____

ASIA **STANDARD NEUROLOGICAL CLASSIFICATION OF SPINAL CORD INJURY** **ISCO S**

MOTOR KEY MUSCLES (see parentheses for innervation)

	R	L	
C5	<input type="checkbox"/>	<input type="checkbox"/>	Elbow flexors
C6	<input type="checkbox"/>	<input type="checkbox"/>	Wrist extensors
C7	<input type="checkbox"/>	<input type="checkbox"/>	Elbow extensors
C8	<input type="checkbox"/>	<input type="checkbox"/>	Finger flexors (distal phalanx of middle finger)
T1	<input type="checkbox"/>	<input type="checkbox"/>	Finger abductors (5th finger)
UPPER LIMB TOTAL (MAXIMUM)			(26) (26) (52)

Comments: _____

SENSORY KEY SENSORY POINTS

	LIGHT TOUCH		PIN PRICK	
	R	L	R	L
C2				
C3				
C4				
C6				
C7				
C8				
T1				
T2				
T3				
T4				
T5				
T6				
T7				
T8				
T9				
T10				
T11				
T12				
L1				
L2				
L3				
L4				
L5				
S1				
S2				
S3				
S4-S5				
TOTALS (MAXIMUM)			(26) (26)	(26) (26)

Legend: 0 = absent, 1 = impaired, 2 = normal, NT = not testable

UPPER LIMB TOTAL (MAXIMUM) (26) (26) (52)

LOWER LIMB TOTAL (MAXIMUM) (50) (50) (100)

Voluntary anal contraction (Yes/No)

Any anal sensation (Yes/No)

PIN PRICK SCORE (max: 112)

LIGHT TOUCH SCORE (max: 112)

NEUROLOGICAL LEVEL: SENSORY MOTOR

COMPLETE OR INCOMPLETE? (Incomplete = any sensory or motor function in SAK)

ASIA IMPAIRMENT SCALE

ZONE OF PARTIAL PRESERVATION: (smaller area of partially preserved sensation)

SENSORY MOTOR

* Key Sensory Points

This form may be copied freely but should not be altered without permission from the American Spinal Injury Association.

MUSCLE GRADING

- 0 total paralysis
 - 1 palpable or visible contraction
 - 2 active movement, full range of motion, gravity eliminated
 - 3 active movement, full range of motion, against gravity
 - 4 active movement, full range of motion, against gravity and provides some resistance
 - 5 active movement, full range of motion, against gravity and provides normal resistance
 - 5* muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present
- NT not testable. Patient unable to reliably exert effort or muscle unavailable for testing due to factors such as immobilization, pain on effort or contracture.

ASIA IMPAIRMENT SCALE

- A = Complete:** No motor or sensory function is preserved in the sacral segments S4-S5.
- B = Incomplete:** Sensory but not motor function is preserved below the neurological level and includes the sacral segments S4-S5.
- C = Incomplete:** Motor function is preserved below the neurological level, and more than half of key muscles below the neurological level have a muscle grade less than 3.
- D = Incomplete:** Motor function is preserved below the neurological level, and at least half of key muscles below the neurological level have a muscle grade of 3 or more.
- E = Normal:** Motor and sensory function are normal.

CLINICAL SYNDROMES (OPTIONAL)

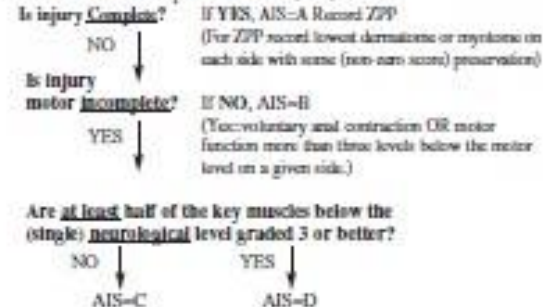
- Central Cord
- Brown-Sequard
- Anterior Cord
- Conus Medullaris
- Cauda Equina

STEPS IN CLASSIFICATION

The following order is recommended in determining the classification of individuals with SCI.

1. Determine sensory levels for right and left sides.
2. Determine motor levels for right and left sides.
Note: in regions where there is no myotome to test, the motor level is presumed to be the same as the sensory level.
3. Determine the single neurological level.
This is the lowest segment where motor and sensory function is normal on both sides, and is the most cephalad of the sensory and motor levels determined in steps 1 and 2.
4. Determine whether the injury is Complete or Incomplete (sacral sparing).
If voluntary anal contraction = No AND all S4-5 sensory scores = 0 AND any anal sensation = No, then injury is COMPLETE. Otherwise injury is incomplete.

5. Determine ASIA Impairment Scale (AIS) Grade:

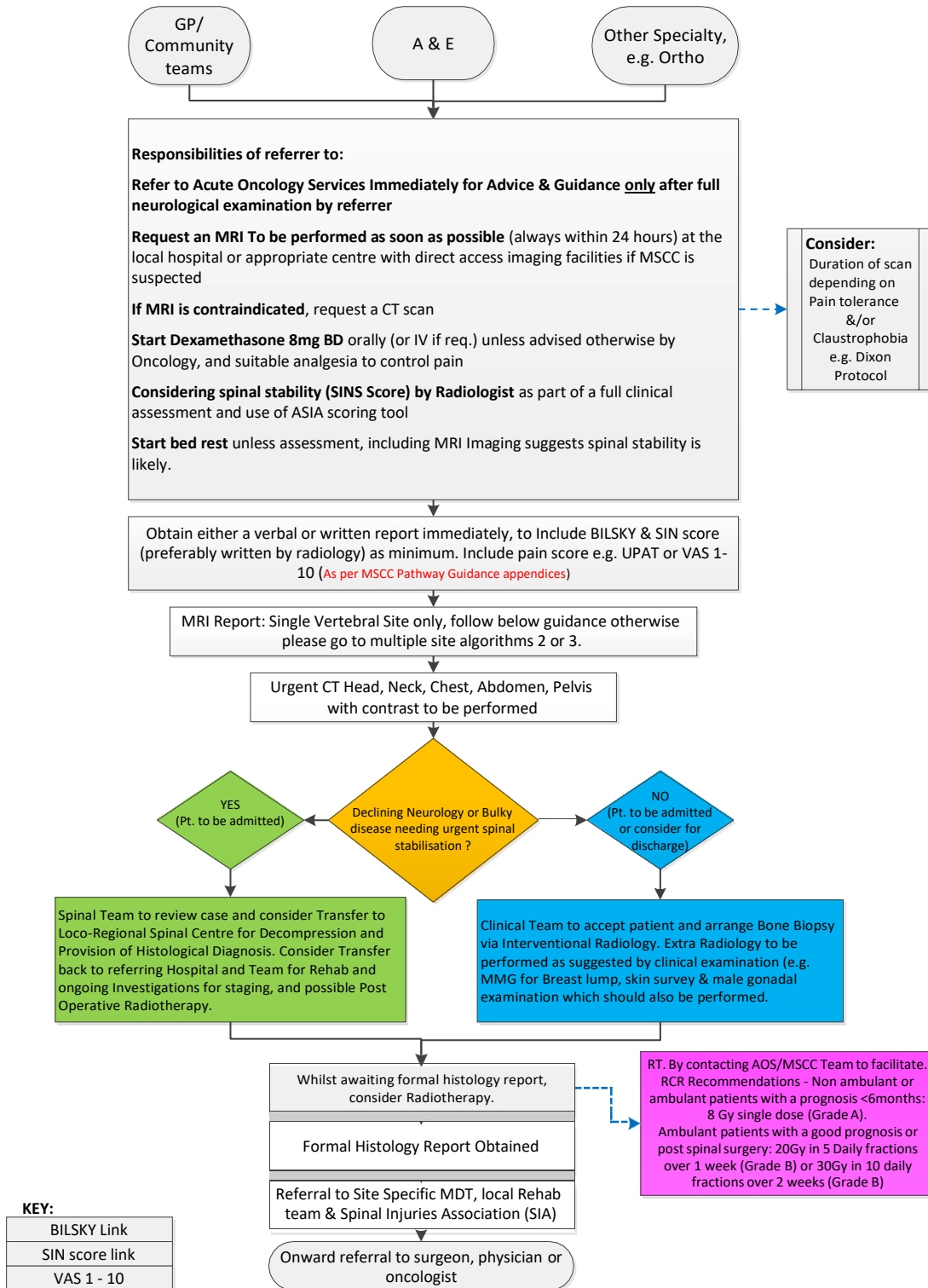


If sensation and motor function is normal in all segments, AIS=E
Note: AIS E is used in follow up testing when an individual with a documented SCI has recovered normal function. If at initial testing no deficits are found, the individual is neurologically intact; the ASIA Impairment Scale does not apply.

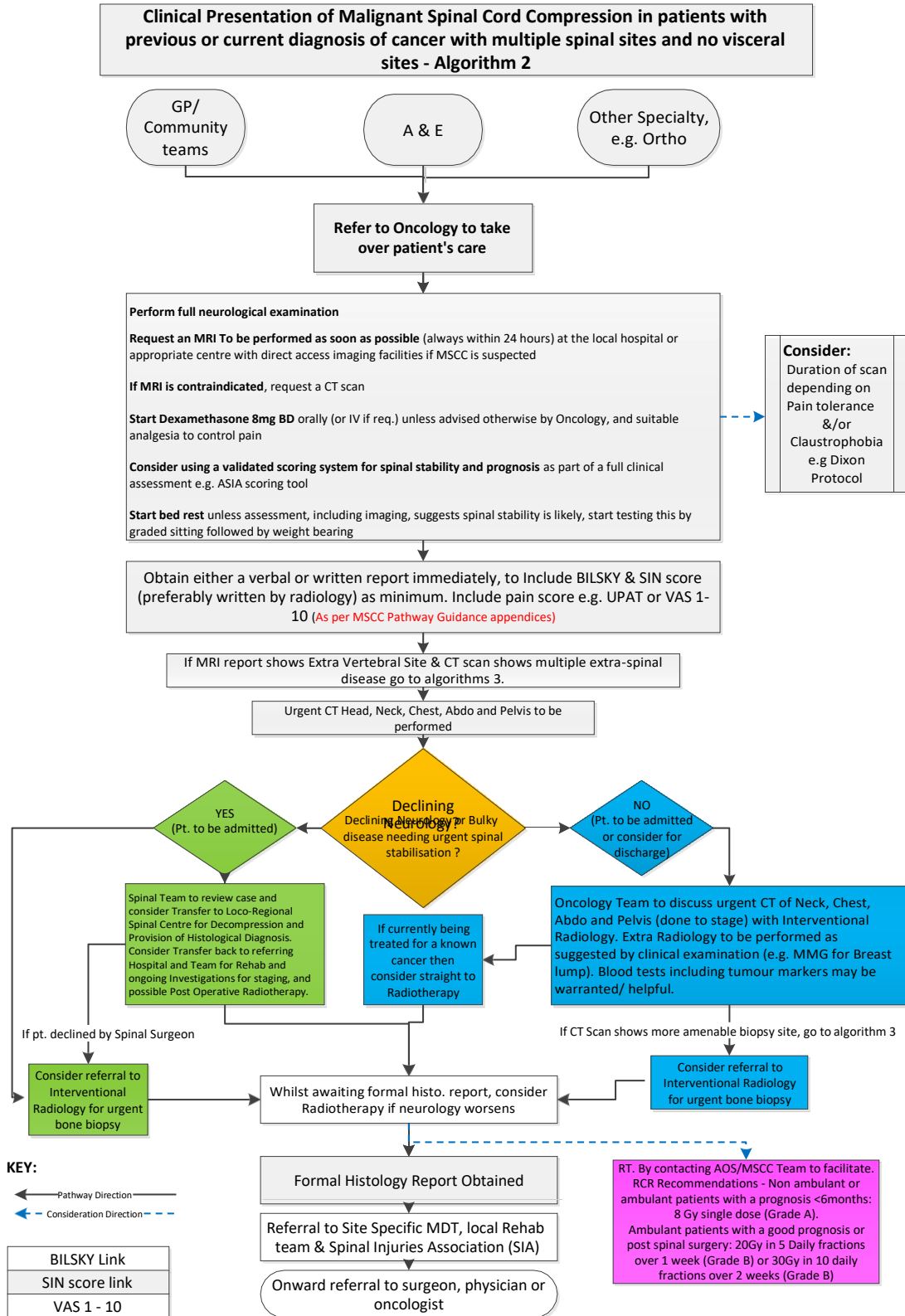
[ASIA-ISCOS-IntlWorksheet_2019.pdf \(asia-spinalinjury.org\)](http://asia-spinalinjury.org)

APPENDIX 2A: ROUTINE PRESENTATION OF MSCC

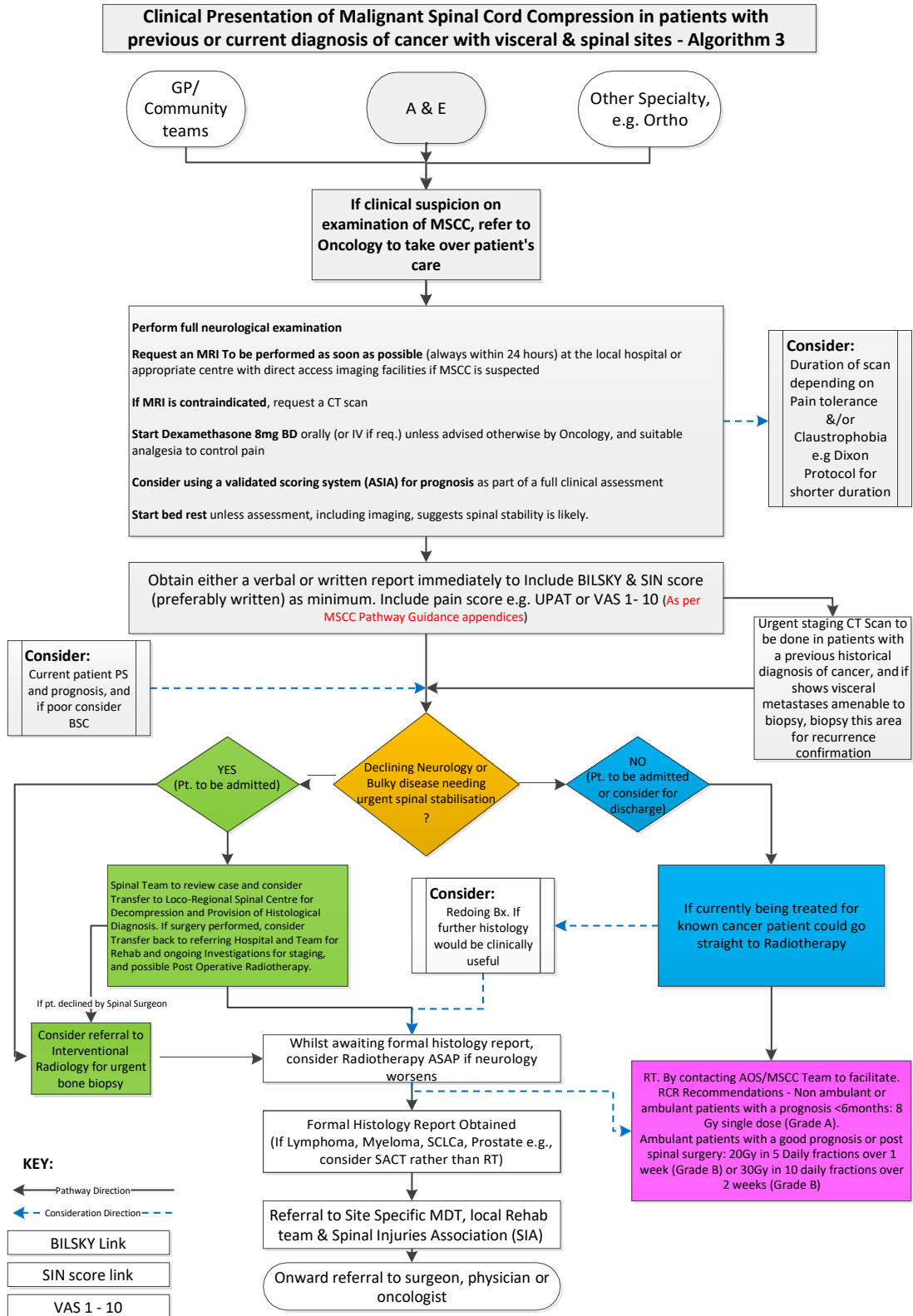
Clinical Presentation of Malignant Spinal Cord Compression – Main Algorithm 1



APPENDIX 2B: MSCC PRESENTATION IN CANCER PATIENTS WITHOUT VISCERAL METASTASES



APPENDIX 2C: MSCC PRESENTATION IN CANCER PATIENTS WITH VISCERAL METASTASES



APPENDIX 3: REGION CONTACT DETAILS - MSCC COORDINATORS

Derby (RDH)
MSCC Co-ordinator can be contacted during office hours via the trauma co-ordinators. In Hours: Mon -Fri 9am – 5pm Trauma co-ordinators 07585 966 174 / 07917650719 (trauma phone) or Bleep 3013 uhdb.traumanursecoordinators@nhs.net Out of hours: Ortho SpR on-call via Switchboard
Burton Foundation Trust (BFT)
Contact Acute Oncology Team at Burton In hours: Mon – Fri 9am – 5pm 01283 593108 or email burton.aos@nhs.net Out of hours: Orthopaedic SpR on call at RDH via Derby Switchboard
University Hospitals Leicester (UHL)
The Acute oncology team cover the MSCC co-ordinators Discuss case with MSCC co-ordinator or a clinical oncologist who will liaise with a spinal surgeon in order to decide on the most appropriate management of either radiotherapy or surgery followed by radiotherapy (unless clearly not suitable for surgery) In hours: Mon – Fri 9am-5pm 07908 178 232 or email acute.oncology@uhl-tr.nhs.uk Out of hours: Oncology registrar on-call.
Northampton General Hospital (NGH)
All patients, whether known to an oncologist or unknown malignancy will be assessed by an oncologist at NGH and the on-call spinal surgeon at UHL will be contacted by them to obtain surgical opinion. If not known to oncology the patient must be assessed by the on-call orthopaedic consultant and discussed with the on-call oncology consultant who should contact the on-call spinal surgeon at UHL to obtain surgical opinion. In hours: Mon – Fri 9am-5pm Contact MSCC Clinical Nurse Specialist on Bleep 7027 Out of hours: SpR bleep 4623
Kettering General Hospital (KGH)

The patient must be assessed by the on-call orthopaedic consultant who should contact the on-call spinal surgeon at UHL to obtain surgical opinion. Liaison with the patient's own oncologist (if known to oncology) should be made to establish oncology plan.

If the patient is unknown to oncology the patient should be discussed with the on-call oncology consultant or registrar at NGH. Inform MSCC coordinator – Acute Oncology Nurse on bleep 844 (via switchboard 01536 49200) Email: kgh-tr.AONS@NHS.NET

SpR advice sought from NGH

Out of Hours:

Oncology Registrar at NGH

Nottingham University Hospitals (NUH)

All patients with confirmed metastatic spinal cord compression (both known or unknown malignancy) MUST be discussed with NUH on-call oncologist (Spr/Consultant) as first point of contact, to make decision for onward spinal surgical referral or urgent radiotherapy.

All MSCC patients must be referred to Acute Oncology Service (AOS) via NerveCentre for tracking.

QMC patients: AOS CNS support and advice available during weekdays 8-4pm - 07812 268675/07812 276520

NCH patients: No AOS CNS cover. Advice available from on-call oncologist

- For patients accepted for spinal surgery: Marie Donaldson (Spinal-Oncology Surgical CNS): 07812 27005324 hours a day

Always call the NUH Oncologist on call via switchboard;

- QMC:01159249924
- NCH : 0115 9691169

24 hours a day

On-call Spinal Fellow Via Switchboard + Referapatient

Sherwood Forest Hospitals Foundation Trust (SFHFT)

All patients with confirmed metastatic spinal cord compression (both known or unknown malignancy) MUST be discussed with NUH on-call oncologist (Spr/Consultant) as first point of contact, to make decision for onward spinal surgical referral or urgent radiotherapy.

In hours:

All MSCC patients must be referred to KMH Acute Oncology 24 hours a day

NUH Oncologist on-call: via Switchboard

NUH Spinal fellow on-call: via Switchboard + Referapatient

Out of hours: including weekends

Oncology registrar at NUH via switchboard: 01159249924 on # 6122Service (AOS) during weekdays 8-4pm - Ext 6103

For patients accepted for spinal surgery: Marie Donaldson (Spinal-Oncology Surgical CNS): 07812 270053

Chesterfield Royal Hospital (CRH)

During office hours, contact patient's responsible oncologist, if known. If not known, or out of hours contact the acute Oncologist.

Contact Spinal Surgeons at Northern General Hospital

Acute Oncologist 07949 021 449/ via West Park Hospital Switchboard

Spinal Surgeon 9-5, weekdays

0114 271 5244

OOH via Northern General Switchboard

United Lincolnshire Hospitals (ULHT)

First Contact should be through Acute Oncology or Oncologist on call

There is a single point of access across ULHT, covering, Lincoln County Hospital, Pilgrim Hospital, Boston, Grantham Hospital

Office Hours:

01522 573 024 (acute Oncology)

Out of Hours:

On-call Oncology via switchboard (01522 512512)

APPENDIX 4: ROLES AND RESPONSIBILITIES OF THE MSCC COORDINATOR/ COORDINATING SERVICE

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.

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.

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.
- Take the lead for ensuring that the MSCC Alert Cards are ordered & distributed

The optimal care of patients with MSCC should be determined by senior clinical advisors (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.

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

APPENDIX 5: T2 DIXON (FAST SCAN) PROTOCOL

T2 Dixon Protocol

This is a whole spine protocol for a query of MSCC:

It takes on average about less than 20min for T2 DIXON versus 35min for a conventional protocol with T1, T2 and STIR sagittal images.

Protocol

- Sagittal T2 DIXON®(In and out of phase, Water and Fat only)
- Axial 2D MERGE C-spine
- Axial T2 (lowest 3 discs plus any other levels of pathology)
- Axial T1 (lowest 3 discs plus any other levels of pathology)

©If T2 DIXON is not available, please, use:

- o Sag T2
- o Sag T1
- o Sag STIR (If trauma, infection or tumour)
- o Axial 2D MERGE C-spine
- o Axial T2 (lowest 3 discs plus any other levels of pathology)
- o Axial T1 (lowest 3 discs plus any other levels of pathology)

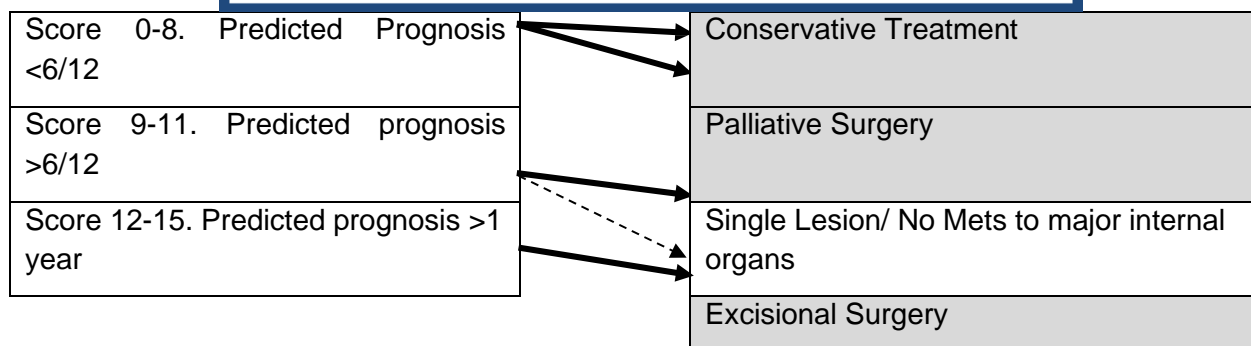
APPENDIX 6: SCORING SYSTEMS

ECOG performance status

SCORE	PERFORMANCE STATUS
0	Fully active, able to carry on all pre-disease performance without restriction
1	Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g. light housework, office work
2	Ambulatory and capable of self-care, but unable to carry out any work activities. Up and about more than 50% of waking hours.
3	Capable of only limited self-care, confined to bed or chair more than 50% of waking hours
4	Completely disabled. Cannot carry out self-care. Totally confined to bed or chair.

Modified Tokuhashi Scoring System

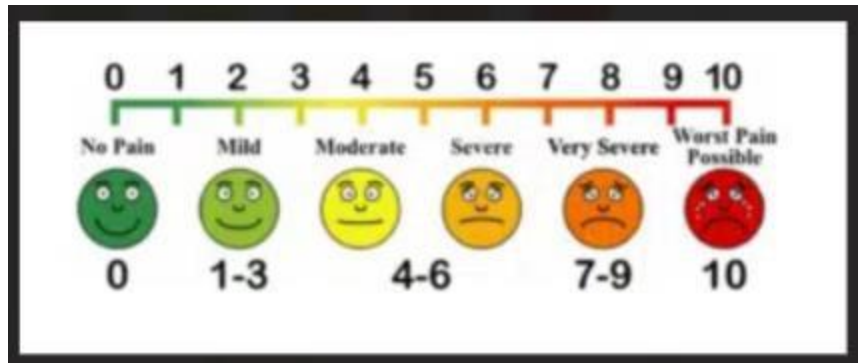
Modified Tokuhashi Score	
Patient condition	Score
Poor (performance status 10%–40%)	0
Moderate (performance status 50%–70%)	1
Good (performance status 80%–100%)	2
No. of bone metastases outside spine	
> 2	0
1–2	1
0	2
No. of bone metastases in vertebral body	
> 2	0
1–2	1
0	2
Metastasis to major organs	
Nonremovable	0
Removable	1
None	2
Primary cancer site	
Lung, osteosarcoma, stomach, bladder, oesophagus, pancreas	0
Liver, gallbladder, unidentified	1
Other	2
Kidney, uterus	3
Rectum	4
Thyroid, breast, prostate, carcinoid tumour	5
Palsy	
Complete (Frankel A, B)	0
Incomplete (Frankel C, D)	1
None (Frankel E)	2
Total Modified Tokuhashi score	
Survival: Tokuhashi score: 0 - 8 <6 months; 9 - 11 6 - 12 months; 12 - 15: >1 year	



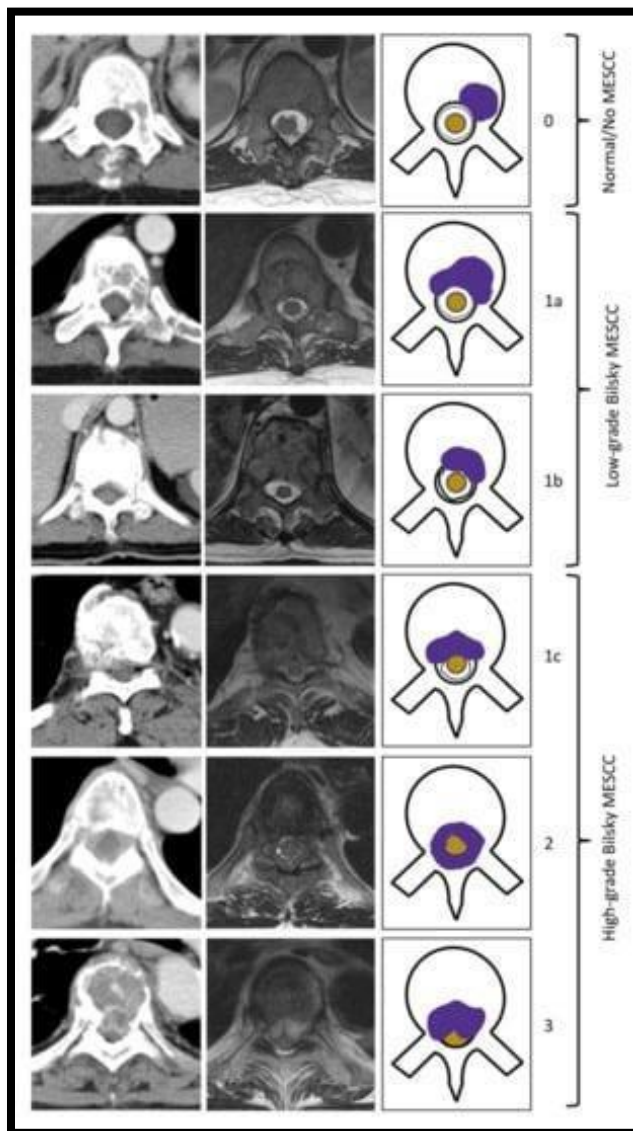
Spine Instability Neoplastic Score (SINS)

SINS Spine Instability Neoplastic Score		
Location		
Junctional (C0-C2, C7-T2, T11-L1, L5-S1)	3 Points	
Mobile spine (C3-C6, L2-L4)	2 Points	
Semi-rigid (T3-T10)	1 Points	
Rigid (S2-S5)	0 Points	
Pain relief with recumbency +/- pain with movement/loading of the spine		
Yes	3 Points	
No (occasional pain but not mechanical)	1 Points	
Pain free lesion	0 Points	
Bone lesion		
Lytic	2 Points	
Mixed (lytic/blastic)	1 Points	
Blastic	0 Points	
Radiographic spinal alignment		
Subluxation / translation present	4 Points	
De novo deformity (kyphosis / scoliosis)	2 Points	
Normal alignment	0 Points	
Vertebral body collapse		
>50% collapse	3 Points	
<50% collapse	2 Points	
No collapse with >50% body involved	1 Points	
None of the above	0 Points	
Posterolateral involvement of the spinal elements (facet, pedicle or costovertebral joint fracture or replacement with tumour)		
Bilateral	3 Points	
Unilateral	1 Points	
None of the above	0 Points	
Total Score		
Stable	sum score	0 - 6
Indeterminate (possibly impending) instability	sum score	7 - 12
instability	sum score	13 - 18
SINS scores of 7 to 18 warrant surgical consultation.		

VAS
Pain
Score



Bilsky Staging



APPENDIX 7: EMSN MSCC REFERRAL PROFORMA

APPENDIX 8: SPINAL STABILITY ASSESMENT FORM



East Midlands Cancer Alliance

Please affix a patient label
Patient name
D.O.B
NHS / K Number

Date of MSCC diagnosis	
Named Spinal Consultant	
Oncology Consultant	

Metastatic Spinal Precautions Proforma

To be completed for all Metastatic Spinal Cord Compression Patients.

If an update is required – please cross through this form and write a new one.

Mobility and Manual Handling

SIN Score	Bilksy Score	Tokuhashi Score

Select (tick)	C0-T4	T5-Sacrum	Recommendation
<input type="checkbox"/>	Stable	Stable	No Spinal precautions
<input type="checkbox"/>	Stable	Unstable	(paraplegic) Log Roll Flat Supine, neutral alignment, non-dynamic mattress
<input type="checkbox"/>	Unstable	Unstable	(tetraplegic) Log Roll Head Hold Flat Supine, neutral alignment, non-dynamic mattress

Quality of life + Consent discussed with patient. Does the patient understand impact of precautions on quality of life. Have risk vs benefits of treatment been explained? Have they consented to treatment option if discussed i.e. brace vs conservative (circle option)	Yes No
Physiotherapy referral	Yes No Date
Occupational Therapy referral	Yes No Date

Community referral required?	Yes / No
If Yes please state which community service	
Tel:	
Name and date referral sent:	

Orthosis Section

Is Orthosis Required? (Circle option)	Yes Complete Section Below	NO
Named Spinal surgeon/fellow		

Reason for orthosis:

Instability		Comfort		Other:	
-------------	--	---------	--	--------	--

			
Aspen Cervical (C2-5)	Aspen CTO (C6-T3)	Aspen TLSO (T9-S1)	Vista II CTLSO (C1-S1)
Date requested :		Consent gained:	
Brace to be fitted	Lying/sitting		
Patient should wear the brace:			
All the time, including night	Yes/No		
If no:			
Only when mobilising	Yes/No		
Going to the toilet at night	Yes/No		
When sitting quietly (e.g. watching TV)	Yes/No		
While having a shower	Yes/No		
Not to drive – always sit in the front seat where there is an air bag	Yes/No		
Avoid extreme bending and twisting	Yes/No		
The patient should wear the brace as above for _____ weeks/months			
Further Imaging required? (date)	Spinal OP Follow up required? (date)	Recommended date for discontinuation of Orthosis	
Completed by:	Name	Signature	Date and Time

For Orthotics to complete:			
Skin care guidance			
Pad removal and cleaning			
Removal and reapplication of the collar			
Signed (Name, designation)		Date and Time	

Please ensure this document is sent to community partners as required on discharge.

APPENDIX 9: EDUCATION FOR PROFESSIONALS GIVING OUT THE ALERT CARD

The lead for MSCC and MSCC coordinators should be the leads for ensuring that education is delivered to the tumour site cancer CNS teams that will be giving out the MSCC alert cards, the key teams within each trust will be:

- Tumour site clinical nurse specialist
- Inpatient Specialist palliative care nurse specialist
- CNS Support nurses
- Allied Health care professionals
- Hospital consultants
- Emergency Cancer assessment unit triage teams
- Rehabilitation teams

Level 2 training will be offered to the professionals giving out the MSCC alert cards (see table 3)

EDUCATION OF PROFESSIONALS TO ENSURE EARLY RECOGNITION OF MSCC

Training and education are required to achieve an early diagnosis while the patient is still ambulant to optimise patient outcomes. Health care professionals need to recognise early signs of MSCC rather than a focus on late signs including loss of neurological function.

NICE Guideline states that health care professionals should consider spinal metastasis as a risk factor for MSCC. Nice guidance encourages the health care professional to consider pain in the back as a main red flag paired with a diagnosis of cancer as an early sign of MSCC. Focus on late signs of MSCC when there is altered neurology results in late referral and delayed diagnosis and leads to poor outcomes for patients.

Aims for training.

- To ensure early identification of red flags for MSCC across all health care settings
- To Ensure timely investigations, diagnosis, and management plan

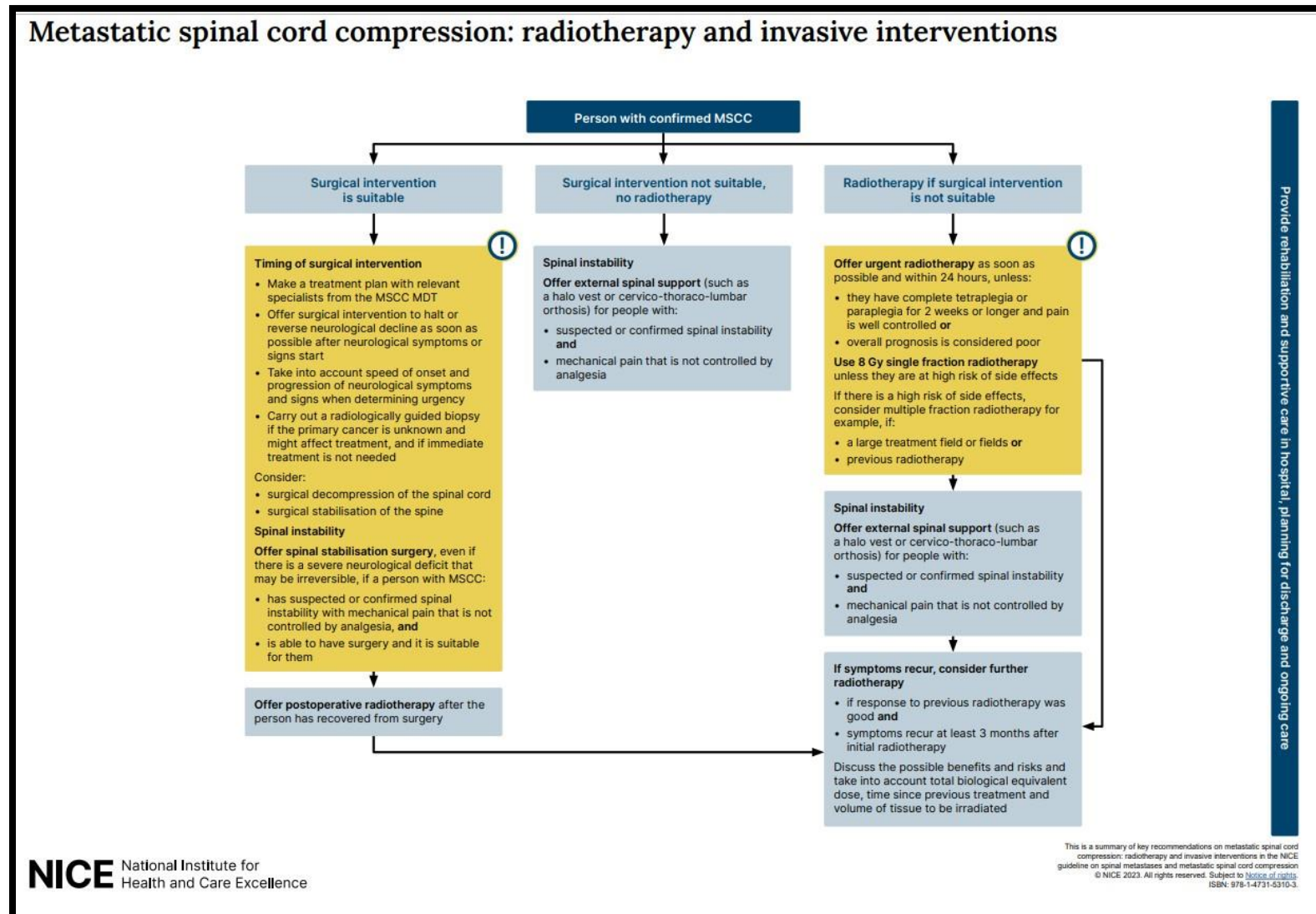
Who should have the training?

Cancer now affects 1 in 2 patients in the UK, this tells us that all health care professionals will come across cancer patients during their work and therefore it is imperative that all health care professionals at varying levels to understand MSCC. It is acknowledged that professionals in different specialities and disciplines will require different levels education and training. It is acknowledged that delivering MSCC education to all specialities is a mammoth task and will require a plan of how this delivery can be achievable. It is anticipated that there are 3 levels of training and education required, this has been considered in line with health Education England Core skills training framework (2021).

Table 3: Levels for training

Level	Definition In Practice	Target Audience	Training Package
Generalist			
Level 1	<ul style="list-style-type: none"> An awareness of Malignant Spinal cord compression (MSCC) Recognise that patient with cancer and new backpain needs an urgent review Understands the later presenting signs of MSCC Understands MSCC is an urgent concern and to seek urgent advice to ensure correct patient management Knows how to contact the MSCC coordinator for advice and referral Recognises need for support for pain control 	<ul style="list-style-type: none"> All staff working in health care settings. A&E nursing and AHP's Primary care all nursing and support staff Hospital setting General practice General wards 	<ul style="list-style-type: none"> Macmillan training package Video Learn Zone
Proficient			
Level 2	<ul style="list-style-type: none"> Knowledge about MSCC with an in-depth awareness of the risk factors for MSCC Proactive recognition of patients at greater risk Can advise correct spinal precautions Steroids Understands treatment modalities and the process for ascertaining best approach for the patient Understands concerns around spinal stability and rehabilitation Can advise on pain management 	<ul style="list-style-type: none"> Works in an Oncology/Haematology/Hospice Speciality Nurse /AHP Responsible for cancer care delivery Triage of cancer related concerns Tumour site specialist nurse Emergency ACP Emergency and acute medical SPR and consultant 	<ul style="list-style-type: none"> Agreed slide pack from network level MSCC coordinator Hospice practice educator
Advanced Knowledge (Responsible for leading decision making and treatment)			
Level 3	<ul style="list-style-type: none"> Aware of physiological, anatomical presentation of MSCC Can advise all levels of health care professionals Direct decision making Negotiate patient management plan Review imaging and understand and initiate a plan of care to ensure non oncology professionals have a clear plan documented <p>Knowledge about MSCC radiological scoring and terminology</p>	<ul style="list-style-type: none"> Radiologist Consultant Oncologist Consultant radiotherapy MSCC coordinator Acute Oncology ACP/CNS General Practitioner Palliative care consultant 	<ul style="list-style-type: none"> Agreed slide pack Delivery MSCC lead

APPENDIX 10: NICE GUIDELINES FOR RADIOTHERAPY & MSCC



APPENDIX 11: REHABILITATION & ONGOING CARE

Ongoing Care Plan	
<p>Discharge planning and ongoing care, including rehabilitation should start on admission and be led by a named individual from within the responsible clinical team. This should include the patient and their family and carers, primary oncology site team, rehab team (including Occupational Therapist) and community support, including primary care and specialist palliative care as required.</p> <p>For patients with T6 lesion and above: monitor for signs of Autonomic Dysreflexia – Hypertension (consider patient's 'norm'), Bradycardia, 'Pounding' Headache.</p> <p>AD information factsheet: https://spinal.co.uk/wp-content/uploads/2022/06/SIA_Autonomic_Dysreflexia_Factsheet_v2.pdf</p>	<p>NICE [1] recommends patients should have access to Physio and Occupational Therapists, for assessment, advice and rehabilitation.</p> <p>Rehab should focus on short term, realistic goals with a goal of promoting functional independence, participation in ADL's and quality of life.</p> <p>Autonomic Dysreflexia is a medical emergency. See EMSN Autonomic Dysreflexia Pathway: Link or appendix?</p>
VTE Prophylaxis	
<p>Prophylactic LMWH (unless contra indicated) and anti-embolism stockings and/or Intermittent pneumatic compression.[1]</p>	
Pressure Ulcer Prevention	
<p>Patients with MSCC are at high risk of Pressure Ulcers.</p> <p>Once spinal stability is confirmed, or patient is confirmed not suitable for definitive stabilising surgery – patients should be:</p> <p>Turned every 2-3 hours if bed-bound</p> <p>Nursed on a high-grade pressure relieving mattress</p> <p>Encouraged to change position and relieve pressure, if able.</p>	
Neurology Testing	
<p>Daily monitoring of neurology. (ASIA chart & MRC Grades – Appendix 1)</p> <p>If neurological deterioration is detected this must be escalated to managing consultant immediately.</p>	<p>To monitor for resolution of spinal shock or any deterioration in neurological status. May need urgent intervention</p>

Bladder and Bowel	
<p>Assess bladder and bowel function in all patients with MSCC. Monitor function as it may change with resolving spinal shock, or worsening cord compression. Manage urinary retention with indwelling catheter in the first instance. Initiate neurogenic bowel management to patients with disturbed bowel habit</p>	<p>Damage to the spinal cord has a profound impact on the function of the large bowel. Stool transit is slowed, placing the individual at risk of constipation. Sensory and motor control of the ano-rectum is lost leaving the injured individual unable to feel the need to evacuate the bowel, or to control the process of defaecation. Without intervention, the Spinal Cord Injured (SCI) individual could be incontinent of faeces and chronically constipated, with all the secondary complications that this implies. The function of the large bowel must be actively managed to allow the individual some degree of continence and to minimise associated health problems. Refer to EMSN Bowel Management Pathway</p>
Circulatory and Respiratory Function	
<p>Patients with MSCC may be at risk of Postural Hypotension [1]. Short-term, this should be managed with patient positioning and/or Anti-embolic stockings/pneumatic foot pumps. Patients need close monitoring of respiratory function, and should receive prophylactic management to include secretion clearing, (breathing exercises, assisted coughing/suction) and deep breathing, positioning and possibly supplemental IPPV or BiPAP</p>	<p>Caution to avoid over-hydration which may lead to pulmonary oedema. To avoid complications such as pneumonia.</p>
Psychological assessment and support	

Diagnosis of MSCC may cause significant distress for patients and their family/carers.

Consider:

Specialist psychological support

Pastoral or spiritual support

Offering written information that explains how to access psychological/spiritual support when needed.

Referral to palliative care team

Offer of bereavement services to patient's family

Referral to Spinal Injuries Association (SIA):

<https://spinal.co.uk/contact-our-sci-nurse-specialists/>

The active holistic care of patients with advanced, progressive illness should include provision of psychological support [1]

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