CLINICAL GUIDELINE	Metastatic spinal cord compression

1) SUMMARY

This guideline provides guidance on the clinical evaluation and management of suspected metastatic spinal cord compression in patients with a known or newly-diagnosed malignancy.

2) INTRODUCTION

This document refers to patients with metastatic spinal cord compression (MSCC) or compression of the cauda equina. MSCC is one of the most serious and devastating complications of malignancy but with early diagnosis and prompt effective treatment many patients can retain good levels of function and independence.

3) DEFINITIONS

Metastatic spinal cord compression (MSCC). Compression of the spinal cord, or cauda equina, by direct pressure and/or vertebral collapse as a result of metastatic spread that may cause neurological deficit and paralysis.

4) SCOPE

These guidelines are intended to support clinical judgement. Healthcare professionals must use discretion and judge the appropriateness of each recommendation to the clinical context when following guidance.

5) FULL GUIDELINE

The current Trust guidelines are included in this document and replace the previous Trust guideline: *Metastatic Spinal Cord Compression Guidelines (updated May 2014)*.

These guidelines also replace *the London Cancer Alliance Guidelines September 2013, updated March 2016*.

Metastatic spinal cord compression

Causes and Presentation

MSCC can occur in virtually all types of malignancy, but most common are myeloma, lung, prostate and breast cancer.

Tumour Site	Proportion of patients who develop MSCC
Lung	20–31%
Prostate	18–21%
Breast	13–17%
Haematology	8–10%
Gastrointestinal	5–13%
Kidney	3–12%
Unknown	4–7%
Other	7–14%

The majority of MSCC cases occur in patients with a pre-existing cancer diagnosis; however, in around 20% of patients it is their first cancer presentation.

Symptoms and signs

- 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.

Patient information

Patients believed to be at risk of developing MSCC should be provided with an MSCC Alert Card (eg. Macmillan: https://be.macmillan.org.uk/be/p-24916-mscc-alert-card.aspx), which details the potential symptoms and to which emergency contact details need to be added. Any patient who is treated for MSCC and is not receiving end-of-life care should also be given a card.

Location of Spinal Cord Compression Service

The Northwest London MSCC Centre for both diagnosis and treatment is at Imperial College Healthcare NHS Trust. The Centre provides: 24/7 access to MRI, neurosurgery and spinal surgery, oncology input and has radiotherapy available 7 days a week if required.

Initial point of contact: the MSCC Coordinator

To provide the most rapid access to the system, the request for urgent referrals and review of patients suspected of MSCC should be made directly to:

Contact via Switchboard on 020 3311 1234	MSCC Coordinator
During working hours: 9 am to 5 pm weekdays Monday to Friday)	8082 bleep holder
Out-of-hours: 5 pm to 9 am weekdays Monday to Friday and at all times during weekends on Saturday and Sunday	On-call Clinical Oncology SpR or On-call Radiotherapy SpR

Clinical pathway for clinical suspicion of MSCC

Advise:

- If at peripheral hospital:
  - Initiate **Dexamethasone 16 mg stat po/iv** and a **high-dose proton-pump inhibitor** (PPI eg. Omprazole 40mg od).
  - Request an urgent MRI whole-spine (<12 hours), or if a permanent pacemaker present then CT whole-spine, and CT CAP and rediscuss with IEP images.
- If in the Community or unable to investigate within time:
  - Transfer to the Acute Oncology Unit at Charing Cross Hospital on 6 West within the hour
  - A&E at Charing Cross Hospital within the hour.

At Imperial College Healthcare NHS Trust:

1. Clinical assessment:
   a. Including a full neurological examination, anal tone and pain.
   b. Assess spinal stability. If changing neurology, increased pain on movement, or cervical MSCC then stabilise the spine: cervical collar, strict bed-rest lying flat, no mobilisation and log roll only.
2. Initial treatment:
   a. Unless already administered, initiate **Dexamethasone 16 mg stat po/iv** and a **high-dose proton-pump inhibitor** (PPI eg. Omprazole 40mg od).
   b. Continue **Dexamethasone 8 mg bd PO/IV at 8 am and noon**. Do not withhold steroids in patients with suspected lymphoma and a neurological deficit. Discuss these cases with a Senior.
   c. Prescribe analgaesia.
3. Imaging:
   a. **Urgent MRI whole spine <24 hours** (Consultant-to-Consultant if an out-of-hours request).
   b. CT chest-abdomen-pelvis (CT CAP) with bone reconstruction unless recent CT within four weeks with IEP images available on admission.
4. Senior review: admit if needed.

5. Ensure that VTE thromboprophylaxis measures are in place [Refer to Intranet Page *Venous thromboembolism (VTE) treatment with Tinzaparin: Tinzaparin Dosing Guidelines for adults*]. MSCC patients are at high risk for VTE.

If MSCC confirmed:

1. Discuss with AOS Consultant, routine Oncology or Haematology Consultant for a perspective on prognosis.
2. Discuss with Neurosurgical SpR on call immediately.
3. Discuss at daily Neurosurgical Review Meeting 8.15 am on 10 East.
4. Transfer to Neurosurgery if accepted.
5. If not for surgery, for urgent radiotherapy (RT). Discuss with on-call Clinical Oncology SpR (Ext. 17866).
6. Physio and OT to review for a functional assessment.
7. Consider management as an Outpatient.
8. Palliative Care review.
9. Assess analgesic needs, bowel and bladder function.

If MSCC not present:

1. Discuss with AOS Consultant, routine Oncology or Haematology Consultant.
2. Consider Outpatient Radiotherapy (or chemotherapy where appropriate).
3. Discharge or arrange repatriation to the referring hospital.
4. Assess analgaesic needs.

Background and rationale

The primary key questions in patients with MSCC are:

1. Does the patient have MSCC?
2. Should they have surgery?

The first is answered by the MRI whole-spine. The second is answered by reviewing the CT CAP, discussing first with a site-specific oncologist (to give a feel for prognosis and treatment options, for which CT CAP is helpful) and then discussing feasibility and benefit with the neurosurgeons.

The CT scan serves to both update the current information regarding the overall cancer burden and also gives considerable additional information to the bone quality that will be of use to the surgical team.

You must review patients who have MSCC with a Consultant Clinical Oncologist and Neurosurgeon prior to treatment decisions. Treatment decisions regarding the role of surgery or radiotherapy are dependent on the cancer diagnosis, MSCC characteristics, functional level, overall disease burden and status (stable versus rapid progression) and likely prognosis (prognosis >3 months for Neurosurgery).

- *For patients with a diagnosis of a malignancy that is likely to be very chemosensitive*, including gestational trophoblastic disease, germ cell tumours, small cell lung cancer, lymphoma, leukaemia or myeloma, primary treatment with urgent chemotherapy should be considered and the on-call Specialist Teams contacted as appropriate (either Medical Oncology or Clinical Oncology).

- *For patients without a pre-existing diagnosis of malignancy*, consideration to diagnostic biopsy should be made if spinal surgery is not indicated and discussion at a relevant MDT meeting.
- Selected patients may be transferred to other cancer or surgical centres dependent on their diagnosis and clinical team workings.

Out of hours, patients will be admitted under the care of the On-Call Clinical Oncology Consultant.

Discharge Planning

During or after treatment, develop a discharge plan, rehabilitation, social services, oncology follow-up and palliative care as appropriate.

Agreed Policy with Radiology for urgent MRI scans in suspected MSCC

1. For patients with spinal pain suggestive of spinal metastases and with neurological symptoms or signs suggestive of MSCC, an MRI whole-spine will be performed within 24 hours. In certain clinical situations where emergency treatment is clinically indicated (i.e. deteriorating neurology or patient at a peripheral hospital), the scan should be performed more urgently (<12 hours).
2. Out-of-hours, MRI whole-spine has to be requested at Consultant level and should only be performed in clinical circumstances where there is an emergency need and an intention to proceed immediately to treatment. This is typically when there is progressive neurological deterioration but may be with escalating pain without neurology. **Out of hours, if there is stable neurological deficit, it may be reasonable to defer the MRI until the next day. This may mean (e.g.) scanning a patient on Saturday morning rather than at midnight on Friday if their neurology is stable**.
3. In patients with pain suggestive of spinal metastases but no neurological signs or symptoms an outpatient MRI whole-spine should be performed within 1 week, if clinically indicated.
4. Patients with cauda equina compression should be managed as MSCC.
5. Patients who have *radicular* (i.e. nerve root) symptoms in isolation should be imaged within 1 week. A proportion of these patients develop MSCC. Bilateral radicular symptoms and associated back pain is a classic presentation of MSCC and should be managed as MSCC.
6. Good prognosis patients with single-level MSCC without evolving neurology may be eligible for high-dose palliative radiotherapy. Discuss these cases directly with Consultant Neuro-Oncologists Dr Matthew Williams or Dr Waqar Saleem.

Spinal Stability

The assessment of spinal stability in patient with MSCC is difficult. The best guide is often clinical examination (e.g. increased pain or neurology on movement). However, as a guide, SINS represents the best available scoring system [Table 1]. Patients with a SINS score of <= 6 are considered stable, and >=13 as unstable, with the intermediate score being of uncertain stability

- For immediate assessment if **changing neurology**, **increased pain on movement**, **or if a cervical lesion present**. Then:

1. Treat as an unstable spine: **cervical collar, strict bed-rest lying flat, no mobilisation and log roll only.**

If findings do not suggest spinal instability, the patient can mobilise pending further assessment.

Table 1. Spinal Instability Neoplastic Score (SINS).

Component	Score
Location	
Junctional: O-C2; C7-T2; T11-L1; L5-S1	**3**
Mobile spine: C3-6; L2-4	**2**
Semirigid : T3-10	**1**
Rigid: S2-S5	**0**
Mechanical pain	
Yes	**3**
No	**2**
Pain free lesion	**1**
Bone lesion	
Lytic	**2**
Mixed: lytic or blastic	**1**
Blastic	**0**
Radiographic spinal alignment	
Subluxation or translation present	**4**
Deformity: kyphosis or scoliosis	**2**
Normal	**0**
Vertebral body collapse	
>50% collapse	**3**
<50% collapse	**2**
No collapse with >50% body involved	**1**
None of the above	**0**
Posterolateral involvement	
Bilateral	**3**
Unilateral	**1**
None of the above	**0**

Score Total 0-18	**1-6**	**7-12**	**13-18**
Clinical categories	Stable	Potentially unstable	Unstable
Binary	Stable	Current or potentially unstable = possible surgical intervention	

Role of the MSCC co-ordinator

The MSCC Co-ordinator is responsible for the investigation and management of all patients with actual or suspected MSCC, both within the Trust and for patients who have been referred to them. The MSCC Co-ordinator may delegate some of these responsibilities to local ward teams (e.g. ordering scans), or referring teams, but is responsible for ensuring that they have happened.

In addition, the MSCC co-ordinator is responsible for ensuring that all patients with actual or suspected MSCC are referred to the MSCC MDT.

MSCC MDT Meeting

The MSCC MDT Meeting provides a regular forum for the retrospective discussion of investigated and treated patients and the planning of treatment for new ones. All patients who go through the MSCC pathway (irrespective of whether or not they have MSCC) should be discussed. Patients should be referred via email: imperial.mscc.mdt@nhs.net.

The MSCC MDT currently runs on alternate Friday mornings 9 am – 10am in the 2 North Radiology Seminar Room. It is expected that one of the AOS SHOs will attend and will be able to inform the MDT about the treatment of patients on the list.

All patients investigated for suspected or actual MSCC should be discussed at the MDT Meeting to ensure accurate data capture and enable audit of our service. Referral of patients should normally be done by the MSCC Co-ordinator or their delegated representative.

MSCC Clinical Oncology Guidelines

1. Confirm Dexamethasone and PPI administration.
2. Review of the clinical situation and radiology with the imaging team, neurosurgery and clinical oncology team prior to treatment decision.
3. If the patient is not for surgical decompression and there is no pathological diagnosis, then a biopsy of the mass should be obtained urgently if possible. Radiotherapy can be started in advance of obtaining a biopsy result and on occasion when a biopsy is not possible.
4. Consider early referral to Palliative Care Medicine if pain is difficult to control, or complex.
5. Radiotherapy treatment plan is to be delivered in line with the Imperial College Healthcare NHS Trust Radiotherapy Protocols. There are dedicated MSCC RT protocols (CC1 – 3).
6. Review steroid dosage and dose-reduction plan during and after treatment.
7. Develop discharge plans and return to local care as appropriate.

MSCC Neurosurgery and Spinal Surgery Guidelines

1. Discuss referral with the spinal team (Mon – Fri 08.00 – 17.00) or on-call Neurosurgical SpR (Bleep 8075).
2. Keep patient nil by mouth if an urgent operation is a possibility and send up to date bloods for FBC, U&E, clotting and G&S. Ensure that other appropriate pre-operative investigations (CXR, ECG) are available.
3. If the patient is for surgical decompression, the neurosurgical team/spinal team will make appropriate arrangements for timing of surgery and transfer to the neurosurgical ward. If imaging has been done outside Imperial NHS Trust, please ensure this is available on CD/IEP/PACS and should be with the patient when transferred.
4. Inpatients who are not for surgery, a surgical opinion on stability of the spine is also essential. In addition, the spinal surgery team MUST ensure that the MSCC Co-ordinator is aware of the patient, unless they are under another cancer centre, in which case their local MSCC Co-ordinator should be informed.

5. If no diagnosis has been made prior to surgery, a biopsy should always be attempted during surgery.
6. Consider early referral to Palliative Care Medicine if pain is difficult to control, or complex. Review bowel and bladder function on admission and consider urinary catheter and bowel care regimen as appropriate.
7. Ensure that VTE thromboprophylaxis measures are in place [Refer to Intranet Page *Venous thromboembolism (VTE) treatment with Tinzaparin: Tinzaparin Dosing Guidelines for adults*]. MSCC patients are at high risk for VTE.
8. Radiotherapy or chemotherapy should only be commenced after surgery when the wound has fully healed and there is no sign of wound breakdown or infection (at least 10-14 days post-operatively). However, the treating oncologist should be informed on the day of surgery (usually via email) so that they can arrange to see the patient sooner.
9. Review steroid dosage post-operatively in collaboration with the oncology team.
10. Patients should be transferred back to the referring hospital as soon as the surgical team discharges the patient. This is to ensure the availability of emergency beds for the regional neurosurgical service.
11. For "oncological" problems, patients should normally be discussed with their treating consultant. However, if there is a problem with patients being reviewed (oncology team off-site, patient from external hospital, etc.), please contact the on-call Consultant Clinical Oncologist via Switchboard who will provide additional input; contactable via mobile telephone through switchboard.

MSCC Rehabilitation Pathway

1. Presentation of confirmed spinal cord compression (after admission or transfer to Charing Cross Hospital):
    a. See below for discussion of spinal stability.
    b. For cervical lesions ensure immobilisation with hard collar.
    c. Refer to physiotherapist within 24 hours of admission, OT within 24 /48 hours and to other members of the MDT as appropriate.
    d. Undertake respiratory assessment and treat as appropriate.
    e. Carry out neurological assessment.
2. Unstable spine: prior to treatment
    a. Surgery – as above.
    b. Or Radiotherapy if surgery not appropriate – as above.
3. Stable spine:
    a. Commence gentle mobilisation as soon as possible and when the pain is well-controlled.
    b. Encourage gradual sitting from supine to 45 degrees initially. If tolerated progress to 60 and 90 degrees as able usually the same day. Monitor neurology and pain during this process.
    c. Carry out the following: manual handling risk assessment, assessment and balance and sitting over edge of bed, gradual mobilise as patient's condition allows.
    d. Refer to other MDT member as appropriate.
    e. If pain limits the patient's mobility consider use of a brace.
    f. Carry out wheel chair assessment.
    g. Teach carers and family on use of complex equipment.

h. Assess functional roles including primary care/leisure/work/family/social.
i. Assess home environment.

4. Discharge
   a. Prepare patient and carers for discharge, liaising with MDT.
   b. Refer to specialist services: continue rehab and support as appropriate.
5. Approaching end of life
   a. Recognise when end-of-life is approaching.
   b. Explore needs and adjust accordingly.

Arrange review of pain control, spinal stabilisation, Clinical Nurse Specialist input and AHP arrangements on admission. New patients with suspected MSCC are to be admitted initially under the care of AOS.

6) IMPLEMENTATION

Training required for staff	X Yes ☐ No
If yes, who will provide training:	Emergency Services Team
When will training be provided?	Ad hoc for new Staff Members
Date for implementation of guideline:	14.02.20

7) MONITORING / AUDIT

When will this guideline be audited?	Three-monthly
Who will be responsible for auditing this guideline?	AOS Team
Are there any other specific recommendations for audit?	Emphasis on: 1. Timely MRI imaging. 2. Dexamethasone administration when MSCC first suspected.

8) REVIEW

Frequency of review	**Please indicate frequency of review:** 3 years **Persons and posts responsible for the review:** Dr Michael Gonzalez, Consultant in Medical Oncology and Acute Oncology Service Lead. Dr Matthew Williams, Consultant in Clinical Oncology and MSCC Lead.

Version	Date	Author	Status	Description
1.0	09.07.19	Dr Matthew Williams Dr Michael Gonzalez	Draft	Updates on Trust and LCA guideline.

1.1	23.07.19	AOS Guideline Review Meeting	Approved	Updates reviewed and approved. Reference links.
1.2	29.11.19	Cancer Quality and Safety	Approved	29th November 2019 Q&S minutes state approved by Chairman's Action after October meeting.
1.2	27.04.20	Divisional Quality and Safety		Guideline review with additional comments.
1.3	17.06.20	Divisional Quality and Safety	Approved	Updates approved.

9) REFERENCES

NICE Guideline 'Neutropenic sepsis: prevention and management in people with cancer.'
https://www.nice.org.uk/guidance/cg151

10) GUIDELINE DETAIL

Start Date:	14.02.20
Approval Dates	AOS: 23.07.19 Cancer Q&S: 29.11.19 SCC Q&S 17.06.20
Has all relevant legislation, national guidance, recommendations, alerts and Trust action plans been considered, and included as appropriate in the development of this guideline?	NICE Guideline Neutropenic sepsis: prevention and management in people with cancer. https://www.nice.org.uk/guidance/cg151
Have all relevant stakeholders been included in the development of this guideline?	All AOS Consultants and Nurse Practitioners
Who will you be notifying of the existence of this guidance?	All Trust via intranet communication All cancer Clinician nurses and pharmacists Cancer Wards, day care and outpatients Consultants and Trainees A&E Staff Acute Medicine Staff
Related documents	Chemotherapy handbook regimens
Author/further information	Name: Dr Michael Gonzalez Title: Consultant in Medical Oncology, AOS Lead

	Division: Cancer Site: Charing Cross Hospital Trust email address: michael.gonzalez1@nhs.net
Document review history	Next review due: August 2022
THIS GUIDELINE REPLACES:	Metastatic Spinal Cord Compression Guidelines (updated May 2014).

11) INTRANET HOUSEKEEPING

Key words	Metastatic spinal cord compression, MSCC.
Which Division/Directorate category does this belong to?	Cancer
Which specialty should this belong to when appearing on the Source?	N/A

12) EQUALITY IMPACT OF GUIDELINE

Is this guideline anticipated to have any significant equality-related impact on patients, carers or staff?

Yes ☐ No ☒