The Christie
NHS Foundation Trust

GUIDELINES FOR RADIOTHERAPY IN SPINAL CORD COMPRESSION

THE CHRISTIE, GREATER MANCHESTER & CHESHIRE

Procedure Reference:		Version:	*V6*
Document Owner:	Dr V. Misra	Accountable Committee:	*Acute Oncology Group Network MSCC Group*
Date Approved:	*January 2018*	Review date:	*January 2023*
Target audience:	*All Clinicians*		

Indications for Radiotherapy:

- Cancer diagnosis established
- Spinal cord compression confirmed by imaging
- Following clinical triage as per pathway
- Following spinal surgery for spinal cord compression unless the patient has had previous radiotherapy to the same level.
- Not suitable for surgery (*See Surgical Guidelines)*

Aims of Radiotherapy

The aim of radiotherapy is to reduce pressure on the cord through tumour shrinkage, and to achieve local tumour control at this site. This can lead to some or complete resolution of neurological symptoms and signs, or at least prevent further deterioration. It may also help to relieve spinal and radicular pain.

Results of radiotherapy are closely linked to neurological status at time of treatment and patients who are already paraplegic, especially for over 48 hours, with loss of bladder control are unlikely to have neurological recovery with radiation.

Relative contraindications to radiotherapy

- No histological diagnosis of cancer
- Relatively radio resistant tumour, if surgery is an option (renal carcinoma, sarcoma, melanoma)
- Cord compression is due to vertebral displacement/spinal instability
- Previous radiotherapy to same spinal site
- Poor general condition due to other major and irreversible clinical problems
- Prognosis likely to be less than 1- 2 months

Indications for getting a Surgical Opinion
(*See Surgical Guidelines and pathway document)*

Surgery should be considered as first line treatment in patients who

- Are medically fit for a general anaesthetic,
- have a life expectancy greater than 6 months (Tokuhashi Score)
- have limited disease elsewhere,
- have minimal neurological deficit
- have limited levels of compression.

Surgery is also indicated if there is

- Spinal instability and/or deformity
- No tissue diagnosis
- Worsening of symptoms/disease progression during/after radiotherapy
- No scope for further radiotherapy to involved spinal site

Referral for Radiotherapy

All patients should be referred via the MSCC co-ordinator service by calling The Christie switchboard on 0161 446 3000 All patients will then be triaged on the electronic form available on the internal Christie Clinical Web Portal.

If the triage decision is for radiotherapy, this will be arranged by the on-call Specialty Trainee (ST) in conjunction with the radiotherapy department. For inpatients at Oldham/Salford, the ST should discuss with the local satellite centre to see if the patient can be simulated and treated locally. If this is not possible, then patients should be brought to the Withington site.

A transfer checklist will be used by the Radiotherapy department to gather pertinent details about the patient needs from the referring hospital / hospice. This information will ensure that the team at the Christie are capable of providing for the patients' needs from the moment they arrive in the hospital.

It is the responsibility of the on call Clinical Oncology Specialty Trainee to inform the clinical oncology consultant on-call if urgent radiotherapy is indicated at weekends/Bank Holidays. All referrals need to be discussed with the responsible consultant or the on-call consultant.

AIM TO GIVE RADIOTHERAPY WITHIN 24 HOURS OF THE CONFIRMED DIAGNOSIS OF SPINAL CORD COMPRESSION.

Radiotherapy Treatment Planning

All radiotherapy treatment should be planned using the reported MRI (CT if MRI contraindicated) of the whole spine.

Treatment Volume

- The field is centred on the cord compression, including 1 vertebra above and below.
- Attention to the transverse axial imaging is important to ensure that any lateral or paravertebral extension is covered in the volume width.
- Treatment may be required to more than one level of compression.
- Junctional overlap with previously irradiated fields should be avoided / taken into account when deciding dose and fractionation.

Technique

- Treat supine using single mega voltage beam through the grid / dosemax couch top
- Where the depth of field, as assessed by the MRI scan, exceeds the mid-plane, a parallel opposed pair arrangement is indicated.
- The cervical spine may be treated with a lateral opposed pair to reduce potential oral side effects (mucositis).

Dose and fractionation

The preliminary result of the SCORAD III Trial, presented at ASCO in 2017 suggests that a single exposure of 8Gy is as good as 20Gy in 5 fractions in terms of neurological recovery and overall survival. From previous non-RCT data there is an indication that patients who survive longer require more in-field retreatment with single exposures or short courses of treatment.

Based on this evidence, the standard recommended doses are:

- 8Gy single exposure [suitable for most patients]
- 20Gy in 5 fractions [Where a long prognosis is expected or if there is significant soft tissue disease]
- 30Gy in 10 fractions [Post-spinal surgery only]

Prescription Point: dose prescribed at depth. The recommended depth is the distance from the skin to the anterior edge of the spinal cord or the posterior edge of the vertebral body as assessed on the diagnostic MR/CT scan or the virtual simulation scan. The depth should be assessed at the centre of the planned field.

Good prognosis patients:

Patients who are likely to improve following radiotherapy and maintain benefit:

Estimated survival of over 3 months (Assess with the Tokuhashi Score)
Minor neurological impairment
Still ambulatory
Limited and treatable disease elsewhere

These patients may benefit from fractionated treatment e.g. 2000 cGy in 5 treatments.

Poor prognosis patients:

Patients who are unlikely to improve following radiotherapy and maintain benefit:

Estimated survival of less than 3 months (Assess with Tokuhashi Score)
Extensive or untreatable disease elsewhere
Severe established neurological deficit (especially of acute onset or for >48 hours)

Treatment is unlikely to lead to useful functional improvement, but may contribute to pain relief. These patients may be treated with a single fraction of 800 cGy at depth. For patients with myeloma, 800-1000 cGy may be prescribed.

Post-operative radiotherapy:

Good prognosis patients would warrant fractionated treatment of 3000 cGy in 10 fractions.

Special Circumstances:

There are some special circumstances that may warrant alternative fraction schedules, for example:

- Solitary plasmacytoma : 40 – 50 Gy in 20 – 25 fractions
- Lymphoma: Primary radiotherapy for chemo-resistant or low grade lymphoma and post-chemotherapy radiotherapy for high grade lymphoma is 30 Gy in 15 fractions.

Re-treatment with radiotherapy

There is evidence of the benefit of retreatment after initial benefit from radiotherapy for recurrent MSCC. The absolute maximum retreatment dose has not been established, but a cumulative BED (initial + re-irradiation) of 120 Gy_2 appears to be safe and effective. Effect of previous radiation, time to develop motor deficit, presence of visceral metastases and performance status have an impact on effectiveness of repeat treatment but schedule of treatment do not.

Re-irradiation should be considered for patients with a good performance status, absent or controlled visceral metastases and a slow development of motor deficit.
8 Gy single exposure or 20 Gy in 5 daily fractions prescribed at depth should be considered as long as the cumulative BED is <120 Gy_2

General care of patients receiving radiotherapy

All patients should commence dexamethasone 16 mg daily before the first treatment in combination with appropriate PPI for gastric protection. This minimizes additional nerve compression from increased inflammation/oedema (see steroid protocol for guidance on dose reduction).

Pain relief is important, especially as spinal disease may cause severe pain in relation to movement and changes in position. Consider:

- Additional "breakthrough" medication prior to attempting simulation or treatment. This is often an opioid analgesic, by mouth if administered at least 45 minutes prior to moving patient, or by injection.
- Use of pneumatic mattress for transfer from trolley to couch
- Use of Entonox during movement and this can be used by the patient even during treatment itself, to enable them to maintain position

Anti-emetics e.g. ondansetron 8 mg p.o. or i.v. should be given at least 30 minutes prior to treatment if the lower thoracic or upper lumbar spine is being irradiated.

Patients should be warned about subsequent mucositis/oesophogitis where applicable and soluble paracetamol advised.

***For more information and protocols on management of MSCC see: http://www.christie.nhs.uk/MSCC**

CONSULTATION, APPROVAL & RATIFICATION PROCESS

All documents must be involved in a consultation process either locally within a department or division or throughout the trust at relevant board/committee meetings before being submitted for approval.

VERSION CONTROL SHEET

Version	Date	Author	Status	Comment
V1	Aug 2007	Vivek Misra	Creation	
V2	Dec 2010	Vivek Misra Lena Richards	Update Review	Updated document Reviewed content
V3	Nov 2013	Vivek Misra Conor Fitzpatrick	Update Review	Updated document Reviewed content
V4	Jan 2016	Conor Fitzpatrick Vivek Misra	Update Review	Minor text updates completed
V5	Jan 2018	Conor Fitzpatrick Vivek Misra	Update Review	Update with results of SCORAD Trial added
V6	Sept 2020	Claire Shanahan Vivek Misra	Update	Minor text updates