



**Clinical Commissioning  
Policy Proposition:  
Palliative radiotherapy  
for bone pain**

## DRAFT FOR CONSULTATION

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## **DRAFT FOR CONSULTATION**

# **Clinical Commissioning Policy Proposition: Palliative radiotherapy for bone pain**

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## Contents

Equality Statement .....	4
Plain Language Summary .....	4
1. Introduction .....	5
2. Proposed Intervention and Clinical Indication .....	5
3. Definitions .....	5
4. Aim and Objectives .....	6
5. Epidemiology and Needs Assessment .....	6
6. Evidence Base .....	6
7. Proposed Criteria for Commissioning .....	8
8. Proposed Patient Pathway .....	9
9. Proposed Governance Arrangements .....	9
10. Proposed Mechanism for Funding .....	9
11. Proposed Audit Requirements .....	9
12. Documents That Have Informed This Policy Proposition .....	10
13. Date of Review .....	10

## Equality Statement

NHS England has a duty to have regard to the need to reduce health inequalities in access to health services and health outcomes achieved as enshrined in the Health and Social Care Act 2012. NHS England is committed to fulfilling this duty as to equality of access and to avoiding unlawful discrimination on the grounds of age, gender, disability (including learning disability), gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, gender or sexual orientation. In carrying out its functions, NHS England will have due regard to the different needs of protected equality groups, in line with the Equality Act 2010. This document is compliant with the NHS Constitution and the Human Rights Act 1998. This applies to all activities for which NHS England is responsible, including policy development, review and implementation.

## Plain Language Summary

The policy proposition aims to confirm NHS England's commissioning approach to palliative radiotherapy for patients with symptomatic bone metastases.

Bone metastases are the result of cancer cells spreading to the bone from a primary cancer, the place where the cancer starts. Metastases, or secondary cancers, occur when cells from the original tumour spread to another part of the body, in this case the bone. Bone metastases can cause symptoms such as pain or fractures.

Radiotherapy is highly effective in the treatment of symptomatic bone metastases. A significant number of patients require this type of palliation for secondary bone disease from the more common cancers such as prostate, breast and lung cancers.

NHS England currently commissions radiotherapy for bone pain when associated with metastatic cancer, but does not specify how the dose of radiation should be delivered. The dose can be split into a number of fractions delivered on separate days, or delivered in one dose on one day (single fraction radiotherapy). There is currently variation in how many fractions patients with symptomatic bone metastases receive.

NICE has published guidelines for the treatment of pain associated with bone metastases secondary to breast cancer (NICE clinical guideline CG81: <http://www.nice.org.uk/guidance/CG81>) and lung cancer (NICE clinical guideline CG121: <http://www.nice.org.uk/guidance/cg121>). In these indications, a single fraction of radiotherapy is recommended and is known to be highly effective in the majority of patients.

Delivering the radiation dose in one fraction and one visit, rather than multiple fractions and multiple visits, will prevent unnecessary travel, discomfort and inconvenience for many patients with no compromise to clinical effectiveness.

NHS England has concluded that there is sufficient evidence to support a proposal for the routine commissioning of a single fraction of radiotherapy for patients with uncomplicated symptomatic bone metastases.

## 1. Introduction

This document describes the evidence that has been considered by NHS England in formulating a proposal to routinely commission single fraction radiotherapy for symptomatic bone metastases.

This document also describes the proposed criteria for commissioning, proposed governance arrangements and proposed funding mechanisms.

For the purpose of consultation NHS England invites views on the evidence and other information that has been taken into account as described in this policy proposition.

A final decision as to whether single fraction radiotherapy for patients with symptomatic bone metastases will be routinely commissioned is planned to be made by NHS England by June 2016 following a recommendation from the Clinical Priorities Advisory Group.

## 2. Proposed Intervention and Clinical Indication

Radiotherapy is a highly effective palliative treatment to control pain due to secondary bone disease from a wide range of cancers. A significant number of patients require this type of palliation for secondary bone disease from the more common cancers, such as from prostate, breast, and lung. It may be given combined with other types of treatment, depending on the type of cancer.

NICE has published guidelines for the treatment of pain associated with bone metastases secondary to breast cancer (NICE clinical guideline CG81: <http://www.nice.org.uk/guidance/CG81>) and lung cancer (NICE clinical guideline CG121: <http://www.nice.org.uk/guidance/cg121>). In these indications a single fraction of radiotherapy is recommended.

Single fraction radiotherapy is recommended as the standard treatment for the majority of patients with symptomatic bone metastases, both for the above indications and other metastatic bone radiotherapy episodes. Delivering the radiation dose in one fraction and one visit, rather than multiple fractions and multiple visits, will prevent unnecessary travel, discomfort and inconvenience for many patients with no compromise to clinical effectiveness.

## 3. Definitions

Bone metastases are caused by cancer cells spreading to the bone from a primary cancer, which is the place where a cancer starts in the body. A malignant (cancerous) tumour is made up of millions of cancer cells. Some of these cells may migrate to another part of the body and form a new tumour. When these cells settle within the bone, it's called bone metastases.

External beam radiotherapy (EBRT) focuses high-energy radiation beams onto the area requiring treatment. External beam radiotherapy is completely painless.

The radiation dose can be split into a number of fractions delivered on separate days (multiple fractions radiotherapy), or delivered in one dose on one day (single fraction radiotherapy).

## DRAFT FOR CONSULTATION

The fractionation schedule describes the number of fractions of the treatment.

### 4. Aim and Objectives

This policy proposition aims to define NHS England's commissioning position on the fractionation schedule of palliative radiotherapy as part of the treatment pathway for patients with symptomatic bone metastases from cancer.

The objective is to ensure evidence based commissioning with the aim of improving outcomes for patients with symptomatic bone metastases from cancer.

### 5. Epidemiology and Needs Assessment

In 2013, about 23,000 episodes of radiotherapy were delivered in the treatment of bone pain, involving over 67,000 patient attendances. 18,911 episodes and over 46,000 attendances were attributed to the top two fractionation regimes: a single fraction or five fractions (Radiotherapy Dataset, RTDS).

In the first quarter of 2015, 61% of episodes used single fraction for bone pain treatment (RTDS).

### 6. Evidence Base

NHS England has concluded that there is sufficient evidence to support a proposal for the routine commissioning of single fraction radiotherapy for patients with uncomplicated symptomatic bone metastases.

#### **Summary:**

This review set out to answer the following research question regarding palliative radiotherapy for bone pain:

Is there evidence for the use of single fraction of radiotherapy compared to other fractional schedules for the treatment of painful or symptomatic bone metastasis in patients with cancer? This review looks at both primary and re-irradiation treatment for bone metastasis.

Palliative radiotherapy for bone pain is delivered as single or multiple fractions. Overall there is good evidence for the use of single fraction (SF) radiotherapy, compared to multiple fraction (MF) radiotherapy, for the palliative treatment of painful or symptomatic bone metastasis, in patients with cancer. There is level 1 evidence that both treatments deliver the same levels of pain relief and SF therapies have lower levels of acute toxicities. There is also evidence that SF therapies have higher retreatment rates. However, there is level 1 evidence that the response rates of these retreatments are comparable to those of initial treatments.

### Detailed summary:

The goal of palliative care includes pain relief, improved quality of life, prevention of further complications and minimisation of hospitalisation, hence there are a large number of outcomes that can be used in order to test the efficacy of palliative treatments. For primary outcomes that the majority of studies have used are complete response rate defined as the decrease in pain score to zero without increased analgesics use, the partial response rate defined as a decrease of at least 2 points in the pain score and overall response rate (OR). Secondary outcomes can include retreatment rates, spinal cord compression rates, pathological fracture rates, acute toxicities and survival time. There is also some variety in the studied dose schedules, although the most common single fraction (SF) intervention was 8 Gy, while multiple fractions (MF) typically range from 20 - 30 Gy over 5 - 10 fractions. Currently there is insufficient evidence to guide optimal dose schedules (see Lohre et al. 2012).

### Pain relief outcomes:

The strength of the evidence for the equivalence of SF and MF treatments, in terms of pain relief, has come from the large number of RCTs that have been combined in a number of meta-analyses and systematic reviews (Chow et al. 2012, Chow et al. 2007, Bedard et al. 2014). It should be noted that these are non-blinded RCTs, leading to potential risk of bias, particularly considering the potential for non-optimal use of analgesics in end of life patients. Nonetheless, the number and agreement of the RCTs has led to the conclusion that there is strong evidence for the equivalence in the efficacy of the two fractional regimes. In particular:

- A meta-analysis based on 17 RCTs found complete response rates of 23% of 2641 patients for SF vs 24% of 2622 patients for MF ( $p=0.97$ ) (Chow et al. 2012)
- The same analysis, based on 25 RCTs found overall response rates of 60% of 2818 patients for SF vs 61% of 2799 patients for MF ( $p=0.98$ ).
- Numerous studies have reported statistically similar partial response rates including (Howell et al. 2013, Arnalot et al. 2008, Chow et al. 2014), although these have not been combined in a meta-analysis.

There is strong evidence that SF treatments have higher retreatment rates. A combination of 12 RCTs found retreatment rates of 20% of 2323 patients for SF vs. 8% of 2309 patients for MF ( $p<0.00001$ ).

### Pain relief outcomes in re-treatments:

There is level 1 evidence for the efficacy of retreatment coming primarily from two systematic reviews and meta-analyses (Huisman et al., 2012; Wong et al. 2014), including 15 studies with 5 RCTs, that found:

- Overall response rates for retreatment of 58- 68% in 645 patients
- Partial response rates for retreatment of 50% in 355 patients.
- Complete response rates of 20% in 355 patients.

Majority of the analyses involved in these studies did not distinguish between SF or MF re-treatment. Overall response rate of combined primary and retreatment therapy for SF and MF was reported as not significantly different in a meta-analysis of 850 patients. (Bedard et al. 2014).



### Safety outcomes:

There is level 1 evidence that SF treatments have lower toxicity levels than MF treatments. A meta-analysis (Yoon & Morton, 2014) found acute grade 2-4 toxicities rates of 20% for MF versus 10% for SF. This difference is primarily due to gastrointestinal and skin toxicities. In particular:

- differences in rates of skin reddening (24% for MF vs 14% for SF,  $p=0.002$ ). (Chow et al. 2014)
- acute toxicity rates of 18% for MF vs 12% for SF. (Arnalot et al. 2008, Howell et al. 2013)
- 15% for MF vs 6% SF gastrointestinal toxicities. (Howell et al. 2013)

There were no differences found in the study of other complications (Chow et al. 2012):

- No difference were found in pathological fracture rates (3.3% of 2120 SF patients vs. 3.0% of 2159 MF patients,  $p=0.75$ ) based on 10 studies.
- No differences were found in spinal compression rates (2.8% of 1443 SF patients vs. 1.9% of 1443 patients,  $p=0.13$ ) based on 6 studies.

It should also be noted that the above studies focused on uncomplicated bone metastases. There is some expert opinion that MF radiotherapies may be more suitable for impending pathological fractures and impending spinal cord compression (Fairchild 2014).

### Safety outcomes in re-treatments:

The evidence for the toxicity rates in retreatment is limited and unable to distinguish between the toxicity rates of SF and MF re-treatments (Jeremic et al., 1999; van der Linden et al., 2004; Roszkowski et al, 2005 included in the systematic review by Wong et al. 2014). The studies report similar toxicity rates to those found in the initial treatment, in particular:

- Grade 1 or 2 nausea and vomiting (12%-19%)
- Grade 1 or 2 diarrhea (2%-12%)
- 3 out of 135 patients (2%) had pathological fractures and spinal compressions.

### Cost effectiveness:

The cost effectiveness of SF vs MF radiotherapy has been examined in a number of studies (Konski et al. 2009, van der Hout et al. 2003, Pollicino et al. 2005, Steenland et al. 1999, quoted in Chow et al. 2012). The studies find that, after taking into account increased retreatment rates and increased quality adjusted life years, SF radiotherapies are 26%-66% lower cost than MF radiotherapies. Clearly, these figures are sensitive to assumptions in the analysis.

## 7. Proposed Criteria for Commissioning

NHS England commissions radiotherapy for bone pain when associated with metastatic cancer. A single fraction is recommended for the majority of patients receiving external beam radiotherapy for uncomplicated symptomatic bone metastases from cancer. At least 70% of the total metastatic bone radiotherapy episodes should receive a single fraction of external beam radiotherapy as standard treatment. Single fraction is recommended for both primary (initial) treatment and re-treatment (re-irradiation).

## DRAFT FOR CONSULTATION

Exclusion criteria: under certain clinical conditions, multiple fractions may be appropriate. For example, impending pathological fractures and impending spinal cord compression may be suitable for multiple fractions.

Reasons for all individual treatments exceeding a single fraction must be recorded by the trust. Providers should be aware that NHSE may wish to audit any significant variation in the rates of treatment courses exceeding a single fraction.

### 8. Proposed Patient Pathway

The service specifications for radiotherapy (B01/S/a) describe the detail of the care pathways for this service.

Radiotherapy is part of an overall cancer management and treatment pathway. Decisions on the overall treatment plan should relate back to an MDT discussion and decision.

Radiotherapy in the NHS in England is delivered by 50 centres; all centres provide radiotherapy for bone pain. If EBRT is indicated, the patient is referred to a clinical oncologist for assessment, treatment planning and delivery of radiation fractions. Each fraction of radiation is delivered on one visit, usually on an outpatient basis.

### 9. Proposed Governance Arrangements

The service specifications for radiotherapy (B01/S/a) describe the governance arrangements for this service.

In particular, it is imperative that the radiotherapy service is compliant with the Ionising Radiation (Medical Exposure) Regulations (IR(ME)R) 2000.

Clinical Governance systems and policies should be in place and integrated into organisational governance with clear lines of accountability and responsibility for all clinical governance functions and Providers should produce annual Clinical Governance reports as part of NHS Clinical Governance reporting system.

### 10. Proposed Mechanism for Funding

Radiotherapy planning and delivery is a national tariff service covered by payment by results.

### 11. Proposed Audit Requirements

Radiotherapy providers must submit their activity to the national Radiotherapy Dataset (RTDS) on a monthly basis. Reasons for all individual treatments exceeding a single fraction must be recorded by the trust. Providers should be aware that NHSE may wish to audit any significant variation in the rates of treatment courses exceeding a single fraction.

The Quality System and its treatment protocols will be subject to regular clinical and management audit.

## DRAFT FOR CONSULTATION

See radiotherapy service specifications B01/S/a for the most up to date audit requirements.

### **12. Documents That Have Informed This Policy Proposition**

Clinical commissioning policy statement: palliative radiotherapy for bone pain (B01/PS/c), NICE clinical guideline CG81 Advanced breast cancer: diagnosis and treatment, and NICE clinical guideline CG121 Lung cancer: diagnosis and management

### **13. Date of Review**

This document will lapse upon publication by NHS England of a clinical commissioning policy for the proposed intervention that confirms whether it is routinely or non-routinely commissioned (expected by June 2016).