Integrated Impact Assessment Report for Clinical Commissioning Policies

Policy Reference Number	B01X03		
Policy Title	Palliative radiotherapy for bone pain		
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Section K - Activity Impact			
Theme	**Questions**	**Comments** (Include source of information and details of assumptions made and any issues with the data)	
K1 Current Patient Population & Demography / Growth	K 1.1 What is the prevalence of the disease/condition?	K1.1 This policy proposes to set out a **routine commissioning** position for delivering a single fraction of palliative radiotherapy (in preference of other fractionation schedules)[i] for the treatment of bone pain secondary to a wide range of cancers. This has already been the subject of a policy statement that came into effect in July 2014.[ii] Bone pain can occur in patients with certain primary cancers that metastasise to the bone. Prevalence of solid tumours and bone metastases is estimated at 2 to 3 per 1,000 population, or c. 146,000	

		cases in England in 2014/15.[iii]
	K1.2 What is the number of patients currently eligible for the treatment under the proposed policy?	K1.2 Management of bone metastases depends on the primary tumour, and includes the use of radiotherapy.[iv] The current number of patients receiving radiotherapy for bone pain that have 1 or 5 fraction radiation schedules is estimated at c.19,000 in 2014/15.[v] Of that number, an estimated c.11,600 to 13,300[vi] (or between 61% and 70% of those receiving one or five fractions) could be eligible for single fraction radiotherapy treatment under the new policy.[vii] The number eligible for a single fraction is therefore estimated at around 11,600 to 13,300, or around 8% - 9% of the prevalent population.
	K1.3 What age group is the treatment indicated for?	K1.3 This treatment is indicated for adults (18 years or older).
	K1.4 Describe the age distribution of the patient population taking up treatment?	K1.4 The cancers that account for most metastatic bone pain mainly affect adults, and are most frequently diagnosed in the 55 to 85 year age group.[viii]

	K1.5 What is the current activity associated with currently routinely commissioned care for this group?	K1.5 Palliative radiotherapy for bone pain is already commissioned and carried out nationally by all 50 radiotherapy centres.[ix] In 2014/15, activity for the eligible patient group defined in K1.2 is estimated at c.11,600[x] patients receiving a **single fraction** schedule. This relates to c.11,600 fractions and planning sessions. In 2014/15, c.7,400 patients within the target population of c.19,000 were receiving **five fractions** of radiotherapy.[xi] This relates to c.37,000 fractions and 7,400 planning sessions.
	K1.6 What is the projected growth of the disease/condition prevalence (prior to applying the new policy) in 2, 5, and 10 years?	K1.6 In future, the number of patients with primary tumours that could result in bone pain is estimated in the region of:[xii] • ~ 148,000 individuals in 2016/17 • ~ 149,000 individuals in 2017/18 • ~ 152,000 individuals in 2020/21 Of these, the number expected to receive radiotherapy of one or five fractions is estimated at:[xiii] • ~ 19,300 patients in 2016/17 • ~ 19,400 patients in 2017/18 • ~ 19,800 patients in 2020/21

	K1.7 What is the associated projected growth in activity (prior to applying the new policy) in 2,5 and 10 years?	K1.7 The future activity of the target population is estimated to be in the region of: [xiv] **Single fraction schedules:**[xv] • ~ 11,750 patients (and fractions) in 2016/17 • ~ 11,850 patients (and fractions) in 2017/18 • ~ 12,100 patients (and fractions) in 2020/21 **Five fraction schedules:** • ~ 7,500 patients (37,500 fractions) in 2016/17 • ~ 7,550 patients (37,750 fractions) in 2017/18 • ~ 7,750 patients (38,750 fractions) in 2020/21 These numbers relate to treatment in the first instance and potential retreatment episodes. An estimated 20% of patients receiving a single fraction of radiotherapy are assumed to require retreatment (compared to 8% of patients receiving five fractions).[xvi]
	K1.8 How is the population currently distributed geographically?	K1.8 Across England, (with some geographic variation expected because of differences in the prevalence of the primary tumours associated with bone pain across England). Age standardised prevalence rates for breast cancer are significantly higher in Dorset and South East London, which both have 10 year prevalence rates at over 450 per 100,000 against the national average of around 420. Prostate cancer is also more prevalent in Dorset with an age standardised prevalence of 702 against the national average of 486.[xvii] These two cancers account for 80% of bone metastases from solid tumours.[xviii]
K2 Future Patient Population & Demography	K2.1 Does the new policy: move to a non-routine commissioning position / substitute a currently routinely	K2.1 Radiotherapy for bone pain is already routinely commissioned. This policy formally presents the current policy statement (B01/PS/c).[xix]

	commissioned treatment / expand or restrict an existing treatment threshold / add an additional line / stage of treatment / other?	
	K2.2 Please describe any factors likely to affect growth in the patient population for this intervention (e.g. increased disease prevalence, increased survival)	K2.2 Some of the cancers considered are linked to lifestyle factors such as smoking or alcohol consumption. Changes in smoking rates in particular could thus affect the prevalence of this disease. [xx]
	K 2.3 Are there likely to be changes in geography/demography of the patient population and would this impact on activity/outcomes? If yes, provide details	K2.3 None identified.
	K2.4 What is the resulting expected net increase or decrease in the number of patients who will access the treatment per year in year 2, 5 and 10?	K2.4 Under the policy, it is estimated that there will be an increase in the number of patients with a single fraction schedule, and a decrease in the number of patients with a five fraction schedule. If the policy is implemented, it is estimated that for 61% to 70% of the patients currently undergoing a single or 5 fraction schedule (see K1.2), it would be clinically appropriate to receive a single fraction of radiotherapy.[xxi] As compared to the do nothing case, each year, the increase in patients receiving single fraction radiotherapy schedules could therefore be estimated as:[xxii] **Additional single fraction schedules:**[xxiii] • ~ 0 to 1,000 more patients in 2016/17 • ~ 0 to 1,950 more patients in 2017/18 • ~ 0 to 2,000 more patients in 2020/21

		This includes potential retreatments. The reduction in the number of patients receiving a five fraction schedule in each of the years estimated in the region of: **Reduction in five fraction schedules:**[xxiv] • ~ 0 to 900 fewer patients in 2016/17 • ~ 0 to 1,750 fewer patients in 2017/18 • ~ 0 to 1,800 fewer patients in 2020/21
K3 Activity	K3.1 What is the current annual activity for the target population covered under the new policy? Please provide details in accompanying excel sheet K3.2 What will be the new activity should the new / revised policy be implemented in the target population? Please provide details in accompanying excel sheet	K3.1 The current activity is set out in K1.5; with c. 61% of activity relating to single fraction schedules. K3.2 If the policy is implemented, the new activity for single fractions and five fractions is estimated to be in the range of: [xxv] **Single fraction schedules:**[xxvi] • ~ 11,750 to 12,750 patients (and fractions) in 2016/17 • ~ 11,850 to 13,800 patients (and fractions) in 2017/18 • ~ 12,100 to 14,100 patients (and fractions) in 2020/21 **Five fraction schedules:** • ~ 6,650 to 7,500 patients (33,250 to 37,500 fractions) in 2016/17 • ~ 5,800 to 7,550 patients (29,000 to 37,750 fractions) in 2017/18 • ~ 5,950 to 7,750 patients (29,750 to 38,750 fractions) in 2020/21

	K3.3 What will be the comparative activity for the 'Next Best Alternative' or 'Do Nothing' comparator if policy is not adopted? Please details in accompanying excel sheet	K3.3 If NHS England has no position on the policy, use of the single fraction radiotherapy schedule could stay at current levels at around 61%.Activity levels under this scenario are as set out in K1.7.
K4 Existing Patient Pathway	K4.1 If there is a relevant currently routinely commissioned treatment, what is the current patient pathway? Describe or include a figure to outline associated activity	K4.1 Radiotherapy is currently routinely commissioned for bone pain caused by metastases. The service specifications for radiotherapy (B01/S/a) describe the detail of the care pathways for this service. Decisions on the overall treatment plan relate back to an MDT discussion and decision. 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.
	K4.2. What are the current treatment access criteria?	K4.2 Access can be determined by MDT assessment, through standard follow up within outpatient clinic setting (or occasionally inpatient stays) or through wider disease specific management by an oncologist.
	K4.3 What are the current treatment stopping points?	K4.3 Stopping points can be determined by MDT assessment, through standard follow up within outpatient clinic setting (or occasionally inpatient stays) or through wider disease specific management by an oncologist.
K5 Comparator (next best alternative treatment) Patient Pathway	K5.1 If there is a 'next best' alternative routinely commissioned treatment what is the current patient pathway? Describe or include a figure to outline associated	K5.1 A single fraction of radiotherapy is already routinely commissioned through a policy statement.

	activity. K5.2 Where there are different stopping points on the pathway please indicate how many patients out of the number starting the pathway would be expected to finish at each point (e.g. expected number dropping out due to side effects of drug, or number who don't continue to treatment after having test to determine likely success). If possible please indicate likely outcome for patient at each stopping point.	K5.2 Not applicable.
K6 New Patient Pathway	K6.1 Describe or include a figure to outline associated activity with the patient pathway for the proposed new policy K6.2 Where there are different stopping points on the pathway please indicate how many patients out of the number starting the pathway would be expected to finish at each point (e.g. expected number dropping out due to side effects of drug, or number who don't continue to treatment after having test to determine likely success). If possible please indicate likely outcome for patient at each stopping point.	K6.1 The new policy specifies the number of fractions of radiotherapy to be delivered and will not affect the current patient pathway (K4). The new policy specifies delivery of radiation in a single fraction. K6.2 Not applicable.

K7 Treatment Setting	K7.1 How is this treatment delivered to the patient? ○ Acute Trust: Inpatient/Daycase/ Outpatient ○ Mental Health Provider: Inpatient/Outpatient ○ Community setting ○ Homecare delivery K7.2 Is there likely to be a change in delivery setting or capacity requirements, if so what? *e.g. service capacity*	K7.1 This treatment is delivered as an outpatient appointment.[xxvii] K7.2 No anticipated change in delivery setting or capacity, as this policy is largely already in place.
K8 Coding	K8.1 In which datasets (e.g. SUS/central data collections etc.) will activity related to the new patient pathway be recorded? K8.2 How will this activity related to the new patient pathway be identified?(e.g. ICD10 codes/procedure codes)	K8.1. All patients undergoing radiotherapy treatment are recorded in the National Radiotherapy Dataset (RTDS) and Secondary Uses Services (SUS) dataset. K8.2 Activity could be identified by relevant ICD-10 codes and procedure codes.[xxviii]
K9 Monitoring	K9.1 Do any new or revised requirements need to be included in the NHS Standard Contract Information Schedule? K9.2 If this treatment is a drug, what	K9.1 No K9.2 Not applicable.

	pharmacy monitoring is required?	
	K9.3 What analytical information /monitoring/ reporting is required?	K9.3 Radiotherapy providers must submit their activity to the RTDS on a monthly basis. Reasons for all individual treatments exceeding a single fraction must be recorded by the trust and may be subject to audit by NHS England.
	K9.4 What contract monitoring is required by supplier managers? What changes need to be in place?	K9.4 No change required.
	K9.5 Is there inked information required to complete quality dashboards and if so is it being incorporated into routine performance monitoring?	K9.5 None known.
	K9.6 Are there any directly applicable NICE quality standards that need to be monitored in association with the new policy?	K9.6 No quality standards known.
	K9.7 Do you anticipate using Blueteq or other equivalent system to guide access to treatment? If so, please outline. *See also linked question in M1 below*	K9.7 No

Section L - Service Impact		
Theme	**Questions**	**Comments** (Include source of information and details of assumptions made and any issues with the data)
L1 Service Organisation	L1.1 How is this service currently organised? (i.e. tertiary centres, networked provision)	L1.1 Radiotherapy in the NHS in England is delivered by 50 centres; all centres provide radiotherapy for bone pain.
	L1.2 How will the proposed policy change the way the commissioned service is organised?	L1.2 No change to service organisation.
L2 Geography & Access	L2.1 Where do current referrals come from?	L2.1 Patients referred by MDT.
	L2.2 Will the new policy change / restrict / expand the sources of referral?	L2.2 No change.
	L2.3 Is the new policy likely to improve equity of access?	L2.3 No change from current practice.
	L2.4 Is the new policy likely to improve equality of access / outcomes?	L2.4 No change from current practice.
L3 Implementation	L3.1 Is there a lead in time required prior to implementation and if so when could implementation be achieved if the policy	L3.1 No implementation requirements.

	is agreed?	
	L3.2 Is there a change in provider physical infrastructure required?	L3.2 No change in provider physical infrastructure.
	L3.3 Is there a change in provider staffing required?	L3.3 No change required.
	L3.4 Are there new clinical dependency / adjacency requirements that would need to be in place?	L3.4 No new requirements.
	L3.5 Are there changes in the support services that need to be in place?	L3.5 No change in support services.
	L3.6 Is there a change in provider / inter-provider governance required? (e.g. ODN arrangements / prime contractor)	L3.6 No change in governance required.
	L3.7 Is there likely to be either an increase or decrease in the number of commissioned providers?	L3.7 No change in the number of providers anticipated.

	L3.8 How will the revised provision be secured by NHS England as the responsible commissioner? (e.g. publication and notification of new policy, competitive selection process to secure revised provider configuration)	L3.8 Not applicable.
L4 Collaborative Commissioning	L4.1 Is this service currently subject to or planned for collaborative commissioning arrangements? (e.g. future CCG lead, devolved commissioning arrangements)	L4.1 No plans re co-commissioning of this service are known at this time..
Section M - Finance Impact		
Theme	**Questions**	**Comments** (Include source of information and details of assumptions made and any issues with the data)
M1 Tariff	M1.1 Is this treatment paid under a national prices*, and if so which?	M1.1 This treatment is paid under national tariff and falls under the unbundled HRG codes SC47Z for planning and SC22Z for the delivery of a fraction of radiotherapy.[xxix]
	M1.2 Is this treatment excluded from national prices?	M1.2 As described in M1.1, this treatment is paid under national prices.
	M1.3 Is this covered under a local price arrangements (if so state range), and if so are you confident that the costs are not also attributable to other clinical services?	M1.3 There are no local price arrangements around this service.

	M1.4 If a new price has been proposed how has this been derived / tested? How will we ensure that associated activity is not additionally / double charged through existing routes?	M1.4 Not applicable.
	M1.5 is VAT payable (Y/N) and if so has it been included in the costings?	M1.5 Not applicable.
	M1.6 Do you envisage a prior approval / funding authorisation being required to support implementation of the new policy?	M1.6 Not applicable.
M2 Average Cost per Patient	M2.1 What is the revenue cost per patient in year 1?	M2.1 The revenue cost per patient is estimated at £386 in the first year. This is composed of £289 for the planning of radiotherapy treatment and £97 for the delivery of a single fraction of radiotherapy.[xxx]
	M2.2 What is the revenue cost per patient in future years (including follow up)?	M2.2 As this is a one-off treatment, revenue costs per patient in future years could be zero if there is no retreatment for pain. If pain recurs, the cost of an additional treatment could be in the region of £386 for a single fraction.[xxxi].
M3 Overall Cost Impact of this Policy to NHS England	M3.1 Indicate whether this is cost saving, neutral, or cost pressure to NHS England	M3.1 Cost neutral or saving. If the policy is implemented and most patients receive a single fraction of radiotherapy, the estimated cost saving for radiotherapy treatments could be: [xxxii] • ~ £0 to £291k in 2016/17

		• ~ £0 to £586k in 2017/18 • ~ £0 to £598k in 2020/21 Please refer to M6.3 for a list of the factors used to estimate these ranges.
	M3.2 Where this has not been identified, set out the reasons why this cannot be measured	M3.2 Not applicable.
M4 Overall cost impact of this policy to the NHS as a whole	M4.1 Indicate whether this is cost saving, neutral, or cost saving for other parts of the NHS (e.g. providers, CCGs)	M4.1 There is no evidence of any cost impact on other parts of the NHS.
	M4.2 Indicate whether this is cost saving, neutral, or cost pressure to the NHS as a whole	M4.2 Cost neutral or saving. Please see M3.1.
	M4.3 Where this has not been identified, set out the reasons why this cannot be measured	M4.3 Not applicable.
	M4.4 Are there likely to be any costs or savings for non NHS commissioners / public sector funders?	M4.4 No evidence of costs or savings for non NHS commissioners was identified.
M5 Funding	M5.1 Where a cost pressure is indicated, state known source of funds for	M5.1 Not applicable.

	investment, where identified *e.g. decommissioning less clinically or cost-effective services*	
M6 Financial Risks Associated with Implementing this Policy	M6.1 What are the material financial risks to implementing this policy?	M6.1 The policy is estimated to be cost saving. Several scenarios are tested around the amount of savings, but these are not considered substantial risks as this is not a cost pressure position.
	M6.2 Can these be mitigated, if so how?	M6.2 Not applicable.
	M6.3 What scenarios (differential assumptions) have been explicitly tested to generate best case, worst case and most likely total cost scenarios?	M6.3 The 'low' scenario assumes that 61% of patients would continue to receive a single fraction of radiotherapy as part of their treatment. The 'high' case assumes that this number could increase to 70% of patients.
M7 Value for Money	M7.1 What evidence is available that the treatment is cost effective? *e.g. NICE appraisal, clinical trials or peer reviewed literature*	M7.1 The cost effectiveness of single fraction (SF) vs multi fraction (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
	M7.2 What issues or risks are associated with this assessment? *e.g. quality or availability of evidence*	M7.2 These figures are sensitive to assumptions in the analysis.

M8 Cost Profile	M8.1 Are there non-recurrent capital or revenue costs associated with this policy? *e.g. Transitional costs, periodical costs*	M8.1 None identified.
	M8.2 If so, confirm the source of funds to meet these costs	M8.2 Not applicable.

[i] There could be many different fractionation schedules. The analysis within this document focuses on an average of five fractions as a comparator treatment.

[ii] NHS England Interim Clinical Commissioning Policy Statement: Palliative Radiotherapy for Bone Pain (B01/PS/c) (2015).[Online]. Available from: https://www.england.nhs.uk/commissioning/wp-content/uploads/sites/12/2015/01/b01-policy-stat-pallitv-bone-radthrpy.pdf [Accessed: 10/12/2015].

[iii] Based on a reported prevalence of bone metastases in Wales and England of 150,000 published in 2012 [Source: NICE technology appraisal guidance [TA265]. (2012) Denosumab for the prevention of skeletal-related events in adults with bone metastases from solid tumours. [Online] Available from: https://www.nice.org.uk/guidance/ta265/chapter/2-clinical-need-and-practice. [Accessed 04/11/2015]], which is grown by demographic growth rates and corrected to cover only the population of England [Source: Office for National Statistics (ONS) (2012). Population Estimates for England and Wales, Mid-2011 (2011 Census-based) and ONS (2012). Population projections].

[iv] Please see the policy proposition; NICE technology appraisal guidance [TA265]

[v] Episodes are used as a proxy for patients as discussed with the policy working group. Based on a reported 18,911 episodes in 2013 [Source: Clinical Priorities Advisory Group (CPAG) (2014), and NHS England Interim Clinical Commissioning Policy Statement: Palliative Radiotherapy for Bone Pain (B01/PS/c) (2015)], which is grown by one year to arrive at the 2014/15 figure (this uses the overall population growth rate [Source: ONS (2013) *Population Estimates for UK, England and Wales, Scotland and Northern Ireland, Mid-2011 and Mid-2012*]). The total number of episodes (for all fractional schedules) is reported as 23,000 in 2013 [Source: Clinical Priorities Advisory Group (CPAG) (2014), and NHS England Interim Clinical Commissioning Policy Statement: Palliative Radiotherapy for Bone Pain (B01/PS/c) (2015)]. This includes episodes related treatment to in the first instance as well as episodes related to retreatment.

[vi] Based on 61%-70% being eligible for a single fraction of radiotherapy under the policy [Source: CPAG (2014) and Interim Clinical Commissioning Policy Statement (2015) and discussions with the policy working group]. This would apply to the 19,000 patients are currently receiving 1 or 5 fractions of radiotherapy.

[vii] This estimate includes all episodes of radiotherapy for bone pain, regardless of the primary tumour.

[viii] Based on ONS (2014). Registrations of newly diagnosed cases of cancer (4th digit): site, sex and age, England, 2012.

[ix] Source: CPAG (2014) and Interim Clinical Commissioning Policy Statement (2015).

[x] This number is based on 61% of the target population of 19,000 identified in K1.2 currently receiving a single fraction (based on data from June 2015 from the National Radiotherapy Dataset (RTDS) (provided by the policy working group)).

[xi] This is based on the difference between 19,000 patients following either a single or five fraction regime (as described in K1.2) and the 11,600 patients identified to receive a single fraction.

[xii] Demographic growth rates are applied to the prevalence noted in K1.1 [Source: ONS (2012) Population Projections]. Prevalence estimates are indicative only and do not relate directly to activity or costs estimated in this document.

[xiii] Based on 19,000 episodes related to single and five fraction schedules in 2014/15, which is grown by demographic growth as applied to prevalence numbers (please also see footnote xii).

[xiv] These figures assume that the activity outlined in K1.5 grows in line with demographic growth rates, further to discussions with members of the policy working group on the appropriate growth rate given uncertainty around the future treatment of bone pain.

[xv] These figures are based on a take-up of single fraction radiotherapy treatment at 61% [Source: CPAG (2014) and discussions with the policy working group].

[xvi] Based on Level 1++ evidence identified as part of the Clinical Evidence Review (CER). [Source: Chow, Edward; Harris, Kristin; Fan, Grace; Tsao, May; Sze, Wai M. (2007). "Palliative radiotherapy trials for bone metastases: a systematic review". *J. Clin. Oncol.* 25(11):1423-1436.]. For more details refer to the CER. Based on discussions with the policy working group, an assumption is made that a single fraction would be used for retreatment. Please refer to the policy proposition for the benefits of a single fraction over other fractionation schedules.

[xvii] Based on National Cancer Intelligence Network (NCIN) (2006). "One, Five and Ten Year Cancer Prevalence by Cancer Network, UK".

[xviii] NICE technology appraisal guidance [TA265]. (2012) Denosumab for the prevention of skeletal-related events in adults with bone metastases from solid tumours. [Online] Available from: https://www.nice.org.uk/guidance/ta265/chapter/2-clinical-need-and-practice. [Accessed 04/11/2015]

[xix] NHS England Interim Clinical Commissioning Policy Statement: Palliative Radiotherapy for Bone Pain (B01/PS/c) (2015).

[xx] Sources: Cancer Research UK. *Breast cancer risk factors overview.* [Online] Available from: http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/breast-cancer/risk-factors#heading-Zero [Accessed: 04/11/2015]; Cancer Research UK. *Lung cancer risk factors overview.* [Online] Available from: http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/lung-cancer/risk-factors#heading-Zero [Accessed: 04/11/2015]; Cancer Research UK. *Bladder cancer risk factors overview.* [Online] Available from: http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/bladder-cancer/risk-factors [Accessed: 04/11/2015]; Cancer Research UK. *Kidney cancer risk factors overview.* [Online] Available from: http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/kidney-cancer/risk-factors#heading-Two [Accessed: 04/11/2015].

[xxi] This is to take into account the different patient backgrounds that might warrant the use of other fractional schedules [Based in CPAG (2014) and Interim Commissioning Policy (2015)].

[xxii] This assumes a 'phasing' of the policy impact (61% to 70% receiving single fractions) over two years (50% effect after one year) and applies the growth rate identified in K1.7 to the target population.

[xxiii] This estimate is based on 61% to 70% of the patients receiving a single fraction and takes into account the higher retreatment rate for patients receiving a single fraction (20% vs. 8%). Moreover, a simplifying assumption is made that the shift from 61% to 70% includes mainly treatment in the first instance.

[xxiv] This is based on 61% to 70% of the patients receiving a single fraction. The smaller numbers as compared to the increase in single fractions are due to the difference in retreatment rates.

[xxv] These numbers assume a 'phasing' of the policy recommendations (61%-70%, receiving single fractions) over two years (with 50% effect after one year) and apply the growth rate identified in K1.7 to the target population. Moreover, a simplifying assumption is made that the shift from 61% to 70% includes mainly treatment in the first instance.

[xxvi] This includes retreatment episodes as patients are expected to receive a single fraction if pain recurs.

[xxvii] NHS Choices (2015). *Radiotherapy-How it is performed*. [Online] Available from http://www.nhs.uk/Conditions/Radiotherapy/Pages/How-it-is-performed.aspx [accessed: 09/11/2015].

[xxviii] The ICD-10 codes for the primary malignancies could include breast cancer-C50; prostate cancer-C61; lung cancer-C33-C34; bladder cancer-C67; kidney cancer-C64; thyroid cancer-C73. OPCS codes of the procedure could include X654 - Delivery of a fraction of external beam radiotherapy NEC and X678 - Other specified preparation for external beam radiotherapy based on CPAG (2014).

[xxix] Based on CPAG (2014).

[xxx] Based on 2014/15 Tariff for unbundled services (HRG codes SC47Z and SC22Z) set out in M1.1 and a Market Forces Factors (MFF) uplift of 10%.

[xxxi] This assumes that retreated patients would all receive a single fraction of radiotherapy, based on correspondence with the policy working group.

[xxxii] These figures assume that 61% to 70% would receive a single fraction (as opposed to 61% currently) as noted in the CPAG and correspondence with the policy working group. As set out in K1.5, those not receiving 1 fraction currently are estimated to be receiving 5 fractions. Also accounts for the increase in retreatment rates of 12 percentage points for patients receiving a single fraction with a cost of £386 per patient (retreatments are assumed to be single fractions as per discussions with the policy working group).