Business Case

Bisphosphonates to Improve Breast Cancer Survival

February 2016
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**EXECUTIVE SUMMARY**

- The purpose of this business case is to set out a case for the introduction of bisphosphonates (specifically oral ibandronate and zoledronic acid infusions) into the routine management of breast cancer for post-menopausal women to reduce premature mortality.

- A large collaborative meta-analysis (>18,000) has been undertaken to clarify the risks and benefits of adjuvant bisphosphonate treatment in breast cancer. This suggests that there will be a reduction in mortality for post-menopausal women from 18% to 14% within 10 years with about one in six breast cancer deaths prevented.

- Nationally there is strong clinical support and it will be a recommendation in the breast cancer CRG service specification. It was unanimously endorsed as a priority for implementation at the recent UK Breast Cancer Meeting (November 2015).

- Breast cancer is one of the areas where we have started to improve survival nationally, although in some parts of the region (for example Sheffield) our 5 year breast cancer survival is not as good as the England average.

- Strategically the introduction of bisphosphonates clearly aligns to one of the key aims set out in the National Cancer Strategy, Achieving World Class Cancer Outcomes: to improve 1 year survival rates. It is also in line with the NHS Planning Guidance for 2016/17-2020 (Delivering the Five Year Forward View).

- Across the region the likely cohort to benefit is estimated to be circa 926 women, with up to 463 women diagnosed in the last 6 months that could also benefit.

- A number of delivery options have been considered and modelled. The option recommended is predominantly oral ibandronate (75%) as this enables delivery closer to home, empowers and supports individuals to self care and does not significantly increase hospital follow ups. However it is reasonable to enable clinicians to offer an infusion of zoledronic acid for those that are clearly unable to tolerate oral therapy to avoid compliance issues and ensure that we are able to realise the anticipated benefits.

- Across the region the total estimated cost of the new pathway for year 1 is £221,747, with a net cost of £133,202 (all the financial modelling is in the enclosed sheet). Ultimately the initial investment will be offset in the short term by a reduction in DEXA scans. In the longer term, the remaining costs will be offset by a reduction in the women requiring treatment and care for metastatic disease within the next 10 years. The findings from the meta analysis suggest the reduction in mortality will be from 18% to 14%. A study undertaken in the UK in 2004 estimated the lifetime cost of treatment for patients in the UK presenting with stage IV breast cancer was circa £12,500 per patient and this is most likely a gross underestimate.
SECTION 1: INTRODUCTION

The purpose of this business case is to set out a case for the introduction of bisphosphonates (specifically oral ibandronate and zoledronic acid infusions) into the routine management of breast cancer for post-menopausal women to reduce premature mortality. The case is for consideration across South Yorkshire (through the South Yorkshire Cancer Strategy Group and the Working Together Programme).

Bisphosphonates have profound effects on bone physiology and it was anticipated that they could therefore modify the process of metastasis and a large number of randomised trials have been performed to investigate this. Hence a large collaborative meta-analysis (>18,000) was undertaken to clarify the risks and benefits of adjuvant bisphosphonate treatment in breast cancer. The study was led locally by Prof. Rob Coleman and has recently been published in the Lancet. The study is enclosed as appendix 1. The findings usefully clarify the role of bisphosphonates to reduce the rate of breast cancer recurrence in the bone and improve breast cancer survival, but there is definite benefit only in women that were post menopausal when treatment began. It is therefore this cohort of women that are to be considered by this business case.

Currently bisphosphonates are commonly prescribed in primary care to treat osteoporosis and other bone diseases. As outlined above the findings from the recent meta analysis identified an additional use for them in the management of early breast cancer. Discussion with Dr Rob Coleman and his clinical colleagues recommends that the bisphosphonates that we look to introduce in line with the evidence are daily ibandronate and infusions of zoledronic acid (alongside chemotherapy). The alternative that has been considered is sodium clodronate, but this would be expensive. The numbers were insufficient in the breast cancer studies to assess the efficacy of risedronate and alendronate.

The introduction of bisphosphonates (ibandronate and zoledronic acid) for this new cohort of post menopausal women would mean a new use for them outside their current license arrangements. It is understood that the license arrangements for repurposing of generic drugs are under review but support would need to be sought through the medicines safety forum at Sheffield Teaching Hospital and via the region’s Area Prescribing Forums. Initial contact with the Sheffield Area Prescribing Committee via the Chair Dr Richard Oliver has been positive and it is proposed that primary care prescribing guidelines are developed and approved by the region’s APC early in the implementation of this proposal.

Nationally there is strong clinical support for the introduction of bisphosphonates for post menopausal women with breast cancer. They are included as a recommendation in the breast cancer CRG service specification and were unanimously endorsed as a priority for implementation at the recent UK Breast Cancer Meeting (UKKBCM) in November 2015. The outcome of this was the development of an algorithm to guide their introduction (see enclosed in appendix 2) and this provides the foundation for the preferred delivery option recommended in this business case.
SECTION 2: CASE UPDATES

Strategic context

The NHS Planning Guidance for 2016/17-2020 (Delivering the Five Year Forward View) identifies cancer as a ‘must do’ with a clear goal to enable delivery of the National Cancer Strategy, Achieving World Class Cancer Outcomes and more specifically an emphasis on improving 1 year survival rates. The National Cancer Strategy acknowledges that in comparison to our European counterparts there is significant scope for England to improve survival rates and thus outlines its ambition to improve 1, 5 and 10 year survival rates. Breast cancer is one of the areas where we have started to demonstrate improvement nationally, although in some parts of South Yorkshire (for example Sheffield) our 5 year breast cancer survival is not as good as the England average. It is therefore locally identified as an area with scope for improvement.

It is clear that we need a multifaceted approach, one that looks across the whole pathway, operationalises a broad range of plans, from reducing the variation in breast cancer screening uptake (particularly in more deprived and culturally diverse areas) to ensure that there is equitable access to breast cancer treatment. The introduction of bisphosphonates for post menopausal women as set out in this case would be an evidence based intervention to reduce the risk of recurrence; improve survival and reduce premature mortality for this particular cohort. Taken forward on a South Yorkshire footprint it would enable regional progress towards the nationally identified ambition to improve cancer survival rates, specifically for breast cancer.

The National Cancer Strategy also prioritises the need to improve follow on care and support after cancer treatment. Discharge from treatment is often identified by patients, their families and carers as a particularly difficult time. The South Yorkshire region has already undertaken significant work on the breast cancer pathway, reducing hospital follow ups and managing the transition to primary care. Primary care already provides routine care and support as advised by the discharge information and where appropriate continues prescriptions for endocrine treatments for breast cancer, and could, with support, easily adapt practice to support the prescribing of adjuvant oral bisphosphonates. In some cases bisphosphonates will already have been prescribed, albeit not necessarily with the additional breast cancer benefit in mind. It therefore makes sense for the introduction of bisphosphonates to be considered within this context where there is reduced hospital follow up as part of the existing pathway.

It is within this strategic context that the South Yorkshire Cancer Strategy Group and the Working Together Programme are asked to consider this business case.

Potential Benefits

The following potential benefits have been identified -

- The evidence suggests that there will be a reduction in mortality for the cohort (post-menopausal women) from 18% to 14% within 10 years with about one in six breast cancer deaths prevented. More specifically the 10 year risk of bone recurrence is expected to reduce from 8.8% to 6.6%.
The introduction of a bisphosphonate accompanied by good communication outlining the importance of compliance may also have an impact on compliance for other medicines such as tamoxifen and aromatase inhibitors.

Those women within the cohort that are already prescribed a bisphosphonate will benefit from being transferred onto one where there is evidence of this additional benefit to reduce recurrence in the bone and premature mortality, without incurring the total cost.

As bisphosphonates are already routinely prescribed in primary care, practices are well placed to support this as part of the ongoing follow on care for the patient. Patients may also accept this more readily due to familiarity with the type of medicine, which combined with good communication outlining the reason why it is important to take it every day should maximise compliance and therefore overall benefit realisation.

It will provide a specific example of how the South Yorkshire Cancer Strategy Group (in its early development to formulate a Cancer Alliance) is working to take forward specific areas of action to improve cancer survival rates, a key ambition set out in the National Cancer Strategy.

Anticipated Cohort

It is expected that two thirds of post menopausal women diagnosed with breast cancer (those 55+ and younger that can be categorised as post menopausal) will be considered at sufficient level of risk for recurrence of breast cancer to benefit from introduction of bisphosphonates. The following table sets out the likely numbers across the South Yorkshire, Bassetlaw and North Derbyshire footprint.

Discussion with the lead clinicians has also indicated that there is likely to be benefit for those post-menopausal women that have been diagnosed in the last 6 months. They will still be under specialist care, but in most cases likely to have completed their chemotherapy. The table below suggests utilising 50% of the proposed cohort as a back log to build in the women diagnosed in the last 6 months.

<table>
<thead>
<tr>
<th>Area</th>
<th>Breast cancer incidence 2013</th>
<th>Breast cancer incidence 55+ 2013</th>
<th>Additional 10% under 55?</th>
<th>Total 55+ &amp; additional 10%</th>
<th>Proposed Cohort (63%)</th>
<th>Backlog cohort (50% of proposed cohort?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheffield</td>
<td>492</td>
<td>341</td>
<td>50</td>
<td>391</td>
<td>246</td>
<td>123</td>
</tr>
<tr>
<td>Rotherham</td>
<td>234</td>
<td>163</td>
<td>23</td>
<td>186</td>
<td>117</td>
<td>59</td>
</tr>
<tr>
<td>Barnsley</td>
<td>223</td>
<td>153</td>
<td>22</td>
<td>175</td>
<td>110</td>
<td>55</td>
</tr>
<tr>
<td>Doncaster</td>
<td>302</td>
<td>218</td>
<td>30</td>
<td>248</td>
<td>156</td>
<td>78</td>
</tr>
<tr>
<td>Bassetlaw</td>
<td>132</td>
<td>93</td>
<td>13</td>
<td>106</td>
<td>67</td>
<td>34</td>
</tr>
<tr>
<td>Hardwick</td>
<td>126</td>
<td>95</td>
<td>13</td>
<td>108</td>
<td>68</td>
<td>34</td>
</tr>
<tr>
<td>North Derbyshire</td>
<td>322</td>
<td>223</td>
<td>32</td>
<td>255</td>
<td>161</td>
<td>81</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1831</strong></td>
<td><strong>1286</strong></td>
<td><strong>183</strong></td>
<td><strong>1469</strong></td>
<td><strong>926</strong></td>
<td><strong>463</strong></td>
</tr>
</tbody>
</table>

Across South Yorkshire the likely cohort is estimated to be 926 women, with up to 463 women diagnosed in the last 6 months that are likely to also benefit.
Overview of the Case

The strategic context and potential benefits that we can anticipate are outlined above. In order to realise the benefits from the introduction of bisphosphonates into routine breast cancer management it will require some additional initial investment. This would be offset by a combination of short term and long term factors – based on the impact of bisphosphonates on bone density and metastatic recurrence.

In the short term it will be possible to offset some of this investment with a reduction in DEXA scans for the same cohort of women. As part of their routine management most of the women within this cohort currently have at least 3 DEXA scans in 5 years and the initiation of bisphosphonates as per this case would mean that this could be reduced to circa 33% requiring scans, as the scans would no longer be required for all, due to the preventative effect of adjuvant bisphosphonates against bone loss and development of osteoporosis.

In the longer term, the remaining investment will be offset by a reduction in the women requiring treatment and care for metastatic disease. It is not easy to calculate an average cost for managing metastatic breast cancer at an individual level and especially not when considering costs across the system as a whole. These are likely to be significant from active treatment and care, palliative care and more broadly, home care support, social care and end of life care. The potential substantial costs are indicated by the available studies. A brief literature search identified a study undertaken in the UK in 2004 that estimated the lifetime cost of treatment for patients in the UK presenting with stage IV breast cancer suggested that even over a decade ago this was circa £12,500 per patient. Given advances in management over the last 10 years, such as trastuzumab (Herceptin™), this is most likely a gross underestimate now. A more recent study undertaken in Portugal outlined that the mean annual cost of treatment for a patient with metastatic breast cancer (bone) was just under £4,000 pounds. Whilst another study in the Netherlands undertaken in 2004 suggested that the average cost of treatment of patients with breast cancer metastatic to bone ranged from just over 25,000 euros (circa 18K) per patient to just below 10,000 euros (circa 7K). Ultimately it is clear from each study that there are substantial costs associated with the treatment and management of metastatic disease, even without taking into consideration the broader whole system costs.

Utilising the findings from the meta analysis they suggest that there will be a reduction in premature mortality for post-menopausal women from 18% to 14% within 10 years and that the 10 year risk of bone recurrence is expected to reduce from 8.8% to 6.6%. Working this through for Sheffield as an example this means:

<table>
<thead>
<tr>
<th>Proposed Sheffield cohort (new each year)</th>
<th>Anticipated change in premature mortality for cohort (within 10 yrs)</th>
<th>Potential number of lives expected to be saved, elongated (10 yrs).</th>
<th>Potential spend avoided due to reduced metastatic disease (in 10yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circa 250</td>
<td>From 22 (current pathway) to 17 (routine bisphosphonates)</td>
<td>5</td>
<td>5* 12.5K = £62.5K (12.5K = lifetime cost of treatment stage IV breast cancer identified in 2004 study likely to be underestimate)</td>
</tr>
</tbody>
</table>
There are a number of delivery options to consider which would influence the overall cost of introducing bisphosphonates for breast cancer management. These are considered (alongside do nothing) below, followed by the financial modelling -

Options

1. **Do nothing**

   The increasing financial challenges across the health and care system require us to closely review any potential additional areas of investment, including the potential benefits and associated risks. Doing nothing at this time would mean that post-menopausal women in South Yorkshire do not benefit from the anticipated reduction in bone recurrences and premature mortality as identified in the meta analysis. Regionally we would not benefit from the likely improvement in breast cancer survival (conscious that in parts of South Yorkshire our survival rate is worse than the England average). It is likely with the significant national support that this will be integrated into National/NICE guidance in future and therefore the region will be required to revisit this.

2. **Predominantly Zoledronic acid infusions**

   The algorithm developed nationally (appendix 2) advocates that the initiation of bisphosphonates where chemotherapy is planned should be alongside their chemotherapy with 3 infusions of zoledronic acid, after which they could either proceed with 6 monthly infusions of zoledronic acid or swap to an oral bisphosphonate. For those where there is no chemotherapy planned they could be initiated with either an oral bisphosphonate or IV infusions of zoledronic acid.

   Introducing bisphosphonates with predominantly infusions of zoledronic acid is one option, which may support good compliance (as long as patients attend for their infusion). However it would require additional hospital follow ups (6 monthly) for patients and this may not be possible to deliver operationally and will incur additional costs. It would also require patients to continue to be followed up in hospital at a time when we are strategically promoting and operationally planning to reduce hospital follow up and provide after care and support closer to home.

3. **Predominantly Oral Ibandronate**

   Another option to enable the introduction of bisphosphonates is to offer oral ibandronate as a first choice for all once chemotherapy is complete (or initially for those where chemotherapy is not planned). This would not require additional hospital follow up appointments and therefore be less costly than zoledronic acid infusions. It would however need to be supported by primary care as they would be required to continue to prescribe for these patients as part of their ongoing care post discharge. This is already undertaken in primary care for tamoxifen and aromatase inhibitors and in other areas there are examples of medicines that are initiated by specialists and continue to be prescribed in primary care with guidelines. Bisphosphonates are already commonly prescribed by GPs for osteoporosis (albeit not necessarily the ones identified with the additional benefits). However oral medication may not be tolerated by all and consideration needs to be given to potential issues with compliance, acknowledging that it is generally a challenge with this type of medication. Although this particular cohort would be taking the medication in the knowledge that it was to reduce their risk of recurrence, rather than to improve their bone health which is likely to aid compliance.
Newly Diagnosed/Diagnosed within 6 months

The bisphosphonates could be introduced for all newly diagnosed post-menopausal women. However it has also been identified through discussion with the clinicians that those diagnosed within the last 6 months are likely to benefit (as set out above). There is therefore also the option to commence with the newly diagnosed and simultaneously for those currently within the system diagnosed in the last 6 months. The latter will still be care for by specialists, although most likely completed their chemotherapy and so could be commenced on oral therapy. This will increase the initial cost of introducing bisphosphonates, although likewise the benefits could be realised for more patients.

The options as outlined above were discussed at the South Yorkshire Cancer Strategy Group early in 2016 and it was agreed that it was reasonable to strategically advocate for predominantly oral medication as the option that enables delivery closer to home, empowers and supports individuals to self care and does not significantly increase hospital follow ups. It was also agreed that it would be reasonable to build in the ability for clinicians to offer an infusion for those that are clearly unable to tolerate oral therapy in order to avoid compliance issues and ensure that we are able to realise the anticipated benefits. All 4 options have been modelled financially (set out in the appendix 3).

Overall given the steer by the South Yorkshire Cancer Strategy Group and the outcome of financial modelling Option 3 (predominantly oral ibandronate) is recommended. It is also suggested that consideration is given to simultaneously initiating oral ibandronate for those already within the system diagnosed in the last 6 months.

A summary of the modelling for option 3 and 4 is in the financial modelling.

Financial Modelling

See enclosed summary spreadsheet.

Risks

The following key risks and potential mitigating actions have already been identified -

<table>
<thead>
<tr>
<th>Key risks</th>
<th>Scoring</th>
<th>Mitigating Actions</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a risk that not all patients will be able to tolerate oral ibandronate and so some may require a switch to zoledronic acid infusions requiring additional FU appointments and their associated cost.</td>
<td>3x3 = 9</td>
<td>To advocate a 25% zoledronic acid v 75% oral ibandronate split as the preferred option in the business case, rather than a 10% zoledronic acid, 90% oral ibandronate. In order to enable a small proportion of people to switch where necessary.</td>
<td>2x3=6</td>
</tr>
<tr>
<td>There is a risk that not all patients that are transferred to oral ibandronate will take it as advised. Therefore it will not be possible to realise the full anticipated benefits on</td>
<td>3x3=9</td>
<td>To advocate the split as outlined above and therefore where really necessary enable people to access an infusion. To ensure that the plan for implementation includes</td>
<td>2x3=6</td>
</tr>
<tr>
<td>Issue</td>
<td>Risk</td>
<td>Action</td>
<td>Notes</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Reduced premature mortality.</td>
<td>Educating and supporting all clinicians within the current pathway to clearly communicate with patients why they are being asked to take this medication, what the benefits are (provide supplementary information to support this?) so as to maximise compliance from the outset.</td>
<td>To build in an audit (details to be developed as part of detailed implementation plan) to look at compliance levels and establish if there are any potential issues and if they are likely to impact on benefit realisation.</td>
<td>3x3=9</td>
</tr>
<tr>
<td>There is a risk that it is not possible to secure agreement regionally to introduce bisphosphonates into the breast cancer management pathway for all South Yorkshire patients and if this was progressed it could result inequity for patients.</td>
<td></td>
<td>Develop the business case for the region with support from the South Yorkshire Cancer Strategy Group, secure support via commissioners and progress through the established working together programme infrastructure to enable regional consideration of the case and a regional decision.</td>
<td>2x3=6</td>
</tr>
<tr>
<td>There is a risk that it is not as straightforward as anticipated to implement through integration into the existing pathway.</td>
<td></td>
<td>Develop a high level implementation plan that is reviewed and progressed into a detailed plan upon approval to proceed.</td>
<td>2x2=4</td>
</tr>
<tr>
<td>There is a risk that primary care may not be able to follow on the prescribing after discharges as part of the patients follow on care.</td>
<td></td>
<td>Discuss development of the case with colleagues leading primary care development and the LMC to identify potential challenges. Enable regional commissioning colleagues to discuss locally. Develop prescribing guidelines to support primary care with implementation.</td>
<td>2x3=6</td>
</tr>
<tr>
<td>There is a risk that it will not be possible to gain support for the medicines to be prescribed outside their current license arrangements for this cohort of patients.</td>
<td></td>
<td>Ensure approach to the STHFT medicines safety committee is built into the plan. Also ensure that the development of the case is flagged to the Local Area</td>
<td>2x3=6</td>
</tr>
<tr>
<td>There is a risk associated with implementation ahead of national guidance. Although it is clear that there is strong national support for expediting the findings into practice, as demonstrated by the outcome of the national breast cancer forum.</td>
<td>2x2=4</td>
<td>For implementation to be developed in line with the approach advocated by the National Breast Cancer forum (utilising their proposed algorithm).</td>
<td>2x1=2</td>
</tr>
</tbody>
</table>

**Interdependencies**

The Macmillan Living with and Beyond Cancer Programme (LWABC) to be initiated across the regional footprint in April 2016 has been identified as a key interdependency. The Programme focuses on 3 specific cancer pathways including breast cancer and the implementation of risk stratified follow up pathways of care, embedding the recovery package, across the region. Operationally if not already in place this means reduced hospital follow ups for those after treatment for breast cancer, and hence the need to manage the interdependence between this work and the introduction of bisphosphonates into routine breast cancer management. As the latter may require a small number of additional follow ups (6 monthly) for a specific cohort unable to tolerate oral medication.

**SECTION 3: PROCUREMENT PROCESS**

Procurement is not applicable for this particular business case. The introduction of bisphosphonates for post menopausal women will need to be integrated into the existing pathway for the routine management of breast cancer. Upon discharge the ongoing prescribing of bisphosphonates will transfer to the patient's GP as part of their overall follow on care.

**SECTION 4: CONTRACT AWARD**

The introduction of bisphosphonates should not result in any contractual implications. As outlined above the introduction of bisphosphonates needs to be integrated into the existing pathway for the routine management of breast cancer and upon discharge will be part of the patients follow on care overseen by their general practitioner.

**SECTION 5: SERVICE DELIVERY**

In order to enable the introduction of bisphosphonates a draft high level implementation plan has been developed (see appendix 4). In summary the plan is to initiate bisphosphonates (starting with infusions of zoldronic acid) for all those women currently within the system undergoing chemotherapy, at the end of this the majority of women will be transferred to oral ibandronate.
Appendix 1 – See enclosed - Adjuvant bisphosphonates treatment in early breast cancer: meta-analyses of individual patient data from randomised trails.

Appendix 2 – See enclosed nationally developed algorithm

Appendix 3 – See enclosed finance modelling spreadsheet

Appendix 4 – Draft High Level Implementation Plan

<table>
<thead>
<tr>
<th>High Level Actions</th>
<th>By</th>
<th>Anticipated time to enact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of prescribing guidelines for primary care approved by Area Prescribing Committee(s)</td>
<td>CCG Pharmacy Team(s)</td>
<td>Within 1 month of approval (TBC)</td>
</tr>
<tr>
<td>Approval sought and confirmed from STHFT Medicines Safety Committee and appropriate forums across the region.</td>
<td>Lead Clinician(s)</td>
<td>Within 1 month of approval (TBC)</td>
</tr>
<tr>
<td>Operational plan developed to enable integration into existing pathway for all Trusts to include:</td>
<td>STHFT and DGHs – to be confirmed</td>
<td>Plan within a month (TBC) Implementation within 2/3 months (TBC)</td>
</tr>
<tr>
<td>· Communicating with clinical teams rationale/and pathway including monitoring (reduction in need for scans).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>· Zoledronic acid infusions alongside existing chemotherapy (operational aspects of delivery)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>· How to enable data to be captured to understand the infusions V oral therapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>· Information to be communicated with patient upon discharge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>· Discharge treatment summary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>· Audit plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential local audits with primary care to understand compliance with oral medication to inform benefits realisation. Audit to include review of complications side effects to understand any potential impact with increased routine prescribing of bisphosphonates.</td>
<td>CCG Pharmacy Teams (TBC)</td>
<td>To be enacted a year after introduction TBC</td>
</tr>
</tbody>
</table>


2 Reference planning guidance


4 Cost of managing women presenting with stage IV breast cancer in the UK, E Remak and L Brazil, British Journal of Cancer, 2004

5 Hospital resource utilisation and treatment cost of skeletal related event in patients with metastatic breast or prostate cancer: Estimation for the Portugese Health Service, Value in Health, 2011

6 Cost of breast cancer metastatic to the bone in the Netherlands, MT Groot, HP Sleebloom, W Gerristen, CA Uyl de Groot, Institute for Medical Technology Assessment, 2004