Costing statement: Capecitabine for the first-line treatment of inoperable advanced gastric cancer

The guidance on capecitabine for the treatment of inoperable advanced gastric cancer (NICE technology appraisal guidance TA191) is unlikely to result in a significant change in NHS resource use. A switch towards capecitabine may result in small savings due to a reduction in drug administration costs with an annual net saving of approximately £500,000 expected nationally by year 5, based on uptake as predicted by the manufacturer. As the estimated saving is below £1 million, a costing statement has been produced rather than a template.

The guidance states that capecitabine, in combination with a platinum-based regimen, is recommended for the first-line treatment of inoperable advanced gastric cancer.

Background to this appraisal

Capecitabine (Xeloda, Roche Products) is an orally administered pro-drug of fluorouracil. Fluorouracil is used in current practice, and is administered as a continuous infusion through a central venous line. This is inserted at the start of treatment and remains until treatment has finished. A portable pump controls the dosage and must be replaced every week.

The main capecitabine- and fluorouracil-based chemotherapy regimens that patients with gastric cancer can receive are:

- epirubicin, cisplatin and capecitabine (ECX) or epirubicin, cisplatin and fluorouracil (ECF)
- epirubicin, oxaliplatin and capecitabine (EOX) or epirubicin, oxaliplatin and fluorouracil (EOF)

Costing statement: Capecitabine for the treatment of inoperable gastric cancer
• cisplatin and capecitabine (CX) or cisplatin and fluorouracil (CF).

**Patient numbers affected**

The number of new cases of gastric cancer in England in 2007 was 6,330\(^1\). The proportion of people with gastric cancer whose disease is advanced is estimated to be 80%\(^2\). Of patients with advanced disease, it is estimated that 66%\(^3\) have inoperable cancer, and of these 53%\(^4\) are estimated to be fit enough to receive first-line chemotherapy.

This gives an eligible population of 1,771.

**Resource impact**

The only significant difference in cost between the alternative regimens is caused by the choice of whether to use capecitabine or fluorouracil, so only the costs of these drugs have been calculated.

The overall tolerability profile of capecitabine is considered to be similar to and at least as good as fluorouracil. As a result adverse events costs are not discussed in this statement.

As oral administration allows for less frequent hospital visits without the continuous presence of a pump, oral capecitabine therapy is considered to be the preferred first-line treatment option in most people able to tolerate it. Some patients may find it difficult to swallow the tablets.

---


\(^2\) Cancer Research UK: ‘Around half of patients have some form of surgery but due to the late diagnosis of the disease in the UK only around 20% of patients have curative resections.’ It has therefore been assumed that the 80% of patients who do not have curative resections have presented with advanced gastric cancer. Cancer Research UK, accessed on 10 May 2010, available from: http://info.cancerresearchuk.org/cancerstats/types/stomach/symptomsandtreatment/index.htm


\(^4\) Stomach cancer occurs mainly in older people (Cancer Research UK) and as a result some eligible patients are unlikely to be fit enough to receive chemotherapy. The estimated percentage of patients who will be fit enough to receive chemotherapy has been taken from the manufacturer’s submission and is based on market research.

Costing statement: Capecitabine for the treatment of inoperable gastric cancer
The recommended dose of capecitabine is 625 mg/m² twice daily for 21 days if it is used as part of the ECX regimen or the EOX regimen. If it is used as part of a CX regimen, the recommended dose of capecitabine is 1000 mg/m² twice daily for 14 days in every 21 days.

The recommended dose of fluorouracil is 200 mg/m² per day as a continuous infusion for all 21 days of each cycle if it is used as part of the ECF regimen or the EOF regimen. If it is used as part of the CF regimen, the recommended dose is 800 mg/m² for 5 days in every 21 days as a continuous infusion.

Figure 1 shows that although the drug cost for capecitabine is higher than for fluorouracil, the higher administration cost for fluorouracil as a result of intravenous as opposed to oral administration means that the total treatment cost of capecitabine is lower. Therefore a switch from fluorouracil to capecitabine may result in a net saving.

**Figure 1 Regimen cost per patient**

![Figure 1 Regimen cost per patient](image)

Costing statement: Capecitabine for the treatment of inoperable gastric cancer
Table 1: Estimated annual resource cost per patient for each regimen (including wastage)

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Body surface area (m²)</th>
<th>Recommended dose</th>
<th>Drug cost per cycle (£)</th>
<th>Administration cost per cycle (£)</th>
<th>Total cost per patient (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EOX</td>
<td>1.75</td>
<td>625 mg/m² twice daily for 21 days</td>
<td>1,243&lt;sup&gt;7&lt;/sup&gt;</td>
<td>1,425&lt;sup&gt;8&lt;/sup&gt;</td>
<td>2,668</td>
</tr>
<tr>
<td>EOF</td>
<td>1.75</td>
<td>200 mg/m² per day for 21 days</td>
<td>528&lt;sup&gt;9&lt;/sup&gt;</td>
<td>3,820&lt;sup&gt;10&lt;/sup&gt;</td>
<td>4,348</td>
</tr>
<tr>
<td>ECX</td>
<td>1.75</td>
<td>625 mg/m² twice daily for 21 days</td>
<td>1,243&lt;sup&gt;7&lt;/sup&gt;</td>
<td>1,425&lt;sup&gt;8&lt;/sup&gt;</td>
<td>2,668</td>
</tr>
<tr>
<td>ECF</td>
<td>1.75</td>
<td>200 mg/m² per day as a continuous infusion for all 21 days</td>
<td>528&lt;sup&gt;9&lt;/sup&gt;</td>
<td>3,820&lt;sup&gt;10&lt;/sup&gt;</td>
<td>4,348</td>
</tr>
<tr>
<td>CX</td>
<td>1.75</td>
<td>1000 mg/m² twice daily for 14 days in every 21 days</td>
<td>1,326&lt;sup&gt;7&lt;/sup&gt;</td>
<td>1,425&lt;sup&gt;11&lt;/sup&gt;</td>
<td>2,751</td>
</tr>
<tr>
<td>CF</td>
<td>1.75</td>
<td>800 mg/m² for 5 days in every 21 days</td>
<td>493&lt;sup&gt;9&lt;/sup&gt;</td>
<td>2,654&lt;sup&gt;12&lt;/sup&gt;</td>
<td>3,147</td>
</tr>
</tbody>
</table>

<sup>5</sup> The drug dosage is based on a standard body surface area of 1.75 m² in line with costing methodology.

<sup>6</sup> The prices quoted for drugs are the prices given in the 'British national formulary' edition 59. This is net of VAT. If drugs are purchased by a hospital pharmacy they will be subject to VAT. Some hospitals negotiate discounts from suppliers depending on level of spend; this discount varies between organisations, and is estimated to be about 15%.

<sup>7</sup> Per expert clinical opinion, wastage only occurs when patients interrupt or stop treatment early with capecitabine. Therefore minimal wastage has been assumed.

<sup>8</sup> The administration cost has been calculated using national reference costs for 2008–09: ‘Day case SB14Z deliver complex chemotherapy, including prolonged infusional treatment at first attendance.’ The cost is based on a mean of 5.5 cycles with one attendance per cycle.

<sup>9</sup> This includes wastage each week the pump is changed as it has been assumed that vials cannot be shared given the small number of patients.

<sup>10</sup> The cost of inserting a central venous line is estimated at £451 (Boland et al 2003). The administration cost has been calculated using national reference costs for 2008–09: ‘Day case SB14Z deliver complex chemotherapy, including prolonged infusional treatment – single professional.’ The administration cost has been calculated using national reference costs for 2008–09: ‘Day case SB14Z deliver complex chemotherapy, including prolonged infusional treatment at first attendance.’ The cost is based on a mean of 5.5 cycles with one attendance per cycle.

<sup>11</sup> The cost of a home visit by a qualified district nurse has been taken from PSSRU 2009. The cost is based on a mean of 5.5 cycles with one attendance per cycle.

Costing statement: Capecitabine for the treatment of inoperable gastric cancer
Figure 2 shows the estimated savings over time. These are based on the predicted number of patients who will switch to capecitabine in the next 5 years, as given in the manufacturers’ submission.

**Conclusion**

Capecitabine, in combination with a platinum-based regimen, is recommended for the first-line treatment of inoperable advanced gastric cancer. Switching from fluorouracil to capecitabine is expected to result in an annual net saving of approximately £500,000 nationally from year 5 onwards.