Targeted Therapies for Metastatic Colorectal Cancer: A Systematic Review of Cost Effectiveness

Tanya G Bentley, Ph.D.,¹ Michael S Broder, M.D., M.S.H.S.,² Lopamudra Das, M.P.H.,¹ Jesse Ortendahl, B.S.,¹ Yu Sun, M.P.H.,¹ Samuel Wagner, Ph.D.¹
¹ Partnership for Health Analytic Research, LLC, Beverly Hills, CA; ² Bristol-Myers Squibb, Princeton, NJ; ³ Bristol-Myers Squibb, Lawrenceville, NJ.

Background

• Targeted therapies interfere with molecular mechanisms in order to reduce tumor growth and slow disease progression.
• Currently three targeted agents (bevacizumab, cetuximab, and panitumumab) have FDA (and Drug Administration approval for the treatment of metastatic colorectal cancer (mCRC).
• Choosing among agents to treat mCRC requires balancing efficacy, safety, quality of life, and, in cost-constrained systems, cost.

Objectives

This study aims to determine the most cost effective targeted therapy for mCRC.

Methods

• Systematic review of published studies of cost effectiveness of treatments for mCRC. Inclusion criteria: English language studies of adults with mCRC published between 2004-2011 (for manuscripts) or 2009-2011 (for abstracts). Studies must have included standard targeted therapy and reported cost effectiveness outcomes from a payer or societal perspective.
• Databases searched: Medline, CancerLit, Embase, Cochrane, CINAHL, BIDS, Web of Science, Tufts CEA registry, ASCO and ASCO GI Conference Proceedings.
• Keywords: colorectal neoplasms, antineoplastic agents, drug therapy, bevacizumab, cetuximab, panitumumab, cost analysis, economic, cost effectiveness, cost utility, cost consequence, cost minimization
• Incremental CE ratios (ICERs) were converted to US$ using 2010 purchasing power parity.
• All accepted articles were evaluated for quality using a validated instrument, the Quality of Health Economic Analyses (QHES).

Results

Table 1: First line CEA models

<table>
<thead>
<tr>
<th>Publication/ Yr, Country/ Model</th>
<th>Population/ Comparators</th>
<th>CEA/ QHES Score/ Per LY</th>
<th>QHES Score/ Per QALY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available 2007</td>
<td>BRITISH MT, UK</td>
<td>Cetuximab vs BR actresses</td>
<td>$146,076 100</td>
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Table 2: Second line CEA models

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Conclusions

• All included CEA’s had at least some limitations including pooling of data from studies with different designs, imbalance in the number of patients across trial arms, and use of less than optimal comparators.
• Some models used flawed inputs including median instead of mean survival and use of highly uncertain data. Some studies considered non standard treatments or considered a very limited population, thereby limiting the generalizability of the results.
• Most studies considered results among the same lives and comparators but with varying mCRC treatment.
• No models evaluated all three targeted agents simultaneously

Future models should evaluate:

• Various patient populations and sub-populations (e.g., KRAS WT and mutant; chemo-refractory; older patients; patients with metastases confined to the liver)
• All targeted agents: bevacizumab, cetuximab, panitumumab
• Data based on rigorous methodology and valid sources
• Cost, quality-of-life, and utilization assumptions and data that accurately reflect the full impact of therapy
• A wide range of sensitivity analyses that address a variety of assumptions

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