Cost Effectiveness of a Geriatric Oncology Clinic

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Disclosures

• No conflicts of interest to disclose
Background

• Majority of patients who develop cancer are older adults (≥65 years)
Background

- Older adults with cancer face unique challenges
- The Comprehensive Geriatric Assessment (CGA) allows for a more holistic evaluation of the patient
Background

- The Comprehensive Geriatric Assessment is recommended by several international authorities including SIOG$^1$ and ASCO guidelines$^2$
- However, implementation of CGA is not widespread
- Lack of resources is a major barrier to its implementation
Background

• CGA helps to inform treatment decision-making
• A median of 28% of treatment decisions are modified post CGA³
• Potential cost savings from avoiding over-treatment may make a compelling business case for the use of CGA
• Little data has been published thus far on the economics of CGA in geriatric oncology
Objectives

• To examine the cost-effectiveness of an academic geriatric oncology clinic
Study Design

• Retrospective study
• Patients with cancer aged 65 years and older, in the pre-treatment setting
• Older Adults with Cancer Clinic (OACC) at the Princess Margaret Cancer Centre in Toronto, Canada
• July 2016 to June 2018, years 2 and 3 of the clinic
Study Flow

162 Patients

- 91 patients seen pre-treatment
  - 35 (38%) with change in treatment
- 71 patients seen during treatment
  - 56 without change in treatment

*Both groups were costed*
# Demographic Data

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total # of patients</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td>Median Age in years</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>ECOG Performance Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>18</td>
<td>(19.8)</td>
</tr>
<tr>
<td>1</td>
<td>35</td>
<td>(38.5)</td>
</tr>
<tr>
<td>≥2</td>
<td>38</td>
<td>(41.8)</td>
</tr>
<tr>
<td>Disease Site</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>35</td>
<td>(38.5)</td>
</tr>
<tr>
<td>Genitourinary</td>
<td>18</td>
<td>(19.8)</td>
</tr>
<tr>
<td>Head and Neck</td>
<td>15</td>
<td>(16.5)</td>
</tr>
<tr>
<td>Leukemia, Lymphoma</td>
<td>7</td>
<td>( 7.7)</td>
</tr>
<tr>
<td>Skin (not melanoma)</td>
<td>4</td>
<td>( 4.3)</td>
</tr>
<tr>
<td>Thoracic</td>
<td>4</td>
<td>( 4.3)</td>
</tr>
<tr>
<td>Breast</td>
<td>4</td>
<td>( 4.3)</td>
</tr>
<tr>
<td>Melanoma</td>
<td>1</td>
<td>( 1.1)</td>
</tr>
</tbody>
</table>
Methods

1. Initial treatment plan costs
   - Surgery, radiation, systemic therapy or best supportive care
   - Obtained through detailed retrospective chart review
   - 3 independent reviewers (ZA, UM, RS)

2. Costs associated with CGA / OACC clinic
   - Physician fees, ancillary/allied health staff salaries
   - Investigations, imaging and referrals

3. Final treatment costs
   - Initial treatment commenced during 6 month window
   - Surgery, radiation, systemic therapy or best supportive care, as above
Methods

• Calculated the net difference between the initial proposed treatment plan and the final treatment plan with CGA associated costs

• Costs for each component were gathered in Canadian Dollars and were not adjusted for year

• Used a government-payer perspective
## Costs

<table>
<thead>
<tr>
<th>Component</th>
<th>Source</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical procedures</td>
<td>OCC costing tool</td>
<td>Specific procedure was not always reported in notes</td>
</tr>
<tr>
<td></td>
<td>(average cost per case)</td>
<td></td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>Government formulary</td>
<td>6 cycles, 28 days each</td>
</tr>
<tr>
<td>Radiotherapy</td>
<td>Published Ontario costing data</td>
<td>Extrapolated from costs for breast and prostate (Yong et al.)</td>
</tr>
<tr>
<td>Laboratory tests, imaging</td>
<td>Government reimbursement schedules</td>
<td></td>
</tr>
<tr>
<td>Physicians</td>
<td>Government billing guides</td>
<td>No costs for residents/fellows in the clinic</td>
</tr>
<tr>
<td>Nurse, Social Work, Interpreter,</td>
<td>Hourly wages</td>
<td>15 minute phone follow-ups</td>
</tr>
<tr>
<td>PT/OT</td>
<td></td>
<td>No nursing costs in follow up visits</td>
</tr>
</tbody>
</table>
Other Assumptions

1. Best supportive care was costed at $0.00
2. When multiple initial treatment plans were considered, the most aggressive/invasive plan was costed if the preference was unclear
3. Only the initial line of therapy was costed, assumed no subsequent changes in treatment
4. Assumed changes from initial to final treatment plan were solely due to CGA and further OACC recommendations
5. Investigations or imaging that were suggested from OACC were costed at 60% assuming a similar implementation rate
Sample Case

ID #109  77 year old male  GI Cancer

- **Initial treatment plan:** Sigmoid colectomy, neoadjuvant radiation
  
  - Surgery: $33,593.00
  - Radiation: $11,008.66
  - Total: $44,601.66

- **Final treatment plan:** Palliative radiation only
  
  - Radiation: $6,042.53
  - 20Gy in 5 fractions

- **OACC costs:** CGA + follow up + RN phone call = $477.80

<table>
<thead>
<tr>
<th>Initial Cost</th>
<th>Final Cost</th>
<th>OACC</th>
<th>Net Cost Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>$44,601.66</td>
<td>$6,042.53</td>
<td>$477.80</td>
<td>$38,081.33</td>
</tr>
</tbody>
</table>
Results

- Treatment plans were modified in \( \approx 38\% \) of cases
- \( >90\% \) of these plans resulted in a reduction in treatment intensity
- Cost savings of $859,485 attributed to these changes in treatment plans
- Costs associated with OACC/CGA and resulting subsequent interventions was $389,834
- Net savings associated with the clinic were $469,651 or $5,161 per patient, for all 91 patients irrespective of change in final treatment or not.
Limitations

• Single centre study with small sample size
• Retrospective study design
• Previously mentioned assumptions
• Costs were not adjusted for year/inflation
• Patient adherence with therapy was not systematically captured
• Generalizability to non-academic, non-government payer-based systems is uncertain
Future Considerations

• Sensitivity analyses pending
• Similar studies in *different settings* (ie. Academic/non-academic centers, private/public funded healthcare, patient volumes, access to resources)
• Explore other barriers in implementing the CGA
• Analyzing hospitalizations/re-admissions or treatment complication rates as another way to assess the utility of the CGA
• Cost effectiveness of CGA in the post-treatment/during active treatment settings
Conclusion

• A geriatric oncology clinic is highly cost effective in our academic setting.

• These data can inform a strong business case in health care environments similar to ours, but additional studies in diverse health care settings are warranted.
QUESTIONS / COMMENTS

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THANK YOU!
References


