Financial Toxicity of Cancer

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Disclosures

Ryan Nipp, MD, MPH, discloses no relevant financial relationships.
Full Disclosure: Out-of-Pocket Costs as Side Effects

Consider a Medicare patient with metastatic colorectal cancer

Addition of bevacizumab to standard chemo extends life by an average of ~5 months over chemotherapy alone.

Over the course of a median of 10 months of therapy, bevacizumab may cost ~ $44,000.00

Patient may be responsible for paying 20% of that cost, or $8,800, out of pocket – plus other meds, tests, visits

We discuss the risk of cardiovascular effects associated with bevacizumab, but do we discuss the potential financial effects?
bankruptcy

cancer

patients

2.65x

more likely

Ramsey et al, Health Aff 2013
Cancer Patients At Greater Risk For Bankruptcy Than People Without A Cancer Diagnosis

Monthly Rate Of Bankruptcies For Cancer Patients And Matched Group Without Cancer, Western Washington State, 1995-2009

Bankruptcy reform act goes into effect
Bankruptcy reform act signed into law

Financial Toxicity

- Financial burden can negatively impact health outcomes, including QOL, symptom burden, and potentially survival.

<table>
<thead>
<tr>
<th>Effect of Financial Burden on QOL, Symptom Burden, and Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kale - Cancer 2016</strong></td>
</tr>
<tr>
<td>Financial Burden → Quality of Life (SF-12 PCS)</td>
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<tr>
<td></td>
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<tr>
<td>Financial Burden → Depressed Mood (PHQ-2)</td>
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<tr>
<td><strong>Lathan - JCO 2016</strong></td>
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<td>Financial Reserves → Pain</td>
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<tr>
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<tr>
<td>Financial Reserves → Symptom Burden</td>
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<td><strong>Ramsey - JCO 2016</strong></td>
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<td>Bankruptcy → Survival</td>
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Financial Toxicity of Cancer Treatment

677 eligible

258 participants

64 did NOT apply for copay assistance
190 applied for copay assistance

419 declined
4 excluded

254 full cohort
42% report financial burden
Lifestyle Altering Strategies

- Reduced spending on leisure: 78%
- Reduced spending on basics: 57%
- Borrowed money for meds: 54%
- Used savings: 50%
- Sold possessions: 18%
- Family worked more: 15%

Medical Care Altering Strategies

- Missed an appointment: 6%
- Missed a procedure: 8%
- Missed a test: 10%
- Took less medication: 22%
- Didn’t fill a Rx: 28%

Any Lifestyle Altering Strategy: 89%

Any Medical Care Altering Strategy: 39%

Nipp et al. Psychooncology 2016
can we identify patients at greatest risk for financial burden?
Characteristics associated with financially motivated behavior

<table>
<thead>
<tr>
<th>Demographic</th>
<th>More Likely</th>
<th>Less Likely</th>
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<tr>
<td>EDUCATION</td>
<td>Beyond High School</td>
<td>High School and Less</td>
</tr>
<tr>
<td>CHEMOTHERAPY DURATION</td>
<td>Less than 1 Year</td>
<td>1 Year or More</td>
</tr>
<tr>
<td>AGE</td>
<td>Under Age 65</td>
<td>Age 65 and Over</td>
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<tr>
<td>INCOME</td>
<td>Under $20,000 yearly</td>
<td>Over $20,000 yearly</td>
</tr>
<tr>
<td>AGE</td>
<td>Under Age 65</td>
<td>Age 65 and Over</td>
</tr>
</tbody>
</table>
What about out-of-pocket expenses?
Survivors of childhood cancer were more likely to have out-of-pocket medical costs ≥ 10% of annual income (10.0% v 2.9%; P < .001).
Financial Burden in Survivors of Childhood Cancer: A Report From the Childhood Cancer Survivor Study

Potential Solutions
Local efforts at MGH Cancer Center have targeted clinical trial participants...
<7% participate in clinical trials

Ramsey et al, J Natl Cancer Inst. 2010
cancer clinical trial accrual lower for certain subgroups

Sateren et al, JCO 2002
Murthy et al, JAMA 2004
Can we improve clinical trial participation by targeting financial burden?
Cancer Care Equity Program (CCEP)

- In 2013 Massachusetts General Hospital (MGH) partnered with the Lazarex Cancer Foundation.

- **Community Outreach**
  - Education to build awareness of available cancer care options, especially clinical trials

- **Patient Navigation**
  - Ensure appropriate cancer screening and follow-up of results

- **Financial Assistance**
  - Reimbursement for trial participants struggling with travel and lodging costs
Patient Selection:
• enrolled in or being screened for a clinical trial
• referred to CCEP by their cancer team

Patient Referral:
Oncology provider • Social work • New patient access nurse • Research nurse

Lazarex Foundation:
• Determines need for assistance
• Reimburses patients monthly

CCEP:
• Liaise with Lazarex Foundation, patient & team
• Track patient outcomes and collect data
Average Monthly Clinical Trial Enrollment by Year

- **Actual average monthly enrollment**
- **Predicted average monthly enrollment**
- **95% Prediction intervals**

- **p-value < 0.001**

- **CCEP began**
  - **12/1/2013**
What patient characteristics might have contributed to higher participation?

- 2013 and 2014 differed in the overall distribution of patient characteristics (p<0.02)*
  *Accounting for the temporal changes in the proportions of metastatic disease, cancer type and enrollment in phase I trials

- Specifically, higher proportions of minority (p<0.01) patients and those living > 50 miles from MGH (p<0.01)

- Suggests CCEP targeted an underserved population
### Monthly Reimbursement per Participant Enrolled in the CCEP

<table>
<thead>
<tr>
<th>Local</th>
<th>Regional</th>
<th>National</th>
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<tr>
<td>$185</td>
<td>$300</td>
<td>$900</td>
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</table>
Baseline Financial Barriers

All p-values <0.01

CCEP (N=49)  non-CCEP (N=38)

Bothered by any financial concerns  56.3%  11.1%
Concerned about travel costs for the trial  69.4%  11.4%
Concerned about lodging costs for the trial  60.4%  9.1%
Worried about affording medical costs of trial  46.9%  14.3%
Afraid health insurance would not pay for trial  42.9%  14.3%
Thought I wouldn't be able to keep up with trial schedule  38.8%  8.6%
Thought I wouldn't be able to find transportation to trial center  34.7%  2.9%
Longitudinal Financial Concerns

• From 7/2016-1/2017, we enrolled clinical trial patients who expressed interest in the CCEP and a group of control patients
  – Matched by trial, sex, age, cancer type, & trial phase

• Surveyed patients at baseline and day 45

• We used GLM, generalized estimating equations, to evaluate changes from baseline to day 45 between the intervention and control groups
# Longitudinal Financial Concerns

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<th>Outcome</th>
<th>CCEP x time*</th>
<th>P-value</th>
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<td>Not filling a prescription for a medication</td>
<td>0.18</td>
<td>0.009</td>
</tr>
<tr>
<td>Concerned about costs for clinical trial-related travel</td>
<td>-0.53</td>
<td>0.023</td>
</tr>
<tr>
<td>Concerned about costs for clinical trial-related lodging</td>
<td>-0.41</td>
<td>0.074</td>
</tr>
</tbody>
</table>

* Change from baseline to day 45
Summary

• After implementation of the CCEP, cancer clinical trial participation increased greater than what would have been expected.

• The CCEP served a population in need of financial assistance.
  – Younger patients, lower incomes, traveling farther
  – Surveys illustrate their financial concerns
Conclusions

• Costs are a major concern for cancer clinical trial participants

• The CCEP represents a novel way to potentially improve trial participation

• Future directions:
  – Address the financial burden of trial participants
  – Develop tools to identify those needing financial aid
  – Encourage key stakeholders to support efforts to remove financial barriers to trial participation
Thank you

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