Health Economics Research: Cancer Treatment

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On behalf of the Cancer Treatment Workgroup
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Conflicts of Interest

• DS:
  • Gave a talk at ESMO 2019 at Pfizer Satellite Symposium
  • Advised Grail on liquid biopsy tests 2020
  • Editorial fees from JAMA
  • Funding from AACR for Project Genie which gets funding from a variety of pharmaceutical firms

• JY
  • Boston scientific – speaking fees / consulting
  • Galera pharmaceuticals – advisory board
Outline of Talk

• Background

• Recommendations:
  • Data needs to expand cancer economics research capacity
  • Training needs to expand cancer economics impact
  • Integrating economic endpoints into clinical trials
Health Economics Research Framework

Economic Inputs
- Insurance coverage
- Benefit Design
- Access to Care
- Price of care
- Social Determinants of Health
- Employee Benefits

Cancer Control Continuum
- Prevention
- Screening
- Treatment
- Survivorship
- End-of-Life

Structural Factors
- Cancer care workforce
- Health care organizations/system
- Availability of personnel, services, and technologies

Policy Factors
- Coverage and eligibility
- Payments/payment models
- Federal or state mandates
- Regulatory factors
- Innovation and technology diffusion

Patient-Level Outcomes
- Survival
- QALYs
- Patient Costs
- Financial Hardship
- Variations by Patient/Provider Characteristics
- Employment Impacts

Payer-, Provider-, System- and Societal-Level Outcomes
- Cost-Effectiveness
- Value of Care
- Cost of Care
- Health Equity
- Quality of Care

Background: Treatment

• **Multiple types** of cancer treatment (surgery, radiation therapy, systemic therapies) that vary by cancer site, stage, and molecular characteristics

• Cancer treatments are evolving **rapidly**
  • Novel treatments, including targeted therapies, rapidly introduced
  • Treatment intensity and duration increasing

• Cancer treatments are increasingly **expensive**
  • Insurers and payers need information about value
  • Patient financial hardship/toxicity a growing concern
  • Economic data especially relevant for decision making
Background: Treatment

• Many economic studies of cancer treatment use existing health insurance claims data and EHR data
• Data have limitations in terms of relevance and timeliness
  • Health insurance coverage benefit design rapidly changes
  • Data linkages (e.g., SEER-Medicare) provide information about cancer characteristics and treatment for select populations
• Few prospective economic studies, including as part of clinical trials
Data limitations in conducting health economics research focused on cancer treatment: Unavailability of Key Measures

- Treatment eligibility measures
  - Functional and performance status
  - Molecular data
  - Treatment recommendations and factors affecting decision-making
- Key treatment outcomes
  - HRQOL, treatment-specific utility estimates, and other PROs
  - Treatment intent, reasons for switching, dose changes, and discontinuation
  - Recurrence, recurrence location, and recurrence timing
  - Survival and cause-specific mortality
- Other patient characteristics
  - Granularity on race/ethnicity
  - Sexual orientation and gender identity
  - Social determinants of health
- Non-medical economic data
  - Financial distress, food and housing insecurity
  - Productivity loss
- Provider characteristics

Absence of these measures limit observational studies as well as comparative studies of payment models.
Data limitations in conducting health economics research focused on cancer treatment: Comprehensiveness

- Population-based data generally defined by geography, age, and insurance coverage type
- Detailed information about treatment and many outcomes end when health insurance coverage ends or changes, especially for <65 years without Medicare coverage
  - Median enrollment for Medicaid in 8 months
  - Transitions in coverage can be meaningful (switch to disability, unemployed due to cancer)
- Information about vital status frequently unavailable
- Area-level identifiers missing (e.g., zip code, census tract) and some vendors offer two versions of data requiring investigators to chose between key economic factors and other identifiers
- Caregiving data largely absent

Lack of comprehensive data limit understanding of disparities and evaluation of many outcomes in observational studies as well as comparative studies of payment models
Data limitations in conducting health economics research focused on cancer treatment: Timeliness

- Timeliness especially challenging with rapid changes in treatments
  - Tradeoffs between timeliness and representativeness
  - Data linkages provide rich data, but are even less timely
- Reliance on historical data less useful for research to inform changes in benefit design (e.g., high deductible health insurance plans, bundled payment, value-based payment)

Lack of “real time” data means harder for research to inform policy and practice

Training needs: For clinicians

- Health economics research requires multiple diverse skillsets
  - Economic analytic expertise is not taught in medical school – to understand and measure economic inputs and outcome

- Training intensity can vary depending on the end goal
  - Fellowship level training / K award for clinicians who are interested in a career in health economics
  - Health economics MPH programs
  - Policy issues can be learned in partnerships with clinical and advocacy groups
  - Meetings and seminars may help clinicians who want to collaborate without necessarily being the analytic engines for research
Training needs: For Health Services Researchers and Economists

• Clinical knowledge of cancer treatment is difficult to obtain
  • Knowledge of the rapidly changing cancer control continuum will likely require partnering with clinicians
  • Meetings and collaborative seminars may be optimal combination of efficiency and timeliness
Other opportunities for collaboration

• Meetings and Seminars to increase interactions
  • Sessions for cancer health economics research in clinical AND economic and health services research meetings
  • Annual or biennial meeting of cancer health economics
• Partnerships
  • CCDR within cooperative groups
  • Professional organizations (ASCO, Academy Health, ASHEcon)
  • Examples from Dissemination and Implementation Science
  • Collaboration in increasing utility of large datasets and research resources
    • Improve treatment and economic data available in large prospective cancer cohorts (e.g. add economic and behavior data to ASCO Cancer LinQ)
    • Including standardized economic data collection at baseline and follow-up
Economic Analyses Alongside Clinical Trials

Can this new treatment work?
RCTs still offer most unbiased estimate of whether a treatment can work

What is the incremental value of this new treatment?
What does it cost to deliver this treatment?

<table>
<thead>
<tr>
<th>Individual/Society</th>
<th>Direct Costs</th>
<th>Indirect Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Costs</td>
<td>Immunotherapy</td>
<td>Premature death</td>
</tr>
<tr>
<td></td>
<td>MD visit</td>
<td></td>
</tr>
<tr>
<td>Non-Medical Costs</td>
<td>Taxi to hospital</td>
<td>Sick leave</td>
</tr>
<tr>
<td></td>
<td>Family caregiver</td>
<td>Early retirement</td>
</tr>
</tbody>
</table>
Integrating Economic Analyses Alongside RCTS

**Is it worthwhile?**

- Are anticipated differences in economic resource utilization meaningful from a societal perspective?
- Will adding an economic component influence clinical practice or health policy?
- Is collecting of good economic data feasible within the context of the overall trial design?
- Does the trial design have external validity from an economic perspective?

**General Strategy:**
- Capture baseline information on all participants
- Track resource utilization (big ticket items) for participants
- Estimate costs from resource utilization using CMS data
- Nice to add some indirect cost info with baseline data collection
Proposed Economic Companion May 2020:
What is the incremental cost-effectiveness of continuation of ICI therapy for patients with metastatic bladder cancer

Schema

Cycle definition is based on ICI cycle length

<table>
<thead>
<tr>
<th>RANDOMIZE</th>
<th>Arm A: Continue immune checkpoint inhibitor (ICI)* until disease progression or unacceptable toxicity</th>
<th>Disease progression or toxicity</th>
<th>Treat at physician’s discretion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm B: Discontinue ICI treatment</td>
<td>Disease progression</td>
<td>Option to restart ICI</td>
<td></td>
</tr>
</tbody>
</table>
Current state:
Infeasible to integrate economic companions alongside clinical trials

Reference Number: P4631901_000PCONS01
Protocol Consensus Review:
Date: 06/09/2020
NCI Protocol #: 4631901
Local: 4631901
Version Date: 05/04/2020
Principal Investigator: Xiao X. Wei, MD, Masters

Monica Marie Bertagnolli, MD
Alliance for Clinical Trials in Oncology
75 Francis Street
Boston, MA 02115

Dear Dr. Bertagnolli:

Your Protocol, “Duration of Immune Checkpoint Therapy in Locally Advanced or Metastatic Urothelial Carcinoma: A Randomized Phase 3 Non-Inferiority Trial,” NCI Document # A031901, was reviewed by the Protocol Review Committee (PRC) of the Cancer Therapy Evaluation Program (CTEP) on 05/20/2020. The PRC requests that you address the comments in the enclosed Consensus Review. Each comment falls into one of the following categories:

- Comments from CTEP or Pharmaceutical Collaborator requiring a Response: For each comment, please make suitable revisions in the protocol; or, if you disagree with the reviewers, provide the reasons for not making the suggested revision(s) in the summary of changes that accompanies the revised protocol.
- Recommendations from CTEP or Pharmaceutical Collaborator: These comments are advisory and you are not obligated to make these changes. However, the PRC requests that you consider whether they would improve your study.

In the summary of changes embedded in your revised protocol, please address each numbered comment point by point. Your response to each comment should appear in bold directly below the specific comment from the Consensus Review. Include the section(s) where the changes are located in the revised protocol or informed consent and hyperlink them to comply with CTEPs electronic submission policy. A copy of the informed consent (regardless of whether changes have been made to it or not) must be submitted. All changes to the protocol or informed consent must be detailed in the summary of changes. Submissions that do not respond point by point will be returned to the Investigator without re-review. Please be advised that changes to the protocol outside of those requested by NCI may delay re-review and could jeopardize activation by the OEWG deadline.

In addition, an unofficial copy of the protocol with administrative comments already inserted into the protocol or informed consent via Track Changes may be attached. The comments inserted into the unofficial copy of the protocol or informed consent have been highlighted in yellow in the section field of the consensus review for easy identification between the two documents. To respond to those changes that

5. 14.1.1, 14.1.2, 14.1.3

PI response:
The investigators noted the inclusion of health economics and healthcare utilization. Both should be deleted from the protocol. Neither CTEP nor DCP provides funding for these studies.

Are Cost Effective Analysis (CEA) studies eligible for BIQSFP funding?
NO... CEA studies are no longer eligible for BIQSFP funding. NCI is exploring other mechanisms through which CEA studies may be supported, outside the BIQSFP program.
Strategies to Get Economic Data on Indirect Costs Exist

Direct Medical Costs
- Resource Utilization from EHRs or Patient Reporting
- Use Administrative data to estimate costs

Indirect medical costs
- Surveys of trial participants (with consistent elements across studies)

Indirect costs
- New data linkages
- Surveys of trial participants/caregivers
<table>
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<tr>
<th>The Fundamental Research Question</th>
<th>Transformational Intervention</th>
<th>Desired State/Outcome</th>
</tr>
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</table>
| What is the ICER of Treatment A vs. Treatment B? | Provide clear mechanism to support integration of economic analyses alongside clinical trials | Straightforward to integrate CEA into relevant RCTs  
Cross-trial comparisons are possible |
| What does it cost the health system to deliver 1 month, 1 year, typical course of this treatment? | Develop standard methods that facilitate comparisons across treatments | Costs for delivering standardized units of all cancer treatments are available in league tables—downstream pressure on prices |
| What does it cost the patient to obtain 1 mo, 1 year, typical course of this treatment in terms of time? | Develop/deploy standard methods to estimate the economic burden of treatment. Eg: 4 visits, 16 hours per month | Patients have access to clear information about what it takes to get a specific treatment over standardized courses |
| What does it cost the patient to obtain 1 mo, yr, typical course of this treatment in terms of $$ | Develop/deploy standards based on CMS pricing and average co-pay/coinsurance. | Patients have access to clear information about what it costs to get a treatment over standardized courses (adjustable based on plan-specific cost-sharing requirements) |
| What does it cost society to have patients get this treatment with respect to productivity? | Develop/deploy standard methods to estimate missed work/return to work usual activities | Society and employers paying for Rx are able to compare treatments in terms of anticipated lost productivity |
| How do economic factors influence treatment outcomes? | Deploy standardized evaluations that include Social Determinants of Health for all trial participants—more important than the bilirubin and CTCAE grading! | The risk of disparate outcomes can be identified from RCT experience and remediation strategies introduced to mitigate risk of exacerbating disparities |
Thanks!

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