The Cost – Outcomes Tension in Community Oncology Practice

JR Hoverman MD, PhD
VP Quality Programs, Texas Oncology
The Untold Story of Those Who Survived the Great American Dust Bowl

The WORST HARD TIME

TIMOTHY EGAN

Read by Patrick Lawlor

UNABRIDGED

Texas Oncology

During and shortly after WWI the government paid $2 per bushel for wheat. Millions of acres of the High Plains were plowed and planted. After the war the price of wheat plummeted. In order to meet notes and make profits, millions more marginal acres of prairie sod were turned over. Even so it was possible to make more than the President.
Then, in the summer of 1931, the weather changed.
Clinical Trial

\[ x\{I (a_1+a_2+a_3 \ldots a_n+b)\} \rightarrow O_1 \]

\[ y\{I (a_1+a_2+a_3 \ldots a_n+b+c)\} \rightarrow O_2 \]

\[ y\{I (a_1+a_2+a_3 \ldots a_n+b+c)\} \rightarrow O_2 \]

\[ -x\{I (a_1+a_2+a_3 \ldots a_n+b)\} \rightarrow O_1 \]

\[ \sqrt{c} \quad P \quad O_2-O_1 \]
Subjective Evidence

\[ I (a_1 + a_2 + a_3 \ldots a_n) + b + c \rightarrow O_1 \]
\[ I (a_1 + a_2 + a_3 \ldots a_n) + b + d \rightarrow O_2 \]
\[ I (a_1 + a_2 + a_3 \ldots a_n) + b + e \rightarrow O_3 \]
Value Formula

\[ V = \frac{O}{C} \]
Relative Value

RV1 = O1/C1
RV2 = O2/C2
RV3 = O3/C3
The judge of the relative value of an intervention is first and foremost the patient.

The determinant of that value depends on both empiric and subjective evidence.
Quality

- Quality is that which distinguishes one process from another by enhancing relative value.

- Reducing costs while maintaining empiric and subjective outcomes improves quality.
Relative Value

RV1 = O1/C1 distributive justice
RV2 = O2/C2 physician/hospital income
RV3 = O3/C3 employer competitiveness
RV4 = O4/C4 shareholder value
RV5 = O5/C5 Special Interest Groups
Delivery Metrics: What would constitute system failure?

- Wrong treatment
- Unsafe
- Don’t respect my time, don’t respect me
- Not informed and not participating
- Poor symptom control
- Not dying “in place”
2003 Develop a uniform web-based reporting tool for medication occurrences. Reporting available to any practice

2004 Practice Quality and Efficiency (PQE)

2005 QOPI

2005 Level 1 Pathways for Medical Oncology and Hematology: evidence, toxicity, cost to patient

2009 Innovent Oncology: Pathways, telephonic call system with OCN certified nurse for support for self-management with chemotherapy, Advance Care Plans

2010 800+ Medical Oncologists using a single EHR (iKnowMed – iKM)
Service Metrics: PQE: Lean/Six Sigma

- Reduction in wait times
- Reduced lab cycle times
- Reduced peak flow in infusion rooms
- Eliminated returns to waiting room after vital signs, port draws
- New patient appointments within 2 days
- Re-engineered MD, lab, infusion processes to enhance ideal patient flow

MD Comment: The atmosphere in the clinic is so much better.
Three Phase Development Approach:
- Evaluate Strongest Clinical Evidence for comparable drugs
- Compare Toxicity Profile
- If drugs are clinical equivalent, least costly drug becomes ON-Pathway option

Apply 80/20 Rule:
- Recommend therapies that work for the majority of patients

Clinical trials always considered On-Pathway:
- Current health plan precertification workflows remain unchanged
- Coverage is subject to employer benefit guidelines/limitations

Generally offer Pathways choices for 1st, 2nd, and 3rd line in advanced setting Point-of-care Pathways clinical decision tools provided:
- US Oncology Practices - iKnowMed US Oncology’s EMR
- Non-US Oncology Practices - Web Based Portal

Pathways are reviewed on quarterly basis:
- Participating oncologists are encouraged to provide feedback
# Level I Pathways Development

## A More Precise Approach

<table>
<thead>
<tr>
<th><strong>Level I Pathways</strong></th>
<th><strong>Other Guidelines/Labels</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Regimens are generally recommended in step-wise sequence by Lines of Therapy</td>
<td>General panel of options only. No sequence or preference among options stated.</td>
</tr>
<tr>
<td>Lines of Therapy are limited</td>
<td>NO limits in Lines of Therapy</td>
</tr>
<tr>
<td>Costs to patients and payers are considered.</td>
<td>Costs to patients and payers are NOT considered.</td>
</tr>
<tr>
<td>Structured with implementation tools and feedback mechanism to ensure consistent quality of care.</td>
<td>Generally not associated with point of care ordering, reporting and feedback structure.</td>
</tr>
</tbody>
</table>
Level I Pathways – Physician Performance

# Regimens: 30

### Breast Cancer Pathway
- **On-Pathway:** 92%
- **Off-Pathway:** 1%
- **Missing:** 0%
- **Conflicting:** 0%

### Colon Cancer Pathway
- **On-Pathway:** 100%
- **Off-Pathway:** 0%
- **Missing:** 0%
- **Conflicting:** 0%

### Non Small Cell Lung Cancer Pathway
- **On-Pathway:** 60%
- **Off-Pathway:** 20%
- **Missing:** 0%
- **Conflicting:** 0%

### Other Pathways
- **On-Pathway:** 73%
- **Off-Pathway:** 13%
- **Missing:** 0%
- **Conflicting:** 0%

### % Pathway Adherence - All Pathways Rolling 6 Months
- **Monthly Adherence**
  - 10%
  - 20%
  - 30%
  - 40%
  - 50%

- **Avg Adherence**
  - 60%
  - 70%
  - 80%
  - 90%
  - 100%

### Off-Pathway Exception Reasons For All Pathways

#### Number of Off Pathway cases:
- **0%**
- **0%**
- **0%**
- **0%**
- **100%**

- **Patient Clinical Factors:** 0%
- **Scenario Not Addressed:** 0%
- **External Reconciled:** 0%
- **Disagreed w/Pathway:** 0%
- **Undocumented:** 0%

% Exceptions Documented = 0%
Premier Standard = 10%
Level I Pathways – Physician Performance

### Level I Pathways - Physician Performance

**10/01/2010 - 12/31/2010**

![Level I Pathways Diagram](image)

**Breast Cancer Pathway**
- On-Pathway: 58%
- Off-Pathway: 22%
- Missing: 22%

**Colon Cancer Pathway**
- On-Pathway: 100%
- Off-Pathway: 0%
- Missing: 0%

**Non Small Cell Lung Cancer Pathway**
- On-Pathway: 60%
- Off-Pathway: 0%
- Missing: 0%

**Other Pathways**
- On-Pathway: 67%
- Off-Pathway: 17%
- Missing: 17%

### Pathway Adherence

<table>
<thead>
<tr>
<th>Month</th>
<th>Avg Adherence</th>
<th>Monthly Adherence</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8/2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9/2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/2010</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Number of Off Pathway cases:** 3

### Off-Pathway Exception Reasons

- Patient Clinical Factual
- Scenario Not Add.
- External Reasons
- Disagrees With Path
- Other
- Undocumented

% Exceptions Documented = 0%
Premier Standard = 10%
Cost-Effectiveness of Evidence-Based Treatment Guidelines for the Treatment of Non-Small-Cell Lung Cancer in the Community Setting

By Marcus A. Neubauer, MD, J. Russell Hoverman, MD, Michael Kolodziej, MD, Lonny Reisman, MD, Stephen K. Gruschkus, PhD, MPH, Susan Hoang, PharmD, Albert A. Alva, MEd, Marilyn McArthur, MS, Michael Forsyth, RPh, Todd Rothermel, and Roy A. Beveridge, MD

Kansas City Cancer Center, Overland Park, KS; Texas Oncology, Austin; US Oncology, Houston, TX; New York Oncology Hematology, Albany, NY; Aetna Informatics; and Aetna, Hartford, CT

Abstract

Purpose: The goal of this study was to evaluate the cost-effectiveness of Level I Pathways, a program designed to ensure the delivery of evidence-based care, among patients with non-small-cell lung cancer (NSCLC) treated in the outpatient community setting.

Patients and Methods: We included patients with NSCLC initiating a chemotherapy regimen between July 1, 2006, and December 31, 2007, at eight practices in the US Oncology network. Patients were characterized with respect to age, sex, stage, performance status, and line of therapy and were classified by whether they were treated according to Level I Pathways effectiveness acceptability curves were used to evaluate the cost-effectiveness of Level I Pathways.

Results: Overall, outpatient costs were 35% lower for on-Pathway versus off-Pathway patients (average 12-month cost, $18,042 vs $27,737, respectively). Costs remained significantly less for patients treated on Pathway versus off Pathway in the adjuvant and first-line settings, whereas no difference in overall cost was observed in patients in the second-line setting. No difference in overall survival was observed overall or by line of therapy. In the net monetary benefit analysis, after adjusting for potential confounders, we found that treating patients on Pathway was cost effective across a plausible range of willingness-to-pay thresholds.
Level I Pathways – related savings*

- 37% reduction in chemotherapy costs
- 35% reduction in total medical oncology costs
- Total Savings: On vs. Off-Pathway = $9,695 per patient

<table>
<thead>
<tr>
<th></th>
<th>On-Pathway Treatment (N=1,095)</th>
<th>Off-Pathway Treatment (N=314)</th>
<th>Cost Savings (On vs. Off )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Med Oncology Cost</td>
<td>$18,042</td>
<td>$27,737</td>
<td>$9,695</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>$11,839</td>
<td>$18,762</td>
<td>$6,923</td>
</tr>
<tr>
<td>Oncology–related Outpatient visits</td>
<td>$1,124</td>
<td>$1,060</td>
<td>$64</td>
</tr>
<tr>
<td>Supportive Care Medications</td>
<td>$4,374</td>
<td>$7,198</td>
<td>$2,824</td>
</tr>
</tbody>
</table>

* Neubauer, et al., Cost Effectiveness of Evidence-Based Treatment Guidelines for the Treatment of Non Small Cell Lung Cancer in the Community Setting. JOP 2010;6:1
The Downside

Virginia Mason Back Pain Program: A troublesome pattern – the more cost effective it became, the bigger the financial hit the medical center took.

Losing $200 per case due to decrease in MRI use
Solution (partial)

Negotiate with payers (Aetna) to pay more for less expensive treatments. (in this case Physical Therapists)

Volume (must be combined with efficiencies)
Metastatic Breast Pathway

**Patient Case:**

A.B., has received several therapies for her Stage IV, ER-, PR-, HER2- mbc to the liver, lung, and pleura. Karnofsky PS is 70%. Pleural effusions are controlled with an external drain, but LFTs have recently increased with bilirubin WNL but AST/ALT ~2x ULN. Her previous treatments include:

- **1st-line** bevacizumab + paclitaxel x 8 mos; d/c due to Gr2 neuropathy and PD
- **2nd-line** Clinical Trial with gemcitabine + carboplatin + investigational tx x 6 mos; d/c due to PD
- **3rd-line** capecitabine x 5 mos; d/c due to PD
- **4th-line** vinorelbine x 3 mos; d/c due to PD
- **5th-line** liposomal doxorubicin x 2 mos; d/c due to PD and increased LFTs
What would you consider next?

1. Alternative taxane – nab-paclitaxel, docetaxel
2. Ixebepilone (Ixempra)
3. Iribulin
4. Hospice
5. Advance care planning discussion
### Mitigating Factors

#### Ixabepilone + Capecitabine Study

<table>
<thead>
<tr>
<th>Baseline Patient Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Status</td>
<td>KPS 70-100% (99%)</td>
</tr>
<tr>
<td>Prior Chemotherapy Treatment</td>
<td>2 or less (95%)</td>
</tr>
</tbody>
</table>

**Key Results**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade ¾ sensory neuropathy</td>
<td>21% (65% overall)</td>
</tr>
<tr>
<td>GCSF usage</td>
<td>20%</td>
</tr>
</tbody>
</table>

**Cost (DIRECT)**

- $ Cost per QALY for ixabepilone alone = $359,000
- 60-70K for combo vs $30K for capecitabine alone

**Cost (INDIRECT)**

??

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*Patient A.B. KPS = 70%*

*Patient A.B. had 5 prior treatments*

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Thomas JCO 2007;25:5210  Reed JCO 2009;27:218
## Mitigating Factors

### Ixebeplilone monotherapy Study

<table>
<thead>
<tr>
<th>Baseline Patient Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Status</td>
<td>KPS ≥90% (100%)</td>
</tr>
<tr>
<td>Prior Chemotherapy Treatment</td>
<td>3 or less (100%)</td>
</tr>
</tbody>
</table>

- **Patient A.B.**
  - KPS = 70%
  - Had 5 prior treatments

<table>
<thead>
<tr>
<th>Key Results</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Rate</td>
<td>11.5%</td>
</tr>
<tr>
<td>Cost</td>
<td>?</td>
</tr>
</tbody>
</table>

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1. Perez et al JCO 2007;25:3407-3414
Ixabepilone in MBC

Background

- Ixabepilone reviewed 1Q2008 after approved by FDA
- Not added to MBC pathway due to:
  - *Ixabepilone + Capecitabine vs. Capecitabine* (Phase III data)
    - Limited PFS - improved by only 1.6 months, no OS data
    - Notable toxicities - grade 3/4 neutropenia (68%), neuropathy (21%), and death (3%)
  - *Black box warning in hepatic impairment if AST or ALT > 2.5x ULN or bilirubin > 1x ULN*
  - *Ixabepilone monotherapy* (Phase II data only)
    - Had not been compared to other drugs
    - Limited efficacy: RR of 12% and median TTP of 2.2 months, no OS data
Pathways Potential

- Include consultation recommendations on Pathways, including Advance Care Planning
- Integrate Medical, Radiation and Surgical Oncology Pathways
- Retrospective review of multidisciplinary treatment of specific diseases
- Patient portal
- Defines the role of a patient navigator/support nurse
Where things can go wrong...

1. Difficulty Comprehending the Disease
2. Insufficient Understanding of Treatment & Side Effects
3. Succumb to Side Effects
4. Adverse Event

Diagnosis

- Emotional Distress
- Information Overload

Side Effects 1

- Nausea/Vomiting
- Fatigue
- Diarrhea
- Dehydration

Treatment

- Surgery
- Chemotherapy
- Radiation

Side Effects 2

- Anemia
- Anorexia
- Fever
- Pain

Restart Rx

- New Therapy
- Disease Progression
- Anxiety

Hospitalization

- Adverse Event

Deterioration of Patient Health Status Between Treatments

Patient Support Services begins

High Cost Therapies & Tx Combinations

Struggle to Manage Side Effects

Lost Therapy
Lack of communication between patients, families and care providers

- End-of-life discussions are difficult with high patient and family anxiety
- Patient and family wishes about end of life treatments often unknown, resulting in treatments the patient really may not want
- Patient decisions and preferences should be documented regardless of disease outcome

Aggressive treatment in last 30 days of life result in costly resource use
Headwinds

- National average practice size: 3-4
- Median drop in oncology practice income 2007-2008: 25%
- Seeing more new patients (380+ per year)
- Most practices are single specialty
- Even within practices, software platforms do not talk to each other: med onc, rad onc, urology, pathology, imaging, practice management - all different
- Reimbursement structure