Cancer Care in the Veterans Health Administration

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ECRI Annual Conference, Cancer Care Delivery in a Rapidly Changing Healthcare System
Washington DC, November 17-18, 2015
How Well Do You Know the VA?

• Veterans: 22 million, ~9% female, 22% minority
• VA composed of VHA, VBA, National Cemeteries
• VHA enrolled Veterans: 9.11 million (Aug ‘15)
• VA Hospitals: 144
• VA Outpatient sites: 1203
• ~50,000 new cancer cases per year
  – 3.5% of national total
• Well established, integrated EHR
OBAMA VOWS ACTION ON ANY VA 'MISCONDUCT'

VA CHIEF: 18 VETS LEFT OFF WAITING LIST HAVE DIED

VA SECRETARY ROBERT MCDONALD: 'I WILL DO BETTER'
How Does Quality of Oncology Care in VA Compare to Rest of US?

• Better
• Worse
• About the same
Quality of Care for Older Patients With Cancer in the Veterans Health Administration Versus the Private Sector

• CRC: diagnosed at earlier stage
• Colon: higher rate of curative-intent surgery
• DLBCL: higher rate of standard chemotherapy
• Myeloma: higher rate of bisphosphonate
• Prostate: lower use of IMRT or 3D-CRT
• 9 other measures: similar
• Conclusions:
  – VHA system generally similar to or better than care for fee-for-service Medicare beneficiaries
  – adoption of some expensive new technologies may be delayed in the VHA

VHA – VistA Background

VistA is:

- Single, integrated Computerized Patient Record System (CPRS) used throughout VHA in all health care settings (Inpatient, Outpatient, Long-term care)
- Delivers an integrated record covering all aspects of patient care and treatment
- Implemented in late 1990s
Cancer Screening Rates: VA vs non-VA

Source: 2010 VHA Facility Quality and Safety Report, June 2010
Breast Care Registry (BCR) BCR Link

- BCR provides longitudinal tracking of mammograms and other tests related to breast cancer screening.
RESULTS: Surgical Treatment

<table>
<thead>
<tr>
<th>Type of SURGICAL TREATMENT</th>
<th>Blacks</th>
<th>Whites</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lobectomy</td>
<td>76%</td>
<td>76%</td>
<td>0.91</td>
</tr>
<tr>
<td>Wedge Resection</td>
<td>13%</td>
<td>13%</td>
<td>0.56</td>
</tr>
<tr>
<td>Pneumonectomy</td>
<td>5%</td>
<td>6%</td>
<td>0.15</td>
</tr>
<tr>
<td>Other</td>
<td>7%</td>
<td>5%</td>
<td>0.01</td>
</tr>
<tr>
<td>30-day mortality</td>
<td>2%</td>
<td>2%</td>
<td>0.10</td>
</tr>
</tbody>
</table>

MINI06-06 Early-stage lung cancer treatment and survival: impact of race—Michael J. Kelley
Results: Overall survival by treatment

- Surgical tx (Blacks): HR: 0.90(0.83-0.97)
- Surgical tx (Whites): HR: 1.00
- NonSurgical tx (Blacks): HR: 0.83(0.76-0.91)
- NonSurgical tx (Whites): HR: 1.00
- No tx (Blacks): HR: 0.91(0.82-1.00)
- No tx (Whites): HR: 1.00
Adjuvant Chemotherapy Use by Time Period: 2001-2008

Stages IB-III surgically resected NSCLC

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>IB</td>
<td>3</td>
<td>24</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>10</td>
<td>39</td>
<td>47</td>
<td>1674</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>22</td>
<td>40</td>
<td>46</td>
<td></td>
<td>2482</td>
</tr>
</tbody>
</table>
Overall Survival with use of Adjuvant Chemotherapy (AC)

By stage and time period

Hazard Ratios, reference = No chemotherapy

No AC (ref) 01-03 04-05 06-08
Stage IB
0.82
0.54

01-03 04-05 06-08
Stage II
0.73
0.68
0.75

01-03 04-05 06-08
Stage III
0.97
0.69
0.78
Overall Survival Regardless of Adjuvant Chemotherapy

By Time Period and Stage

Hazard Ratios, reference = 2001-2003

Stage IB: 0.88 0.82
Stage II: 0.96 0.77
Stage III: 0.92 0.74
Overall Survival: Cisplatin vs Carboplatin, 2006-2008 diagnoses

- Unadjusted log-rank $P$: 0.41 (Cis)
- Unadjusted log-rank $P$: 0.003 (No PB AC)

Adjusted HR for Cis (ref=Carbo): 0.94 (0.75-1.16)
Adjusted HR for No PB AC (ref=Carbo): 1.87 (1.31-2.66)
Adjuvant Chemotherapy in the Elderly (Age >= 70 years)

• Less frequent use of AC (30.4% vs 13.9%)
• Less frequent use of cisplatin-based AC (26.8% vs. 14.1%)
• Similar effectiveness of AC
  – <70 yr: HR = 0.73 (0.67 – 0.81)
  – >= 70 yr: HR = 0.76 (0.66 – 0.87)
• Cisplatin-based AC associated with improved survival relative to carboplatin-based only in elderly 0.65 (0.43 – 0.99)
Chemotherapy in Locally Advanced (Stage III) NSCLC

- Currently treated with concurrent combined chemotherapy and radiotherapy
- In US, cisplatin-etoposide (SWOG regimen) is one of the NCCN preferred regimens
- Weekly carboplatin-paclitaxel is commonly used in US, but not preferred by NCCN
- Goal: to compare effectiveness and toxicity of EP vs CP chemotherapy when combined with radiation for stage III NSCLC
NSCLC Stage III EP vs CP: Propensity Matching – Survival

HR 1.01, 95% CI 0.86-1.2, p=0.87
## NSCLC Stage III EP vs CP: Complications

<table>
<thead>
<tr>
<th>Outcome*</th>
<th>Carboplatin</th>
<th>Cisplatin</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalizations (mean, SD)</td>
<td>1.7 (1.9)</td>
<td>2.6 (2.4)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>LOS in days (mean, SD)</td>
<td>10.8 (13.1)</td>
<td>10.3 (13.8)</td>
<td>0.6549</td>
</tr>
<tr>
<td>Outpatient visits (mean, SD)</td>
<td>12.2 (6.6)</td>
<td>16.4 (9.5)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

At least one encounter for any of the following complications (N (%))*

<table>
<thead>
<tr>
<th>Complication</th>
<th>Carboplatin</th>
<th>Cisplatin</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infectious</td>
<td>415 (39.3%)</td>
<td>186 (48.9%)</td>
<td>0.0011</td>
</tr>
<tr>
<td>Acute Kidney Injury/Dehydration</td>
<td>415 (21.3%)</td>
<td>186 (48.9%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Nausea/Vomiting</td>
<td>85 (8.1%)</td>
<td>54 (14.2%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Esophagitis/Mucositis</td>
<td>157 (14.9%)</td>
<td>79 (20.8%)</td>
<td>0.0077</td>
</tr>
<tr>
<td>Any of the above</td>
<td>583 (55.3%)</td>
<td>257 (67.6%)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>
EP vs CP Chemoradiotherapy for Stage III NSCLC: Conclusions

• CP and EP are the most commonly used concurrent chemotherapy regimens in VHA
• Use of EP vs CP is variable among VHA providers
• EP is typically used for patients with better prognostic covariates
• Use of EP is not associated with a survival advantage
• EP use is associated with a higher degree of adverse events
Epidermal growth factor receptor (EGFR) mutation testing and erlotinib treatment among Veterans diagnosed with lung cancer

Lynch JA1, Berse B2, Chun D1,3, Freedman A4, Filipski KK4, DuVall SL1,3, Kulich S5, Kelley M6,7

1VA Salt Lake City Health Care System, Salt Lake City, UT, 2 Boston University Medical School, Boston, MA, 3University of Utah School of Medicine, Salt Lake City, UT,
4National Cancer Institute, Rockville, MD, 5Veterans Health Administration, Pittsburgh, PA, 6Duke University, Durham, NC, US, 7Department of Veterans Affairs, Durham, NC

World Conference on Lung Cancer, Denver, CO, September 8, 2015
Figure 1. Incidence of EGFR mutation among Veterans

- No mutation present, 632, 65%
- Non activating single-nucleotide polymorphisms, 171, 17%
- Activating mutations, 51, 5%
- Tumor not present in tissue, 40, 4%
- Variants of unknown significance, 8, 1%
- Result not reported in record, 75, 8%
Figure 2. Comparison of trends in erlotinib treatment and EGFR testing

- Erlotinib prescription filled
- Patients treated with erlotinib
- EGFR tests
Conclusions

• Veterans have a much lower rate of clinically actionable EGFR mutations (5.5%) than the reported average rate of 15%.

• Among Veterans diagnosed with lung cancer, 47% are current smokers, 33% are former smokers, which may explain the low rate of EGFR mutations.

• Increased use of EGFR testing resulted in decreased use of erlotinib treatment.

• Erlotinib continues to be used for compassionate use to treat patients who progress on standard treatment yet who lack EGFR mutations.