SEER 2014

TNM Training Needs Assessment Study

Availability of Cancer Staging Information at the Time of Registration

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1. Background
2.Goals of this analysis
3. Study design & Methods
4. Results
5. Discussion
Background

- In 2016, the registry community began directly assigning staging elements based on AJCC staging system.

- Stage reported by the physician is critical since it is the basis for clinical decision making:
  - Cancer registrars obtain information from the medical records available to them at the time of registration.
  - General guidance is to transcribe information given by the physician in the medical record.
  - If the stage or an element is not available, then the registrar is to assign from available information.
Background

- Challenge: Cancer stage evolving during diagnostic workup

Lung tumor diagnostic and staging workup

Diagnostic workup

- PE, chest CT
- Bronchoscopy
- Brain MRI
- Surgical thoracoscopy

Physician assigning stage elements as info becomes available

Registrar retrospectively reviews all info
Research Question

- Feasibility of using T, N, M and stage group available in the hospital medical record to automatically assign AJCC TNM stage

1. Availability of these data elements in the medical record
   - Issues of selecting the best value among multiple
2. Agreement between physician and registrar-assigned values
3. What source documents may be most reliable
Study Design

Original case files: Breast, colon, lung, ovary, prostate
2013 diagnosis year
56 for each site, 280 total

- Redact documented staging info from medical records

Pathologic T, N, M
Clinical T, N, M
AJCC 7th group stage (P & C)
SS2000
PSA & Gleason (not redacted)

- Participant reviews cases and assigns staging elements

2 reviewers assign staging elements

- 3rd reviewer adjudicates

- Keep redacted info for analysis

- 100 cases for special review
Methods: T, N, M and Stage Group Data

- Consolidated answer
  - Determined by CTR panel by review of the full medical record
  - T, N and stage group experts provided clinical and pathologic stage separately
- M
  - M1 is either cM1 or pM1
  - M0 otherwise
Methods: T, N, M and Stage Group Data

- Physician-assigned
  - If available, taken from the medical record
  - All data elements from each record were classified as
    - No occurrence
    - One occurrence: Same value could appear more than once
    - More than one occurrence: Different values
Methods: Source Document Classification

- For a random subset of 100 cases (20 per cancer site)
- Each physician-assigned T,N,M, stage group value was categorized according to the type of source document that included the value
- Source document categories
  - Oncology consult
  - Surgical consult
  - Radiation Oncology consult
  - Other consult, PE
  - Imaging reports
  - Invasive staging reports
  - Operative reports (resection)
  - Path report/ staging form
  - Discharge summary
Methods: Analysis

1. Frequency of physician-assigned stage elements
   - By stage and cancer site
   - Collected for each medical record (N=282)

2. Agreement between physician-assigned and consolidated answer
   - Among records with just one value
   - Number of records varies by data element

3. Agreement by document type
   - By document type and data element
   - Number of records varies by document type and data element
Results: Availability of data elements

Clinical T
- Breast (n=57)
- Colon (n=56)
- Lung (n=56)
- Ovary (n=56)
- Prostate (n=57)

Pathologic T
- Breast (n=57)
- Colon (n=56)
- Lung (n=56)
- Ovary (n=56)
- Prostate (n=57)

Clinical N
- Breast (n=57)
- Colon (n=56)
- Lung (n=56)
- Ovary (n=56)
- Prostate (n=57)

Pathologic N
- Breast (n=57)
- Colon (n=56)
- Lung (n=56)
- Ovary (n=56)
- Prostate (n=57)
Results: Availability of data elements

- **Clinical/Path M**
  - Breast (n=57)
  - Colon (n=56)
  - Lung (n=56)
  - Ovary (n=56)
  - Prostate (n=57)

- **Clinical Stage Group**
  - Breast (n=57)
  - Colon (n=56)
  - Lung (n=56)
  - Ovary (n=56)
  - Prostate (n=57)

- **Pathologic Stage Group**
  - Prostate (n=57)
Results: Agreement between physician-assigned and consolidated answer
Results: Agreement between physician-assigned and consolidated answer
Results: Agreement between physician-assigned and consolidated answer

[Graph showing agreement percentages for Pathologic T, Pathologic N, and Pathologic Stage Group]
## Results: Agreement by Source Document

<table>
<thead>
<tr>
<th>Source Document Category</th>
<th># reports</th>
<th>Agreement with consolidated answer</th>
<th># reports</th>
<th>Agreement with consolidated answer</th>
<th># reports</th>
<th>Agreement with consolidated answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oncology consult</td>
<td>6</td>
<td>83%</td>
<td>5</td>
<td>80%</td>
<td>6</td>
<td>33%</td>
</tr>
<tr>
<td>Surgical consult</td>
<td>8</td>
<td>50%</td>
<td>5</td>
<td>60%</td>
<td>6</td>
<td>67%</td>
</tr>
<tr>
<td>Radiation oncology consult</td>
<td>10</td>
<td>40%</td>
<td>9</td>
<td>78%</td>
<td>5</td>
<td>100%</td>
</tr>
<tr>
<td>Other consults, PE, notes</td>
<td>14</td>
<td>36%</td>
<td>3</td>
<td>33%</td>
<td>8</td>
<td>50%</td>
</tr>
<tr>
<td>Imaging reports</td>
<td>1</td>
<td>100%</td>
<td>0</td>
<td>N/A</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Invasive staging reports</td>
<td>2</td>
<td>0%</td>
<td>2</td>
<td>50%</td>
<td>2</td>
<td>50%</td>
</tr>
<tr>
<td>Operative report (resection)</td>
<td>1</td>
<td>100%</td>
<td>1</td>
<td>100%</td>
<td>4</td>
<td>25%</td>
</tr>
<tr>
<td>Path report/staging form</td>
<td>2</td>
<td>100%</td>
<td>3</td>
<td>33%</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>Discharge summary</td>
<td>1</td>
<td>100%</td>
<td>1</td>
<td>100%</td>
<td>3</td>
<td>67%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>45</strong></td>
<td><strong>51%</strong></td>
<td><strong>29</strong></td>
<td><strong>66%</strong></td>
<td><strong>37</strong></td>
<td><strong>59%</strong></td>
</tr>
</tbody>
</table>
## Results: Agreement by Source Document

<table>
<thead>
<tr>
<th>Source Document Category</th>
<th>Pathologic T</th>
<th>Pathologic N</th>
<th>Pathologic Stage Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td># reports</td>
<td>Agreement with consolidated answer</td>
<td># reports</td>
</tr>
<tr>
<td>Oncology consult</td>
<td>15</td>
<td>87%</td>
<td>13</td>
</tr>
<tr>
<td>Surgical consult</td>
<td>10</td>
<td>100%</td>
<td>11</td>
</tr>
<tr>
<td>Radiation oncology consult</td>
<td>7</td>
<td>100%</td>
<td>7</td>
</tr>
<tr>
<td>Other consults, PE, notes</td>
<td>6</td>
<td>100%</td>
<td>5</td>
</tr>
<tr>
<td>Imaging reports</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>Invasive staging reports</td>
<td>2</td>
<td>100%</td>
<td>2</td>
</tr>
<tr>
<td>Operative report (resection)</td>
<td>1</td>
<td>100%</td>
<td>0</td>
</tr>
<tr>
<td>Path report/staging form</td>
<td>58</td>
<td>79%</td>
<td>56</td>
</tr>
<tr>
<td>Discharge summary</td>
<td>6</td>
<td>67%</td>
<td>6</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>105</strong></td>
<td><strong>85%</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Discussion

- Provider-assigned stage not available in general, less available for clinical stage, better availability for tumors with recommendation for surgical resection
- Registrars cannot simply transcribe information from the medical records because
  - Clinical or pathologic T,N,M, stage group most often not assigned by providers
  - Multiple, slightly different stage categories across various source documents of the same medical record
  - Inconsistencies between T,N,M and stage assigned across various source documents of the same medical record
- Using provider-assigned stage is unlikely to save significant time for registrars
Discussion

- Pathologic T and N higher agreement than clinical T and N
  - Reflection that pathologic staging occurs later and uses more information
  - Consistent with most reference manuals that recommended assigning the highest level of certainty to pathologist statements

- Sensitivity analysis of agreement after collapsing into broad categories of T, N, M
  - Some improvement but loss of granularity
  - Stage group did not improve much
Discussion

- Consultation notes
  - High agreement with consolidated answer
  - Not often in hospital record
  - Probably created later in the diagnostic process
  - Limited utility since often in the physician office
    - Unless hospital and physician on same EMR

- Pathology reports
  - MX is not a valid value but used in about 25% of assignments
  - Problems with T were mostly in the substages
Conclusion

- Cancer registrars abstracting new cases need to assign stage using all available information in the medical record
  - When available in certain source documents, registrars may use provider-assigned clinical stage, and should use provider-assigned pathologic stage
- Central registries often have no access to medical records, thus provider-assigned codes are not available (unless documented in text fields)
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