International Cancer Staging

“The Need for a Simplified Stage Language”

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Cancer Staging

To effectively care for any patient with cancer it is essential to consider three factors;

1. The site of origin of the cancer (e.g. lung, prostate, breast);

2. The histologic/biologic characteristics (e.g. NSCL v Small Cell lung, Gleason 8 adenocarcinoma, receptor status);

3. The extent of the cancer or its stage
   - The globally accepted method of describing anatomical extent of cancer is the TNM Classification.
The Objectives of Staging

- To aid in the planning of treatment
- To give some indication of prognosis
- To assist in evaluation of the results of treatment
- To facilitate the exchange of information and aid research
- To contribute to research
- To support cancer control activities
Distribution of cancer stage at diagnosis for top 4 disease sites in 2008, 6th edition TNM

<table>
<thead>
<tr>
<th>Disease Site</th>
<th>IV</th>
<th>III</th>
<th>II</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>BREAST</td>
<td>5%</td>
<td>15%</td>
<td>38%</td>
<td>42%</td>
</tr>
<tr>
<td>CRC</td>
<td>20%</td>
<td>29%</td>
<td>30%</td>
<td>22%</td>
</tr>
<tr>
<td>LUNG</td>
<td>48%</td>
<td>27%</td>
<td>6%</td>
<td>19%</td>
</tr>
<tr>
<td>PROSTATE</td>
<td>8%</td>
<td>11%</td>
<td>80%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Brierley et al.  
Healthcare Quarterly  
Vol.16 No.3 2013
Use of population stage data

- Survey of providers of stage data and users
  - Provincial and Canadian Cancer Registries
  - Researchers known to have performed population based stage data
    - Epidemiologists
    - Provincial cancer service providers and cancer control analysts
## Results

<table>
<thead>
<tr>
<th>Research type</th>
<th>Stage Group</th>
<th>Raw Data</th>
<th>Additional Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveillance</td>
<td>96%</td>
<td>36%</td>
<td>52%</td>
</tr>
<tr>
<td>Guideline Concordance</td>
<td>93%</td>
<td>50%</td>
<td>64%</td>
</tr>
<tr>
<td>Outcome analysis</td>
<td>100%</td>
<td>58%</td>
<td>27%</td>
</tr>
<tr>
<td>Quality Management</td>
<td>93%</td>
<td>43%</td>
<td>50%</td>
</tr>
<tr>
<td>Program Planning</td>
<td>91%</td>
<td>27%</td>
<td>36%</td>
</tr>
<tr>
<td>Screening Evaluation</td>
<td>100%</td>
<td>44%</td>
<td>33%</td>
</tr>
<tr>
<td>Clinical Research</td>
<td>100%</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td>Cross Jurisdictional Comparisons</td>
<td>85%</td>
<td>45%</td>
<td>38%</td>
</tr>
</tbody>
</table>
Population based stage data has been used in many types of cancer control activities in Canada. Stage group is invariably used. However, both raw data and additional prognostic factors have been used and are requested for further research.
To facilitate the exchange of information and aid research

We all need to speak the same language.

Pieter Brueghel the Elder – The Tower of Babel
To facilitate the exchange of information and aid research

- In the UK TNM 5th Edition is used by pathologist for colorectal cancer

- In Japan some organ site committees recommend UICC TNM (ie gastric cancer)
  Other organ site committees use their own staging system
Comparability of stage data in six countries

- Comparability of stage data in cancer registries in six countries: lessons from the International Cancer Benchmarking Partnership
- UK, Sweden, Norway, Denmark, Canada and Australia.
- One-year and five-year relative survival were lowest in the UK and Denmark, highest in Sweden, Canada and Australia, and intermediate in Norway.

S Walters et al Int J Cancer. 2013 Feb 1;132
Comparability of stage data six countries

The second phase of analysis considers whether these differences are explained by stage at diagnosis and stage-specific survival.
Comparability of stage data six countries

- Stage data only available for about 50% of cases
- Editions TNM Used: 5, 6 and 7th
- Other classifications used:
  - Dukes
  - FIGO
  - Norway - Localized, Regional, Distant
  - New South Wales - Localized, Regional, Distant
Comparability of stage data six countries

Table 1. Extract of the translation of TNM to SEER Summary Stage 2000 for lung cancer

<table>
<thead>
<tr>
<th>SEER Summary Stage 2000</th>
<th>TNM edition 7</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Localised</strong></td>
<td>Tumour involves main bronchus, 2cm or more from carina</td>
</tr>
<tr>
<td>Extension confined to main stem bronchus, 2cm or more from carina</td>
<td><em>Invades visceral pleura</em></td>
</tr>
<tr>
<td></td>
<td>Atelectasis or obstructive pneumonitis that extends to the hilar region but does not involve the entire lung</td>
</tr>
<tr>
<td></td>
<td>Atelectasis or obstructive pneumonitis of the entire lung</td>
</tr>
<tr>
<td></td>
<td>Tumour invades: Mediastinum, heart, great vessels, trachea, recurrent laryngeal nerve, oesophagus, vertebral body or carina</td>
</tr>
<tr>
<td></td>
<td>Separate tumour nodules in a different ipsilaterable lobe</td>
</tr>
<tr>
<td><strong>Regional</strong></td>
<td>T2</td>
</tr>
<tr>
<td>Atelectasis or obstructive pneumonitis</td>
<td>T3</td>
</tr>
<tr>
<td>Extension to: Visceral pleura, oesophagus, mediastinum, trachea, carina, recurrent laryngeal nerve, major vessels</td>
<td>T4</td>
</tr>
<tr>
<td>Separate tumour nodule in the same lobe</td>
<td><strong>Distant</strong></td>
</tr>
<tr>
<td></td>
<td>Extension to: Heart, vertebra(e)</td>
</tr>
<tr>
<td></td>
<td>Separate tumour nodule(s) in a different lobe</td>
</tr>
</tbody>
</table>

Geographical comparisons very complicated

T2N0M0 - localized - can be SEER Regional
T4N0M0 - localized - can be SEER Distant
Comparability of stage data six countries - Conclusions

- Comparative research would be facilitated if clinicians adhered to a common staging system, such as TNM. **TNM should remain simple enough for epidemiological research.**

- Registries should record the component T, N and M values where possible, and not just the grouped stage.

- The edition of TNM used to stage each tumour should be explicitly recorded.
Conclusion

- Even in High Income Countries international comparisons by stage are challenging
- Use TNM whenever possible
Simplified TNM

European Network of Cancer Registries

- I  Tumour localized  (TL/N0/M0)
- II Tumour with local spread  (TA/N0/M0)
- III Tumour with regional spread (any T/N+/M0)
- IV Advanced cancer (metastatic) or unresectable (any T/any N/M+)

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Simplified Proposal

- I Tumour
- II Tumour
  (any T/N0/M0)
- III Tumour with regional spread
  (any T/N+/M0)
- IV Advanced cancer
  (any T/any N/M+)

Localized
Regional
Metastatic
WHO

- The International Classification of Diseases 11th Revision is due by 2017
- ICD-11
- Will incorporate TNM stage
Paediatrics

- Consensus Meeting on Pediatric Staging for Cancer Registries
- Multinational
- NCI, IARC, UICC
Great Ocean Road