SNoMAP
Pioneering the path for clinical coding to improve patient care

Michael Lawley\textsuperscript{a}, Donna Truran\textsuperscript{a}, David Hansen\textsuperscript{a}, Norm Good\textsuperscript{a}, Andrew Staib\textsuperscript{b}, Clair Sullivan\textsuperscript{b}

\textsuperscript{a}Australian eHealth Research Centre, CSIRO

\textsuperscript{b}Princess Alexandra Hospital, Clinical Excellence Division Queensland Health
Acknowledgements

- Dr Andrew Staib
- Australian eHealth Research Centre
- Mr Michael Draheim, Mr Stephen Canaris and Metro South Health ICT
Clinical Setting

- Demand for healthcare is increasing
- No commensurate increase in resources
- We need clinical data to improve the quality and efficiency of our patient care
- Australia has a clinical coding dilemma
  - Best codeset for clinicians is not the same as the funding codeset required by the government
Clinical Background

- Emergency Medicine Coding
  - Clinical codes entered by clinicians at the point of care
  - Directly feed to reports used for hospital and ED funding
  - >1.5 million patients/year in Qld
  - Almost $1 billion in funding
<table>
<thead>
<tr>
<th>ICD</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Classification of Diseases</td>
</tr>
<tr>
<td>Administrative dataset for coding for inpatient episodes of care</td>
</tr>
<tr>
<td>Not suitable for clinical record documentation or use by clinicians *</td>
</tr>
<tr>
<td>Mandated for Australian hospital funding models</td>
</tr>
<tr>
<td>10018 terms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SNOMED</th>
<th>ICD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systematised nomenclature of medicine</td>
<td>International Classification of Diseases</td>
</tr>
<tr>
<td>Designed for use by clinicians to record documentation at the point of care</td>
<td>Administrative dataset for coding for inpatient episodes of care</td>
</tr>
<tr>
<td>Can be aggregated and repurposed for multiple uses</td>
<td>Not suitable for clinical record documentation or use by clinicians *</td>
</tr>
<tr>
<td>Used by clinicians at the point of care in Queensland digital hospitals EMR</td>
<td>Mandated for Australian hospital funding models</td>
</tr>
<tr>
<td>1 414 009 terms</td>
<td>10242 terms</td>
</tr>
</tbody>
</table>

Clinical Problem Statement

- Unless this tension between the clinician coding and the administrative requirement for funding was resolved, funding of the new digital hospital was threatened
Technical Brief

- To allow clinicians to use the most clinically appropriate dataset for patient care in a digital hospital and to satisfy reporting requirements accurately
- Existing tools were inadequate
- We needed to create an automated solution which transforms and maps clinically entered data (SNOMED) to be suitable for administrative purposes (ICD10).
- This would allow clinicians to use the dataset that is best for patients while simultaneously allowing funding requirements to be satisfied
Technical Brief: SNOMap Solution

- SNOMap is a web-based data mapping tool
- Data managers upload SNOMED coded by clinicians during an episode of care in a digital hospital
- SNOMap processes that data into ICD10 code
- Any cases that cannot be mapped are flagged for ongoing iterative improvements in accuracy
- Maps updated twice per month
SNOMED
Systematised nomenclature of medicine
Designed for use by clinicians to record documentation at the point of care
Can be aggregated and repurposed for multiple uses
Used by clinicians at the point of care in Queensland digital hospitals EMR
1 414 009 terms

ICD
International Classification of Diseases
Administrative dataset for coding for inpatient episodes of care
Not suitable for clinical record documentation or use by clinicians *
Mandated for Australian hospital funding models
10 242 terms

snoMAP
N = 80 265 unique SNOMED concepts
N = 10 242 unique ICD 10 AM codes

Implementation and Results

- Data was mapped by AEHRC and then accuracy was validated

<table>
<thead>
<tr>
<th>Data Set Characteristic</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of unique ICD-10-AM codes</td>
<td>801</td>
<td>817</td>
<td>2254(a)</td>
</tr>
<tr>
<td>Number of unique SNOMED CT AU concepts used</td>
<td>na</td>
<td>na</td>
<td>6007</td>
</tr>
<tr>
<td>Number of patient cases that resulted in ABF errors</td>
<td>1</td>
<td>0</td>
<td>28</td>
</tr>
<tr>
<td>Total NEP resources (Cost weight from IHPA URG grouper and specifications multiplied by $5000) per case.</td>
<td>$25,378,031</td>
<td>$26,205367</td>
<td>$26,413,558</td>
</tr>
</tbody>
</table>

Terminology and code use, and the influence on ABF outcomes (overall $ only)
ICD-10-AM codes achieved after SnoMAP processing
Clinical Impact

- SnoMAP provides an accurately coded and clinically useful diagnosis for every emergency visit.
- This rich clinical data will allow improvement of the quality and efficiency of emergency care at scale.
Conclusion

- For the first time, Australian emergency clinicians caring for patients in a digital hospital can record data accurately at the point of care.
- This same data can then be repurposed into an accurate codeset for funding purposes.
- This allows digitisation and standardisation of clinical information to drive data driven decision making in Australian hospitals to improve the quality, efficiency and the value of the care that we provide to our patients.