Solution to SNOMED CT Implementation in Clinical Systems

IHTSDO Conference Oct 2011
WHAT WE’LL DISCUSS:

1. Setting the Scene
2. The Pilot and How it Works
3. Results
4. Conclusions
THE CHALLENGE IN THE ED:

- SNOMED CT coding of specific ED data elements is required for national initiatives such as the PCEHR

- ICD codes are required for emergency service reporting

- ICD codes are required to support morbidity reporting for admitted patients
A KEY QUESTION:

Could we achieve ICD and SNOMED code capture accurately without interrupting the clinician workflow with time-consuming pick lists?
Could clinicians enter data in the way that is meaningful to them and maintains clinical communication quality?
Could we achieve meaningful clinical input plus coding with a single natural language input?
Natural Language Entry
= Fields: Presenting Problem, Prov. Diagnosis, Diagnosis

Yields Multiple Results

SNOMED-CT
• Presenting Problem,
• Prov. Diagnosis,
• Diagnosis.

ICD-10
• Diagnosis
• Plus for admitted patients
• Cause of injury
• Place of occurrence of injury
• Activity when injured

URG

Other Coding Systems
Such a system is presently in pilot at a major Victorian hospital.
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THE PILOT:

Objectives:
- To confirm and quantify the clinical and financial benefits:
  - Faster coding using fewer resources
  - Less clinical intrusion
  - Increased accuracy and specificity
- Refine processes relating to:
  - Documentation
  - Coding
  - Terminology
- Create live system implementation approach
## THE TRIAL PROCESS

### Trial Process

<table>
<thead>
<tr>
<th>Hospital Systems</th>
<th>Extract and Analysis</th>
<th>Smart Termer / Coder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symphony Emergency Department System</td>
<td>Extract of Provisional Diagnosis and Presenting problem text</td>
<td>Termer processes text</td>
</tr>
<tr>
<td>Review of SNOMED CT / ICD results</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review of Bucket</td>
<td>Output and Analysis</td>
<td></td>
</tr>
<tr>
<td>Hospital Review</td>
<td></td>
<td>Termer Run 2</td>
</tr>
</tbody>
</table>
Entries may be

- Simple
- Multiple concept
- Complex

Trial entries are largely multiple concept and complex - i.e. multiple sentences.
**EXAMPLE - CLINICIAN RECORDING DIAGNOSTIC INFORMATION**

- **Diagnosis (text entered):**
  
  fell down stairs at home and # nof

System returns to specified fields in host product:

- SNOMED CT concepts for the diagnosis: # NOF
- ICD concepts for the diagnosis reporting field
- ICD concepts for the cause of injury field
- ICD concepts for place of occurrence
- ICD concepts for activity
DEMONSTRATION OF TERM ENTRY

- Response shown is for demonstration, user interface is dependent upon the host but can be provided by Health eWords
<table>
<thead>
<tr>
<th>SNOmed-CT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>disorder:</td>
<td>Fracture of neck of femur (disorder)</td>
</tr>
<tr>
<td>cause:</td>
<td>Fall down stairs (event)</td>
</tr>
<tr>
<td>child:</td>
<td>Home (environment)</td>
</tr>
<tr>
<td>ICD 10 AM cause:</td>
<td>Fall on and from other and unspecified stairs and steps</td>
</tr>
<tr>
<td></td>
<td>Home</td>
</tr>
<tr>
<td>ICD 10 AM activity:</td>
<td>Unspecified activity</td>
</tr>
<tr>
<td>ICD 10 AM injury:</td>
<td>Fracture of neck of femur</td>
</tr>
</tbody>
</table>
WHAT WE’LL DISCUSS:

- 1. Setting the Scene
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- 3. Results
- 4. Conclusions
# The Results to Date ICD:

<table>
<thead>
<tr>
<th>Date of run</th>
<th>No. of entries with Provisional Diagnosis</th>
<th>Number coded first run</th>
<th>% coded</th>
<th>Number coded second run</th>
<th>% coded 2nd run</th>
<th>Number unable to be coded</th>
<th>% of codeable cases coded 2nd run</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 August</td>
<td>648</td>
<td>634</td>
<td>97.8</td>
<td>642</td>
<td>99.2</td>
<td>6</td>
<td>100.0</td>
</tr>
<tr>
<td>21 August</td>
<td>699</td>
<td>652</td>
<td>93.3</td>
<td>681</td>
<td>98.0</td>
<td>12</td>
<td>99.7</td>
</tr>
<tr>
<td>28 August</td>
<td>722</td>
<td>596</td>
<td>82.6</td>
<td>710</td>
<td>98.3</td>
<td>11</td>
<td>99.9</td>
</tr>
<tr>
<td>4th Sept</td>
<td>729</td>
<td>610</td>
<td>83.7</td>
<td>714</td>
<td>97.9</td>
<td>12</td>
<td>99.6</td>
</tr>
</tbody>
</table>
### The Results to Date SNOMED CT:

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<th>Date of run</th>
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<th>Number coded first run</th>
<th>% coded</th>
<th>Number coded second run</th>
<th>% coded 2(^{nd}) run</th>
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RESULT COMMENTS

- No clinical process change
  - Clinical documentation errors or imprecision is responsible for approximately 80% of the items not coded in run 1.
  - Clinical practice records many elements which are unnecessary in an electronic record - i.e. they are already present in the record e.g.:
    - “82 yo male presents to see Dr Williams” This is not a diagnostic statement.
    - ACS - used to mean Acute Coronary Syndrome AND Altered Conscious State

- With feedback to clinicians and minor modifications to current recording it is estimated that the initial run would result in a much higher accuracy.
All ‘new’ words are collected and analysed
Currently 45 ‘words’ meaning diarrhoea

Context: Speciality influences meaning

- e.g.: The abbreviation DD

Example:
- Musculoskeletal = Disc Degeneration
- Gastrointestinal = Diverticular Disease
Negation

- Diagnosis fields don’t record non conditions
- These are identified in the software process but codes not applied (ensuring term is not provided)

Text: bee sting - no signs of allergy or anaphylaxis, no cellulitis

<table>
<thead>
<tr>
<th>SNOMED-CT disorder:</th>
<th>262552005</th>
<th>Bee sting without reaction (disorder)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICD 10 AM cause:</td>
<td>X2330</td>
<td>Contact with unspecified bees</td>
</tr>
<tr>
<td>ICD 10 AM location:</td>
<td>Y929</td>
<td>Unspecified place of occurrence</td>
</tr>
<tr>
<td>ICD 10 AM activity:</td>
<td>U739</td>
<td>Unspecified activity</td>
</tr>
<tr>
<td>ICD 10 AM injury:</td>
<td>T634</td>
<td>Venom of other arthropods</td>
</tr>
</tbody>
</table>
RESULT ANALYSIS (OF CODEABLE ENTRIES)

- **Multiple results**
  - 1 result  52.5% (n331)
  - 2 results  19.4% (n232)
  - 3 results  2.5% (n16)
  - 4 or more results 8.1% (n51)

- **Post-coordination e.g. Suspected, left, right.**
  - 25% (n 158)
RELATIONSHIP TO REFERENCE SETS

- National emergency reference set
- 9.5% of terms represent concepts not in the national reference set
- 1.3% represent causes not diagnoses
WHAT WE’LL DISCUSS:

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IN SUMMARY:

- Simple data entry
- Single entry - multiple results
  - Diagnostic, Cause of Injury and other information is able to be coded.
- Learns the words you use
  - New words (misspellings etc) found and added each week. This has decreased by 34% over the initial 4 weeks of the trial.
- With or without user intervention
  - Currently no user intervention, clinical review and training would improve the results - limited changes needed.
- SNOMED CT and ICD-10-AM
  - Returns ICD - diagnosis, cause, injury activity, injury location
  - Returns SNOMED-CT disorder - when able to be coded. Approx: 11% of the text provided is not represented in the current national emergency term set.

Note: TM Pending
This makes host software more attractive:

- Clinicians enter data in the way that is meaningful to them and clinical communication quality is maintained.
- Code requirements for national initiatives such as the PCEHR to use SNOMED CT can be met with minimum functional changes to the host software product or clinical practice.
- ICD codes required for emergency service reporting can be produced from the single process.
- ICD codes required to support morbidity reporting for those patients who are admitted can be provided for clinical coder audit (reducing coding time).
QUESTIONS?

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  - www.healthewords.com.au