SNOMED in Big Data and Analytics: Where We Are and Where We Are Going

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• What is Big Data?
• Claims data
• Unstructured documentation
• Decision support
• Quality measures
• The future
Big Data

What is Big Data?

Structured
- Claims data
- Lab orders
- Drug orders
- EMR
- CCDs, HL7

Unstructured
- Dictations
- Notes
Analytics
Method: 120,000 ICD-9-CM Claims converted to ICD-10-CM and SNOMED CT using SmartGEMS and ICD-10-CM to SNOMED maps.
• What do these SNOMED concepts tell us?
  • Provide common diagnosis that could be on problem lists and in pick lists
  • Inform decision support applications - will these SNOMED concepts trigger the best decision support?
  • Transmit to quality measure programs - do we have the right SNOMED concepts for quality measure reporting?
Method: Use the simulated ICD-10-CM claims to analyze the documentation elements (attributes) now required in ICD-10-CM.
Method: Using the simulated ICD-10-CM claims, estimate the potential use of unspecified ICD-10-CM codes

<table>
<thead>
<tr>
<th>ICD-10-CM</th>
<th>ICD-10-CM Description</th>
<th>SNOmed Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M17.9</td>
<td>Osteoarthritis of knee, unspecified</td>
<td>Osteoarthritis of knee</td>
</tr>
<tr>
<td>N17.9</td>
<td>Acute kidney failure, unspecified</td>
<td>Acute renal failure syndrome</td>
</tr>
<tr>
<td>I63.50</td>
<td>Cerebral infarction due to unspecified occlusion or stenosis of unspecified cerebral artery</td>
<td>Cerebral infarction</td>
</tr>
<tr>
<td>J18.9</td>
<td>Pneumonia, unspecified organism</td>
<td>Pneumonia</td>
</tr>
<tr>
<td>M16.9</td>
<td>Osteoarthritis of hip, unspecified</td>
<td>Osteoarthritis of hip</td>
</tr>
<tr>
<td>A41.9</td>
<td>Sepsis, unspecified organism</td>
<td>Systemic infection</td>
</tr>
<tr>
<td>I48.91</td>
<td>Unspecified atrial fibrillation</td>
<td>Atrial fibrillation</td>
</tr>
<tr>
<td>L03.119</td>
<td>Cellulitis of unspecified part of limb</td>
<td>Cellulitis</td>
</tr>
<tr>
<td>C64.9</td>
<td>Malignant neoplasm of unspecified kidney, except renal pelvis</td>
<td>Primary malignant neoplasm of kidney</td>
</tr>
<tr>
<td>K85.9</td>
<td>Acute pancreatitis, unspecified</td>
<td>Acute pancreatitis</td>
</tr>
</tbody>
</table>
Use the results of the analytics to inform CDI initiatives and recommendations for clinicians.

Osteoarthritis of knee (239873007)

Osteoarthritis of knee unspecified (M17.9)

Primary
- Bilateral: M17.0
- Unilateral
  - Right: M17.11
  - Left: M17.12
  - Unspecified: M17.10

Post-traumatic
- Bilateral: M17.2
- Unilateral
  - Right: M17.31
  - Left: M17.32
  - Unspecified: M17.30
Unstructured Text
Unstructured Text - NLP

- Most clinical information is locked up as free text
- SNOMED provides the best terminology for NLP
- Once unlocked, we now have computable data
Using SNOMED
SNOMED → Decision Support

http://www.uptodate.com/hl7/infobutton?
mainSearchCriteria.v.cs=2.16.840.1.113883.6.96&
mainSearchCriteria.v.c=44054006
&age.v.v=8&age.v.u=a
SNOMED → Decision Support

Drug
Carvedilol Oral Tablet 6.25 MG

Allergies
[no allergies]

Diseases/Symptoms

Condition Search Type: SNOMED CT
Condition Identifier: 195967001
Condition Name: Asthma

Disease Contraindications
Asthma - Carvedilol Oral Tablet 6.25 MG
Administration of Carvedilol Oral Tablet 6.25 MG is contraindicated in Asthma.
Acute myocardial infarction: aspirin at arrival (NHIQM AMI-1)

- Administer aspirin immediately to all patients with suspected MI, unless contraindicated.

National Hospital Inpatient Quality Measure (NHIQM) - CMS/TJC

- The number of acute myocardial infarction (AMI) patients aged $\geq 18$ years who received aspirin within 24 hours before or after hospital arrival.

CMS = Centers for Medicare and Medicaid Services; TJC = The Joint Commission

Note:

- Reporting of this measure to CMS is voluntary.

Population

- Includes patients discharged with an ICD-9-CM Principal Diagnosis Code for AMI (as defined in Appendix A, table 1.1 in the NHIQM Specifications Manual).
The Future

Additional sources and uses of Big Data
DIY Healthcare

- Apple’s App Store offers thousands of mobile health apps
- Cholesterol, HIV, UTI, allergy, STD testing kits
- Home EKG, pulse ox, blood pressure and glucose
- Where is all this personal health information going to go?
- How do we get this information codified?
Google - Calico

‘The marriage of great thinking, guts, with technology, Big Data and genomics...’
- Forbes

‘Can Google Solve Death?’
- Time

• Calico may become a global clinical trial around health

• Google will sort data, pattern match, and find correlational and causal relationships within data
Conclusion

We will have all this great healthcare data...

Now let’s do something with it!
Questions?
Thank you

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