Standards for Computing and Communications

Stanley M. Huff, MD

NAACCR 2002

Pre-Conference Workshop

Sunday, June 9, 2002

http://www.ihc.com
coshuff@ihc.com
Topics

• Standards at IHC
• The key standards to use
• Challenges to the use of standards
• Opportunities for cancer registries
• Some current experiments
Intermountain Health Care (IHC)

- Not for profit corporation
- 22 Hospitals
  - 500 to 25 beds
  - ~ 1.1 million patients/members
- 24 Clinics
- 14 Urgent Care Centers
- Health Plans Division (Insurance)
- Physician’s Division (~400 employed physicians)
‘... All confirm what would be expected from common sense: The complexity of modern medicine exceeds the inherent limitations of the unaided human mind.’

David M. Eddy, MD, Ph.D.
Clinical Decision Making
JAMA 263:1265–75, 1990
‘... man is not perfectible. There are limits to man’s capabilities as an information processor that assure the occurrence of random errors in his activities.’

Clement J. McDonald
New England Journal of Medicine
1976
Strategic Concepts

• People need help (decision support)
  – Patient centered record
  – Decision support integrated with patient care processes
  – Clinical and administrative research

• Capture data only once
  – Data capture is expensive in time and resources
  – Real time, at the point of care

• Data content changes slowly

• Technology changes quickly

• No vendor does it all
Over 1.4 Million transactions per day
700+ Unique Point-to-Point Connections

Interface Connections

Month

Mar-01 Apr-01 May-01 Jun-01 Jul-01 Aug-01 Sep-01 Oct-01 Nov-01 Dec-01 Jan-02 Feb-02 Mar-02

Interfaces

500 550 600 650 700 750

618 632 645 650 660 668 669 688 688 694 707 724 720
Statistical Profile

- HDD (Healthcare Data Dictionary)
  - 538,774 Concepts
  - 3,496,281 Terms

- Interfaces
  - 60+ different interfaces
  - 720+ interface instances

- Work to do:
  - 20+ interfaces in current development
  - 50+ new interfaces on the “To Do” list
What is my point?

• IHC must use standards or we have no hope of dealing with the complexity of the integrated system

• Messaging standards
  – HL7 – Clinical data
  – X12 – Financial data, HIPAA mandated transactions
  – DICOM – Images
  – IEEE – Bedside instruments

• Terminology standards
  – LOINC – Logical observation identifier names and codes
  – Drugs – NLM/FDA/VA collaboration, proprietary codes
  – Billing – CPT, ICD-9CM
  – Clinical – UMLS, SNOMED and others
Data exchange to the outside world

- Immunizations (State/CDC)
- Reportable Diseases (State/CDC)
- Patient Care Data (CMS)
- STS, NRMI, NICU, etc. …
- Cancer Registries
- Clinical Research
- Cancer Trials (NCI)
- Drug Trials (FDA)
The wonderful thing about standards…

… is that there are so many to choose from!

• Vertical (within discipline) standards
  – NAACCR
  – NCI data elements
  – FDA drug trial submissions
  – STS (Society of Thoracic Surgeons)
  – NRMI (National Registry of Myocardial Infarctions)
  – Neonatal data sets

• General (global to industry) standards
  – Messages
    • HL7, X12, DICOM, IEEE
  – Terminology
    • LOINC, UMLS, ICD-9CM, CPT, SNOMED
What to do?

• Vertical standards help a given discipline, but they do not scale for health care providers

• General standards provide tremendous value in reuse of interfaces, commercial tools, consultants, and staff training

• **Issues**

  • My code/term is not there!
    – *Get them to add it!*

  • The message format is too general!
    – *Create implementation guides specific to the domain!*

  • It is too hard to implement the standard!
    – *The value is in 2nd, 3rd, and 4th interfaces!*
### Issue: Granularity of Coding Systems

<table>
<thead>
<tr>
<th>SNOMED</th>
<th>Clinical Concept</th>
<th>CD-O 2/3</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-63000</td>
<td>Gallbladder, NOS</td>
<td>C23.9</td>
</tr>
<tr>
<td>T-63000</td>
<td>Cholecystic</td>
<td>C23.9</td>
</tr>
<tr>
<td>T-63000</td>
<td>Cholecysto-</td>
<td>C23.9</td>
</tr>
<tr>
<td>T-63010</td>
<td>Fundus of gallbladder</td>
<td>C23.9</td>
</tr>
<tr>
<td>T-63020</td>
<td>Body of gallbladder</td>
<td>C23.9</td>
</tr>
<tr>
<td>T-63030</td>
<td>Neck of gallbladder</td>
<td>C23.9</td>
</tr>
<tr>
<td>T-63040</td>
<td>Valve of Heister</td>
<td>C23.9</td>
</tr>
<tr>
<td>T-63100</td>
<td>Mucosa of gallbladder</td>
<td>C23.9</td>
</tr>
<tr>
<td>T-63110</td>
<td>Mucous gland of gallbladder</td>
<td>C23.9</td>
</tr>
<tr>
<td>T-63200</td>
<td>Muscularis of gallbladder</td>
<td>C23.9</td>
</tr>
<tr>
<td>T-63300</td>
<td>Serosa of gallbladder</td>
<td>C23.9</td>
</tr>
<tr>
<td>T-63310</td>
<td>Subserosa of gallbladder</td>
<td>C23.9</td>
</tr>
<tr>
<td>T-63320</td>
<td>Luschka’s ducts</td>
<td>C23.9</td>
</tr>
</tbody>
</table>
Issue: Styles of Data Representation

Positional Strategy (“flat file”)

… T1 N0 M0 19860628 C50.4 M8500 l …

OBR and OBX Strategy (“Name Value Pairs”)

OBR|XYZ^Registry|22051-7^Stage/prognostic factors^LN|
OBX|21899-0^TNM PATH T^LN|T1^T1 STAGE^AJCC|
OBX|21900-6^TNM PATH N^LN|N0^N0 STAGE^AJCC|
OBX|21901-4^TNM PATH M^LN|M0^M0N STAGE^AJCC|
Issue: Where do I put the information?

Interface A (Rheumatologist view)

OBX|4821-5^HLA-B27^LN|1|G-A203^Present^SNI|

Interface B (Paternity testing)

OBX|4694-6^HLA-TYPE^LN|1|F-C4327^B27^SNI|
### Issue: Relational table implications

<table>
<thead>
<tr>
<th>Patient Id</th>
<th>DateAndTime</th>
<th>Test Name</th>
<th>Test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1234567</td>
<td>1/22/01 10:20:00 AM</td>
<td>HLA B27 Antigen</td>
<td>Present</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patient Id</th>
<th>DateAndTime</th>
<th>Test Name</th>
<th>Test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1234567</td>
<td>1/22/01 10:20:00 AM</td>
<td>HLA Antigen Found B27</td>
<td></td>
</tr>
</tbody>
</table>

Terminology and structure must be coordinated to achieve an integrated whole and consistency in data exchange.
“Almost” Typical Clinical Data Flow

Standard Interfaces

Interface Engine

EMR
Cancer Registry Data Flow (worst case)

Hospital Registry

Regional or National Registry

Standard Interfaces

Manual Processes
Future?

Hospital Registry

Filtering and Processing

Interface Engine

Regional or National Registry

Standard Interfaces
Opportunity: The value of general standards

- Human resources (people) perform data review, quality assurance, validity, rather than data entry and discovery
- Decreased cost because data is re-used (not re-entered)
- Data is more timely because of automated processes
- Data is more accurate (decreased data entry errors)
- Data is more comprehensive (if available electronically)
- Decreased cost and time to deploy because of re-use of existing interfaces
- Better commercial and public domain tools
Experiments using general standards

- Experiments using HL7 and LOINC to transmit cancer registry data
- Synoptic reporting developed by the Cancer Committee in the College of American Pathologists
- SNOMED encoded pathology databases
- SPIN – Shared Pathology Information Networks
- Direct communication of filtered clinical data to cancer registries