SNOMED Clinical Terms® Overview

2006 HIMSS
HL7 Provider Solutions Showcase Theater
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SNOMED® International
Agenda

- What is SNOMED Clinical Terms (SNOMED CT)?
- What is the need?
- Adoption
- Content and Structure
- SNOMED CT’s future
What is SNOMED CT?

Systematized Nomenclature of Medicine Clinical Terms® (SNOMED CT)
SNOMED CT

- A comprehensive clinical terminology covering diseases, clinical findings, and procedures
- Allows for a consistent way of indexing, storing, retrieving and aggregating clinical data across specialties and sites of care
- Helps to structure and computerize the medical record, reducing the variability in the way data is captured, encoded and used for clinical care of patients and research
SNOMED® International

- Division of the College of American Pathologists (CAP)
- Leading provider of healthcare terminology and implementation products and services
- Advance excellence in patient care through the delivery of SNOMED CT
Our current focus

- Customer Requirements
- New agreements
- Quality/Usability of SNOMED CT
- Governance
- Process and Technology Transformation
Key Customers

- A4 Health Systems (EmSTAT)
- Centers for Disease Control (CDC)
- Cerner
- Danish Board of Health
- Genelogic
- Hospital Corporation of America
- Hospital Authority (Hong Kong)
- Kaiser Permanente
- National Centre for Classification in Health (Australia)
- National Health Service (U.K.)
- National Library of Medicine (U.S.)
- Seoul National University
- Singapore Computer Systems
- Wolters Kluwer Health
Examples of Applications Using SNOMED CT

- Electronic Medical Records
- CPOE
  - e-prescribing
  - lab order entry
- Problem lists
- Disease templates
- Remote ICU Monitoring
- Lab Reporting
- 3D Image Auto-indexing
- ER Charting

- Cancer Reporting
- Therapeutic Decision Support
- Genetic Databases
- Radiology Image Bank
- Autopsy Databases
- Literature Encoding
- Clinical Research
- Global Benchmarking
- Surgical Procedure Masters
Key Customer Requirements

- Education
- Mapping
- Documentation
- Communication on future releases
- Request submission process
- Customer service
- Post coordination/lateralization
- Proof of concept materials
Principles for Development

- Quality focused
- Clinicians should determine content
- Broad, inclusive involvement of diverse specialty groups and medical informatics
- Minimal barriers to adoption and use
- A quality improvement process open to public scrutiny and vendor input
What is the need?
The Current Situation
Current State of Healthcare

- Patients are treated in many settings across the continuum of healthcare
- Many healthcare facilities have limitations on which aspects of information they can electronically exchange within their facility or with other facilities
- Inability to access electronic patient record information is a barrier to delivering the best patient care
CAP/NLM Agreement

- July 2003: Announcement of National Library of Medicine licensure of SNOMED CT on behalf of US marketplace
  - “NLM wishes to incorporate SNOMED into the UMLS metathesaurus under terms that facilitate the use of SNOMED in health information creation, dissemination, exchange and research.”
CAP/NHS Agreement

- National Health Service in the United Kingdom has been a leader in standardization of clinical terminology.
- Clinical Terms was merged with SNOMED for the creation of SNOMED CT.
- The NHS has designated SNOMED CT as the vocabulary for its EHR.
EC Health Telematics WG

- “Non-interoperability of IT systems represents perhaps the biggest single problem in transferring data securely between different parts of healthcare.”
- “There needs to be a standardized terminology by which to code diseases and clinical interventions.”

EC High Level Committee on Health
January, 2003
The Problem: Healthcare is Unique

- IT has funding constraints
- Healthcare is complex and evolving
- Paper-based records are prevalent
- Different ways of expressing the same thing…
  
  A myocardial infarction is also heart attack….
Variations in Expression

Myocardial infarction  Myocardial infarct
MI-Myocardial infarction Heart attack
Infarction of heart  Cardiac infarction

…To a computer these are all different

How can they be tracked, analyzed and reported?
In a SNOMED CT Enabled Database

**Solution:**
Run a query in the patient database for the SNOMED codes related to the inclusion/exclusion criteria.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>102526007</td>
<td>Female age 50+</td>
</tr>
<tr>
<td>14045001</td>
<td>Caucasian</td>
</tr>
<tr>
<td>2004005</td>
<td>Normal blood pressure</td>
</tr>
<tr>
<td>58460004</td>
<td>Type O blood</td>
</tr>
<tr>
<td>69896004</td>
<td>Rheumatoid Arthritis</td>
</tr>
</tbody>
</table>

Doctor's Patient Base 2,500

Eligible Patients: 40
SNOMED CT is Gaining Adoption
Countries with SNOMED CT licensees

- Argentina
- Australia
- Austria
- Belgium
- Canada
- Czech Rep.
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hong Kong
- Iceland
- Ireland
- Israel
- Italy
- Japan
- Kuwait
- Malaysia
- The Netherlands
- New Zealand
- Norway
- Portugal
- Scotland
- Singapore
- South Korea
- Spain
- Sweden
- Taiwan
- United Kingdom
- United States
Initiatives & Standards
Pushing Adoption
The Need for Usable and Accessible Healthcare Data

- Automation of systems that deal with health information requires clinical data that:
  - is recorded at the appropriate level of detail
    - not forced to be either too general or too specific
  - is consistent over time and across boundaries
  - can be transmitted without loss of meaning
  - can be aggregated at more general levels, and along multiple different perspectives
  - can be interpreted by automated systems

- Natural language does not meet these requirements
- Classifications do not meet these requirements
Governments Seek Infrastructure Modernization and Standardization

- U.K. – Information Strategy for Health
- EU-CEN/ISSS report on e-Health
- Denmark – National Strategy for IT
- The Netherlands – NICTIZ
- U.S. National Healthcare Information Network (NHIN)
- Australia – National e-Health Transition
- Hong Kong – Hospital Authority’s Clinical Management System Migration
- Mexico – HL7 RIM 3
Department of Health & Human Services

- Office of the National Coordinator for Health Information Technology
- David J. Brailer, M.D., Ph.D., was named the first National Coordinator for Health Information Technology in May 2004.
- Brailer's duties are to execute the actions ordered by President Bush in the Executive Order issued in April 2004 that called for widespread deployment of health information technology within 10 years to help realize substantial improvements in safety and efficiency.
SNOMED CT - The Standard

- Registered standard with the HL7 Vocabulary Technical Committee for use in HL7 messages; the CAP actively contributes to the coordination of HL7 messaging standards and SNOMED content
- NCVHS recommended general core terminology for the exchange, aggregation, and analysis of patient medical record information
- ANSI Approved Healthcare Terminology Structure Standard for use in distributing healthcare terminology
Integration and Convergence

Health care terminology domain areas

**Diagnoses & Procedure Codes**
- CDT-2/ SNODENT
- ICD-9-CM
- ICD-10
- OPCS-4 (UK)

**Message Specific Codes**
- HL7

**Nursing Codes**
- PNDS
- NANDA
- NIC
- NOC
- OMAHA
- CCC (HHCC)

**Convergence**
- SNOMED Clinical Terms

**Clinically Specific Codes**
- DICOM
- LOINC
- ICD-O
- SNOMED RT
- CTV3

**Drug Codes**
- US proprietary
- UK proprietary
Collaborative Initiatives

- American Academy of Ophthalmology (AAO)
- American Osteopathic Association (AOA)
- American Association of Colleges of Osteopathic Medicine (AACOM)
- American Veterinary Medical Association (AVMA)
- ANA Recognized Nursing Terminologies
- Anesthesia Patient Safety Foundation (APSF)
- British Academy Dermatologists (BAD)
- Kaiser Permanente
- Digital Imaging and Communications in Medicine (DICOM)
Goals for EC Healthcare

- Maintain sustainable health care for all
- Improve safety of healthcare delivery and reduce the number of errors
- Support secure authorised access to patients’ relevant health documentation anytime, anywhere
- Support the mobile citizen in seeking high quality care throughout Europe

Report from the CEN/ISSS e-Health Standardisation Focus Group Draft V8.2
Health informatics standards are essential to achieve the goals of e-Health in Europe for:

- **Interoperability** between systems and patient information exchange between health organisations of varying size and complexity;
- Market efficiency by providing increased understanding between all players in that market through a **common technical framework and terminology** for e-Health application development, procurement and implementation;
- Meeting non-functional requirements to **ensure safety, security and legal requirements** e.g. protecting the privacy of the citizens.

Report from the CEN/ISSS e-Health Standardisation Focus Group Draft V8.2
Recommendation 18

- The Commission, should examine the business case for negotiating an EU-wide licence for the EU to use SNOMED CT.

- The study should consider whether there is a justification for a body to provide a channel for EU input into the further development and maintenance of SNOMED since it still needs to be improved.

- The EU should further consider whether there an international agreement could be reached whereby SNOMED could be managed by a global public body.

- The business case should consider support for establishing European interests in creating and maintaining a unified approach to medical terminology in the wider context of world markets and specialist requirements.
Content and Structure
Current Release: January 2006

- 300K Active Concepts
- 1M Descriptions
- 900K Relationships
- 10 cross mappings
- 3 language editions

Top level hierarchies:

- Attributes
- Body structure
- Clinical Finding
- Context-dependent categories
- Environments/geographical locations
- Events
- Linkage concept
- Observable entity
- Organism
- Pharmaceutical/biological product
- Physical force
- Physical object
- Procedure/intervention
- Qualifier value
- Record artifact
- Social context
- Special concept
- Specimen
- Staging and scales
- Substance
Basic Elements of SNOMED CT

- Concepts
- Hierarchies
- Relationships
- Descriptions
Concept

- The basic unit of SNOMED CT
- Any clinical concept to which a unique Concept Identifier has been assigned
Hierarchies

- Many top level hierarchies
- Each hierarchy has sub-hierarchies
Top Level Hierarchies
Relationships

- **Is_a relationships**: Relationships that link concepts within a hierarchy.

- **Attribute relationships (roles)**: Allow links between concepts across hierarchies.
Descriptions

- Terms or names assigned to a concept
- Each concept has:
  - Fully Specified Name (FSN)
  - Preferred Term (display term)
- Concept may have:
  - One or more synonyms
Descriptions

- Fully specified name: Neoplasm of abdomen (disorder)
- Synonym: Tumor of abdomen

Fully defined by:
- Disorder of abdomen
- Neoplasm of trunk
- Abdominal mass

Group
- Associated morphology
  - Neoplasm
- Finding site
  - Abdominal structure
SNOMED CT’s Future
The Case of eHealth

- Considerable advantages could accrue if SCT became the standard for the EU as a whole. However this raises a question of licensing, translations and mechanisms for maintenance whereby EU member states could influence future SNOMED developments and maybe additions to the terminology (some terms may be peculiar to particular member states).

CEN/ISSS report draft V8.2, November 2004
WHO gains interest

- The FDC (Family Development Committee) accepted that there should be engagement between classifications and terminologies.
- Agreed to consider terminologies in relation to the WHO-FIC.
- The depth of engagement between WHO-FIC and SNOMED-CT now required a stronger structure than the FIC terminologies working group. This would be further discussed by the planning committee.
Integrating Terminology and Messaging/Information

- Collaboration between HL7 & SNOMED
- Highly productive ongoing work
- Open participation
- SNOMED’s Concept Model Working Group
- HL7’s TermInfo Project
  http://www.hl7.org/Special/committees/terminfo/index.cfm
SNOMED® International business model has two distinct functions

STANDARDS ORGANIZATION
{IT, Production, Administrative, R&D, Boards}

Commercial Products related to SNOMED®
An alternative SNOMED® International business model

GLOBAL GOVERNANCE ORGANIZATION
{IT, Production, Administrative, R&D, Boards}

GLOBAL TERMINOLOGY SERVICE PROVIDER *
and/or
SECRETARIAT **

CAP core competencies
* Terminology producer * QA/Accreditation provider ** Association manager

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