Consolidated Health Informatics

Standards Adoption Recommendation

Nursing

Index

Summary

Domain: Nursing

Standards Adoption Recommendation:
Systematized Nomenclature of Medicine Clinical Terms® (SNOMED CT®)

SCOPE
This domain is defined as a terminology that is used to identify, classify, and name the delivery of nursing care. Sub-domains are derived from the Nursing Process and ANA recognized Nursing Minimum Data Set (NMDS), emphasizing nursing assessment, diagnosis, interventions, and outcomes of nursing care.

RECOMMENDATION
SNOMED CT®

OWNERSHIP
SNOMED CT® is a copyrighted work of the College of American Pathologists (CAP).

APPROVALS AND ACCREDITATIONS
The CAP is an ANSI Standards Development Organization. The SNOMED CT®. Healthcare Terminology Structure is ANSI approved.

ACQUISITION AND COST
The CAP and the National Library of Medicine (NLM) entered into an agreement to provide SNOMED CT® core content (English and Spanish language editions) via the UMLS® at no charge to those who execute a license agreement. This agreement is for healthcare applications and uses within the US and any application of use of SNOMED CT® by any US government facility or office, whether permanent or temporary, wherever located. This no-charge feature has been supported by HHS (NLM, NIH/OD, CDC, ASPE, AHRQ, CMS, FDA, HIS, SAMSHA, HRSA), DoD and VA.

Health care entities can also choose to purchase SNOMED CT® as a stand-alone terminology directly from SNOMED® International at (http://www.snomed.org)

REVISION HISTORY

DATE	VERSION	COMMENT
2/20/2003	Public Document	Final Recommendation
2/24/2006	1.1	AHRQ reference added

Part I – Team & Domain Scope Identification

Target Vocabulary Domain

Common name used to describe the clinical/medical domain or messaging standard requirement that has been examined.

Nursing

Describe the specific purpose/primary use of this standard in the federal health care sector (100 words or less)

This domain is defined as a terminology that is used to identify, classify, and name the delivery of nursing care. Sub-domains are derived from the Nursing Process and ANA recognized Nursing Minimum Data Set (NMDS), emphasizing nursing assessment, diagnosis, interventions, and outcomes of nursing care.

Sub-domains *Identify/dissect the domain into sub-domains, if any. For each, indicate if standards recommendations are or are not included in the scope of this recommendation.*

Domain/Sub-domain	In-Scope (Y/N)
Assessment / Observations	Y
Plan / Goals	Y
Diagnosis	Y
Interventions	Y
Evaluation / Outcome	Y
Intensity of Nursing Care	N*****
Patient Demographics	N*****

*****Intensity of nursing care, part of the NMDS, is out of scope as no unified rating or vocabulary standard exists or is widely implemented. Patient demographic data is out of scope and being covered by demographic workgroup.

Information Exchange Requirements (IERs) *Using the table at appendix A, list the IERs involved when using this vocabulary.*

Body of Health Services Knowledge
Care Management Information
Case Management Information
Clinical Guidelines
Cost Accounting Information
Customer Approved Care Plan
Customer Demographic Data
Customer Health Care Information
Customer Risk Factors

Encounter (Administrative) Data
Improvement Strategy
Labor Productivity Information
Patient Satisfaction Information
Patient Schedule
Provider Demographics
Provider Metrics
Resource Availability
Tailored Education Information

Team Members *Team members' names and agency names with phone numbers.*

Name	Agency/Department
LCDR Alicia Bradford (Team Lead)	**HHS/CMS/OHS**
Barbara Lang	VA
Tim Cromwell	VA
Nancy Orvis	DoD
Mary Pratt	HHS/CMS
Cathy Rick	VA
CAPT David Taylor	HHS/IHS
David Taylor	HHS/IHS
Bonnie Leibel	VA
MAJ Nicole L. Kerkenbush	DoD

Work Period *Dates work began/ended.*

Start	End
09/02/03	10/07/03

Part II – Standards Adoption Recommendation

Recommendation *Identify the solution recommended.*

The nursing workgroup recommends the adoption of Systematized Nomenclature of Medicine Clinical Terms®, (SNOMED CT®).

Ownership Structure *Describe who "owns" the standard, how it is managed and controlled.*

The College of American Pathologists (CAP) is holder of the copyright, trademark and patent rights in SNOMEDCT®. The CAP owns the copyright in all editions of SNOMED®, including the copyright in any allowable adaptations, the trademarks SNOMED® and SNOMED CT®, and any and all patent rights in SNOMED®. Within the governance structure of the CAP, the SNOMED® International Authority has the direct responsibility for terminology-related activities. It establishes strategic direction for the CAP's clinical terminology activities, advises management, monitors division performance, and provides connections to the broader outside world. The SNOMED® International Authority protects the purpose of SNOMED® for clinical care and prevents drift of its purpose through its constitution, decision-making criteria, and the expertise of voting members. The SNOMED® International Editorial Board is responsible for the scientific direction, editorial processes, and scientific validity of the terminology. The Editorial Board, composed of voting members and organizational liaisons, recommends guidelines for external input and field-testing. It also oversees the quality assurance process. The Editorial Board consists of both clinical content experts and medical informatics experts, with equal representation from the UK's National Health Service. In addition, liaisons from numerous associations reflect the vision of an integrated clinical vocabulary useful for dentistry, nursing, veterinary medicine, radiology, ophthalmology, public health, and other clinical specialties, and that is compatible with standards such as HL7® and DICOM®. Participation of liaisons ensures scientific input from a range of clinical specialties and government agencies. Chaired by the SNOMED® Scientific Director, this group provides scientific direction for and supports the work of a multidisciplinary team of modelers and data administrators.

Summary Basis for Recommendation *Summarize the team's basis for making the recommendation (300 words or less).*

The Nursing workgroup team initially considered all thirteen of the American Nurses Association's (ANA) recognized terminologies, as potential candidates for federal adoption. Three of them, ABC Codes, the Nursing Minimum Data Set (NMDS) and the Nursing Management Minimum Data Set (NMMDS), are primarily administrative and were not considered further. Our next step was to research the representation of the other nursing terminologies within SNOMED CT®, as the American Nursing Association

(ANA) has recognized SNOMED RT ® (1999) and SNOMED CT® (2003) as a concept-based reference terminology able to support the integrated electronic medical record for nursing. Considerable work has been accomplished between nursing terminology developers and SNOMED CT®, namely the SNOMED® Convergent Terminology Group for Nursing, to direct nursing concept integration efforts. Agreements have been made with many the developers of the ANA recognized nomenclatures to integrate nursing content and concepts into SNOMED CT® and to provide mapping tables to those users who were using both SNOMED CT® and one of the other source nursing vocabularies within their systems.

Currently, SNOMED CT® contains over 1,000 nursing intervention concepts modeled from the Georgetown Home Health Care Classification, the Omaha System and the Nursing Interventions Classification (NIC); Intervention Concepts from the Perioperative Nursing Data Set (PNDS); Nursing diagnosis and problem concepts from NANDA, PNDS, HHCC, and Omaha. NOC will be integrated into the January 2004 release. The outcomes and new interventions from HHCC and Omaha Systems will be included in July 2004. Discussions continue with ICN and PCDS.

Nursing has been defined as, "The use of clinical judgment in the provision of care to enable people to improve, maintain, or recover health, to cope with health problems, and to achieve the best possible quality of life, whatever their disease or disability, until death" (Royal College of Nursing, 2003). Given this definition of nursing, it is evident that nursing care is very individualized to the situation, practitioner and recipient of care. Considering this, there are several areas within the SNOMED CT ®concepts that nursing documentation could lie.

For nursing assessments and documentation of care, nurses often choose medical terms. Many of these would fall in the SNOMED CT® concepts, such as: **Disease** (i.e. petechaie, blood transfusion reaction); **Physical object** (Hickman catheter); **Specimen** (catheter tip specimen); **Body structure** (subclavian vein); **Qualifier Value** (Blood Products, HLA matched platelets); **Organism** (Pt on isolation for MRSA of the nares); **Context-Dependent Categories** (sick child at home); **Staging and scales** (Likert scale for pain rating); & **Substance** (sweat). Essentially, nursing documentation could easily involve all of the 19 SNOMED CT® concept hierarchies. Obviously, the workgroup could not examine the entirety of SNOMED CT® therefore; the workgroup is recommending SNOMED CT® as it contains nursing concepts from the previously mentioned source nursing terminologies. The specific concepts in the SNOMED CT® hierarchy that form the basis of our recommendation are primarily found in the Findings & Procedures hierarchies, as they represent the majority of nursing diagnoses, interventions and outcomes.

For example:

A Nursing Diagnosis (NANDA) of "**Acute Pain**"

Finding
Clinical history and observations finding
Pain / sensation finding
Pain finding
Finding of pattern of pain
Acute Pain

A Nursing Intervention (NIC) of "**Pain Management**"

Procedure
Procedure by Intent
Therapeutic Procedure
Medical Therapies
Pain Management

A Nursing Outcome (NOC) of "**Pain Control**"- modeling hierarchy has 2 parents for pain control behavior:

Observables
Clinical history/examination observable
Pain/sensation observable
Pain observable
Pain control behavior

Observables
Clinical history/examination observable
Personal health management behavior
Pain control behavior

Conditional Recommendation *If this is a conditional recommendation, describe conditions upon which the recommendation is predicated.*

No conditions noted.

The entirety of SNOMED CT® is not being recommended, only the content that contains nursing concepts as modeled / integrated from the source nursing terminologies. (The workgroup would like to see mappings between the nursing terminologies and SNOMED CT®, and for these mappings to be maintained, validated, and distributed via the UMLS®. The workgroup recognizes the importance of the collaboration of the source nursing terminology owners and the SNOMED® CTG for Nursing in the appropriate inclusion and representation of nursing terms within SNOMED CT®.)

Approvals & Accreditations

Indicate the status of various accreditations and approvals:

Approvals & Accreditations	Yes/Approved	Applied	Not Approved
Full SDO Ballot	Y		
ANSI	Y		

Options Considered *Inventory solution options considered and summarize the basis for not recommending the alternative(s). SNOMED® must be specifically discussed.*

Refer to chart, Appendix B for additional information

ABC Codes- Primarily for administrative / billing purposes.
NANDA *(The North American Nursing Diagnosis Association)*- Fully integrated and mapped in SNOMED CT®
NIC *(Nursing Interventions Classification)*- Concepts in SNOMED CT®.
NOC (Nursing Outcomes Classification)- Concepts planned in July 2004 SNOMED CT®.
Omaha System- Concepts in SNOMED CT®. Omaha developed by the Omaha Visiting Nurse Association covers some of the same ground as the NANDA nursing diagnoses, and incorporates the Nursing Minimum Data Set (NMDS)
HHCC (Home Health Care Classification)- Integrated into SNOMED CT®. It is copyrighted, but placed in the Public Domain and is available free of charge with permission.
PCDS (Patient Care Data Set)- It is only in use at Vanderbilt University, and not freely available at present. Plans are to have it coded according to the standards of Clinical LOINC® and mapped into SNOMED CT®.
PNDS (Perioperative Nursing Data Set)- Currently integrated and mapped to SNOMED CT®.
ICNP® (International Classification for Nursing Practice) -A framework in development for unifying and mapping existing nursing terminologies. Not widely deployed, Beta Version available with plans to release Version 1 in 2005. Not currently mapped to SNOMED CT®—discussions continue.
Clinical LOINC® (Logical Observation Identifiers Names & Codes)-Group convened to evaluate overlap between SNOMED CT® and Clinical LOINC®. Only a few areas of nursing are currently addressed (vital signs, intake & output, pain, obstetrics)-not comprehensive of nursing care. Have recently developed a Clinical LOINC® Nursing subcommittee.

Current Deployment

Summarize the degree of market penetration today; i.e., where is this solution installed today?

As of January 31,2003, CAP holds 317 direct licenses for the use of SNOMED CT®. Additionally, at least 1,234 sublicense agreements are held by vendors who have distribution rights to SNOMED®. SNOMED CT® is being adopted by the UK's National Health Service (NHS) for use in any computerized information system being developed to support clinical information system. Has users in the public sector (e.g., CDC, Public Health Laboratory of Hong Kong), non-profit private sector (e.g., University of Texas Houston, Duke University); and for profit sector (e.g. Cerner, Oracle) in over 40 countries today.

What number of or percentage of relevant vendors has adopted the standard?

As of April, 2003, the College holds 59 commercial licenses for SNOMED®. The state of incorporation into vendor systems varies and is largely dependent on the vendor's development cycle. Following is a representative list of the vendors who have licensed SNOMED®, it should be noted that license does not equate to adoption.

Cerner Corporation
ComMedica Limited
Eclipsys Corporation
Epic Systems Corporation
GE Medical Systems Information Technologies
IDX Systems Corporation
McKesson Information Solutions
MEDITECH, Inc.
Oracle Corporation
Per-Se Technologies
Siemens Medical Solutions Health Services
deCode Genetics
Egton Medical Information Systems (UK)
GeneLogic, Inc.
In Practice Systems (UK)
Institute for Medical Knowledge Implementation (IMKI)
Reuters Health Information, Inc.
Safescript Ltd (UK)
Apelon, Inc.
Health Language, Inc.
Intelligent Medical Objects
Language & Computing
A4 Health Systems
ABLESoft
AssistMed
Clinical & Biomedical Computing, Ltd.
Cogient Corporation
Creative Computer Applications
Détente Systems Limited (Australia)
ibex Healthdata Systems, Inc.
IMPATH Inc.
iSOFT
Misys Healthcare Systems
Monarch Medical International Ltd.
Picis
Sysmex Delphic Ltd. (New Zealand)
Torex Laboratory Systems Ltd. (Scotland)
Triple G Systems Group, Inc.

TheraDoc, Inc.	VISICU, Inc.
TherapyEdge	Dictaphone
WellMed, Inc.	Berkeley Computer Systems
	William Woodward

What number or percentage of healthcare institutions has adopted the standard?

More than 50 commercial healthcare software developers have incorporated SNOMED CT® into their systems. As of April, 2003, approximately 1500 health care institutions have licensed the standard. The College holds 244 direct end-user licenses for the use of SNOMED® and 1,234 sublicenses through the vendors who are licensed for distribution, for a total of 1,478 end-user institutions, ranging in size from countrywide health care systems to small community facilities.
Two examples of the extent of support for SNOMED® are Kaiser Permanente and the National Health Service (NHS) of the United Kingdom. Kaiser Permanente, who provides health care coverage to 3% of the U.S. population, has actively participated in the development of SNOMED® and is actively rolling out SNOMED®-compatible solutions throughout its organization. Kaiser is using SNOMED® within domain-specific standard documentation templates for use throughout the organization. Also, as of April 1, 2003, the NHS, representing a population of 56 million covered lives, officially stated that: "Subject to successful development and testing of implementability, after April 1, 2003 any computerized information system being developed to support any clinical information system, such as EPRs and EHRs, should use the NHS preferred clinical terminology, SNOMED® Clinical Terms."

Other examples of health care institutions that have adopted SNOMED® are summarized as follows: The University of Nebraska Medical Center is using SNOMED CT® in the development of problem lists which are then mapped to ICD-9; Cedars Sinai Medical Center used SNOMED CT® in its web-based order entry system which processed 700,000 orders for over 8,000 patients between October 2002 and January 2003; HCA is implementing SNOMED CT® within its laboratory network, consisting of over 200 sites in both the US and Canada, for lab test results and diagnosis; University of Tennessee used SNOMED® in the lab to improve patient safety by detecting cases for which follow-up intervention did not occur despite abnormal Pap tests; Barnes Jewish Christian Health Care is using SNOMED CT® within its perioperative and surgery suites for medical transcription.

What number or percentage of federal agencies have adopted the standard?

Versions of SNOMED® are currently used by: the Centers for Disease Control and Prevention (CDC), Department of Defense (DoD), Indian Health Services (IHS) and the Department of Veterans (DVA) in specific applications. As SNOMED CT® was first released a year ago in January, 2002, most of the government applications for which

SNOMED CT® has been licensed are in evaluation or developmental stages.

Agency/Organization	Approved	Description
ANSI		The structure of SNOMED CT® is in the process of being balloted as an ANSI standard. On the initial canvass, 72% of the list responded to the ballot, with 86% voting to approve the SNOMED CT® Structure as an American National Standard. A standard proposal addressing the concerns raised increased the favorable vote to 89%.
CDC	10/1/2002 9/22/1999 7/11/2002	1. Licensure of SNOMED® for reporting bioterrorism and infectious disease data from up to 500 sites plus 150 back-up laptops 2. Licensure of SNOMED® for reporting cancer data from up to 100 cancer registries 3. Licensure of SNOMED® for internal evaluation purposes
DoD	1/31/2003	Licensure of SNOMED® for use in standardization of medical data and treatment protocols in the Special Operations Forces Medical Handbook
NIH/NCI	1/7/2003	Licensure of SNOMED® for use in NCI's Apelon DTS server to evaluate the use of SNOMED® codes in reporting NCI-sponsored clinical trials. New clinical documentation system in development will use SNOMED CT®.
Quality Practice Groups		Upon request of the National Quality Forum, the "never events" have been integrated into SNOMED®
Tumor Registries	9/22/1999	Licensure by CDC of SNOMED® for reporting cancer data from up to 100 cancer registries
DVA	9/14/2000	Many DVA hospitals have used earlier versions of SNOMED® for many years, particularly for laboratory applications, and have made extensive local extensions to reflect their specific need. The DVA, in conjunction with the DoD and Indian Health Service, licensed SNOMED

		RT® for use in the pilot phase of the GCPR project, which has now been replaced by the CHI initiative.
NASA (contract held by Wyle Laboratories)	1/31/2002	Use of SNOMED® in the Astronaut Longitudinal Database
AFIP	5/26/1999	Use of SNOMED® in coding of pathology specimens

Is the standard used in other countries?

As of April, 2003, the CAP has licensed users of SNOMED CT® in 31 countries. Earlier editions of SNOMED® have been licensed in over 40 countries. Following are the countries in which SNOMED CT® has been licensed:

Argentina
Australia
Belgium
Brazil
Canada
China
Colombia
Denmark
Hong Kong
Iceland
India
Ireland
Israel
Italy
Japan
Kuwait
Mexico
The Netherlands
New Zealand
Norway
Peru
Portugal
Puerto Rico
Scotland
South Korea
Spain
Sweden
Turkey
United Kingdom
United States
Venezuela

As previously noted, the UK's National Health Service has officially stated that any computerized information system being developed to support any clinical information system, should use the NHS preferred clinical terminology, SNOMED® Clinical Terms. In Australia, where the use of electronic health cares systems to support general practice is relatively advanced, a "Coding Jury" had been established to select a single coding system to support GP clinical systems. Currently, the GP Vocabulary Project is underway, and is designed to assist in the building and support of a standard general practice interface terminology suitable for the management of information collected during the clinical encounter. Phase 2 of this project will include the mapping of a subset of the GP Vocabulary to SNOMED CT®.

Are there other relevant indicators of market acceptance?

Market share information provided by CAP indicates that 79% of computerized patient record systems and 85% of laboratory systems vendors have made licensing commitment. Following are other relevant indicators of SNOMED's® market acceptance:

- Both HL7® and DICOM® have formally recognized SNOMED® as a standard code set within their messaging standard. SNOMED® is embedded in the DICOM® Structured Reporting Standard for Wave Forms.
- The American Veterinary Medical Association (AVMA) has adopted SNOMED CT® as the official terminology for veterinary practice in the US. It has been used extensively by the veterinary community in a collaborative product to track health care data on a national basis.
- The American Nurses Association (ANA) has recognized SNOMED CT® as a terminology that supports nursing practice, specifically: nursing assessments, plans, interventions and outcomes.
- WASPalm, the World Association of Societies of Pathology and Laboratory Medicine, representing 59 member societies throughout the world, has endorsed SNOMED® as the preferred reference language for laboratory clinicians.

Part III – Adoption & Deployment Information

Provide all information gathered in the course of making the recommendation that may assist with adoption of the standard in the federal health care sector. This information will support the work of an implementation team.

Existing Need & Use Environment

Measure the need for this standard and the extent of existing exchange among federal users. Provide information regarding federal departments and agencies use or non-use of this health information in paper or electronic form, summarize their primary reason for using the information, and indicate if they exchange the information internally or externally with other federal or non-federal entities.

Column A: Agency or Department Identity (name)
Column B: Use data in this domain today? (Y or N)
Column C: Is use of data a core mission requirement? (Y or N)
Column D: Exchange with others in federal sector now? (Y or N)
Column E: Currently exchange paper or electronic (P, E, B (both), N/Ap)
Column F: Name of paper/electronic vocabulary, if any (name)
Column G: Basis/purposes for data use (research, patient care, benefits)

Department/Agency	B	C	D	E	F	G
Department of Veterans Affairs	Y	Y	Y	B		Patient
Department of Defense	Y	Y	Y	B		Patient
HHS Office of the Secretary						
Administration for Children and Families (ACF)						
Administration on Aging (AOA)						
Agency for Healthcare Research and Quality (AHRQ)						
Agency for Toxic Substances and Disease Registry (ATSDR)						
Centers for Disease Control and Prevention (CDC)	Y	Y		B		Public Health
Centers for Medicare and Medicaid						

Services (CMS)						
Food and Drug Administration (FDA)						
Health Resources and Services Administration (HRSA)						
Indian Health Service (IHS)	Y					
National Institutes of Health (NIH)	Y			B		
Substance Abuse and Mental Health Services Administration (SAMHSA)						
Social Security Administration						
Department of Agriculture						
State Department						
US Agency for International Development						
Justice Department						
Treasury Department						
Department of Education						
General Services Administration						
Environmental Protection Agency						
Department of Housing & Urban Development						
Department of Transportation						
Homeland Security						

Number of Terms

Quantify the number of vocabulary terms, range of terms or other order of magnitude.

Of the 344,549 concepts and 913,696 terms in SNOMED CT® there are over 1,000 nursing intervention concepts modeled from the HHCC, Omaha, NIC and PNDS; as well as nursing diagnosis and problem concepts from NANDA, PNDS, HHCC and Omaha System.

How often are terms updated?

Semiannually (January 31st and July 31st)

Range of Coverage

Within the recommended vocabulary, what portions of the standard are complete and can be implemented now? (300 words or less)

SNOMED CT® is a fully functional and is being fully deployed now. The SNOMED® Convergent Terminology Group for Nursing (CTGFN) (a domain-specific working group of the SNOMED® International Editorial Board) directs nursing concept integration efforts. Agreements have been made with many of the developers of the ANA recognized nursing languages to integrate nursing content into SNOMED CT®, and to provide mapping tables to those users who were using both SNOMED CT® and one of the nursing vocabularies within their systems.

As a result of the SNOMED® CTGFNs efforts, SNOMED CT® currently contains nursing diagnostic concepts from NANDA, HHCC, Omaha System, and the PNDS; as well as nursing intervention concepts from HHCC, Omaha System, the PNDS, and NIC. Nursing outcomes concepts from the above systems including the NOC are planned for integration within future releases.

Acquisition

How are the data sets/codes acquired and use licensed?

It will soon be in the UMLS®, anticipated January 2004, free of charge to anyone who agrees to the license terms. UMLS® license terms allow use for all patient record uses and messaging. An in-principal agreement has been reached that provides, in the US, SNOMED CT® as one of the Category 0 code sets essentially allowing free distribution and use in the US.

Cost

What is the direct cost to obtain permission to use the data sets/codes? (licensure, acquisition, other external data sets required, training and education, updates and maintenance, etc.)

There is no acquisition cost due to the CAP & NLM agreement. We have no knowledge of the cost of implementing SNOMED® as a source terminology from UMLS® but it is our understanding that it can be extracted easily and then implemented as the current stand-alone version is. Successful implementation of the current version of SNOMED® requires knowledge of the file and data structure that can be obtained from extensive provided documentation or training courses, offered for a fee, on-site or at the CAP offices on a regular basis. Similarly, full use of the hierarchies and relationships in SNOMED® also require extensive training, education and in many cases extensive software changes. The United Kingdom has been working with CAP for 3+ years on implementation, Kaiser Permenate in US has for 5+ years, and various other prototype sites exist. To our knowledge, none have successfully used all features of SNOMED CT®. Hence, no estimates on cost in this area can be offered.

Systems Requirements

Is the standard associated with or limited to a specific hardware or software technology or other protocol?

SNOMED CT® is both vendor and platform neutral, and can thus be implemented into systems based on any technology.

Guidance

What public domain and implementation and user guides, implementation tools or other assistance is available and are they approved by the SDO?

An extensive set of education material is provided as well as training courses for SNOMED CT®. Training and educational material are more limited for UMLS®. Information and current draft documents can be found at www.snomed.org.

The Workgroup notes that the implementation of any coding system for any purpose within an institution is complex and actual guidance is outside the scope of this report and may be outside the scope of the terminology provider.

Is a conformance standard specified? Are conformance tools available?

No. Discussion is under way regarding conformance-testing tools for use in the UK and

subsequent use in the US, but they are at least one to two years away.

Maintenance

How do you coordinate inclusion and maintenance with the standards developer/owners?

The College of American Pathologists (CAP) is an ANSI standards development organization and is the sponsor of the Terminology Structure Standard. SNOMED® International is a division of the CAP and has an integral role in maintaining this standard and SNOMED CT's® use of it. The College has been an active participant in standard development organizations. Following is a summary of this involvement:

- ANSI: approved as an ANSI accredited standards developer; the SNOMED CT® terminology structure is ANSI approved
- American Nurses Association: SNOMED CT® has been recognized as an ANA nomenclature;
- DICOM®: Secretariat of Working Group 8 (Structured Reporting) and participant in Working Group 13 (Visible Light Images);
- HL7®: SNOMED RT® is registered and SNOMED CT® registration is in progress;
- ISO: Participation in ISO Technical Advisory Group on Health Concept Representation;
- X12: Approved as a code source for ASC X12 version 4010 for the purpose of reporting more precise terms of medical results primarily for statistical purposes in the public health system;
- NCHS: SNOMED® monitors and integrates updates to ICD-9-CM as available;
- NCVHS: SNOMED® has consistently testified and responded to NCVHS requests in its evaluation of standards. In the February, 2003 NCVHS questionnaire, SNOMED® was identified as the most comprehensive nomenclature;
- NQF: SNOMED® has frequently been in attendance at NQF hearings and has testified whenever requested. At the request of the NQF, SNOMED® has also identified and incorporated “never events” into the SNOMED® structure;
- IOM: SNOMED® continues to testify and monitor deliberations regarding development of data standards applicable to the collection, coding and classification of patient safety information.

What is the process for adding new capabilities or fixes?

The SNOMED® International Editorial Board (SIEB) recommends content direction, which is then sent to the SNOMED® International Authority for approval. Proposals

come from requests from individual users, user groups, professional societies, internal editorial staff, and external consultants/advisors
The process includes:

- Collection of requests for changes and enhancements
- Prioritization of requests
- Implementation of changes
- Distribution to the relevant user base
- Quality assurance of the change.

Request for changes to SNOMED CT® come from many industry sources. To date, key contributors have been the result of close working partnerships with Kaiser Permanente, a large US healthcare organization, and the UK's National Health Service. SNOMED® International also partners with specialty medical groups including the American Dental Association, the American Academy of Ophthalmologists, DICOM®, and the American Veterinary Medical Association. SNOMED CT® has over 200 licensees that also provide detailed suggestions about new concepts and terms. An annual User's Group is a focal point for collecting input about the overall direction, although content submissions can be made at any time. SNOMED® also benefits from the detailed review of the terminology conducted during the translation to other languages. The scientific experts of the SNOME®D team, as part of its day-to-day work with SNOMED®, proactively scan new developments in healthcare and clinical treatments. In addition, SNOMED® sponsors a series of Convergent Terminology Groups (CTGs) to advise the Editorial Board. The CTGs recommend direction and priorities for a specialty area. Example CTGs include nursing, mapping, pathology, and imaging. SNOMED® has developed a web-based application for submitting change requests and recommending improvements to the vocabulary. This process will provide the end-user with better management of change requests and improved communication regarding its status. The status of requests can be viewed online 24x7 and email notifications are sent to the requestor at selected checkpoints as the request is processed. The process will acknowledge submissions within 1 working day, with most requests accepted or declined within a month. This application has been in pilot with several licensees since November 2002, and is being used actively within the SNOMED® team. All terminology suggestions are compiled and prioritized with input of the Editorial Board. If accepted, they are then scheduled to be addressed by the SNOMED® Clinical Editor team for a future release. Suggestions to other components of SNOMED CT®, such as documentation or file changes, are managed by other members of the SNOMED® team using a similar process. Major changes to content or technical structure are researched, documented and submitted to the SNOMED® International Editorial Board for formal consideration. Once scheduled, the change is made, reviewed, and incorporated into the next release. History files, subsets, cross-mappings, documentation, training, and release materials are all updated to reflect the change.

What is the average time between versions?

The average time between versions of SNOMED® is 6 months, January and July for

English editions; April and October for Spanish editions. New editions have been released less frequently. For example, SNOMED® has published five editions over the last 40 years. The first edition, SNOMED® for Pathology (known as SNOP) was developed in 1965. SNOMED® II was released in 1979, followed by SNOMED® International in 1997. SNOMED Reference Terminology® (SNOMED RT®), which revolutionized the structure of SNOMED®, was released in July 2000, followed by SNOMED Clinical Terms® (SNOMED CT®) in January, 2002, essentially doubling the content. There are no plans for an edition to replace SNOMED CT®. Predating the launch of SNOMED RT®, SNOMED® has issued updates (version releases) on a twice annual basis. This practice is expected to continue.

What methods or tools are used to expedite the standards development cycle?

SNOMED CT® infrastructure comprises a unified set of tools, structures and processes used to create, maintain and build upon the SNOMED CT® Core. The infrastructure includes a range of third party proprietary tools as well as CAP developed tools including the following:

SNOMED® Terminology Platform Tools

- Terminology Development (editor and classifier, QA tools, subset editor, release process tools, QA scripts);
- Mapping tools (mapping master);
- Content tools (editor style guides, authors web site);
- Translation tools (translation master, validation web site, memory tools);
- Documentation tool;
- Back-up/recovery.

License Deployment Tools

- License terminology tools (browser, request submission toolkits).

As an ANSI approved developer of standards, SNOMED® has a formalized set of procedures for the development and coordination of standards, and specifically SNOMED®. An integral part of this standard is the function of the SNOMED® International Editorial Board, which holds regularly scheduled meetings, and is consulted by email and phone conference as needed. As previously discussed, the Editorial Board consists of experts from a number of medical disciplines, thus enhancing the breadth and scope of the content. Working groups are formed as required and then dissolved when their mission is accomplished. As an example, a "context of care" working group has worked for the past several months to create an approach and guidelines for how terminology can be used in the context of a healthcare record. In addition to exposing these ideas for dialog in the informatics research community through such forums as AMIA (American Medical Informatics Association), SNOMED® holds memberships in standards groups such as HL7® and ISO to ensure alignment with evolving standards. To ensure that the standards can be used in a practical way, the SNOMED® team uses the broad experience of SNOMED CT® licensees, the SNOMED® Industry Advisory Group,

SNOMED® CTGs, and the SNOMED® International Editorial Board to shorten the cycle from idea to standard discussion, and most importantly, to standard adoption. Other processes that are used to expedite the development of the terminology include the use of alpha and beta tests, validation studies, consultative reviews and focus groups. The ANSI guideline document also outlines both quality assurance and continual quality indicator processes.

How are local extensions, beyond the scope of the standard, supported if at all?

Local extensions are supported within the SNOMED® structure. They provide extensibility of SNOMED CT® for specialized organizational terminology. Extensions may be developed by CAP or by one of its licensees who have applied to CAP for a designated name space in accordance with the SNOMED CT® extension policy. Local concepts can be kept in separate extension files using the SNOMED CT® standard structure with locally assigned identifiers. The identifiers are kept distinct from SNOMED CT® and from other local extensions utilizing a "namespace" that is assigned by SNOMED® International. Currently, the US Drug extension and the UK Drug extension are maintained by the College of American Pathologists and the National Health Service respectively. When content overlaps the scope of SNOMED CT®, it is submitted to the SNOMED® International team for consideration for the core content, so that other SNOMED CT® licensees can also take advantage of this work. Similarly, this structure can also help organizations transfer responsibility for terminology not only to SNOMED® International but also to another organization as appropriate.

Customization

Describe known implementations that have been achieved without user customization, if any.

A large number of SNOMED® end-users use SNOMED® in an as-delivered format as incorporated into software solutions. Perhaps the greatest number of these exists within the anatomic/clinical pathology environment, where numerous end-users have deployed SNOMED® as a standard component of their LIS. Many of the software suppliers are also in various stages of implementing SNOMED CT® into other systems, such as EMR and Order Entry. Kaiser Permanente has also made extensive use of SNOMED® throughout its health care system. As SNOMED CT® has been in the market for little over a year, many organizations have not yet completed their implementation process.

If user customization is needed or desirable, how is this achieved? (e.g., optional fields, interface engines, etc.)

Localization can be achieved throughout to development SNOMED CT® compliant subsets, mapping and extensions to content. The SNOMED CT® structure supports this

process by offering tools such as the subset editor, mapping master, and editor style guidelines. Additionally, the CAP supports consultative services that can assist customization efforts on an individual client basis.

Mapping Requirements

Describe the extent to which user agencies will likely need to perform mapping from internal codes to this standard.

The workgroup would like to see mapping of the nursing terminologies in the UMLS® to SNOMED CT® to be maintained, validated, and distributed in through the UMLS. The workgroup recognizes the importance of the collaboration of the source nursing terminology owners and the SNOMED® CTG for nursing in the appropriate inclusion and representation of nursing terms within SNOMED CT®.

Identify the tools available to user agencies to automate or otherwise simplify mapping from existing codes to this standard.

Under the guidance of the Mapping Convergent Terminology Group, predefined mappings have been developed between SNOMED CT® and existing code sets. This can simplify the mapping process for organizations using the SNOMED CT® standard. These pre-defined mappings include ICD-9-CM, ICD-10, OPCS-4 (used in the UK), Nursing Intervention Classification scheme (NIC), and NANDA. SNOMED® morphology codes were adopted by ICD-O for Oncology and are actually a part of SNOMED CT®; a predefined ICD-O mapping also exists. LOINC® codes have been integrated into SNOMED CT® as well. SNOMED CT's® predecessor works, SNOMED RT® and the UK National Health Service's Clinical Terms Version 3 (CTV3), are fully integrated into the terminology. Migration files are also available for earlier editions of SNOMED® terminology. Documentation about the mapping structure and heuristics used to develop these mappings is available. Internal tools assist the mapping and the validation of those pre-defined maps. Among the tools that are available to those interested in mapping are:

- The SNOMED® Registry of Subsets, Extensions and Mappings, which identifies who is or has developed a SNOMED CT® compliant work;
- The SNOMED® Mapping Kit, in development, which summarizes the key structure and content decision rules to consider when mapping;
- Consultative services available for custom mapping projects.
- Identify the extent of off-the-shelf conformity with other standards and requirements

SNOMED® has developed a number of maps, such as those to ICD-9-CM, NIC, NOC, NANDA and OPCS-4. SNOMED® has also integrated LOINC® and ICD-O-3 into the vocabulary.

Compatibility:
Identify the extent of off-the-shelf conformity with other standards and requirements:

Conformity with other Standards	Yes (100%)	No (0%)	Yes with exception
NEDSS requirements	Y		
HIPAA standards			
HL7 2.x	Y		

Implementation Timeframe

Estimate the number of months required to deploy this standard; identify unique considerations that will impact deployment schedules.

Though currently not widely used in federal systems, it is anticipated that further deployment will occur once rapidly once available free of charge through the UMLS®. The amount of time required for deployment of SNOMED CT® can vary dramatically. Among the factors that can affect the length of time required are the scope and complexity of the system into which SNOMED® is being deployed, the internal resource commitment, testing, migration requirements, training schedules and the planned go-live date.

If some data sets/code sets are under development, what are the projected dates of completion/deployment?

NA

Gaps

Identify the gaps in data, vocabulary or interoperability.

The entirety of SNOMED CT® was not assessed, only it's applicability to nursing documentation. Although SNOMED CT® provides the most comprehensive coverage of nursing domain concepts, no terminology is complete and continued collaboration of SNOMED CT® and nursing terminology developers is essential. Additionally, the hierarchies within SNOMED CT® that contain nursing content must be evaluated to ensure the appropriate classification of nursing concepts

Obstacles

What obstacles, if any, have slowed penetration of this standard? (technical, financial, and/or cultural)

Many software suppliers and health care providers have delayed adoption and deployment of SNOMED CT® pending positive conclusion of the relationship or of the

NCVHS recommendations regarding clinical terminology. Experience has also shown that while organizations recognize the value of terminologies and the effort in developing and maintaining them, many also believe that funding should be at a national level. Also, the lifecycles of terminologies are very long. For example, many laboratory information systems in the U.S. still autoencode using SNOMED® II (circa 1979). Health care organizations need to be confident over long-term development, control, and costs of the terminology prior to making the commitment to their use. In some organizations, the scope and pace of implementation is determined by factors such as health priorities, the lifecycles of information systems, and their associated funding streams, legislation, accreditation, billing requirements as well as the level of market acceptance. As the hurdles to implementing electronic records are addressed, SNOMED CT® provides the framework for interoperability, at a local, regional, national, or global level. To manage the scale of the commitment and its associated risks, organizations need to be able to evaluate, experiment, make adaptations, and share the results with others. For many, industry is the distribution and implementation channel for SNOMED CT®. Software suppliers also need to assess the cost of system redesign with the benefits in their market sector. Past experience has revealed a number of associated risks that must be managed for suppliers to engage in the necessary systems development, including:

- Perceived high whole systems costs to migrate a health care enterprise to a new software platform;
- Uncertain realizable benefits from full use of the clinical richness of the terminology and the robustness of its infrastructure;
- Long time-scales (12-24 months to market);
- Diverse, potentially conflicting stakeholder requirements including the preservation of legacy information;
- Dependencies on other “user” initiatives, local priorities and information systems life cycles; and
- Reluctance to commit to terminology produced by a terminology developer that is not committed to long-term maintenance using commercial grace processes.

Appendix A

Information Exchange Requirements (IERs)

Information Exchange Requirement	Description of IER
Beneficiary Financial / Demographic Data	Beneficiary financial and demographic data used to support enrollment and eligibility into a Health Insurance Program.
Beneficiary Inquiry Information	Information relating to the inquiries made by beneficiaries as they relate to their interaction with the health organization.
Beneficiary Tracking Information	Information relating to the physical movement or potential movement of patients, beneficiaries, or active duty personnel due to changes in level of care or deployment, etc.
Body of Health Services Knowledge	Federal, state, professional association, or local policies and guidance regarding health services or any other health care information accessible to health care providers through research, journals, medical texts, on-line health care data bases, consultations, and provider expertise. This may include: (1) utilization management standards that monitor health care services and resources used in the delivery of health care to a customer; (2) case management guidelines; (3) clinical protocols based on forensic requirements; (4) clinical pathway guidelines; (5) uniform patient placement criteria, which are used to determine the level of risk for a customer and the level of mental disorders (6) standards set by health care oversight bodies such as the Joint Commission for Accreditation of Health Care Organizations (JCAHO) and Health Plan Employer Data and Information Set (HEDIS); (7) credentialing criteria; (8) privacy act standards; (9) Freedom of Information Act guidelines; and (10) the estimated time needed to perform health care procedures and services.
Care Management Information	Specific clinical information used to record and identify the stratification of Beneficiaries as they are assigned to varying levels of care.
Case Management Information	Specific clinical information used to record and manage the occurrences of high-risk level assignments of patients in the health delivery organization..
Clinical Guidelines	Treatment, screening, and clinical management guidelines used by clinicians in the decision-making processes for providing care and treatment of the beneficiary/patient.

Cost Accounting Information	All clinical and financial data collected for use in the calculation and assignment of costs in the health organization .
Customer Approved Care Plan	The plan of care (or set of intervention options) mutually selected by the provider and the customer (or responsible person).
Customer Demographic Data	Facts about the beneficiary population such as address, phone number, occupation, sex, age, race, mother's maiden name and SSN, father's name, and unit to which Service members are assigned
Customer Health Care Information	All information about customer health data, customer care information, and customer demographic data, and customer insurance information. Selected information is provided to both external and internal customers contingent upon confidentiality restrictions. Information provided includes immunization certifications and reports, birth information, and customer medical and dental readiness status
Customer Risk Factors	Factors in the environment or chemical, psychological, physiological, or genetic elements thought to predispose an individual to the development of a disease or injury. Includes occupational and lifestyle risk factors and risk of acquiring a disease due to travel to certain regions.
Encounter (Administrative) Data	Administrative and Financial data that is collected on patients as they move through the healthcare continuum. This information is largely used for administrative and financial activities such as reporting and billing.
Improvement Strategy	Approach for advancing or changing for the better the business rules or business functions of the health organization. Includes strategies for improving health organization employee performance (including training requirements), utilization management, workplace safety, and customer satisfaction.
Labor Productivity Information	Financial and clinical (acuity, etc.) data used to calculate and measure labor productivity of the workforce supporting the health organization.
health organization Direction	Goals, objectives, strategies, policies, plans, programs, and projects that control and direct health organization business function, including (1) direction derived from DoD policy and guidance and laws and regulations; and (2) health promotion programs.
Patient Satisfaction Information	Survey data gathered from beneficiaries that receive services from providers that the health organization wishes to use to measure satisfaction.

Patient Schedule	Scheduled procedure type, location, and date of service information related to scheduled interactions with the patient.
Population Member Health Data	Facts about the current and historical health conditions of the members of an organization. (Individuals' health data are grouped by the employing organization, with the expectation that the organization's operations pose similar health risks to all the organization's members.)
Population Risk Reduction Plan	Sets of actions proposed to an organization commander for his/her selection to reduce the effect of health risks on the organization's mission effectiveness and member health status. The proposed actions include: (1) resources required to carry out the actions, (2) expected mission impact, and (3) member's health status with and without the actions.
Provider Demographics	Specific demographic information relating to both internal and external providers associated with the health organization including location, credentialing, services, ratings, etc.
Provider Metrics	Key indicators that are used to measure performance of providers (internal and external) associated with the health organization.
Referral Information	Specific clinical and financial information necessary to refer beneficiaries to the appropriate services and level of care.
Resource Availability	The accessibility of all people, equipment, supplies, facilities, and automated systems needed to execute business activities.
Tailored Education Information	Approved TRICARE program education information / materials customized for distribution to existing beneficiaries to provide information on their selected health plan. Can also include risk factors, diseases, individual health care instructions, and driving instructions.

Appendix B

ANA-Recognized Terminologies	**Assessment**	**Diagnosis**	**Interventions**	**Outcomes**	**Mapped or Concepts Integrated in SNOMED CT®?**	**In the UMLS®?**	**NOTES**
	Scope Intent						
SNOMED CT®	X	X	X	X		Category 0 as of 01/04	Convergent Terminology Group for Nursing—collaborates with ANA and terminology owners
ABC Codes			X		**No**	Category 3	Primarily administrative / billing codes
NANDA		X			**Integrated** & mapping tables available	Category 3	Fully integrated in SNOMED CT
NIC			X		**Integrated** & mapping tables available	Category 3	
NOC				X	Plan to complete **integration** for 1/2004 release	Category 3	
OMAHA System		X	X	X	**Integrated**	Category 1	

ANA-Recognized Terminologies	Assessment	Diagnosis	Interventions	Outcomes	Mapped or Concepts Integrated in SNOMED CT®?	In the UMLS®?	NOTES
	Scope Intent						
HHCC		X	X	X	**Integrated** (Diagnoses & Interventions; Outcomes pending)	Category 1	Integrated into SNOMED CT
PCDS		X	X	X	Discussions Continue	Category 3	ONLY in use at Vanderbilt University; Plan to have it coded according to clinical LOINC® and mapped into SNOMED
PNDS		X	X	X	**Integrated** & mapping tables available	N	
ICNP®	X	X	X	X	Discussions continue	N	Version I not due for release TIL 2005
Clinical LOINC®	X		X	X	Workgroup convened by NLM	Y	Unidentified overlap with SNOMED-CT; Not comprehensive of nursing terms. Has convened a nursing subcommittee—early stages.