

Workshop on Standards and Terminologies

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Terminologies with Nursing Content

	Diagnoses	Interventions	Outcomes	Goals
NANDA	X			
NIC		X		
NOC			X	
CCC	X	X	X	X
Omaha	X	X	X	
ICNP	X	X	X	X
LOINC		X	X	X
SNOMED CT	X	X	X	X

Clinical Care Classification System (2.0)

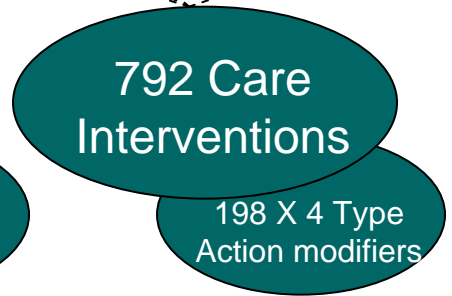
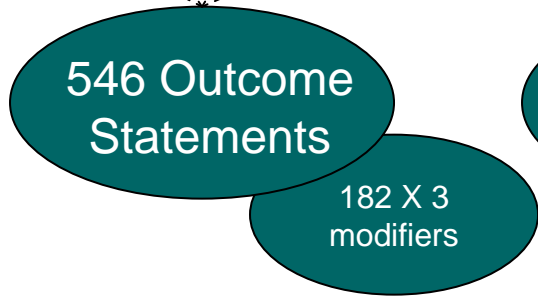
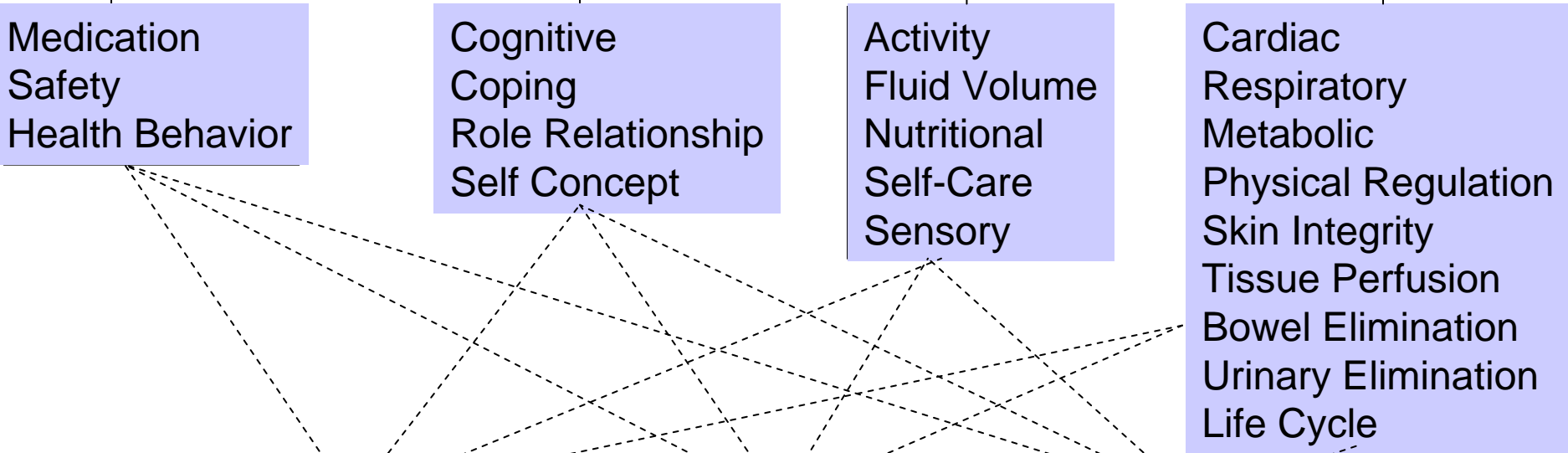
- Two Interrelated Terminologies
- CCC of Nursing Diagnoses & Outcomes
 - 182 Diagnoses
 - 546 Outcomes
- CCC of Nursing Interventions & Actions
 - 782 Nursing Intervention Actions
- Organized into Single CCC System
 - 21 Care Component Classes
 - 4 Health Care Patterns

CCC System Framework

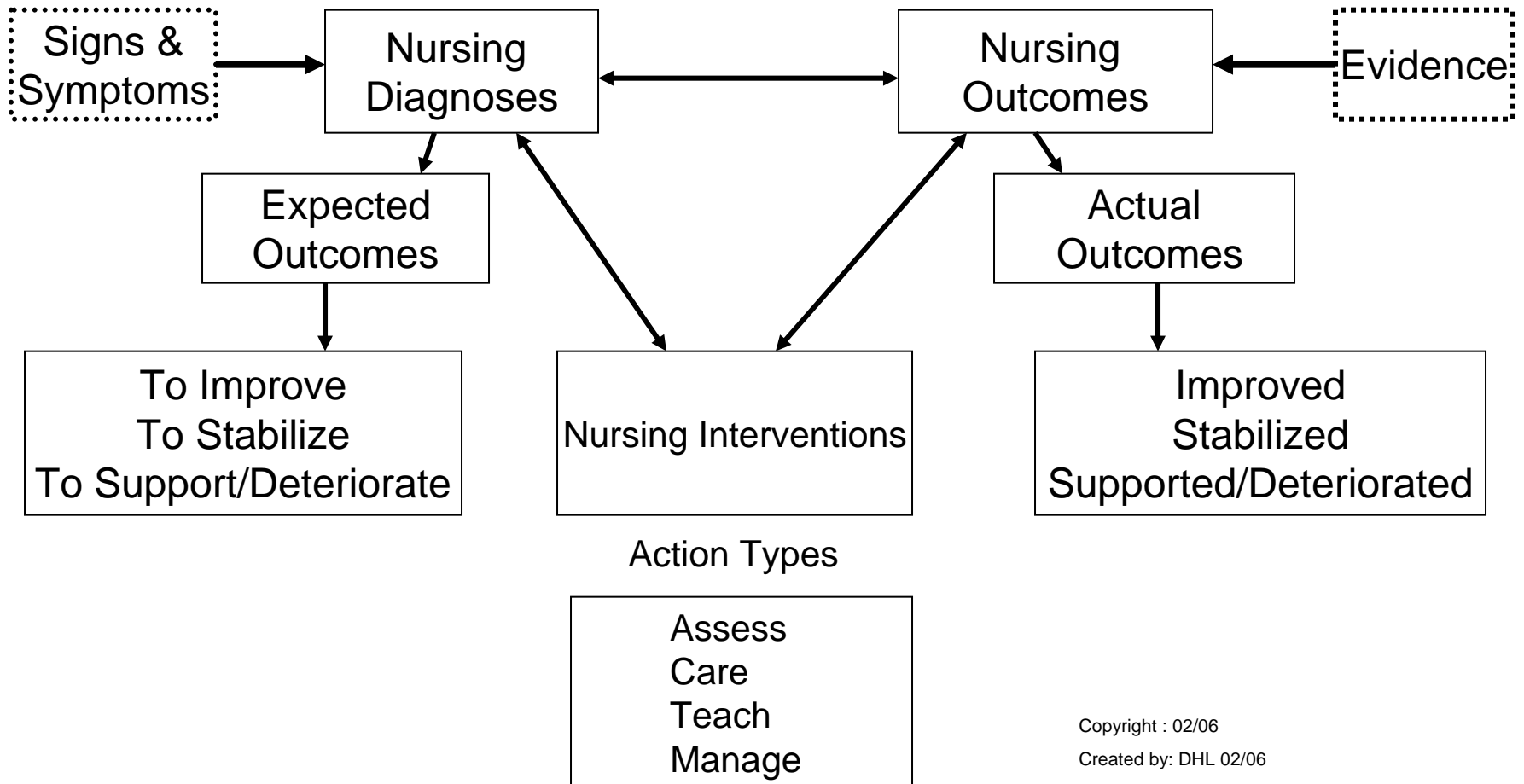
Health / Care Patterns



Care Component Classes



CCC Information Model



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Created by: DHL 02/06

Virginia Saba, Ed.D, RN, FAAN, FACME

& Jean Arnold, Ed.D, RN, BC

Example:

CCC of Nursing Diagnoses

- Activity Alteration
- Bowel Elimination Alteration
- Dying Process
- Urinary Elimination Alteration

Example:

CCC of Expected Outcomes

- Activity Alteration
- Expected Outcomes
 - Activity Alteration will Improve
 - Activity Alteration will Stabilize
 - Activity Alteration will Deteriorate

Example:

Core CCC of Nursing Interventions

Atomic (discrete) concepts

- Activity Care
- Bowel Care
- Terminal Care
- Bladder Care

Example: Nursing Interventions & 4 Action Qualifiers

Activity Care

- Assess/Monitor Activity Care
- Care/Perform Activity Care
- Teach/Educate Activity Care
- Manager/Refer Activity Care

Example: CCC of Actual Outcomes

- Activity Alteration
- Actual Outcomes
 - Activity Alteration Improved
 - Activity Alteration Stabilized
 - Activity Alteration Deteriorated

CCC System Status

- Recognized by ANA 1991
- Registered HL7 Language
- Approved ANSI-HISP Code Set
- Terms included in LOINC
- Integrated into UMLS
- Indexed into CINAHL
- Conforms to ISO Nursing RT Model
- Integrated into SNOMED CT
- Translated into Dutch, Finnish, Chinese, Portuguese, Spanish, German, Korean, Slovenia

CCC Information

- *Clinical Care Classification (CCC) Manual: A Guide to Clinical Documentation (2007)* Available: Springer Publications
- <http://www.sabacare.com>
- Contact: <vsaba@ worldnet.att.net>

Logical Observation Identifiers, Names, and Codes (LOINC)

- Originally designed for laboratory names
- Expanded to other clinical measurements
- Health Level 7/LOINC Document
Ontology
- Section names for Health Level 7 Clinical
Document Architecture (CDA)

Nursing Content in LOINC Database: Examples

- Clinical assessments
 - Pain, functional status
- Physical measurements
 - Vital signs, obstetric
- Assessments from nursing terminologies
 - Omaha Problem Rating Scale
 - Clinical Care Classification expected outcomes
- Nursing research instruments
 - Sign and System Checklist for HIV/AIDS
- Nursing document names

Axes in Clinical LOINC

- Component (analyte) - The substance or entity that is measured, evaluated, or observed. — e.g., head circumference, pain severity, potassium.
- Kind of Property - The characteristic or attribute of the analyte that is measured, evaluated, or observed — e.g., length, volume, circumference, mass, ratio, number, temperature.
- Time Aspect - The interval of time over which the observation or measurement was made - e.g., point in time, 24 hours.
- System - The system (context) or specimen type within which the observation was made — e.g., urine, blood, artery, patient, family.
- Type of Scale — e.g., whether the measurement is quantitative (blood pressure), ordinal (improved, maintained, deteriorated), nominal (e.g., *E. coli*; *Staphylococcus aureus*), or narrative (e.g., dictation results from x-rays).
- Type of Method - The procedure used to make the measurement or observation. It is only used when it makes an important distinction in sensitivity or specificity. Method is the only axis that is optional.

Standardized Assessments in LOINC

Component	Property	Time	System/Sample	Scale	Method	Answer List
ACTIVITIES OF DAILY LIVING ALTERATION	FIND	PT	^PATIENT	ORD	OBSERVED.HHCC	IMPROVED, STABILIZED, DETERIORATED
ANXIETY	FIND	24H	^PATIENT	ORD	REPORTED.HIV-SSC	MILD, MODERATE, SEVERE
PAIN DURATION	FIND	PT	^PATIENT	NOM	REPORTED	Continuous , Intermittent, Constant
PAIN DURATION	TIME	PT	^PATIENT	QN	REPORTED	Minutes, Hours, Days, Weeks, Months, Years
PAIN SEVERITY	FIND	PT	^PATIENT	ORD	REPORTED. VISUAL ANALOG SCORE	0-10
NEONATAL APGAR.TOTAL^10M POST BIRTH	FCN	PT	^PATIENT	ORD		0-10
EFFACEMENT	PRCTL	PT	CERVIX^PATIENT	ORD	PALPATION	Closed, fingertip, 50%, etc.
BIRTHS.TOTAL	NUM	PT	^PATIENT	QN	REPORTED	

Telehealth Device Measurement Names

Component	Property	Time	System/Sample	Scale	Method	Code
Vendor Device Name	ID	PT	Pedometer	NOM		41947-3
Vendor Device Model	ID	PT	Pedometer	NOM		41948-1
Calories Burned	ERGAT	24H	^Patient	QN	Calculated	41979-6
Calories Burned	ERGAT	1W	^Patient	QN	Calculated	41980-4
Number of Steps	NRAT	24H	^Patient	QN	Measured	41950-7
Walk Distance	LEN	24H	^Patient	QN	Calculated	41954-9
Walk Distance	LEN	24H^MEAN	^Patient	QN	Calculated	41955-6
Walking Speed	VEL	1W^MEAN	^Patient	QN	Calculated	41958-0

Document Ontology

- HL7/LOINC document ontology task force
- Initially funded by the VA
- Document names represented using LOINC semantic model
- Improve sharing of documents among institutions

Document Ontology Axes

- Kind of Document
- Type of Service
- Setting
- Subject Matter Domain
- Training/Professional Level

Kind of Document

- Required axis
- Examples:
 - Clinical note
 - Letter
 - Consent

Type of Service

- Characterizes the type of service that is provided to (or for) the subject of the note, usually the patient.
- Examples:
 - Admission history and physical
 - Communication
 - Interventional procedure
 - Discharge summary

Setting

- An extension of CMS's coarse definitions
 - Hospital
 - Telehealth
 - Office
- Not equivalent to location which is often more locally defined and can be included within the message itself when documents are sent between institutions

Subject Matter Domain

- Characterizes the subject matter and/or discipline that is relevant to the document being considered, and is the main focus of the current study.
- Examples:
 - Urology
 - Respiratory Therapy
 - Cardiology

Training/Professional Level

- Characterizes the training or professional level of the physician or nurse creating the document
- Examples:
 - Attending
 - Resident
 - Nursing Student
 - Nurse
 - Nurse Practitioner

Naming Convention

- Kind of Document and at least one of the names from one of the other four axes
- Example - a dermatology note by an attending physician for evaluation and management via telehealth technology:

<Dermatology>	:	<Subject Matter>
<Attending>	:	<Training/Professional Level>
<Telehealth>	:	<Setting>
<Eval & Mgmt>	:	<Type>
<Clinical Note>	:	<Kind>

Naming Convention

- Kind of Document and at least one of the names from one of the other four axes
- Example - a nursing admission note in oncology:

<Oncology>	:	<Subject Matter>
<Nurse>	:	<Training/Professional Level>
<Hospital>	:	<Setting>
<Admission Evaluation>	:	<Type>
<Clinical Note>	:	<Kind>

Document Ontology in LOINC

Semantic Structure

LOINC Semantic Structure	Document Ontology for Clinical Note	Example: Cardiology Attending Physician Subsequent Evaluation Note
Component	Type of Service	Subsequent evaluation note
Property		Finding
Time		Point
Scale		Document
System/Sample	Setting	Inpatient
Method	Subject Matter Domain+ Professional Level	Cardiology.Attending Physician

```

<?xml version="1.0" encoding="UTF-8"?>
<ClinicalDocument xmlns="urn:n1:org:v3"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:n1:org:v3 http://www.hl7.org/standards/terminology/schema-instance/classCode=DOCCLR moodCode=EVN">
<!--
-----
CDA Header
-----
-->
<?typeId= </?typeId>
<?templateId= </?templateId>
<code code="34744-3" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="Admission Evaluation Note"/>
<!-->
<title>Admission Note</title>
<effectiveTime></effectiveTime>
<!--
-----
CDA Body
-----
-->
<component typeCode="COMPS" contextConductionInd="true">
<structuredBody>
<!-- Admission Diagnosis -->
<component>
<section>
<code code="29306-4" codeSystem="2.16.840.1.113883.6.1"
codeSystemName="LOINC"/>
<!-->
<title>Admission Diagnosis</title>
<!-->
<text>Lung Cancer</text>
<!-->
<entry>
<observation classCode="OBS" moodCode="EVN">
<code code="254637007" codeSystem="2.16.840.1.113883.6.99"
codeSystemName="SNOMED CT" displayName="non-small cell lung cancer"/>
</code>
</entry>
</component>
</section>
<!-- Allergies -->
<component>
<section>
<code code="29306-4" codeSystem="2.16.840.1.113883.6.1"
codeSystemName="LOINC"/>
<!-->
<title>Allergies</title>
<!-->
<text>Allergic to tests, itching</text>
<!-->
<entry>
<observation classCode="OBS" moodCode="EVN">
<code code="414285001" codeSystem="2.16.840.1.113883.6.99"
codeSystemName="SNOMED CT" displayName="itching of skin"/>
</code>
<entryRelationship typeCode="MFST" -->
<!-- semantically linked to an entry that
exists within the same document -->
<observation classCode="OBS" moodCode="EVN">
<code code="414285001" codeSystem="2.16.840.1.113883.6.99"
codeSystemName="SNOMED CT" displayName="Food allergy"/>
</code>
</entry>
</section>
</component>
</section>
<!-- Past Medical History -->
<component>
<section>
<code code="10153-2" codeSystem="2.16.840.1.113883.6.1"
codeSystemName="LOINC" displayName="History of Past Illness"/>
<!-->
<title>Past Medical History</title>
<!-->
<text></text>
</section>
</component>
</section>
<!-- Current Medication -->
<component>
<section>
<code code="10160-0" codeSystem="2.16.840.1.113883.6.1"
codeSystemName="LOINC" displayName="History of Medication Use"/>
<!-->
<title>Current Medication</title>
</section>
</component>
</section>
<!-- Pain Assessment -->
<component>
<section>
<code code="38212-7" codeSystem="2.16.840.1.113883.6.1"
codeSystemName="LOINC"/>
<!-->
<title>Pain Assessment</title>
</section>
</component>
</section>
<!-- Physical Assessment -->
<component>
<section>
<code code="11384-5" codeSystem="2.16.840.1.113883.6.1"
codeSystemName="LOINC" displayName="PHYSICAL EXAMINATION BY ORGAN SYSTEMS"/>
<!-->
<title>Physical Assessment</title>
</section>
</component>
</section>
<!-- Advanced Directives -->
<component>
<section>
<code code="310301000" codeSystem="2.16.840.1.113883.6.99"
codeSystemName="SNOMED CT" displayName="Advanced directive status"/>
<!-->
<title>Advanced Directives</title>
</section>
</component>
</section>
<!-- Nutritional Status -->
<component>
<section>
<code code="360364004" codeSystem="2.16.840.1.113883.6.99"
codeSystemName="SNOMED CT" displayName="Finding of nutritional status"/>
<!-->
<title>Nutritional Status</title>
</section>
</component>
</section>
<!--
-----
nonXML Body
-----
-->
<nonXMLBody classCode="DOCBODY" moodCode="EVN">
<realmCode></realmCode>
<typeId></typeId>
<templateId></templateId>
<text></text>
<nonXMLBody>
</component>
</ClinicalDocument>

```

ACDA document

Document Name
HL7 LOINC Document Ontology

Document Component

Document Component

Document Component

Nursing Admission Assessment Documentation Form

The screenshot shows a web-based form for a nursing admission assessment. Key sections include:

- Vital Signs:** Fields for mmHg, Pulse, Temp, and Respiration.
- Weight/Height:** Fields for kg and cm.
- Reasons for Admission:** A text input field.
- Admission Diagnosis:** A dropdown menu.
- Allergies:** A table with columns for Allergies, Reaction, and a dropdown for 'Other'.
- Past Medical History:** Checkboxes for Surgery, Hospitalization, DM, HTN, and None.
- Family History:** Checkboxes for Ca, MI, DM, and Other, each with a dropdown for 'who' and 'what'.
- Current Medication:** A table with columns for Drug, Dose, Freq, Route, and Last Time Taken.
- Patient Activity Level:** Radio buttons for Independent, Assisted, Total Care, and Other.
- Functional Status:** Radio buttons for various functional areas like Vision, Hearing, Speech, Feeding, Ambulation, Bowel, and Bladder.
- Discharge Planning:** Radio buttons for Advance Directives and Discharge Planning options.

Document Component

Document Component

Document Component

Document Component

A CDA document ↔ **Blood Administration Documentation Form**

```

<!--
CDA Header
-->
<!--
CDA Body
-->
<!-- Informal Consent -->
<!-- Blood Given -->
<!-- Medication -->
<!-- Transfusion Reactions -->
<!-- VITAL SIGNS -->

```

Document Name
HL7 LOINC Document Ontology

Document Component

Document Component

Document Component

Transfusion Reactions

Vital Signs	At Start (time)	After 15 min (time)	After 1 hour (time)	After 2 hours (time)	Completion (time)
SBP/DBP					
Pulse					
Temperature					
Respiration					

CDA for Blood Administration Documentation Note template

RELMA: LOINC Searching and Mapping Tool

LOINC Input Form

Local Code: Local Name:
 Battery (OBR-4): Local Name:
 Test (OBX-3): Local Name:
 Local Units: LOINC #: Lab:
 Spec:

Navigation: All Mapped Unmap

Use	Local Words	# Hits	Limit by TERM PART	# Hits
<input checked="" type="checkbox"/> 1	<input type="text" value="GLUCOSE"/>	388	<input type="text" value="{Limit by Property}"/>	
<input type="checkbox"/> 2	<input type="text" value="FASTING"/>	35	<input type="text" value="{Limit by Time}"/>	
<input type="checkbox"/> 3	<input type="text"/>		<input type="text" value="{Limit by System}"/>	
<input type="checkbox"/> 4	<input type="text"/>		<input type="text" value="{Limit by Scale}"/>	
<input type="checkbox"/> 5	<input type="text"/>		<input type="text" value="{Limit by Method}"/>	

Search (Ctrl + Rtn) Standard Grid Grouping Grid

Row	LOINC #	Short Common Name	Component	Property	Time	System	Scale	Method
1	10449-7		GLUCOSE^1H POST MEAL	MCNC	PT	SER/PLAS	QN	
2	10450-5		GLUCOSE^POST 10H CFST	MCNC	PT	SER/PLAS	QN	
3	10832-4		GLUCOSE^15M POST 50 G LACTOSE PO	MCNC	PT	SER/PLAS	QN	
4	10833-2		INSULIN^7H POST 75 G GLUCOSE PO	MCNC	PT	SER/PLAS	QN	
5	10966-0		GLUCOSE^2.5H POST 75 G GLUCOSE PO	ACNC	PT	UR	ORD	TEST STR:

Entry #: 21 of 66 Units: Specimen Methodless: Common Max Words: Class Tree: Grid No Dups: 388 records found in 0.14 sec

SNOMED CT: Then

- Merger of SNOMED RT and NHS Clinical Terms
- Convergent Terminology Group for Nursing
 - Reports to Editorial Board
 - Anne Casey, Royal College of Nursing, UK – Editorial Board Member
 - Facilitated agreement with nursing terminology developers for integration of nursing content into SNOMED CT
 - Models for integrating nursing content into SNOMED CT
 - Evaluation studies

Nursing Terminologies Integrated into SNOMED CT

- NANDA
- Clinical Care Classification
- Omaha System for Community Health
- Nursing Interventions Classification
- Nursing Outcomes Classification
- Perioperative Nursing Data Set

SNOMED CT: Now

- International Health Terminology Standards Development Organization <http://www.ihtsdo.org/>
- Charter members
 - Australia
 - Canada
 - Denmark
 - Lithuania
 - Netherlands
 - New Zealand
 - Sweden
 - UK
 - USA
- Nursing Representation Standing Committees
 - Content - Anne Casey, Royal College of Nursing, UK
 - Quality Assurance – Kathryn Hannah, Canada; Susan Matney, US; Judith Warren, US
 - Research and Innovation - none
 - Technical - none

- The organization
- History
- Vision
- Governance
- Working Groups**
- Standing Committees
- SNOMED CT Publications
- Other Publications
- FAQ
- Administration

Working Groups

Working Groups are divided into two types: Special Interest Groups (SIGs) and Project Groups (PGs).

Current SIGs include:

- ◆ Anesthesia
- ◆ Concept Model
- ◆ Education
- ◆ Mapping
- ◆ Nursing
- ◆ Primary Care
- ◆ Pathology and Laboratory Medicine
- ◆ Pharmacy
- ◆ Translation

Current PGs with areas on the collaborative site (<https://thecap.seework.com/login>) include:

- ◆ Collaborative working
- ◆ Education
- ◆ Machine and Human Readable Concept Model
- ◆ Mapping SNOMED to ICD-10
- ◆ Mapping standard processes
- ◆ Pharmacy content and model
- ◆ Pharmacy naming and editorial rules
- ◆ Request submission
- ◆ Substance hierarchy redesign
- ◆ Translation standard processes

All Working Groups support open participation. For access to the collaborative site for any of the SIGs or PGs, please send an email to support@ihtsdo.org.

Questions?