

## Technology in Nursing



09 August 2006

## Thought for the Session

*Knowledge is the most democratic source of power..... Alvin Toffler*

*Nurses, the largest group of health care practitioners, have an unparalleled opportunity to attract and disseminate power through informed practice.*



## Our information legacy

Despite that potential nursing's information legacy remains data rich, but information poor.

*"In attempting to arrive at the truth, I have applied everywhere for information, but in scarcely an instance have I been able to obtain hospital records fit for any purpose of comparison."*

*Florence Nightingale, 1896*

## 1993: Comparable data collected once, and used across the health care spectrum

USERS	DATA/ INFO	SCOPE
World health, Policy makers, Researchers, Lawmakers	Nation's Health Needs	Worldwide Data
Policy Makers, Researchers, Lawmakers, Insurers	Trends-costs, incidence, outcomes	Nationwide Data
Analysts, QM, Researchers, Public Health	Comparisons of costs, treatments, & outcomes	Community/Region-Wide Data
Administrators, QM, Researchers, Accreditor	Costs of care by category of patients, outcomes groupings	Agency-wide Data
Care givers, QI, Agencies, Insurers	Atomic level or patient specific data	Individual Data

Source: Zielstorff, R.D., Hudgings, C.I., Grobe, S.J. & The National Commission on Nursing Implementation Project Task force on Nursing Information Systems (1993)

Today....



- In every corner of the world, Nightingale's words are as true today as they were in 1896.
- Each session addresses global and local strategies associated with nursing's information imperative.

## *Standardized Terminologies in Action*

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## Thought for the lesson

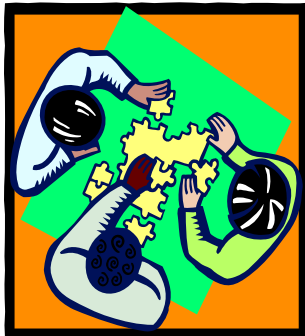
*"Il est plus aise de sire des choses nouvelles que  
de concilier celles qui on etes dites"*

*It is easier to say something new than to reconcile  
things that have already been said.*

*Luc de Clapier Vauvenargues, 1715-1747 (Relexions et Maximes)*

*Source: Iain Chalmers, Editor James Lind Library <http://www.jameslindlibrary.org>*

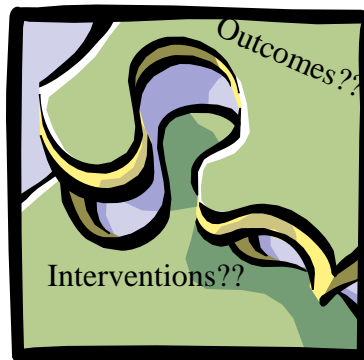
It is clear that knowing the evidence is good practice



Data helped to piece  
together that puzzle

D. Wayne Calloway of Pepsico, told his stock holders at a recent meeting, ""Ten years ago I could have told you how Doritos were selling west of the Mississippi. Today, not only can I tell you how well Doritos sell west of the Mississippi, I can tell you how well they are selling in California, in Orange County, in the town of Irvine, in the local Von's supermarket, in the special promotion, at the end of aisle four, on Thursdays."

*Sadly, we know more about Doritos than we do best nursing practices...*



## Mandate for Action

- In April, 2004, there was an executive order calling for most Americans to have electronic health records by 2014.
- The National Health Information Initiatives (NHII) was formed and four strategic goals for an EHR identified:

Goal 1-Inform clinical practice  
Goal 2-Interconnect clinicians  
Goal 3-Personalize care  
Goal 4-Improve population health

## Fact and Fallacy have emerged

- Call for action has jump started efforts in the massive US health care system to implement EHRs
- Proposed strategies have been grounded in both fact and fallacy.

## Fact: EHR Requirements

- The work of the NHII builds on previous work by the National Committee on Vital and Health Statistics (NCVHS) and others to facilitate computerizing health information.
- Common among these efforts were the following EHR requirements:
  - Contain information from all providers involved in health care.
  - Include nationally recognized standardized clinical terminologies to facilitate interoperability of data between systems and across health care delivery

*Source: Westra, 2005*

Fact: Initiated Strategies

- **Certification Commission for Healthcare Information Technology** - began the process of defining the requirements for EHRs for use in ambulatory settings.
- **American Health Information Community**-provided details on several funded projects to speed technology adoption in health care.

Fact: NCVHS Testimony Recommendations identified need for use of interoperable common terminologies

- SNOMED CT was chosen because it contains:
  - Over 1,000 nursing intervention concepts modeled from the Georgetown Home Health Care Classification (now CCC), 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, CCC and Omaha System.
  - Nursing sensitive outcomes from NOC, CCC and Omaha Systems

Fact: SNOMED CT-Large in scope and comprehensive in knowledge representation

The SNOMED CT collection contains:

- SNOMED Reference Terminology ®
- Clinical Terms Version 3®
- 357,000 health care concepts
- 957,000 synonyms
- 1.37 million semantic relationships

Fact: SNOMED CT Comprehensive Structures:  
18 Upper Level Concepts

- Clinical Finding - **Nursing Dx.**
- Procedure - **Interventions**
- Observable entity - **Outcomes**
- Body structure
- Organism
- Substance
- Pharmaceutical/biology product
- Specimen
- Physical object
- Physical force
- Events
- Environments/Geographical locations
- Social Context
- Context-dependent categories
- Staging and scales
- Attribute
- Qualifier value
- Special concept

Some myths have proliferated as well

1. There is no difference in the use of interface and reference terminologies.
2. Standardized clinical terminologies used at the point of service are no longer necessary.
3. SNOMED CT can be used as “plug and play” types of applications in the clinical record.

It is time to bust some of the myths

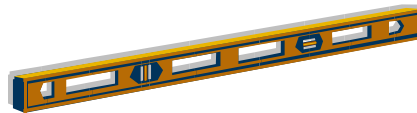


Use tools for Building

## Myth #1: There is no difference in the use of interface and reference terminologies



**Interface terminologies** provide translation from the clinician's own natural language into more structured representations required by application programs. They are usually pre-coordinated to have clinically useful terms.



**Reference terminologies** allow for mapping among concepts and supply common meaning that is independent of the terms or codes used. Reference terminologies represent knowledge and must have the capability of being post-coordinated.

## Myth # 2 Standardized clinical terminologies offer no value



In fact, the **Consolidated Health Informatics Initiative** workgroup recommended SNOMED CT because it contains nursing concepts from the previously mentioned source nursing terminologies which help to facilitate mapping among the various interface terminologies..

The specific concepts in the SNOMED CT hierarchy that form the basis of the CHII recommendation are primarily found in the "Findings & Procedures" hierarchies, as they represent the majority of nursing diagnoses and interventions.

http://www.umichhands.net - HANZS - Hands on Automated Nursing Data System - Microsoft Internet Explorer  
Saturday, July 22, 2006

**HANZS - Hands-On Automated Nursing Data System**

Print

Patient Name : Young, Peter

DOB : 8/22/1987 Nurse : Elifink Victoria

NANDA Diagnoses NOC Outcomes NIC Interventions

Rate NOC Tally NIC Preview Plan of Care Finish Later Submit Plan of Care

Search By: Top Picks Domain & Class A-Z List Keyword NANDA -> NOC

**NANDA - Top Picks** Results 1 to 21 of 21

- Activity Intolerance
- Acute Pain
- Anxiety
- Caregiver Role Strain
- Constipation
- Decreased Cardiac Output
- Deficient Fluid Volume
- Deficient Knowledge
- Excess Fluid Volume
- Impaired Gas Exchange
- Impaired Physical Mobility
- Impaired Skin Integrity
- Impaired Urinary Elimination
- Ineffective Coping
- Ineffective Health Maintenance
- Nausea
- Risk For Falls
- Risk For Infection
- Risk For Injury
- Unilateral Neglect

**Plan of Care Main Menu**

- Acute Pain
  - Pain Control
    - Active Listening (1)
    - Environmental Management: Comfort (1)
    - Documentation (1)
    - Pain Management (1)
  - Knowledge: Treatment Regimen
    - Teaching: Prescribed Medication (1)
    - Teaching: Disease Process (1)
  - Client Satisfaction: Teaching
    - Active Listening (1)
    - Learning Facilitation (1)
    - Learning Readiness Enhancement (1)
  - NOC Parking Lot**
  - NIC Parking Lot**

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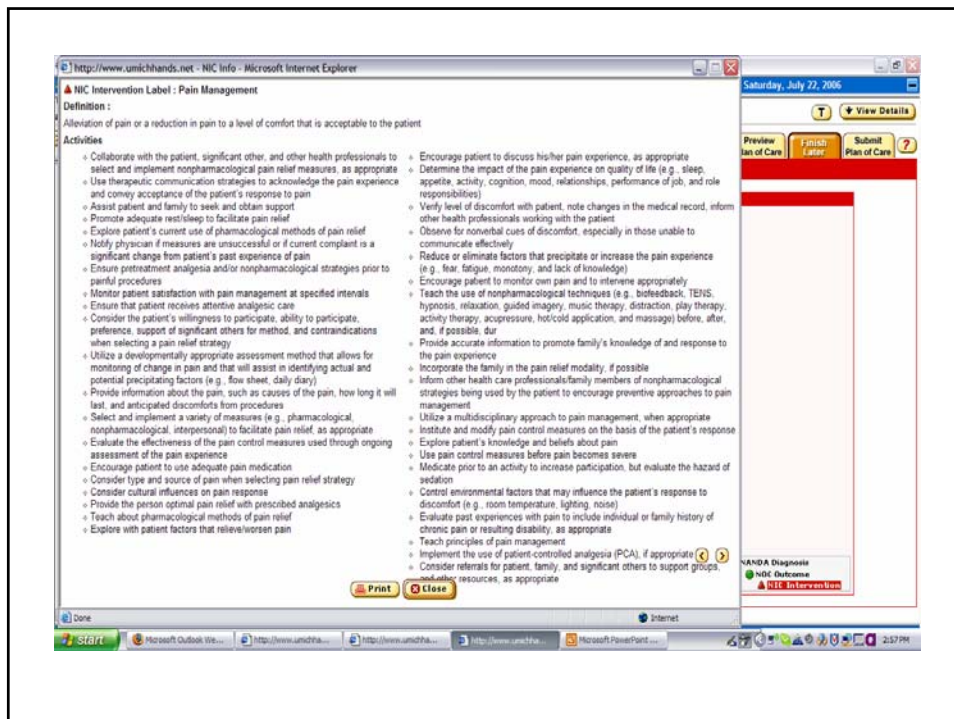
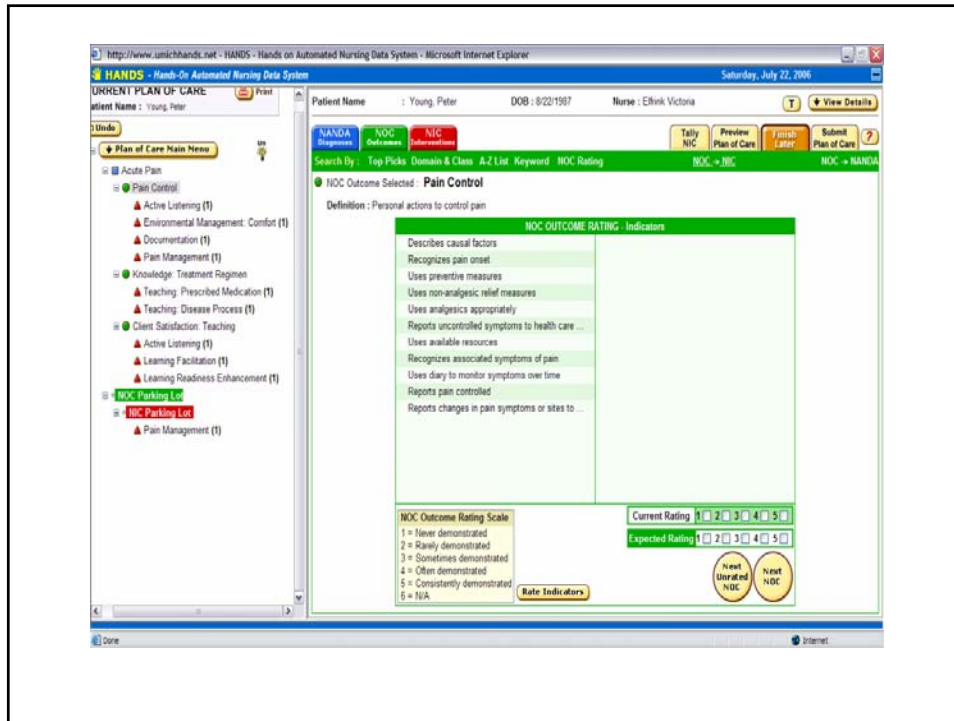
Search By: Top Picks Domain & Class A-Z List Keyword NOC Rating NOC -> NIC

**NOC - Top Picks** Results 1 to 21 of 21

- Activity Tolerance
- Bowel Elimination
- Cardiac Pump Effectiveness
- Caregiver Lifestyle Disruption
- Client Satisfaction: Access to Care Resources
- Coping
- Fall Prevention Behavior
- Fluid Balance
- Health Promoting Behavior
- Hydration
- Knowledge: Disease Process
- Knowledge: Medication
- Knowledge: Treatment Regimen
- Mobility
- Mood Equilibrium
- Nausea & Vomiting Control
- Neurological Status
- Respiratory Status: Gas Exchange
- Symptom Control
- Urinary Elimination

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    - Learning Readiness Enhancement (1)
  - NOC Parking Lot**



http://www.umichhands.net - Visit\_Preview - Microsoft Internet Explorer

◆ Preview Plan of Care [Print] [Close]

Young Peter Date Of Birth : 8/22/1987  
Primary : Current Date : 7/22/2006  
DX :  
Unit Type : Current Time : 15:1  
Shift :

NANDA Diagnoses	NOC Outcomes	Cur	Exp	NIC Interventions	Tot
Acute Pain	Pain Control	NR	NR	Active Listening	1
	Knowledge: Treatment Regimen	NR	NR	Environmental Management: Comfort	1
	Client Satisfaction: Teaching	NR	NR	Documentation	1
				Pain Management	1
				Teaching: Prescribed Medication	1
				Teaching: Disease Process	1
				Learning Facilitation	1
				Learning Readiness Enhancement	1

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## Pain mapped to SNOMED CT

Example of pain mapped to the Findings and Procedures Level use NANDA, NIC and NOC

A Nursing Diagnosis (NANDA) of “**Acute Pain**”

– **Finding**

- Finding of pattern of pain (finding)
  - Pain (finding)
    - » Finding of pain sense (finding)

*Source: Consolidated Health Informatics Initiative Final Recommendation Information Sheet1-Centers for Medicare and Medicaid Services*

## Mapping continued

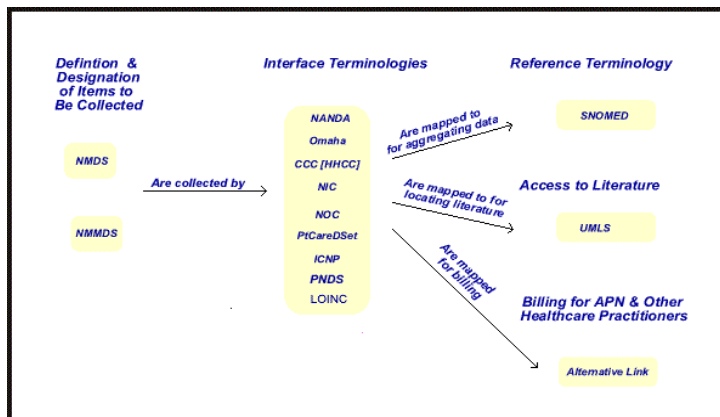
### Acute Pain

- A Nursing Intervention (NIC) of “**Pain Management**”
  - **Procedure**
    - Procedure with a clinical finding focus (procedure)
    - Patient management procedure (procedure)
      - Management procedure (procedure)
        - » Procedure by method (procedure)

### Pain Management

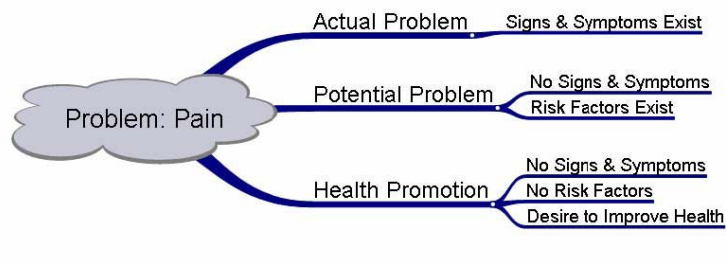
- A Nursing Outcome (NOC) of “**Pain Control**”
  - **Observable entity**
    - Pain control behavior (observable entity)
      - Pain observable (observable entity)
        - » Clinical history/examination observable (observable entity)

## Myth # 3: SNOMED CT is a plug and play application



Source: Thede, 2003.

## Example using The Omaha System



## Problem Rating Scale & Interventions

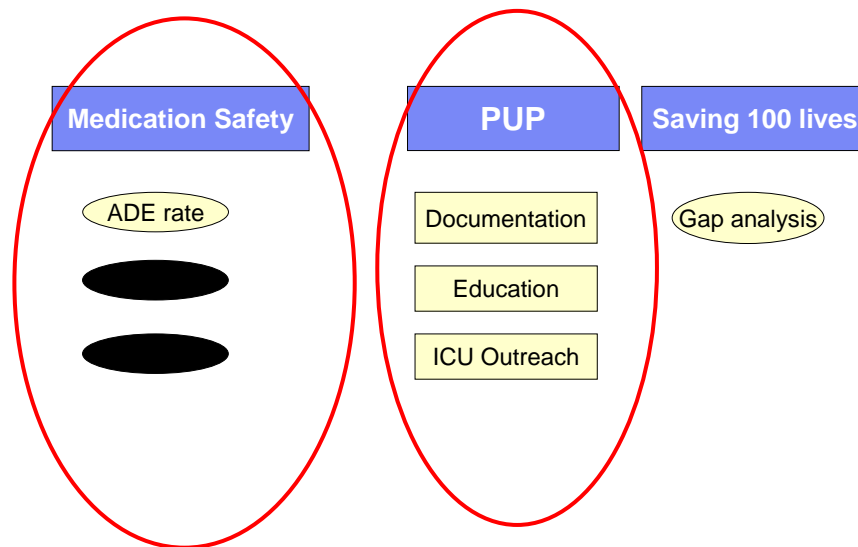
K	1	2	3	4	5
B	1	2	3	4	5
S	1	2	3	4	5

Category	Target	Description	Note
Teaching and Counseling (HTGC)	SS	SS Pain	S&S S&S: Pain Notify clinician or MD if pain increases significantly

## Omaha System Mapping to SNOMED CT: Pain

- Omaha: Problem: Pain
  - Pain (finding)
    - IsA Finding of pain sense
      - » IsA Pain / sensation finding
- Omaha Signs and Symptoms: Expresses discomfort (Will be Released SNOMED '07)
  - Discomfort (finding)
    - IsA Comfort alteration (finding)
      - » IsA Sensory nervous system finding (finding)
    - IsA Sensory nervous system finding (finding)
- Omaha Intervention Scheme: Teaching, guidance, and counseling durable medical equipment
  - Durable medical equipment teaching, guidance, and counseling (procedure)
    - IsA Education, guidance and counseling (procedure)
  - Medication action/side effects education, guidance, and counseling (procedure)
    - IsA Education, guidance and counseling (procedure)
    - IsA Procedure with a procedure focus (procedure)
- Omaha Problem Rating Scale for Outcomes
  - Pain level (observable entity) + Health-related behavior (observable entity) = pain level health-related behavior (observable entity)

## Patient Safety Campaign: Structure



## Relevance to New Zealand

- “New Zealand Data Quality Evaluation Framework (DQF) .” one of the expected qualities is “representational” which includes the dimensions of : Interoperability, Ease of understanding, Concise representation Consistent representation” Kerr, 2004
- “NZ has signed onto the SNOMED SDO(Standards Development Organization) so terminology times are coming”...Deb Konicek, Terminology Manager, SNOMED.

## Stone quote

#### References

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Hands on Automated Nursing Data System. Used with permission by Dr. Gail Keenan,  
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