International Classification for Nursing Practice (ICNP®) masterclass

10 September 2015
Nursing counts: using ICNP to evidence the contribution of nurses

Nick Hardiker & Amy Coenen
International Council of Nurses (ICN)
Overview

• Motivation, development and delivery of ICNP
  – Background
  – Development
  – Delivery
  – Maintenance
• Case study: nationwide use of ICNP-enabled nursing information systems
• Implementation and exploitation of ICNP
  – Implementation
  – Harmonisation
  – Next steps
Background
The International Council of Nurses (ICN)

- A federation of more than 130 national nurses associations representing more than 16 million nurses worldwide
- Operated by nurses and leading nursing internationally since 1899
- Its purpose is to represent nursing worldwide, advancing the profession and influencing health policy
International Council of Nurses

NURSES: A force for change

CARE EFFECTIVE

COST EFFECTIVE

Improving Health and Well-being

12 May 2015
International Nurses Day

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Hospital statistics

‘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 purposes of comparison’ (p 176)

ICN eHealth Programme

• Transforming nursing through the visionary application of information and communication technology
• 25 years in the making
• Announced at the ICN Conference 2011 in Malta

http://www.icn.ch/what-we-do/ehealth/
A personal vision

- eHealth systems are in routine use to parallel other aspects of contemporary life
- Data is available and routinely used/exploited for the benefit of patients and those caring for them
- People are actively working on continually improving how things are i.e. advancing together the art/science of nursing informatics
eHealth
New ICN position statement

• The right to connect via information and communications technology
  – ICT can improve access to good healthcare, address inequalities in its provision and help citizens take a more active role
Why ICN eHealth?

• Worldwide proliferation of ICT
• ICN informs, supports and advocates for nursing and its members
• eHealth threads through ICN processes and products
• ICT in health care provides new opportunities, not least equity and improved access
ICN eHealth workstreams

- Connecting Nurses
- ICN Telenursing Network
- International Classification for Nursing Practice (ICNP®)
Connecting nurses

• A forum for expert healthcare professionals from around the world to share their ideas, advice and innovations
Information Shareapy

• A patient education service for nurses and midwives to share, via a dedicated and moderated social network, links to high quality, reputable health resources with their patients, families, friends or colleagues
Pain Management

Activity | My Likes | My Posts

1. Posted 17 days ago by Robert Fraser:
   - **Opioid Overdose Toolkit**
   - Facts for community members, first responders, prescribers, patient and family members.

2. Posted 6 months ago by Adrienne Huston:
   - **The British Pain Society - Pain scales in multiple languages**

3. Posted 6 months ago by Robert Fraser:
   - **Opioid Pain Medicines**
   - Great information on pain medications for patients

4. Posted about 1 year ago by Scott Emory Moore:
Care Challenge

• A contest that highlights nursing innovations and helps to put them into practice

• There have been two winning entries this year. The authors have chosen a professionally produced video displaying their project as means of support from Connecting Nurses
Reducing Social Isolation for Our Residents in Long Term Care via Skype, a Best Practice

by Lorraine B. La France | Ste. Anne de Bellevue, Canada

Goal: Reduce social isolation and promote intergenerational communication through the use of technology.
ICN Telenursing Network

• Global resource for sharing knowledge and expertise around telehealth and telecare
• Launched in 2009
• 296 members in 65 countries
• Membership open to all
International Classification for Nursing Practice (ICNP®)
Nursing is...

- Nursing encompasses **autonomous and collaborative** care of individuals of all ages, families, groups and communities, **sick or well** and in all settings. Nursing includes the **promotion** of health, **prevention** of illness, and the **care** of ill, disabled and dying people. **Advocacy**, promotion of a safe environment, **research**, participation in shaping health policy and in patient and health systems management, and **education** are also key nursing roles.

www.icn.ch
Electronic health record (EHR)

• A longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting
• Spans episodes of care encounters, across settings and time
• The EHR should automate and streamline the clinician's workflow

HIMSS, 2010
Systems integration & data sharing using the electronic health record

- Governments & health ministries
- Delivery settings (hospital & pharmacy)
- Health care providers (nurses)
- Researchers
- Patients (citizens) at home, school, work
EHR is a GOAL for the FUTURE

• Improve patient care through access to data, information, and knowledge
  – Across delivery settings
  – Across all users (including professionals and patients)
  – Across time
EHR COMPONENTS - examples

- Nursing
- Medicine
- Other disciplines/professions

- Laboratory
- X-Ray & Diagnostics Tests
- Medication

- Other
Nursing Process

Assess
Gather information about the patient’s condition

Evaluate
Determine if goals and expected outcomes are achieved

Diagnose
Identify the patient’s problems

Plan
Set goals of care and desired outcomes and identify appropriate nursing actions

Implement
Perform the nursing actions identified in planning

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USING NURSING DATA
From PRACTICE and back to PRACTICE

NURSING PRACTICE
Data recorded in the EHR using ICNP

INFORMATION & KNOWLEDGE

DATA COLLECTION

ANALYSIS

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Activity

- What data and information do nurses need? What data should nurses contribute to and manage in the EHR?
Nursing Minimum Data Set

- Nursing Diagnoses
- Nursing Interventions
- Nursing Sensitive Outcomes (Goals or Expected Outcomes)
- Nurse Intensity/Patient Acuity
Examples of medical data and nursing data

Medical Diagnosis
Fractured hip

Medical Treatments
Replacement
Pinning

• Nursing Diagnoses
• Pain
• Incontinence
• Decreased mobility
• Confusion
• Wound
• Risk for pressure ulcer
• Inadequate sleep

• Nursing Interventions
• Teaching about pain control
• Preventing pressure ulcer
• Wound care

(Baernholdt and Lang, 2003)
ICNP

- ICN has supported ICNP since 1989
- A standardised terminology used to represent nursing diagnoses, interventions and outcomes
Activity

• Why do we (you) need an international nursing terminology?
ICNP

- Norma Lang interview
ICNP Definition

- The International Classification for Nursing Practice (ICNP), a product of the International Council of Nurses (ICN), is a **formal terminology**. It provides a **dictionary of terms and expressive relationships** that nurses can use to **describe and report their practice in a systematic way**. The resulting information is used reliably to support care and effective decision-making, and inform nursing education, research and health policy.
ICNP Vision

• ICNP is an integral part of the global information infrastructure, informing health care practice and policy to improve patient care worldwide
ICNP Strategic Goals

• To serve as a major force to articulate nursing’s contribution to health and health care globally
• To promote harmonization with other widely used classifications and the work of standardization groups in health and nursing
Activity

• What are the benefits of an international nursing terminology?
ICNP Benefits

- Establishes an international standard to facilitate description and comparison of nursing practice
- Serves as a unifying nursing language system for international nursing based on state-of-the-art terminology standards
- Represents nursing concepts used in local, regional, national and international practice, across specialties, languages and cultures
- Generates information about nursing practice that will influence decision-making, education and policy in the areas of patient needs, nursing interventions, health outcomes, and resource utilization
- Facilitates the development of nursing data sets used in research to direct policy by describing and comparing nursing care of individuals, families and communities worldwide
- Improves communication within the discipline of nursing and across other disciplines
- Encourages nurses to reflect on their own practice and influence improvements in quality of care

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Activity

• What are the desirable characteristics of an international nursing terminology?

• You should assume content coverage
ICNP Characteristics

• Reliable
  • Compliance with international standards
  • Quality improvement process
  • A formal infrastructure that facilitates cross-mapping and allows output in multiple formats
ICNP Characteristics

• Easy to understand
  • Ongoing focus on pre-formed (pre-coordinated) statements
  • Increasing numbers of catalogues (subsets tailored for specific purposes)
  • Available in 17 different languages
• Brazilian Portuguese
• Chinese (Simple)
• Chinese (Traditional)
• English
• Farsi (Persian)
• French
• German
• Indonesian

• Italian
• Japanese
• Korean
• Norwegian
• Polish
• Portuguese
• Romanian
• Spanish
• Swedish
ICNP Characteristics

- Internationally-recognised
  - Recognised by a number of National Nurses Associations
  - A Related Classification in WHO-FIC
  - Harmonisation/collaboration agreements with other standards development organisations
Vital statistics

• 2013
  – 783 pre-coordinated diagnosis and outcome statements (15% increase from 2011)
  – 809 pre-coordinated intervention statements (50% increase from 2011)
• 2015
  – 805 pre-coordinated diagnosis and outcome statements (3% increase from 2013)
  – 1019 pre-coordinated intervention statements (26% increase from 2013)
  – The 2015 release comprises over 4000 elementary and pre-coordinated concepts
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Activity

- [http://www.icn.ch/ICNP-Browser-NEW.html](http://www.icn.ch/ICNP-Browser-NEW.html)

- Explore ICNP, change from English to another language, look at different views (List, Hierarchy, Axis), and move up and down the hierarchy using parents and children
Discussion
Development
## ICNP β-2

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Preventing nonsense through constraints

Injecting

Treating

Glass eye

Medicine

Hypnosis

Syringe

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myocardial infarction

ConceptStatus: Current

Fully defined by:
- 116680003  Is a myocardial disease
- 55641003  infarct
- 36369007  Finding site
- 74281007  myocardium structure

Group:
- 116676008  Associated morphology

Qualifiers:
- 246100006  Onset
- 246112005  Severity
- 272141005  severities

Episodicity:
- 246456000
- 288526004  Episodicities

Course:
- 260908002
- 288524001  courses

Legacy codes:
- SNOMED: D3-15000
- CTV3ID: X200E
7-axis model

- Action
- Client
- Focus
- Judgement
- Location
- Means
- Time
Natural language (speech and text)

- Main currency for clinical information
- Expressive
- Familiar...

...but complex and difficult to analyse, manipulate and reuse
Finding the incidence of heart disease

✓ angina pectoris
✓ mitral stenosis
X angina pectoris ruled out
X family history of heart disease
• Dog for sale. Will eat anything. Especially fond of children
• Undeletable
• Un-deletable
• Undelet-able
Terminology systems

• A terminology system relates concepts of a particular subject field among themselves and to their linguistic designations (CEN)
• Ruth Hargreaves is 64 years old. She has been married for 40 years. Her only child lives abroad. She usually looks after her husband, who has had Multiple Sclerosis for 12 years, helping him in and out of the bath and on and off the toilet. Ruth herself has had heart failure for some time; she had a heart attack five years ago. Recently she has been complaining that she cannot catch her breath. She finds it hard to clean, cook, look after her husband, get up and down stairs. Her neighbour who helped her with day-to-day tasks has recently moved away. Ruth tends not to look after her own health and tends to overdo things. She takes diuretics (water tablets) but since a recent bout of ‘flu she hasn’t been taking her medicine as regularly as she should.
Activity

• Capture in a single word or phrase the most important aspect of the Ruth Hargreaves story
• Ruth Hargreaves is 64 years old. She has been married for 40 years. Her only child lives abroad. She usually looks after her husband, who has had Multiple Sclerosis for 12 years, helping him in and out of the bath and on and off the toilet. Ruth herself has had heart failure for some time; she had a heart attack five years ago. Recently she has been complaining that she cannot catch her breath. She finds it hard to clean, cook, look after her husband, get up and down stairs. Her neighbour who helped her with day-to-day tasks has recently moved away. Ruth tends not to look after her own health and tends to overdo things. She takes diuretics (water tablets) but since a recent bout of ‘flu she hasn’t been taking her medicine as regularly as she should.
Proliferation of terminologies

- Many tasks, many users
- Health care changes constantly
- Health care is very ‘big’
- For a particular purpose it is easy to build your own

- Terminologies are getting bigger, more numerous, more complex
Terminologies within UMLS

- AI/RHEUM, 1993
- Alternative Billing Concepts
- Alcohol and Other Drug Thesaurus, 2000
- Beth Israel Vocabulary, 1.0
- Canonical Clinical Problem Statement System, 1999
- Clinical Classifications Software, 2003
- Current Dental Terminology (CDT), 4
• COSTAR, 1989-1995
• Medical Entities Dictionary, 2003
• Physicians' Current Procedural Terminology, 2004
• CRISP Thesaurus, 2004
• COSTART, 1995
• Diseases Database, 2000
• German translation of ICD10, 1995
• German translation of UMDNS, 1996
• DSM-III-R, 1987
• DSM-IV, 1994
• DXplain, 1994
• Gene Ontology, 2004_03_02

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• HCPCS Version of Current Dental Terminology (CDT), 4
• HCFA Common Procedure Coding System, 2004
• Health Devices Alerts, 1999
• Home Health Care Classification, 2003
• Health Level Seven Vocabulary, 1998-2002
• ICPC2E-ICD10 relationships from Dr. Henk Lamberts, 1998
• Health Product Comparison System, 1999
• ICD10, 1998
• ICD10, American English Equivalents, 1998
• International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification, January 2000 Release
• ICD10, Dutch Translation, 200403
• ICD-9-CM, 2004
• International Classification of Primary Care, 1993
• International Classification of Primary Care 2nd Edition, Electronic, 2E, Dutch Translation, 200203
• International Classification of Primary Care 2nd Edition, Electronic, 2E, 200203
• International Classification of Primary Care, Version 2-Plus, 2000
Multiple nursing terminologies
Diverse overlapping systems

- Endotracheal extubation
- Positioning endotracheal tube
- Removing endotracheal tube
A solution?

Classification Of Nursing

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Another solution?

Endotracheal extubation

Positioning endotracheal tube

Removing endotracheal tube
Reference terminologies

• Terminologies with reference properties
  – SNOMED® Clinical Terms (SNOMED® CT)
  – The International Classification for Nursing Practice (ICNP®)
Acute pain

Pain that comes on suddenly

Pain

Acute pain
Neuralgia

Pain

Acute pain

Acute pain

Neuralgia
A unifying framework in practice

- As a unifying framework ICNP® should be able to:
  - handle a range of nursing terminologies
  - determine any relationships/mappings between them
    - the same entities
      - ‘Acute pain’
        » is equivalent to
      - ‘Pain that came on suddenly’
    - entities with more/less detail
      - ‘Acute pain’
        » is a child of
      - ‘Pain’
How many times do we do bladder washouts?

ICNP IrrigatingBladder
How many times do we do bladder irrigations?

Bladder irrigation

ICNP
IrrigatingBladder
How many bladder procedures do they do?

Bladder procedure

ICNP
PerformingOnBladder

© Healthcare Information and Management Systems Society
Action
  Performing
  Irrigating

BodyPart
  UrinaryBladder

Bladder washout
  IrrigatingBladder
  PerformingOnBladder

Bladder irrigation

Bladder procedure

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</table>
How?

• The primitive *Irrigating* is a child of *Performing*

• Both ‘act on’ *Urinary Bladder*

• We overlooked the fact that *IrrigatingBladder* SHOULD BE a child of *PerformingOnBladder*

• Software can use the semantic information we provide to help manage the terminology
Action

Performing

Irrigating

IrrigatingBladder

PerformingOnBladder

IrrigatingBladder

BodyPart

UrinaryBladder

Bladder procedure
Bladder irrigation

Bladder irrigation = Bladder washout

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Pain

Acute pain

Dog

Mammal

Gall stone

Cholelithiasis

Cat

Dog

Mammal
OWL demonstration

* Demo
Translation of ICNP

- A Translation Agreement should be signed with ICN
- Use a systematic and fully-documented process to provide evidence for the validity of the translation
- Assign one or more nurses as members of the translation team
- Assign nurses with substantial knowledge of English and the target language in the translation process
- Consider involving linguistic experts in the translation process
- Use the most current (English) version of ICNP® as the source for translation. Other translations of the current version could assist the translators, if the target languages are similar
- Assure cross-cultural equivalence of concepts. Word-for-word or etymological equivalence is not adequate for ICNP® translation
- Avoid terms or concepts that cannot be clearly defined or are open to wide interpretation
- Avoid ambiguous terms that have more than one meaning
- Use specific terms or concepts rather than general terms
- Avoid colloquial phrases, jargon, metaphors and idiomatic expressions. If these must be used to represent nursing practice in the target language, give examples of their use in context
- Report identification of jargon or other colloquial expressions in the source ICNP® to ICN. If appropriate, jargon in the source ICNP® can be translated into words with a similar meaning in the target language
• Determine culturally adapted translations for culturally laden terms

• If there is no appropriate term in the target language, translate the source term into a set of words using the definition (e.g. the source term “stress incontinence” can, in Portuguese, be “abdominal pressure associated incontinence”)

• A set of words in the source ICNP® may be translated into one word in the target ICNP® if semantically equivalent

• Gerund forms in ICNP® can be translated to an infinitive verb in the target language, e.g. (“observing” may be translated into “observe” in the target language)

• If there are a variety of prefixes or suffixes for the same noun, adjective or verb (depending on gender, singular or plural, nominative, accusative or genitive), translate into a neutral term where possible

• Plural words in the source ICNP® can be translated into singular words if the target language does not distinguish between singular and plural

• If there are different terms in the source ICNP® with the same meaning in the target language, translate to one term in the target language (e.g. in Korean, ‘altering’ and ‘changing’ have the same meaning)

• Word order may need to be different between the source ICNP® and the target language (e.g. a term with modifier cannot be translated in the same order in Korean and English)

• Validity testing should be conducted in the field to refine the translation of ICNP®

• Validity testing is done to assess and assure the quality and comparability of ICNP®, while increasing its application in actual nursing practice

• Throughout the translation process, ICNP® concepts may be identified for submission to ICN for addition, modification or retirement. The ICNP® review process should be used for this purpose
Discussion
Delivery
Activity

- What would be the best way to deliver ICNP?
Release format

a. Entities table (labeled asserted.csv)
b. Hierarchy table (labeled inferred.csv)
c. Changes table (labeled editorial_changes.csv)
d. Inactivated entities table (labeled inactivated.csv)
e. Replacement entities table (labeled replaced.csv)
f. New entities table (labeled new.csv)
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<td>Catalogues (PDF version)</td>
<td>X</td>
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</tr>
<tr>
<td><strong>External Deliverables: U.S. National Library of Medicine</strong></td>
<td>Entities table: Asserted for DC and IC only</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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<tr>
<td></td>
<td>Entities table: Inferred for DC and IC only</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cross-mapping between ICNP (DC and IC) and SNOMED CT</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
</tbody>
</table>

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ICNP release files

- Tabular format
- OWL
Licensing

- Owned and copyrighted by ICN
- Facilitating access to ICNP® and promoting its use
- Commercial, for-profit, use requires an ICNP® Licensing & Distribution Agreement, and a fee
- Non-commercial, non-profit use requires an Agreement for Non-commercial Use of ICNP® (as part of download) but no fee
- Other applications, e.g. government use, will be negotiated on a case-by-case basis

- Licensing of ICNP is non-exclusive
## Fees for commercial use (USD)

<table>
<thead>
<tr>
<th>Size of Company</th>
<th>Annual Revenue</th>
<th>ICNP® Licensing Fee (2 year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>&lt; $25,000,000</td>
<td>$ 5,500</td>
</tr>
<tr>
<td>Medium</td>
<td>$25,000,000 – 50,000,000</td>
<td>$11,000</td>
</tr>
<tr>
<td>Large</td>
<td>&gt; $50,000,000</td>
<td>$22,000</td>
</tr>
</tbody>
</table>

Note that there are no additional costs for numbers of users, translations, releases during the licensing period.
Discussion
Maintenance
Activity

- How should ICN decide what to include in ICNP?
Submissions to ICNP

Concepts submitted for addition, modification or inactivation

ICN staff review suggestions

Send for further review to nursing practice expert reviewers and/or technical and informatics experts

Reviewers recommend acceptance of suggestion

Reviewers recommend against acceptance of suggestion

Reviewers recommendation inconclusive

Send for expanded review

ICN staff review

Change made in ICNP

No change made in ICNP

Person making submission notified of decision by ICN

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Changes to ICNP

- No changes allowed to derived representations
- Changes to OWL file (by ICN staff only)
  - Delete (inactivate)
  - Make minor amendments (change)
  - Add
    - Many changes require inactivation (with replacement as appropriate) of a class or property
    - Minor changes to terms, descriptions, capitalisation, punctuation, spelling or style that do not affect the underlying meaning of a component are permitted and represent the majority of changes
    - Changes are logged as OWL annotations (and in an ‘Inactivated entities tracker’ as appropriate)
Evaluation criteria for new proposals

- Within the dynamic domain of nursing
- Not redundant (If the concept is redundant it will be reviewed for use as a synonym. If the concept is retained as a synonym, a preferred term would be identified)
- Expressed in a clinically relevant way via use case
- A Use Case to describe reuse of a concept (e.g. quality reporting, decision support)
- Consider level of granularity needed for reuse
- Congruent with scientific knowledge
- Note supporting evidence, e.g. clinical trials, validation study, literature review
- Not inconsistent with the ICNP® structure
- Avoid negation
Discussion
Case study: nationwide use of ICNP-enabled nursing information systems

- Background research began in 1996 at ESEP (Porto School of Nursing) in Portugal
- 3 hospital wards (Medical, ICU, Coronary Care)
  - 60 nurses
- Action-research project
  - Analysis of 1800 clinical records
  - Impact on documentation with the introduction of nursing terminology
    - Expressiveness
    - Time spent

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• Specification of a new data model
• Development of nursing information system (SAPE) in collaboration with the Ministry of Health’s Informatics Department
• Prototyping, testing, dissemination
• Replication in primary care (in 3 health centres)

• Now used in approximately 90% of public hospitals and health centres
  – Approximately 50,000 nurses
• Well-received as it provided an opportunity to make visible the contribution of nurses to care
A year of nursing interventions in one region (6.6m!)

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Hospital</th>
<th>Community</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Monitoring blood pressure</td>
<td>260652</td>
<td>86832</td>
<td>347484</td>
<td>5.26%</td>
</tr>
<tr>
<td>2 Monitoring heart rate</td>
<td>274268</td>
<td>64981</td>
<td>339249</td>
<td>5.14%</td>
</tr>
<tr>
<td>3 Assessing pain</td>
<td>252392</td>
<td>3796</td>
<td>256188</td>
<td>3.88%</td>
</tr>
<tr>
<td>4 Environmental safety management</td>
<td>252609</td>
<td>2284</td>
<td>254893</td>
<td>3.86%</td>
</tr>
<tr>
<td>5 Monitoring body temperature</td>
<td>243122</td>
<td>743</td>
<td>243865</td>
<td>3.69%</td>
</tr>
<tr>
<td>6 Motivating patient for self-turning</td>
<td>236949</td>
<td>3202</td>
<td>240151</td>
<td>3.64%</td>
</tr>
<tr>
<td>7 Monitoring blood oxygen saturation</td>
<td>175180</td>
<td>1503</td>
<td>176683</td>
<td>2.68%</td>
</tr>
<tr>
<td>8 Maintaining bed rail</td>
<td>166976</td>
<td>559</td>
<td>167535</td>
<td>2.54%</td>
</tr>
<tr>
<td>9 Positioning patient</td>
<td>165594</td>
<td>1689</td>
<td>167283</td>
<td>2.53%</td>
</tr>
<tr>
<td>10 Monitoring blood glucose</td>
<td>131576</td>
<td>12934</td>
<td>144510</td>
<td>2.19%</td>
</tr>
</tbody>
</table>
## Comparing practice across settings

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring heart rate</td>
<td>Supervising adherence to immunization regime</td>
</tr>
<tr>
<td>Monitoring blood pressure</td>
<td>Assisting the patient with positioning</td>
</tr>
<tr>
<td>Environmental safety management</td>
<td>Monitoring weight</td>
</tr>
<tr>
<td>Acessing pain</td>
<td>Surveillance of wound dressing</td>
</tr>
<tr>
<td>Monitoring body temperature</td>
<td>Monitoring blood pressure</td>
</tr>
<tr>
<td>Motivating patient for self turning</td>
<td>Monitoring height</td>
</tr>
<tr>
<td>Monitoring blood oxygen saturation</td>
<td>Calculating body mass index</td>
</tr>
<tr>
<td>Maintaining bed rail</td>
<td>Planning immunization regime</td>
</tr>
<tr>
<td>Positioning patient</td>
<td>Monitoring heart rate</td>
</tr>
<tr>
<td>Monitoring blood glucose</td>
<td>Teaching about vaccine</td>
</tr>
</tbody>
</table>

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Discussion
Implementation
Implementation

• Practical use at point of care
  – A degree of national endorsement in Portugal, Poland, Norway, Canada, USA
  – Commercial agreements with software suppliers in Norway, USA, Portugal

• Catalogue development and translation activity
• Individual and collaborative R&D projects
• ICN Accredited Centres for ICNP® Research & Development
• ICNP Technical Implementation Guide
ICNP Technical Implementation Guide

- Applications that use ICNP
- Approaches to implementation
- Structure and content of ICNP
- ICNP in health records
- Change management
Applications that use ICNP

• Clinical recording
  – As an interface terminology
  – As a reference terminology
  – Alone or in combination

• Data retrieval, aggregation and analysis
  – Need for a robust information model (and queries that can be run against this model)
  – The generic relation facilitates the consistent aggregation of data

• Indexing and decisions support
  – Activation of CCDSS protocols
  – Context-sensitive access to ICNP-indexed reference books

• Terminology tools
  – Browsers
  – Authoring ICNP
Approaches to implementation

• Scope of ICNP
  – All nursing diagnoses and all nursing interventions

• Clinical context for ICNP entities
  – General contextual information should be provided by an information model
    (e.g. the fact that a particular diagnosis is a goal or outcome or that an
    intervention is a planned intervention)

• Extent of ICNP implementation
  – Pre-coordinated only, post-coordinating only, a mixture
  – Sets of pre-coordinated entities form terminologies in their own right (e.g.
    IC/DC, catalogues)
  – Post-coordination is possible but must be locally-defined (note that this may
    impact on data analysis)
Structure and content of ICNP 1

• Technical overview
  – Entities
  – Labels
    • Knowledge names, preferred terms synonyms
  – Codes
  – (Descriptions)
  – Derivative products
    • Catalogues, 7-axis model
  – Related products
    • Translations, mappings
  – Formal OWL model
Structure and content of ICNP 2

• Release files
  – a. Entities table (labeled asserted.csv)
  – b. Hierarchy table (labeled inferred.csv)
  – c. Changes table (labeled editorial_changes.csv)
  – d. Inactivated entities table (labeled inactivated.csv)
  – e. Replacement entities table (labeled replaced.csv)
  – f. New entities table (labeled new.csv)
  – Plus README, LICENSE and roots.csv
ICNP in health records

- ICNP does not provide instance-level data
  - Date, time, points on a numerical scale, specified people
- ICNP does not provide contextual information
  - History of, planned, goal, outcome
  - DC and IC are not confined to diagnosis and intervention sections of health records
Change management

• Many changes require inactivation and replacement
• Minor editorial changes are permitted if they do not affect underlying meaning
• New releases of ICNP should normally be replaced in entirety
  – Note that translation is an ongoing process
Primary use of clinical data

- Facilitating communication
- Providing a record of care
- Acting as an aide memoire
Focus for ICNP®

- Using ICNP® to provide raw data for primary use
  - Catalogues
  - Clinical Care Classification
  - SNOMED® CT
ICNP Catalogues

- Clinically relevant subsets of ICNP concepts (and other relevant concepts) for:
  - Nurse documentation at the point of care
  - Data are coded and stored in retrievable manner for reuse, such as decision support and research
ICNP Catalogues

- Partnering with patients to promote adherence
- Palliative care
- Community nursing dataset
- Canadian Health Outcomes for Better Information and Care (CHOBIC)
- Total-hip surgery
- Neonate (special care) nursery
- Nursing Care of Children with HIV/AIDS (U.S.A.)
- Medication management with community-dwelling older adults

- Acute adult mental health
- Paediatric pain management
- Pressure ulcer prevention
- Prevention of falls and falls injuries
- Smoking cessation
- Breastfeeding support
- Clinical care classification nursing diagnoses
- SNOMED-CT & ICNP nursing diagnoses equivalency table
- Prenatal Nursing Care (under development by Lin Liu, Visiting Scholar)
Secondary use of clinical data

- Country
- Region
- Hospital
- Unit

Aggregation

Abstraction

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Examples of secondary use

• Mortality and morbidity reporting
• Public health surveillance
• Clinical audit
• Research
• Hospital financing
Focus for ICNP®

- Using the International Classification for Nursing Practice (ICNP®) to provide raw data for secondary use
  - Hierarchisation
  - Belgian Nursing Minimum Data Set (B-NMDS)
  - International Classification of Health Interventions (ICHI)
Activity

• How would/will you implement ICNP?

• You should focus on motivation, application and approach to implementation
Discussion
Harmonisation
Harmonisation

• CCC
  – Mapping and integration
• SNOMED CT
  – Mapping and content development
• International Classification of Health Interventions
  – Evaluation of content coverage and content development
Harmonisation

- Harmonisation agreement in place with Sabacare Inc. (CCC)
  - Equivalency tables
  - Using CCC 21 framework (21 Care Components) to organise ICNP nursing diagnoses, outcomes and interventions
- ICNP is a related classification in the WHO Family of International Classifications (ICD, ICF, ICHI)
  - ICN provided nursing content submission to International Classification of Health Interventions (ICHI)
- Collaboration agreement in place with IHTSDO
  - First IHTSDO product released May 2015: Terminology Preview of Nursing Problem Subset (over 500 SNOMED CT concepts with ICNP source, required ICN submission of over 120 new concepts to IHTSDO)
  - Approximately 480 new interventions added to SNOMED CT
Examples of new ICHI content

- 67 new interventions
  - Managing enteral feeding
  - Genetic counselling
  - Managing pain
  - Measuring fluid intake
  - Education about medication
  - Service planning
  - Fertility counseling

- 7 new targets
  - Functions related to fertility
  - Functions related to pregnancy
  - Parent-child relationships
  - Growth maintenance functions
  - Artificial body structure: Other stoma
  - Genome
  - Whole person
Examples of new SNOMED CT content

- Treating injury
- Teaching about fall prevention
- Supporting dignified dying
- Screening child development
- Reporting test result
- Reinforcing adherence
- Referring to family therapy
- Providing privacy
- Promoting use of glasses
- Nephrostomy care
- Monitoring pain
- Managing anxiety
- Implementing safety regime

- Fluid therapy
- Facilitating drug abuse recovery
- Encouraging rest
- Diabetic ulcer care
- Counselling about fears
- Collaborating with social worker
- Assisting with mobility
- Assessing skin integrity
- Assessing attitude toward disease
- Assessing ability to walk
- Administering antipyretic
Examples of missing content in SNOMED CT (diagnoses)

- Effective Cardiac Function
- Able To Participate In Care Planning
- Caregiver Able To Perform Caretaking
- Effective Recovery from Abuse
- Effective Continuity Of Care
- Improved Nutritional Status
- Improved Self Control

- Reduced Distortion In Thinking
- No Aggressive Behaviour
- Family Able To Participate In Care Planning
- Diet Tolerance
- Effective Response To Therapy
- No Fall-Related Injury
- Knowledge Of Patient Controlled Analgesia
- No Medication Side Effect
Activity

• Should this content be included in SNOMED CT?
Examples of missing content in SNOMED CT (diagnoses)

- Effective Cardiac Function
- Able To Participate In Care Planning
- Caregiver Able To Perform Caretaking
- Effective Recovery from Abuse
- Effective Continuity Of Care
- Improved Nutritional Status
- Improved Self Control
- Reduced Distortion In Thinking
- No Aggressive Behaviour
- Family Able To Participate In Care Planning
- Diet Tolerance
- Effective Response To Therapy
- No Fall-Related Injury
- Knowledge Of Patient Controlled Analgesia
- No Medication Side Effect
Discussion
Next steps
Next steps for ICNP®

- Reassert ICNP as a key component of the global informatics infrastructure
  - Pan-European collaborative project
- Routine biennial release (with early release for commercial partners and translators)
- Implementation
  - Facilitate translation
  - Continue development and publication of catalogues
  - Complete mapping to SNOMED® CT and other terminologies
  - Foster further commercial partnerships
- Dissemination
  - Easier distribution
  - Presentations and publications
  - Positions, eHealth Bulletin, web pages
Discussion
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