Nursing Documentation

Modern Times in Nursing

Waid Symposium

"Advanced Nursing Process in Practice"

October **24th**

Prof. Dr. Wolter Paans

Hanze University Groningen Applied Sciences

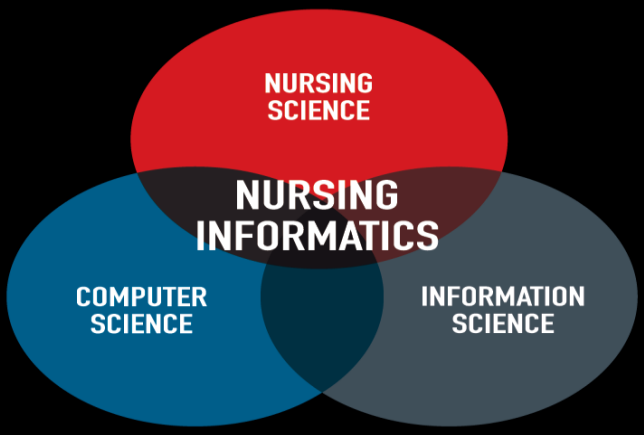
Topics

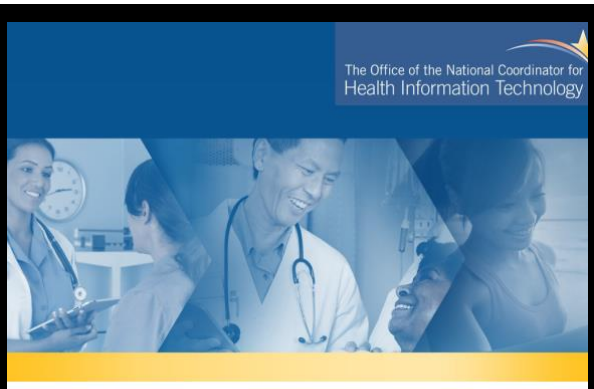
- **Four major movements influencing nursing documentation**
- **Developments in standardized nursing languages (SNL)**
- **Application of SNL in EHR**
- **Developments towards DDSS**
- **Creating connectability**
- **Influencing factors on the quality of documentation**
- **Prevalence & Predictive power calculations.**
- **Quality improvement by using nursing documentation.**
- **Auditing in documentation – how can we evaluate our documentation? The use of instruments.**
- **Big Data in nursing: how and why?**

Four major movements with a significant effect on nursing documentation in the EHR, now and in the near future

Nursing documentation (systems) need to be responsive to a continuum of change toward family health care developments, knowledge sharing, shared desicion making, and new selfmanagement strategies

Information & Integration





Standard Nursing Terminologies: A Landscape Analysis

MBL Technologies, Clinovations,
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Preliminary Evidence for the Usefulness of Standardized Nursing Terminologies in Different Fields of Application: A Literature Review

Eva Törnvall, PhD, and Inger Jansson, PhD

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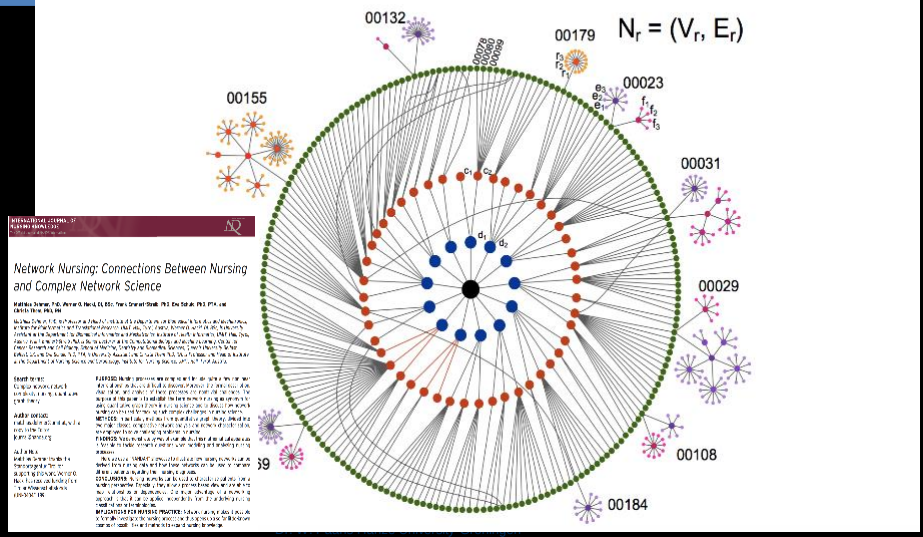
E. Törnvall and I. Jansson

- Longitudinal studies and studies with control groups are needed to learn more about the effect of standardized nursing terminologies.
- There are still shortcomings in using standardized terminology and EPRs as well in the performance of nursing documentation that obstruct evaluation of nursing care.

Table 1. ANA-Recognized Standard Nursing Terminologies

Interface Terminologies	Minimum Data Sets
1. Clinical Care Classification (CCC) System 2. International Classification for Nursing Practice (ICNP) 3. North American Nursing Diagnosis Association International (NANDA-I) 4. Nursing Interventions Classification System (NIC) 5. Nursing Outcomes Classification (NOC) 6. Omaha System 7. Perioperative Nursing Data Set (PNDS) 8. ABC Codes	1. Nursing Minimum Data Set (NMDS) 2. Nursing Management Minimum Data Set (NMMDS) **Reference Terminologies** 1. Logical Observation Identifiers Names and Codes (LOINC) 2. SNOMED Clinical Terms (SNOMED CT)

Figure 1. Graph Inferred From NANDA-I Taxonomy II. Partial View Only: Domains (d_1, d_2, . . .) Are Collocated in the First, Classes (c_1, c_2, . . .) in the Second, and Nursing Diagnoses (00001, 00002, . . .) in the Third Orbit. Defining Characteristics (e_1, e_2, . . .), Related Factors (f_1, f_2, . . .), or Risk Factors (r_1, r_2, . . .) Are Only Shown Exemplarily



Network Nursing: Connections Between Nursing and Complex Network Science

FEATURE ARTICLE

An Internationally Consented Standard for Nursing Process-Clinical Decision Support Systems in Electronic Health Records

Maria Müller-Staub, PhD, EdN, RN, FEANS, Helen de Graaf-Waar, RN, MSc, Wolter Paans, PhD, RN

Nurses are accountable to apply the nursing process, which is key for patient care: It is a problem-solving process providing the structure for care plans and documentation. The state-of-the art nursing process is based on classifications that contain standardized concepts, and therefore, it is named Advanced Nursing Process. It contains valid assessments, nursing diagnoses, interventions, and nursing-sensitive patient outcomes. Electronic decision support systems can assist nurses to apply the Advanced Nursing Process. However, nursing decision support systems are missing, and no "gold standard" is available. The study aim is to develop a valid Nursing Process-Clinical Decision Support System Standard to guide future developments of clinical decision support systems. In a multistep approach, a Nursing Process-Clinical Decision Support System Standard with 28 criteria was developed. After pilot testing (N = 29 nurses), the criteria were reduced to 25. The Nursing Process-Clinical Decision Support System Standard was then presented to eight internationally known experts, who performed qualitative interviews according to Mayring. Fourteen categories demonstrate expert consensus on the Nursing Process-Clinical Decision Support System Standard and its content validity. All experts agreed the Advanced Nursing Process should be the centerpiece for the Nursing Process-Clinical Decision Support System and should suggest research-based, predefined nursing diagnoses and correct linkages between diagnoses, evidence-based interventions, and patient outcomes.

KEY WORDS: Clinical decision support system, D-catch, Documentation, Electronic nursing record, Q-DIO, Standard validation

hampers good documentation.[2] The nursing process is key to ensure patient safety as it provides the structure for care plans and documentation.[3] Nurses are accountable for the nursing process, and health law requires its documentation.[3] However, applying the nursing process is demanding, and nurses would profit from computer systems providing clinical decision support to its use.[3]

Clinical decision support systems (CDSSs) are designed to assist physicians and nurses in determining diagnoses based on accurate information.[4,5] Hunt et al[6] defined CDSS as "…any software designed to directly aid in clinical decision-making in which characteristics of individual patients are matched to a computerized knowledge base for the purpose of generating patient-specific assessments or recommendations that are then presented to clinicians for consideration."(pp 1339–1340) The study aim is to produce a standard that guides the development of a CDSS addressing the nursing process.

The nursing process comprises nursing assessments, nursing diagnoses, planning outcomes, implementing interventions, and evaluating the effectiveness of interventions and nursing-sensitive patient outcomes.[7] Nursing diagnoses are a core element of this process because they are the basis for selecting effective interventions.[7,8] This process guides communication at handovers, whereby the oncoming shift nurse receives information regarding patients' nursing diagnoses (eg, nausea), planned outcomes (eg, well-being), and interventions (eg, nausea care). Studies have shown that handover effectiveness, interdisciplinary communication, and intrainstitutional and interinstitutional patient information rely on comprehensive and accurate nursing process documenta-

Table 2. NP-CDSS Standard

NP-CDSS standard
1. The NP-CDSS offers the *Nursing Process as the CENTERPIECE of nursing information and documentation*, eg, the nursing process is the backbone for nursing care planning and documentation which is presumed to be "nursing-process centered planning and documentation."
2. The NP-CDSS supports the nurse by presenting *all phases of the Advanced Nursing Process:* Assessment, nursing diagnoses, nursing interventions, planning, nursing-sensitive patient outcomes, and evaluations that are based on "state-of-the-art" (evidence-based/knowledge-based) Advanced Nursing Process and nursing classifications/taxonomy literature.[3,8,10,11,17,34]
3. The NP-CDSS supports the nurse by *containing SNL presenting knowledge* (defined concepts) for each phase of the Advanced Nursing Process.
4. The NP-CDSS supports the nurse with possibilities for *free text entries* (besides standardized terminology) and open documentation (ie, specific judgments, rapports, protocol adaptations related to the patient situation, operationalization of unclassified diagnoses, goals, interventions, and outcomes and evaluations).
5. The NP-CDSS supports the nurse by containing *relevant, holistic nursing documentation* regarding patient information on physical aspects, psychosocial aspects, functional aspects, and environmental aspects.
6. The NP-CDSS supports the nurse by presenting prestructured, standardized, logical, and coherent (knowledge-based) *linkages*[a] between all phases of the nursing process: It links assessments with diagnoses, interventions and nursing-sensitive patient outcomes.[c]
7. The NP-CDSS supports the nurse by *offering nursing diagnoses* (to choose from) when defining characteristics/problem statements are entered.
8. The NP-CDSS supports the nurse by *offering nursing diagnoses* when related causes/etiologic factors/problem statements are entered.
9. The NP-CDSS supports the nurse by *offering risk diagnoses* when risk factors are entered.
10. The NP-CDSS supports the nurse by *offering health promotion diagnoses* when health readiness descriptions are entered.
11. The NP-CDSS supports the nurse by *offering standardized, knowledge-based, effective nursing actions/interventions* when nursing diagnoses are entered/selected.
12. The NP-CDSS supports the nurse by *offering standardized, knowledge-based, meaningful nursing-sensitive patient outcomes* when nursing diagnoses or interventions are entered/selected.
13. The NP-CDSS supports the nurse by *offering evaluation criteria or outcome indicators* related to the nursing diagnoses and nursing goals.
14. The NP-CDSS supports the nurse by *connecting nursing data with medical, allied healthcare, and interdisciplinary* diagnostics, interventions, and outcome data.
15. The NP-CDSS supports the nurse by *connecting the results of measurement instruments* such as VAS-pain scores, delirium scores, ulcer scores, or (basic) biomedical scores to the documentation of nursing diagnoses, interventions, and outcomes.

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Development and Implementation of the Clinical Decision Support System for Patients With Cancer and Nurses' Experiences Regarding the System

Arzu Akman Yılmaz, RN, PhD, and Leyla Ozdemir, RN, PhD

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Search terms:
Clinical decision support system, decision making, decision support system, nursing care management

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Conflicts of interest: The authors declare that they have no conflicts

PURPOSE: The purpose of this study was to develop and implement the clinical decision support system (CDSS) for oncology nurses in the care of patients with cancer and to explore the nurses' experiences about the system.
METHODS: The study was conducted using a mixed-methods research design with 14 nurses working at a gynecological oncology clinic at a university hospital in Turkey.
FINDINGS: The nurses stated that they did not experience any problems during the implementation of the CDSS, and its usage facilitated the assessment of patients' needs and care management.
CONCLUSIONS: The results indicated that the CDSS supported the nurses' decision-making process about patients' needs and preparation of individual care plans.

24.11.16

Instruments for nursing documentation measurement

Table 1. Previous Instruments and Their Main Characteristics or Foci of Measurement[11,25,26,28]

Instrument Name	Main Characteristics/Focus of Instrument
Ziegler Criteria for Evaluating the Quality of the Nursing Process (ZCEQNP)	Measuring the structural aspects of nursing process documentation
NoGA	Measuring the content and structure of nursing documentation
Degrees of Accuracy in Nursing Diagnoses Scale (Lunney Scale)	Measuring the accuracy of nursing diagnoses based on defining characteristics and their relevancy with respect to patient assessment data
Cat-ch-Ing	Measuring the quantity and quality of the nursing process documentation based on Swedish law
Quality of Nursing Diagnosis (QOD)	Measuring the accuracy of nursing diagnoses
Q-DIO	Measuring the quality, accuracy, and correctness of assessment data, nursing diagnoses, interventions, nursing outcomes, and their coherent internal, logical relations, or linkages[25,26,28]
D-Catch	This instrument bases on the Cat-ch-Ing and on the Lunney Scale for Degrees of Accuracy.[28] It measures the accuracy and quality of the nursing process.[11]

JAN JOURNAL OF ADVANCED NURSING

RESEARCH METHODOLOGY

D-Catch instrument: development and psychometric testing of a measurement instrument for nursing documentation in hospitals

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66(6), 1388–1
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Abstract
Title. D-Catch
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Background. I

INTERNATIONAL JOURNAL OF NURSING KNOWLEDGE
The Official Journal of NANDA International, Inc.

Psychometric Evaluation of the D-Catch, an Instrument to Measure the Accuracy of Nursing Documentation

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valuate the psychometric properties of the D-Catch instrument.
ross-sectional methodological study. Validity and reliability were
onfirmatory factor analysis (CFA) and internal consistency and
ility, respectively.
mple of 250 nursing documentations was selected. CFA showed
a 1-factor model (chronologically descriptive accuracy) with an
rsing diagnosis accuracy). Internal consistency and inter-rater
dequate.
: The D-Catch is a valid and reliable instrument for measuring the
ing documentation. Caution is needed when measuring diagnostic
nly one item measures this dimension.
FOR NURSING PRACTICE: The D-Catch can be used as an
accuracy of nursing documentation and the quality of nursing

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Cross-Cultural Adaptation of the Quality of Diagnoses, Interventions and Outcomes (Q-DIO) Instrument into Brazilian Portuguese

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JAN JOURNAL OF ADVANCED NURSING

ORIGINAL RESEARCH

Prevalence of accurate nursing documentation in patient records

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PAANS W., SERMEUS W., NIEWEG R. M.B. & VAN DER SCHANS C.P. (2010) Prevalence of accurate nursing documentation in patient records. *Journal of Advanced Nursing* 00(0), 000–000. doi: 10.1111/j.1365-2648.2010.05433.x

Abstract
Aim. This paper is a report of a study con
nursing documentation in patient records in he
Background. Accurate nursing documentatio
review the nursing process and to evaluate th
reports in patient records can be helpful for
documentation.
Method. In 2007–2008, we screened patient
10 hospitals in the Netherlands. The D-Catch i
accuracy of the (1) record structure, (2) adm
(4) nursing interventions, (5) progress and outc
nursing reports. Items 2–5 were measured as a
and quality criteria (1–4), whereas Items 1 and
scale that addressed only quality criteria.
Findings. The domain 'accuracy of the inter
scores: 95% of the records revealed a scale sco
domain 'admission' had the highest scores: 80%

Article in Press

Accuracy of documentation in the nursing care plan in long-term institutional care

Astrid Tuinman, MSc, RN, Mathieu H.G. de Greef, PhD, Wim P. Krijnen, PhD, Wolter Paans, PhD, RN, Petrie F. Roodbol, PhD

PlumX Metrics

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Article Info

Int J Nurs Knowl. 2015 Oct;26(4):176-86. doi: 10.1111/2047-3095.12063. Epub 2014 Oct 31.

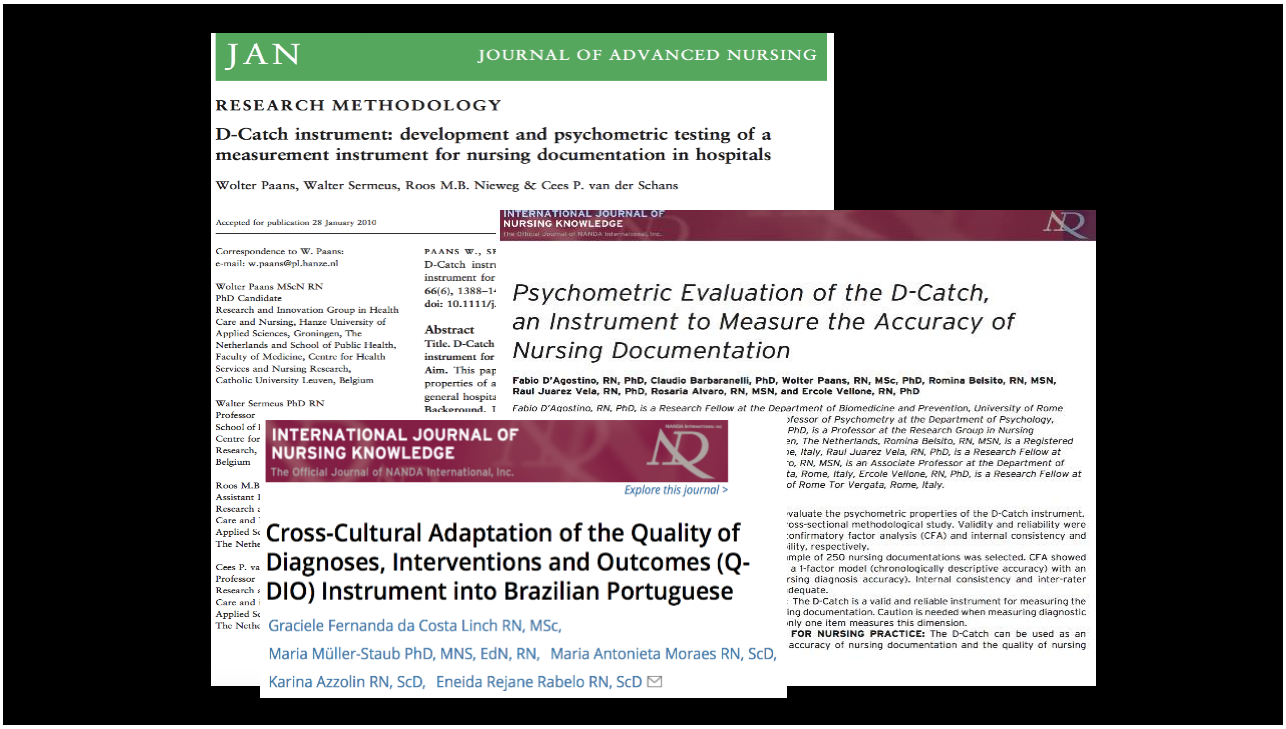
Patients' Care Needs: Documentation Analysis in General Hospitals.

Paans W[1], Müller-Staub M[2].

Author Information

Abstract
PURPOSE: The purpose of the study is (a) to describe care needs derived from records of patients in Dutch hospitals, and (b) to evaluate whether nurses employed the NANDA-I classification to formulate patients' care needs.
METHODS: A stratified cross-sectional random-sampling nursing documentation audit was conducted employing the D-Catch instrument in 10 hospitals comprising 37 wards.
FINDINGS: The most prevalent nursing diagnoses were acute pain, nausea, fatigue, and risk for impaired skin integrity.
CONCLUSIONS: Most care needs were determined in physiological health patterns and few in psychosocial patterns.
IMPLICATIONS FOR NURSING PRACTICE: To perform effective interventions leading to high-quality nursing-sensitive outcomes, nurses should also diagnose patients' care needs in the health management, value-belief, and coping stress patterns.

t References



n long-term institutional care attend to residents with an increasing number of severe
limitations. To exchange information about the health status of these residents, accurate
n is important to ensure the safety of residents. This study examined the accuracy of
n in 197 care plans of five long-term institutional care facilities. Based on the phases of
e D-Catch instrument measures the accuracy of the content and coherence of
uacies were especially found in the description of residents' care needs and stated
well as in progress and outcome reports. In somatic and psycho-geriatric units, higher
determined compared with residential care units. Investments in resources (e.g., time),
sing staff, and implementation of professional standards in accordance with legal
needed to enhance the quality of nursing documentation.

Table 2 – Diagnostic labels according to NANDA-I classification

Ordening	Diagnoses	N	%
1	Acute pain	212	57,5
2	Nausea	125	33,9
3	Fatigue	117	31,7
4	Risk for impaired skin integrity	79	21,4
5	Imbalanced nutrition: less than body requirements	69	18,7
6	Impaired skin integrity	66	17,9
7	Insomnia	56	15,2
8	Impaired urinal elemination	54	14,6
9	Peripheral neurovascular dysfunction	54	14,6
10	Impaired gas exchange	50	13,6
11	Ineffective breathing patterns	50	13,6
12	Diarrhea	50	13,6
13	Hyperthermia		
14	Constipation		
15	Anxiety		
16	Hopelessness		
17	Impaired physical mobility		
18	Sensory perception alterations		
19	Self-care deficit syndrome		
20	Impaired swallowing		
21	Functional incontinence		
22	Acute confusion		
23	Deficient fluid volume		
24	Risk for falls		
25	Hypothermia		
26	Decreased cardiac output		
27	Bowel incontinence		
28	Risk for infection		
29	Readiness for enhanced knowledge		
30	Risk for spiritual distress		
31	Dressing self-care deficit		
32	Toileting self-care deficit		
33	Bathing self-care deficit		
34	Feeding self-care deficit		
35	Fear		
36	Risk for acute confusion		
37	Impaired verbal communication	5	1,4
38	Delayed surgical recovery	5	1,4
39	Risk for spiritual distress	4	1,1
40	Risk for other-directed violence	4	1,1
41	Altered thought processes	4	1,1
42	Impaired memory	3	0,8
43	Decisional conflict	3	0,8
44	Defensive coping	1	0,3
45	Risk for electrolyte imbalances	1	0,3
46	Noncompliance	1	0,3
47	Impaired bed mobility	1	0,3
	Total:	1.539	

Table 2 – Diagnostic labels according to NANDA-I classification

Ordening	Diagnoses	N	%
1	Acute pain	212	57,5
2	Nausea	125	33,9
3	Fatigue	117	31,7
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6	Impaired skin integrity	66	17,9
7	Insomnia	56	15,2
8	Impaired urinal elemination	54	14,6
9	Peripheral neurovascular dysfunction	54	14,6
10	Impaired gas exchange	50	13,6

Int J Nurs Knowl. 2015 Oct;26(4):178-86. doi: 10.1111/2047-3095.12063. Epub 2014 Oct 31.

Patients' Care Needs: Documentation Analysis in General Hospitals.

Pesut W[1], Müller-Staub M[2].

Table 1 First 20 nursing diagnoses most frequently selected for the study population. The diagnoses selected only by one ICU are in Italic.

Enrolled population (*N*; %)	ICU-A (*N*; %)	ICU-B (*N*; %)
Bathing/hygiene self-care deficit (100; 100)	Bathing/hygiene self-care deficit (31; 100)	Bathing/hygiene self-care deficit (69; 100)
Risk for infection (95; 95·0)	Risk for disuse syndrome (29; 93·5)	Risk for infection (67; 97·1)
Interrupted family process (93; 93·0)	Risk for infection (28; 90·3)	Interrupted family process (66; 95·7)
Risk for disuse syndrome (86; 86·0)	Interrupted family process (27; 87·1)	Risk for imbalanced fluid volume (63; 91·3)
Risk for impaired skin integrity (80; 80·0)	Risk for falls (27; 87·1)	Risk for impaired skin integrity (59; 85·5)
Risk for imbalanced fluid volume (78; 78·0)	Risk for impaired skin integrity (21; 67·7)	Ineffective airway clearance (59; 85·5)
Ineffective airway clearance (70; 70·0)	Impaired social interaction (20; 64·5)	Risk for disuse syndrome (57; 82·6)
Impaired social interaction (68; 68·0)	Impaired urinary elimination (19; 61·3)	*Impaired oral mucous membrane (56; 81·2)*
Risk for unstable blood glucose (66; 66·0)	*Hyperthermia (16; 51·6)*	Risk for unstable blood glucose (51; 73·9)
Impaired oral mucous membrane (63; 63·0)	*Acute pain (16; 51·6)*	Impaired social interaction (48; 69·6)
Risk for dysfunctional gastrointestinal motility (57; 57·0)	*Disturbed sleep pattern (16; 51·6)*	*Risk for dysfunctional gastrointestinal motility (48; 69·6)*
Risk for falls (51; 51·0)	Risk for imbalanced fluid volume (15; 48·4)	Impaired gas exchange (34; 49·3)
Impaired urinary elimination (48; 48·0)	Risk for unstable blood glucose (15; 48·4)	*Impaired bed mobility (34; 49·3)*
Impaired gas exchange (47; 47·0)	*Ineffective breathing pattern (15; 48·4)*	*Risk for dry eye (34; 49·3)*
Risk for bleeding (46; 46·0)	*Risk for ineffective peripheral tissue perfusion (15; 48·4)*	Risk for bleeding (33; 47·8)
Impaired bed mobility (44; 44·0)	Impaired gas exchange (13; 41·9)	
Risk for dry eye (41; 41·0)	Risk for bleeding (13; 41·9)	
Hyperthermia (40; 40·0)	*Deficient fluid volume (13; 41·9)*	
Ineffective breathing pattern (39; 39·0)	*Risk for peripheral neurovascular dysfunction (12; 38·7)*	
Impaired spontaneous ventilation (38; 38·0)	Ineffective airway clearance (11; 35·5)	

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Informing Practice and Policy Worldwide through Research and Scholarship

ORIGINAL RESEARCH: EMPIRICAL RESEARCH – QUANTITATIVE

Nursing diagnoses, outcomes and interventions as measures of patient complexity and nursing care requirement in Intensive Care Unit

Cristaca Castellini, Silvia Sfoga, Eleonora Spina & Gianfranco Sansoni

Accepted for Publication: 12 December 2015

Outcome calculations based on nursing documentation in the first generation of electronic health records in the Netherlands

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Abstract. Objectives. Previous studies regarding nursing documentation focused primarily on documentation quality, for instance, in terms of the accuracy of the documentation. The combination between accuracy measurements and the quality and frequencies of outcome variables such as the length of the hospital stay were only minimally addressed. Method. An audit of 300 randomly selected digital nursing records of patients (age of >70 years) admitted between 2013-2014 for hip surgery in two orthopaedic wards of a general Dutch hospital was conducted. Results. Nursing diagnoses: Impaired tissue perfusion (wound), Pressure ulcer, and Deficient fluid volume had significant influence on the length of the hospital stay. Conclusion. Nursing process documentation can be used for outcome calculations. Nevertheless, in the first generation of electronic health records, nursing diagnoses were not documented in a standardized manner (First generation 2010-2015; the first generation of electronic records implemented in clinical practice in the Netherlands).

Keywords. nursing documentation, outcome calculation, nursing process, orthopedic surgery, electronic health record.

First Example

Review of 300 patient records in *hip prostheses patients*:
mean (SD) age: 78 (11) 220 female, 80 male.

Review of 604 patient records in *knee prostheses patients*:
mean (SD) age: 69 (8) 413 female, 191 male.

Nursing Diagnoses Documentation & L.O.S. *In Hip Patients*

Nursing diagnosis (n=300 records)	%(n)	Mean(SD) L.O.S.		P-value*
		Diagnosed	Not diagnosed	
Pain	70(210)	10,92(6.589)	7,35(3,207)	<0,000
Disordered/Distressed	42(126)	11,42(7,564)	9,07(4,382)	0,008
Pressure ulcer	18(55)	14,72(8,833)	8,96(4,594)	<0,000
Obstipation	20(60)	12,73(7,958)	9,46(5,428)	0,011
Anxiety	15(45)	12,23(7,585)	9,77(5,828)	0,018
Imbalanced Nutrition/less than body requirements	14(42)	14,23(9,615)	9,46(5,074)	0,011
Imbalanced fluid volume/deficient fluid volume	12(37)	15,57(10,265)	9,32(4,779)	0,004
Impaired tissue perfusion	13(38)	15,34(9,382)	8,99(4,451)	<0,000
Total NDx N=613/300 rec.				
Median discharge bn 5th day including day of admission/discharge				

A Independent Samples T-test
B L.O.S
*P=<0,05

Nursing Diagnoses Documentation & L.O.S. In *Knee Patients*

Nursing Diagnoses (n=604 records)	%(n)	Mean(SD) L.O.S		P-value*
		Diagnosed	Not Diagnosed	
Impaired tissue perfusion	16,0(97)	5.44(3.31)	4.85(3.12)	<0,000
Disoriented/Distressed	3,80(23)	6,48(2,57)	4,88(3,16)	<0,000
Nausia	18,15(110)	6,75(4,93)	4,54(2,42)	<0,000
Anxiaty	3,30(20)	5,35(2,71)	4,93(3,16)	0,001
Pain in rest situation	31,35(190)	6,54(3,01)	4,67(3,18)	0,011
Delirium	1,16(7)	9,71(2,81)	4,89(3,11)	0,029
Pressure Ulcer	2,31(14)	10,07(5,03)	4,82(3,00)	<0,000
Obstipation	9,74(59)	7,59(2,78)	4,65(3,05)	<0,000
Diarrhea	5,12(31)	9,61(4,45)	5,73(3,30)	<0,000
Total NDx: N=551/604 rec.				
Median discharge bn 4th day (Including day of admission & discharge)				

A Independent Samples T-test
B L.O.S
*P=<0,05

Pain measurements and L.O.S. In *Knee patients*

Pain scores VNRS/VAS (n=1504 records)	% (n)	Mean (SD)	P-value
0-3	60,89 (369)	4,76 (3,38)	0,030*
4-7	21,12 (128)	5,27 (3,09)	
8-10	2,31 (14)	5,71 (2,55)	
Missing values	15,68 (93)		

[A] Kruskal-Wallis H test
[B] L.O.S.
* P < 0,05

Results from modeling days hospitalized by Poisson regression in terms of the estimated parameters, their standard errors (SE), t-value, significance measured by p-value, the rate ratio and their 95% Confidence interval.

Hip sample

	Estimate	SE	t.value	P-value	Exp Estimate	CLL	CLR
(Intercept)	1,2688	0,3657	3,47	0.0000	3,5567	1,7312	7,2595
Age	0,0103	0,0043	2,3788	0,0181	1,0104	1,0018	1,019
Impaired tissue perfusion (surgical wound area)	0,3423	0,0768	4,46	0,0000	1,4082	1,2091	1,6338
Pressure ulcer	0,2607	0,0808	3,2261	0,0014	1,2979	1,1059	1,5183
Deficient fluid volume	0,3464	0,0899	3,8546	0,0000	1,414	1,1828	1,6826
Diabetes	0,214	0,0672	3,1848	0,0016	1,2386	1,0843	1,4111

Results from modeling days hospitalized by Poisson regression in terms of the estimated parameters, their standard errors (SE), t-value, significance measured by p-value, the rate ratio and their 95% Confidence interval.

Knee sample

	Estimate	SE	T-Value	P-Value	Exp Estimate	CLL	CLR
(Intercept)	1,2892	0,0268	45,1260	<0.0000	3,6299	3,4307	3,8373
Medical Treatment	0,3755	0,0625	6,0056	<0,0000	1,4557	1,2867	1,6440
Pressure Ulcer	0,4024	0,1025	3,9261	0,0001	1,4954	1,2172	1,8196
Thrombosis	0,2783	0,0693	4,0140	0,0001	1,3209	1,1503	1,5098
Inpaired Tissue Perf.	0,1502	0,0510	2,9475	0,0032	1,1621	1,0505	1,2828
Nausea	0,2393	0,0460	5,1986	<0,0000	1,2704	1,1601	1,3896
Delirium	0,6232	0,1389	4,4860	<0,0000	1,8649	1,4055	2,4251
Obstipation	0,2704	0,0559	4,8389	<0,0000	1,3105	1,732	1,4606

Conclusions

Nursing interventions are documented with low accuracy; the effect on outcomes is (still) not to measurable.

Relationship between nursing diagnoses and nursing actions / interventions, as well as the effect of nursing interaction is hard to measure as the nature of the documentation is descriptive and not systematically (sometimes diffuse / cryptic, unclear and redundant in nature).

Conclusions

Diagnostic information:

[Duration review: two hours per record]

T1 (diagnostic assessment information): poor,

T2 (diagnostic post surgery information): moderate,

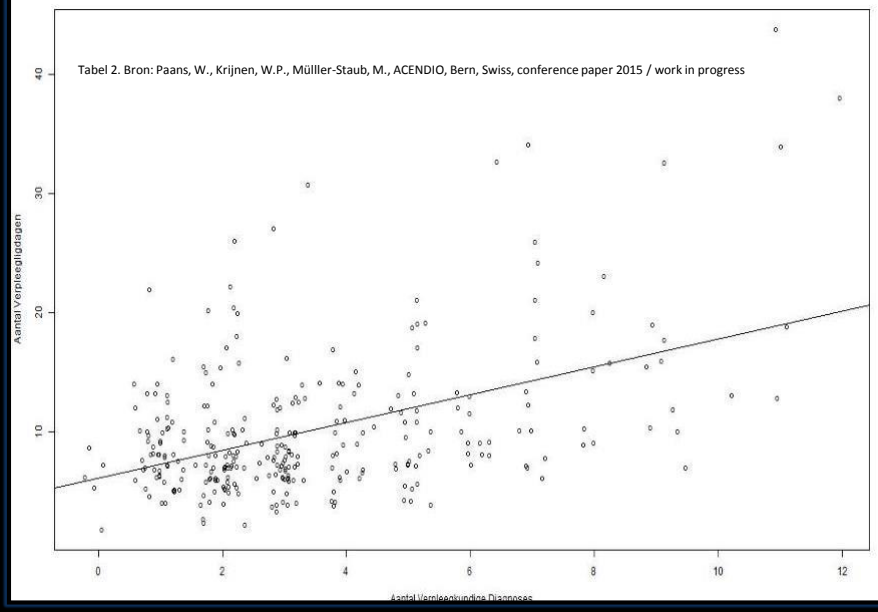
T3 (diagnostic discharge / hand over information) poor.

Needs for Big Data Computing

Technical improvements in the EHR are needed, i.e. output calculation possibilities:

- Nursing Process Decision Support Systems (NPDSS) Implementation of the use of definitions and classificatons
- i.e. Nanda-I, NIC, NOC for accuracy and efficiency in documentation
- Trans-sectorial care cooperation developments
- E-Health / interoperability to foster data exchange
- The use of new technologies (QS).

Tabel 2. Bron: Paans, W., Krijnen, W.P., Mülller-Staub, M., ACENDIO, Bern, Swiss, conference paper 2015 / work in progress



JAN
Informing Practice and Policy Worldwide through Research and Scholarship

ORIGINAL RESEARCH: EMPIRICAL RESEARCH – QUANTITATIVE

Prevalence of nursing diagnoses as a measure of nursing complexity in a hospital setting

Fabio D'Agostino, Gianfranco Sanson, Antonello Cocchieri, Ercole Vellone, John Welton, Massimo Maurici, Rosaria Alvaro & Maurizio Zega

Accepted for publication 9 February 2017

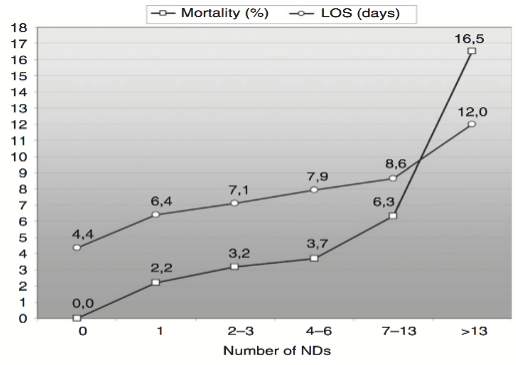
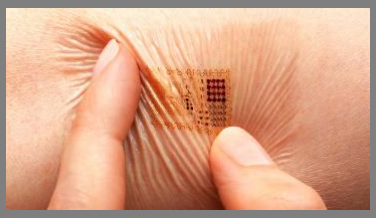


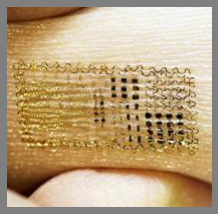
Figure 1 Relationship between the number of nursing diagnoses (NDs), the mortality rate and the mean hospital length of stay (LOS).

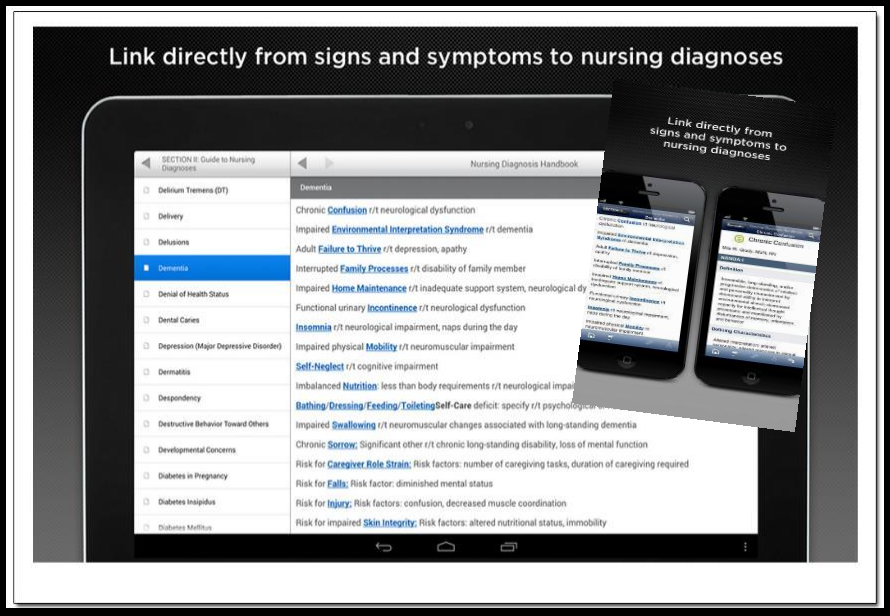
24.11.16

Measurement links

Linkages of sensor techniques and nursing diagnoses in the PES structure (SSEP-I-O): signs detections by sensor second skin applications as a validation of nurses' observation)







Nursing Knowledge: Big Data Research for Transforming Healthcare
University of Minnesota, School of Nursing, Center for Nursing Informatics
August 12 – 13, 2013

Developed by: John Welton, PhD, RN

Nursing and the Value Proposition: How information can help transform the healthcare system

The Wisdom of Nightingale 150 years later:

> *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. If they could be obtained, they would enable us to decide many other questions besides the one alluded to. They would show subscribers how their money was being spent, what amount of good was really being done with it, or whether the money was not doing mischief rather than good; they would tell us the exact sanitary state of every hospital and of every ward in it, where to seek for causes of insalubrity and their nature; and, if wisely used, these improved statistics would tell us more of the relative value of particular operations and modes of treatment than we have any means of ascertaining at present. They would enable us, besides, to ascertain the influence of the hospital with its numerous diseased inmates, its overcrowded and possibly ill-ventilated wards, its bad site, bad drainage, impure water, and want of cleanliness - or the reverse of all these - upon the general course of operations and diseases passing through its wards; and the truth thus ascertained would enable us to save life and suffering, and to improve the treatment and management of the sick and maimed poor.*

Florence Nightingale (1863)[1]

John M. Welton
Ellen M. Harper

Nursing Care Value-Based Financial Models

Executive Summary

- Nursing care makes up one of the largest expenditures in the health care system, yet patient-level nursing intensity and costs are essentially unknown.
- Prior efforts to define nursing care value have been stymied by a lack of available data; however, emerging information from electronic health records provide an opportunity to measure nursing care in ways that have not been possible.
- New metrics using these data will allow improved measurement of cost, quality, and intensity at the level of each nurse and patient across many different settings which can be used to inform operational and clinical decision making.
- In this article, the initial results and recommendations of an expert panel tasked with defining and measuring nursing care value as part of a larger effort to address evolving issues related to big data and nursing knowledge development are described.

If value is the function of quality and cost, what is the contribution of each nurse to patient care? Existing health care finance metrics hide inherent and intangible characteristics of nursing care value such as caring, expertise, empathy, intuition, trust, and excellence to name just a few. Yet progress towards a value-based health care payment system creates an urgent need to better articulate the nursing product and determine the economic value of nursing care within the health care system. A key question is how can existing and emerging nursing data in electronic health records (EHR) be used to measure both the quality as well as the cost of nursing care?

Background

Nursing labor is one of the largest expenditures of resources and dollars spent within the health care system. Over half of the three million registered nurses in the United States work in hospitals, yet inpatient nursing care is billed as a daily per diem charge and there is no direct relationship between the actual nursing care hours provided to individual patients and the associated nursing care costs (Thompson & Diers, 1991). In other health care settings, nursing care is subsumed within procedure codes, bundled payment, or fee-for-service reimbursement. The variation in nursing resources provided to each patient is essentially unknown and there is no alignment among nursing direct-care time and costs, billing for nursing services, and payment for care. This will be increasingly problematic as payers, such as the Centers for Medicare & Medicaid Services, move toward a value-based payment scheme (CMS, 2014).

For most health care settings, internal inpatient cost-accounting processes related to nursing care are based on average resource use

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24.11.16

https://www.youtube.com/watch?v=1TcmOtCBz54

Or Type in Google: 'modern times in nursing'

Bron: Chaplin, C. *Modern Times* (1935), Movie United Artists.