

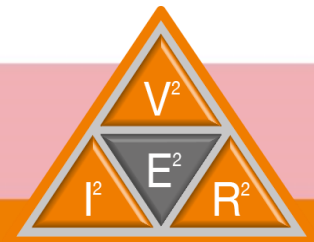


Research Group Nursing Diagnostics

Wolter Paans, PhD, RN., Wim Krijnen PhD & Maria Müller-Staub, PHD, RN, EDS, FEANS,
Research Group Nursing Diagnostics, Hanze University Groningen, the Netherlands.

Predictive Power of Nursing Documentation on Length of Hospital Stay in Hip Fracture Patients

Introduction



Research Group Nursing Diagnostics

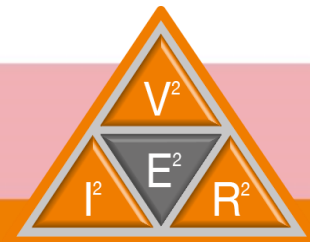
The use of nursing documentation output calculations may have a positive influence on quality of care, patient safety and cost savings in the near future.

(Belcher *et al*, 1999, Cots *et al*, 2004).



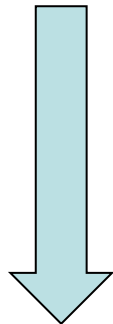


Background



Research Group Nursing Diagnostics

The accuracy and relevancy of nursing documentation is important as this may have a:

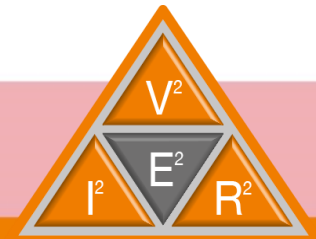


- Predictive power on health care problems

&

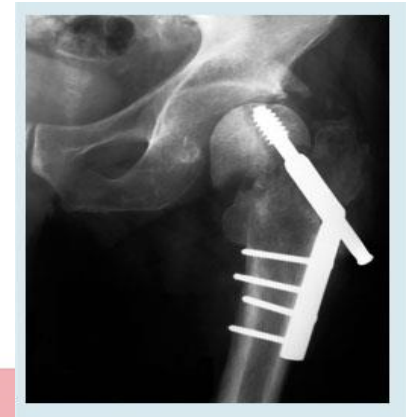
- Length Of Hospital Stay (LOS)

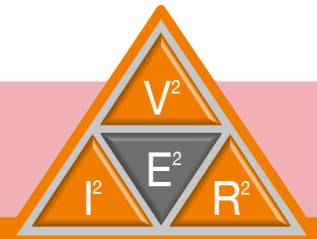
(Welton *et al* 2005, Alameda *et al*, 2009, Paans *et al* 2010).



What is the predictive power of nursing diagnosis documentation in the patient record on Length Of Hospital Stay (LOS)?

Hip fracture patients in age of > 70 , admitted in hospitals for surgery.

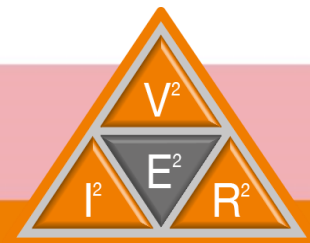




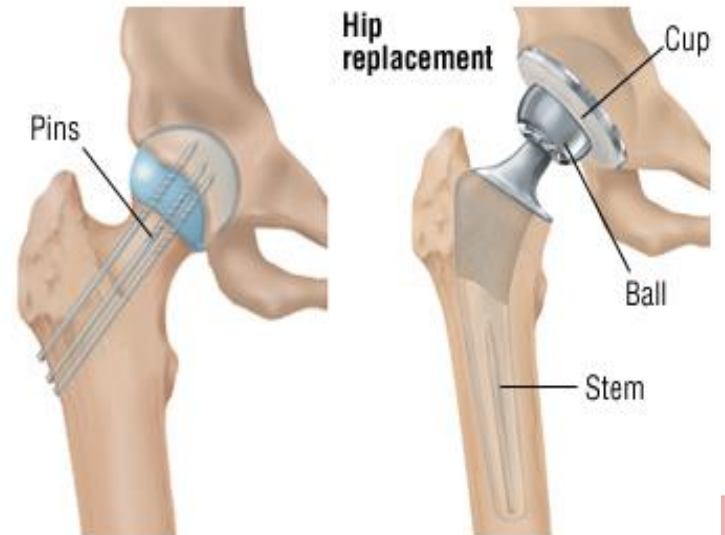
Review of 300 patient records in hip fracture patients.

Instrument: D-Catch instrument developed for the analysis of the accuracy in nursing documentation.
Reference: NANDA-I, NIC, NOC.

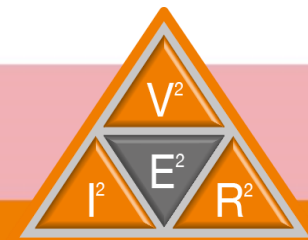




Measurement: first day Post-Surgery (PS)



Difference in Length of Stay (LOS) and medical diagnoses

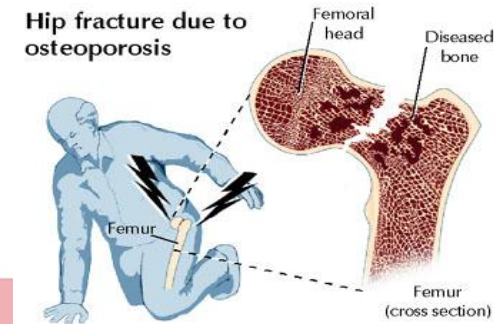


Research Group Nursing Diagnostics

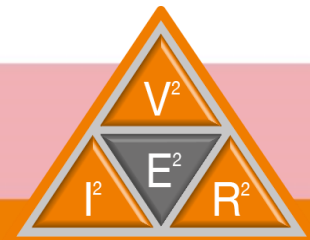
A Independent samples T-test
 B Dependent variable: LOS, $p < .05$.

Medical diagnoses (Cases: n=262)	%, (n)	Mean LOS in days		LOS p-value
		Mean (standard deviation)		
		Diagnosed	Not diagnosed	
Dementia	20 (52)	8,93 (5,068)	10,42 (6,283)	0,0530
Lung disease	21 (55)	11,31 (7,643)	9,90 (5,778)	0,0457*
Cardiac disease	58 (152)	11,00 (7,152)	9,11 (4,475)	0,0027*
CVA (Stroke)	8 (21)	14,20 (8,170)	9,88 (5,948)	0,0405*
Diabetes	18 (47)	12,03 (8,241)	9,80 (5,635)	0,0430*
Osteoporosis	14 (37)	10,01 (6,172)	8,90 (4,491)	0,1674

- ?
- ?
- ?
- ?
- ?



Difference between LOS and medical treatment



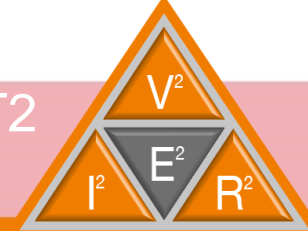
Research Group Nursing Diagnostics

A Independent samples T-test
 B Dependent variable: LOS, $p < .05$

Medical treatment (n=262)	%, (n)	Mean LOS Mean (standard deviation)		LOS p-value*
		Treatment	Others	
Dynamic hip screw (DHS)	18 (47)	11,11 (7,403)	10,01 (5,949)	0,923
Cannula hip screws	11 (29)	8,59 (3,647)	10,40 (6,451)	0,119
Gamma nail	49 (128)	10,39 (6,786)	10,02 (5,664)	0,129
Hemiarthroplasty (hip prosthesis)	12 (32)	9,22 (4,680)	10,33 (6,397)	0,338
Other treatments	10 (26)	-	-	-



Difference between LOS and nursing diagnoses at T2 (Post Surgery)



Research Group Nursing Diagnostics

A Independent samples T-test
B Dependent variable: LOS, $p < .05$

Nursing diagnosis (n=262)	%(n)	Mean LOS		P-value
		Mean (standard deviation)		
		Diagnosed	Not Diagnosed	
Pain	80 (210)	10,92 (6,589)	7,35 (3,207)	0,000*
Disordered / Distressed	48 (126)	11,42 (7,564)	9,07 (4,382)	0,008*
Pressure Ulcer	21 (55)	14,72 (8,833)	8,96 (4,594)	0,000*
Nausea	35 (92)	11,86 (7,703)	9,30 (5,060)	0,061
Obstipation	23 (60)	12,73 (7,958)	9,46 (5,428)	0,011*
Anxiety	17 (45)	12,23 (7,585)	9,77 (5,828)	0,018*
Imbalanced Nutrition / less than body requirements	16 (42)	14,23 (9,615)	9,46 (5,074)	0,011*
Imbalanced fluid volume / deficient fluid volume	14 (37)	15,57 (10,265)	9,32 (4,779)	0,004*
Impaired tissue perfusion	20 (38)	15,34 (9,382)	8,99 (4,451)	0,000*

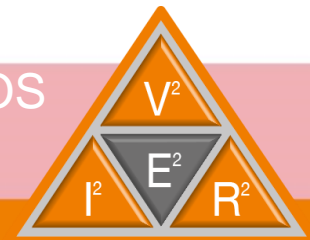
Results from modeling days hospitalized by Poisson regression in terms of the estimated parameters, their standard errors (SE), t-value, significance measured by p-value, the rate ratio and their 95% Confidence interval.

	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	



The association between the number of nursing diagnoses and LOS

One-way ANOVA, dependent variable: LOS, $P = < 0.0001$

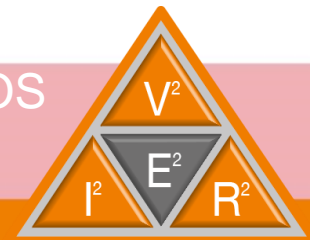


Research Group Nursing Diagnostics

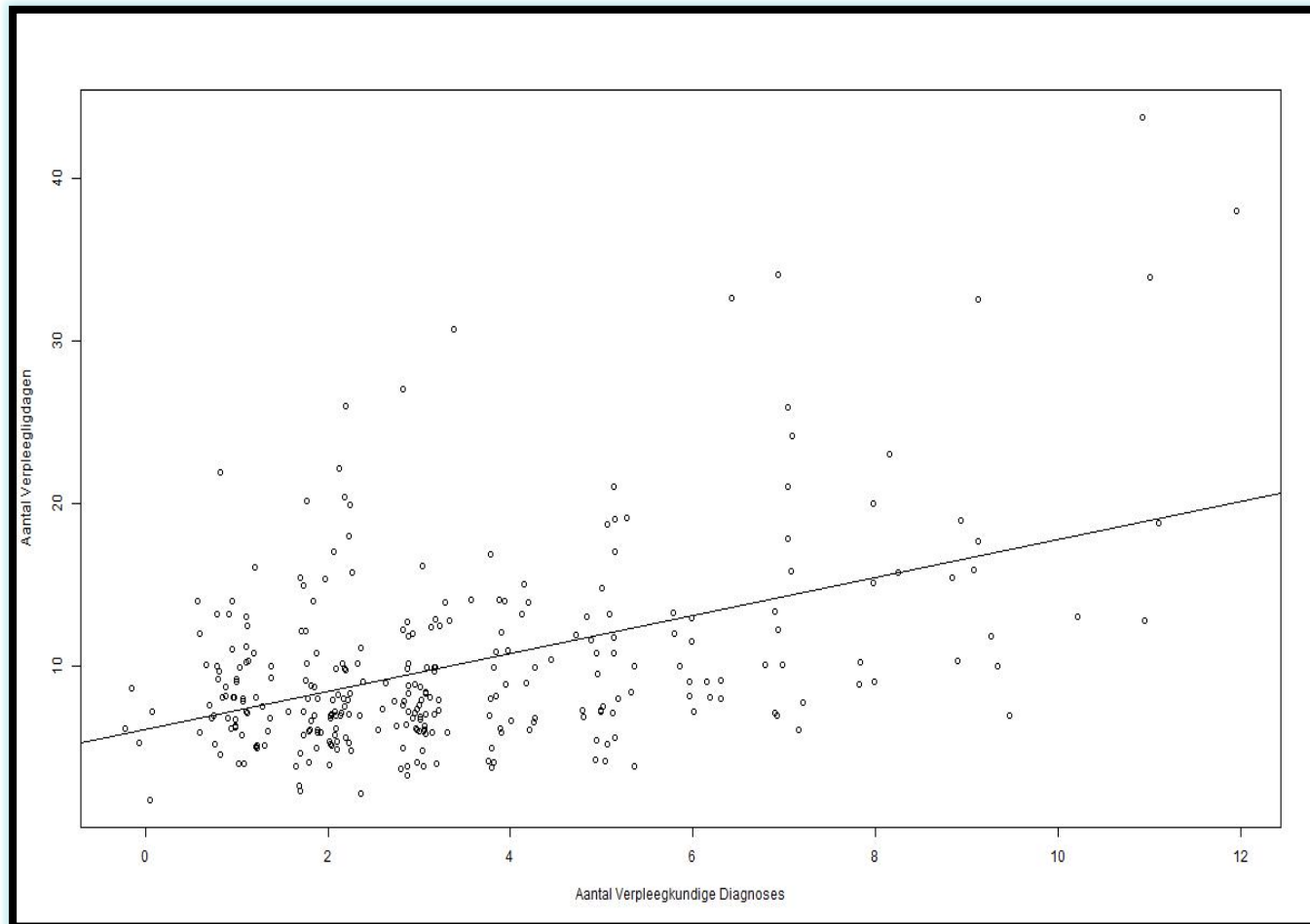
Number of diagnoses	% (n)	Mean LOS (standard deviation)
1,00	9 (24)	7,50 (2,093)
2,00	16 (42)	7,28 (2,943)
3,00	25 (66)	8,39 (4,276)
4,00	12 (32)	9,13 (3,615)
5,00	15 (39)	10,55 (4,859)
6,00	6 (16)	9,75 (2,050)
7,00	6 (16)	15,77 (8,187)
8,00	4 (11)	14,57 (5,563)
9,00	4 (11)	15,67 (7,665)
11,00	2 (5)	27,50 (14,107)
Total	100 (262)	10,20



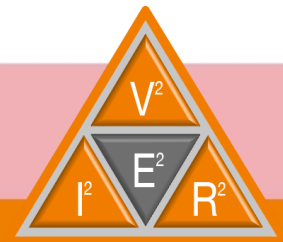
The association between the number of nursing diagnoses and LOS
Plot dependent variable: LOS, $P = < 0.0001$



Research Group Nursing Diagnostics



Conclusions I

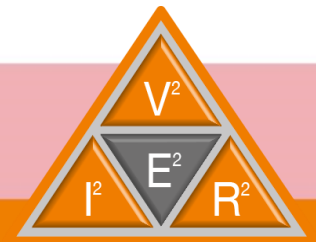


Research Group Nursing Diagnostics

- Output calculation based on unclassified diagnoses and interventions: time consuming analysis: app. 120 minutes per record.
- Technical possibilities to aggregate output data was limited.



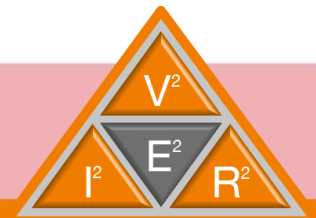
Conclusions II



Research Group Nursing Diagnostics

- Some medical diagnoses are predictive to LOS: (i.e. Diabetes M.).
- Medical treatment is not predictive to LOS.
- Several nursing diagnoses demonstrated predictive power on LOS: (pain, disorder, obstipation, imbalanced nutrition, imbalanced fluid volume, impaired tissue perfusion).
- Nursing interventions are documented with low accuracy; the effect is hard / not to measure.

Conclusions III



Research Group Nursing Diagnostics

- Relationship between nursing diagnosis 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).

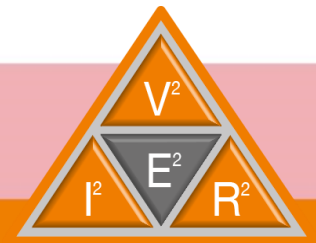
94 yrs old black female. Alert, oriented x3.
RR clear and unlabored. BBS clear. Abd, soft,
NM distended. BBS x 4quads. Skin warm to touch.
WNL. VS: 110/64, 62, 20, 97.3 wt 138 pds Ankle 22^{cm}/23^{cm}
H⁺ edema noted to bilateral pedal. SOB noted.
H⁺ pulse (pedal) + femoral noted. Pt instructed to avoid pro-long
sitting/standing, take frequent rest periods, elevate BLE when
rest & take Lewis as ordered.

Charting is my favorite
part of my job.

Said no nurse ever!



someecards
user card

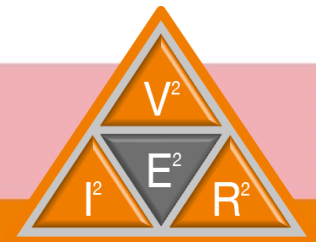


Technical improvements in the EHR are needed, i.e.

- Output calculation possibilities by using Standardized Nursing Language (SNL) in the EHR.
- Nursing Process Decision Support Systems (NPDSS) developments.

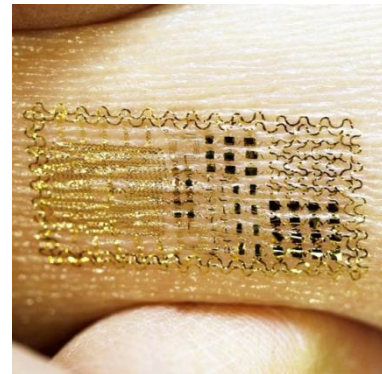
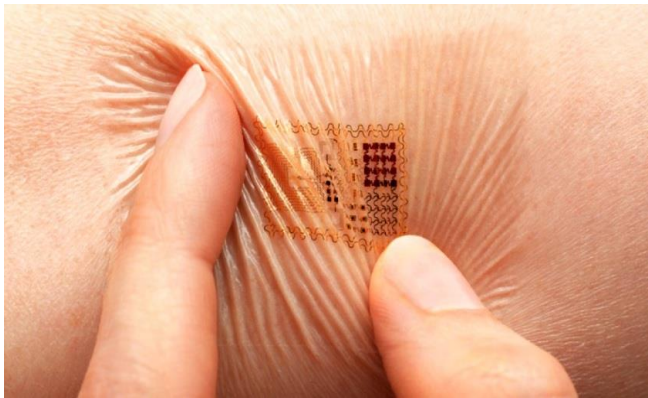
Implementation of the use of definitions and classifications i.e.

- Nanda-I, NIC, NOC for accuracy and efficiency in documentation

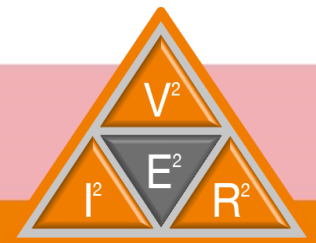


International Master Program Sensor Techniques in Healthcare
(Hanze University of Applied Sciences)

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

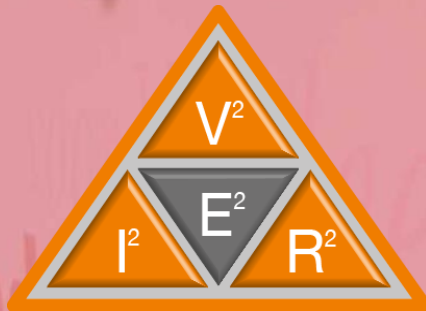


Referenties



Research Group Nursing Diagnostics

- Alameda, C., Suárez, C.(2009) *Clinical outcomes in medical outliers admitted to hospital with heart failure*. European Journal of Internal Medicine 20 764–767.
- Belcher, J.V.R., Alexy, B. (1999) *High-Resource Hospital Users in an Integrated Delivery System*. The Journal of Nursing Administration.Vol 29(10), p 30-36.
- Cots, F., Mercadé, L., Castells, X. Salvador, X.(2004) *Relationship between hospital structural level and length of stay outliers Implications for hospital payment systems*. Health Policy 68 159–168.
- Freitas, A., Silva-Costa, T., Lopes, F., Garcia-Lema, I., Teixeira-Pinto, A., Brazdil, P., and Costa-Pereira, A. (2012). *Factors influencing hospital; high length of stay outliers*. BMC Health Services Research.
- Hauskrecht, M., Valko, M., Batal, I., Clermont, G., Visweswaran, S. & Cooper, G.F. (2010) *Conditional Outlier Detection for Clinical Alerting*. AMIA Annu Symp Proc. p. 286–290.
- Kuwabara, K., Imanaka, Y., Matsuda, S., Fushimi, K., Hashimoto, H., Ishikawa, K.B., Horiguchi, H., Hayashida, K., Fujimori, K.(2008) *The association of the number of comorbidities and complications with length of stay, hospital mortality and LOS high outlier, based on administrative data*. Environ Health Prev Med 13:130–137
- Müller-Staub, M., Lavin, M.A., Needham, I. & Achterberg, T van (2006). Nursing diagnoses interventions and outcomes – application and impact on nursing practice: systematic review. *Journal of Advanced Nursing*, 56, 514-531
- Paans, W., Sermeus, W., Nieweg, R., Schans, van der, C.P. (2010²). Prevalence and accuracy of nursing documentation in the patient record.*Journal of Advanced Nursing*, 66 (11), 2481-2490, published on line: doi:10.1111/j.1365-2648.2010.05433.x
- [Perimal-Lewis L.](#), [Hakendorf Li J.Y.](#), [Ben-Tovim D.I.](#), [Qin S.](#), [Thompson C.H.](#) (2012) *The relationship between in-hospital location and outcomes of care in patients of a large general medical service*. Internal Medicine Journal - Royal Australasian College of Physicians.
- Veer, A.J.E de & Francke, A.L. (2009). *Attitudes of nursing staff towards electronic patient records: a questionnaire survey*. International Journal of Nursing Studies.
- Welton J.M., & Halloran E.J. (2005). *Nursing diagnoses, diagnosis-related group, and hospital outcomes*. JONA
- Xiao, J., Douglas, D., Lee, A.H. and Vemuri, S.R.A (1997). *Delphi evaluation of the factors influencing length of stay in Australian hospitals*. International Journal of Health planning and management. Vol 12, 207-218.



Research Group Nursing Diagnostics

THANK YOU FOR YOUR ATTENTION

W.PAANS@PL.HANZE.NL

WWW.HANZE/VERPLEEGKUNDIGEDIAGNOSTIEK.NL