

The Challenge of Staff Planning

Staffing requirement calculations from routine data

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Articles



Nurse staffing and education and hospital mortality in nine European countries: a retrospective observational study

Linda H Aiken, Douglas M Sloane, Luk Bruyneel, Koen Van den Heede, Peter Griffiths, Reinhard Busse, Marianna Diemidous, Juhka Kimminen, Maria Kõrkkü, Emmanuel Lesaffre, Matthew D McHugh, M T Morena-Casbas, Anne Marie Rafferty, Rene Schwendimann, P Anne Scott, Carol Tishelman, Theo van Achterberg, Walter Semmeus, for the RN4CAST consortium*

Summary

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Background Austerity measures and health-system redesign to minimise hospital expenditures risk adversely affecting patient outcomes. The RN4CAST study was designed to inform decision making about nursing, one of the largest components of hospital operating expenses. We aimed to assess whether differences in patient to nurse ratios and nurses' educational qualifications in nine of the 12 RN4CAST countries with similar patient discharge data were associated with variation in hospital mortality after common surgical procedures.

Methods For this observational study, we obtained discharge data for 422 730 patients aged 50 years or older who underwent common surgeries in 300 hospitals in nine European countries. Administrative data were coded with a standard protocol (variants of the ninth or tenth versions of the International Classification of Diseases) to estimate 30 day in-hospital mortality by use of risk adjustment measures including age, sex, admission type, 43 dummy variables suggesting surgery type, and 17 dummy variables suggesting comorbidities present at admission. Surveys of 26 516 nurses practising in study hospitals were used to measure nurse staffing and nurse education. We used generalised estimating equations to assess the effects of nursing factors on the likelihood of surgical patients dying within 30 days of admission, before and after adjusting for other hospital and patient characteristics.

Findings An increase in a nurses' workload by one patient increased the likelihood of an inpatient dying within 30 days of admission by 7% [odds ratio 1.068, 95% CI 1.031-1.106], and every 10% increase in bachelor's degree

ePA-AC

ergebnisorientiertes PflegeAssessment AcuteCare
(„outcome-oriented nursing assessment AcuteCare“)

- Measures patient's capabilities and impairments
- Provides numerical indicators for
 - care planning
 - process engineering
 - measuring outcomes
 - ...

LEP

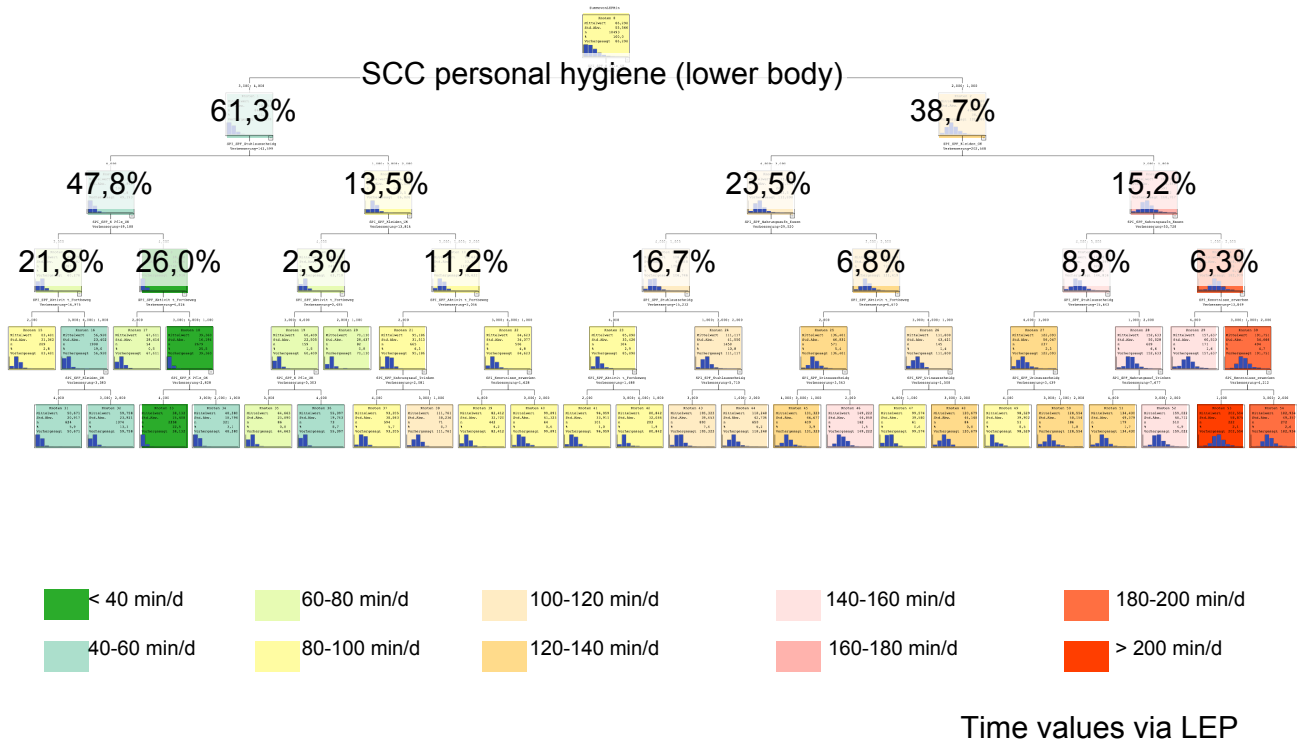
Leistungserfassung in der Pflege
(„nursing workload measurement“)

- Classification of nursing interventions
- Time value for every intervention

New solution approach: Data from routine records

- Daily **patient status** (nursing care needs) via ePA-AC
 - interventions why?
 - with which outcome?
- Daily **nursing interventions** via LEP
 - what?
 - when?
 - which quantity?

Indicators for extensive nursing care needs via ePA-AC

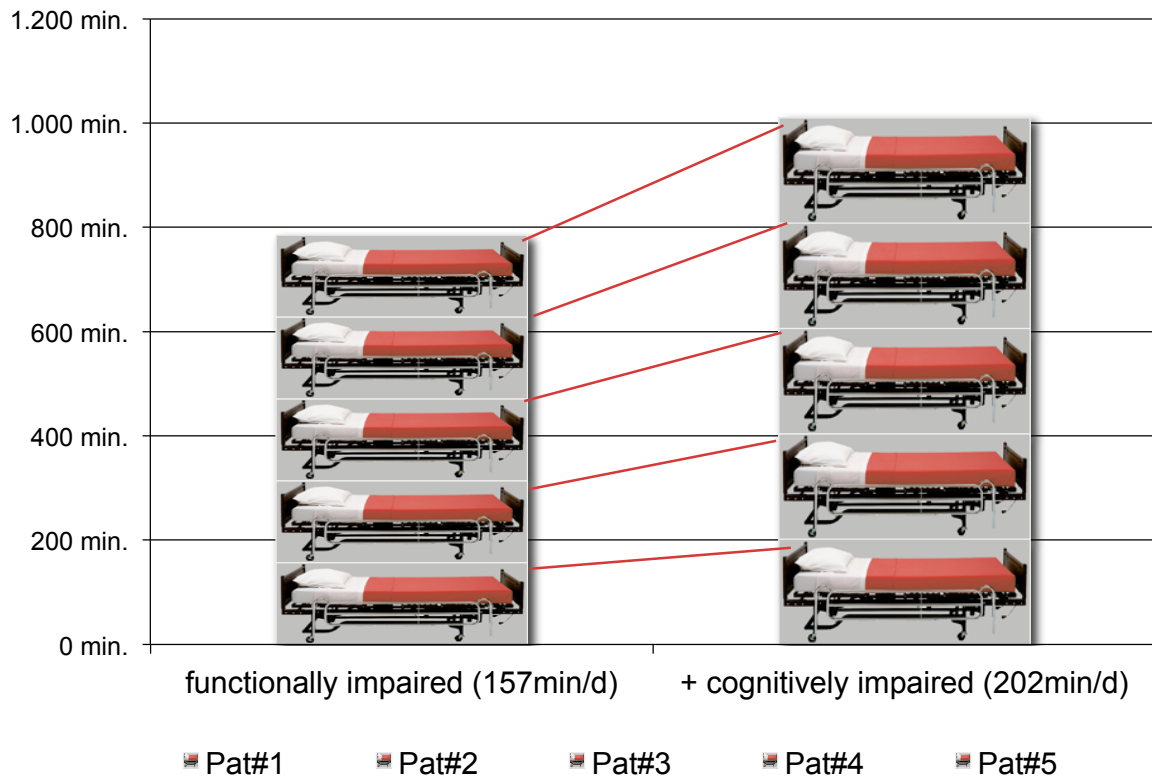


Prediction of Workload

SCC Dressing/ undressing	≤ 2	≤ 2
and SCC Eating	≤ 2	≤ 2
and Acquisition of new knowledge	1	4
∅ Minutes per day	202 min/ d	157 min/ d

Scales in ePA-AC:
 4 = full capability (to perform a task)
 3 = slight impaired capability
 2 = severely impaired capability
 1 = no capability

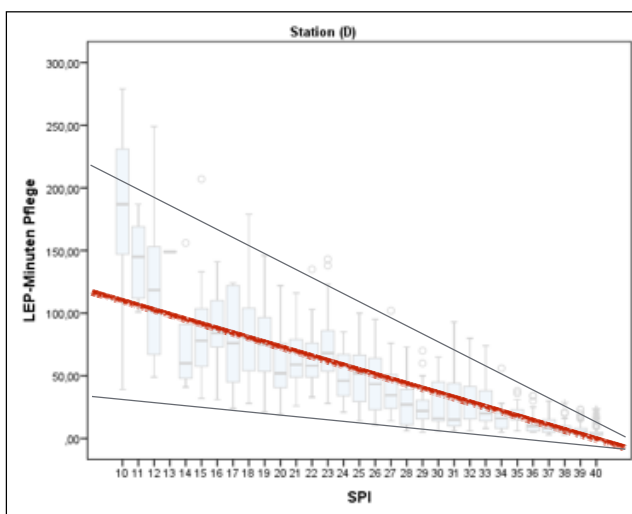
Staffing via Nurse-Patient-Ratio? CAVE!



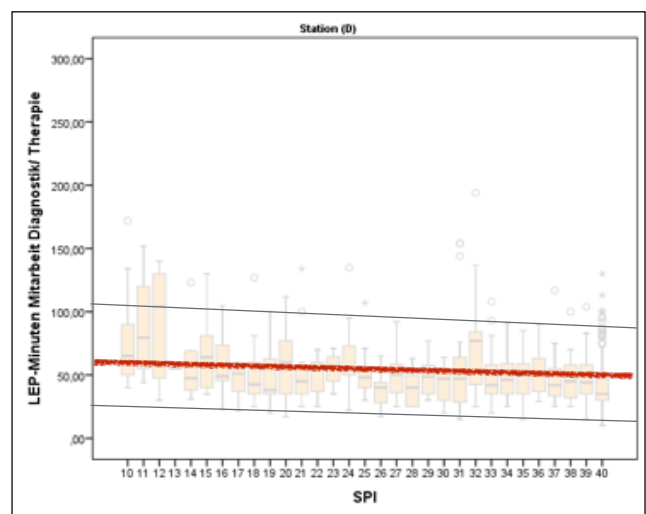
Reasons for nursing interventions

Example: Cardiology; N = 1.230

SPI = SelfCareIndex (the higher the more independent)



Interventions triggered by impaired capabilities (Nursing care needs)



Interventions triggered by medical diagnosis and therapy

Summary

- Staffing calculations with normative figures such as a nurse-patient ratio are not adequate
- Routine data from the nursing process provide an appropriate basis for predicting the nursing care workload
- Factor-based models might be a suitable approach for staffing

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