

The impact of an Advanced Practice Nurse (APN)-led delirium consultation service on costs for ortho-trauma patients

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Literature: Nurse-led delirium Management

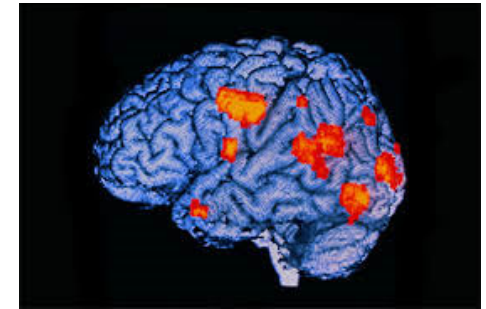
- Recent interprofessional delirium approaches: doctor driven and liason-nurse led supervised^(2,3)
 - Diagnostic approach and therapeutic decision by doctors
 - Nurses (RN) either provided geriatric assessments and/or supervised implementation of recommendations
- Peer support by specially trained nurses (RN)⁽¹⁾
 - Possibility of supervision by APN and/or geriatrician
- Our study: All patients were seen by APN ($\geq 2x$)

¹ Milisen, K., Foreman, M. D., Abraham, I. L., De Geest, S., Godderis, J., Vandermeulen, E., . . . Broos, P. L. (2001). A nurse-led interdisciplinary intervention program for delirium in elderly hip-fracture patients. *Journal of the American Geriatrics Society*, 49(5), 523-532.

² Cole, M. G., McCusker, J., Bellavance, F., Primeau, F. J., Bailey, R. F., Bonnycastle, M. J., & Laplante, J. (2002). Systematic detection and multidisciplinary care of delirium in older medical inpatients: a randomized trial. *CMAJ: Canadian Medical Association Journal*, 167(7), 753-759.

³ Deschodt, M., Braes, T., Flamaing, J., Detroyer, E., Broos, P., Haentjens, P., . . . Milisen, K. (2012). Preventing delirium in older adults with recent hip fracture through multidisciplinary geriatric consultation. *Journal of the American Geriatrics Society*, 60(4), 733-739. doi:<http://dx.doi.org/10.1111/j.1532-5415.2012.03899.x>

Background



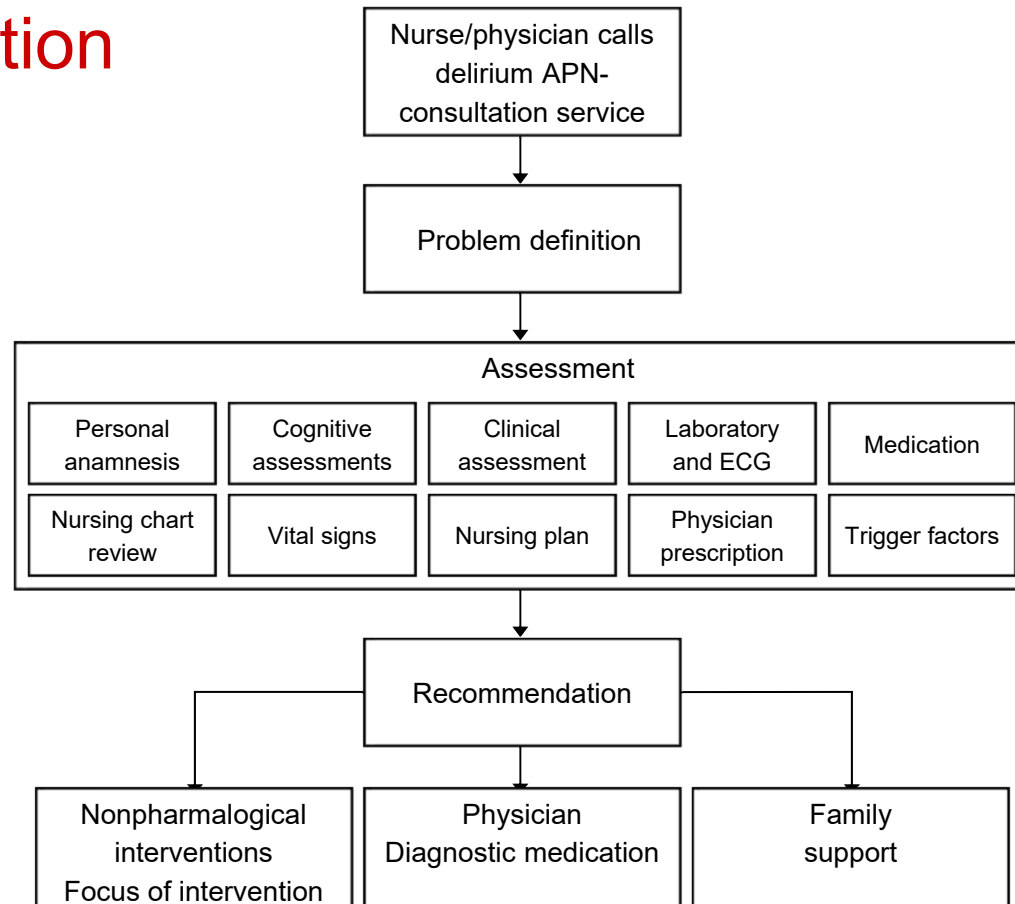
- Delirium prevalence in University Hospital Basel (all wards) 10%⁽¹⁾
- Estimated number of delirious patients / year: 3'690⁽²⁾
- Since 2004: Start with delirium management program containing staff education, systematic screening and 3 main strategies in treatment:
 - Causal therapy of precipitating factors (e.g. infection)
 - Targeting predisposing factors (e.g. pain, stress, obstipation)
 - Managing psychotic symptoms by neuroleptics, etc.
- 2012: Implementation of a **low-threshold APN-led delirium consultation service** in Surgery Department for additional support
 - **Main study: Evaluation of benefits of APN-consultation service**⁽³⁾
 - **Present study: Evaluation of effect on costs**

¹ Hasemann, Kressig, Ermini Funschilling, Pretto, Spirig. (2007). Pflege, 20(4), 191-204.

² Estimation based on total number of patients in annual report 2016

³ Weber, Fierz, Katapodi, Hasemann (2016). Thesis. University Basel, Switzerland

Intervention



Methods



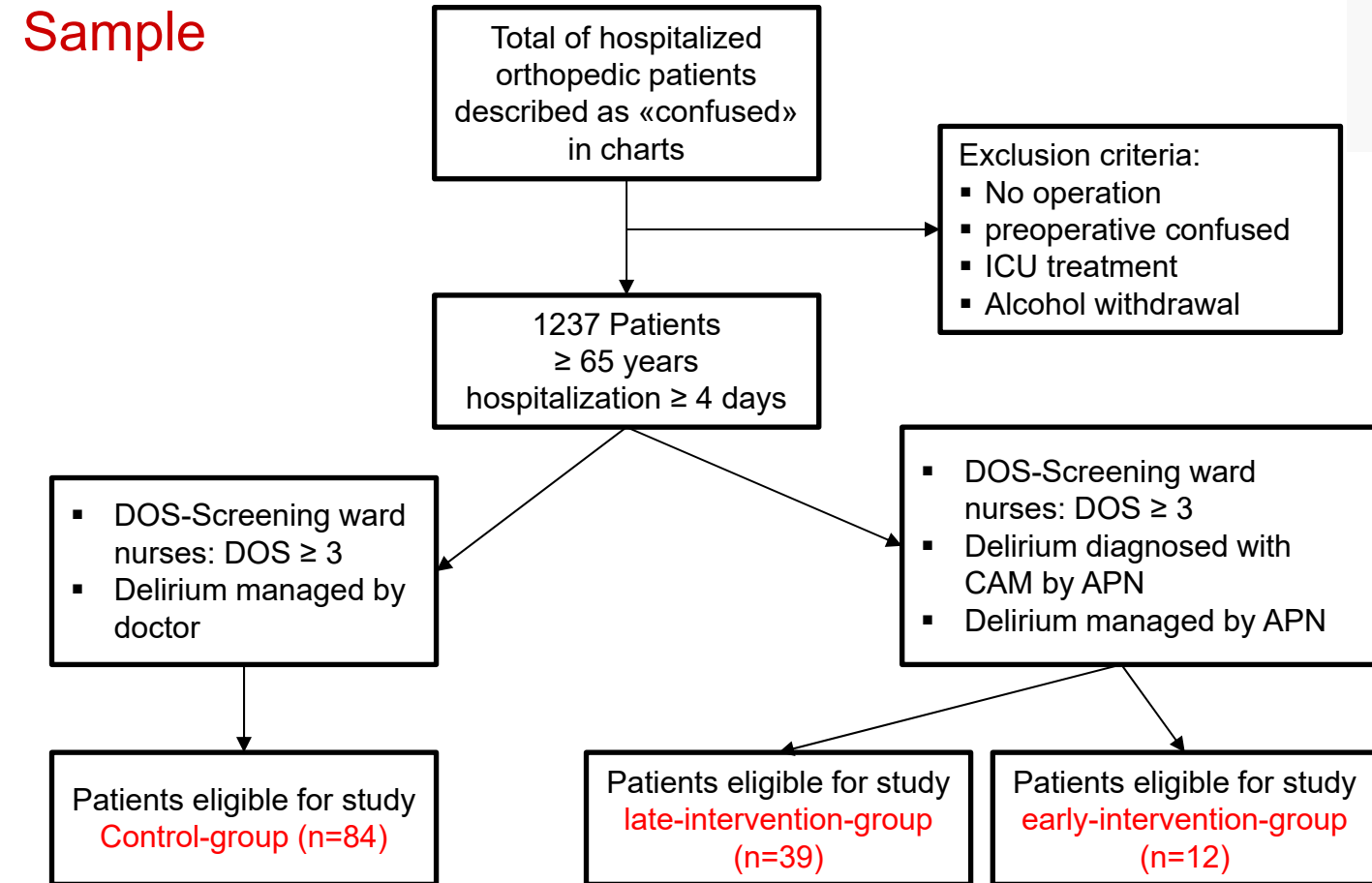
- Secondary data analysis based on main study (2012-2015) «Evaluation of benefits of consultation service»: delirium severity, -duration and length of stay⁽¹⁾
- Sample divided into three pre-defined subgroups according to main study: «early consultation» (≤ 3 days, $n=12$), «late consultation» (>3 days, $n=39$) and «control group» ($n=84$)
- Additional calculation of case-mix-index (CMI)*, costs, revenue, and cost-coverage ratios**
- Calculations of differences between 3 subgroups for cost-coverage ratios statistically controlled by CMI (analysis of covariance)

*CMI: Depending on diagnosis, complexity of illness and treatment, that is relevant for calculation of costs. Higher CMI = more complexity

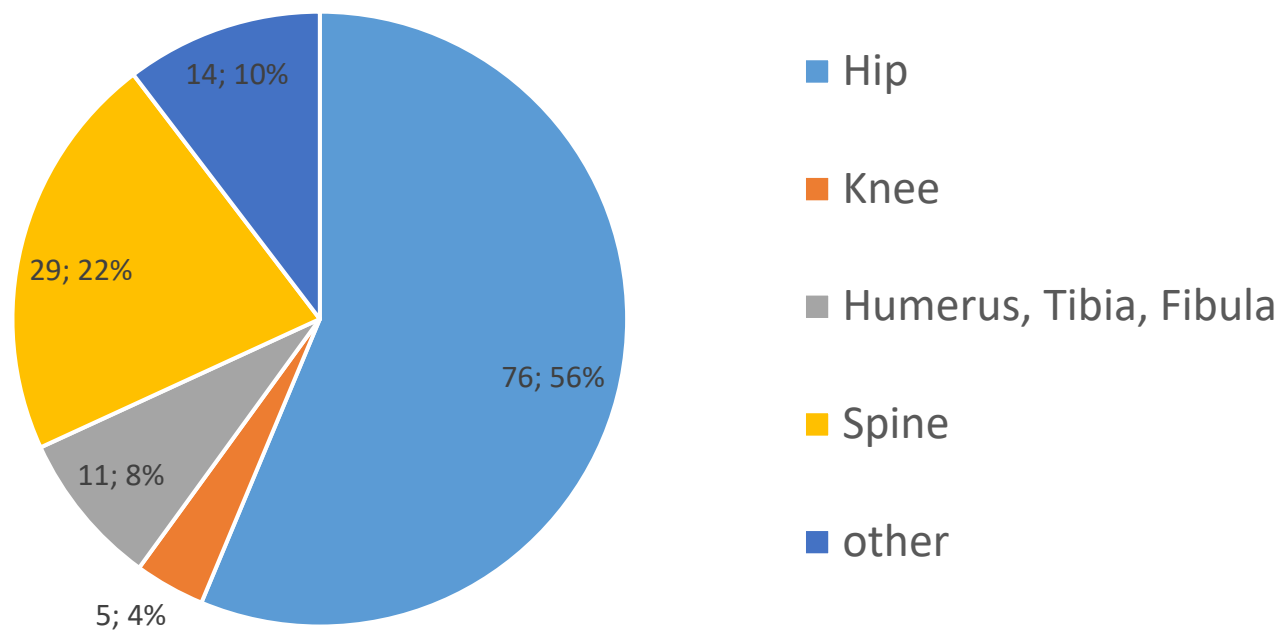
**Cost-coverage ratio (or operating expense ratio) = part of costs that are covered by revenue. Formula: $\text{costs/revenue (in \%)}$

(1) Weber, C. et.al.: A nurse-led delirium consultation service in a Swiss Hospital. Thesis

Sample



Sample: Type of surgery



Sample (Total, N=135)



	Mean	Median	SD	Min.	Max.
Age (years)	83.50	83.92	7.00	65.17	100.03
LoS (days)	13.99	12.00	7.07	4.00	52.00
CMI	2.10	2.03	0.83	0.56	5.33
Costs (CHF)	33'881	28'348	18'891	12'129	113'777
Revenue (CHF)	28'487	22'828	16'330	5'835	125'649
Cover ratio (%)	88.34	89.57	26.02	23.81	173.36

Results: Cost coverage ratios, LoS, CMI

3 subgroups	Cost-coverage-ratio* (%)	LoS** (days)	CMI
Early consultation (n=12)	100.4%	10.43	2.27
Late consultation (n=39)	89.1%	14.22	2.02
No consultation (control) (n=84)	86.3%	12.89	2.12

Delirium severity was lowest in the early-consultation group and highest in control group (p= .041)

*p= .192 covariate CMI = 2.104
**p= .037 comparison between longest and shortest LoS¹⁰ (ANOVA)

Mean deficit per patient: Differences in subgroups



Deficit per patient (mean)	CHF
Early consultation	1'866
Late consultation	4'784
No consultation	6'181

*Although mean cost coverage ratio in group "early consultation" was >100%, there is an under-coverage of costs when considering amount of CHF. Background: Wide range of amount of over- and under-coverage between +12'459 to -75'848 CHF.

Summary & Take Home Message



- Differences in cost coverage ratios and monetary deficit between groups of delirious patients who received APN-led delirium consultation vs. usual care
- Under-coverage lowest for patients with „Early“ consultation (mean of CHF 1'866.-), and highest for patients without consultation (mean of CHF 6'181.-)
- ➔ Early involvement of APN-led consultation service for delirious patients results in lower costs
- ➔ Difference to earlier studies: Nurse-consultations were all done by Geriatric APN in present study
- ➔ Investment in academic prepared Advanced Practice Nurses for consultation service and in supporting structures (background Geriatrician) can save costs

Thank you for your attention



Patient A

Patient B

