

# Implementation of guidelines on delirium in a General Hospital

## A before–after study of their impact on caregivers' knowledge and clinical skills

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### Summary

**Introduction:** Delirium is a highly prevalent disorder, with serious consequences for the hospitalised patient. Nevertheless, it remains under-diagnosed and under-treated. We developed evidence-based clinical practice guidelines (CPGs) focusing on prevention, screening, diagnosis, and treatment of delirium in a general hospital. This article presents the implementation process of these CPGs and a before-after study assessing their impact on healthcare professionals' knowledge and on clinical practice.

**Methods:** CPGs on delirium were first implemented in two wards (Neurology and Neurosurgery) of the Lausanne university hospital. Interactive one-hour educational sessions for small groups of nurses and physicians were organised. Participants received a summary of the guidelines and completed a multiple choice questionnaire, assessing putative changes in knowledge, before and three months after the educational session. Other indicators such as “diagnosis of delirium” reported in the discharge letters, and mean duration of patients' hospital stay before and after implementation were compared.

**Results:** Eighty percent of the nurses and physicians from the Neurology and Neurosurgery wards attended the educational sessions. Both nurses and physicians significantly improved their knowledge after the implementation (+9 percentage-points). Other indicators were not modified by the intervention.

**Conclusion:** A single interactive intervention improved both nurses' and physicians' knowledge on delirium. Sustained and repeated interventions are probably needed to demonstrate changes in clinical practice.

**Key words:** delirium; clinical practice guideline; implementation; knowledge transfer; general hospital; questionnaires

### Introduction

The prevalence of delirium ranges from 11 to 33% in hospital admissions, and its incidence during hospital stays varies between 3 and 56% [1–5]. Despite its association with increased morbidity, mortality, and health services utilisation, delirium remains under-diagnosed and under-treated [3, 6–9]. In order to improve the management of delirium in a general hospital, we developed evidenced-based clinical practice guidelines (CPGs) addressing prevention, screening, diagnosis, and treatment of delirium, based on an extensive review of the literature and a structured consultation of a multidisciplinary team of clinical experts from the Lausanne university hospital [10].

Since guidelines have to be properly implemented to ensure their utilisation in clinical practice, an evaluation of the implementation process is crucial to know whether the intervention is successful or not. There is growing evidence that a “passive dissemination” of CPGs is ineffective in changing professional behaviour [11, 12], whereas interactive and more active implementation is more effective [13–15]. This article describes the procedure used to implement these guidelines in a university hospital. A before-after design assessed whether the implementation improved caregivers' knowledge on delirium and whether indirect indices of clinical practice changed.

### Material and methods

#### Preparation phase

On the basis of the full CPG-document (174 pages), we prepared a 4-page summary<sup>1</sup>, a PowerPoint® presentation and a short algorithm<sup>2</sup>, summarising the main recommendations in prevention, screening, diagnosis and treatment of delirium. The algorithm was submitted to clinical experts in delirium, and refined, before being issued in the format

1 The French version of the Summary is available on [www.chuv.ch/cepic/delirium\\_summary.pdf](http://www.chuv.ch/cepic/delirium_summary.pdf)

2 The French version of the Algorithm is available on [www.chuv.ch/cepic/delirium\\_algo.pdf](http://www.chuv.ch/cepic/delirium_algo.pdf)

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of a plastic coated C6 card. In close collaboration with chief nurses, we organised one-hour training sessions in small groups (max. 10 participants), focusing on prevention and screening. Upon the request of chief nurses, assistant nurses were also trained, as they work closely with patients and are confronted daily with delirious patients. Similarly, training sessions were organised for physicians and chief physicians, focusing on diagnosis and treatment.

A 13-question Multiple Choice Questionnaire (MCQ) (five *right/wrong* answers per question, maximal score =  $13 \times 5 = 65$ ) was developed to evaluate participants' knowledge<sup>3</sup>. Questionnaires for physicians and nurses were quite similar. Only two out of thirteen questions differed.

### Implementation phase

The implementation phase occurred between November 2005 and January 2006, in both the Neurology and Neurosurgery wards. Before each training session, participants completed the MCQs anonymously (only the professional category of the participants was registered), which were then collected in a sealed envelope. We presented our guidelines [10] using a printed PowerPoint document and discussed participants' questions. At the end of each session, participants received the 4-page summary of the CPGs and the algorithm. As reminders, posters displaying the algorithm were placed in both wards and an email was sent to all physicians and chief nurses, reminding them of the accessibility of the guidelines on the hospital's intranet.

Three months after the end of the training sessions, the same MCQ was personally sent to each assistant nurse, nurse, physician and chief physician, with a request to return it anonymously to the research team by means of an enclosed envelope. Two additional questions asked whether the person had participated in the training (Yes / No), and if not, why not (night shift / lack of time / lack of interest / other). One additional question asked whether participants thought they had a better knowledge of delirium after the training session (yes, considerably / yes, slightly / no, very little / not at all), and another question asked whether this training had modified their clinical practice (yes, con-

siderably / yes, slightly / no, very little / not at all); a final question evaluated their global satisfaction with the training (1–9 Likert scale).

### Statistical analyses

We compared the scores of the MCQs for each professional category, before and after the training sessions, using the Wilcoxon rank-sum test (questionnaires from people who had not taken part in the training were not used for these specific analyses).

Electronic medical records were consulted to calculate the rate of reports of delirium diagnoses in the discharge letters, before and after the intervention. We calculated a sample size of 600 patients (three to four months needed), to obtain a statistically significant doubling of the reported diagnoses ( $\alpha = 0.05$ ,  $\beta = 0.2$ ). We compared the mean duration of hospital stay by patients, and the number of hours spent by nurses per patient-day (mean number of nursing hours spent for the treatment of one patient during one day), before and after the intervention (t-test). In order to minimise seasonal biases on the sample, data of patients hospitalised within the three months following our intervention (18<sup>th</sup> January – 30<sup>th</sup> April 2006) were compared with those of patients hospitalised during the same three months of the previous year (18<sup>th</sup> January – 30<sup>th</sup> April 2005).

The study was approved by the Ethics Committee of the Faculty of Biology and Medicine of Lausanne, Switzerland.

### Results

By providing 23 one-hour educational sessions to small groups, we reached 80% of the nurses and physicians from Neurology and Neurosurgery. A total of 110 MCQs were completed before, and 67 after the intervention. Among the 67 participants who returned the questionnaire after the intervention, 16 had not participated in the training, but had had access to the educational material. The main reasons for non-participation were due to "night shift" and "lack of time".

Regardless of the professional category, the mean total score of correct answers increased from 47.5/65 [SD 7.2] (73%) before, to 53.3/65 [SD 7.4] (82%) after the intervention (Wilcoxon rank-sum test:  $p < 0.001$ ) (table 1). Nurses improved their score by 5.8 points (from 48.0, [SD 4.8], to 53.8, [SD 7.0],  $p < 0.001$ ) and physicians by 4.1 points (from 52.6, [SD 6.9] to 56.8, [SD 6.7],  $p < 0.001$ ). The best improvement was found in questions assessing symptoms and diagnosis, as well as aetiology/risk factors. Among the participants in the teaching sessions, 96% estimated that they had improved their knowledge and 75% that they had improved their skills in the management of delirium.

The 758 discharge letters of patients hospitalised in the two wards between January 18, 2005 and April 30, 2005 (206 days) were compared with the 765 letters from the same time span in 2006. The socio-demographic characte-

**Table 1**  
Number of correct answers to the questionnaires (MCQs), on a maximal score of 65 points, before and after the intervention.

	Professional categories			Total
	Assistant nurses	Nurses	Physicians	
<b>Before intervention</b>				
Number of participants	23	62	25	110
Mean score (SD)	40.7 (8.2)	48 (4.8)	52.6 (6.9)	47.5 (7.2)
Median score (min – max)	42 (9–52)	48.5 (38–58)	54 (30–62)	47.5 (9–62)
<b>After intervention*</b>				
Number of participants	7	34	10	51
Mean score (SD)	46 (6.3)	53.8 (7.0)	56.8 (6.7)	53.3 (7.4)
Median score (min – max)	48 (35–55)	54.5 (28–62)	59.5 (43–63)	54 (28–63)
p value (Wilcoxon rank-sum test)	0.05	<0.001	0.001	<0.001

\* Results taking into account those who took part in the teaching sessions only.

3 The French version of the Multiple Choice Questionnaire (physicians) is available on [www.chuv.ch/cepic/delirium\\_qcm.pdf](http://www.chuv.ch/cepic/delirium_qcm.pdf)

istics of the patients did not differ between the two years (mean age: 59 years [SD 18.7], t-test:  $p = 0.5$ ; gender: 51% men in 2005 and 49% in 2006,  $p = 0.4$ ). The diagnosis rate of delirium reported in the discharge letters was very low and identical (1.6%) between 2005 and 2006. The mean length of stay in Neurology was 6.8 days (95% CI 6.3; 7.3) in 2005, and 6.4 (95% CI 5.9; 6.9) in 2006 (t-test:  $p = 0.25$ ). In Neurosurgery, the mean length of stay was 6 days (95% CI 5.5; 6.6) in 2005 and 2006. The number of nursing hours spent per patient-day was 4.1 and 4.2 in Neurology and 4.7 and 4.8 in Neurosurgery in 2005 and 2006, respectively.

## Discussion

The study demonstrates that a single one-hour interactive intervention to small groups and the distribution of reminders of CPGs improved knowledge about delirium in both physicians and nurses. Moreover, participants in the intervention were satisfied with the training and found it useful. Davis and colleagues investigated knowledge in trainee physicians in UK and found that there were lacks of knowledge in diagnostic criteria for delirium [16]. Hare and colleagues assessed the level of knowledge of delirium among hospital nurses and found an unsatisfactory level [17], particularly in relation to risk factors. Interestingly, our results showed that a single intervention improves nurses' and physicians' knowledge, especially on the diagnosis and risk factors for delirium.

Other indicators – rate of diagnosis reported in the discharge letters, length of hospital stay, and number of nursing hours spent per patient-day – however, were not modified by the intervention. Of note, the rate of delirium diagnosis in discharge letters, both before and after the intervention, was much lower than one would expect in such wards, probably reflecting that delirium is not considered as a diagnosis in itself and that it is not systematically reported in discharge letters.

These results highlight the complexity in identifying and measuring indicators of the impact of CPG implementation on clinical practice, even in the case of a highly prevalent syndrome. Much larger means would be required, with direct and independent assessments of patients' outcomes, pre- and post-intervention, in order to adequately evaluate a potential impact on clinical practice and quality of care.

Evidence on the effectiveness of interventions to prevent and treat delirium is sparse [18]. While some studies evaluating the impact of CPGs focusing on prevention and management of delirium demonstrated a favourable and significant impact on clinical outcomes such as recognition rate, use of psychotropic medication, delirium incidence and hospital stay [19, 20], others did not [21, 22]. It is interesting to note that interventions targeting the prevention of delirium seem to be more effective than those targeting its management [4, 23, 24].

While the implementation of CPGs is always a challenging task, we consider that the main difficulty of this project was that new guidelines were introduced within an already overloaded healthcare service. This is certainly one of the main reasons for the lower response rate of caregivers

in the second questionnaire. Moreover, increasing quality related activities is now required in healthcare, and assessing caregivers knowledge is felt as an additional significant stress factor.

The current study has several limitations. Since there was a lower participation in the second session and since MCQs were not individually matched before and after the intervention, we cannot exclude that this may have led to an overestimation of the improvement in knowledge. Indeed, individuals who did not participate in the second questionnaire may have been the "bad" learners. However, we found a significant improvement in knowledge in each professional category, which suggests a real effect.

Nurses considered that the guidelines contributed to a better collaboration amongst nurses, and between nurses and physicians. This was an unexpected positive outcome of the study. Moreover, since our intervention, all nurses and physicians starting to work in these two wards receive the educational material about delirium, and are informed about its contents by a senior colleague working in the ward. Accordingly, we propose that one strategy to reduce the workload of the implementation, and maybe to increase the efficiency of the implementation, is to provide a more in-depth training of key persons in the clinical staff who could then educate their peers. This might contribute to the sustainability of the guidelines' use.

## Conclusion

A single structured one-hour intervention led to a slight improvement in knowledge on delirium in both nurses and physicians. Sustained and repeated interventions are probably needed to objectively modify clinical practice. This study illustrates the effort required to successfully implement recommendations, a critical step in the use of CPGs.

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## Authorship:

Substantial contribution to conception and design of the study (all), acquisition of data (RV, FS, PM, YD, AB), analysis and interpretation of data (RV, FS, BB, AB).

Drafting the article (RV, FS, LM, BB, AB), revising it critically for important intellectual content (all).

Final approval of the version to be published (all).

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