Educational Impact of a Psychiatric Liaison in the Medical Intensive Care Unit: Effects on Attitudes and Beliefs of Trainees and Nurses Regarding Delirium

Scott R. Beach, MD; Donna T. Chen, MD; and Jeff C. Huffman, MD

ABSTRACT

Objective: Despite high rates and increased risk of mortality, delirium remains underdiagnosed and a minimal focus of formal medical education. This is the first study to examine the educational impact of a psychiatric liaison on beliefs and knowledge about delirium among both nurses and residents.

Method: One psychiatrist spent 9 months rounding weekly in the medical intensive care unit, interacting with critical care nurses and internal medicine residents. Preintervention and postintervention surveys were distributed in July 2009 and June 2010, respectively, to staff (critical care nurses: n = 23 and n = 25, respectively; internal medicine residents: n = 31 and n = 23, respectively) and a comparison group (psychiatry residents: n = 29 and n = 23, respectively). Participants responded to 12 statements regarding delirium on a 5-point Likert scale.

Results: There were no statistically significant differences between the presurveys and postsurveys for any item when examining all respondents together, as well as psychiatry and internal medicine residents as individual groups. Critical care nurses showed a significant change between surveys for the statements, "Patients with new-onset anxiety or depression in the intensive care unit most commonly have delirium" (17.4% agree presurvey vs 56.0% agree postsurvey, $\chi^2 = 7.62$, $P = .006$) and "Delirium is diagnosed less often than it actually occurs" (100% agree presurvey vs 80% agree postsurvey, $\chi^2 = 5.13$, $P = .023$).

Conclusions: Though introduction of a psychiatric liaison was very well received by clinical staff, we did not meaningfully affect the attitudes and beliefs of trainees and nurses regarding delirium. Robust and lasting changes in attitudes regarding delirium may require more intensive efforts involving longer intervention periods, greater rounding frequency, or additional didactic teaching.

Prim Care Companion CNS Disord 2013;15(3):doi:10.4088/PCC.12m01499

Submitted: *December 6, 2012; accepted February 19, 2013.*
Published online: *June 6, 2013.*
Corresponding author: *Scott R. Beach, MD, Department of Psychiatry, Massachusetts General Hospital, 55 Fruit St/Warren 605, Boston, MA 02114 (sbeach1@partners.org).*

Delirium is common, costly, associated with adverse long-term neuropsychiatric consequences and increased mortality, and distressing to patients, families, and care providers.[1–4] Despite this, delirium remains largely underdiagnosed. Although awareness of the syndrome appears to be increasing and educational interventions targeted at preventing delirium are more commonly reported in the literature, much work is needed to make delirium a prominent focus of formal undergraduate and graduate medical education.[5–7] It is therefore important to understand attitudes and knowledge about delirium among clinicians and trainees in intensive care settings so that appropriate education can occur. Prior studies surveying critical care practitioners regarding delirium have focused primarily on knowledge regarding delirium or attitudes toward delirium screening tools, and none have examined the educational impact of a liaison intervention on attitudes and beliefs.[7–11] We planned to use a liaison model to introduce a psychiatrist to medical intensive care unit rounds once a week over a 9-month period and assess whether this level of increased presence would result in changes in attitudes and beliefs about delirium among clinicians and trainees. Using systematic presurveys and postsurveys of front-line clinicians, we set out to determine how resident trainees and critical care nurses thought about and understood delirium before and after the liaison intervention.

METHOD

Participants were care providers in the 16-bed medical intensive care unit at an academic medical center. The medical intensive care unit was chosen because it had a high volume of delirious patients, was a frequent source of psychiatric consultations, and had a leadership willing to introduce a psychiatric liaison into morning rounds. A 12-item survey with additional demographic questions specific to discipline was generated and posted online using SurveyMonkey (www.surveymonkey.com). In July 2009, e-mail invitations to complete the surveys were distributed to critical care nurses, internal medicine residents, and psychiatry residents. Respondents completed the survey at their discretion in an anonymous fashion. In June 2010, the same online survey was distributed again to the same groups. The initial and follow-up surveys were not linked to respondents in any way but were identical. In both cases, the survey was left open for 3 weeks, with a reminder e-mail sent to each group after 1 week. Institutional review board approval was obtained for this project at the University of Virginia (Charlottesville).

Items in the survey consisted of statements regarding delirium. The majority of statements were opinion based, though some statements were evidence or knowledge based. The authors formulated questions based on prior delirium survey studies and clinical experience, with attention paid to common misconceptions and attitudes that could impede appropriate recognition and treatment of delirium.[8–10] Participants were asked to rate agreement with the statement using a 5-point Likert scale; responses were given a numerical score (strongly disagree = 1, somewhat disagree = 2, neutral = 3, somewhat agree = 4, strongly agree = 5). A series of additional

Clinical Points

- Formal educational interventions to enhance knowledge of delirium among critical care providers are lacking at many institutions.
- A psychiatric liaison rounding weekly with the medical intensive care unit team for 9 months was reported subjectively as being "very helpful" in terms of enhancing the overall care of patients and helped improve relations between medicine and psychiatry but appeared insufficient to meaningfully affect the attitudes and beliefs of frontline clinicians regarding delirium.
- Successful delirium educational interventions for critical care providers will most likely involve a multimodal approach that combines didactic and clinical teaching on an ongoing basis, with opportunity for reflection and feedback.

Table 1. Demographic Information for Respondents

Demographics	Presurvey, n	Postsurvey, n
Total	83	71
Psychiatry residents	29	23
PGY-1	6	4
PGY-2	7	4
PGY-3	4	7
PGY-4	6	3
PGY-5 or higher (fellow)	6	5
Internal medicine residents	31	23
PGY-1	10	9
PGY-2	10	9
PGY-3	11	5
Critical care nurses	23	25
Time in intensive care unit		
<6 mo	1	3
6–12 mo	1	3
1–2 y	3	0
>2 y	18	19

questions were asked specific to each specialty (eg, duration of experience in a medical intensive care unit setting for critical care nurses, year of training for internal medicine residents).

After the initial online survey was closed, beginning in September 2009, one of the authors (S.R.B.), a fourth-year psychiatry resident, served as an on-site psychiatric liaison in the medical intensive care unit, rounding with the team once weekly for 9 months. A frequency of once weekly was chosen to allow for some degree of longitudinal interaction with survey participants without overburdening the liaison. In this liaison role, S.R.B. participated actively in walk rounds, reviewing the cases of all patients and addressing any psychiatric concerns. Walk rounds, lasting 3–4 hours, were led by the critical care attending physician and involved participation of up to 8 internal medicine residents, who rotated on staggered 4- to 5-week cycles. Critical care nurses were present at and actively participated in walk rounds for discussions of their individual 1 or 2 patients. Psychiatry residents do not rotate through the medical intensive care unit and were therefore not present for rounds. Though there were no formal didactic lectures delivered by the psychiatric liaison, he actively contributed to the discussion for three-quarters of patients seen at each rounds session and gave impromptu 3- to 5-minute teaching talks regarding psychiatric topics on several occasions. Covered topics included delirium, alcohol withdrawal management, and insomnia treatment. During these discussions, the psychiatric liaison engaged internal medicine residents and critical care nurses, asking them both knowledge-based and attitudinal questions regarding the topic being discussed. Patients requiring more formal psychiatric assessment or input than could be provided during rounds were seen formally by the psychiatric liaison or a member of the Psychiatry Consultation Service within 24 hours. On other days, the medical intensive care unit continued to place psychiatric consultation requests in the usual fashion.

The objective of this small pilot project was to assess whether the introduction of a psychiatric liaison resulted in differences preintervention and postintervention in attitudes and knowledge about delirium. For each survey item, percentage of agreement with the survey item (score of 4 or 5) and mean response score (with standard error) were calculated for the overall sample and for each subgroup (eg, critical care nurses). Results of presurveys and postsurveys for each group were compared using χ^2 tests for proportion of respondents agreeing with the item and independent samples *t* tests for mean response scores. All analyses were performed using Stata statistical software (version 11.0, Stata Corp, College Station, Texas). All *P* values were 2-tailed, and a *P* value ≤ .05 was considered statistically significant.

RESULTS

The psychiatric liaison attended walk rounds 89.7% (35/39) of the weeks during the intervention. Overall, 83 care providers within the 3 subgroups of interest completed the presurvey (internal medicine: n = 31, psychiatry: n = 29, critical care nurses: n = 23) and 71 completed the postsurvey (internal medicine: n = 23, psychiatry: n = 23, critical care nurses: n = 25) as shown in Table 1. Total response rates for the surveys were 60.1% (83/138) (internal medicine: 44.3% [31/70], psychiatry: 72.5% [29/40], critical care nurses: 82.1% [23/28]) for the presurvey and 51.4% (71/138) (internal medicine: 32.9% [23/70], psychiatry: 57.5% [23/40], critical care nurses: 89.3% [25/28]) for the postsurvey. Regarding experience, most (78% presurvey, 76% postsurvey) critical care nurses had been working in the medical intensive care unit for over 2 years; internal medicine and psychiatry residents were fairly evenly distributed across training years in both surveys, though the postsurvey had a smaller proportion of internal medicine PGY-3 residents (35.4% vs 21.7%).

Percentages of respondents agreeing with the individual statements for the presurvey and postsurvey are presented in Table 2, with mean scores for both surveys presented in Table 3. Comparison of presurvey and postsurvey responses revealed no statistically significant differences in terms of percent in agreement or total mean scores when all

Prim Care Companion CNS Disord
2013;15(3):doi:10.4088/PCC.12m01499

Table 2. Percentage of Respondents Agreeing With Presurvey and Postsurvey Items[a]

Statement	Total Respondents				Critical Care Nurses				Internal Medicine Residents				Psychiatry Residents			
	Presurvey (n = 83)	Postsurvey (n = 71)	χ^2	*P*	Presurvey (n = 23)	Postsurvey (n = 25)	χ^2	*P*	Presurvey (n = 31)	Postsurvey (n = 23)	χ^2	*P*	Presurvey (n = 29)	Postsurvey (n = 23)	χ^2	*P*
Delirium is a preventable illness	72	60	2.37	0.12	74	52	2.45	.12	74	61	1.09	.30	69	70	0.00	.96
Delirium is a manageable illness	95	97	0.43	0.51	96	96	0.010	.93	94	96	0.11	.74	97	100	0.81	.37
Delirium is diagnosed less often than it actually occurs	94	85	2.83	0.09	**100**	**80**	**5.13**	**.023***	87	87	0.00	.99	97	91	0.65	.42
Patients with new-onset anxiety or depression in the intensive care unit most commonly have delirium	49	60	2.36	0.13	**17**	**56**	**7.62**	**.006***	42	44	0.01	.91	79	83	0.09	.76
Delirium is a "normal" part of intensive care unit hospitalization	13	16	0.40	0.53	17	12	2.45	.12	13	22	0.74	.39	10	17	0.55	.46
Delirium has long-lasting detrimental effects	70	71	0.07	0.79	87	80	0.42	.52	61	61	0.00	.98	66	74	0.42	.52
It is the responsibility of the primary resident to diagnose delirium	65	69	0.27	0.60	22	40	1.86	.17	74	87	1.33	.25	90	83	0.55	.46
It is the responsibility of the primary resident to treat delirium	82	84	0.21	0.64	68	80	0.86	.35	94	91	0.97	.76	79	83	0.09	.76
My patients with delirium have longer intensive care unit stays and more complications than those without delirium	95	95	0.03	0.86	100	96	0.94	.33	90	96	0.55	.46	97	96	0.03	.87
Oversedation of patients in the intensive care unit contributes significantly to delirium	78	85	1.49	0.22	74	84	0.74	.39	71	74	0.06	.81	90	100	2.52	.11
Most patients in the intensive care unit are oversedated	37	39	0.07	0.79	26	20	0.25	.62	26	26	0.00	.98	59	74	1.33	.25
Obtaining a psychiatric consultation is very useful in managing patients with delirium	57	59	0.05	0.82	64	56	0.28	.60	19	30	0.89	.35	93	91	0.06	.81

[a]Data are presented as %.
*$P < .05$. Bolding indicates statistical significance.

respondents were pooled. Furthermore, no presurvey/postsurvey differences were found on any item in the internal medicine or psychiatry groups. For the critical care nurses group, there was a statistically significant decline presurvey and postsurvey in both the mean score (4.74 vs 4.04, respectively, $t = 2.49$, $P = .016$) and the percentage of respondents agreeing (100% vs 80%, respectively, $\chi^2 = 5.13$, $P = .023$) with the statement, "Delirium is diagnosed less often than it actually occurs." Additionally, there was a statistically significant increase presurvey and postsurvey in the percentage in agreement (17.4% vs 56.0%, respectively, $\chi^2 = 7.62$, $P = .006$) with the statement, "Patients with new-onset anxiety or depression in the intensive care unit most commonly have delirium."

DISCUSSION

To our knowledge, this is the first study to examine the educational impact of increased psychiatric presence during weekly rounds on the attitudes and beliefs regarding delirium among nurses and housestaff in the medical intensive care unit. The results of this small pilot study suggest that the presence of an on-site psychiatric consultant once weekly for 9 months may be insufficient to affect the attitudes and beliefs of these groups despite subjectively improving interdisciplinary relationships.

Examining all respondents together as well as psychiatry and internal medicine groups individually showed no statistically significant changes between the presurveys and postsurveys. Psychiatry residents were used primarily as a control group and were not expected to demonstrate significant change given that they did not directly experience the educational intervention. One could postulate that there may have been an increase in their knowledge about delirium over the course of a single academic year as part of their residency training, but changes of the nature assessed through the surveys would most likely have occurred during their PGY-1 year, as they serve on the psychiatry consultation service for several months of that year. Thus, the general lack of change on the items we assessed is unsurprising.

The critical care nurses group demonstrated statistically significant change on 2 items of the survey. These respondents were less likely to agree that delirium is underdiagnosed on the postsurvey, though 80% continued to agree, a figure that is consistent with prior surveys.[9,10] This decline is perhaps reflective of a belief among nurses that more cases of delirium were being recognized in the intensive care unit during the intervention period. In addition to the educational intervention central to this study, the Confusion Assessment Method, a validated nursing screening tool for delirium, was piloted in

Table 3. Respondents' Mean (SD) Scores for Presurvey and Postsurvey Items

Statement	Total Respondents				Critical Care Nurses				Internal Medicine Residents				Psychiatry Residents			
	Score Presurvey (n = 83)	Score Postsurvey (n = 71)	*t*	*P*	Score Presurvey (n = 23)	Score Postsurvey (n = 25)	*t*	*P*	Score Presurvey (n = 31)	Score Postsurvey (n = 23)	*t*	*P*	Score Presurvey (n = 29)	Score Postsurvey (n = 23)	*t*	*P*
Delirium is a preventable illness	3.71 (0.10)	3.47 (0.12)	1.48	.14	3.70 (0.19)	3.16 (0.21)	1.89	.07	3.84 (0.14)	3.48 (0.15)	1.73	.09	3.59 (0.20)	3.83 (0.24)	−0.77	.45
Delirium is a manageable illness	4.39 (0.08)	4.31 (0.06)	0.77	.44	4.18 (0.14)	4.12 (0.09)	0.38	.71	4.16 (0.13)	4.17 (0.10)	−0.07	.94	4.79 (0.12)	4.65 (0.10)	0.89	.38
Delirium is diagnosed less often than it actually occurs	4.57 (0.08)	4.28 (0.13)	1.96	.05	**4.74 (0.09)**	**4.04 (0.25)**	**2.49**	**.016***	4.26 (0.15)	4.17 (0.18)	0.35	.73	4.76 (0.12)	4.65 (0.19)	0.49	.63
Patients with new-onset anxiety or depression in the intensive care unit most commonly have delirium	3.48 (0.11)	3.59 (0.14)	−0.65	.52	2.78 (0.15)	3.24 (0.25)	−1.54	.13	3.39 (0.14)	3.30 (0.19)	0.36	.72	4.14 (0.17)	4.26 (0.20)	−0.47	.64
Delirium is a "normal" part of intensive care unit hospitalization	2.18 (0.11)	2.25 (0.12)	−0.45	.65	2.39 (0.21)	2.32 (0.21)	0.24	.81	2.19 (0.17)	2.43 (0.20)	−0.93	.36	2.18 (0.96)	2.23 (1.09)	0.00	1.00
Delirium has long-lasting detrimental effects	3.86 (0.13)	3.90 (0.13)	−0.25	.80	4.39 (0.20)	4.12 (0.20)	0.96	.34	3.65 (0.21)	3.65 (0.19)	−0.02	.98	3.66 (0.22)	3.91 (0.27)	−0.74	.46
It is the responsibility of the primary resident to diagnose delirium	3.59 (0.12)	3.66 (0.15)	−0.37	.71	2.56 (0.23)	2.80 (0.27)	−0.65	.52	3.81 (0.16)	4.09 (0.18)	−1.15	.25	4.17 (0.15)	4.17 (0.22)	−0.01	1.0
It is the responsibility of the primary resident to treat delirium	3.98 (0.09)	4.06 (0.10)	−0.60	.55	3.72 (0.20)	3.88 (0.20)	−0.53	.60	4.13 (0.11)	4.13 (0.11)	−0.01	.99	4.17 (0.93)	4.17 (0.17)	−0.07	.49
My patients with delirium have longer intensive care unit stays and more complications than those without delirium	4.55 (0.06)	4.61 (0.09)	−0.48	.63	4.65 (0.10)	4.44 (0.17)	1.03	.31	4.35 (0.12)	4.65 (0.15)	−1.58	.12	4.69 (0.10)	4.74 (0.11)	−0.33	.75
Oversedation of patients in the intensive care unit contributes significantly to delirium	4.06 (0.09)	4.24 (0.10)	−1.29	.20	3.87 (0.18)	4.04 (0.20)	−0.64	.53	3.81 (0.16)	3.96 (0.17)	−0.64	.53	4.48 (0.13)	4.74 (0.09)	−1.54	.13
Most patients in the intensive care unit are oversedated	3.16 (0.12)	3.18 (0.12)	−0.16	.87	2.91 (0.25)	2.64 (0.18)	0.89	.38	2.84 (0.17)	2.96 (0.16)	−0.49	.62	3.69 (0.16)	4.15 (0.74)	−1.38	.17
Obtaining a psychiatric consultation is very useful in managing patients with delirium	3.61 (0.14)	3.51 (0.15)	0.50	.62	3.77 (0.24)	3.40 (0.19)	1.23	.22	2.61 (0.18)	2.61 (0.29)	0.01	.99	4.55 (0.14)	4.52 (0.14)	.15	.88

*$P < .05$. Bolding indicates statistical significance.

the medical intensive care unit beginning in January 2010. Nurses subjectively reported an increase in the number of patients they diagnosed with delirium as a result of the tool and became more vocal during rounds regarding concerns about delirium, perhaps contributing to a belief that cases were no longer being missed.

A significantly higher percentage of critical care nurses recognized anxiety and depression as potential diagnostic confounders on the postsurvey. A previous study suggested that more than half of elderly patients who exhibit depressive or anxious symptoms may actually have delirium,[12] a finding that is consistent with our experience in evaluating patients for the question of a new diagnosis of anxiety or depression in the intensive care unit. The change in this response could be suggestive of a potential positive effect of the educational intervention, as this was a frequent topic of conversation at rounds during the time of the intervention. Alternatively, it may again reflect the impact of the implementation of the Confusion Assessment Method, as nurses were detecting more cases of hypoactive delirium with this assessment tool and may have recognized the symptom overlap. On the other hand, given that this statement is not wholly evidence based, the change may simply reflect nonoptimal wording.

The absence of differences between the presurveys and postsurveys for all statements in the internal medicine group and for most statements in the critical care nurses group suggests that weekly rounding by a psychiatric liaison may have been insufficient to produce meaningful change in the attitudes and beliefs of housestaff and nurses. One possible explanation for the absence of change is that the respondents to the survey did not sufficiently experience the educational intervention. Although internal medicine residents and critical care nurses all most likely experienced the intervention at some point, due to the brevity of rotation for the internal medicine residents and the intermittent nature of rounds for the critical care nurses (depending on frequency of weekday morning shifts), the learning received in an individual rounds session

may not have been adequately reinforced over time. Although attempts were made to reiterate key teaching points throughout the year, the lack of a list of mandatory topics and the nature of the morning rounds at times yielded a random and haphazard mixture of teaching points. Even for respondents who attended multiple weekly sessions in sequence, such an interval may be too infrequent to reiterate key teaching points regarding delirium, particularly given the intensity of the medical intensive care unit environment, in which the knowledge curve is often steepest and learning covers a multitude of domains. Further, in a group of mixed knowledge and experience, trainees and nurses may have lacked a detailed understanding of key principles, preventing them from consolidating the information presented during rounds.

Though the psychiatric liaison did not provide didactic lectures, the educational approach employed was one of interactive, clinically integrated teaching, an approach that should have been optimal for changing attitudes and beliefs. Studies have suggested that interactive teaching is more efficacious for adult learning than is didactic teaching and that clinically integrated teaching, as opposed to stand-alone educational activities, has a more significant impact on attitudes and behavior.[13,14] However, several additional elements of ideal adult learning, including reinforcement of learning, self-motivation, and opportunities for reflection and feedback, were missing from the intervention.[15,16]

Our results contrast with those of a recent study suggesting that the implementation of a delirium screening tool in combination with an educational program involving a didactic presentation and bedside demonstration of the screening tool led to improvement in knowledge among critical care nurses when compared to implementation of the screening tool alone.[7] One key difference between these 2 survey studies is that knowledge was tested immediately following the single intervention in the previous study, perhaps indicative of a transient increase, whereas our postsurvey was conducted at a time point weeks to months following the last interaction with the liaison.

This survey and analysis have several limitations. The survey was limited to a single academic medical center and involved a moderate sample size. Generalizability is potentially limited by the presence of a single psychiatrist serving as liaison and by the presence of a medical intensive care unit willing to welcome the liaison psychiatrist. It is possible that the apparent lack of change represents a form of type II error, suggesting that the study may have been underpowered to detect change. However, nonsignificant changes are present in opposite directions for different groups on the same items, arguing against this being a primary explanation. An additional limitation is that not all care providers who were sent a survey completed it, raising the possibility of responder bias, particularly for the internal medicine group, which had a lower response rate. Different individuals also may have responded to the presurveys and postsurveys, and change was therefore measured among groups rather than individuals. The use of psychiatry residents as a control may not have been ideal given that delirium is a component of psychiatry residency education. Further, as mentioned above, the time period during which the educational intervention was undertaken overlapped with the piloting of the Confusion Assessment Method tool and a linked nursing educational intervention in the same unit. Finally, given the numerous analyses performed, it is possible that the changes detected in 2 responses for the critical care nurses group may be a factor of multiple comparisons and not entirely valid. It is important to recognize as well that the survey study was not aimed at detecting change in pure knowledge, but rather in attitudes and beliefs. Although the lack of change in some specific evidence-based items suggests that knowledge was unaffected, this was not actually directly measured in the study.

Though this intervention was reported subjectively as being "very helpful" in terms of enhancing the overall care of patients and appeared to improve relations between medicine and psychiatry, thus fulfilling the goals of the liaison intervention, the presence of a psychiatry consultant rounding with the intensive care unit team once weekly for 9 months appeared to be insufficient to meaningfully affect the attitudes and beliefs of trainees and nurses regarding delirium. A larger study, involving matched surveys, ability to account for confounders such as introduction of a simultaneous screening tool intervention, and perhaps variable degrees of frequency and intensity of the intervention, would constitute the next step in better understanding the requirements for an appropriate educational intervention in a medical intensive care unit liaison context.

Nonetheless, this small pilot study suggests that robust and lasting changes in attitudes regarding delirium may require more intensive efforts that could include a longer intervention, greater frequency of rounding, or additional didactic teaching to fit even more strongly with the literature on adult learning theory and effective educational interventions. Specifically, this intervention could include supplementation with formal didactics, development of a formal list of related topics to cover each month, distribution of relevant articles in real-time, and follow-up with the teams the following day to determine the efficacy of interventions and to provide feedback. Such an intervention would also occur more frequently, ideally 3–4 times weekly, and would need to be ongoing for several years. Finally, given the frequent rotation of trainees through the intensive care unit, successful interventions may benefit from a "train-the-trainer" mindset and involve targeting of critical care attending physicians and nursing leadership to further embed educational objectives and effect a culture change from within.

Author affiliations: Harvard Medical School, Boston, Massachusetts (Drs Beach and Huffman); Department of Psychiatry, Massachusetts General Hospital, Boston (Drs Beach and Huffman); and the Department of Psychiatry and Neurobehavioral Sciences, University of Virginia School of Medicine, Charlottesville (Dr Chen).
Potential conflicts of interest: None reported.
Funding/support: None reported.

REFERENCES

1. McCusker J, Cole M, Abrahamowicz M, et al. Delirium predicts 12-month mortality. *Arch Intern Med*. 2002;162(4):457–463.
2. McCusker J, Cole MG, Dendukuri N, et al. Does delirium increase hospital stay? *J Am Geriatr Soc*. 2003;51(11):1539–1546.
3. McCusker J, Cole M, Dendukuri N, et al. Delirium in older medical inpatients and subsequent cognitive and functional status: a prospective study. *CMAJ*. 2001;165(5):575–583.
4. Fann JR. The epidemiology of delirium: a review of studies and methodological issues. *Semin Clin Neuropsychiatry*. 2000;5(2):64–74.
5. Wand AP. Evaluating the effectiveness of educational interventions to prevent delirium. *Australas J Ageing*. 2011;30(4):175–185.
6. Teodorczuk A, Mukaetova-Ladinska E, Corbett S, et al. Reconceptualizing models of delirium education: findings of a Grounded Theory study. *Int Psychogeriatr*. 2013;25(4):645–655.
7. Gesin G, Russell BB, Lin AP, et al. Impact of a delirium screening tool and multifaceted education on nurses' knowledge of delirium and ability to evaluate it correctly. *Am J Crit Care*. 2012;21(1):e1–e11.
8. Ely EW, Margolin R, Francis J, et al. Evaluation of delirium in critically ill patients: validation of the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU). *Crit Care Med*. 2001;29(7):1370–1379.
9. Ely EW, Stephens RK, Jackson JC, et al. Current opinions regarding the importance, diagnosis, and management of delirium in the intensive care unit: a survey of 912 healthcare professionals. *Crit Care Med*. 2004;32(1):106–112.
10. Davis D, MacLullich A. Understanding barriers to delirium care: a multicentre survey of knowledge and attitudes amongst UK junior doctors. *Age Ageing*. 2009;38(5):559–563.
11. Devlin JW, Fong JJ, Howard EP, et al. Assessment of delirium in the intensive care unit: nursing practices and perceptions. *Am J Crit Care*. 2008;17(6):555–565.
12. Sandberg O, Gustafson Y, Brännström B, et al. Clinical profile of delirium in older patients. *J Am Geriatr Soc*. 1999;47(11):1300–1306.
13. Thomson O'Brien MA, Freemantle N, Oxman AD, et al. Continuing education meetings and workshops: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev*. 2001;(2):CD003030.
14. Coomarasamy A, Khan KS. What is the evidence that postgraduate teaching in evidence based medicine changes anything? a systematic review. *BMJ*. 2004;329(7473):1017.
15. Khan KS, Coomarasamy A. A hierarchy of effective teaching and learning to acquire competence in evidenced-based medicine. *BMC Med Educ*. 2006;6(1):59.
16. Brigley S, Young Y, Littlejohns P, et al. Continuing education for medical professionals: a reflective model. *Postgrad Med J*. 1997;73(855):23–26.

Prim Care Companion CNS Disord
2013;15(3):doi:10.4088/PCC.12m01499