

# Diagnosis and management of delirium in critical care patients: a French national survey

## Diagnostic et prise en charge du delirium auprès des patients de réanimation : enquête en France

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**Abstract Purpose:** Delirium has severe consequences on hospital mortality, length of stay, costs, and long-term cognitive function. No study has ever investigated French intensivists' attitude, a basis for management improvement. We conducted a national survey to describe the attitudes of French intensivists toward delirium screening and management.

**Methods:** A questionnaire was sent by e-mail to the intensivists of the French intensive care society. Up to three e-mails have been sent to nonrespondents during a 75-day period.

**Results:** The response rate was 25.7% (n = 283). Twenty-eight respondents (10%) reported screening for delirium with a validated screening tool. Among respondents, 60% estimated that delirium occurs in less than 25% of intubated patients. Antipsychotics, benzodiazepines, and hydroxyzine were prescribed as first-line therapy in 77%, 53%, and 36% of the cases, respectively. Mobilization of intubated patients occurred less frequently than estimated as possible. Physicians who screened for delirium had a higher estimation of its severity and occurrence than physicians who did not.

**Conclusions:** Respondents among French intensivists rarely screen for delirium with a dedicated tool. Treatments reported as used in that setting are often different from the guidelines.

**Keywords** Delirium · Survey · Screening · Critical care

**Résumé Rationnel :** La survenue d'un épisode de delirium en réanimation a des conséquences sur la mortalité, la durée de séjour, les coûts et les performances cognitives à long terme. Aucune étude n'a rapporté les attitudes des réanimateurs français face à ce problème. Nous avons mené une enquête nationale interrogeant les praticiens sur leurs attitudes diagnostique et thérapeutique.

**Méthodes :** Un questionnaire envoyé par courriel aux médecins réanimateurs membres de la Société de réanimation de langue française (SRLF). Après le premier envoi, deux messages de rappel étaient envoyés aux non-répondeurs sur une période de 75 jours.

**Résultats :** Le taux de réponse était de 25,7 % (n = 283). Seuls 10 % (n = 28) des répondeurs déclaraient dépister les delirium avec un outil validé. Ainsi, 60 % des répondeurs estimaient que le delirium survient chez moins de 25% des patients. Les neuroleptiques, les benzodiazépines et l'hydroxyzine étaient les traitements de première ligne utilisés respectivement selon 77, 55 et 36 % des répondeurs. La mobilisation des patients intubés survenait concrètement moins souvent qu'estimé possible. La fréquence et la sévérité du delirium étaient estimées comme plus élevées chez les réanimateurs qui le dépistaient.

**Conclusions :** Les répondeurs parmi les réanimateurs français dépistent rarement le delirium avec un outil validé. La prise en charge thérapeutique diverge souvent des recommandations.

**Mots clés** Delirium · Enquête · Dépistage · Réanimation

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## Introduction

Delirium is characterized by an acute brain dysfunction, whose incidence in critical care patients is reported to be as high as 82% in ventilated patients [1]. Delirium in the intensive care unit (ICU) is associated with a decreased probability of survival [2], depending on the duration of the episode [3], and it increased the length of stay in the intensive care

unit, in the hospital [4], hospital costs [5], incidence of hospital-acquired infections [6], and the risk of developing long-term cognitive impairment [7]. Some of the identified risk factors depend on the underlying conditions of the patients and cannot be modified [8], while others, like the amount of sedation, can be controlled [9].

The use of specific tools to screen for delirium in the ICU is recommended. Some screening tools have been validated in the ICU setting [10]: the confusion assessment method in ICU (CAM-ICU) [1], the Intensive Care Delirium Screening Checklist (ICDSC) [11], the Neelon and Champagne Score (Neecham) [12], the Delirium Detection Score (DDS) [13], and the cognitive test for delirium [14]. Furthermore, it has been proved that delirium is under-recognized in daily care in the absence of a dedicated screening tool [15].

Haloperidol has been recommended as the first-line pharmacological therapy to treat delirium by the Society of Critical Care Medicine; however, this recommendation seems to be supported by very few evidence-based data [16]. Atypical antipsychotics seem to be more effective and have fewer side effects than haloperidol [17–19]. However, these results are debatable, and were not confirmed by the recent MIND trial, built to demonstrate the feasibility of a randomized controlled trial. In this study, which included mechanically ventilated patients, three treatment regimens were compared: ziprasidone, haloperidol, and placebo. The main outcome was the duration of life span of the patient without delirium or coma, which was not significantly different between the three treatment groups [20]. On the other hand, nonpharmacological management, such as early mobilization, is effective to reduce the duration of delirium in ICU [21], although methodological pitfalls might have biased these results [22]. Recent foreign surveys have reported attitudes of intensivists toward delirium in different countries which represents a first step toward a potential implementation of educational courses [23–28]. Since no such survey has been done in France, we conducted a national investigation.

## Methods

We conducted a Medline search of the literature on the following: “sedation,” “delirium,” “mechanical ventilation,” and “ICU” to identify the most important aspects in the field that could facilitate the development of the items in the questionnaire. A 5-part questionnaire was established, which evaluated the respondents and their related ICU profile, delirium assessment, and physicians’ knowledge, sedation practice, mobilization, and occupation of patients practice as well as pharmacological treatments for delirium.

All the physicians of the French intensive care society (SRLF) whose e-mail was available on the web-based directory were screened for the survey. We did not solicit

paediatric intensivists, as well as physicians in specific dedicated intensive care units (neurologic, respiratory or hepatologic ICU). The questionnaire was sent by e-mail in a Word<sup>®</sup> (Microsoft France, Issy-les-Moulineaux, France) form with boxes to mark their answers against the options. Although respondents of this study had the choice between several responses for each question, they preexisted and were all close ended. The questionnaire was sent back to the dedicated e-mail after the responses were filled. If a physician did not send the questionnaire, two other e-mails were sent during the 75-day period (January to March 2010) as reminder. Although names could sometimes be identified through e-mails, data were anonymous on the data set. Comparisons of percentages were made using Chi-square tests.

## Results

A total of 1113 physicians were eligible for this study. Thirteen e-mails were sent incorrectly and did not reach the corresponding physician. A total of 283 surveys were completed, leading to a response rate of 25.7%.

The demographics are detailed in Table 1. A vast majority of respondents were men, two-third were aged more than 35 years. Nearly 60% worked in nonacademic ICU, and roughly half of them worked in medico-surgical ICUs. Two-thirds of the units had 10 to 20 beds, 72% of which had an access to natural light.

**Table 1** Demographics of respondents

	n (%)	
Gender (f/m)	57/226	
Age (years)	<35	103 (37)
	35-45	97 (34)
	45-55	57 (20)
	>55	25 (9)
Years of practice	1-5	86 (30)
	5-10	73 (26)
	>10	123 (44)
Pratice setting	Academic	115 (41)
	Non-academic	164 (59)
Type of ICU	Medical	97 (35)
	Surgical	36 (13)
	Mixed	143 (52)
Number of ICU beds	<10	47 (17)
	10-20	189 (67)
	>20	44 (16)
Natural light in rooms	202 (72)	
Two patients per room	59 (21)	

Fifty respondents (17.6%) reported to screen patients for delirium; 28 among them used a validated screening tool (Table 2). When asked about their estimation of the number of patients experiencing delirium, 60% (n = 168) estimated that delirium occurs in less than 25% of intubated patients and 4% (n = 12) estimated that it occurs in more than 50% of intubated patients. These estimations were 82% (n = 225) and 3% (n = 9) when asked about nonintubated patients, respectively.

Seventy percent (n = 197) of the respondents agreed with the fact that delirium increases hospital mortality, 97% (n = 275) agreed that it increases hospital costs, 46% (n = 130) considered that delirium may have long-term consequences on the cognitive functions, 90% (n = 262) estimated that delirium may contribute to respiratory weaning difficulties, and 65% (n = 183) declared that it increases the number of hospital-acquired infections (Table 3).

	n (%)
No screening	233 (82.4)
Screening for delirium	50 (17.6)
Among	
ICDSC	3 (1)
CAM ICU	17 (6)
Delirium Detection Score	6 (2.1)
Cognitive Test for Delirium	2 (0.7)
Neelon and Champagne score	0
Physicians' clinical assessment	22 (7.8)

CAM-ICU = confusion assessment method in ICU, ICDSC = Intensive Care Delirium Screening Checklist.

	No (%)	Yes (%)	Do not know (%)
Increased hospital mortality	39 (14)	197 (70)	47 (16)
Increased hospital costs	1 (0,5)	275 (97)	7 (2,5)
Long-term cognitive impairment	60 (21)	130 (46)	93 (33)
Ventilation weaning difficulties	9 (3)	262 (93)	12 (4)
Modifications of the incidence of hospital acquired infections	26 (9)	183 (65)	74 (26)

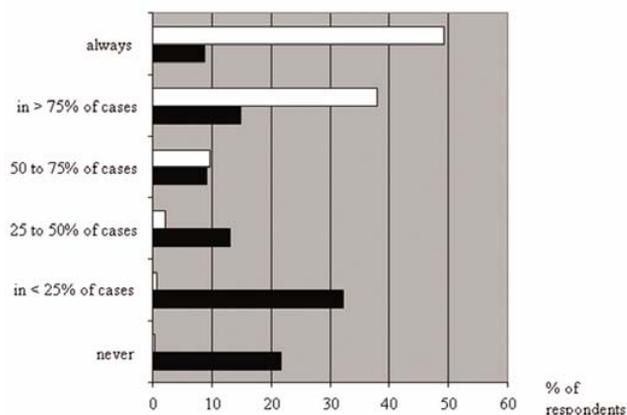
When asked about the risk factors and diagnosis, 84% (n = 238) of the respondents thought that delirium is underdiagnosed, 73% (n = 206) thought that delirium is not an unavoidable condition, and 89% (n = 253) that preventive treatment is possible; 80% (n = 224) thought that a patient not exhibiting psychomotor agitation is possibly experiencing delirium, 86% (n = 243) thought that agitation is an usual pattern of delirium. About 61% (n = 173) thought that agitation scores are not appropriate to diagnose delirium. Roughly 81% (n = 229) thought that sedation drugs can influence the transition to delirium and 78% (n = 219) thought that the sedation amount has significant consequences. Regarding sleep, 83% (n = 234) thought that the sleep quality is a factor of importance in the transition to delirium, and 65% (n = 184) thought that the severity of the condition of the patient influences the occurrence of delirium (Table 4).

Regarding sedation, 77% (n = 218) of the respondents confirmed that the sedation level was monitored several times a day. Ramsay (48%), Richmond Agitation Sedation Scale (RASS, 37%), Sedation Agitation Score (SAS, 5%), Motor Activity Assessment Scale (MAAS, 0.5%), Adaptation to the Intensive Care Environment (ATICE, 6.5%), and clinical experience in 3% of respondents were the tests used to calculate the scores. A preexisting sedation protocol was used by 46% (n = 129) of the respondents, based either on a sedation target (80%) or on the daily interruption of sedative infusion (20%).

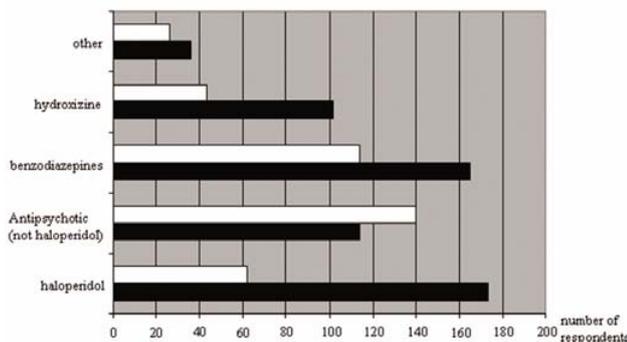
	No (%)	Yes (%)	Do not know (%)
Delirium is underdiagnosed	27 (10)	238 (84)	18 (6)
Delirium is an unavoidable evolution in ICU	206 (73)	45 (16)	30 (10)
Preventive therapies exist	5 (2)	253 (89)	25 (9)
A patient without agitation can experience delirium	36 (13)	224 (80)	21 (7)
Agitation is a usual pattern of delirium	32 (12)	243 (86)	6 (2)
Agitation scores are appropriate to diagnose delirium	171 (61)	30 (11)	78 (28)
The sedative drugs can influence the occurrence of delirium	18 (7)	229 (81)	34 (12)
The sedative amount can influence the occurrence of delirium	18 (7)	219 (78)	44 (15)
Sleep quality can influence the occurrence of delirium	17 (6)	234 (83)	31 (11)

Regarding mobilization of the patients, the intensivists were questioned about the frequency at which a patient effectively sat in an armchair as soon as he was able to do so. More than 87% of the respondents declared that non-intubated patients sat whenever possible in more than 75% of the cases, whereas the majority (53.8%) answered that intubated patients sat in less than 25% of cases (Fig. 1). Nonintubated patients were also more likely to wear their glasses and their auditory-assisting device than intubated patients. Both intubated and nonintubated patients (data not shown) were able to see the time, watch television, and receive visitors.

First-line drugs of delirium were antipsychotics (77%,  $n = 217$ ), including haloperidol ( $n = 173$ ), benzodiazepines (53%,  $n = 150$ ), and hydroxyzine (36%,  $n = 102$ ). Antipsychotics were still the most employed drugs for second-line treatment (haloperidol less frequently), with benzodiazepines and hydroxyzine (Fig. 2). The drugs were prescribed



**Fig. 1** Estimation by the respondents of percentage of patients raising out of their bed according to their ventilation status. Black bars represent intubated patients, and white bars represent nonintubated patients



**Fig. 2** Treatments of delirium as assessed by respondents. Black bars represent first-line treatments, and white bars represent second line treatments (Several answers were possible)

for the following reasons: proven efficacy in 15.3% ( $n = 41$ ), proven efficacy and safety in 4.1% ( $n = 11$ ), personal background in 42.2% ( $n = 113$ ), and department routine use in 38.4% ( $n = 103$ ) of the cases.

These results were independent of the following variables: age and gender of the respondent, type of the ICU, and the academic status of their institution. Nevertheless, respondents who are used to screen for delirium were more likely to understand that delirium is responsible for long-term cognitive impairment ( $p = 0.0002$ ). Similarly, estimation of the frequency of delirium occurrence in intubated patients was higher ( $p = 0.048$ ). These respondents were also more likely to use a preexisting sedation protocol ( $p = 0.04$ ) and monitor sedation depth ( $p = 0.006$ ). Moreover, the duration of visiting in their ICU were significantly longer, irrespective of the patient, ventilatory status ( $p = 0.0006$ ).

## Discussion

Here we report the first French national survey on delirium screening and its management. Although limited by the relatively small percentage of respondents, we found that respondents underestimated the frequency of delirium as compared to the available data and rarely screened it with dedicated tools. The most reported treatment was antipsychotics and mainly haloperidol, while benzodiazepines and hydroxyzine were often used. According to this survey, it seemed that mechanically ventilated patients were less likely to benefit from early mobilization, as compared to nonventilated patients.

In contrast to the fact that respondents of this study widely recognized delirium as a serious condition associated with an increase of mortality, hospital costs, long-term consequences on cognitive functions and that preventive therapies exist, less than 20% of them screened for delirium with a validated dedicated tool.

Several delirium forms exist for motor aspects, the hypoactive and mixed forms being the most frequent [29]. A majority of respondents thought that psychomotor agitation is a key-pattern despite the fact that they agreed that a patient without agitation may experience delirium. Furthermore, only 61% of them knew that agitation screening scores are not appropriate to diagnose delirium. Nevertheless, most of the respondents were aware that sedation can have an impact in the occurrence of delirium and 77% monitored sedation several times a day, with a dedicated score most of the time. Of particular note is the fact that respondents who advocated screening for delirium were more likely to follow a pre-existing sedation protocol and monitor the sedation. They also had a higher estimation of the frequency of delirium occurrence and of the severity of its consequences.

Regarding the non-pharmacological management of delirium, we observed that mechanically ventilated patients were not mobilized as often as possible. Sensorial aids such as visual and auditory assist devices were not provided as often as possible. It has been recently described that early mobilization could have beneficial effects on the duration of delirium [21,30]. Furthermore, there is growing evidence that early physical activity and occupation is safe [31]. Once again, these findings contrasted with the wide assessment of respondents who stated that therapies to prevent delirium were available.

This survey indicates that the respondents did not screen for delirium as often as predicted, based on their concerns. Furthermore, they largely underestimated the frequency of delirium in comparison to the available data [1]. These results are consistent with other recently published foreign surveys. Among the advocated reasons, we noticed the lack of evidence-based data regarding the relevancy of antipsychotics [32], as well as the lack of information regarding the screening tools and the misinterpretation of neurological symptoms attributed to a baseline disease rather than delirium [33]. Several barriers in implementing delirium screening programs exist including lack of buy-in, time, confidence in performing and interpreting the screening tests, as well as performance feedback [34].

Regarding pharmacological intervention, hydroxyzine seemed frequently prescribed in case of delirium, though anxiety and general anaesthesia premedication are its only two indications validated by the French health authorities. Till date, only one study reports its use for delirium in few patients, without describing its efficacy [35]. Thus, in the absence of evidence, we think that further studies focusing on hydroxyzine efficacy in that setting and its potential drawbacks are warranted.

The wide use of benzodiazepines is also a matter of concern. These molecules can induce delirium and are classically contraindicated in this setting [16]. The most used antipsychotic drug was haloperidol. However, although mostly assessed outside the ICU, there is reliable evidence demonstrating that atypical antipsychotics have the same efficacy but cause less side effects than haloperidol [17–19].

In comparison to national surveys in other countries, we found that French ICU respondents screen less often for delirium than Brazilian [23], Dutch [24], British [25], and American [26] ICU physicians (Table 5). They use benzodiazepines more frequently and atypical antipsychotics less often than American or Brazilian physicians. Although not specified, none of these studies reported the use of hydroxyzine. Importantly and by contrast to other surveys in which the use of hydroxyzine is not reported, respondents of this study believed that this drug may be efficient in the treatment of delirium despite the absence of evidence.

**Table 5** Comparison of delirium screening rates among different national survey

Canada 2006 [27]	3.7%
Australia–New Zeland 2008 [26]	9%
France 2010 (this study)	9.9%
Brazil 2009 [22]	13%
United Kingdom 2010 [24]	14%
United States 2008 [25]	19.8%
Netherlands 2010 [23]	25%

Our study has several limitations. We sent our questionnaires to a subgroup of French ICU physicians belonging to the SRLF, which could have lead to a bias. The small number of respondents might have biased our results and induced discrepancies between the reported and the actual practice. The low rate of answers might be explained by the employed methodology and the short period of time scheduled to collect the data. Nevertheless, the number of respondents and response rate were comparable with other surveys [28], remaining in the range reported by other investigators who used Internet-based survey. Two out of the six national surveys used an ICU-based survey [23, 26], whereas the others including our study used a practitioner-based survey, which could have biased the comparison between them. Although we did report the use of sedation protocols, we did not ask about the employed drugs and sedation goals. A huge heterogeneity in these variables among respondents may have significantly influenced our findings. Furthermore, as in other previously reported national surveys, we did not include nurses [23, 28].

## Conclusion

We reported a French national survey on delirium screening and its management for the first time ever according to our knowledge. Even though French ICU physicians participating in our survey are aware of the possible severity of delirium, they rarely use a dedicated and validated screening tool. Early patient mobilization is less frequent than declared as possible, mainly in mechanically ventilated patients. Treatments include antipsychotics, benzodiazepines, and hydroxyzine.

**Conflict of interest :** none.

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