Delirium diagnosis, screening and management

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**Purpose of review**
Our review focuses on recent developments across many settings regarding the diagnosis, screening and management of delirium, so as to inform these aspects in the context of palliative and supportive care.

**Recent findings**
Delirium diagnostic criteria have been updated in the long-awaited Diagnostic Statistical Manual of Mental Disorders, fifth edition. Studies suggest that poor recognition of delirium relates to its clinical characteristics, inadequate interprofessional communication and lack of systematic screening. Validation studies are published for cognitive and observational tools to screen for delirium. Formal guidelines for delirium screening and management have been rigorously developed for intensive care, and may serve as a model for other settings. Given that palliative sedation is often required for the management of refractory delirium at the end of life, a version of the Richmond Agitation-Sedation Scale, modified for palliative care, has undergone preliminary validation.

**Summary**
Although formal systematic delirium screening with brief but sensitive tools is strongly advocated for patients in palliative and supportive care, it requires critical evaluation in terms of clinical outcomes, including patient comfort. Randomized controlled trials are needed to inform the development of guidelines for the management of delirium in this setting.

**Keywords**
assessment, delirium, management, palliative care, screening

**INTRODUCTION**
Delirium is a complex neurocognitive manifestation of an underlying medical abnormality such as organ failure, infection or drug effects. It occurs frequently in palliative and supportive care, particularly in patients with advanced cancer, wherein most will experience delirium in the terminal phase of the illness \cite{1}. Both advanced age and dementia are recognized risks factors for delirium \cite{2}, and projected demographic changes over the next two decades suggest that both will increase dramatically \cite{3,4}. Cancer is predominantly a disease of the elderly and an increase in cancer-associated deaths is also expected \cite{5}. The cognitive deficits arising in relation to cancer, its treatment, aging, frailty and their pathophysiological intersection are well highlighted \cite{6,7}. Given the increasing exposure of practitioners in palliative and supportive care to delirium in the context of a broad spectrum of life-threatening diseases and care settings, their approach to the diagnosis, screening and management of delirium warrants careful consideration. Our review addresses predominantly recent publications and advances in relation to these specific issues. The scope of this review does not include the pivotal role of family support and education to both family and carers in the management strategy.

**MEETING THE STANDARD DIAGNOSTIC CRITERIA FOR DELIRIUM**
The diagnosis of delirium is based on clinical assessment and is guided by standard criteria \cite{8,9}. The delirium diagnostic criteria of the International Classification of Diseases, tenth edition (ICD-10) and the recently published Diagnostic Statistical...
Both the recognition and documentation of delirium is poor across most settings of care, including those wherein palliative or supportive care is likely to be delivered.

Validated, low-burden assessment tools exist to assist practitioners in screening and diagnosing delirium.

Screening needs to be critically evaluated in relation to outcomes such as the benefits and burdens of clinical interventions, including prevention, quality of life and cost.

Randomized control trials of therapeutic interventions are needed to inform the development of guidelines for the management of delirium in palliative and supportive care settings.

Preliminary validation of an observational tool (RASS-PAL) to monitor palliative sedation, most commonly used in the context of refractory agitated delirium, shows favourable characteristics.

KEY POINTS

- Both the recognition and documentation of delirium is poor across most settings of care, including those wherein palliative or supportive care is likely to be delivered.
- Validated, low-burden assessment tools exist to assist practitioners in screening and diagnosing delirium.
- Screening needs to be critically evaluated in relation to outcomes such as the benefits and burdens of clinical interventions, including prevention, quality of life and cost.
- Randomized control trials of therapeutic interventions are needed to inform the development of guidelines for the management of delirium in palliative and supportive care settings.
- Preliminary validation of an observational tool (RASS-PAL) to monitor palliative sedation, most commonly used in the context of refractory agitated delirium, shows favourable characteristics.

Manual of Mental Disorders, fifth edition (DSM-5) represent definitive standards in terms of diagnosis [10*,11], based on the best available evidence and maximal expert consensus at the time of their publication. DSM-5 diagnostic criteria for delirium are as follows [10*]:

1. A disturbance in attention (i.e. reduced ability to direct, focus, sustain, and shift attention) and awareness (reduced orientation to the environment).
2. The disturbance develops over a short period of time (usually hours to a few days), represents a change from baseline attention and awareness and tends to fluctuate in severity during the course of a day.
3. An additional disturbance in cognition (e.g. memory deficit, disorientation, language, visuospatial ability or perception).
4. The disturbances in Criteria 1 and 2 are not better explained by another preexisting, established or evolving neurocognitive disorder and do not occur in the context of a severely reduced level of arousal, such as coma.
5. There is evidence from the history, physical examination or laboratory findings that the disturbance is a direct physiological consequence of another medical condition, substance intoxication or withdrawal (i.e. because of a drug of abuse or to a medication), or exposure to a toxin, or is because of multiple etiologies.

Published comparative study data regarding ICD-10 and DSM-5 are limited, given that the latter was only published in mid-2013. However, earlier studies comparing the delirium diagnostic criteria of DSM-IV and ICD-10 suggested that the DSM criteria were more inclusive [12]. In research studies, use of either ICD-10 or DSM-5 criteria is recommended as the gold standard diagnostic criteria [9*]. To date, most studies have used earlier DSM versions, as they have been easier to operationalize and standard user-friendly tools have been developed to meet this need, such as the Confusion Assessment Method (CAM) [13], the most widely used tool to diagnostically screen for delirium in both clinical practice and research studies.

Subsyndromal delirium (SSD) is a more controversial clinical entity than full syndrome delirium [14*]. Although SSD does not have universally agreed and clearly defined descriptive diagnostic criteria, it is listed in the neurocognitive disorder section of DSM-5 as ‘attenuated delirium syndrome’ [10*]. In their systematic review of SSD in older people, Cole et al. [15*] defined SSD as the presence of one or more symptoms of delirium, not meeting criteria for delirium and not progressing to delirium. In the 12 studies meeting their inclusion criteria, there was a combined SSD prevalence of 23% (95% confidence interval 9–42%). It is unclear whether SSD should be diagnosed categorically, as defined by Cole et al., or viewed from a broader dimensional perspective and defined on the basis of a subdiagnostic score on a delirium diagnostic tool, such as the Delirium Rating Scale-Revised-98 (DRS-R-98) [16]. In a point prevalence study of delirium in a single acute care hospital, Ryan et al. [17] found an SSD prevalence of 10%, based on a DRS-R-98 subdiagnostic score range of 7–11. Further studies and consensus are needed to better define SSD.

Franco et al. [18] conducted exploratory and confirmatory factor analyses on a pooled 7-country, 14-study dataset of 445 nondemented patients with either full syndrome or subsyndromal delirium, based on DRS-R-98 scores. The study confirmed a core phenotype of delirium, based on three core domains: circadian disturbances (sleep–wake cycle and motor behavior changes); attentional and other cognitive impairments; and higher-level thinking (language, thought processing) deficits. The refinement and development of future versions of standard diagnostic criteria hinges on studies such as this and on more rigorous characterization of the nature of delirium and its core domains.

ISSUES REGARDING DELIRIUM RECOGNITION IN CLINICAL PRACTICE

Recent studies have detected delirium with a prevalence in the range of 20–27% in acute care [17,19],...
and a systematic review reported a documented range of 7–20% in emergency care [20\textsuperscript{\textcircled{a}}]. Although delirium is a known reason for seeking emergency medical care [21], the level of recognition in this setting is strikingly poor [20\textsuperscript{\textcircled{a}}]. Much higher prevalence rates have been reported in palliative care settings, yet the level of recognition and documentation here too is remarkably poor [22\textsuperscript{\textcircled{a}}].

Recognition may clearly be difficult with some of the specific syndromal features of delirium, such as their tendency to overlap or comorbidly exist with depression and dementia [14\textsuperscript{\textcircled{a}},23]; fluctuation in levels of symptom presentation; and the presence of hypoactivity [24\textsuperscript{\textcircled{a}}]. Underrecognition may also relate to many professional, site of care and institutional policy issues, such as a lack of knowledge regarding cognitive assessment [25\textsuperscript{\textcircled{a}},26\textsuperscript{\textcircled{a}},27,28]; privacy and time constraints in the emergency department [27]; under appreciation of nursing observations [26\textsuperscript{\textcircled{a}}]; failure to integrate the assessment of delirious symptoms within the care delivery process and a conventional care pathway that is supported by guidelines [26\textsuperscript{\textcircled{a}}]; and failure to incorporate a screening tool [20\textsuperscript{\textcircled{a}},25\textsuperscript{\textcircled{a}},26\textsuperscript{\textcircled{a}},27,29\textsuperscript{\textcircled{a}}].

Collectively, delirium recognition problems require solutions at many levels, as graphically summarized in Fig. 1. At the carer level, there is a need for better communication within the interprofessional team and between the interprofessional team and family caregivers, so that valuable observations and information are appropriately conveyed [25\textsuperscript{\textcircled{a}},30,31,32\textsuperscript{\textcircled{a}}]. At an institutional level, policies, protocols and guidelines regarding delirium detection need to be developed and implemented, and supported by effective educational initiatives [32\textsuperscript{\textcircled{a}},33,34\textsuperscript{\textcircled{a}}]. The evidence-based guidelines that were developed by physicians and nurses for the management (including recognition and diagnosis) of pain, agitation and delirium in intensive care are a good example of how to address this need [35\textsuperscript{\textcircled{a}},36\textsuperscript{\textcircled{a}}]. The implementation of guidelines on delirium recognition and screening is facilitated by many factors other than education and includes leadership; promotion as a quality improvement and safety culture initiative; and electronic health record documentation and prompting [37]. In terms of delirium recognition and screening, nurses occupy a uniquely strategic position in inpatient care; their 24-h level of patient contact affords an ideal opportunity to observe and record the fluctuating feature of delirium symptoms [33].

**POTENTIAL DELIRIUM SCREENING STRATEGIES AND TOOLS**

The ideal screening tool should have a high level of sensitivity, be brief and easy to use with minimal training [9\textsuperscript{\textcircled{a}}]. In addition to minimizing burden on a vulnerable group of patients, the approach to delirium screening in supportive and palliative care should factor in the contextual aspects such as the specific location or point of care, or status in terms of disease trajectory [9\textsuperscript{\textcircled{a}},24\textsuperscript{\textcircled{a}}]. Cognitive screening tools such as the Short Orientation Memory Concentration Test [38] are likely to be of most use on a more intermittent basis, particularly in relation transitions in the point of care such as emergency department attendance, hospice or acute care admission or outpatient encounters. Meanwhile, purely observational tools such as the Nursing Delirium Screening Scale (Nu-DESC) [39] are better adapted to the continuous surveillance mode of screening that might be required during inpatient care. Some tools have more of a hybrid nature, such as the CAM or the Memorial Delirium Assessment Scale (MDAS) [40], and include observational and cognitive assessment components. Using item response theory to improve screening brevity, a preliminary study by Yang et al. identified a parsimonious item bank of indicators that align with the major CAM features [41]. Although the MDAS was developed as a severity rating tool, it has also been used but not validated for delirium screening in palliative care [42].

Recent validation and other delirium screening tool studies are summarized in Table 1 [43\textsuperscript{\textcircled{a}},44,45–49,50\textsuperscript{\textcircled{a}},51,52,53\textsuperscript{\textcircled{a}}]. Foremost among these is a systematic review of the CAM [43\textsuperscript{\textcircled{a}}]. It concluded with the recommendation that the CAM should not replace clinical judgment in the diagnosis of delirium. Although the CAM has been validated in a palliative care population, its sensitivity is very much dependent on user training [54]. Combined
| Screening tool | Reference | Study sample | Administration | Sensitivity | Specificity | Comments |
|---------------|-----------|--------------|----------------|-------------|-------------|----------|
| CAM           | [43]      | Mixed medical and postsurgical (n = 2442) | Mixed observational and direct patient questioning | 82% (Pooled) (95% CI: 69–91%) | 99% (Pooled) | Used frequently in research. Sensitivity dependent on rater training (95% CI: 87–100%) |
| Brief CAM (bCAM) and DTS combined | [44] | Emergency department, aged ≥65 years | Mixed observational and direct patient questioning | 78–84% (Combination) | 95.8–97.2% (Combination) | DTS alone appears to have a high level of sensitivity at 98% |
| FAM-CAM       | [45]      | Caregiver and elder (with dementia) dyads (n = 52) | Family observations used to score FAM-CAM and compared with interviewer CAM | 88% (95% CI: 47–99%) (using CAM as reference) | 98% (95% CI: 86–100%) (using CAM as reference) | High level of convergent validity of FAM-CAM and CAM: kappa = 0.85 |
| Single Question in Delirium | [46] | Friend or relatives of oncology inpatients (n = 21) | “Do you think [name] has been more confused lately?” | 80% (95% CI: 28.3–99.49%) | 71% (95% CI: 41.9–91.61%) | Very brief question. Good sensitivity using psychiatric diagnosis as reference |
| Nu-DESC       | [47]      | Post cardiac surgery (n = 142) | Observational, five items. Swedish version | 71.8% | 81.3% | Lower sensitivity for detection of hypoactive delirium |
| Nu-DESC       | [48]      | Postsurgical, aged ≥70 years (n = 196) | Observational, five items | 32% (Threshold score ≥2) | 29% (Threshold score ≥2) | The original cutoff score of ≥2 for positive screening performed poorly here |
| Nu-DESC       | [49]      | Last week of life in a home hospice programme (n = 78) | Observational, five items | 80% (Threshold score ≥1) | 72% (Threshold score ≥1) | Diagnostic cutoff of >7/30 on Memorial Delirium Assessment Scale |
|               |           |              |                | 63% (Nurse) | 67% (Nurse) |        |
|               |           |              |                | 35% (Caregiver evening) | 80% (Caregiver evening) |        |
|               |           |              |                | 21% (Caregiver night) | 95% (Caregiver night) |        |
Table 1 (Continued)

| Screening tool | Reference | Study sample | Administration | Sensitivity | Specificity | Comments |
|----------------|-----------|--------------|----------------|-------------|-------------|----------|
| 4AT            | [50*]     | Elderly medical and postsurgical (n = 236), aged ≥70 years | Part observational. Has orientation questions, and months of the year backwards as a test of attention | 89.7%       | 84.1%       | Allows assessment of ‘untestable’ patients (drowsiness). Brief (<2 min), no special training required. Ideal for intermittent administration for diagnosis) |
| Months of the year backwards | [51*] | Mixed general hospital (n = 265) | Direct patient questioning | 83.3% | 90.8% | Very brief. Needs further validation |
| Delirium Observation Screening Scale | [52] | Hospital Palliative Care Unit (n = 48) | Observational, 13 items | 81.8% | 96.1% | Brief, low burden Requires verbally active patients |
| Observational Scale of Level of Arousal | [53*] | Acute hip fracture (n = 30). Exploratory study | Observational, four domains with 24 different descriptors | 87% | 81% | Verbal response is not required. Needs further validation |

bCAM, brief Confusion Assessment Method; CAM, Confusion Assessment method; CI, confidence interval; DTS, Delirium Triage Screen; FAM-CAM, family Confusion Assessment method; Nu-DESC, Nursing Delirium Screening Scale.

PHARMACOLOGICAL MANAGEMENT OF DELIRIUM WITH ANTIPSYCHOTICS

There remains a lack of good randomized controlled trial (RCT) evidence for the optimal treatment of delirium in palliative care patients. Furthermore, limited up-to-date clinical care guidelines on the management of delirium are currently available in this patient population. Consequently, management decisions in the palliative care setting are largely guided by expert opinion [62]. A survey of gerontologists and internal medicine specialists residing in Europe demonstrated an ongoing lack of consensus as to the management of both hyperactive and hypoactive delirium [63].

The use of the bCAM, a brief modified version, along with the Delirium Triage Scale (DTS) in older emergency department patients had an acceptable screening sensitivity range of 78–84% [44]. Interestingly, the DTS, which combines a single test of attention (to spell ‘lunch’ backwards) and a consciousness score from the Richmond Agitation-Sedation Scale (RASS) [55], had a very high sensitivity at 98% for both physician and research assistant assessors. In terms of informant input, the Family version of the CAM (FAM-CAM) had a sensitivity of 88% in relation to the CAM as a diagnostic reference [45], whereas the Single Question in Delirium, the briefest of all tools, had moderately good sensitivity at 80% in a single study [46]. The original Nu-DESC validation study in mixed medical and hemato-oncology patients had a sensitivity of 85.7%, but more recent studies in postsurgical patients [47,48], and a study using caregiver ratings in home hospice care [49], all gave poorer results. Newer tools with promise but requiring further testing include the 4AT [50*], Months Of The Year Backwards [51*], Delirium Observational Screening Scale [52], and the Observational Scale of Level of Arousal [53*], all giving promise results. Newer tools with promise but requiring further testing include the 4AT [50*], Months Of The Year Backwards [51*], Delirium Observational Screening Scale [52], and the Observational Scale of Level of Arousal [53*].

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Despite demonstrable delirium prevention benefits in many other settings [59], a single evaluation study in palliative care with substantive methodological limitations showed no benefit [60]. Studies are needed to rigorously evaluate the benefits and potential harms of screening in relation to multiple outcomes such as medical intervention requirements, preventive strategies, delirium reversibility, care needs and economic burden [24].
antipsychotic medications [63*]. Haloperidol was the most frequently used antipsychotic for situations in which respondents used pharmacological approaches [63*]. A pharmacovigilance study of haloperidol in 119 hospice/palliative care patients with delirium reported an average haloperidol dose of 2.1 mg every 24 h in a mostly elderly population with a poor performance status [64]. Over one-third of patients had a reduction in delirium as measured by the Common Toxicity Criteria for Adverse Events (CTCAE) [65] delirium scale after 48 h of treatment. After 10 days of treatment, somnolence was reported in 11 patients and urinary retention in six patients.

A recently published prospective double-blind RCT compared haloperidol with quetiapine in the management of multifactorial delirium in 52 medically ill hospital inpatients, aged 30–75 years (mean age 56.8 years and 67% male) in Thailand [66*]. Both antipsychotics were administered with a flexible oral dose scheduled at bedtime and then every 2–3 h as needed for agitation, up to a set maximum dose per 24 h. Benzodiazepines and other antipsychotic medications were not allowed during the study period and there was no placebo arm. Thirteen of 24 (54.2%) patients completed 7 days of treatment with quetiapine as compared with 22 of 28 (78.6%) patients who received haloperidol. Results were analyzed on an intention-to-treat basis. Mean doses of antipsychotic used were low: quetiapine 67.6 mg/day and haloperidol 0.8 mg/day. The response rates as measured by the reduction in the DRS-R-98 severity scores were not significantly different between the two groups. The total sleep time per day was greater in the quetiapine group, but was not significantly higher than the haloperidol group.

In a prospective observational study of 2453 general hospital inpatients in Japan, the three most common antipsychotics prescribed by consultation-liaison psychiatrists were risperidone (34%), quetiapine (32%) and intravenous haloperidol (20%) for those patients who were unable to take oral antipsychotic [67]. Mean patient age was 73.5 years and the comorbid dementia rate was 30%. Delirium resolved within 1 week in 54% of patients. The rate of serious adverse events was reported as 0.9% with no deaths attributed to antipsychotics. However, electrocardiogram monitoring was not reported. In the study by Hatta et al. [67] and another observational study of 80 patients referred to the consultation-liaison psychiatry service in a tertiary level hospital [68], it was the psychiatrist who determined the choice of antipsychotic.

Further to the 2012 Cochrane review by Candy et al. [69*], recent systematic literature searches have also explored the evidence for antipsychotic therapy [62*,70*]. Out of 16 identified RCTs, palliative care patients were included in one study of 30 terminally ill patients [71]. None of the 15 prospective cohort studies specifically examined palliative care patients; however, four studies evaluated hospitalized cancer patients (total N = 139) [62*]. A review of 28 prospective antipsychotic treatment studies for delirium concluded that around 75% of patients improved clinically when antipsychotic medications were administered [70*]. Antipsychotic dose ranges (as measured by haloperidol equivalent daily doses) were higher in the palliative care and ICU populations. The authors suggested that improved patient outcomes may be demonstrated with the consistent use of protocolized care [70*].

A recent systematic review on the pharmacological treatment of ICU delirium included three antipsychotic RCTs, of which two had placebo arms [72]. Sample sizes were small and the authors detailed methodological concerns. Similar to the intensive care and other settings, further well designed studies, including placebo RCTs, comparing the dosing schedule and antipsychotic selection in different delirium motor subtypes, and efficacy and adverse effects of antipsychotics in palliative care patients, are still needed.

Rather than relying on consensus expert opinion, the revised clinical practice guidelines for the management of pain, agitation and delirium in adult intensive patients assigned ‘no recommendation’ to statements if there was insufficient evidence or if, after reviewing the literature, the group could not reach consensus [35*,36*]. For adult ICU patients, the task force found low-level evidence for atypical antipsychotics and reduction in delirium duration but no evidence for haloperidol treatment and reduced duration of delirium [35*]. Whereas some published delirium guidelines have suggested doses of antipsychotics, a less prescriptive approach may increase acceptance and uptake of a guideline into clinical practice, with local guideline adaptation specifically tailored for the local culture and environment.

In the elderly, it has been recommended that medications are reserved for severely agitated patients, or those with severe psychotic symptoms, and low antipsychotic starting doses have been suggested for this population, for example haloperidol 0.25–0.5 mg orally twice a day [8*].

**PHARMACOLOGICAL MANAGEMENT WITH OTHER MEDICATIONS**

There is growing evidence to support many hypotheses for the development of delirium, including
a neuroinflammatory hypothesis and circadian rhythm dysregulation or melatonin deficiency [73\textsuperscript*,74,75]. In addition to proinflammatory cytokines leading to a reduction in melatonin production, many other medical conditions are also postulated to reduce melatonin activity [73\textsuperscript*]. Melatonin controls the sleep-wake cycle and circadian rhythms, and a small study of family caregivers (n = 20) confirmed sleep disturbance as a prodromal symptom for delirium [31\textsuperscript*]. A case study reported the successful treatment of a delirious 100-year-old Japanese male using a melatonin receptor agonist, ramelteon [76]. An older randomized placebo-controlled double-blind trial of 145 internal medicine inpatients (mean age 84.5 years) demonstrated a significant reduction in the risk of delirium [77]; thus, the role of melatonin in reducing delirium in palliative care patients warrants further study.

Dexmedetomidine, an α\textsubscript{2}-receptor agonist, has been trialed for the treatment and prevention of delirium in ICU patients [78]. For palliative care patients, the roles of dexmedetomidine in the management of delirium sedation at the end of life and analgesia require further evidence [79].

NON-PHARMACOLOGICAL MANAGEMENT OF DELIRIUM

The role of nonpharmacological strategies in both the prevention and treatment of delirium in many medical ill populations, including elderly and postoperative patients, has been demonstrated [8\textsuperscript**]. These strategies have been recommended in the recent National Institute for Health and Clinical Excellence clinical practice guidelines, which exclude patients at the end of life [80,81]. This is in contrast with palliative care populations and older people in long-term institutional care wherein nonpharmacological strategies have yet to demonstrate efficacy in delirium prevention [60,82]. Deprescribing (the dose reduction, withdrawal, or cessation) of psychoactive medications is an essential step in management in all patient populations [83], although for patients with advanced cancer, its benefits have not been clearly demonstrated at this time [84].

As each specialty (e.g., geriatrics, intensive care and palliative care) has a differing patient population, ongoing evidence and consensus should be sought for both the pharmacological and nonpharmacological management of delirium within each patient group. This can then be systematically evaluated for both efficacy, as assessed by delirium severity rating scales that have been validated in that specific population, and adverse effects using standardized tools specific to each particular patient population.

THE ROLE OF HYDRATION IN DELIRIUM MANAGEMENT

A trial of hydration is often given if attempts are made to reverse a delirium episode in line with the patient’s goals of care. In a multicenter RCT of 129 hospice patients with cancer, incident delirium levels (as measured by the MDAS) deteriorated in both hydration (1000 ml/day) and placebo patient groups [85]. Similarly, a prospective study of 75 terminally ill cancer patients did not show a difference in the prevalence of hyperactive delirium between hydration and nonhydration groups [86]. Further studies including patients with delirium are needed to provide evidence for this practice.

PALLIATIVE SEDATION

For the optimal symptom management of refractory agitated delirium at the end of life, palliative sedation is frequently necessary, including the home setting [87–90]. Brinkkemper et al. [91\textsuperscript*] examined the availability of suitable tools for the appropriate monitoring of palliative sedation by the interprofessional team. A modified Spanish version of the RASS, originally validated in intensive care patients, was developed for the assessment of Spanish patients with advanced cancer [92]. In this study, 38 (24\%) of the 156 patients admitted to the palliative care unit were receiving palliative sedation and 57 (37\%) had delirium. When used by professionals experienced in palliative care, this modified version of the RASS demonstrated high inter-rater reliability.

In a small mixed-methods pilot study of 10 patients receiving palliative sedation or with an agitated delirium, the RASS-PAL (RASS modified for palliative care inpatients) also showed good psychometric properties and high inter-rater reliability [93]. The inter-rater intraclass correlation coefficient range of the RASS-PAL for the five assessment time points was 0.84–0.98. Training in the appropriate use of these instruments is essential, especially for nonexperienced staff [92,93].

CONCLUSION

Delirium continues to be poorly recognized and documented in many care settings, including palliative care. In addition to formal systematic screening, improved interprofessional team communication, educational initiatives and institutional policies that support the implementation of screening and a culture of better delirium recognition are necessary. The quest for briefer yet sensitive delirium screening tools continues and many validation and other tool assessment studies have recently been published. Screening tools should be selected on the basis of contextual
need; at some points of care, a cognitive screening tool is most ideal, whereas an observational tool may be more appropriate for continuous inpatient surveillance and screening. Screening in supportive and palliative care settings needs to be critically evaluated in relation to outcomes such as the benefits and burdens of clinical interventions, including preventative measures of quality of life and cost. RCTs of pharmacological and nonpharmacological therapeutic strategies are needed to inform the development of guidelines for the management of delirium in palliative and supportive care settings.

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Conflicts of interest
Both authors declare no competing interests. Both authors were involved in multiple recent publications on delirium and some of these are referenced in this review.

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