*Special Article*

# Practical Assessment of Delirium in Palliative Care

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## Abstract

**Context.** Delirium is a common, distressing neuropsychiatric complication for patients in palliative care settings, where the need to minimize burden yet accurately assess delirium is hugely challenging.

**Objectives.** This review focused on the optimal clinical and research application of delirium assessment tools and methods in palliative care settings.

**Methods.** In addition to multidisciplinary input from delirium researchers and other relevant stakeholders at an international meeting, we searched PubMed (1990–2012) and relevant reference lists to identify delirium assessment tools used either exclusively or partly in the context of palliative care.

**Results.** Of the 26 delirium scales identified, we selected six for in-depth review: three screening tools, two severity measures, and one research tool for neuropsychological assessment of delirium. These tools differed regarding intended use, ease of use, training requirements, psychometric properties, and validation in or suitability for palliative care populations. The Nursing Delirium

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Screening Scale, Single Question in Delirium, or Confusion Assessment Method, ideally with a brief attention test, can effectively screen for delirium. Favoring inclusivity, use of Diagnostic and Statistical Manual of Mental Disorders-IV criteria gives the best results for delirium diagnosis. The Revised Delirium Rating Scale and the Memorial Delirium Assessment Scale are the best available options for monitoring severity, and the Cognitive Test for Delirium provides detailed neuropsychological assessment for research purposes.

**Conclusion.** Given the unique characteristics of patients in palliative care settings, further contextually sensitive studies of delirium assessment are required in this population. J Pain Symptom Manage 2014;■:■−■. 

***Key Words***
*Delirium, assessment, screening, diagnosis, rating scales, palliative care*

## *Introduction*

Delirium is a common and invariably burdensome neuropsychiatric syndrome among palliative care patients. Widely varying incidence and prevalence rates of delirium are reported in this population.[1] Hosie et al[2] conducted a recent systematic review of delirium studies in palliative inpatient populations (1980−2012). Differences in incidence and prevalence rates of up to 30% were reported in patients on admission, during admission, and the weeks and hours before death.[2−4] Studies suggest that between one-third and one-half of cases of delirium occurring in palliative care are reversible,[3,5] with less reversibility in cases of organ failure and greater severity of delirium.

Assessment of delirium in palliative care patients can be challenging for many reasons, such as the burden of frequent assessments as part of the required clinical and scientific rigor, especially in research studies; significant family and nurse distress; the superficial understanding of delirium by nurses regardless of their speciality;[6,7] and lack of consensus regarding optimal assessment approaches.[2] The frequent need for sedative and other psychoactive medication for symptom control can further complicate assessment.[8,9] Delirium in palliative care is underdiagnosed[10−12] and often misdiagnosed as depression or fatigue.[13,14] Consistent and timely diagnosis of hypoactive delirium is especially challenging because of the frequent overlap of delirium and depressive symptoms.[15] A study of patients referred to a cancer center−based palliative care consultation service noted that delirium featured infrequently as the primary reason for requesting a palliative care consultation, yet it was identified in more than 50% of the cases.[11] This suggested that delirium may be viewed either in a normative manner as an acceptable or expected condition, or that it is commonly missed. Moreover, hypoactive delirium has been identified as a particular risk factor for under-recognition by nurses.[16] Similarly, hyperactive delirium can masquerade as anxiety, mania, or akathisia.

Phenomenological studies of delirium have used a plethora of instruments for delirium detection, with imprecise and widely varying definitions of delirium,[17] all of which contribute to the variability in reported incidence and prevalence rates. Kean and Ryan[18] suggest that the development of instruments should be guided by the dichotomization of expert and nonexpert raters.

The purpose of this open review is to provide an overview of delirium assessment tools commonly used in palliative care settings and to recommend suitable tools and assessment methods for clinical practice and research in the context of palliative care. Recent reviews of delirium assessment scales have identified 24 different instruments,[1,19−24] many of which have been evaluated in a single study. One of these reviews focused specifically on palliative care[1] and provides a comprehensive review of the methods of assessment of delirium in palliative care patients. In their review, Adamis et al[19] concluded that only four of the 24 scales under review had sufficient evidence to

support its validity and reliability. This article also provides suggestions regarding future directions for the assessment of delirium in palliative care settings.

## Methods

We conducted a search of PubMed from 1990 to 2012 to identify English language studies reporting the use of delirium assessment tools in palliative care. Search terms included "delirium," "confusion," and "cognitive failure" in "palliative" and "hospice care." Additional articles of interest to palliative care or those that overlapped with other populations were identified through relevant reference lists. We considered the following factors in our preferred choice of instruments: 1) intended use (screening vs. diagnostic vs. severity measure vs. phenomenological profile); 2) ease of use and training requirements; 3) evidence to support validity and reliability, including comprehensiveness of delirium domains; and 4) suitability for use or level of experience to date with use in highly morbid palliative care populations. Our literature search was complemented by recorded multidisciplinary input from delirium researchers and other relevant stakeholders at the two day Studies to Understand Delirium in Palliative Settings (SUNDIPS) international meeting in June 2012 in Ottawa, Canada.

## Results

Our search yielded 26 instruments used in the assessment of delirium in palliative care settings. Only four of these instruments have undergone validation studies in these settings, including the Confusion Assessment Method (CAM),[25] the Memorial Delirium Assessment Scale (MDAS),[26] the Bedside Confusion Scale (BCS),[27] and the Communication Capacity Scale and Agitation Distress Scale.[28] The BCS is a brief, easy-to-use, two-item instrument assessing the level of alertness and a test of attention, which does not require special training. It was validated in 41 patients. The Communication Capacity Scale and Agitation Distress Scale, the latter component of which is an observer-rated scale, was validated in 30 patients and also fails to assess cognitive impairment. The reported use of the BCS and the Communication Capacity Scale and Agitation Distress Scale in palliative settings has been relatively limited, whereas use of the MDAS and CAM has been frequently reported.

Based on the literature search and selection criteria, six tools were selected for further examination, namely the CAM,[29] the Single Question in Delirium (SQiD),[30] the Nursing Delirium Screening Scale (Nu-DESC),[31] the Revised Delirium Rating Scale (DRS-R-98),[32] the MDAS,[33] and the Cognitive Test for Delirium (CTD).[34] The first three tools were included as screening tools, whereas the MDAS[33] and the DRS-R-98[32] were included as severity measures. The sixth tool, the CTD,[34] also was included as it has been used extensively for research purposes by Meagher et al[35–39] in the specialist assessment of the neuropsychological profile of delirium in palliative care. The utility and acceptability of the six selected tools in the context of palliative care were evaluated by the attendees at the Studies to Understand Delirium in Palliative Settings delirium study planning meeting. The debate in this forum also highlighted the role of cognitive screening tools in delirium assessment and a potential role for the Delirium Observation Screening Scale (DOS) in palliative care settings.

Accordingly, both of these roles are further described in the section on screening. Given that uncontrolled and irreversible delirium is the most frequent indication for palliative sedation in palliative care settings, our group considered the need to include a description of the Richmond Agitation-Sedation Scale, Palliative version (RASS-PAL), which is used to monitor sedation in this situation.

The International Classification of Diseases (ICD-10)[40] and Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)[41] are the most frequently used diagnostic tools over the past 15 year period and these diagnostic classification systems are discussed. A summary of the characteristics and representativeness of delirium domains by each of the six tools appears in Tables 1 and 2.

### *Screening for Delirium in Palliative Care*

Nurses are uniquely positioned to assist in delirium assessment by virtue of their

*Table 1*
**Characteristics of Delirium Tools Used in Palliative Care Populations**

| Category | Scale | Dimensions | Items | Score | Administration Time (min) | Characteristics |
|---|---|---|---|---|---|---|
| Delirium screening | CAM | Nine operationalized criteria based on DSM-III-R, classified as four features | 9 | Observational | 5[a] | • Required for diagnosis: Features 1 (acute onset and fluctuating course) and 2 (inattention) + either Feature 3 (disorganized thinking) or 4 (altered level of consciousness) |
| | Nu-DESC | Four items from the CRS + psychomotor retardation | 5 | 0–10 Cutoff: ≥2 | 1 | • Three-point scale: 0–2<br>• Observational scale<br>• Higher score = positive delirium |
| | SQiD | Third party perception of patient's confusion | 1 | Yes/no | | • Simple single question<br>• Perception of family member/friend |
| Delirium severity | DRS-R-98 | 13 Severity items (including five cognitive domains)<br>Three diagnostic items | 16 | 0–39 (Severity)<br>0–46 (total)<br>Cutoff: 15.25 (severity)<br>Cutoff: 17.75 (diagnostic) | 20–30 | • Items rated from zero (normal) to three (severely impaired)<br>• Symptoms rated over 24 h<br>• Higher score = increased severity<br>• 13-Item severity section can be scored separately from three-item diagnostic section<br>• Total scale can be scored initially to enhance differential diagnosis |
| | MDAS | Based on DSM-IV, DSM-III, and ICD-9 criteria:<br>Arousal and LOC<br>Cognitive functioning<br>Psychomotor activity | 10 | 0–30 Diagnostic cutoff: 7–13 | 10 | • Four-point scale: 0–3<br>• Higher score = increased severity |
| Neuropsychological assessment of delirium for research purposes | CTD | Orientation, attention, memory, vigilance, and comprehension | | 0–30 Cutoff: <19 | 20 | • Lower score = lower cognitive function |

CAM = Confusion Assessment Method; Nu-DESC = Nursing Delirium Screening Scale; CRS = Cognition Rating Scale; SQiD = Single Question in Delirium; DRS-R-98 = Delirium Rating Scale-Revised; MDAS = Memorial Delirium Assessment Scale; LOC = level of consciousness; CTD = Cognitive Test for Delirium.
[a]For experienced users.

*Table 2*
**Representativeness of Delirium Domains**

| Domain (DSM-IV Criteria) | Dimensions | CAM | Nu-DESC | SQiD[a] | DRS-R-98 | MDAS | CTD |
|---|---|---|---|---|---|---|---|
| Consciousness | Altered level of consciousness | ✓ | | | | ✓ | |
| | Inattention | ✓ | | | ✓ | ✓ | ✓ |
| | Inappropriate behavior | | ✓ | | | | |
| | Decreased psychomotor activity | ✓ | ✓ | | ✓ | ✓ | |
| | Increased psychomotor activity | ✓ | ✓ | | ✓ | ✓ | |
| | Sleep-wake cycle disturbance | ✓ | | | ✓ | ✓ | |
| Cognition | Disorientation | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | Memory deficit | ✓ | | | ✓ | ✓ | ✓ |
| | Perceptual disturbance | ✓ | ✓ | | ✓ | ✓ | |
| | Language disturbance (speech) | | | | ✓ | | |
| | Delusions | | | | ✓ | ✓ | |
| | Impaired digit span | | | | | ✓ | |
| | Decreased visual-spatial ability | | | | ✓ | | |
| | Decreased comprehension | | | | | | ✓ |
| | Vigilance | | | | | | ✓ |
| | Disorganized thinking | ✓ | ✓ | | ✓ | ✓ | |
| Onset | Acute onset | ✓ | | | ✓ | | |
| Course | Fluctuating course | ✓ | | | ✓ | | |
| Physical disorder related to disturbance | | | | | ✓ | | |
| Affect | Liability of affect | | | | ✓ | | |

DSM-IV = Diagnostic and Statistical Manual of Mental Disorders-IV; CAM = Confusion Assessment Method; Nu-DESC = Nursing Delirium Screening Scale; SQiD = Single Question in Delirium; DRS-R-98 = Delirium Rating Scale-Revised; MDAS = Memorial Delirium Assessment Scale; CTD = Cognitive Test for Delirium.
[a]Single question assesses for nonspecific feature of "confusion."

sustained contact with patients and relatives/carers during periods of hospitalization. Agar et al,[7] in a survey of 40 nursing staff, identified a number of challenges in the assessment of delirium by nurses across a wide variety of medical settings, including palliative care. Remarkably, there was a limited appreciation of the key diagnostic features or specific criteria for delirium. No participant recognized baseline vulnerability factors as increasing the risk for delirium. Perhaps, most concerning was the belied belief expressed by some that being "pleasantly confused" did not merit intervention.[7]

*Confusion Assessment Method.* The CAM[16] comprises nine operationalized criteria derived from the DSM-III-Revised[42] and has been translated into more than 10 languages. A training manual is available online. This tool has played a pivotal role in the assessment of delirium in clinical practice and in research, and is recommended in the diagnosis of delirium.[43] The four-item diagnostic algorithm is based on evidence of an acute change in mental status and fluctuating course from baseline, inattention, and either disorganized thinking or altered level of consciousness. Lemiengre et al[44] concluded that when item one (acute onset/fluctuating course) was distinguished by "and" and "or," the latter criterion is more sensitive and sensitivity rates increased to more than 66% among the nursing staff. The CAM is used as a screening tool and does not provide a severity score. A validity study, focusing on sensitivity and specificity, has been conducted in a combined sample of 84 palliative care patients; however, its use is dependent on the skill of the operator and thus requires moderate training.[25] Sensitivity of the tool can be poor when administered by inadequately trained nurses[16,44] and doctors,[25,30] but other work has highlighted how detailed and sustained training can achieve an inter-rater reliability of 95%.[45] The CAM requires formal assessment of cognition, for example, using the Blessed Orientation Memory Concentration test, known also as the Short Orientation Memory and Concentration Test (SOMCT),[46] the Mini-Mental State Examination (MMSE)[47] or brief tests of attention.

*Role of Cognitive Screening Tools.* Cognitive screening tools are used in palliative care settings both to screen for dementia and delirium, given that cognitive deficit is a criterion in the diagnosis of delirium. The MMSE

and the SOMCT are two of the most commonly used cognitive screening tools in this context. The MMSE[47] assesses orientation, memory, attention, concentration, and language, but does not accommodate the inclusion of psychomotor disturbances or psychotic phenomena. Moreover, it lacks both sensitivity and specificity for delirium, which is in part a result of the significant weighting for orientation.[35,48] In addition, the MMSE may prove difficult to use for some palliative care patients because of the requirement for motor skills, and recent copyright issues may deter some users.[48,49] The SOMCT[46] is increasingly used as supplementary cognitive testing for the CAM[16,25] and may be administered by a nonphysician; it has been shown to discriminate among mild, moderate, and severe cognitive deficits.[46] Inattention may be assessed by distractability and an inability to focus during routine interaction; tests of attention include months of the year backward, counting from 20 to one backward, or spelling "world" backward.[50]

*Single Question in Delirium.* The SQiD[30] is a simple screening tool that asks a single question of a patient's relative or friend: "Do you think (patient's name) has been more confused lately?" A positive response indicates the need for more detailed assessment. In a validation study of 19 oncology inpatients, the SQiD was compared with the CAM, MDAS, and MMSE, when administered by minimally trained medical students. Independent assessment diagnosed delirium based on DSM-IV criteria and a psychiatric clinical interview. When compared with the psychiatric interview, the SQiD yielded a sensitivity of 80% and specificity of 71%. The CAM and SQiD demonstrated negative predictive values of 80% and 91%, respectively. The SQiD had a slightly better correlation with the psychiatric interview ($\kappa = 0.43$, $P = 0.023$) than the CAM ($\kappa = 0.37$, $P = 0.05$). Only five of the 19 patients were identified as true-positive cases of delirium based on the psychiatric interview. Validation studies have not been conducted in palliative care populations. Recent evidence suggests that almost one-third of general hospital patients with delirium can identify their muddled thinking correctly on direct questioning.[45]

*Nursing Delirium Screening Scale.* The Nu-DESC[31,51] allows continuous screening, symptom monitoring, and severity rating. It comprises four items from the Confusion Rating Scale,[52,53] including disorientation, inappropriate behavior, inappropriate communication, and illusions/hallucinations, with an additional fifth item, psychomotor retardation. In contrast to the Confusion Rating Scale,[52] the Nu-DESC can detect both hypoactive and hyperactive features. Each item is scored zero to two, and a total score of two or more is considered positive on screening. In a sample of 52 inpatients (59 assessments) on a hemato-oncology/internal medicine unit, the Nu-DESC had a sensitivity and specificity of 86% and 87%, respectively, and has been shown to be more sensitive than the CAM in postoperative patients both in the recovery room and in the surgical ward.[54,55] To date, no validity studies have been conducted in palliative care patients.

*Potential Role of the Delirium Observation Screening Scale.* Although not one of the six selected tools, the DOS[56] is worthy of mention as a potential nurse observation screening tool. It is designed to capture early signs of delirium by nurses during routine care and takes less than five minutes to complete. Nurses rated the practical use of the DOS as significantly easier to use than the NEECHAM confusion scale.[57] The DOS originally consisted of 25 items but has been reduced to 13 items. It has been shown to have satisfactory validity and reliability evidence, including high internal consistency, in geriatric medicine and hip fracture patients and is commonly used as a delirium screening tool in Holland. A score of zero is "normal behavior," the highest score is 13 and the cutoff is three. It has not undergone any validation studies in palliative populations.

### *Rating Delirium Severity in Palliative Care*

Many delirium severity rating tools, such as the DRS-R-98 and MDAS embody measures of cognitive deficit and behavioral disturbance, and thus have inherent diagnostic potential. Alternatively, many nursing assessment tools such as the Nu-DESC are designed for brief administration and observationally capture behavioral disturbance. Although the Nu-

DESC has its origin as a severity rating tool and has been validated for screening, it has not been formally validated as a severity measure.

*The Revised Delirium Rating Scale.* The DRS-R-98[32] was developed from the Delirium Rating Scale[58] and is the most detailed delirium phenomenological tool available. It is useful both as a diagnostic and as an assessment tool. It also allows for repeated measurements and as such is a popular tool for assessing change over time in treatment studies. It is a 16-item, clinician-rated scale, with 13 severity items including five cognitive domains, and three diagnostic items (temporal onset of symptoms, fluctuation of symptoms, and physical disorder); and is a valid measure of delirium severity over a broad range of symptoms. All items are anchored by text descriptions as guides for rating along a continuum from normal to severely impaired. Use of all available sources of information is recommended. It rates symptoms over the previous 24 hour time frame, but both longer and shorter time frames can be used or may be applied biweekly to encompass the previous three to four day period (i.e., since last assessment). The DRS-R-98 was originally designed for administration by clinicians with appropriate training in psychiatry and delirium. However, it also may be used by nurses and psychologists provided they have had appropriate training in evaluating psychiatric phenomenology in medically ill patients. A manual to guide rating is available.[59] It has high inter-rater reliability, validity, sensitivity, and specificity for distinguishing delirium from mixed neuropsychiatric populations, including dementia, depression, and schizophrenia,[32] and has been used in the assessment of delirious palliative care patients.[35,37–39,60] In referrals to a consultation-liaison psychiatry service,[61] as well as in a mixed population including palliative care patients,[62] exploratory and confirmatory factor analyses of the DRS-R-98 have confirmed the presence of the three core domains of delirium (circadian, higher order thinking, and cognitive). Further detail is provided in Tables 1, 2 and 4.

*Memorial Delirium Assessment Scale.* The MDAS[33] is a clinician-rated scale designed to assess the severity of delirium. The 10 items include arousal and level of consciousness, cognitive functioning (memory, attention, orientation, and thought disturbances), and psychomotor activity. Its comprehensive items capture both hypoactive and hyperactive delirium. The MDAS is relatively brief, requiring 10 minutes to complete, excluding time required to develop rapport, review charts, and obtain collateral history. To assess medical changes or the impact of clinical interventions over time, repeat same-day administrations of the MDAS are conducted regularly. In addition to monitoring delirium severity, it also has been used as a screening tool.[20,63,64] Although it was originally designed for administration by psychiatrists, adequately trained nonclinician interviewers also have used the tool.[65] It has been translated into other languages, including Japanese[66] and Italian.[67] Validity evidence has been gathered in cancer and palliative care inpatient settings, resulting in varying sensitivity, specificity, and optimal diagnostic cutoff scores. Using factor analytic procedures, two underlying factors, global cognitive and neurobehavioral, have been identified.[26] The MDAS adequately detects hypoactive psychomotor subtypes of delirium. However, the assessment of arousal disturbance can only include reduced level of consciousness and it does not detect hyperarousal or hypervigilance; as such its adaptation is currently being considered.[68] Unlike the DRS-R-98, the MDAS does not include items such as temporal onset or fluctuation of symptoms, which are needed to diagnose delirium and help to distinguish it from dementia. Evidence from the initial validation study suggests that it can distinguish delirium from depression or dementia.[33] Further detail is provided in Tables 1–4.

### *Neuropsychological Profiling of Delirium in Palliative Care*

*The Cognitive Test for Delirium.* The CTD[34] was originally designed to assess neuropsychological performance in seriously ill delirious intensive care unit patients. It has been extensively used in the assessment of delirium in palliative care patients[35–39] to capture the broad range of neuropsychological disturbances that occur. It is generally considered a specialist tool and reserved for research purposes. Higher cutoff scores have been reported in traumatic brain

*Table 3*
**Validation Studies in Palliative Care Populations**

| Scale | First Author (Publication Date) | Sample/Setting | Reliability | Validity | Cutoff | Sensitivity (%) | Specificity (%) |
|---|---|---|---|---|---|---|---|
| CAM | Ryan (2009) | Palliative care inpatients, mostly advanced cancer<br>$n = 32$ (phase 1)<br>$n = 52$ (phase 2) | | | | (Phase 2) 88.0 | (Phase 2) 100.0 |
| MDAS | Breitbart (1997) | Study 1 ($n = 33$):<br>Cancer inpatients ($n = 30$)<br>AIDS ($n = 2$)<br>Noncancerous pancreatitis ($n = 1$) | Internal consistency<br>Cronbach's $\alpha = 0.91$<br>Inter-rater reliability<br>$r = 0.92$<br>Inter-item reliability<br>$r = 0.64–0.99$ | | 13 | 70.6 | 93.8 |
| | Breitbart (1997) | Study 2 ($n = 51$):<br>Cancer inpatients ($n = 48$)<br>AIDS ($n = 3$) | | Concurrent validity<br>DRS: $r = 0.88$<br>MMSE: $r = -0.91$<br>Clinician rating: $r = 0.89$ | | | |
| | Lawlor (2000) | Advanced cancer ($n = 104$) | Internal consistency<br>Cronbach's $\alpha = 0.78$<br>Inter-rater reliability (total score)<br>ICC = 0.89 | Concurrent validity<br>MMSE: $r = 0.55$<br>Factor structure: two factors<br>Global cognitive<br>Neurobehavioral | 7 | 98.0 | 96.0 |

CAM = Confusion Assessment Method; MDAS = Memorial Delirium Assessment Scale; DRS = Delirium Rating Scale; MMSE = Mini-Mental State Examination; ICC = intraclass correlation coefficient.

injury patients.[69] Further detail is provided in Tables 1, 2 and 4.

### *How Do Assessment Scales Compare?*

These scales were further compared using the following criteria: 1) purpose (screening, diagnostic, and severity rating), 2) ease of use, 3) study populations where tools have been used, and 4) psychometric properties in palliative care settings. These comparisons are summarized in Tables 3 and 4 As shown in Table 3, only two of the tools, the CAM and the MDAS, have undergone validation studies in palliative care.

### *Criteria-Based Diagnostic Tools*

The major criteria-based diagnostic methods, such as ICD-10 and DSM-IV, may be operationalized in the form of semistructured interviews for application in research studies and clinical practice. The ICD-10[40] includes separate criteria for clinical and research purposes. Both criteria require not only the presence of a broad range of symptoms, including core features such as impairment of attention and consciousness, global disturbance of cognition, and psychomotor and sleep-wake cycle disturbances but also emotional disturbances, which are not consistently found in studies of delirium phenomenology. Thus, the ICD-10 lacks sensitivity in that many patients who are diagnosed as delirious using DSM-IV criteria are excluded by ICD-10.[70–72] It has been suggested that ICD-11 should emphasize the distinction between mandatory features (e.g., impaired attention) that are invariably present vs. features that are suggestive (emotional disturbances) but not consistently present to achieve better inclusiveness.[71]

In contrast, the DSM-IV does not include features such as sleep-wake cycle disturbances or altered psychomotor behavior, but has greater inclusivity. In a comparison study of the current and previous diagnostic classifications, Laurila et al[70] found that prevalence rates varied depending on the diagnostic criteria used: 12.9%, 13.5%, 23.5%, and 2.9% were diagnosed as delirious according to DSM-III, DSM-IIIR, DSM-IV, and ICD-10 criteria, respectively. Similar differences were found for demented patients. It is generally concluded that the DSM-IV is the most

*Table 4*
**Comparison of Delirium Scales**

| Scale | Purpose | Ease of Use | Population(s)[a] | Strengths | Challenges/Deficiencies |
|---|---|---|---|---|---|
| CAM | Screening | Requires moderate training and cognition assessment | Palliative care | • Operationalized<br>• Training manual available online<br>• Translated into more than 10 languages | • Assessment of cognition required<br>• Does not provide a severity score<br>• Moderate training required |
| Nu-DESC | Screening | Nurse rated | Oncology, hemato-oncology, internal medicine | • Completed at the end of each nursing shift, thereby providing continuous 24 h assessment | • Not representative of all DSM-IV criteria<br>• Observational assessment, does not formally assess cognition and attention |
| DRS-R-98 | Diagnostic and severity | Clinician rated (with appropriate training in psychiatry) items anchored by text descriptions | Palliative care | • Useful as both a diagnostic and assessment tool<br>• Allows for repeated measurements<br>• Can be used over variable periods from hours to weeks<br>• Most detailed phenomenological tool available<br>• Reliably distinguishes delirium from dementia and depression | • Time consuming<br>• Requires training |
| MDAS | Severity and diagnostic (+screening)[b] | Clinician rated (originally developed by psychiatrists), used by trained nonclinician interviewers | Cancer, advanced cancer, AIDS, psychogeriatrics, seniors post-hip fracture surgery, cardiac surgery, medical/cardiac ICU | • Based on DSM-IV, DSM-III, DSM-III-R, and ICD-9 criteria; items reviewed by clinical experts<br>• Assesses hyper- and hypoactive delirium<br>• Integrates behavioral observations and objective cognitive testing<br>• Intended for repeated administration for measurement of change (e.g., within 24 h) | • Does not include variability of symptoms or acuteness of onset<br>• Limited standardized training programs; no formal manual<br>• Variable cutoff scores<br>• Best used to quantify severity of delirium after initial diagnosis<br>• Potential scoring complexity (pro-rating scores, multiple assessments)<br>• Not yet been shown to distinguish delirium from depression or dementia |

(*Continued*)

*Table 4*
**Continued**

| Scale | Purpose | Ease of Use | Population(s)[a] | Strengths | Challenges/Deficiencies |
|---|---|---|---|---|---|
| CTD | Severity | Specialist assessment/ research | ICU/palliative care | • Allows for detailed neuropsychological testing (emphasizing nonverbal over verbal abilities) in seriously ill patients including intubated and aphasic patients<br>• Reliably distinguishes delirium from dementia, schizophrenia, and depression | • Requires training<br>• Assesses orientation, attention, memory, comprehension, and vigilance only |

CAM = Confusion Assessment Method; Nu-DESC = Nursing Delirium Screening Scale; DSM = Diagnostic and Statistical Manual of Mental Disorders; DRS-R-98 = Delirium Rating Scale-Revised; MDAS = Memorial Delirium Assessment Scale; ICD = International Classification of Diseases; CTD = Cognitive Test for Delirium.
[a]Refers to the different populations where the tool has been used; only the CAM and the MDAS have undergone validation studies in palliative populations (Table 3).
[b]Although primarily a severity tool, the MDAS also has been used as a screening tool by trained health care professionals (20, 63, 64); it has also been used as a diagnostic tool but has variable cut-off scores.

inclusive diagnostic classification system currently in use, but the inclusion of fluctuation "over hours or days" can bias against hypoactive delirium presentations. Hosie et al[2] concluded in their recent systematic review of delirium rates among palliative care inpatients that studies that used DSM-IV criteria report higher prevalence and incidence rates.

*Monitoring Palliative Sedation in the Management of Delirium in Palliative Care*

*Richmond Agitation-Sedation Scale, Palliative Version.* Although not included as one of the six selected tools, the RASS-PAL[73] was identified at our international meeting as having potential as a nurse- or physician-rated tool to monitor sedation levels. Having modified the original RASS[74] to adapt it to palliative care, Bush et al[73] conducted a small pilot study involving 35 observations of 10 patients receiving palliative sedation or with agitated delirium, to assess the feasibility of the tool in an inpatient palliative care setting. The group concluded that it measured sedation well and is useful for monitoring sedation but not "agitated delirium." Future studies are needed to validate the RASS-PAL against other sedation monitoring instruments.

## Discussion

Despite their potential limitations, the advantage of the assessment tools discussed in our review is that, broadly, they provide a standardized, systematic approach for assessing delirium and a common language for communicating with team members. In the clinical setting, these tools offer a guiding framework for conducting assessments and deepening clinical expertise in this area. For research purposes, these tools also can be used to enhance our understanding of this complex syndrome. However, no single tool will probably capture the extensive complexities of delirium in palliative care patients. There will always be a tradeoff between comprehensiveness and practicality. Given that only two of the six selected instruments have undergone validation studies in palliative care settings, further validation and other studies are clearly required.

*Table 5*
**Key Features and Questions to Aid in the Selection of a Delirium Assessment Tool in Palliative Care**

| Feature | Questions |
|---|---|
| Intended use | • What is the purpose of use?<br>○ Clinical, research, quality assurance<br>• What types of tools are available?<br>• What is the intended focus of the tool?<br>○ Screening, diagnostic, severity, neuropsychological assessment<br>• In what types of palliative care settings will the tool be used?<br>○ Acute/tertiary palliative care, hospice, outpatients<br>• How will the assessments be documented, reported and used? |
| Ease of use | • Who will administer the tool—ideally and/or practically?<br>○ Nurses, physicians, other staff<br>• What types of additional resources may be needed?<br>• What type of training is required? Is there a formal training program and/or availability of a training manual?<br>• How much time is required to administer the tool?<br>• How often will the tool be administered?<br>• What is the level of patient, family and staff burden? |
| Psychometric properties | Comprehensiveness<br>• Which domains of delirium should be represented in an ideal tool?<br>• Which domains of delirium are represented in the tool?<br>• Which domains are not represented?<br>Reliability and validity<br>• What types of reliability and validity evidence have been gathered in palliative care settings?<br>• What is the sensitivity and specificity of the tool in palliative care? |

*Future Directions*

Gathering reliability and validity evidence is an ongoing process that needs to be conducted within the appropriate contexts and settings where the tool will be used. To date, validation studies of delirium assessments tools are generally quite limited in palliative care settings. For some tools, such as the Nu-DESC, SQiD, and DRS-R-98, specific validity evidence in palliative care is lacking. For other tools, such as the CAM and MDAS, there are few studies with relatively small sample sizes involving mostly cancer or advanced cancer inpatients. Further validation studies, involving both advanced cancer and noncancer palliative patients in diverse palliative settings, particularly with the Nu-DESC, SQiD and DRS-R-98, are warranted to ultimately enhance the assessment and management of delirium in this vulnerable population. Studies focusing on the factor analytic structure of the tools and their corresponding representativeness of the delirium construct, using larger sample sizes, would deepen our understanding of this complex syndrome in palliative care settings. Gathering validity evidence of measurement changes, with multiple assessments per patient and potentially high attrition rates over time, adds another layer of complexity that requires further study. To reduce patient burden, Exton and Leonard[75] are investigating the use of eye tracking as a means of minimally invasive assessment in delirious patients.

The evaluation of the quality of these tools remains an ongoing challenge because of the lack of standardized scoring systems. Consensus-seeking processes involving palliative care experts, such as the Delphi method, could assist in the identification of key components of a delirium assessment tool and the development of quality indicators for evaluating the effectiveness of existing delirium assessment tools. Systematic standardized training programs, including the use of simulated cases[63] and online training programs, would further enhance consistent use of these tools for both clinical and research purposes. Education in the detection and assessment of delirium in palliative care settings is of paramount importance. The difficulties in nurses' conceptual understanding of delirium and its management present a key target for educational interventions, as well as the need to penetrate curricula at both undergraduate and continuing professional development levels to align practice to best evidence care.[7] The development of training manuals, particularly for the MDAS and Nu-DESC, also is necessary to ensure proper administration of these tools.

There is no universally accepted delirium assessment tool or protocol in palliative care. An ideal delirium assessment tool needs to

incorporate the core features of any good measure, including adequate representation of the underlying phenomenon or construct, ease of administration, and psychometric soundness for the appropriate population. To address the unique challenges of detecting delirium in palliative care settings, additional key features to consider include the capacity to capture prominent hypoactivity, as well as the requirement for multiple assessments of a condition with a dynamic unpredictable course, while still being practical and brief with minimum patient burden. A summary of key features and questions to aid in the selection of a delirium assessment tool appears in Table 5.

## Conclusions

In addition to maintaining a high index of suspicion for delirium development, we suggest that the considerable nurse-patient contact can be used to allow continuous bedside assessment for delirium using simple screening tools such as the Nu-DESC, SQiD, or CAM. The routine clinical use of these screening tools, ideally coupled with simple bedside tests of attention and general interaction can offer a first step in the detection of delirium in palliative care patients. These screening tools need to be embedded within a formal delirium assessment protocol that includes screening, diagnosis, and ongoing monitoring of severity. The DSM-IV is the most inclusive and frequently used diagnostic classification system to date. Both the DRS-R-98 and the MDAS offer the best currently available options for monitoring delirium severity. A similar assessment algorithm has been suggested by Hall et al[50] for use outside the intensive care unit. There is an urgent need for education, for all health professionals, in the detection and assessment of delirium across all medical settings, including palliative care. Future validation and other studies of existing or newly developed tools ought to be contextually sensitive to the unique characteristics of patients in palliative care settings.

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