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## Assessment and measurement of pain in older adults

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### Abstract

Although the empirical base is still limited when providing clear directions for pain assessment and management in older adults, it is possible to identify recommendations for guiding practice based on consensus and a developing scientific base to support best practice activities. This article offers a brief overview of the epidemiology and consequences of pain, followed by a summary of issues and approaches relevant to pain assessment in older adults. Cohort specific recommendations for comprehensive pain assessment and measurement are then addressed.

### Prevalence and Consequences of Pain in Older Adults

Older individuals frequently suffer from both acute and chronic painful diseases, have multiple diseases, and take numerous pain medications, [2] although relatively little investigative or clinical attention has been paid to the assessment of pain in the geriatric population, compared with the general population. This is surprising because population-based figures indicate that the prevalence of pain is twofold higher in those over age 60 (250 per thousand), compared with those under age 60 (125 per thousand). [24] [79] [108] Further, prevalence estimates suggest that approximately 60% of community-dwelling older adults and up to 80% of elderly long-term care facility residents experience substantial pain. [24] [79] [108] Because pain is often remediable, [2] [25] it is thought that the high prevalence estimates of unrelieved pain in elderly persons may result from underrecognition, which in turn results in undertreatment. [65] [91] [120] The consequences of untreated pain can profoundly impact the older person's quality of life. In addition to physiologic risks associated with untreated pain (e.g., cough suppression with subsequent retention of pulmonary secretions), depression, [58] [82] [94] [125] impaired cognitive function, [29] [66] sleep disturbance, [40] [82] impaired functional abilities, [14] [39] [40] [82] [94] diminished socialization, [82] and increased health care use and costs [43] [104] are all associated with the presence of pain in older adults.

Despite the prevalence and consequences of pain among older adults, health care professionals remain ineffective in assessing [50] [70] [103] [119] [124] and treating pain. [12] [37] [39] [90] Therefore, it is imperative that health care professionals' knowledge and skills related to pain assessment in older adults be improved, and aggressive approaches to comprehensive pain assessment be adopted, to ensure and improve the quality of life of our senior citizens.

## Pain Assessment is an Institutional Necessity

In an effort to address the issue of inadequate pain treatment, clinical practice and quality assurance guidelines have been published by the Agency for Health Care Policy and Research (AHCPR), [3] [4] the American Pain Society, [6] [7] and the Joint Commission on Accreditation of Healthcare Organizations. [67] Although these guidelines are broad in scope, considerations unique to the care of older persons are limited. To address the special concerns of pain in older adults, the American Geriatrics Society published clinical practice guidelines specific for the assessment and management of pain in older persons, [1] [2] and the American Medical Directors Association recently published clinical practice guidelines for the management of pain in long-term care settings. [5] Although these guidelines provide useful sources from which to base clinical practice decisions, the expert panels strongly recommend that investigations into the assessment and management of pain among older persons continue in an effort to build on and further refine recommendations for clinical practice.

## Issues Related to Pain Assessment in Older Adults

### Misconceptions

Lack of systematic investigation into the phenomena of pain in older adults has led to several misconceptions that have serious implications for the assessment and treatment of pain in the elderly population. One pervasive misconception is the belief that pain is an expected and natural consequence of aging. The notion that pain is an outcome of aging is not supported in the literature. [2] [24] [54] In fact, little is known about neuroanatomic and neurochemical changes associated with aging. Although preliminary evidence suggests there may be altered neural transmission along A-delta and C nerve fibers associated with aging, it is not clear how this might affect a person's experience of pain. [18] [55]

Similar misconceptions exist regarding pain perception in older adults. [2] Previous research using low-dose electrical stimulation or other methods of experimentally induced pain to detect age-associated differences in pain thresholds and tolerance resulted in equivocal findings. [22] [52] [54] [114] Although it is argued that experimentally induced pain is not the same as clinical pain, [51] one cannot assume that older people experience less pain than their younger counterparts without convincing empirical evidence to suggest that this is true.

Older individuals themselves frequently present barriers to pain assessment. [40] Many older people expect pain with aging. In addition, a large portion of elderly residents in long-term care facilities fail to report pain and request pain management interventions because they do not want to be a nuisance to staff or because they get tired of asking staff to treat their pain. [40] [60] Elderly persons also may be reluctant to report pain because of their fear that pain is indicative of severe pathology or even impending death and because of their fear of the consequences of acknowledging pain such as the need for hospitalization, diagnostic tests or medications that have undesirable side effects, additional expenses, or loss of independence or autonomy. [63] [95] Therefore, failure to report pain must not be interpreted as absence of pain in elderly patients, and aggressive approaches to pain assessment should be instituted.

### Communication Barriers

Major pain management advocates, including the AHCPR panel for acute [4] and cancer pain, [3] the American Pain Society, [7] and the AGS, [1] [2] all address the importance of obtaining the patient's self-report of pain whenever possible. A relatively high percentage of older adults, however, experience alterations in cognitive, sensory-perceptual, and motor abilities which interfere with their ability to communicate or to quantify their pain

experience. Examples include persons with dementia or delirium, paraplegia, dysphasic or aphasic syndromes, presbycusis, developmental delays, and non-English-speaking patients. Patients may have communication problems but no cognitive impairment, or they may be cognitively impaired with no communication barriers. To further complicate assessment in this age group, pain expression sometimes takes on the form of confusion, social withdrawal, or apathy in an otherwise alert and social older adult. [117] It is suggested that many of these individuals are incapable of directly making their pain known [104] [120] and are therefore at extremely high risk for nondetection and undertreatment of pain.

### **Cognitive Barriers**

A diagnosis of delirium (common among acutely ill frail elderly patients) or dementia (occurring in as many as 50% of institutionalized elderly persons) represents a serious barrier to pain assessment. Clinical staff often discount complaints of pain in persons with cognitive impairment because of inconsistent pain reports. [104] [122] Although findings from several studies suggest that verbal complaints of pain among cognitively impaired individuals are reliable and valid, [35] [38] [39] [91] [107] [118] investigations also indicate that verbal reports of pain tend to decrease as cognitive impairment increases [78] [94] and that ability to respond to direct questioning is impacted. [96] Thus, findings from these studies suggest that the lack of pain assessment among older patients with cognitive impairment puts this segment of the population at greatest risk for the under-recognition and undertreatment of pain. [91] [107]

## **Approaches to Pain Assessment with Older Adults**

### **Clinical Assessment**

In the clinical setting, accurate assessment of pain is critical for the identification of appropriate interventions and for evaluating the effectiveness of such interventions. Patients should be assessed regularly for the presence of pain and for improvement, deterioration, or complications attributable to pain treatment. [2] The frequency of the follow-up should be a function of the severity of the pain and the potential for adverse effects of treatment. Documentation of pain assessment formalizes the pain assessment process and is essential in the provision of individualized care from both a legal and professional perspective. [17]

Inherent in the assessment of pain among older adults is the understanding of its potentially remediable components. For example, if a patient has acute pain, assessment should focus on the underlying pathology responsible for the pain stimulus. If the patient suffers from chronic pain, assessment must be geared toward determining both the pain-causing pathology and the physical, psychological, and social consequences of the pain experience. Therefore, comprehensive pain assessment frequently includes both the unidimensional measurement of pain intensity and the multidimensional comprehensive evaluation of the pain experience. Complex pain problems may benefit from a multidisciplinary approach to evaluation report. [2]

### **Self-Report of Pain**

The patient's self-report is the most accurate and reliable evidence of the existence of pain and its intensity, [2] [4] [6] and this holds true for patients of all ages, regardless of communication or cognitive deficits. Therefore, it is the responsibility of the clinician to foster productive pain-related discussions with the patient. The following section offers suggestions for eliciting verbal reports of pain from older adults.

Determining the patient's preferred pain terminology is an important part of the comprehensive assessment. It is common for older adults to deny pain, but to respond

positively when asked about related terms, such as discomfort, aching, or soreness. [2] [35] [88] [104] Thus, after denial of pain, a reworded question such as “Do you hurt anywhere?” or “Are you uncomfortable?” is important to verify the absence of discomfort. [29] [35] [88] [104] Once preferred pain terminology is established, it needs to be documented, communicated to other health care practitioners, and used throughout the course of treatment. [88]

If a self-report pain measurement scale is to be used with a person known to have cognitive, sensory, or motor deficits, it is crucial to first determine the patient’s ability to use the selected scale. Recent reports from ongoing work among the elderly nursing home population suggest that many patients with moderate to severe cognitive impairment are able to report pain reliably at the moment or when prompted; although pain recall and integration of pain experience over time may be less reliable. [35] [37] [39] [88] [91] [94] [96] [104] [107] [118]

Further, it is extremely important to allow sufficient time for the older adult to process the question asked and to formulate a response. [39] [94] [123] If the older adult demonstrates any type of sensory, motor, or cognitive impairment, it is recommended that the person be instructed on the use of the pain tool each time it is administered [37] [57] and that sensory assistive devices are intact and adjustments are made to accommodate deficits (e.g., providing written and oral instruction, use of enlarged type, and adequate lighting). [4] [57] [67]

## Comprehensive Pain Assessment

Comprehensive assessment of pain in older adults includes careful evaluation of not only the etiology and related factors, but also the impact of pain on the individual’s function and overall quality of life. Because treatment strategies targeted specifically to underlying mechanisms are likely to be most effective, a thorough health history, physical examination, and a review of pertinent laboratory or diagnostic tests are crucial for identifying the underlying etiology and subsequent pathophysiology of pain. [2] [4] [77]

### Physical Examination and Health History

The initial physical examination includes a comprehensive evaluation of all major physiologic systems with special attention given to the neuromuscular and the musculoskeletal system. [2] [36] Within the neuromuscular system, it is important to search for neurologic impairment, weakness, hyperalgesia, hyperpathia, allodynia, numbness, and paresthesia. Palpation for tenderness, inflammation, deformity, and trigger points are a crucial component of the musculoskeletal system examination. [2] Specific maneuvers that produce pain, such as straight-leg raising and joint motion may be useful in determining a diagnosis. [36] It is particularly important in the cognitively impaired older adult to search for the presence of pathologic conditions known to be painful and common in this population, including arthritis, old fracture site pain, peripheral neuropathy, and infections (particularly pneumonia, urinary tract infection, and skin and soft tissue infections), as well as procedures associated with pain. [39] [77] [88] [89]

The health history should also contain a complete medication history, including current and previously used prescription and over-the-counter medications, as well as “natural” remedies and alcohol, tobacco, and illicit drug use. The effectiveness and side effects (including allergies) of current and previously used medications and remedies need to be ascertained. [1] When asking about alcohol, tobacco, and illicit drug use, questions must be asked in a nonjudgmental manner. [1] The older person’s significant other or primary caregiver may be needed to obtain reliable information about prior pain experience and treatment.

## Present Pain Complaint

It is also important to determine pain onset, severity or intensity, quality, pattern, duration, character and location, and both precipitating and relieving factors. [2] Careful questioning is needed, and various strategies may be needed to gather accurate information about the older person's current pain problem. To establish the location and extent of pain, a chart consisting of drawings of the human body or body parts on which the patient marks the location of pain can be a very useful tool. [86] In clinical settings, pain charts (also known as pain maps and pain drawings) are useful for guiding the choice of interventions because they may provide insight into the patient's psychological state [112] or pain-related etiology. [33] The pain chart reveals sound psychometric properties when used among adults of all ages with both acute and chronic pain [32] [48] and has recently been shown to be a valid measure when used with cognitively impaired elderly patients in long-term care facilities. [118] Pointing to the body part that hurts has also been shown to be an effective approach with cognitively impaired older adults. [127] Strategies for evaluation of pain intensity in older adults will be discussed in detail in a later section.

## Psychosocial and Functional Assessment

The comprehensive evaluation of chronic pain should also include an evaluation of physical and psychosocial function to provide a benchmark for progress or deterioration in management of pain and its impact. [2] The association between pain and depressed mood is well established for older adults residing both in the community [82] [125] and in institutional settings. [20] [93] This means that a large proportion of older adults experiencing chronic pain will have significant depressive symptoms at some time and may benefit dramatically from psychological or psychiatric intervention. [36] [41] Recognition and effective treatment of the underlying pain may alleviate the patient's depressed mood; however, when this is not the case, it is crucial to treat the concomitant mood disorder because failure to do so results in ineffective pain management. Further, the assessment of mood, especially depression, is an essential component of the comprehensive pain assessment with older adults because mood states may alter pain perception or enhance pain intensity. [1] [4] [115] Recommended screening tools for depression among older adults include the short form of the Geriatric Depression Scale [105] or the Center for Epidemiological Studies-Depression (CED-D) Scale. [98]

Anxiety is also closely associated with physical health and functional disability in elderly patients. [21] [94] The association between pain and anxious mood has received far less empirical attention than the association between pain and depression. [92] Because of the close association between depression and anxiety among older adults, it is reasonable to expect that anxiety also is a strong concomitant of pain. [92] Therefore, assessment and treatment recommendations for concurrent depression and pain also apply to coexisting pain and anxious mood states. The Profile of Mood States [85] and the Pain Discomfort Scale [68] have been psychometrically tested for use among elderly patients and can be used to assess for anxiety in the older adult experiencing pain.

Delirium (acute confusion) is surprisingly common among persons who are medically ill or elderly, [49] [62] and clinical evidence suggests that cognitive impairment can be exacerbated by pain and its treatment. [36] For example, a recent meta-analysis established that from 60% to 70% of elderly postoperative patients develop delirium [30] and that up to 80% of cases were undiagnosed by physicians (32% of cases missed by nurses). [49] Delirium is characterized by a disturbance in consciousness, impaired attention, and changes in cognitive abilities. Therefore, even among persons with a history of dementia (chronic confusion), evaluation of mental status is crucial to the comprehensive assessment of pain. The following questions or procedures may help determine if the current mental status is

“typical” for the patient: Determining level of orientation to person, place and time; establishing if cognitive impairment might contribute to their confusion; and asking family members or significant others about the patient’s prior mental status. Standard mental status assessment tools such as the Folstein Mini-Mental State Examination[45] or the Orientation-Memory-Concentration Test can be used to assess the patient’s cognitive abilities and to monitor for change in mental status over the course of care. [1] [29] [60] [72] [88] [109]

The context of pain is important to older adults. Pain can represent a loss, threat, or challenge. When illness is accompanied by pain, it often signifies a loss of function, loss of independence, and sometimes, loss of life. Elderly individuals do not perceive, however, all pain as a major stressor or as having deep psychological significance. Therefore, it is important to evaluate both the meaning of the painful experience and the older adult’s coping resources, including the perceived effectiveness of coping strategies and the perceived ability to control one’s pain. [46] Information about how the older adult has coped with prior pain experiences, knowledge of and preference for pain management methods, concerns about analgesic use, and economic issues also are pertinent to developing a plan of care that is tailored to the older patient and is more likely to be implemented.

The impact of pain on functional, social, recreational, family, and occupational activities, as well as perceived control over life, can all significantly contribute to the relationship between pain and depression in the general population, [102] and this relationship may be even more pronounced among older adults. [115] [125] The availability of social support also plays an important role in depression among older persons with chronic pain. Therefore, it is important to routinely assess the impact of pain on the patient’s ability to engage in physical activity (self-care and instrumental activities of daily living [IADL]), impact on relationships with others, and its impact on sleep, appetite, and sexual activity. [1] [2]

Functional abilities can be assessed using valid and reliable activities of daily living (ADL) or IADL measures such as the Katz ADL Scale, [71] the Lawton IADL Scale, [80] the FIM Instrument, or the Barthel Index. [83] A discussion of participation in activities such as hobbies, physical exercise, and socialization with family and friends can elicit information about the behavioral impact of pain on the older person’s life. Asking questions such as “How many days over the past six months have you been unable to do what you would like to do because of your pain?” is suggested for assessing the global impact that pain has on the older person’s quality of life. [116] Other useful tools for assessing the global impact of pain on quality of life of older adults are the Multidimensional Pain Inventory, [74] the Pain Disability Index, [111] and the Brief Pain Inventory. [27]

Lastly, the pain experience is influenced by a wide range of ethnic, cultural, demographic, spiritual, social, and familial factors. The patient’s cultural background, ethnic heritage, gender, and age sometimes influence the expression (and assessment) of pain. [31] [76] Certain cultures have strong beliefs about pain and its management. [97] Thus, patients may express pain in ways that are unfamiliar to us, or they may hesitate to complain about unrelieved pain. Therefore, sociocultural variables that may influence pain assessment must be identified and respected by all members of the health care team. Further, every effort should be made to attend to the preferences and needs of the patient whose cultural traditions impede effective communication with the health care team.

## Measurement of Pain Intensity

It is thought that the severity or intensity of an individual’s pain is the primary factor that determines the impact of the pain on the person’s overall functioning and sense of well-being. [26] Thus, pain intensity serves as a benchmark for comparison of pathologic conditions over time and is important for determining the effectiveness of intervention

strategies. [60] Although self-report pain rating scales are most commonly used to quantify pain intensity, observational and surrogate reporting methods can also be used to detect pain in older adults. Each of the approaches is discussed in the following section.

### **Self-Report Intensity Tools**

A variety of tools are available to quantify pain intensity. Psychometric evaluation of pain intensity scales suggests that variations of the numeric rating scales (NRS), verbal descriptor scale (VDS), faces pain scales (FPS), and visual analogue scale (VAS) are appropriate for use with older adults. As noted earlier, a prerequisite for selecting an appropriate pain measurement scale involves determining the individual's ability to read, hear, and understand the directions for completing the tool. A large proportion of older persons will not exhibit cognitive impairment and will have adapted to sensory losses with hearing aids and corrective lenses. For these individuals, very few adaptations may be required when measuring pain with standard scales. For individuals with special needs, however, clinicians may need to match or adapt a particular scale to meet the older person's capabilities. [57] Several of these scales and related research support are described in the subsequent section and presented in Table 1.

### **Numeric Rating Scale**

Numeric rating scales involve asking the patient to rate their pain from 0 to 10 (or 0 to 5, 0 to 20), with 0 representing one end of the pain continuum (e.g., no pain) and 10 (or 5, 20) representing the other extreme of pain intensity (e.g., pain as bad as it could be). Although the NRS can be oriented either vertically or horizontally, a vertical presentation may be easier for persons with alterations in abstract thinking and is often preferred by older elders. [58] In an experimental study of 175 older and younger adults comparing five pain scales for sensitivity and utility in reporting experimental pain sensations, the 21-point NRS was preferred by many elders and is sensitive to changes in pain sensation. [59] Although the NRS is a reliable and valid pain intensity scale when used among older adults, [58] [59] [120] [123] a substantial portion of older adults (both with and without cognitive impairment) have difficulty responding to this scale. [120] [127]

### **Verbal Descriptor Scale**

The VDS consists of a series of phrases that represent different levels of pain intensity (e.g., "no pain," "mild pain," "moderate pain," "severe pain," "extreme pain," and "the most intense pain imaginable"). [59] It has shown good reliability and validity when used with older adults. Because it requires that patients interpret and express their pain in verbal terms, the VDS is best suited for more articulate patients. Of all the pain intensity scales evaluated with older adults, the VDS is the preferred pain scale for many older adults. [58] [59] In a recent experimental pain study that evaluated 89 older adults, [59] 100% were able to complete this scale. Even when evaluated for use among cognitively impaired elderly patients, the VDS demonstrates a 73% completion rate. [34] The present pain inventory (PPI) is another VDS, which uses the adjectives none, mild, discomforting, distressing, horrible, and excruciating to describe pain. [86] The PPI demonstrates good validity and is feasible for older patients, including those with mild to moderate cognitive impairment, with completion rates up to 65% [39] [99] [121] [127]; however, some researchers note more difficulty with its use by cognitively impaired persons when compared with a descriptor scale with simpler vocabulary. [35]

The pain thermometer (PT) [58] [101] is a variation of the VDS in that it is a vertical adjectival scale, but it also illustrates a thermometer along the continuum of adjectives describing pain. The PT is preferred for patients with moderate to severe cognitive deficits or for patients who have difficulty with abstract thinking and communicating verbally.

Studies indicate that many older adults prefer the PT to the VAS or to the NRS, [58] [123] and the PT demonstrates good psychometric properties in persons with substantial levels of cognitive impairment. [118] In one sample of nursing home patients, a learning effect emerged when evaluating the use of the PT. Therefore, it is advisable to allow for practice time (and with all pain measurement tools) before recording the patient's response. [123]

### **Pictorial Pain Scales**

The FPS [13] and the Wong-Baker Faces Pain Scale [126] consist of a series of progressively distressed facial expressions which were developed for use with children. The patient chooses the face that represents the severity or intensity of their current pain. Psychometric evaluations of the FPS suggest that it is a reliable and valid alternative for assessing pain intensity in cognitively intact and mild to moderately impaired elders. [59] [61] [110] Preliminary evaluation of the FPS with 39 cognitively intact and impaired African-American older adults suggests that the FPS may actually be measuring a broader pain construct that includes affective and sensory components. [113] Although the FPS demonstrates good psychometric properties among cognitively intact older adults, [61] [110] evaluations of its use among larger samples of cognitively impaired older adults are limited. The FPS is clearly advantageous for older adults with limited education, low literacy levels, or dyslexia. The ability to complete the Wong-Baker Faces Pain Scale has been evaluated in a sample of diverse ages, including 83 (31%) adults over 60 years of age. This scale was selected as easiest to use by 47% of subjects, followed by the NRS (35%). Focused psychometric evaluation of this tool for use with older adults is needed.

### **Visual Analogue Scale**

The VAS consists of a 10-cm line, with the left-hand side labeled "no pain" and the right-hand side labeled "most intense pain imaginable" (or similar descriptor). Although the VAS has acceptable psychomotor properties with older adults, it has a higher failure rate than other less abstract tools. [39] [58] [59] [127] A controlled study using experimental pain stimulus with 89 elders and 86 nonelders showed that failure to use the VAS correctly was related to educational level, cognitive impairment and motor abilities, and not age, per se. [59] Although the VAS is relatively easy to use, it does require abstract thought and sensory, motor, and perceptual abilities necessary to use a pencil (or other fine-point writing instrument) to mark the line. Therefore, the VAS may be inappropriate for patients with lower levels of education or with impaired cognition. If used to measure pain in persons with mildly impaired abstract thinking abilities, a vertical presentation of the 10-cm line is preferable to a horizontal presentation. [57]

### **McGill Pain Questionnaire**

The McGill Pain Questionnaire (MPQ) is a well-known tool for the thorough evaluation of pain location, intensity, temporal qualities, and sensitivity to change, as well as sensory and affective aspects of pain. [86] Although preliminary results suggest that the MPQ is easily understood by older adults and that it shows good concurrent validity with other pain intensity scales, [121] it is not recommended for use by illiterate or cognitively impaired individuals. Because the length of the MPQ may be overwhelming for some older adults, a short version of the MPQ is available, which consists of a 15-word descriptor list with a VDS and VAS for determining pain intensity. [87] Although the MPQ Short Form is less time-consuming to administer, it does not evaluate pain location (as in the long form). The short form has been successfully used in pain clinics for older adults over several years, [56] although it should be noted that neither version of the MPQ has been systematically evaluated for use among persons with cognitive impairment.



## Pain Interview

The use of a structured pain interview, which asks simple questions regarding the presence or absence of pain or discomfort, pain intensity, frequency, location, and impact on daily activities, has been shown to be a feasible approach to gathering pain information from the cognitively impaired older adult. [40] [91] [120] Preliminary research suggests that the pain interview can provide evidence of the presence of pain, even in those unable to respond to pain scales.

## Summary

A variety of self-report pain measurement tools are appropriate to use with older adults in both clinical and research settings, depending on the individuals' cognitive, verbal, auditory, and motor abilities and educational level. It should be noted, however, that research examining the cognitively impaired older adult's ability to use pain scales has provided limited evidence of understanding of tool use, validity of pain report, and determination of levels of cognitive impairment to direct tool choice. At this time, the key for practice is to find an assessment tool that patients can easily use and consistently use with each assessment.

Although VDS, PT, NRS, and FPS have acceptable validity when used among older adults, [15] [35] [58] [59] [61] [110] [118] studies suggest that older adults prefer VDS and NRS. [39] [58] [59] Because of its established psychometric properties, increased ability to discriminate levels of pain, and common use in clinical practice for other populations, use of a 0 to 10 NRS is a good first choice for most older adults.

For adults with mild to moderate cognitive impairment, the PT and VDS are recommended, followed by the FPS, for measuring pain intensity, [39] [59] [118] and the pain map (discussed earlier) is suggested for determining the location and extent of pain. [118] If the patient has severe cognitive deficits, other methods of assessment are necessary, including observation of behavior and surrogate reporting.

## Observational Methods

Noncommunicative, illiterate, and cognitively impaired patients present a challenge when trying to assess their pain using either traditional or modified numeric or verbal pain measurement scales. An alternative approach is the evaluation of behavioral manifestations of pain. [16] [66] [88] [104] [106] Pain behavior protocols have been developed for the general population, [73] [75] [100] and investigators have demonstrated that observational methods of evaluating pain behaviors are psychometrically sound when used with the general population (e.g., acute pain, communicative patients with chronic lower back pain, and osteoarthritic knee pain) and that the behaviors are sensitive to treatment effects. [73] [121] The utility and validity of these approaches with cognitively impaired older adults, however, has yet to be determined.

A large number of pain indicators among cognitively impaired adults have been identified, including nonverbal cues and behaviors, [10] [11] [34] [66] [99] [106] [119] vocalizations, [34] [35] [66] [77] facial indices, [10] [23] [34] [66] [77] and changes in usual behavior [10] [34] [35] [77] [84] (Table 2).

Knowledge of the patient's unique pain behavior or expression is an important component of pain assessment, and family input may be needed to determine the patient's usual pain behaviors. Studies evaluating the use of observational approaches note that behavioral indicators are more evident when the older person is engaged in activity, such as transfers,

ambulation, and repositioning and that observation at rest can be misleading. [11] [34] [35] [99]

It still remains to be shown whether behavioral observations (e.g., agitation, restlessness, groaning, facial expressions) are sensitive and specific for pain assessment among older persons with dementia. [2] In noncommunicative older adults with severe cognitive impairment, typical pain behaviors may be absent or difficult to interpret because of many confounding factors that can impact behavior in the patient with dementia. For example, research on the facial expression of emotion among cognitively impaired persons suggests that some forms of dementia tend to mute facial expression, whereas other forms do not impact facial expressions at all. [9] Although behavioral change appears to be the most reliable means of evaluating pain in this population, empirical study in this area is limited. [44] [79] [96]

In an effort to enhance the validity and reliability of using pain behaviors to quantify pain in older adults with severe cognitive impairment, investigators have developed and are evaluating assessment approaches that focus on behavioral observation approaches. Checklists of pain behaviors developed for use by providers in the clinical setting appear to be congruent with behaviors identified by other researchers [10] [106]; however, these approaches need further validation and refinement before they are used in practice settings.

The Discomfort Scale for Dementia of the Alzheimer's type (DS-DAT) consists of items covering vocalizations, facial expressions, and body language and is developed specifically for use among persons with dementia. [66] The DS-DAT demonstrates acceptable validity and reliability; however, its usefulness has been questioned because of the in-depth training required and because of lack of study of its sensitivity across settings and populations. [64] [88] Further, the DS-DAT is a measure of discomfort (e.g., validated with elevated temperature), and its validity as a pain measure is not clear.

The Checklist of Nonverbal Pain Indicators is a modification of the UAB-PBS [100] tool involving patient observation at rest and during movement of six pain-related behaviors, including vocalizations, grimaces, bracing, rubbing, restlessness, and verbal complaints. [34] The tool addresses the unique needs of the demented population and shows preliminary validity and modest reliability with cognitively impaired older adults in the acute care setting; however, additional refinement and evaluation with larger samples in diverse settings is needed to determine its utility with the demented older adult in acute and chronic pain.

A particularly interesting line of research focuses on the use of an analgesic trial as part of the protocol for assessing presence of pain in the noncommunicative older adult. [10] [77] Preliminary findings from these studies indicate that use of an analgesic trial for patients with changes in typical behavior patterns suggestive of pain can produce improvements in behavior and reduction in pain-related behaviors. Further focused empirical study in this area may be fruitful in addressing the pain assessment and management issues for the demented older adult.

### Surrogate Reporting

When older patients are unable to use traditional self-report pain instruments, eliciting information from surrogates (e.g., family, aides) may be necessary. [2] Although studies of pain behavior observation protocols suggest that well-trained surrogate ratings of pain are relatively accurate, [8] [28] [73] [100] outcomes for health care and family surrogates are much more disappointing. When patient self-reported pain ratings are compared with those of professional caregivers (health care surrogates), both physicians and nurses tend to

underestimate the severity of the patient's pain. [50] [104] [119] Although family caregivers are more adept at estimating the pain of others, they tend to overestimate the intensity of pain. [19] [42] [81] [128] Clearly, further investigative efforts are needed to refine the process of surrogate pain rating. But, until we have a more reliable method of detecting pain in older noncommunicative patients, surrogate reporting of pain must be considered in our efforts to judge pain in this population.

## Conclusion

Pain experiences of older adults are often complex and multidimensional, and require multidisciplinary management. A pain assessment plan that relies on a patient's or a family member's request for analgesia will result in intervals of inadequate pain control with concomitant psychological burden and loss of function. Effective pain control for all persons must become a major component of health care in all treatment settings. A systematic process by which pain is recognized, assessed, documented, and reassessed on a regular basis will result in improved pain management for all patients, especially older adults. The process begins with each member of the health care team becoming "pain vigilant," being constantly alert to cues that suggest the older adult may be experiencing pain, and adapting assessment approaches to meet the needs of each individual. Finally, periodic institutional-level evaluation studies should be conducted to monitor the effectiveness of pain assessment and management procedures.

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**Table 1**

Pain intensity measurement scales

Pain Intensity Scales	Characteristics	Selected Studies	Sample Evaluated	Cognitively Impaired Older Adults in Sample	Unable to Use the Scale
Numeric rating scales	Preferred by many older adults (16%–35%)	Carey [15]	267 AC, age 16–91	No	Unknown
Written	Written version requires use of hands	Ferrell [39]	134 LTC, age 49–103	Yes	V = 53%
Verbal	Verbal version requires speech	Herr [58]	46 CD, age 65–93	No	W = 7.4%
	Requires abstract thought	Herr [59]	175 CD and LTC, age 25–95	Yes	V = 1%
	Categorizes pain severity	Morrison [89]	165 AC, age 20–105	No	W = 2.2%
	Equal distance between pain categories			Unknown	Unknown
	Sensitive to change in pain				
Verbal descriptor scales	Preferred by many older adults (13% 38%)	Stuppy [110]	60 AC, age 55–87	No	W = 0%
	Requires speech	Weiner [123]	115 LTC, age 32–99	Yes	W = 6%
	Does not require use of hands	Weiner [120]	158 LTC, age 35–99	Yes	20–42%
	Requires abstract thought	Wynne [127]	37 LTC, mean age of 78.4 ( $\pm 11.11$ )	Yes	V = 49%
	Categorizes pain severity	Ferrell [39]	134 LTC, age 49–103	Yes	35%–PPI
5–7 Word Scales	Unequal intervals between descriptive anchors	Herr [58]	46 CD, age 65–93	No	3.7%
Present Pain Inventory	Limited number of response categories	Herr [59]	175 CD and LTC, age 25–95	Yes	0%
Pain Thermometer	Preferred by many older adults (31%)	Stuppy [110]	60 AC, age 55–87	No	0%
	Does not require speech	Weiner [123]	115 LTC, age 32–99	Yes	Unknown
	Requires use of hands	Wynne [127]	37 LTC, mean age of 78.4 ( $\pm 11.11$ )	Yes	27 = PPI
	Requires abstract thought	Herr and Mobily [57]	46 CD, age 65–93	No	0%
	Unequal intervals between descriptive anchors	Weiner [123]	115 LTC, age 32–99	Yes	0%
Pictorial Pain Scales	Limited number of response categories	Carey [15]	267 AC, age 16–91	No	Unknown
	Preferred by many older adults (13% 53%)	Herr [59]	175 CD and LTC, age 25–95	Yes	1% = FPS
Faces Pain Scale	Does not require speech				
Wong-Baker Pain Scale	Requires use of hands	Herr [61]	168 CD, age 65–93	No	1% = FPS
	Questionable intervals between response categories				

Pain Intensity Scales	Characteristics	Selected Studies	Sample Evaluated	Cognitively Impaired Older Adults in Sample	Unable to Use the Scale
Visual Analogue Scales	Limited number of response categories  Not preferred by many older adults (3% 16%) Requires use of hands	Stuppy [110] Taylor [113] Wynne [127]	60 AC, age 55–87 39 CD, age 62–90 37 LTC, mean age of 78.4 ( $\pm 11.11$ )	No Yes Yes	0% = FPS 0% = FPS 39% = W-BPS
Vertical	Does not require use of speech Requires greater abstract thought	Carey [15] Ferrell [39] Herr [58]	267 AC, age 16–91 134 LTC, age 49–103 46 CD, age 65–93	No Yes	Unknown 56% 3.7%
Horizontal	Continuous variable (allows sophisticated analyses) Highly sensitive to change in pain Extra step in scoring adds source of error	Herr [59] Stuppy [110] Wynne [127]	168 CD, age 65–93 60 AC, age 55–87 37 LTC, mean age of 78.4 ( $\pm 11.11$ )	Yes No Yes	6.7% Unknown 43%

LTC = long-term care; CD = community dwelling; AC = acute care; PC = pain clinic; PPI = Present Pain Inventory; V = verbal; W = written; FPS = Faces Pain Scale; W-BPS = Wong-Baker Pain Scale.

**Table 2**

## Observational indicators of pain

Type of Behavior		Specific Behavior	
Nonverbal cues and behaviors	Agitation	Repositioning	
	Bracing	Restlessness	
	Distorted posture	Rocking	
	Fidgeting	Rubbing	
	Guarding or splinting	Shortness of breath	
	Noisy breathing	Social withdrawal	
	Rapid eye blinking	Tense body language	
	Nonverbal vocalizations	Crying	Moaning
		Groaning	Sighing
		Grunting	Yelling/screaming
Other vocalizations	Asks for assistance with movement	Talks more than usual Use of profanity	
	Perseverant (repetitive) vocalizations	Verbal outbursts	
	Requests analgesics	Words of discomfort	
	Requests to be "left alone"	Words of protest	
	Talks about pain		
	Facial expressions	Brow lowering with mouth open	Jaw-drop
		Clenched teeth	Narrow or closed eyes
		Distorted facial expression	Sad facial expression
		Fearful facial expression	Tightened lips
		Frowning	Wincing
Grimacing		Wrinkled forehead/furrowed brow	
Changes in usual behavior		Aggression	Fatigue
	Agitation/irritability	Impaired mobility	
	Altered appetite/refusal to eat	Increased confusion	
	Altered gait or limping	Lying down more frequently	
	Altered sleep pattern	Move slower than usual	
	Anxiety	Pace/walk more than usual	
	Attention-seeking behavior	Resistance to care	
	Change in level of activity	Social withdrawal	
	Depression	Uses assistive devices (e.g., walker)	
	Difficult getting up from sitting/lying		