

Original Article

Measuring Pain Intensity in Nursing Home Residents

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Abstract

Assessing pain intensity in nursing home residents remains a challenge. As part of a multifaceted intervention study to improve pain practices in nursing homes, quarterly pain assessments were conducted in 12 Colorado nursing homes. Residents who reported pain or discomfort of any kind in the past 24 hours were asked to choose one of three pain intensity scales to quantify their current and highest level of pain intensity. They were also observed for pain behaviors using Feldt's Checklist of Nonverbal Pain Indicators. Residents preferred the Verbal Descriptor Scale almost 2:1 over the 11-point Verbal Numeric Rating Scale and the Faces Pain Scale. Sex and ethnicity were associated with differences in scale preference. More than one-half of residents reporting pain had an observable pain indicator. There was a monotonic relationship between reported pain intensity and number of observed pain indicators. To improve pain assessment and management in nursing homes, residents should be given a choice of pain intensity scales and observed for possible pain behaviors. J Pain Symptom Manage 2005;30:519–527. © 2005 U.S. Cancer Pain Relief Committee. Published by Elsevier Inc. All rights reserved.

Key Words

Pain, pain intensity scales, pain behaviors, nursing homes

Introduction

Older adults are known to be at increased risk for pain, with prevalence rates as high as

84% in nursing home residents.^{1–5} Studies have reported that a quarter of residents experiencing daily pain fail to receive analgesia for that pain.^{6,7} The risk of not being treated for pain is significantly higher for those over age 85, those with cognitive impairment,⁸ and those who are members of an ethnic minority group.^{6,7} The consequences of unrelieved pain include the following: depression and anxiety, decreased interaction with others, sleep disturbances, impaired mobility, loss of appetite and

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poor nutrition, agitation and delirium, delayed healing, lower quality of life, and higher health care utilization and costs.^{9,10}

Accurate detection of pain is an essential prerequisite to adequate pain management.¹¹ Pain assessment in all individuals is challenging because pain is a subjective experience for which there are no objective biological markers.¹² Pain must, therefore, be measured using self-report. However, the use of self-report in the elderly is made difficult by memory or sensory impairments, depression, and cognitive decline. Further compounding the challenge is the fact that the elderly tend to under-report pain, believing pain is part of the aging process,¹³ and are reluctant to request pain medication for a variety of reasons,¹⁴ including not wanting to bother the health care provider. Clinicians in long-term care settings often underrecognize, underassess, and undertreat pain.¹⁵ Accurate pain assessment and optimal treatment across all ages and ethnic groups have been recommended by multiple professional, and regulatory agencies.¹⁶

Clinical practice guidelines are available for assessing and treating pain in older adults and others,^{10,17–20} and recommend that pain be regularly assessed using a standard pain scale for the quantitative assessment of the pain intensity. Regular pain assessments should be conducted upon admission, if a resident is suspected to be in pain, or when a resident's condition changes; reassessment should occur after an analgesic or nonpharmacologic intervention.^{10,11} There are several instruments available for measuring pain intensity, although validation of their usefulness and reliability in the elderly population has only recently been established. Resident sensory and cognitive impairments make adoption in the nursing home setting even more difficult.²¹ Moreover, pain intensity scales that are valid and reliable for different cultural and ethnic groups are increasingly required, as the proportion of minority elders is projected to increase rapidly over the next 20 years. Studies that focus on appropriate scales and strategies for assessing pain in ethnic minorities remain limited.¹⁶

Pain Intensity Scales

Use of a pain intensity scale is helpful in identifying the presence and severity of pain.

The 11-point Verbal Numeric Rating Scale (VNS), Verbal Descriptor Scale (VDS), and Faces Pain Scale (FPS) are the most commonly used tools for measuring pain intensity^{22,23} and have been shown to be valid and sensitive in general populations.^{16,24} These tools have also established validity and reliability as options for assessing pain intensity in older adults, including some with mild-to-moderate cognitive impairment.^{2,16,21,25–33}

Verbal Numeric Rating Scale. The VNS is a tool that enjoys widespread use due to its ease of administration. Patients are asked to rate their pain on a scale from 0 to 10, where 0 represents “no pain” and 10 represents the “worst possible pain” or “pain as bad as it can be” using whole numbers (11 integers including 0). The VNS is derived from the visual analogue scale (VAS), which was originally developed to measure pain intensity on a 10 cm line with anchor words at opposite ends. Often the value of “4” is used to confirm assessed need for further intervention or to document that the patient's goals for analgesia have been achieved.³⁴ Although validated for use with the elderly, a substantial portion of older adults (both with and without cognitive impairment) have difficulty responding to this scale, particularly if administered verbally.^{32,33}

Verbal Descriptor Scale. The VDS is a scale that incorporates descriptors that are ordinally organized and describe different levels of pain.^{35,36} The words are arranged to describe increasing intensity of pain and are associated with a number that is also organized in a progressive manner. Participants are asked to select the word that best describes their pain—no pain, mild pain, moderate pain, severe pain, very severe pain, and most intense pain imaginable.³⁷ It has demonstrated good reliability and validity with older adults³⁶ and when compared with other pain intensity scales, is often the preferred tool for many older adults.^{36,38} The VDS has also been used successfully with cognitively impaired older adults.³⁹ Advantages of using the VDS include ease of administration and wide applicability.³⁶ Limitations include the possibility that the words may not have the same meaning for each individual, and the intervals between

words do not represent equal segments on the scale.^{37,40}

Faces Pain Scale. Developed by Bieri et al.,⁴¹ the FPS consists of a series of progressively distressed facial expressions that represent the intensity of current pain. The seven line-drawn, oval-shaped faces (without tears) are presented in a horizontal format to represent increasing pain intensity levels. Herr et al.²⁵ found preliminary support for the construct validity, strong ordinal properties, and strong test-retest reliability of the FPS in a sample of white, elderly individuals in the community. Stuppy⁴² evaluated the reliability and validity of the FPS using a sample of 60 patients older than 55, 25 of whom were African-American. Findings revealed that the FPS was reliable, valid, and sensitive to change and was preferred to the NRS, VAS, and VDS by 53% of the subjects, with no difference in preference exhibited by race. Taylor and Herr¹⁶ evaluated the reliability and validity of the Bieri FPS as a pain intensity scale for use with African-American older adults. They reported good test-retest reliability and support for the ordinal nature of the scale, but also found that the meaning of the faces was influenced by the context of the assessment situation. It appeared that the FPS may measure an overall pain construct rather than only pain intensity. The FPS is viewed as a reliable and valid alternative to assess pain intensity in cognitively intact and mild to moderately impaired older adults, and should be considered for use with older adults who are illiterate, dyslexic, or non-English speaking.⁴³

Scales for Pain Assessment in Cognitively Impaired Older Adults

The most challenging assessments are for those residents with severe cognitive impairment and those unable to report their pain verbally.⁴³ Several tools have been developed for the assessment of pain in those with cognitive impairment.⁴⁴ The Checklist of Nonverbal Pain Indicators (CNPI) developed by Feldt,³⁹ was modified from the University of Alabama-Birmingham Pain Behavior Scale used in patients with chronic pain. Health care providers note the presence (score 1) or absence (score 0) of six categories of pain-related behaviors (nonverbal vocalizations, facial grimaces, bracing, rubbing, restlessness, and verbal

complaints) in cognitively impaired residents at rest and during movement. A total possible score (0–12) of behavioral pain indicators is calculated. The tool has been used to identify the presence, not the intensity, of pain. This tool was found to be reliable and valid among cognitively impaired older adults and easy to use by nursing staff.^{27,39}

Choice of Pain Intensity Scale

Various types and combinations of pain intensity scales have been studied in cognitively impaired and unimpaired elderly and nursing home residents. Manz et al.²⁹ evaluated five different pain scales and concluded that most elderly with normal to moderately impaired cognitive functioning, as well as some severely impaired elderly, are capable of using self-report tools to rate their pain. However, they also found that only 45% of the residents communicated a preference for a particular tool. Chibnall and Tait³⁰ compared the psychometric properties of four pain scales (VDS, FPS, 21-point horizontal, and vertical boxes scales) in hospitalized older adults. They found support for use of the 21-point box scale in elders regardless of cognitive impairment. Kamel et al.¹² conducted a cross-sectional study of two groups of elderly nursing home subjects. One group had their pain assessed by being asked if they had pain; the second group was presented with a combination of three standard pain assessment instruments (VAS, FPS, and VDS). Pain prevalence was reported to be 15% in the first group and 30% in the second group, suggesting that using a pain assessment scale increases the possibility of diagnosing pain. Closs et al.²¹ compared five different pain assessment scales in nursing home residents with varying degrees of cognitive impairment and found the VDS was used most successfully, with a completion rate of over 80%. Pain scores were consistent on the five scales in those residents with no cognitive impairment and were poorly consistent in those with severe cognitive impairment. Krulewitch et al.³¹ found that the number of tools completed by cognitively impaired community-dwelling elders decreased with increased cognitive impairment. Taylor and Herr¹⁶ asked 57 elderly African-Americans to select a preference from among four pain intensity scales: the FPS, VDS, NRS, and the Iowa Pain

Thermometer (a modified VDS with more response options). The majority of respondents selected the FPS, however, almost 40% of the subjects had no preference for a specific pain intensity scale and cognitive impairment did not inhibit older minority subjects' ability to use a variety of pain intensity scales. A recent study by Herr et al.³⁶ compared the psychometric properties and usability of five pain rating scales (vertical visual analog scale, 21-point NRS, VDS, 11-point VNS, and FPS). They found the VDS to be most sensitive and reliable. The scale most preferred by both young and old cohorts was the NRS, followed by the VDS. Scale preference was not related to cognitive status, educational level, age, race, or sex. Thus, no single pain scale has been found to be appropriate for all older adults. Moreover, cultural and linguistic differences (e.g., words used to describe pain, verbal fluency) may influence pain assessment and choice of intensity scale. This paper presents new information regarding what intensity scale nursing home residents do select when requested to identify their pain level. It also reports a previously unknown relationship between number of non-verbal pain indicators and reported intensity of pain.

Methods

An intervention study to improve pain practices was conducted in 12 nursing homes in Colorado. Six nursing homes received the multifaceted intervention while the other six served as controls. A detailed description of the study methodology can be found elsewhere.^{45,46} In brief, the multifaceted intervention consisted of an educational component (comprehensive pain resource binder, four staff development sessions, a videotape with case vignettes, posted pain "factoids", a resident educational video and pamphlet, and a single CME session for affiliated physicians) and a behavioral component (formation of an internal pain team to function as change agents, pain rounds and consultations, and creation of a pain vital sign). Baseline information was collected using staff focus groups, surveys of staff knowledge and attitudes towards pain in the elderly, and resident interviews and chart reviews. Postintervention measures were collected using key informant interviews,

staff knowledge and attitude surveys, and resident interviews and chart reviews. Analysis of staff knowledge and attitude changes as a result of the intervention and intervention implementation challenges are reported elsewhere.^{45,46}

Resident Pain Assessments

Every 3 months in every study nursing home, a resident pain assessment was conducted by research assistants on a 20% random sample of residents (with oversampling of Hispanic/Latino residents) for a total of nine pain assessments. The research assistants requested a copy of the daily census and selected every 5th resident, until the necessary sample size was reached. There were the following minimal exclusion criteria: imminent death, absence from the facility during the data collection period, and original admission to the nursing home for a psychiatric disorder. If a resident was not available, the research assistant approached the roommate if one was present. If the required sample size was not achieved using this method, the research assistant was instructed to supplement the sampling with Hispanic/Latino residents if possible. It was necessary to obtain written consent from the subjects or written/verbal consent from legal guardians prior to inclusion in the study. This required asking the resident to return to his/her room if not already there, discussing the study and consent form (and eventually a Health Insurance Portability and Accountability Act, HIPPA release form as well), and getting a signature. Thus, the sequence of data collection activities needed to move from informed consent to pain interview to pain observation, and then to chart and medication administration record (MAR) review.

The research assistants were trained by the study investigators. The interview questions and chart abstraction forms were field tested and modified prior to being used in the study. The quick pain assessment consisted of 11 questions, but number of questions asked depended on respondent answers. The interview began by ascertaining whether the resident had pain, or an equivalent word, since the same time the day before. If the resident responded "no", the research assistant probed for alternative words (aches, soreness, cramps, discomfort). If the resident still denied pain,

the interviewer thanked the resident for their participation and proceeded to the observation phase. If the resident reported pain, the research assistant then asked a series of questions as follows about that pain: location, intensity, duration, extent to which bothered by pain, whether resident asked for pain medication, had to wait for pain medication, never received requested pain medication, whether pain medication helped, extent to which pain medication helped, whether resident had pain but did not request pain medication, and satisfaction with pain management.

Pain intensity was assessed using one of three pain intensity tools. These were selected based on available evidence of their validity and usefulness in a nursing home setting with elderly residents with varying levels of cognitive and sensory impairment, literacy levels, and language skills. The seven-face Bieri FPS (without tears), seven-level VDS (no pain, slight pain, mild pain, moderate pain, severe pain, extreme pain, and pain as bad as it could be), and 11-level VNS (anchored by 0—no pain at one end and 10—worst possible pain on the other) were printed in black ink using large lettering on a trifold piece of paper. The research assistant would first show the resident the three different scales, and ask which one he/she would like to use to show how intense any reported pain was, both now and at its worst level in the last 24 hours. Once the resident selected a scale, the other two scales were folded under, so only the selected scale was visible to the resident. The last step in the pain assessment was observation of the resident at rest and upon movement, using Feldt's CNPI. The research assistant was instructed to either observe the resident move from the bed or chair at the conclusion of the interview, or to ask the staff to notify them when the resident was going to be assisted to move. Residents who were randomly selected for participation but were unable to respond to the initial question about pain were included in the study if consent was obtained from the legal guardian. They were observed for pain indicators using the CNPI, and their chart abstracted for pain-related information.

Statistical Analysis

Data were coded, entered into an SPSS database, and analyzed using SPSS and SAS for

Windows. Descriptive and multivariate analyses were performed. The SAS CATMOD (SAS Computer Software, SAS Institute, Inc., Cary, North Carolina) procedure was used to determine the maximum likelihood for selecting one pain intensity scale over the others, using the VDS as the comparison scale. Resident reports of pain intensity were converted to four broad categories using the scale words themselves, research team member consensus, and clinical practice guidelines: none, mild, moderate, or severe.¹⁹ The Minimum Data Set (MDS) uses broad categories of pain intensity (none, mild, moderate, excruciating) while the Medicare Nursing Home Compare report card reflects residents identified as being in moderate or excruciating pain. The number of nonverbal pain indicators was determined by summing the number of indicators at rest and on movement.

Results

The study sample consisted of 1182 nursing home residents with nonrepeated data over the nine quarterly data collections. Of these, 917 residents were included in the first six rounds and are the focus of this analysis. (The remaining three rounds of data collection used different procedures.) The sample demographics were 85% white and 13% Hispanic; 70% female; 52% urban; and 62% with Medicaid coverage. Mean age was 81 (± 12.9 years) and mean length of stay was 724 (± 1229 days). Of the 917 unrepeated subjects interviewed, 508 (59%) reported pain, and 477 (52%) were able to select and use a pain intensity scale to rate their pain. The VDS was the preferred tool for more than half the residents (52%, [Table 1](#)), compared to 29% for the VNS and 19% for the FPS. The majority of residents reporting pain in the past 24 hours, regardless of scale preference, reported no or mild pain at the current time (the interviewer asked whether the resident had experienced pain in the past 24 hours, then proceeded to ask the resident to identify intensity of their pain both at the time of surgery and at its worst level) ([Table 1](#)). There were some interesting variations in the strength of expressed preferences by certain resident subgroups, although all groups rated the VDS as the most preferred scale. Male residents were significantly more

Table 1
Reported Pain Intensity at the Time of Interview by Preferred Pain Intensity Scale

Pain Intensity					
Scale	None	Mild	Moderate	Severe	All
NRS	25 (18%)	43 (32%)	46 (34%)	22 (16%)	136 (29%)
FPS	8 (9%)	41 (45%)	31 (34%)	11 (12%)	91 (19%)
VDS	42 (17%)	111 (45%)	63 (25%)	32 (13%)	248 (52%)
Total	75 (16%)	195 (41%)	140 (30%)	65 (14%)	475

$\chi^2 = 11.6$; $P = 0.07$.

likely to prefer the VNS scale than females (Figure 1). Minority (90% Hispanic/Latino) residents were significantly more likely to prefer the FPS than white residents (Figure 1).

The resident's self-report of pain was also compared to the overall results of the CNPI,³⁹ which was completed on every subject at rest and on movement. It was hypothesized that residents who reported pain would have at least one observable indicator of pain and that the number of observable indicators of pain would increase with greater reported pain intensity. The results, shown in Table 2, suggest that the CNPI has better specificity than sensitivity for identifying presence of pain. Of those residents reporting pain, 53% had at least one indicator of pain observed by the data collector. Of those not reporting pain, 85% did not have an observable indicator of pain. Figure 2 shows that there was a monotonic relationship between reported intensity of pain and number of observable pain indicators. This relationship held for both intensity of current pain and intensity of worst pain in the past 24 hours, although the relationship was stronger for current pain, as might be expected. Correlation analysis using Spearman's rho

showed that this relationship was statistically significant (pain now: $\rho = 0.490$, $P < 0.001$; pain worst: $\rho = 0.468$, $P < 0.001$). Although somewhat smaller in magnitude (minimum, 0.284 [$P = 0.002$]; maximum, 0.447 [$P < 0.001$]), correlations obtained between CNPI scores on residents at rest or CNPI scores on residents with movement and uncategorized pain intensity scores were similar to those obtained on total CNPI scores and categorized pain intensity scores.

There were some interesting differences in observable pain indicators under the two observation conditions (at rest, upon movement). Moving from observations at rest to observations upon movement, the percentage of residents having observed nonverbal vocalizations, facial grimaces, bracing, and verbal vocalizations increased (nonverbal from 6% to 19%; facial from 13% to 30%; bracing from 5% to 13%; and verbal from 2% to 6%). On the other hand, the percent observed to be restless or rubbing body parts slightly decreased when the resident was moving (restlessness from 6% to 4% and rubbing from 6% to 3%).

Multinomial logistic regression analyses showed that males were 1.3 times more likely than females to choose the VNS over the VDS ($P = 0.02$); non-whites were 1.4 times more likely than whites to choose the FPS over the VDS ($P = 0.03$); and those in moderate or

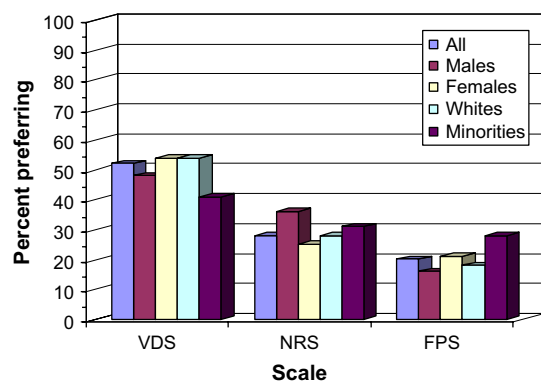


Fig 1. Preference for pain intensity scale by resident demographics.

Table 2
Reported Presence of Pain in Last 24 Hours by Number of Observed Nonverbal Pain Indicators

Reported pain	Number of Observed Nonverbal Indicators of Pain		
	None	One or more	Total
No	303 (85%)	55 (15%)	358 (41%)
Yes	230 (45%)	278 (55%)	508 (59%)
Total	533 (62%)	333 (38%)	866

$\chi^2 = 137.5$; $P < 0.001$.

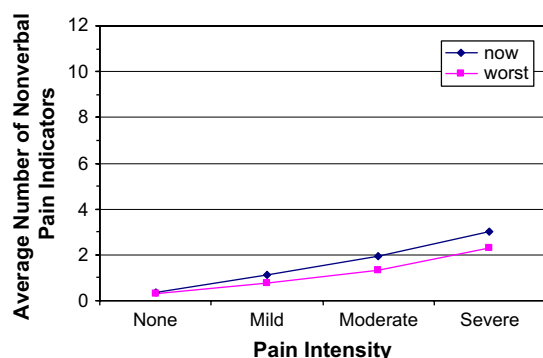


Fig 2. Reported pain intensity by average number of observed nonverbal pain indicators.

severe pain were 1.4 times more likely than those in no or mild pain to choose the VNS as compared to the VDS ($P = 0.007$).

Discussion

Consistent with prior studies, we found that the majority of nursing home residents were able to answer direct questions about the presence and location of pain, regardless of level of cognitive impairment. Slightly fewer residents were able to select a pain intensity tool on which to report the level of their pain. When presented with a choice of which pain intensity tool to use when reporting their pain level, almost all the residents were able to select one. There were, however, definite differences in preferences across the three possible choices, with the VDS being the preferred tool on a 2:1 basis. This was followed by the VNS and then the FPS.

However, our analysis also showed that preferences for a pain intensity scale are likely to vary according to specific subgroups of nursing home residents. Although we did not ask the subjects why they chose their preferred tool, some general observations can be drawn. Men seem to be more comfortable using numbers and numeric scales than women, particularly in the older age groups. Nonwhites (in our study, primarily Hispanics/Latinos), may be less comfortable using English language descriptors, and more comfortable using a pictorial display of pain levels. On the other hand, those over age 85 are more likely to have more severe dementia or diminished visual acuity, and may feel more comfortable with words

rather than pictures. An interesting finding was the fact that those residents who reported being in moderate or severe pain were more likely to have chosen the VNS, or conversely, those using the VNS were more likely to be categorized as having moderate or severe pain. This finding suggests that the general level of pain (mild, moderate, or severe) being reported might differ according to which pain intensity tool is being used. This is important for individual residents since a rating of moderate or severe pain might result in more aggressive treatment. It has social and policy implications because pain level is documented on the MDS and used to generate scores on the Medicare Nursing Home Compare report card. If different nursing homes use different pain intensity tools, the variation in "quality" as reported on the Medicare's Nursing Home Compare website might be due in part to which pain intensity tool a nursing home uses rather than differences in pain management or general comfort level of its residents. This requires further analysis, and a way to calibrate pain levels accurately across pain intensity tools.

Among the most important findings of this study is the performance of Feldt's CNPI relative to resident self-report of pain. Only one-half of the residents who told the data collectors that they had pain had visible indicators of that pain. This implies that when staff members rely on observed pain behaviors alone, a significant amount of pain goes undetected and untreated. Yet feedback from nurses in our focus groups, and those completing the case studies on our knowledge and attitude surveys, suggested that many nursing home staff rely on observed pain behaviors in both their assessment and management of pain.^{46,47} In fact, many nurses "downgraded" resident reports of pain intensity if the observed behaviors were not consistent with what the staff member believed should have been displayed had the resident really been in that much pain. Conversely, our results also suggest that the CNPI could be used to judge the severity of pain, particularly in those residents unable to use a pain intensity tool, given that the number of observed pain behaviors did increase as the reported level of pain increased in those able to report their pain intensity. Since a substantial number of residents who could acknowledge being in pain could not report their

pain intensity, this finding, if replicated, could be used to improve pain management for a significant proportion of nursing home residents who are among the most difficult to assess and treat.

Conclusion

Our findings are consistent with those reported by other studies: most elderly and cognitively impaired nursing home residents are able to report their pain and its intensity. However, more than one pain intensity tool should be offered, since different preferences exist across specific subgroups of residents, and residents were able to select the tool they preferred. Nursing home staff members need to use pain self-report as the first approach to identifying resident pain, since observable indicators of pain are absent about one-half of the time. However, the presence of an increasing number of pain behaviors does suggest a higher pain intensity level in those unable to use a pain intensity scale.

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References

1. Ferrell BA, Ferrell BR, Osterweil D. Pain in the nursing home. *J Am Geriatr Soc* 1990;38:409–414.
2. Ferrell BA, Ferrell BR, Rivera L. Pain in cognitively impaired nursing home patients. *J Pain Symptom Manage* 1995;10:591–598.
3. Teno JM, Weitzen S, Wetle T, Mor V. Persistent pain in nursing homes: validating a pain scale for the Minimum Data Set. *Gerontologist* 2001;41:173–179.
4. Won A, Lapane K, Vallow S, et al. Persistent non-malignant pain and analgesic prescribing patterns in elderly nursing home residents. *J Am Geriatr Soc* 2004;52:867–874.
5. Teno JM, Kabumoto G, Wetle T, Roy J, Mor V. Daily pain that was excruciating and some time in the previous week: prevalence, characteristics, and outcomes in nursing home residents. *J Am Geriatr Soc* 2004;52:762–767.
6. Bernabei R, Gambassi G, Lapane K, et al. Management of pain in elderly cancer patients. *JAMA* 1998;279:1877–1882.
7. Won A, Lapane K, Gambassi G, et al. Correlates and management of nonmalignant pain in nursing homes. *J Am Geriatr Soc* 1999;47:936–942.
8. Horgas AS, Tsai PF. Analgesic drug prescription and use in cognitively impaired nursing home residents. *Nurs Res* 1998;47:235–242.
9. Stein WM, Ferrell BA. Pain in the nursing home. *Clin Geriatr Med* 1996;12:601–613.
10. American Geriatrics Society (AGS) Panel on Persistent Pain in Older Persons. Clinical practice guideline: the management of persistent pain in older persons. *J Am Geriatr Soc* 2002;50:S205–S224.
11. Bachino C, Snow AL, Kunik ME, Cody M, Winters K. Principles of pain assessment and treatment in non-communicative demented patients. *Clin Gerontol* 2001;23:97–114.
12. Kamel H, Phlavan M, Malekgoudarzi B, Gogel P, Morley JE. Utilizing pain assessment scales increases the frequency of diagnosing pain among elderly nursing home residents. *J Pain Symptom Manage* 2001;21:450–455.
13. Warden V, Hurley AC, Volicer L. Development and psychometric evaluation of the pain assessment in advanced dementia (PAINAD) scale. *J Am Med Dir Assoc* 2003;4:9–15.
14. Jones K, Fink R, Clark L, et al. Nursing home resident barriers to effective pain management: why nursing home residents may not seek pain medication. *J Am Med Dir Assoc* 2005;6:10–17.
15. Huffman JC, Kunik ME. Assessment and understanding of pain in patients with dementia. *Gerontologist* 2000;40:574–581.
16. Taylor LJ, Herr K. Pain intensity assessment: a comparison of selected pain intensity scales for use in cognitively intact and cognitively impaired African American older adults. *Pain Manag Nurs* 2003;4:87–95.
17. American Geriatrics Society (AGS) Panel on Chronic Pain in Older Persons. Clinical practice guidelines: the management of chronic pain in older persons. *J Am Geriatr Soc* 1998;46:635–651.
18. American Medical Directors Association (AMDA). Pain management in the long-term care setting: clinical practice guideline. Columbia, Maryland: AMDA, 2003.

19. National Comprehensive Cancer Network. Clinical practice guidelines in oncology. Adult Cancer Pain, V1. <http://www.nccn.org/Professionals/Physician-gls/PDF/contents.pdf>.
20. Miaskowski C, Cleary J, Burney R, et al. Guideline for the management of cancer pain in adults and children. APS Clinical Practice Guideline Series, No. 3. Glenview, Illinois: American Pain Society, 2005.
21. Closs SJ, Barr B, Briggs M, Cash K, Seers K. A comparison of five pain assessment scales for nursing home residents with varying degrees of cognitive impairment. *J Pain Symptom Manage* 2004;27:196–205.
22. McCaffery M, Pasero C. Pain: clinical manual, 2nd ed. St. Louis, Missouri: The C.V. Mosby Company, 1999.
23. McGuire D, Kim HJ, Lang X. Measuring pain. In: Frank-Stromborg M, Olsen SJ, eds. Instruments for clinical health-care research, 3rd ed. Jones and Bartlett Publishers Inc., Sudbury, MA, 2004: 603–644.
24. Jensen M. The validity and reliability of pain measures in adults with cancer. *J Pain* 2003;4:2–21.
25. Herr KA, Mobily PC, Kohart FJ, Wagenaar D. Evaluation of the faces pain scale for use with the elderly. *Clin J Pain* 1998;14:29–38.
26. Taylor LJ, Harris J, Epps CD, Herr K. Psychometric evaluation of selected pain intensity scales for use with cognitively impaired and cognitively intact older adults. *Rehabil Nurs* 2005;30:55–61.
27. Feldt KS, Ryden MB, Miles S. Treatment of pain in cognitively impaired compared with cognitively intact older adults with hip fracture. *J Am Geriatr Soc* 1998;46:1079–1085.
28. Rodriguez CS. Pain measurement in the elderly: a review. *Pain Manag Nurs* 2001;2:38–46.
29. Manz BD, Mosier R, Nusser-Gerlach MA, Bergstrom N, Agrawal S. Pain assessment in the cognitively impaired and unimpaired elderly. *Pain Manag Nurs* 2000;1:106–115.
30. Chibnall JT, Tait RC. Pain assessment in cognitively impaired and unimpaired older adults: a comparison of four scales. *Pain* 2001;92:173–186.
31. Krulewicz H, London MR, Skakel VJ, et al. Assessment of pain in cognitively impaired older adults: a comparison of pain assessment tools and their use by nonprofessional caregivers. *J Am Geriatr Soc* 2000;48:1607–1611.
32. Wynne CF, Ling SM, Remsburg R. Comparison of pain assessment instruments in cognitively intact and cognitively impaired nursing home residents. *Geriatr Nurs* 2000;21:20–23.
33. Weiner D, Peterson B, Ladd K, McConnell E, Keefe F. Pain in nursing home residents: an exploration of prevalence, staff perspectives, and practical aspects of measurement. *Clin J Pain* 1999;15:92–101.
34. Hartwick CT, Kovan JP, Shapiro S. The numeric rating scale for clinical pain measurement: a ratio measure? *Pain Practice* 2003;3:310–316.
35. Jensen MP, Karoly P, Braver S. The measurement of clinical pain intensity: a comparison of six methods. *Pain* 1986;27:117–126.
36. Herr KA, Spratt K, Mobily PR, Richardson G. Pain intensity in older adults. *Clin J Pain* 2004;20:207–219.
37. Ohnhaus EE, Adler R. Methodological problems in the measurement of pain: a comparison between the verbal rating scale and the visual analogue scale. *Pain* 1975;1:379–384.
38. Herr KA, Mobily PR. Comparison of selected pain assessment tools for use with the elderly. *Appl Nurs Res* 1993;6:39–46.
39. Feldt KS. The checklist of nonverbal pain indicators (CNPI). *Pain Manag Nurs* 2000;1:13–21.
40. Paice JA, Cohen FL. Validity of a verbally administered numeric rating scale to measure cancer pain intensity. *Cancer Nurs* 1997;20:88–93.
41. Bieri D, Reeve R, Champion GD, Addicoat L, Ziegler JB. The Faces Pain Scale for the self assessment of the severity of pain experienced by children: development, initial validation, and preliminary investigation for ratio scale properties. *Pain* 1990;41:139–150.
42. Stuppy DJ. The Faces Pain Scale: reliability and validity with mature adults. *Appl Nurs Res* 1998;11:84–89.
43. Weiner D, Herr K. Comprehensive interdisciplinary assessment and treatment planning: an integrative approach. In: Weiner DK, Herr K, Rudy TE, eds. Persistent pain in older adults. New York: Springer Publishing Company, 2002: 18–57.
44. Herr K, Decker S, Bjoro K. State of the art review of tools for assessment of pain in nonverbal older adults. Iowa City, Iowa: University of Iowa College of Nursing, 2004. Available from. <http://www.nursing.uiowa.edu/centers/gnirc/state%20of%20art%20review.htm> 2005. Accessed April 10.
45. Jones KR, Fink R, Vojir C, et al. Translation research in long-term care. *Worldviews on Evidence-Based Nursing* 2004;1:S13–S20.
46. Jones KR, Fink R, Pepper G, et al. Nursing home staff knowledge and attitudes about pain. *Gerontologist* 2004;44:469–478.
47. Clark L, Jones K, Pennington K. Pain assessment practices with nursing home residents. *West J Nurs Res* 2004;26:733–750.