

# **The Prevalence and Treatment of Pain in US Nursing Homes**

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## **EXECUTIVE SUMMARY**

### **Summary**

Nursing homes are increasingly where American elders are dying. The most recent data available from the National Center for Health Statistics reveals that one in five persons died in a nursing home in 1993, a figure that is double that reported 15 years earlier. It has been estimated that by 2040, 40% of deaths will occur in nursing homes. Moreover, the proportion of the elderly population who will use a nursing home, either as a place to recuperate or as a place to live for the rest of their lives, continues to grow. Consequently, how these institutions assess and manage the common symptom of pain represents a critical public health concern.

We used computerized, standardized resident assessment information from 11 states for 1996, to examine the prevalence of pain and its management in American nursing homes. Since the nursing home population is not homogeneous, we considered three types of nursing home residents: those newly admitted to a nursing home, a point prevalence cohort of all residents, (predominantly those staying a long time), and decedents. We conducted separate analyses of pain and its treatment among residents with cancer because they tend to have greater physiological reasons for experiencing pain. In states where consistent longitudinal resident assessment data were available, we were able to determine the proportion of residents who were apparently in persistent pain. For those states in which assessment data included detailed information about all drugs being used, we were able to examine the pharmacological treatment of daily pain. Finally, we examined the degree of variation in pain and its treatment across facilities within each state.

Our analyses reveal that pain abounds in nursing homes and, indeed, is likely to be substantially underestimated. Nearly one sixth of all nursing home residents are reported to be in daily pain. Among residents diagnosed with cancer, slightly more than one in five are in daily pain. The prevalence was similar among decedents; nearly one in five of whom were in daily pain at their last assessment, which occurred on average 47 days prior to death.

Furthermore, one in four newly admitted residents were in daily pain. Moreover, among residents observed to be in daily pain, we found that *two-thirds* were again reported to have been in daily pain at the next assessment 60 to 180 days later. What appears to be persistent daily pain plagues at least one in eleven nursing home residents.

Although the observed prevalence of daily pain may appear substantial, we believe that these data underestimate the prevalence of pain. An examination of the rates of pain by level of cognitive impairment reveals that lower rates of pain were reported for residents with more severe impairment. Rates of daily pain for those with severe impairment were less than half the rates for those with no impairment, or only mild impairment. Since cognitive impairment is very prevalent and we have no reason to believe that pain is diminished for cognitively impaired residents, it is likely that pain assessments are not capturing these residents real experience of pain, our data may underestimate by a third the prevalence of daily pain.

The prevalence of daily pain among nursing home residents varies substantially across the states and within the states across the nursing facilities in those states. Regardless of whether we compared new admissions, residents or even decedents, we observed 3 fold differences in the prevalence of daily pain between states and across facilities within state. It is improbable that this variation reflects actual differences in the occurrence of pain. Rather this variation reflects differences between nursing homes, and between states, in the comprehensiveness and completeness of the pain assessment that must precede proper pain management. Our analyses suggest that some states with lower rates of daily pain are doing a poorer job of assessment.

In those states for which we were able to ascertain the extent and type of analgesic treatment for residents in daily pain, we found that around one quarter of all those in daily pain received no analgesia, not even an aspirin. This was equally true for decedents, and only somewhat less true for decedents with cancer (17% untreated). We also found substantial variability across states in the rates of untreated daily pain, with some states leaving untreated nearly 30% of residents while in others only 16% of residents were untreated. It should be noted that were the additional one third of all residents who may be in pain, although not assessed as such, also considered to be in need of treatment, the rate of under-treatment would be

substantially higher. Clearly, high rates of untreated pain among those in daily pain, unambiguously reflects poor pain management. However, inadequate assessment of residents' pain also reflects poorly on the quality of care since a prerequisite to adequate treatment is a proper diagnosis.

## **Implications**

Pain is prevalent and under-treated in the nursing home setting. To improve this nursing home staff must undertake more complete and comprehensive assessments of pain in order to inform the development of pain management plans for all patients.

While there are numerous sets of guidelines and methodologies that have been identified as effective in improving the comprehensiveness of pain assessments and the quality of pain treatment, the real problem is developing organizational strategies to implement them in the highly diverse nursing home industry.

Improving pain assessment and management will require the introduction of continuous quality improvement approaches combined with a focus on education of nursing staff in the techniques of pain assessment amongst the most common population of nursing home residents, those with substantial cognitive impairment.

States have an important role to play in both improving pain assessment and pain management in nursing homes. Using the now computerized, federally mandated resident assessment data, states can examine the prevalence of reported daily pain across nursing homes, identify facilities with unusually low or high rates of pain, and focus on whether these facilities are appropriately assessing pain. Similarly, states can review and reward efforts to improve pain management. Moreover, states should assess whether their laws and regulations are inadvertently acting as a barrier to pain management by discouraging or inappropriately limiting the use of opiates in the treatment of pain.

## Introduction

As many as 83% of nursing home residents experience pain that impairs mobility, results in depression, and diminishes quality of life (Ferrell, Ferrell, & Rivera, 1995; Bernabei et al., 1998; Roy & Michael, 1986; Parmelee, Smith, & Katz, 1993; Ferrell, Ferrell, & Osterweil, 1990; Wagner et al., 1997; Sengstaken & King, 1993; Ferrell, Dean, Grant, & Coluzzi, 1995). Often, nursing home residents' complaints of pain are not recognized (Ferrell et al., 1995; Sengstaken & King, 1993) or are not appropriately treated (Ferrell et al., 1995; Bernabei et al., 1998; Feldt et al., 1998). Thus, pain appears to be a major problem among the frail elderly. More than 1.5 million frail, older Americans reside in nursing homes (Ouslander, 1989; AHCPR, 1999), and even a decade ago, an estimated 43% of adults 65 and over will enter a nursing home prior to death (Kemper & Murtaugh, 1991). Pain control represents an important, often neglected, special need of this large, vulnerable population.

Research on pain in the elderly is limited and often conflicting. Fewer than 1% of the more than 4000 papers published on pain each year focus on pain in elderly persons (Melding, 1991). Moreover, some studies contradict the common assumption that pain decreases with old age (Harkins, 1996). Clinical research indicates that the elderly may experience more pain than younger people (Crook et al., 1984; Lavsky Shulan et al., 1985; Roy & Thomas, 1986; Corran et al., 1994), although older patients may be less likely to complain of pain (Ferrell, 1991; Foley, 1994). Several studies indicate that the incidence of pain in geriatric populations does not differ from that in younger people (Sorkin et al., 1990; Keefe & Williams, 1990). Controversy remains as to whether there are physiological changes in pain perception in the elderly (Kwentus et al., 1985).

Despite the debate as to whether elderly patients experience either diminished pain or have higher tolerance to pain, they are frequently treated less aggressively than younger patients. Indeed, in a study by the Eastern Cooperative Oncology Group, age of 70 or greater was one of the predictors of inadequate pain management for men and women (Cleeland et al., 1994). A recent study from the Center for Gerontology and Health Care Research at Brown University reported that more than one in three cancer patients newly admitted to a long-term care facility

have daily pain (Bernabei et al., 1998). Furthermore, not even an analgesic medicine such as Tylenol was prescribed for one in four nursing home residents recently discharged from a hospital with a diagnosis of cancer who were reportedly in daily pain (Bernabei et al., 1998).

The high rate of untreated pain does not result from a lack of scientific knowledge regarding pain management. We know how to relieve pain. Substantial scientific data attests to the availability of pharmacological and non-pharmacological treatments for pain. Furthermore, guidelines from authoritative bodies outline key steps to providing compassionate pain management for the older person. The American Geriatric Society (AGS) and the American Medical Director Association have recently released guidelines for the management of chronic pain in the frail elderly (AGS 1998). Yet, despite increasing evidence that pain can be managed effectively in the vast majority of patients, inadequate pain control remains a public health problem.

Numerous conditions contribute to pain among the elderly. Many acute and chronic health conditions common in the elderly are associated with pain. Most pain in nursing home patients is related to arthritis and musculoskeletal problems (Ferrell et al., 1990; Ferrell et al., 1995; Lau Ting & Phoon, 1988; Davis, 1988). Nearly one in four nursing home residents has some form of arthritis. Pain resulting from nervous system damage or disease is also common (Ferrell et al., 1990). Although less common than arthritic pain, cancer pain is a source of severe pain in this setting (Ferrell et al., 1990; Ferrell et al., 1995). Institutionalized elderly appear to be at increased risk for cancer pain (Harkins, 1996). The National Nursing Home Survey reported 2.2% of all residents had cancer listed as either the first or the second diagnosis (National Nursing Home Survey, 1981), although individual facilities have reported prevalence rates as high as 20% (Ferrell, 1992). Cancer pain management guidelines are now well established. In fact, research on cancer patients suggests that implementation of the World Health Organization pain guidelines can bring relief to as high as 90% of those with pain (Foley, 1985; Twycross & Lack, 1983; Rapazz et al., 1985; Takeda, 1986; Ventaffrida et al., 1987; Walker et al., 1988; Goisis et al., 1989; Schug et al., 1990; Ventaffrida et al., 1990; Grond et al., 1991; Wenk et al., 1991; Hillier, 1990; Teoh & Stjernsward, 1992; Mount et al., 1993). The recent guidelines released by the American Geriatric Society and American Medical Directors

Association are informed by the work done on cancer pain management. However, there are not similar benchmarks of the potential for palliation for nursing home residents, who usually have multiple sources of pain including arthritis.

In part, inadequate pain management reflects failures in pain assessment. Nursing home residents present many challenges to adequate assessment of pain. (Stein & Ferrell, 1996). Yet, assessment is key to appropriate palliation of pain (Ahles et al., 1983; Manetto & McPherson, 1996). Multiple medical problems (Agency for Health Care Policy and Research, 1994), the increased likelihood of cognitive and sensory impairment (Sengstaken & King, 1993; Parmelee et al., 1993; Ferrell et al., 1995), the prevalence of depression (Cohen Mansfield & Marx, 1993; Parmelee et al., 1991; Rovner et al., 1991), and difficulty communicating (Simons and Malabar 1995, Stein and Ferrell 1996) make pain evaluation for nursing home residents much more difficult than for other adult populations. Of these, cognitive impairment presents the largest barrier to pain assessment. Because over half of nursing home residents are cognitively impaired, they have difficulty reporting pain and self-reports are likely to underestimate pain. Moreover, structured pain assessment scales designed for cognitively impaired patients are based on observable behaviors that may correlate poorly with self-reports of pain.

Unrelieved pain carries a high price. The presence of pain in elderly patients and nursing home residents has been associated with depression, decreased socialization, sleep disturbance, impaired ambulation, and increased health care use and costs (Shapiro, 1994b; Parmelee et al., 1991; Lavsky, Shulan et al., 1985). Many geriatric conditions are worsened by the presence of pain including deconditioning, gait disturbances, falls, slow rehabilitation, polypharmacy, cognitive dysfunction, and malnutrition (Ferrell, 1991; Ferrell, 1995). Moreover, residents experiencing pain may also have difficulty making their needs known, which, in turn may be a cause of agitation.

In addition to the costs to the patient, unrelieved pain has costs for family members and for society at large. Observing a loved one in unrelieved pain is one of the most distressing experiences for family members. Family members share the suffering, loss of control, and impaired quality of life, and also experience psychological and social stress (Ferrell et al., 1991;

Ferrell et al., 1991; Ferrell et al., 1989; Ferrell et al., 1992). Finally, unrelieved or inappropriately treated pain is costly to society both directly and indirectly, as well as in terms of litigation (Joranson, 1994; Shapiro, 1994b; Cushing, 1992).

Additional barriers to effective pain treatment in the elderly arise from problems related to patients, health care professionals, and to the health care system itself (McCaffery, 1992; Foley, 1995; Cherny & Catane, 1995). Patients are generally reluctant to report pain (Levin et al., 1985; Dar et al., 1992; Von Roenn et al., 1993; Ward et al., 1993). Many simply do not expect pain relief. Pain is considered an expected part of aging, elderly patients fear that pain may suggest that disease is worsening, and they are concerned about not being “good” patients, or distracting physicians from the treatment of the underlying disease. Moreover, health care professionals are seldom trained in pain management (Bonica, 1985; Von Roenn et al., 1993; Cleeland et al., 1986; Ferrell et al., 1992), may not realize the importance of pain management or recognize that a patient is in pain (Von Roenn et al., 1993; Grossman et al., 1991), and may fear prescribing opioid medications because of concerns about the regulation of such substances (Von Roenn et al., 1993; Weissman et al., 1991; Joranson et al., 1992; Shapiro, 1994a; Hodes, 1989). Furthermore, medications may not be reimbursed or readily accessible (Foley, 1985; Weissman et al., 1991; Joranson et al., 1992; Shapiro, 1994a; Hodes, 1989; Ferrell & Griffith, 1994; Joranson, 1994).

Inadequate assessment and under treatment of pain remains a persistent and perplexing concern. Untreated pain has been identified as a major public health concern. Although the relief of pain is considered a moral imperative among health care professionals, the under-treatment of pain among the elderly living in long-term care facilities remains a significant concern since this vulnerable population is totally dependent on others for their medical care. The changing role of nursing homes may increase the salience and heterogeneity of pain encountered, suggesting that not only is more attention needed but that in some instances more skilled attention might be needed. Important opportunities exist to improve and enhance the quality of pain management. Failure to prevent and/or treat pain effectively is not acceptable and should be considered an indicator of poor quality of medical care.

The overall aim of this monograph is to describe the prevalence of pain in American nursing homes, as well as the extent of variation in pain from state to state and from one type of facility to another. This description serves as background for a review of current efforts to improve the management of pain in nursing homes and a call to use pain as an important indicator of the quality of care provided in nursing facilities. Although the extent of relief that can be readily achieved is not well defined for the general nursing home population, important opportunities exist to improve pain management.

## **Methods**

Pursuant to the 1987 Nursing Home Reform Act, since 1991 all Medicare or Medicaid certified nursing facilities in the country have been required to conduct regular comprehensive clinical assessments of each resident. Assessments are performed on admission, upon significant change, and at least annually, so that there are multiple assessments of the same individual over time. Between 1992 and 1997, thirteen states computerized their assessment data, usually to enable payment of nursing homes based on case-mix. [Under new regulations, all states have computerized RAI data since July, 1998]. These data have been gathered in the University of Michigan Assessment Archive Project (UMAAP) under the direction of Dr. Brant Fries. UMAAP currently has over eight million assessments of U.S. nursing home residents. The assessment, known as the Minimum Data Set (MDS), contains over 350 discrete data elements including socio-demographic information, numerous clinical items ranging from degree of functional dependence to cognitive functioning, and a check list for staff to indicate the presence of the most common geriatric diagnoses (Minimum Data Set Plus Training Manual., 1991; Morris et al., 1990).

The reliability of MDS assessments has been tested repeatedly. Field tests conducted in 1989 and 1990 revealed high levels of agreement on the vast majority of MDS items. Moreover, the accuracy of patient records increased significantly with the introduction of the MDS in a 10 state study of 250 facilities while the MDS was being introduced (Hawes, et al. 1997). In general, data items measuring physical functioning and cognitive status constructs are strongly related to research quality instruments (Morris, et al, 1994; Mor, et al, 1995). However, not all

the items are highly correlated with established clinical measures. For example, some authors found that certain behavior and mood items do not correlate well with research scales (Frederiksen et al. 1996). By and large, however, when used in accordance with the training manual, the RAI measures common clinical geriatric phenomenon similar to the way most established research quality scales do (Snowden-M; McCormick-W; Russo-J; Srebnik-D; Comtois-K; et al, 1999).

In addition to the resident level MDS data, for many states we were able to match the individual resident to the facility in which they resided at the time the MDS assessment was conducted. Federal regulations require annual surveys of nursing homes for certification. The data emanating from these visits, known as the “On-line Survey and Certification Automated Report” (OSCAR), capture the results of inspections done by state licensure officials in accordance with federal specifications required by the 1987 Nursing Home Reform Act. Variables reflecting nursing home ownership, structure (e.g. number of beds), staffing level information (e.g. RN to resident ratio) and the availability of specialty services such as hospice were created for use in the analyses. While OSCAR staffing data are fairly detailed, they are not audited so the recorded numbers may not represent usual staffing levels. By linking MDS and OSCAR data we examined the relationship between nursing home characteristics and the prevalence of recorded daily pain.

Finally, for Medicare beneficiaries in 5 states (ME, MS, NY, KS, SD), the MDS assessment data were matched to Health Care Financing Administration (HCFA) administrative enrollment files containing information on coverage as well as vital status. (Gambassi, et al, 1998) This made it possible to identify assessments closest to the date of death among 1996 decedents so as to examine pain management in this important sub-group.

## **Measures**

The version of the MDS available for most of the data in this study included only a single measure of pain. It is drawn from the problems, conditions, signs, and symptoms section of the assessment instrument. The training manual instructs staff to report all problems that are present

in the last 7 days. Pain is described as “complains”, or shows evidence of pain daily or almost daily.” (Minimum Data Set Plus Training Manual, 1991). The assessment evaluates signs and symptoms of pain, but assessors were instructed to rely on self-report whenever possible because the experience of pain is subjective (Minimum Data Set Plus Training Manual., 1991). Daily pain is defined as any type of physical pain or discomfort in any part of the body that was manifested daily. The Manual instructs staff to ask simple direct questions about whether the patient had experienced pain. Because some residents did not complain verbally or were unable to speak, the assessors were supposed to observe these persons for signs of pain including moaning, crying, wincing, frowning, or other facial expressions or posturing such as guarding or protecting an area of the body. If the frequency of pain was difficult to determine, assessors were to code pain as daily. Independent, dual assessment of pain items in a diverse sample of residents during testing and revision of the MDS showed an average weighted Kappa  $\kappa$  exceeding 0.7 (Fries et al., 1997).

The MDS is completed on a quarterly basis, or when there is change in the health status of the nursing home resident. It is possible that daily pain was recognized as an important concern when the interdisciplinary team completed the MDS and that pain was effectively treated soon after the completion of that MDS. An indicator of a more egregious problem with pain management might therefore be whether reports of pain persisted over 2 assessments, generally occurring 90 days apart. We defined persistent pain as having daily pain noted on two consecutive MDS records that were at least 60 but not over 180 days apart.

Pain is hard to assess in old frail demented patients and facilities vary greatly in their efforts to elicit reports. Consequently, differences between facilities in the percentage of patients experiencing pain may reflect either actual differences in the rates of pain or differences in the degree of effort applied to eliciting reports of pain. For example, cognitively impaired elderly may underreport experiencing pain (Parmelee, 1996; Asplund et al., 1991). Thus, clinicians must work with the nursing home resident to find the right approach to use to properly elicit the level of pain the individual is experiencing (Ferrell et al., 1995; Sengstaken & King, 1993). We used an established MDS based measure of cognitive functioning in order to classify residents by degree of cognitive impairment to allow for more equal comparisons of the level of pain in. The

Cognitive Performance Scale (CPS) is a 7 level measure of cognition that is strongly related to standardized measures of memory and cognition commonly used in research studies (Morris, et al, 1994; Snowden, et al, 1999).

Detailed information on all prescription and non-prescription drugs used in the 7 days preceding the assessment is available for Kansas, Maine, Mississippi, New York, Ohio and South Dakota. Nurses completing the MDS assessment also completed a special form in which they recorded the National Drug Code (NDC) for each specific prescription (drug, dose and frequency) drug taken at least once during the last 7 days. By converting the unique NDC elements into broader drug classes, these data make it possible to determine whether nursing home residents recorded as experiencing daily pain were being treated with some form of analgesic or with specific types, such as mild or strong narcotic analgesics. The detailed drug use data have formed the basis for numerous articles characterizing drug use among nursing home residents. (Bernabei & Gambassi, 1998; Gambassi et al., 1998; Bernabei et al., 1999)

Analgesics were categorized into 3 groups according to the WHO ladder (Stjernsward, 1988; Zech et al., 1995; Levy, 1996). Level 1 includes non-opiates such as aspirin, acetaminophen, and nonsteroidal anti-inflammatory drugs such as ibuprofen. Level 2 includes weak opiates, such as codeine, or any weak opiate in combination with WHO level 1 drugs (most commonly with acetaminophen or aspirin). Level 3 includes strong opiates such as morphine. Corticosteroids, antidepressants, benzodiazepines, and anesthetics as well as antineoplastic hormones were considered to be adjuvant medications (Levy, 1996).

We classified residents as having untreated pain if they had daily pain but were receiving no analgesics. For persistent pain, we classified residents as having untreated persistent pain if they were receiving no analgesics at either point at which pain was reported. Thus residents with persistent daily pain were only characterized as untreated if they received no medications at both assessments.

## Cohorts

Nursing home residents are not a static population. Many individuals use nursing homes for “post-acute” recovery, returning home afterwards. Additionally, nursing homes, rather than hospitals, are increasingly used as a place to die. Thus, some “post-acute” patients die shortly after admission but many more long stay nursing home residents are clinically managed in the facility rather than hospitalized during the terminal phase of their condition. In order to assess the rates of pain in these different types of nursing home populations, we examined pain and pain measurement rates in three cohorts of nursing home residents: an admission cohort, which includes those with post-acute disorders, a cohort of all residents in nursing homes around a given day, and a cohort of decedents in 1996 to assess end-of-life care.

The **admission** cohort examines pain among 127,426 individual residents admitted to a nursing home in 1996. Because MDS records from Washington and Wisconsin lacked any indication of the type of assessment record (initial or continuing stay), they were excluded. The admission cohort includes those residents who are temporarily placed in a nursing home to receive post-acute care, those who will go on to stay in the nursing home for an extended period, and those entering the nursing home for use as a place to die.

The **resident** cohort provides a snapshot of the prevalence of pain among nursing home residents in 1996. This cohort identifies individuals’ MDS record closest to April 1, 1996 but no later than July 31, 1996 (with 1995 dates for Wisconsin). These dates were chosen to provide data on the maximum number of residents. All 350,084 individuals meeting the broadest criteria are therefore included in this cohort.

The **decedent** cohort examines pain near the end of life. It includes individuals who had a matching Health Care Financing Administration Medicare enrollment record containing vital status who were known to have died in calendar year 1996. This cohort includes 43,117 individuals from five states. For this cohort, daily pain is measured at the last MDS assessment prior to death (for some it may have been their admission assessment).

For each cohort, we examined rates of daily pain. Furthermore, since patients with a cancer diagnosis are broadly acknowledged to have greater physiological reasons for experiencing pain, separate estimates of the prevalence of pain were made for the subset of residents with cancer. Similarly, we separately estimated the prevalence of pain among residents at 3 different levels of cognitive impairment based upon the Cognitive Performance Scale; mild, moderate and severe. In those states which had consistent longitudinal data, we were able to determine the proportion of residents reported to be in daily pain who were still in daily pain at the next assessment, thus measuring persistent pain. Finally, for those states in which assessment data included detailed information about all drugs being used, we were able to estimate the proportion of residents reported as being in daily pain who were not receiving any analgesia as well as the proportion receiving narcotic analgesics at least once a day.

### **Analytic Approach**

Since our intent was to estimate the prevalence of pain in various populations of nursing home residents, the unit of analysis was either the state or nursing homes. Thus, comparative analyses of pain management by state are based upon the proportion of all residents reported to be in daily pain in the various samples. Since the number of individual residents included in all analyses is very large, we do not focus on statistical significance in highlighting comparisons. By and large, differences larger than 5 percentage points between the comparison groups can be thought of as both statistically and clinically meaningful.

Since these data, for better or worse, emanate from the ongoing clinical assessment process, from the outset we considered the possibility that observed between state differences reflect differences in assessment practices and not “real” pain levels. Assessment practices might vary by state for many reasons, the most important of which is that implementation of the MDS and the allocation of resources for education in the assessment process was done differently from state to state. Additionally, we have not chosen to report adjusted rates of pain after controlling for potential confounders.

### **Study Sample**

Of a total population of nursing home residents in 10 states (Kansas, Maine, Mississippi, Nebraska, New York, Ohio, Pennsylvania, South Dakota, Vermont and Washington) in 1996 and 1 state in 1995 (Wisconsin), we excluded (1) comatose patients and (2) those who lacked information on pain assessment. As a result, the final study sample comprised the 350,084 remaining individuals.

## Results

### Prevalence of Daily Pain among Nursing Home Residents

Table 1 describes the prevalence of daily pain among nursing home residents in all three cohorts of residents being examined: admissions, residents and decedents.

One quarter (25.0%) of the *admissions* to the nursing home in 1996 were recorded as being in daily pain at their first MDS assessment 10 to 14 days after admission. Although the rate of daily pain is high among admissions, there is substantial variation in the prevalence of reported daily pain across states. In fact, rates of daily pain among nursing home residents admitted in 1996 varied by 3 fold, ranging from 18.5% to 55.8%. In 3 of the 9 states examined, more than one third of admissions were reported to be in daily pain over the preceding week.

Differences in the prevalence of recorded daily pain across states can not be assumed to accurately represent differences in the quality of pain management. As previously noted, pain assessment in a cognitively impaired population is difficult. Moreover, nursing homes differ in the type of residents which they serve. Some homes try to accept relatively well functioning residents, while others specialize in the care of the very ill, frail elderly including those with various forms of dementia. Furthermore, nursing homes differ substantially in the expertise and effort devoted to pain assessment. Consequently, two nursing homes with large differences in the reported prevalence of pain may actually serve residents with similar experiences of pain; variation in rates of daily pain may reflect either differences in patient populations, differences in pain assessment, or differences in pain management or any combination of these factors. Thus,

because differences in the prevalence of pain, either between nursing homes or between states, is subject to various forms of bias, these data cannot be used to definitively say whether particular states are doing a better job of pain management.

## **Residents**

In order to get a snapshot of prevalence of pain for the overall nursing home population, we examined reports of pain for all residents based on the MDS assessment that occurred closest to a particular day (4/1/96). Here we found that 15.8% of residents were reported to be in pain. There is substantial variation among states (range 8.4% to 49.0%); nearly a six-fold difference between the lowest and highest rates of daily pain. In 4 of the 11 states examined, more than a quarter of the residents were reported to be in daily pain. But in 5 of the states only around 15% or fewer residents were reported in daily pain.

## **Decedents**

Next we examined the prevalence of pain among nursing home residents who died in 1996. The reports are based on the assessment nearest the time of death. On average the last assessment was done 45 days prior to death, with some occurring only days before death whereas others were as much as a half year before death. These data provide a snapshot of the experience of residents prior to death. Among nursing home residents who died in 1996, we found an overall rate of daily pain of 19.3% (range 13.3% to 34.6%) in the month(s) prior to death. In 3 of the 5 states, over one-quarter of the residents near the end of life were reported to be in daily pain whereas in one state less than 15% of residents were reported to be in daily pain.

## **Residents with Cancer**

In view of prior research on pain physiology, we expected higher rates of daily pain among residents with cancer. The results in the lower half of Table 1 show that rates of daily pain are higher among residents with a diagnosis of cancer. In the resident cohort, over one-fifth (21.6%) of residents with cancer were reported to be in daily pain, compared to less than one-sixth (15.8%) in the overall sample. Furthermore, the rate of daily pain among nursing residents

with cancer who died in 1996 was slightly over one-third (34.5%) compared to less than a fifth (19.3%) among all decedents. As in the general population of nursing home residents, rates of daily pain among residents with cancer varied widely across states, with those states having low rates among all residents also having relatively low rates among cancer patients.

The higher reported rates of daily pain among residents with cancer indicate that despite the limitations of these data for comparisons across states, they do reflect some of the patterns which we expected. Although residents with a diagnosis of cancer experience higher rates of daily pain, they represent less than a tenth of the nursing home population (8.5%). Because only a small fraction of nursing home residents have cancer, it is clear that the high rates of daily pain among residents is not primarily due to cancer pain. Rather, many residents suffer daily pain due to more common diseases, including arthritis.

### **Cognitively Impaired Residents**

Because pain assessment is more difficult among residents with impaired cognition, we also examined rates of pain among residents with cognitive impairment. In the general nursing home population, 22.4% of residents were reported to be severely cognitively impaired, and an additional 33.8% were moderately cognitively impaired (data not shown). Rates of daily pain were highest among those residents with mild or no cognitive impairment, lower among those with moderate impairment, and lowest among those with severe impairment (21.5%, 13.6% and 8.2%, respectively). We have little reason to believe that cognitive impairment reduces pain. Therefore, the difference is likely to reflect a pattern of substantial underassessment of pain among the cognitively impaired elderly, which includes more than half of the nursing home population (55.7%). This finding supports our concern that the rates of daily pain reported in MDS data are underestimates of the actual prevalence of pain among nursing home residents.

### **Prevalence of Persistent Pain**

In order to demonstrate the extent of the problem of pain among nursing home residents, we examined the rates of persistent pain. Persistent pain was defined as two consecutive MDS reports of daily pain between 60 and 180 days apart.

Among all nursing home residents, we found that nearly two-thirds (63.3%) of those who were in daily pain, and remained in the nursing home until a next assessment, were again reported to be in pain at the next assessment. (See Table 2). The prevalence of pain reported in Table 1 might have reflected an initial recognition of pain during the multidisciplinary care planning process that was appropriately treated after completion of the MDS. However, contrary to expectations our results, suggest that daily pain persists for two in three persons. It should be noted that these results are only based on those persons who remained in a nursing home for two assessments. Of the 55,313 residents who were reported in pain, 56.3% (31,177) had a second assessment done at least 60 days later. Since many nursing home residents are hospitalized as their conditions exacerbate, increasing illness and morbidity as well as mortality presumably accounts for the lack of follow-up assessment. Since these conditions are associated with increased pain, our estimate of persistent pain is unlikely to be an overestimate.

Nursing home residents with a diagnosis of cancer experience only marginally higher rates of persistent pain compared to all nursing home residents (i.e., 65.5% in cancer patients compared to 63.3% for all nursing home residents). However, as might be expected due to increased mortality, compared to the general nursing home population, there was greater attrition in the cancer sub-sample; only 42% of the sample remained in the nursing home for at least 60 days and had an additional MDS assessment.

### **Prevalence of Untreated Daily Pain**

As noted, we believe that variation between states in the rates of daily pain reflects differences in assessment rather than actual differences in the experience pain. On the other hand, the rate of untreated pain provides information on how pain is managed once it is recognized. Quite alarmingly, nearly one in four residents reported as being in daily pain were

receiving no pharmacological treatment, not even Tylenol or Aspirin. Table 3 presents the proportion of residents who received no analgesic medication at all in the 5 states where detailed drug data were available. While there is no benchmark for what the “correct” rates of the use of narcotics should be, it is clearly unacceptable for patients in daily pain to receive no treatment at all.

Among admissions who were reported to be in daily pain and for whom drug information was available, 23.2% were receiving no analgesics, not even Tylenol. Both daily pain and medication usage were measured over the preceding week. Therefore, a resident who was reported to be in daily pain and receiving no medications had not received any analgesics, including Tylenol, during that entire week. An additional 24.7% were receiving only WHO category 1 drugs (e.g., aspirin, acetaminophen, and nonsteroidal anti-inflammatory drugs such as ibuprofen--data not shown). Thus, over 47% of newly admitted nursing home residents who were recorded as being in daily pain were receiving at best minimal treatment with over-the-counter drugs. Although it is not clear from these data what treatment rates are appropriate, high rates of untreated pain among residents with documented pain warrants further investigation. It is possible that many residents in daily pain and receiving only WHO category 1 drugs were under treated given that they remained in daily pain.

Rates of untreated pain were higher in the resident population than in the admissions cohort. Among residents with recorded daily pain for whom drug information was available, 27.8 % were receiving no analgesics and an additional 30.0% were receiving only WHO category 1 drugs such as Tylenol. Thus, well over half (57.8%) of the residents who were assessed as having daily pain were receiving at most treatment with over-the counter drugs.

Among residents who died in 1996, 23.4% of those who were reported to be in pain at their last assessment were receiving no pain medications. An additional 22.6% were receiving only WHO category 1 drugs (data not shown). Thus, 46.0% of those residents who were in pain, and approaching the end-of-life were receiving minimal pain treatment. It is important to recall that this final assessment was conducted, on average, 47 days from the known date of death of the resident, a time when patients’ symptoms associated with the terminal phase of their disease

would be most prominent. Furthermore, this group of patients were all assessed as being in daily pain and since they were near death, there was no excuse about residents possibly becoming addicted to the analgesics being prescribed.

Table 3 reveals less, but still substantial inter-state variation. This indicator reflects on a process of care. Prudent medical practices would have persons with daily pain at least on analgesic such as Tylenol. As shown in Table 3, the rate of no pharmacological treatment of daily pain varies between 17.6% and 29.4%. Inter-state variation in the level of untreated pain was also substantial for the new admission and decedent cohorts, mirroring the differences in the resident cohort. For example, among those persons who died in 1996, the rate of untreated pain in the last weeks of residents' lives varied between 15.0% and 30.5%, with the highest rate observed in New York, which also was least likely to recognize pain among patients nearing death.

### **Residents with Cancer**

Among the resident population of cancer patients residing in nursing homes, we found that nearly one in four (23.6%) nursing home residents had untreated pain. Even among decedents, untreated pain was found in more than one in six patients (17.3%).

As we would expect among those reported to be in pain, residents with cancer were more likely than the general population to receive analgesics. Among residents, 23.6% with a diagnosis cancer who were assessed to be in daily pain were receiving no analgesics, not even Tylenol. An additional 19.7% of residents with cancer who reported daily pain were only receiving WHO category 1 drugs. Thus, 43.3% of residents with cancer for whom daily pain was reported were receiving, at best, minimally acceptable and effective treatment of cancer and its treatment for their pain. This is disturbing figure, despite the fact that it compares favorably to the 57.8% of residents in the general nursing home population who were documented as being in pain and receiving at most minimal pain treatment.

Among those residents with a diagnosis of cancer who died in 1996, 17.3% of those who were reported to be in daily pain at their last MDS assessment were untreated. An additional, 13.2% were receiving only WHO category 1 drugs. Thus, 30.6% of those residents with a diagnosis of cancer who died in 1996 were receiving no, or only minimal, pain treatment compared to 46.0% of those without a cancer diagnosis. The relatively more favorable rates of pain treatment in this population are presumably consistent with a greater willingness to treat cancer patients with narcotics.

### **Prevalence of Untreated Persistent Pain**

To conservatively estimate the prevalence of under treatment of persistent pain, residents were categorized by the highest level of treatment at either of the two pain assessments which were used to document persistent pain. For example, a resident was only classified as receiving no treatment if she was receiving no treatment at both points in time. If she was receiving WHO category 1 drugs at one of the two assessments and no treatment at the other assessment, she was categorized as receiving WHO category 1 drugs.

Figure 1 shows the percentage of the general nursing home residents population receiving no treatment at either point in time, overall and by state. Among those residents with persistent pain who remained in the nursing home, 15.5% were receiving no analgesics at either point when pain was documented. An additional 34.3% were receiving only WHO category 1 drugs. Thus, 49.8% of the residents with documented persistent pain were receiving at most only an over-the-counter analgesic such as Tylenol. Among residents with persistent pain, the percentage receiving no treatment varied from 8.3% to 18.9%.

Among nursing home residents with persistent pain and a diagnosis of cancer, 13.8% were receiving no analgesics and an additional 24.6% were receiving only WHO category 1 drugs. Thus 38.4% were receiving minimal pain treatment compared to 49.8% of those without a diagnosis of cancer. We observe more than a two fold difference between cancer patients with untreated pain across states, with nearly 2 in 5 cancer patients from Ohio who were reported to be in daily pain receiving no analgesia in contrast to about 1 in 8 such patients in Maine. Even

among decedents with cancer, the population about which there is universal agreement that pain management is paramount, we observe nearly two fold differences in the likelihood that those in daily pain received no analgesia (12.8% vs. 21.8%).

### **Variation within States in Rates of Daily Pain and Untreated Daily Pain by Facility**

Figure 2 depicts the level of within state variation in daily pain, in this case averaged over all the facilities in the state. The figure shows the distribution of nursing homes within each state in terms of the rate of daily pain based on all residents for whom we have data in each facility. This analysis was limited to facilities for which we had a minimum of 100 MDS records. The tops and bottoms of the boxes indicate the rates of daily pain in those facilities at the 25<sup>th</sup> and 75<sup>th</sup> percentiles for a given state. The ends of the tails indicate the rates of daily pain in those facilities at the 10<sup>th</sup> and 90<sup>th</sup> percentiles.

These results reveal that in many nursing homes in each state, daily pain is common among residents. The observed variation also is unlikely to be explained by differences in the true “underlying” rates of pain in the nursing home population. In other words, it is unlikely that the true rates of daily pain naturally vary as widely as the figure suggests. We cannot discern from these analyses which nursing homes with low rates of daily pain are not assessing pain comprehensively and which are doing a good job of treating pain, resulting in lower observed levels of pain. However, it is likely that many facilities with low rates of pain are not assessing pain well for all their residents.

Figure 3 reveals the degree inter-state variation in the rates of untreated daily pain for facilities in the state. This analysis includes all facilities shown in Figure 2, even if fewer than 100 MDS assessment forms indicated that residents were in daily pain. These results indicate that the rate of untreated daily pain varies substantially across nursing homes within each state. For example, in New York, the facility at the 75<sup>th</sup> percentile of untreated pain leaves nearly one half of all their residents in daily pain untreated. On the other hand, in Maine, less than 10% of all residents in daily pain are untreated in facilities at or near the 25<sup>th</sup> percentile. This figure

demonstrates that the state level differences belie large variation in rates of untreated pain within states and that this variation may actually increase as the state average increases.

The results indicate that there are nursing homes in most states with high rates of untreated daily pain. The variability in and of itself is evidence that untreated pain is a problem for residents in many nursing homes in each state. The worst quarter of nursing homes in 5 of these 6 states were not giving analgesia to over one third of their patients who they reported to be in daily pain. This finding indicates that although state-level policies may be needed to raise standards of care, implementation of such policies must be done at the level of the facility. However, the variation also indicates that there are nursing homes that are doing a better job of pain management. As shown in Figure 3, the top ten percent of the nursing homes in five out of six states had less than one in ten persons with untreated pain. Obviously, some facilities know how to implement pain detection and treatment protocols; these could be models for other facilities seeking to improve their own performance.

## **Discussion**

Pain is not a normal part of aging. Yet, frail, older persons in nursing homes live with untreated pain and sadly, too many persons die with untreated daily pain. Such pain persists in nearly two of three persons. Nursing homes are becoming the major site of care for dying persons. In 1993, the US Mortality Follow Back Survey conducted by the National Center for Health Statistics estimated that one in five person died in a nursing home. By 2040, 40% of persons will die in nursing homes (Brock DB, and Foley DJ 1998). The rate of dying in nursing home varies substantially with some states. In Rhode Island, nearly 40% of all those dying in 1998 died in a nursing home. Thus, nursing homes now, and in the future, will increasingly be responsible for providing pain management for this frail and vulnerable population. Two findings reported here provide convincing evidence that pain is an important public health concern – one worthy of both Federal and State initiative.

- ◆ **An alarmingly high number of nursing home residents with daily pain did not receive the most basic pharmacological treatment.** We found that around one quarter of nursing home residents reported to be in daily pain were not being treated at all. Even more flagrant, 23.4% of those who died in 1996 did not have their daily pain treated, not even with Tylenol or aspirin. This varied two-fold by state, from 15.0% to 30.4%.
- ◆ **The prevalence of pain varied strikingly** – We found the prevalence of pain varied between 8.4% and 49.0% across the 11 states we studied (nearly six fold). Such variation could reflect either inadequate pain assessment, pain management, and the difference in types of persons cared for by that facility. The most likely explanation is inadequate assessment given the challenges of pain assessment in this frail, population, over half of whom have moderate to extensive cognitive impairment.

One response to these findings may be to “punish” or “sanction” nursing homes with high rates of reported pain. We would caution against this approach because of several important limitations that ought to be noted. The federally mandated resident assessment instrument known as the “MDS” is a standardized, comprehensive assessment instrument. Yet, pain was not a special focus of early versions of the MDS which only collected information on whether there was “no pain”, “pain less than daily”, and “daily pain”. No information is collected on whether the patient is satisfied with the degree of relief afforded by pharmacological and non-pharmacological treatment. As we have noted previously, a lower rate of pain may not reflect a better quality of care. Quite to contrary, lower rates of pain may reflect inadequate pain assessment. The recently released JCAHO Guidelines note that initial assessment and timely reassessment are a cornerstone to effective pain management ([http://www.jcaho.org/standard/pm\\_frm.html](http://www.jcaho.org/standard/pm_frm.html)).

### **What are the recommended next steps?**

Rather than proceeding directly to an approach that would sanction nursing homes based on quality indicators derived from the MDS, in this domain we urge first trying a partnership

between states and nursing homes to improve and enhance the quality of pain management. We make this recommendation for several reasons.

1. The version of the MDS now being computerized by all facilities in the country collects information on the frequency, intensity, and site of pain for the highest level of pain in the last seven days. At best, this provides only the most basic information to examine the quality of pain management. Missing is information on: a) pain intensity at its worst, under usual circumstances, and with treatment; b) impact of pain on the persons' daily functioning; and, c) the nursing home residents' desired level of pain relief. The latter is important, because a key goal in pain management is to provide patients' their desired level of relief.

**Recommendation** – New measurement tools and quality indicators need to be developed that address the adequacy of pain assessment in nursing homes and examine whether patients receive their desired level of pain relief.

2. Research has documented the amount of pain relief that can be achieved in patients with cancer. Only recently, the American Geriatric Society and American Medical Directors Association have promulgated recommendations for the treatment and management of chronic pain in nursing home residents. Pain in nursing home residents is often due to arthritis, nerve damage, and perhaps most often from multiple etiologies. Benchmarks for what is the expected relief are not available.

**Recommendation** – Benchmarks are needed to examine the degree to which pain relief can be achieved by employing newly established professional guidelines applicable to the frail, elderly nursing home population.

3. The observed findings may not reflect the quality of pain management, rather they may reflect the influence of state regulatory barriers to pain management. For example, New York has one of the lowest rates of daily pain but the highest rate of untreated pain. This may be in part, explained by the fact that New York still requires triplicate prescription for opiates.

**Recommendation** – States, nursing homes and advocates for the frail and dying should work together to remove both actual and perceived regulatory barriers to the effective management of pain in nursing home residents.

We urge states and nursing homes to work together to improve and enhance the quality of pain management. States should follow the lead of the recently released JCAHO guidelines on pain management that makes pain a focus of inspection. JCAHO pain guidelines call on health care organizations to assure that patients' pain is recognized and appropriately managed through:

- a. initial assessment and regular reassessment;
- b. education of patients and families, when appropriate, regarding their role in pain management, the limitations and side effects of pain treatment; and
- c. a pain management treatment that is developed in light of the patient goals, cultural, spiritual, and/or ethnic beliefs.

Despite the acknowledged limitations of the MDS, nursing homes and states should examine indicators developed from the MDS that the Health Care Financing Administration mandates be computerized and archived into state and national repositories. The first step to improving the quality of care is measuring it! A key first step for each state and nursing home is to examine the results of indicators that we have reported in this monograph. As we have outlined in this report, the following indicators could be examined:

INDICATOR	DEFINITION
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<p style="text-align: center;"><b>Prevalence of Pain</b></p> <p>This indicator may be done for new admissions, the assessment closest to a calendar date, and the last assessment prior to death, regardless of where death occurs.</p>	<p>Numerator = number of persons in daily pain</p> <p>Denominator = nursing home residents who are not comatose</p> <p>Risk Strata = Cognitive Performance levels</p>
<p style="text-align: center;"><b>Persistent Pain</b></p> <p>As we have done in this monograph, this indicator may be examined for the above three cohorts.</p>	<p>Numerator = number of persons in daily pain</p> <p>Denominator = persons with previous assessment of daily pain between 60 and 180 days from this assessment.</p>
<p style="text-align: center;"><b>Untreated Pain</b></p> <p>Requires detailed drug prescription or use data such as the consultant pharmacist would have</p>	<p>Numerator = number of persons in daily pain without a WHO class I, II, or III medication prescribed in the last seven days.</p> <p>Denominator = nursing home residents with at least daily pain</p>

An important caveat to remember is that a low prevalence of pain may reflect inadequate assessment – thus, key to improving pain management is that nursing homes have standardized methods, uniformly applied to measure pain as a “Fifth Vital Sign” among those with and without cognitive impairment. Ferrell and colleagues have found the vast majority of nursing home residents are able to report on their pain intensity using one of three assessment tools. For the cognitively impaired patients unable to report on pain, institutions must rely on observational pain scales. To date, only a few scales have been validated and none have been widely used. The creation of reliable and valid methods of pain assessment remains an important research priority.

Indicators developed using the MDS provide an important starting point to raise awareness of the opportunity to improve. We view the MDS as providing important background data that can be the starting point for an institutional audit to examine the quality of pain management. Additional data collection is often needed to complete this initial audit of pain assessment and management. There are two additional small-scale data collection efforts that we would encourage nursing homes to consider undertaking. First, we would interview both competent nursing home residents and family members of those with diminished capacity to capture their perspective on the quality of pain management. Second, medical record review of

the adequacy of pain documentation provides another important part of the audit that can be fed back to the staff. Weissman and colleagues have developed such an medical record abstraction form that assess the adequacy of pain documentation( Weissman, D. E., Joranson, D. E., & Hopwood, M. B. 1991).) This form has been previously used a multi-institutional quality improvement effort.

Our recommendation regarding interviewing nursing home residents or family needs further clarification. Typically, health care organizations have used satisfaction measures that asked the patient or significant other to rank the quality of pain management on a scale of “very satisfied” to “very dissatisfied.” Too often, this has not led to useful information to guide quality improvement efforts in that many, if not the majority, of persons in moderately severe pain report that they are satisfied with current pain management (Desbiens N, Wu AW, Broste SK 1996). These findings, in part, reflect lowered expectations and a reluctance to criticize health care providers. In response to the perceived inadequacies of current measure of health care satisfaction, Cleary and colleagues has developed, “Patient Centered Reports”, which ask respondents about specific processes of care. For example, a patient centered report (PCR) asks, “Did the staff explain how to take your pain medications in a way you could understand?” PCRs may be summarized in problem scores that count the number of opportunities to improve and enhance quality of care in a particular domain. Brown University’s Center for Gerontology and Health Care Research in conjunction with the Picker Institute and Center for Survey Research at U Mass is now creating both a prospective and retrospective interview that applies PCRs methodology to pain management. Further information about this research effort and measurement tools can be found at the following www site, <http://www.chcr.brown.edu/pcoc/toolkit.htm>.

A second potential strategy is to empower consumers to provide more discriminating information using rankings of the quality of care. With this strategy, the respondent is provided with a standard of excellence to judge the quality of care. For example,

“Medical experts state that a patient's symptoms, such as pain or shortness of breath, should be controlled to a degree that is acceptable to the patient.”

A question such as this has been used to examine the quality of symptom management for 204 deaths in RI. Teno and Casey (Teno, 2000) found that these questions discriminated between the quality of care experienced by survivors of decedents served by nursing homes, hospitals, and hospice.

After a nursing facility has completed an audit of pain management practices, facility leadership should appoint a team to review the results. That team should ask where the facility is now in pain management practices and where the team and the administration feel that they want to be. Particularly pertinent in considering this goal is what kind of promise does administration want to make to the facility residents? The team should set an overall goal (e.g. new admissions achieve their desired level of pain relief by the first MDS assessment) and map out what are the key processes that need to be systematically implemented in the facility to achieve that goal. A process flow-chart can help identify leverage points that will achieve substantial change. Having identified a target issue and a goal as well as having selected the appropriate tools, facility leadership and the team should select an intervention to try out in a small test. A good starting point is to set a goal that nearly 100% of patients will have their pain assessed on each nursing shift for the first 14 days after nursing home admission. Start with this simple goal and move on to interventions that seek to affect key leverage points, or barriers, to pain management. Plot the results of several cycles of these interventions by tracking the key quality indicators on a "run-chart" that plots the indicators on a weekly or bi-monthly basis. This should be displayed in a prominent place where the entire staff can monitor the progress of the effort. Pain is an obvious candidate for rapid and sustained breakthrough improvement. Recently, the Health Care Financing Administration has authorized state Peer Review Organizations to partner with nursing homes to utilize CQI to improve pain management. Pain is also a target for the Joint Commission as well as several private sector initiatives. These can be readily monitored with the professional literature and increasingly on the world wide web.

## **Conclusion**

Pain represents an important public health concern. About one in four persons in the nursing home who are in daily pain are not treated with the most basic treatment, Tylenol or Aspirin. Because of the striking variation in the prevalence of reported pain, we suspect that the prevalence of pain reported in this monograph is a conservative estimate, underestimating the true burden of pain for persons living in a nursing home. When pain is recognized, we found that two of three persons still had daily pain at the next scheduled assessment.

These findings are compelling. However rather than rushing to sanction the industry or specific providers, we urge that regulatory authorities such as the state, Medicare's Peer Review Organizations and nursing homes partner to apply CQI techniques to improve and enhance the quality of care. Pain management should be part of the annual state inspection of nursing homes. There are important limitations to the current data collection in the MDS that limit its use for accountability. Rather, we recommend that the MDS be used as part of a screening process to focus the annual inspection and that nursing facilities examine their own performance by monitoring quality via the rudimentary indicators that can be derived from the computerized MDS. Research is needed to develop new quality indicators with the eventual goal that all nursing homes could be held accountable to a standard that their patients receive their desired level of pain relief.

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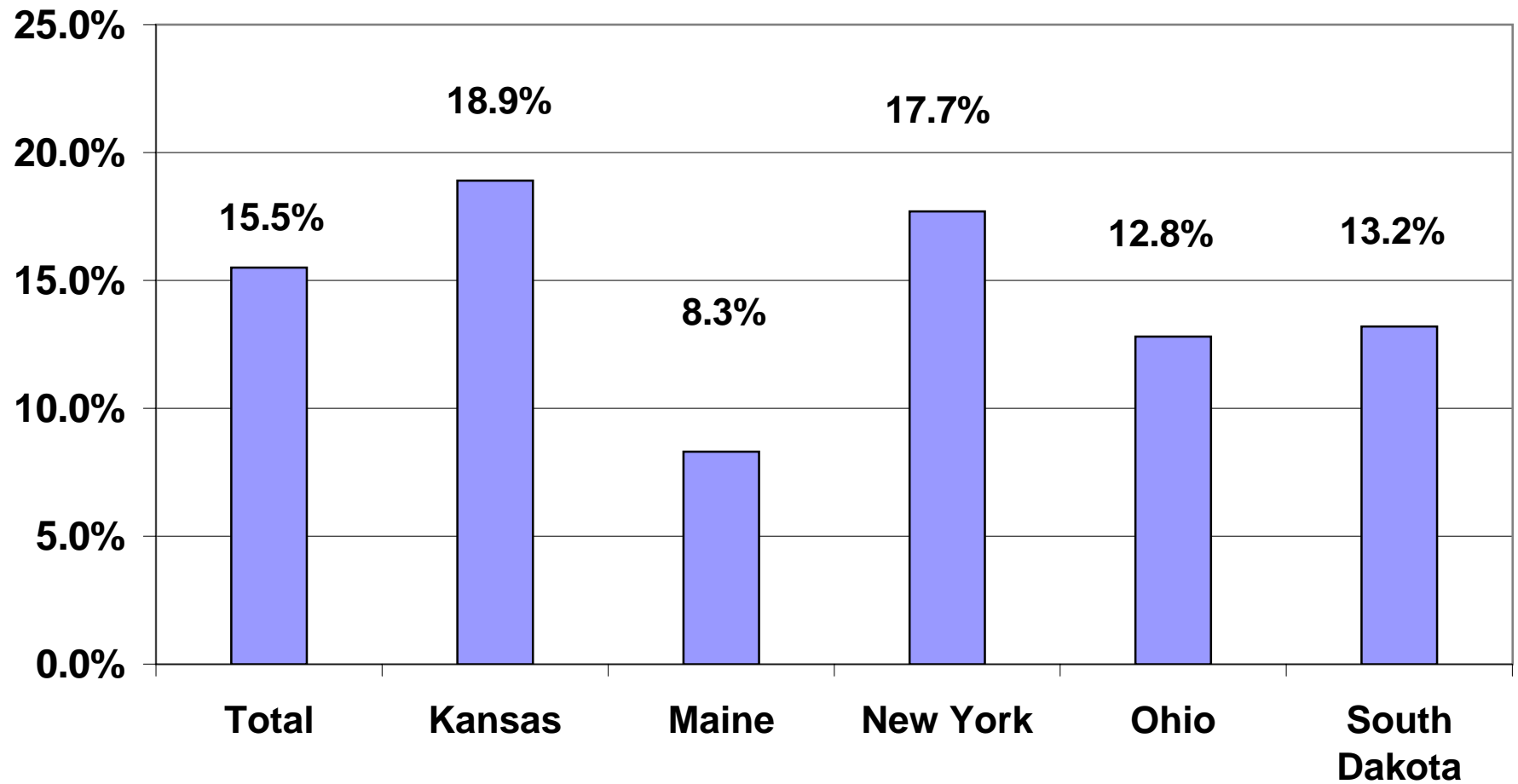
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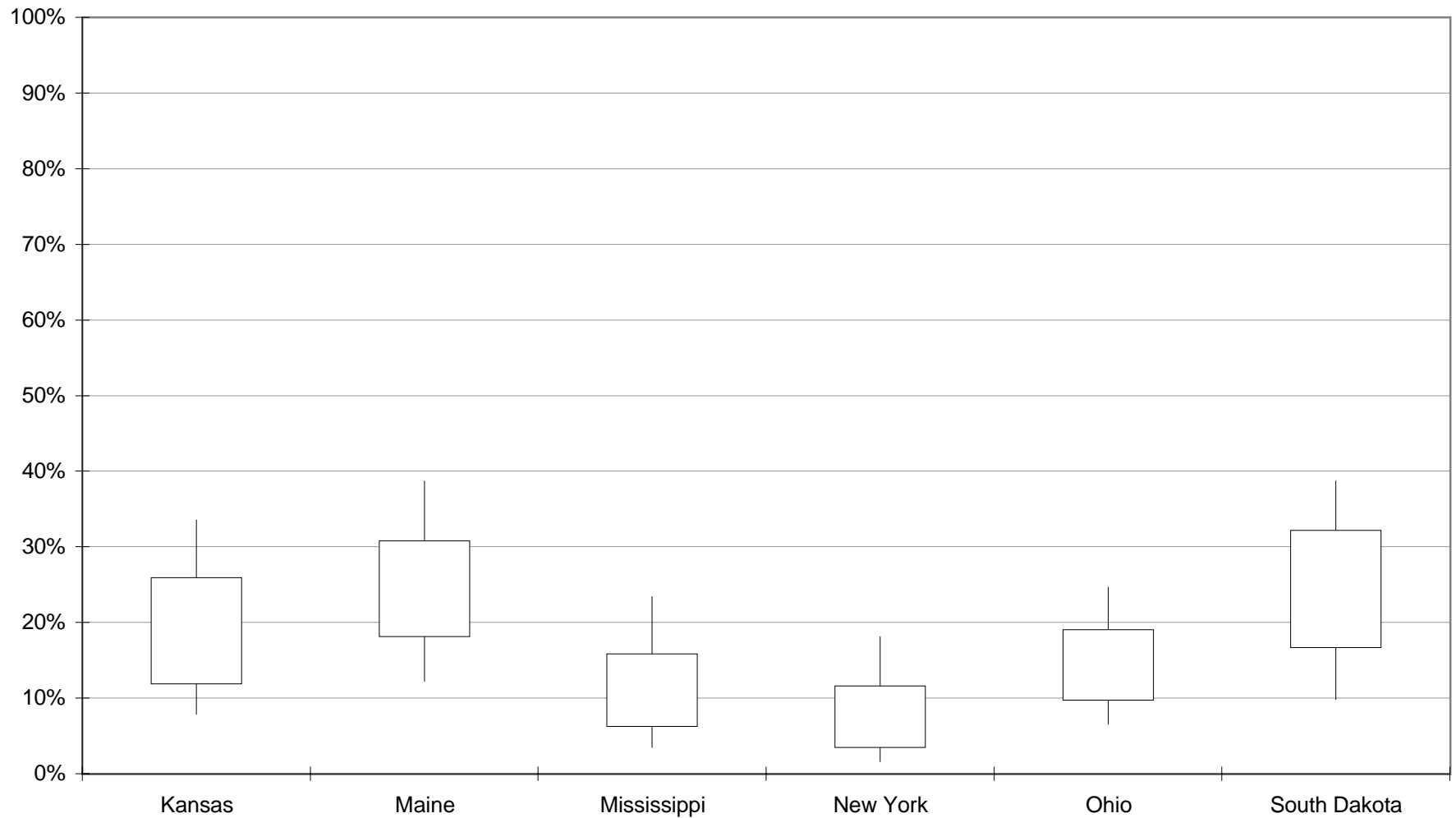
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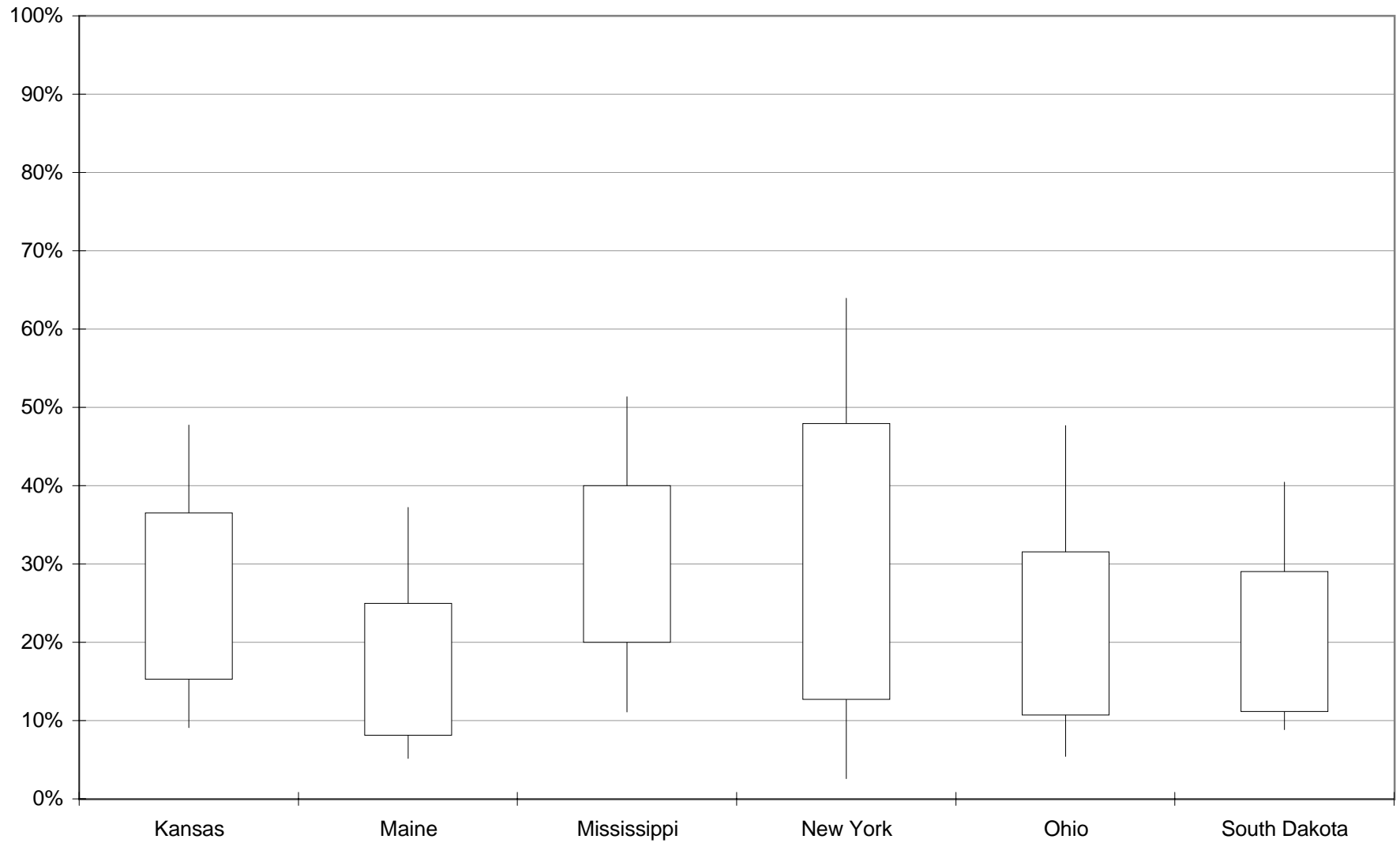
**Figure 1. Percentage of Nursing Home Residents in Persistent Pain who were Receiving no Analgesics by State**



**Figure 2. Within State Variation in Prevalence of Daily Pain, by Facility**



**Figure 3. Within State Variation in Untreated Daily Pain, by Facility**



**Table 1. Prevalence of Daily Pain Among Nursing Home Residents by State**

	<u>Total</u>	<u>Kansas</u>	<u>Maine</u>	<u>Mississippi</u>	<u>Nebraska</u>	<u>New York</u>	<u>Ohio</u>	<u>Pennsylvania</u>	<u>South Dakota</u>	<u>Vermont</u>	<u>Washington</u>	<u>Wisconsin</u>
<b><u>All Residents</u></b>												
<b>Initial Admissions</b>	25.0%	29.9%	38.1%	23.0%	55.8%	18.5%	21.1%	22.8%	35.3%	22.7%	a	a
	<i>127,426</i>	<i>9,812</i>	<i>8,666</i>	<i>2,412</i>	<i>9,416</i>	<i>53,564</i>	<i>35,181</i>	<i>3,197</i>	<i>4,179</i>	<i>999</i>		
<b>Residents Prevalence</b>	15.8%	20.3%	27.8%	14.2%	49.0%	8.4%	10.7%	16.5%	25.1%	16.2%	43.8%	20.4%
	<i>350,084</i>	<i>32,198</i>	<i>12,874</i>	<i>14,236</i>	<i>8,811</i>	<i>127,872</i>	<i>90,679</i>	<i>15,588</i>	<i>9,838</i>	<i>4,043</i>	<i>25,612</i>	<i>8,333</i>
<b>Decedents</b>	19.3%	30.1%	34.6%	16.8%	b	13.3%	b	b	34.3%	b	b	b
	<i>43,117</i>	<i>7,286</i>	<i>3,634</i>	<i>2,270</i>		<i>27,583</i>			<i>2,344</i>			
<b><u>Residents with Cancer</u></b>												
<b>Resident Point Prevalence</b>	21.6%	30.4%	39.9%	19.3%	58.4%	14.3%	12.6%	20.9%	33.0%	23.4%	54.3%	30.0%
	<i>29,618</i>	<i>2,706</i>	<i>1,337</i>	<i>959</i>	<i>712</i>	<i>10,929</i>	<i>7,601</i>	<i>1,381</i>	<i>1,124</i>	<i>414</i>	<i>1,834</i>	<i>621</i>
<b>Decedents</b>	34.5%	47.4%	52.7%	28.3%	b	26.0%	b	b	53.7%	b	b	b
	<i>7,486</i>	<i>1,248</i>	<i>814</i>	<i>276</i>		<i>4,614</i>			<i>534</i>			

Numbers are percentages of residents in daily pain. Denominators are shown beneath each percentage.

<sup>a</sup> Cells are empty because Washington and Wisconsin MDS data lacked an indicator as to whether records were for an admission to the nursing home.

<sup>b</sup> Cells are empty because data for these states (Kansas, Maine, Mississippi, Nebraska, New York, Ohio, Pennsylvania, South Dakota, Vermont, Washington, Wisconsin) could not be merged with Medicare claims to identify decedents.

**Table 2. Prevalence of Persistent Pain Among Nursing Homes Residents by State**

<u>All Residents</u>	<u>Total</u>	<u>Kansas</u>	<u>Maine</u>	<u>Nebraska</u>	<u>New York</u>	<u>Ohio</u>	<u>South Dakota</u>	<u>Washington</u>
<b>All Residents - Prevalence</b>	63.3%	72.9%	71.7%	79.7%	46.1%	49.2%	71.7%	76.0%
	<i>31,177</i>	<i>4,213</i>	<i>1,839</i>	<i>2,761</i>	<i>6,363</i>	<i>6,979</i>	<i>1,629</i>	<i>7,393</i>
<b><u>Residents with Cancer</u></b>								
<b>All Residents - Prevalence</b>	65.5%	80.0%	78.7%	83.0%	50.4%	49.7%	73.0%	76.7%
	<i>2,709</i>	<i>390</i>	<i>188</i>	<i>230</i>	<i>677</i>	<i>559</i>	<i>163</i>	<i>502</i>

Numbers are percentages of residents in daily pain. Denominators are shown beneath each percentage.

**Table 3. Percentage of Nursing Home Residents with in Daily Pain who were Receiving no Analgesics by State**

<u>All Residents</u>	<u>Total</u>	<u>Kansas</u>	<u>Maine</u>	<u>Mississippi</u>	<u>New York</u>	<u>Ohio</u>	<u>South Dakota</u>
<b>Initial Admissions</b>	<i>19,945</i>	<i>2,937</i>	<i>3,304</i>	<i>555</i>	<i>5,788</i>	<i>5,887</i>	<i>1,474</i>
	23.2%	26.4%	16.3%	25.2%	29.4%	20.5%	17.6%
<b>Residents Prevalence</b>	<i>26,937</i>	<i>6,528</i>	<i>3,576</i>	<i>2,024</i>	<i>7,681</i>	<i>4,659</i>	<i>2,469</i>
	27.8%	27.5%	14.4%	29.9%	27.3%	41.9%	20.8%
<b>Decedents</b>	<i>7,331</i>	<i>2,192</i>	<i>1,258</i>	<i>381</i>	<i>2,697</i>	<sup>a</sup>	<i>803</i>
	23.4%	24.7%	15.0%	30.4%	26.7%		18.6%
<b><u>Residents with Cancer</u></b>							
<b>All Residents - Prevalence</b>	<i>3,523</i>	<i>822</i>	<i>534</i>	<i>185</i>	<i>1,142</i>	<i>469</i>	<i>371</i>
	23.6%	25.5%	13.7%	27.6%	23.1%	38.0%	15.4%
<b>Decedents</b>	<i>2,254</i>	<i>591</i>	<i>429</i>	<i>78</i>	<i>869</i>	<sup>a</sup>	<i>287</i>
	17.3%	17.4%	12.8%	21.8%	21.3%		10.8%

Numbers are percentages of residents in daily pain. Denominators are shown beneath each percentage.

<sup>a</sup> Cells are empty because data for Ohio could not be merged with Medicare claims to identify decedents.

**Table 4. Percentage of Nursing Home Residents with in Daily Pain by Nursing Home Characteristics and State**

	<u>Total</u>	<u>Kansas</u>	<u>Maine</u>	<u>Mississippi</u>	<u>New York</u>	<u>Ohio</u>	<u>South Dakota</u>
<u>Nursing Home Size</u>	279,544	30,398	12,830	13,407	127,249	87,436	8,224
Up to 100 Beds	15.5%	19.8%	27.9%	17.5%	10.6%	10.8%	25.3%
101 to 200 Beds	11.3%	20.4%	26.6%	10.7%	8.6%	10.6%	28.5%
Over 200 Beds	8.6%	14.4%	35.2%	12.6%	7.8%	10.8%	28.6%
 <u>Physician Staffing</u>							
None	16.6%	20.8%	30.0%	13.6%	9.2%	10.4%	27.2%
Up to 0.20 FTE's per 100 Beds	12.1%	19.6%	27.1%	12.2%	8.3%	10.7%	24.9%
Over 0.20 FTE's per 100 Beds	10.2%	18.3%	27.0%	16.3%	8.3%	11.0%	27.8%