Prevalence and Characteristics of Moderate to Severe Pain among Hospitalized Older Adults

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OBJECTIVES: To investigate the prevalence, characteristics, and management of pain in older hospitalized medical patients.

DESIGN: Medical record aggregate review.

SETTING: Tertiary care hospital.

PARTICIPANTS: Individuals aged 65 and older admitted to the medicine service between November 28, 2014, and May 28, 2015.

MEASUREMENTS: Demographic characteristics, comorbidity burden, pain characteristics, and analgesics during index hospitalization were assessed in individuals with moderate to severe pain (≥4 on 0–10 Numeric Pain Rating Scale).

RESULTS: Of 1,267 patients admitted to the medicine service, 248 (20%) had moderate to severe pain on admission (mean age 75 ± 8, 57% female, 50% white). During hospitalization, most participants received opioids (80%) and acetaminophen (74%), and few received nonsteroidal antiinflammatory drugs (9%). Participants with chronic pain had less reduction in pain intensity score from admission to discharge than those without a history of chronic pain (mean change score 3.7 vs 4.9, p=.002) and were more likely to receive opioids, adjuvant analgesics, and other analgesics (all p<.05).

CONCLUSION: Twenty percent of older adults admitted to a general medicine service had moderate to severe pain. Further research about optimal pain management in hospitalized older adults, particularly those with chronic pain, is necessary to improve care in this population. J Am Geriatr Soc 2018.
the medicine service of a tertiary medical center in San Francisco between November 28, 2014, and May 28, 2015. Moderate to severe pain was defined as a first documented pain intensity score of 4 or greater within 24 hours of admission as assessed using the 0 to 10 Numerical Pain Rating Scale (NPRS) or a Checklist of Nonverbal Pain Indicators (CNPI) score of 1 or greater. The NPRS is a reliable, commonly used tool to assess pain in older adults, and the CNPI is frequently used to assess pain in cognitively impaired elderly adults. For individuals with multiple admissions during the 6 months of enrollment, the most recent admission was considered. Ethics approval was obtained from the local institutional review board.

Study Measures

Trained clinical and research personnel conducted structured medical record reviews. Demographic data such as age at hospitalization, sex, race, ethnicity, marital status, insurance type, and language preference were abstracted electronically. Abstracted index admission information included length of hospital stay and admission and discharge locations. Pain characteristics included pain sites and relevant pain-related diagnoses from the electronic health record problem list (e.g., chronic pain, dementia, depression).

On admission, the first documented NPRS or CNPI score was recorded. At discharge, the last documented NPRS, CNPI, or Verbal Descriptor Scale (VDS) score was recorded. A subset of participants completed pain assessments at discharge using the VDS, a valid, reliable tool that elicits a verbal description of pain intensity (none, mild, moderate, severe, very severe). Individuals who did not have documented pain scores within 24 hours of admission or within 48 hours of discharge were excluded. To harmonize the 3 pain scales, CNPI scores were converted to NPRS scores using the following algorithm: 1–2 → 5, 3–4 → 8. VDS scores were converted to equivalent NPRS scores using the following algorithm: none → 0, mild → 2, moderate → 5, severe → 8, very severe → 10. We recorded data about analgesics at 3 time points: before hospitalization, during hospitalization, and at discharge. We categorized analgesics into 4 types: nonopioids (acetaminophen, nonsteroidal antiinflammatory drugs (NSAIDs)), opioids, co-analgesics (e.g., antidepressants, anticonvulsants), and other analgesics (e.g., lidocaine, baclofen). We noted nonpharmacological methods of pain treatment (e.g., repositioning, hot or cold application, emotional support). Morphin equivalent daily dose (MEDD) was calculated for opioid intake on the first and last day of admission. A high MEDD was defined as 50 mg or more based on dosing recommendations in the 2016 Centers for Disease Control and Prevention guidelines. To verify accuracy of chart abstraction, an independent abstractor re-evaluated and adjudicated data for 10% of the sample.

We assessed comorbidity burden using the Cumulative Illness Rating Scale for Geriatrics (CIRS-G), a validated tool in older adults that assigns ratings from 0 to 4 based on severity for 14 organ systems. Total score ranges from 0 to 56, with higher scores indicating greater burden of disease. The 1991 CIRS-G manual was the main reference for score calculation, and the 2008 CIRS-G manual was used to clarify ambiguous scoring scenarios. Trained clinical personnel completed CIRS-G scoring. To check interrater reliability, a trained research team member scored a subset of the first 100 charts. All discrepancies were resolved through consultation with the senior author (CSR).

Statistical Analysis

We calculated descriptive summary statistics related to pain prevalence and treatment characteristics using the chi-square test for categorical variables and the Student t-test for continuous variables. Pain prevalence, characteristics, and management were examined in different subgroups of participants. These variables were determined a priori based on previously identified factors associated with pain and included age, sex, race, history of chronic pain, depression, and dementia. We examined outpatient treatment characteristics before hospitalization and at discharge using the McNemar test or Wilcoxon rank sum test and paired t-test as appropriate. To adjust for significant factors based on previous research, multivariate logistic regression analysis was used to determine variables independently associated with history of chronic pain. All analyses were conducted using SAS version 9.4 (SAS Institute, Inc., Cary, NC).

RESULTS

Patient Sample

Of the 1,267 individuals admitted to the medicine service for nonselective procedures, 938 (74.0%) had no pain, 81 (6.4%) had mild pain, and 248 (19.6%) had moderate to severe pain. The current analysis is restricted to the 248 whose admission records reported moderate to severe pain (Figure 1). The mean age of those with moderate to severe pain was 75.0±8.3, 56.5% were female, 50.4% were white, and 49.5% were non-Hispanic; 71.4% reported English as their primary language, 82.7% had Medicare insurance coverage, and 45.2% had Medicaid coverage. Mean length of hospitalization was 5.7±6.4 days, and mean CIRS-G total score was 17.3±5.6 (Table 1).

Pain Characteristics and Management

At the time of admission, mean NPRS score was 6.3±1.8, 55.2% reported moderate pain (NPRS 4–6), and 44.8% reported severe pain (NPRS 7–10); 39.9% had a documented history of chronic pain. The most common sites of pain upon admission were back, knee, hip, and shoulder (26.6%); abdomen (23.4%); and arm, hand, wrist, leg, and foot (21.8%) (Table 1). A significant reduction in mean NPRS score occurred from admission to discharge (4.4±2.9, p<.001).

During hospitalization, 80.2% of participants received opioids, 74.2% received acetaminophen (Figure 2), and 60.5% received acetaminophen and opioids; 8.9%
received NSAIDs. Intravenous self-controlled analgesia was prescribed for 3.6%, and 49.6% received nonpharmacological pain interventions. Of those prescribed opioids during admission, 23.6% received a high MEDD (≥50 mg). Significantly more were prescribed opioids at discharge than before hospitalization (57.3% vs 50.8%, p = .04, Figures 2, 3), 14.1% received new opioid prescriptions at discharge, and 43.1% were prescribed opioids before hospitalization and at discharge (Figure 3). No differences were observed in other outpatient analgesic prescriptions prior to hospitalization compared to at discharge (Figure 2).

**Association Between Participant Characteristics, Pain, and Pain Management**

**Age**

Participants aged 65 to 79 reported higher pain scores at discharge than those aged 80 and older (2.2 ± 2.7 vs 1.3 ± 2.4, p = .02; NPRS ≥1, 49.2% vs 31.9%, p = .01). No differences were found in pharmacological or nonpharmacological pain management according to age (all p>.05).

**Sex**

No differences were observed in admission and discharge pain scores according to sex (all p>.25). Women were more likely than men to be prescribed nonopioids before hospitalization, during hospitalization, and at discharge (all p<.05) and more likely to be prescribed other analgesics during hospitalization and at discharge (all p<.05). There was no difference in nonpharmacological pain management according to sex (p=.15).

**Race**

Admission and discharge pain scores between white and nonwhite participants were not significantly different (all p>.25), although white participants were more likely to be prescribed opioids before and during hospitalization (all p<.05) and less likely to be prescribed acetaminophen at discharge (p=.02). No differences were observed in nonpharmacological interventions according to race (p=.80).

**Chronic Pain**

Participants with a history of chronic pain were more likely to live alone (63.6% vs 43.6%, p=.002) and have a history of depression (33.3% vs 20.1%, p=.02) and sleep apnea (18.2% vs 8.1%, p=.02). In an a priori logistic regression model, depression was the only factor associated with a history of chronic pain (odds ratio=1.94, 95% confidence interval=1.05–3.59, p=.03), after adjusting for age, sex, and body mass index.

No differences were found in admission pain scores between participants with and without a history of chronic pain (p=.83), but at discharge, participants with chronic pain reported less reduction in pain than those without chronic pain (mean change score 3.7±2.9 vs 4.9±2.8, p=.002). Participants with a history of chronic pain were significantly more likely to receive opioids, co-analgesics, and other analgesics before and during hospitalization and at discharge (all p<.05). Although no differences were found between participants with and without chronic pain in nonpharmacological interventions (50% in each group) and nonopioid prescriptions during hospitalization, participants with chronic pain were more likely to
receive nonopioids before hospitalization and at discharge (all p < 0.05, Table 2); 38.9% of participants without chronic pain received opioid prescriptions before admission, of whom 51.7% had a history of a cancer diagnosis.

Dementia
In this sample, 10.1% of participants had a documented history of dementia. Those with dementia were more likely to be older (79.5 ± 10.8 vs 74.5 ± 7.8, p = 0.03) and have a higher CIR5-G score (19.8 ± 5.7 vs 17.0 ± 5.5, p = 0.02). Participants with dementia had pain scores on admission similar to those of individuals without dementia (p = 0.45) but reported lower pain scores on discharge (0.5 ± 1.4 vs 2.1 ± 2.7, p < 0.001) and achieved greater reduction in pain from admission to discharge (mean change score 5.6 ± 2.2 vs 4.3 ± 3.0, p = 0.03). Participants with dementia were less likely to be prescribed opioids before (32.0% vs 52.9%, p = 0.047) and during (64.0% vs 82.1%, p = 0.03) hospitalization. Nonpharmacological interventions during hospitalization and prescription of nonopioids, co-analgesics, and other analgesics before and during hospitalization and at discharge did not differ between participants with and without dementia.

Depression
Sixty-three (25.4%) participants had a documented history of depression. No differences were found in pain scores at admission (p = 0.45) or reduction in pain from admission to discharge (p = 0.23) between participants with and without depression. Participants with depression were more likely to receive opioid prescriptions before (63.5% vs 46.5%, p = 0.02) and during (93.7% vs 75.7%, p = 0.002) hospitalization but not at discharge (65.1% vs 54.6%, p = 0.15). Participants with depression were more likely to receive co-analgesics (34.9% vs 21.6%, p = 0.03) before hospitalization and more likely to be discharged with other analgesics (39.7% vs 21.6%, p = 0.05). There were no differences in nonpharmacological interventions between participants with and without depression (p = 0.42).

Because CNPI scores were converted to NPRS scores, we conducted a sensitivity analysis in which participants with CNPI scores on admission (8.5%) were excluded.

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Table 1. Demographic and Clinical Characteristics of Older Adults Admitted to Medicine Service with Moderate to Severe Pain, Overall and According to Age

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Overall, n = 248</th>
<th>&lt; 80, n = 179</th>
<th>≥ 80, n = 69</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean ± SD</td>
<td>75.0 ± 8.3</td>
<td>70.7 ± 4.4</td>
<td>86.2 ± 4.9</td>
<td>&lt;.001</td>
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<tr>
<td>Female, n (%)</td>
<td>140 (56.5)</td>
<td>102 (57.0)</td>
<td>38 (55.1)</td>
<td>.79</td>
</tr>
<tr>
<td>White, n (%)</td>
<td>125 (50.4)</td>
<td>100 (55.9)</td>
<td>25 (36.2)</td>
<td>.01</td>
</tr>
<tr>
<td>Married, n (%)</td>
<td>110 (44.4)</td>
<td>79 (44.1)</td>
<td>31 (44.9)</td>
<td>.92</td>
</tr>
<tr>
<td>Preferred language English, n (%)</td>
<td>177 (71.4)</td>
<td>137 (76.5)</td>
<td>40 (58.0)</td>
<td>.004</td>
</tr>
<tr>
<td>Admission source community, n (%)</td>
<td>224 (90.3)</td>
<td>165 (92.2)</td>
<td>59 (85.5)</td>
<td>.11</td>
</tr>
<tr>
<td>Discharge location community, n (%)</td>
<td>148 (59.7)</td>
<td>115 (64.2)</td>
<td>33 (47.8)</td>
<td>.02</td>
</tr>
<tr>
<td>Hospital length of stay, mean ± SD</td>
<td>5.7 ± 6.4</td>
<td>5.9 ± 7.1</td>
<td>5.2 ± 4.3</td>
<td>.37</td>
</tr>
</tbody>
</table>

Comorbid conditions, n (%)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Overall, n = 248</th>
<th>&lt; 80, n = 179</th>
<th>≥ 80, n = 69</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>56 (22.6)</td>
<td>47 (26.3)</td>
<td>9 (13.0)</td>
<td>.03</td>
</tr>
<tr>
<td>Cancer</td>
<td>91 (36.7)</td>
<td>74 (41.3)</td>
<td>17 (24.6)</td>
<td>.01</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>38 (15.3)</td>
<td>22 (12.3)</td>
<td>16 (23.2)</td>
<td>.03</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>55 (22.2)</td>
<td>30 (16.8)</td>
<td>25 (36.2)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Dementia</td>
<td>25 (10.1)</td>
<td>14 (7.8)</td>
<td>11 (15.9)</td>
<td>.06</td>
</tr>
<tr>
<td>Depression</td>
<td>63 (25.4)</td>
<td>50 (27.9)</td>
<td>13 (18.8)</td>
<td>.14</td>
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<tr>
<td>Liver disease</td>
<td>26 (10.5)</td>
<td>23 (12.8)</td>
<td>3 (4.3)</td>
<td>.05</td>
</tr>
<tr>
<td>History of falls</td>
<td>59 (23.8)</td>
<td>33 (18.4)</td>
<td>26 (37.7)</td>
<td>.001</td>
</tr>
<tr>
<td>Charlson Comorbidity Index, mean ± SD</td>
<td>3.1 ± 2.3</td>
<td>3.2 ± 2.4</td>
<td>2.6 ± 2.1</td>
<td>.06</td>
</tr>
<tr>
<td>Cumulative Illness Rating Scale for Geriatrics score, mean ± SD</td>
<td>17.3 ± 5.6</td>
<td>16.9 ± 5.6</td>
<td>18.2 ± 5.5</td>
<td>.10</td>
</tr>
<tr>
<td>Body mass index, kg/m², mean ± SD¹</td>
<td>26.1 ± 7.0</td>
<td>26.8 ± 7.4</td>
<td>24.3 ± 5.2</td>
<td>.005</td>
</tr>
<tr>
<td>Creatinine clearance on admission, mean ± SD¹</td>
<td>60.4 ± 34.4</td>
<td>67.6 ± 36.2</td>
<td>41.4 ± 19.0</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Admission pain score

<table>
<thead>
<tr>
<th>Mean ± SD (range)</th>
<th>6.3 ± 1.8 (4–10)</th>
<th>6.4 ± 1.9 (4–10)</th>
<th>6.2 ± 1.7 (4–10)</th>
<th>.45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median (IQR)</td>
<td>6 (5–8)</td>
<td>6 (5–8)</td>
<td>6 (5–8)</td>
<td></td>
</tr>
</tbody>
</table>

Discharge pain score

<table>
<thead>
<tr>
<th>Mean ± SD (range)</th>
<th>1.9 ± 2.7 (0–10)</th>
<th>2.2 ± 2.7 (0–10)</th>
<th>1.3 ± 2.4 (0–10)</th>
<th>.02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median (IQR)</td>
<td>0 (0–4)</td>
<td>0 (0–4)</td>
<td>0 (0–2)</td>
<td>.02</td>
</tr>
</tbody>
</table>

History of chronic pain, n (%)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Overall, n = 248</th>
<th>&lt; 80, n = 179</th>
<th>≥ 80, n = 69</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdomen</td>
<td>58 (23.4)</td>
<td>47 (26.3)</td>
<td>11 (15.9)</td>
</tr>
<tr>
<td>Chest</td>
<td>40 (16.1)</td>
<td>32 (17.9)</td>
<td>8 (11.6)</td>
</tr>
<tr>
<td>Back, knee, hip, shoulder</td>
<td>66 (26.6)</td>
<td>45 (25.1)</td>
<td>21 (30.4)</td>
</tr>
<tr>
<td>Arm, hand, wrist, leg, foot</td>
<td>54 (21.8)</td>
<td>40 (22.3)</td>
<td>14 (20.3)</td>
</tr>
<tr>
<td>Generalized</td>
<td>17 (6.9)</td>
<td>15 (8.4)</td>
<td>2 (2.9)</td>
</tr>
</tbody>
</table>

¹Data missing as follows: body mass index (n = 16), creatinine clearance at admission (n = 14).
SD = standard deviation; IQR = interquartile range.
The overall results were essentially unchanged. The magnitude of the effect remained similar, but age group differences in discharge pain scores and CIRS-G score differences according to dementia group were no longer statistically significant. VDS scores at discharge (13.7% of sample) were converted to equivalent NPRS scores.

DISCUSSION

This study expands our understanding of pain characteristics and current pain management practices in older adults admitted to a medicine service. We found that 1 in 5 older medical patients reported moderate to severe pain. The majority of these individuals received opioid therapy for pain management. Although participants with chronic pain commonly reported pain in the hospital, their pain was often not as responsive to multiple pharmacological agents compared to those without chronic pain.

Our study offers a unique focus on management of moderate to severe pain in older medical patients. Other samples of hospitalized individuals have been smaller, investigated specific analgesics (e.g., opioids), or included more heterogeneous groups (e.g., mixed age groups or combined medical and surgical patients). Although the prevalence identified in our study (20%) was lower than estimates of pain in community-dwelling adults (24–72%), it is likely that this difference is because we focused on moderate to severe pain, whereas other studies...

Figure 2. Types of analgesics prescribed before hospitalization, during hospitalization, and at discharge. NSAID = nonsteroidal anti-inflammatory drug. Co-analgesics = antidepressants, anticonvulsants, and antiarrhythmic. \( p = .04 \). P-value represents comparison between frequency of opioid analgesics prescribed before hospitalization and at discharge.

Figure 3. Flow chart of opioid prescription before hospitalization, during hospitalization, and at discharge. Percentages are calculated based on total study sample (N=248). Received new prescription at discharge, inception cohort, Received prescription before hospitalization at discharge, prevalent cohort, Died during hospital stay. [Color figure can be viewed at wileyonlinelibrary.com]
reported any level of pain. If individuals with mild pain had been included, the total prevalence would have been 26%, similar to previous estimates. In addition, because pain was identified through chart abstraction, pain prevalence may have been lower than if self-reported.

The most common analgesics in our sample were acetaminophen and opioids; NSAIDs were rarely used. Opioid use has grown substantially in the general population, including in older adults. One study showed that, from 1999 to 2010, outpatient opioid prescriptions for older adults almost doubled, from 4% to 9%, and another study reported a 2% annual increase in opioid prescriptions for older adults without cancer between 2004 and 2013. In our study of hospitalized individuals, 51% received opioids before admission, and their use increased to 80% during the hospital stay, which was higher than a recent study of opioid prescription in the emergency department (35%). Our study also reported greater use of opioids at discharge than admission. Of 536,767 opioid-naive individuals who filled an opioid prescription in Oregon, 5% continued with long-term use.42,43 Although not evaluated in our study, it is possible that greater prescription of opioids in the hospital may contribute to persistent use in these older adults.

Almost one-third of participants in our study received high doses of opioids (MEDD ≥50 mg) during admission. Although often needed to control pain adequately, higher doses of opioids are associated with more adverse outcomes. The 2016 Centers for Disease Control and Prevention guidelines and other national and state-based initiatives to curb opioid use have highlighted concerns related to higher doses of opioids and have led to an overall plateauing of opioid use nationally. How these new initiatives to restrict opioid use affect older adults’ pain and pain management remains to be determined.

Opioid therapy is one of the most frequently implicated medications in adverse drug reactions in the hospital. A recent study showed that hospitalized older adults who received opioids had longer hospital stays and were more likely to be readmitted. In our study, participants who had received outpatient opioids before hospitalization experienced longer hospital stays than those who did not. Further research is necessary to clarify the effect of opioid use in this population and to identify nonopioid strategies for pain management in the hospital.

More than one-third of participants in our study had a documented history of chronic pain. Overall, these individuals received more analgesics during their hospitalization yet reported less reduction in pain. Chronic pain is prevalent in older adults and is often challenging to manage. Factors that contribute to chronic pain include age, Hispanic ethnicity, female sex, depression, anxiety, and obesity. In our study, depression was the only factor associated with chronic pain in multivariate analysis. Depression is well studied in individuals with chronic pain and is thought to represent a dyad in which the 2 conditions coexist and may exacerbate each other. Although the American Geriatrics Society guidelines recommend using nonpharmacological methods to manage persistent pain, participants with chronic pain in our study did not receive more nonpharmacological interventions than those without. Our findings underscore the need for better comprehensive management of older adults with chronic pain and attention to psychiatric components of pain in the inpatient setting.

Our study has important implications for clinical practice. As the population ages, an increasing number of older adults will be hospitalized with moderate to severe pain. Healthcare providers should adopt evidence-based approaches to manage their pain. Although our study indicates that opioids are the current mainstay of hospital pain management, their use has significant risks, and there are limited prospective trials examining treatment outcomes in older adults. Furthermore, the effect of opioid administration in individuals with chronic pain in the hospital is unknown. Thus, healthcare providers should exert caution when prescribing opioids to older hospitalized adults.

Several limitations warrant consideration. Our study findings may be limited in generalizability because the sample was from a single medical center with a higher proportion of nonwhite patients than in the general population. Data were abstracted from medical records, which may not reflect actual pain management practices and may underestimate pain prevalence because of missing or incomplete pain documentation. Furthermore, reliability of pain assessments may be limited in individuals

<table>
<thead>
<tr>
<th>Drug Category</th>
<th>Before Hospitalization</th>
<th>During Hospitalization</th>
<th>At Discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonopioid</td>
<td>69 (46.3)</td>
<td>110 (73.8)</td>
<td>77 (51.7)</td>
</tr>
<tr>
<td>Acetaminophen</td>
<td>64 (43.0)</td>
<td>108 (72.5)</td>
<td>70 (47.0)</td>
</tr>
<tr>
<td>Nonsteroidal antiinflammatory drug</td>
<td>13 (8.7)</td>
<td>15 (10.1)</td>
<td>13 (8.7)</td>
</tr>
<tr>
<td>Opioid</td>
<td>58 (38.9)</td>
<td>112 (75.2)</td>
<td>72 (48.3)</td>
</tr>
<tr>
<td>Co-analgesic*</td>
<td>24 (16.1)</td>
<td>23 (15.4)</td>
<td>28 (18.8)</td>
</tr>
<tr>
<td>Other analgesic</td>
<td>24 (16.1)</td>
<td>26 (17.4)</td>
<td>26 (17.4)</td>
</tr>
</tbody>
</table>

*P-values represent comparison of analgesic prescription before the time of hospitalization, during hospitalization, and at discharge among patients with and without a history of chronic pain. P < 0.001, 2.05

*Antidepressant, anticonvulsant, antiarrhythmic.
with cognitive impairment.\textsuperscript{48,49} There is no validated conversion of CNPI to NPRS scores, but our sensitivity analysis indicated that overall results were essentially unchanged when CNPI scores were excluded. Dosing information was not collected for other analgesics except opioids. Because of heterogeneity of admission diagnoses and lack of clarity regarding the rationale for pain management decisions in inpatient and outpatient settings, we could not determine with certainty the indications for analgesic prescription based on chart review. As with any retrospective study, it is difficult to determine temporal relationships between variables. Nevertheless, this study offers important new insights into pain characteristics and pain management in hospitalized older adults with moderate to severe pain.

CONCLUSIONS

Moderate to severe pain was present in 20% older adults admitted to the general medicine service. Opioid therapy was commonly used for pain management. Participants with chronic pain were often less responsive than those without to multiple pharmacological agents. Future research is needed to clarify factors that contribute to the pain experience of hospitalized older adults and to identify optimal pain management strategies in this population.

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Author Contributions: Concept and design: Deng, Ritchie. Data acquisition and analysis: Deng, Patel, Maravilla, Scheer, Garrigues, Ritchie. Data interpretation, drafting of manuscript, critical revision, final approval of submitted manuscript: All authors.

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REFERENCES