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Original Research Article

Using Pain Medication Intensity to Stratify Back Pain Among Older Adults

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Conflicts of interest: Shirley Musich, Shaohung S.
Wang, Karen Keown, Luke B. Slindee, and Kevin
Hawkins are all employed by UnitedHealth Group
and have stock with UnitedHealth Group. Charlotte
S. Yeh is employed by AARP Services, Inc.
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Abstract

Objective. To examine the prevalence of musculo-
skeletal back pain among older adults stratified by
pain medication intensity to 1) review treatment pat-
terns and 2) consider targeted back pain prevention
interventions.

Methods. A random sample of older adults age
64 years and older was utilized to identify new and
recurring back pain. Prescription pain medications
from drug claims were used to stratify to five unique
intensity levels. The characteristics of each level
were determined using regression models.

Results. About 10% had musculoskeletal back pain.
Of these, 54% (N = 20,645) had new back pain and
46% (N = 17,252) had recurring back pain. Overall,
about 35% received physical therapy. Pain medica-
tion intensity levels included no prescription pain
medications, nonsteroidal anti-inflammatory drugs
(NSAIDs), muscle relaxants, low-dose opioids, and
high-dose opioids (new back pain: 39%, 10%, 6%,
23%, and 23%, respectively; recurring back pain
32%, 9%, 4%, 17%, and 38%, respectively). NSAID
and muscle relaxant users were younger, healthier,
and received physical therapy. Opioid users were
younger, in poorer health, used sleep medications,
received physical therapy, and had more falls and
higher health care utilization and expenditures.

Conclusions. New and recurring back pain patients
can be stratified by pain medication intensity to re-
view treatment patterns and target back pain pre-
vention programs. Those with back pain but taking
no prescription pain medications may benefit from
back pain prevention programs. More research on
guidelines for treatment options for those on high
levels of pain medications is warranted.

Key Words. Back Pain; Older Adults; Pain
Medication; Opioids; Morphine Milligram
Equivalents

Introduction

Low back pain is a common condition among
community-dwelling older adults [1–8]. Back pain
among older adults not only impacts quality of life but
often leads to subsequent functional impairment and
disability [2–5,7–14]. Despite different definitions, the
prevalence of some type of back pain among older
adults consistently ranges from about 29% to 36% [1–
8]. Of those with back pain, 12% have been character-
ized as having chronic back pain lasting more than
three months [7], 21% have reported short-term restrict-
ing back pain that interferes with activities [8], and 21%
have reported persistent restricting back pain [8].
Contrary to younger adults, the prognosis for recovery
for older adults is poor [10,12,15–17]. Less than 25% of
new-onset back pain completely resolves within one

year [10,18]; 50% to 60% continue to suffer from chronic back pain [15–17].

Characteristics associated with back pain among older adults include being female, being older, and having more chronic conditions, poorer health, lower education, and poorer psychological health [1,2,5,6,10–12,14,17]. Measured functional impairments also include self-reported difficulties with activities of daily living (ADLs) and documented muscle weakness including trunk extensor muscles, lack of flexibility, slow walking gait, and slower measured functional capabilities [4,5,13–16]. Although older adults suffer longer durations of back pain compared with younger adults [9–11,16], they are less likely to be treated with pain medications, physical therapy, or other alternative therapies [7,18]. Reasons range from acceptance of pain as indicative of the aging process, lack of effectiveness of treatment options, and/or potential undertreatment by physicians [18].

Clinical guidelines for the treatment of back pain have been established primarily based on the prognosis of younger adults, for whom back pain typically resolves within one to two weeks with minimal treatment [7,15,18–20]. Unlike younger adults, however, older adult back pain is less likely to be a result of injury or overuse and is often complicated by multiple chronic conditions, degenerative disc conditions, poor mental and/or physical health, and other functional impairments [1,5–7,10–13,15,18–20]. In addition, pain management with pharmaceuticals often conflicts with other medication protocols [18,19]. Despite these unique circumstances, clinical research into treatment recommendations developed specifically for older adults is limited [2,7,15,18–20].

Firstline treatment options for back pain, regardless of age, are focused on pain management with prescription analgesics including nonsteroidal anti-inflammatory drugs (NSAIDs), muscle relaxants, and opioids [21,22]. Opioids are reserved for higher pain intensities not manageable with lower-level pain medications; about 40% to 45% of older adults with back pain receive opioids [7,23]. Physical therapy can be integrated into back pain treatments, but no standardized prescriptions for physical therapy type (e.g., active, passive), timing (e.g., early within one to 28 days, later after three months), or dose levels (e.g., one to four sessions, five to nine sessions, $\geq$10 sessions) have been determined [2,20,24]. About 35% of back pain patients receive some type of physical therapy, with a median of four sessions [24]. Utilization patterns for physical therapy indicate that, while high-dose ($\geq$10 sessions) and early (within one to 28 days) physical therapy may be most effective, only about 17% receive high doses and about 13% receive early physical therapy [20,24]. There has been concern that physical therapy may needlessly increase health care spending without apparent benefits, especially for younger adults, but a relationship between physical therapy and subsequent health care procedures or

increased expenditures has not been substantiated [23,25]. Second-line treatment options for back pain include steroid injections and back surgeries. Both are utilized less often, and then only when other firstline treatments have failed. Steroid injections have limited, often short-term benefits in reducing pain; back surgeries for older adults have inconsistent success rates, so they are used with caution [2,5,17].

The clinical management of back pain among older adults is of critical importance in preventing subsequent functional limitations and disability [2,3,5,7–10,12–14]. Back pain for older adults is strongly associated with mobility and other ADL limitations [3–5,13,14]. Persistent back pain has also been associated with increased falls, whether a result of the increased pain or associated medications [11,26–28]. Insomnia and other sleep problems associated with back pain further compromise quality of life among older adults [1,29,30]. Although active, high-dose, and early physical therapy has been associated with increased function and decreased pain intensity and/or duration, the delivery and effectiveness of physical therapy is not consistent [20,24]. A key benefit of physical therapy may be to preserve long-term function and prevent disability for older adults, even if pain intensity or duration may not be consistently impacted [24]. In any case, pain management with analgesic medications receives the highest priority regardless of other potential medical procedures [21,22,31].

Interventions for primary or secondary back pain prevention customized for older adults that could prevent or minimize back pain reoccurrence are limited [32]. Generally, active lifestyles with high levels of physical activity have proven to be protective against developing new back pain [33]. Furthermore, there is general consensus that exercises that include trunk extensor strengthening, flexibility, aerobic physical activity, balance training, or body region–specific exercises are effective in improving pain and function and preventing back pain reoccurrence; however, adherence to exercise protocols among older adults has been limited [34,35]. The inclusion of motivational strategies (e.g., booster physical therapy sessions) is helpful in promoting adherence, but these have not been widely promoted [36]. Other interventions include mind-body meditation (mindfulness) and yoga, which have been shown to reduce the use of pain medications while decreasing pain and/or increasing pain acceptance and improving function [37,38]. Nevertheless, back pain prevention programs are not systematically available to older adults, as they are for younger adults in corporate settings [39]. Thus there is a need to apply population health management strategies that effectively stratify older back pain populations to review treatment patterns and to target clinical and nonclinical interventions across a continuum of back pain medication intensity. Interdisciplinary approaches, for example, might integrate physical therapy, typically limited to short time periods, with follow-up exercise options.

No published research studies to date were found that utilized pain medication intensity to stratify back pain patients among older adults with Medicare Supplement plans (i.e., Medigap) [40] for the purpose of considering targeted back pain intervention programs. In the United States, government-funded Medicare covers adults age 65 years and older as well as those younger than age 65 years and disabled. Medicare fee-for-service plans (about 70% of all Medicare plans) pay about 80% of medical expenditures for these individuals but offer no prescription drug benefits. Those enrolled in these Medicare plans are personally responsible for obtaining additional insurance plans to cover the remaining 20% of medical expenses (i.e., Medicare Supplement or Medigap plans) and prescription drug coverage (Medicare Part D plans). While most (about 90%) of those with original fee-for-service Medicare coverage have some type of supplemental insurance coverage, about 28% (currently about 10.2 million adults) have purchased Medigap coverage [40]. As this population may differ from general older adults and/or specifically overall Medicare populations, it was of interest to determine the prevalence of musculoskeletal back pain and to investigate treatment patterns for back pain among these older adults. Furthermore, stratification by pain medication intensity levels could provide a systematic approach potentially utilizable in designing prospective or retrospective back pain prevention programs tailored for older adults. This study adds to the research literature on back pain among older adults in utilizing administrative drug claims to measure prescription pain medication levels as a surrogate measure for pain intensity.

Thus, our primary objective was to estimate the prevalence of new and recurring musculoskeletal back pain among AARP Medicare Supplement insureds and then stratify those patients to five pain medication intensity levels to review treatment patterns. The secondary objective was to consider characteristics associated with new and recurring back pain patients by pain medication intensity levels for use in targeting potential back pain intervention programs. This research was covered under New England Institutional Review Board No. 120160532.

Methods

Study Sample

In 2015, approximately 4 million Medicare insureds were covered by an AARP Medicare Supplement plan insured by UnitedHealthcare Insurance Company. These plans are offered in all 50 states, Washington DC, and various US territories. A 25% random sample of 2015 AARP Medicare Supplement insureds with AARP MedicareRx plans (insured through UnitedHealthcare, about 55% of insureds) who were at least 64 years of age was utilized to define new and recurring back pain patients. Of note, those younger than 65 years and currently enrolled in Medicare Supplement plans are typically a disabled

population, which we chose to include as a potential target for planned interventions. The final study populations that met inclusion criteria included 20,645 new back pain and 17,252 recurring back pain patients (Table 1).

Musculoskeletal Back Pain

New and recurring back pain was defined from suggested Healthcare Effectiveness Data and Information Set (HEDIS) diagnosis codes (Supplementary Data) [41]. New back pain patients must have had a 12-month preperiod (January 1, 2014, to December 31, 2014) without a back pain diagnosis code and a new back pain diagnosis during calendar year 2015. Recurring back pain patients must have had at least one back pain diagnosis in their preperiod (January 1, 2014, to December 31, 2014) and a back pain diagnosis during calendar year 2015. Both groups must have had a 12-month follow-up period. Musculoskeletal back pain was defined from back pain diagnosis codes after excluding all back pain associated with cancer, trauma, and drug abuse, as defined by the HEDIS code specifications [41].

Pain Medication Intensity Levels

Five unique levels of increasing pain medication intensity commonly used to treat back pain were defined: no prescription pain medications, prescription NSAIDs, muscle relaxants, low-dose opioids, and high-dose opioids. At least one prescription was required to document prescriptions within each category; patients were then assigned to their highest level of pain treatment over the course of the year following their diagnosis. Opioid intensity was determined by converting to morphine milligram equivalents (MME) using the following formula: drug quantity*MME conversion factor summed over all the opioid prescriptions filled over the one-year follow-up period [42]. Based on the distribution of MME for new back patients and to distinguish low- and high-dose opioid utilization, the median 600 MME/year was selected as the cut-point to define 1) low-dose opioids (<600 MME/year) and 2) high-dose opioids (≥600 MME/year).

Physical Therapy Treatment

Physical therapy sessions were identified from procedure codes. Diagnosis codes associated with these procedure codes included back pain or other pain. Physical therapy sessions were considered part of the treatment protocol after the 2015 diagnosis for both new and recurring back pain patients.

Covariates

Covariates were included to characterize individuals with new and recurring back pain and to adjust for other risk factors. These covariates included measures of demographics, socioeconomic factors, health status, and

Table 1 Study populations

Attrition Steps	Number	Percent
25% random sample of AARP Medicare Supplement insureds	1,082,348	100
With Medicare Part D prescription drug claims in 2014–2016	446,192	41
With back pain diagnosis codes in 2015	125,458	28
Apply exclusion based on HEDIS rules*	42,502	10
Exclude age younger than 64 y	41,508	9
12 mo of enrollment following index low back pain diagnosis	40,426	9
12 mo of enrollment before index low back pain diagnosis	37,897	8
Final study population	37,897	100
New back pain patients	20,645	54
Recurring back pain patients	17,252	46

HEDIS = Healthcare Effectiveness Data and Information Set.
*HEDIS exclusion diagnosis codes: malignant neoplasms, other neoplasms, history of malignant neoplasm, trauma, intravenous drug abuse, neurologic impairment, and HIV.

other characteristics taken from health plan eligibility and administrative medical claims.

Demographic questions included age and gender. Age groups were defined as 64–69, 70–79, and ≥ 80 years. Geographic regions (Northeast, South, Midwest, and West); low (less than 15% nonwhite), medium (15% to 59% nonwhite), and high ($\geq 60\%$ nonwhite) minority areas; and low (<\$40,179), medium (\$40,179 to <\$57,199), and high ($\geq$\$57,199) median household income levels were geocoded from ZIP codes. AARP Medicare Supplement plan types were grouped by cost-sharing levels, including high-level coverage plans with minimal copayments or deductibles, medium-level coverage, and all other plans. Level of medical service utilization from medical claims was calculated as the Hierarchical Condition Category (HCC) score [43]. This score is used by the Centers for Medicare and Medicaid Services (CMS) to risk-adjust medical payments across various medical plans according to the health status of the different insured populations. HCC subgroups were defined as follows and utilized to control for health status: HCC scores <0.5, HCC scores 0.5 to <1.2, HCC scores 1.2 to <2.8, and HCC scores ≥ 2.8.

Injurious Falls

Injurious falls requiring medical services or hip fractures, as a combined measure, were defined from suggested HEDIS diagnosis codes [41]. Falls or hip fractures were documented from these selected diagnosis codes at any time during the 12-month postperiod after the back pain diagnosis index date.

Pain Management in the Pre- and Postperiods

Pain management in the preperiod was used to control for previous pain treatments. Steroid injections and back surgeries were identified from procedure codes in

the medical claims; opioid use from prescription drug claims.

Steroid injections and back surgery after the back pain diagnosis were considered part of pain management protocols. Both steroid injections and back surgery were considered second-line treatment options to follow primary treatment with pain medication and physical therapy.

Prevalence of Common Chronic Conditions

Nine medical conditions used in calculating the Charlson Comorbidity Index (CCI) score [30] were defined from diagnosis codes in the health care claims: chronic obstructive pulmonary disease (COPD), dementia, diabetes (mild, moderate, or with chronic complications), heart problems (myocardial infarction, heart failure, peripheral vascular disease), liver disease (mild, moderate, or severe), peptic ulcer disease, renal disease, rheumatologic disease, or stroke. The CCI is a measure of the risk of one-year all-cause mortality attributable to selected comorbidities that has also been shown to be highly predictive of morbidity and health care expenditures [44]. These medical conditions were utilized only for descriptive analyses in characterizing those with back pain.

Health Care Utilization and Expenditures

Health care utilization was defined from administrative medical claims as an inpatient (IP) admission or emergency room (ER) visit for any cause within the one-year postperiod for new and recurring back pain patients. Health care expenditures were defined as annual paid claims from the same time period aggregated from Medicare, Medicare Supplement, and patient out-of-pocket paid amounts. Prescription drug expenditures included annual paid drug claims and patient drug copayments.

Statistical Models

Characteristics associated with those with new or recurring back pain by pain medication intensity levels were determined using multinomial logistic regression models. Covariates included all of those variables listed in Tables 2 and 3.

Health care utilization (IP admissions and ER visits) and health care expenditures (medical and prescription drugs) for the five pain medication intensity levels were determined and regression-adjusted using generalized linear models for demographic, socioeconomic, and pain management treatments in the preperiod listed in Tables 2 and 3. Variables with high correlations (e.g., >0.5) were examined; the most impactful were maintained, and the others dropped from regression models. All analyses were completed using SAS Enterprise Guide Version 6.1 (SAS Institute Inc., Cary, NC, USA).

Results

Overall, among the random study sample (N = 446,192), about 28% (N = 125,458) had some type of back pain diagnosis. Of these, 66% (N = 82,956) were excluded due to cancer, trauma, or drug abuse according to the HEDIS rules; 42,502 (34%) remained as musculoskeletal back pain patients. After study inclusion criteria of age ≥64 years and 12-month medical plan eligibility in the pre- and postperiod were applied, the final study populations included 20,645 new back pain patients (5% of the total random sample) and 17,252 recurring back pain patients (4% of the total random sample) (Table 1). New and recurring back pain patients were mostly female (66% and 68%, respectively), 70–79 years of age (50% and 52%, respectively), white (49% and 50%, respectively), and living in the South (38% and 37%, respectively). Overall, among new back pain patients, 28% used NSAIDs, 17% used muscle relaxants, and 45% used opioids. Similarly, among recurring back pain patients, 29% used NSAIDs, 19% used muscle relaxants, and 55% used opioids. About 25% of new and recurring back pain patients utilized combinations of NSAIDs and/or muscle relaxants with opioids and were subsequently categorized as opioid users. Stratification to the five unique categories of pain medication intensity levels, with patients assigned to their highest level of pain treatment over the course of the year following their diagnosis, included no prescription medications, NSAIDs, muscle relaxants, low-dose opioids, and high-dose opioids: 39%, 10%, 6%, 23%, and 23%, respectively, for new back pain patients; 32%, 9%, 4%, 17%, and 38%, respectively, for recurring back pain patients. About 35% of new and recurring back pain patients received physical therapy (Tables 2 and 3).

Characteristics Associated with New and Recurring Back Pain by Pain Medication Intensity Levels

For new back pain patients, characteristics associated with NSAIDs and muscle relaxants included being female (NSAIDs only), younger, healthier, living in the South, and receiving physical therapy as part of their treatment. Those using muscle relaxants also were highly likely to use sleep medications after their back pain diagnosis. Those using low-dose and high-dose opioids were more likely to have been younger, in poor health, lower income, had more falls, used sleep medications after their diagnosis, received physical therapy, and incurred higher health care utilization and higher health care expenditures. All four prescription pain medication categories were more likely to have used opioids prior to their 2015 back pain diagnosis, indicating treatment for previous pain issues (not necessarily associated with back pain), compared with those using no prescription pain medication (Tables 4 and 6).

For recurring back pain patients, characteristics associated with NSAIDs and muscle relaxants included being younger, healthier, living in the South, using sleep medications, and receiving physical therapy treatments. Low- and high-dose opioid users were more likely to be female (high-dose only), younger, in poor health, lower income (high-dose only), using sleep medications, receiving physical therapy, and incurring higher health care utilization and higher health care expenditures. As with new back pain patients, individuals in all four prescription pain medication categories were highly likely to have received opioids prior to their 2015 diagnosis as part of treatment for previous pain issues (Tables 5 and 6).

Characteristics Associated with the Use of Physical Therapy

About 35% of both new and recurring back pain patients received physical therapy as part of their treatment at any time in the year following their back pain diagnosis. We did not have information on the type (e.g., active, passive) of physical therapy. Physical therapy doses included low (one to four sessions), medium (six to nine sessions), and high (≥10 sessions) levels: 42%, 21%, and 37% for new patients, respectively; and 41%, 21%, and 39% for recurring patients, respectively, with a median of six sessions for both new and recurring back pain patients. Characteristics associated with receiving physical therapy for new back pain patients compared with nonrecipients included using prescription pain medications, being younger and higher income, living in the Northeast or West, and less likely to have used opioids prior to their current back diagnosis. For recurring back pain patients, those receiving physical therapy were more likely to be female, using prescription pain medications, in poorer health, living in the Northeast or West, to be higher income, and less likely

Table 2 Unadjusted demographics for new back pain patients

Variable	Overall, % or Mean	No Rx Pain Drugs, % or Mean	NSAIDs, % or Mean	Muscle Relaxants, % or Mean	Opioids <600 MME, % or Mean	Opioids ≥600 MME, % or Mean	P Value
Number	20,645	7,969	2,013	1,300	4,711	4,652	
Gender							
Male	34.4	35.1	31.5	33.4	36.5	32.6	<0.0001
Female	65.6	65.0	68.5	66.6	63.5	67.4	
Age, y							
64–69	25.3	22.4	26.8	33.8	26.3	26.4	<0.0001
70–79	50.2	49.2	52.2	52.3	51.2	49.4	
≥80	24.5	28.4	21.0	13.9	22.5	24.2	
Minority (from ZIP code)							
Low	49.0	49.7	47.1	48.9	49.5	48.1	0.16
Medium	45.3	44.7	46.3	45.9	44.3	46.7	
High	3.5	3.4	3.9	3.5	3.9	3.3	
Income (from ZIP code)							
Low	16.2	14.5	14.3	16.8	16.1	20.1	<0.0001
Medium	35.7	34.6	33.9	34.8	36.4	37.9	
High	47.0	50.0	50.2	48.2	46.6	40.8	
Region							
Midwest	17.2	16.7	15.9	17.8	17.4	18.2	<0.0001
Northeast	23.0	27.4	26.2	24.5	21.1	15.8	
South	38.3	33.9	38.4	43.5	40.2	42.6	
West	20.4	21.1	17.9	13.5	20.5	22.3	
Plan type							
High coverage	78.9	78.4	79.2	81.5	78.7	79.1	0.33
Middle coverage	2.8	2.8	2.7	1.9	2.9	2.9	
Other	18.4	18.9	18.1	16.6	18.5	18.0	
HCC score (pre)							
HCC <0.50	31.4	31.6	37.9	39.8	31.4	25.9	<0.0001
HCC 0.50 to <1.20	46.8	47.3	48.8	45.6	46.3	46.0	
HCC 1.20 to <2.80	19.6	19.3	12.5	13.5	20.0	24.3	
HCC ≥2.8	2.3	1.9	0.8	1.2	2.2	3.9	
CCI conditions (pre)							
COPD	20.2	18.1	17.0	18.5	21.4	24.6	<0.0001
Dementia	1.8	2.2	1.4	0.8	1.8	1.5	0.001
Diabetes	26.5	24.7	23.2	26.7	27.9	29.6	<0.0001
Heart problems	21.6	21.5	17.7	14.8	21.6	25.4	<0.0001
Liver disease	3.3	3.0	3.1	3.5	3.0	4.3	0.001
Peptic ulcer disease	1.1	0.8	0.7	0.9	1.3	1.5	0.001
Renal disease	9.2	8.8	4.8	7.1	9.8	12.1	<0.0001
Rheumatologic disease	4.6	3.6	4.2	4.1	3.8	7.4	<0.0001
Stroke	13.0	13.4	12.1	10.5	13.4	13.0	0.03
Pain medications (post)							
NSAIDs	28.0	0.0	100.0	42.7	33.1	35.5	<0.0001
Muscle relaxants	17.0	0.0	0.0	100.0	22.9	24.3	<0.0001
Opioids	45.4	0.0	0.0	0.0	100.0	100.0	<0.0001
Physical therapy (post)	34.6	30.3	38.2	33.8	36.4	38.7	<0.0001
Fall/hip fracture (post)	3.4	2.8	3.2	2.0	4.2	4.0	<0.0001
Back surgery (post)	2.3	0.2	0.4	0.4	2.3	7.2	<0.0001
Steroid injection (post)	25.3	15.2	27.0	21.3	27.0	41.1	<0.0001
Sleep medication (post)	12.0	8.2	9.9	10.3	12.2	19.6	<0.0001

(continued)

Table 2 Continued

Variable	Overall, % or Mean	No Rx Pain Drugs, % or Mean	NSAIDs, % or Mean	Muscle Relaxants, % or Mean	Opioids <600 MME, % or Mean	Opioids ≥600 MME, % or Mean	P Value
Pain management (pre)							
Opioids	31.4	15.8	18.3	18.6	27.5	71.6	
Steroid injections	14.4	10.0	16.1	11.4	13.9	22.6	<0.0001
Medical utilization (post; annual)							
IP admissions	15.3	9.9	6.5	7.7	18.3	27.4	<0.0001
ER visits	33.8	26.8	25.5	29.8	45.2	38.9	<0.0001
Medical and drug expenditures (post; annual), $							
Total medical	11,559	8,620	7,521	7,471	13,773	17,242	<0.0001
SD	(19,185)	(15,898)	(12,253)	(12,497)	(20,540)	(24,515)	
Total drug	2,579	2,190	2,299	2,621	2,657	3,277	<0.0001
SD	(5,956)	(4,692)	(5,177)	(6,638)	(6,650	(7,091)	
Total medical and drug	14,138	10,810	9,820	10,092	16,430	20,519	<0.0001
SD	(20,572)	(16,988)	(13,750)	(14,597)	(22,049)	(25,937)	

CCI = Charlson Comorbidity Index; COPD = chronic obstructive pulmonary disease; ER = emergency room; HCC = Hierarchical Condition Category; IP = inpatient; MME = morphine milligram equivalents; NSAID = nonsteroidal anti-inflammatory drug; pre = 12 months prior to the back pain index date; post = 12 months after the back pain index date.

to have used opioid treatment prior to their current back pain diagnosis (Table 7).

Discussion

In this population of AARP Medicare Supplement insureds, 28% had some type of back pain diagnosis, reflective of other studies [1–8]. About 10% of the study sample was characterized as having musculoskeletal back pain (excluding those with cancer, trauma, or drug abuse). Of these, 54% and 46% were new and recurring back pain patients, respectively. After stratification to the five unique categories of increasing pain medication intensity, the overall utilization rates across the NSAID, muscle relaxant, and total opioid categories for new and recurring back pain patients were similar. The evident exception was an increased percentage using high-dose opioids among recurring back pain patients compared with new back pain patients: 17% low dose and 38% high dose for recurring back pain compared with 23% low dose and 23% high dose for new back pain patients. Although stratification to low- and high-dose opioids has not been generally utilized in the scientific literature, the overall percentages of new and recurring back pain patients with opioid prescriptions (46% and 55%, respectively) are similar to those reported in other studies [7,23]. About 40% of new and recurring back pain patients used no prescription pain medications [7].

Characteristics associated with use of NSAIDs and muscle relaxants for new and recurring back pain included being younger, healthier, and receiving physical therapy, making this group an ideal target for nonclinical prevention programs. Low- and high-dose opioid users were younger, in poorer health, receiving physical therapy, and had more falls; thus they may be limited to clinical case management interventions. As previously reported, there was a consistent trend across all pain medication categories for younger back pain patients aged 65–69 years to be treated with pain medications compared with patients ≥80 years [18]. Unlike many other studies, however, after controlling for other variables, gender was not strongly associated with pain medication intensity [1,2,5,10–12,14,17]. All of the prescription pain medication subgroups were more likely to be treated in the preperiod with opioids compared with those receiving no prescriptions, indicating preexisting pain issues. Opioid users had higher HCC scores, which are associated with poorer health status. These characteristics are generally in agreement with previous studies detailing risk factors and characteristics associated with back pain among older adults [1,2,5,6,10–12,14,17]. Characteristics associated with receiving physical therapy included receiving prescription pain medications, indicating higher pain intensities, higher income, and having higher-coverage medical plans.

Treatment patterns for both new and recurring back pain patients indicated that about 60% were receiving some type of prescription pain medication, with about 35% receiving physical therapy. These distributions are generally in agreement with other studies [7,20,24]. The median of six physical therapy sessions, with about 40% receiving high dosages (≥10 sessions) of physical therapy, was somewhat higher than another report on physical therapy utilization [24]. In any case, physical therapy tends to be an isolated service not directly integrated with other therapy options for older back pain patients [24]. This is in contrast to working younger

Table 3 Unadjusted demographics for recurring back pain patients

Variable	Overall, % or Mean	No Rx Pain Drugs, % or Mean	NSAIDs, % or Mean	Muscle Relaxants, % or Mean	Opioids <600 MME, % or Mean	Opioids ≥600 MME, % or Mean	P Value
Number	17,252	5,570	1,498	747	2,860	6,577	
Gender							
Male	31.9	34.3	30.6	31.7	32.7	29.9	<0.0001
Female	68.1	65.7	69.4	68.3	67.3	70.1	
Age, y							
64–69	26.3	23.8	27.9	33.1	25.1	28.0	<0.0001
70–79	51.5	51.4	53.1	54.2	51.5	50.8	
≥80	22.2	24.8	19.0	12.7	23.4	21.2	
Minority (from ZIP code)							
Low	49.7	51.8	48.0	48.5	50.7	48.1	0.02
Medium	44.9	42.9	45.7	45.5	44.0	46.7	
High	3.3	3.2	4.1	4.0	3.3	3.3	
Income (from ZIP code)							
Low	16.7	14.2	16.2	16.1	15.6	19.6	<0.0001
Medium	37.2	36.2	35.3	38.0	36.9	38.5	
High	45.1	48.7	47.1	45.0	46.4	41.2	
Region							
Midwest	17.2	17.4	15.1	17.7	17.1	17.5	<0.0001
Northeast	22.1	28.0	28.6	18.5	22.6	15.9	
South	37.2	30.1	37.1	42.3	38.2	42.3	
West	22.6	23.6	17.9	20.2	21.1	23.6	
Plan type							
High coverage	80.4	79.9	80.5	82.7	80.6	80.4	0.18
Middle coverage	3.0	2.7	3.4	2.8	2.7	3.3	
Other	16.7	17.5	16.1	14.5	16.7	16.4	
HCC score (pre)							
HCC <0.50	28.1	31.7	36.2	36.3	28.7	22.1	<0.0001
HCC 0.50 to <1.20	46.7	47.1	47.6	42.0	48.2	45.9	
HCC 1.20 to <2.80	22.7	19.4	15.7	19.5	20.6	28.3	
HCC ≥2.8	2.6	1.8	0.5	2.1	2.5	3.8	
CCI conditions (pre)							
COPD	22.1	18.0	17.4	20.1	20.8	27.4	<0.0001
Dementia	1.2	1.1	1.5	1.1	1.1	1.4	0.56
Diabetes	26.2	23.7	22.0	22.9	29.0	28.5	<0.0001
Heart problems	22.5	20.8	17.7	19.0	21.7	25.9	<0.0001
Liver disease	3.5	3.0	3.3	3.9	3.6	3.8	0.19
Peptic ulcer disease	1.4	1.0	1.1	1.2	1.0	2.0	<0.0001
Renal disease	9.2	7.9	4.3	9.1	9.5	11.3	<0.0001
Rheumatologic disease	5.9	4.0	5.2	6.4	5.7	7.7	<0.0001
Stroke	13.4	12.2	10.7	13.9	13.7	14.8	<0.0001
Pain medications (post)							
NSAIDs	29.3	0.0	100.0	38.8	33.2	35.3	<0.0001
Muscle relaxants	18.8	0.0	0.0	100.0	20.4	29.0	<0.0001
Opioids	54.7	0.0	0.0	0.0	100.0	100.0	<0.0001
Physical therapy (post)	36.2	31.0	39.5	41.6	43.7	36.1	<0.0001
Fall/hip fracture (post)	2.5	1.7	1.8	1.3	3.2	3.2	<0.0001
Back surgery (post)	4.0	0.5	0.7	2.3	4.0	8.0	<0.0001
Steroid injection (post)	36.2	20.8	35.5	29.3	40.6	48.1	<0.0001
Sleep medication (post)	15.9	8.7	12.7	13.5	14.0	23.8	<0.0001

(continued)

Table 3 Continued

Variable	Overall, % or Mean	No Rx Pain Drugs, % or Mean	NSAIDs, % or Mean	Muscle Relaxants, % or Mean	Opioids <600 MME, % or Mean	Opioids ≥600 MME, % or Mean	P Value
Pain management (pre)							
Opioids	53.7	24.4	32.5	34.7	45.9	89.0	
Steroid injections	35.2	22.4	32.4	28.4	35.7	47.2	<0.0001
Back surgery	3.4	2.2	2.9	3.1	3.8	4.5	<0.0001
Medical utilizations (post; annual)							
IP admissions	15.8	7.8	7.5	9.8	17.7	24.4	<0.0001
ER visits	30.6	22.4	24.0	30.4	40.9	34.7	<0.0001
Medical and drug expenditures (post; annual), $							
Total medical	12,903	8,070	8,316	9,274	14,646	17,695	<0.0001
SD	(20,160)	(15,029)	(15,045)	(12,828)	(20,224)	(24,010)	
Total drug	2,853	2,325	2,193	3,014	2,579	3,551	<0.0001
SD	(6,975)	(7,572)	(4,138)	(9,217)	(5,080)	(7,312)	
Total medical and drug	15,755	10,394	10,508	12,287	17,225	21,246	<0.0001
SD	(21,896)	(17,229)	(16,261)	(16,902)	(21,219)	(25,590)	

CCI = Charlson Comorbidity Index; COPD = chronic obstructive pulmonary disease; ER = emergency room; HCC = Hierarchical Condition Category; IP = inpatient; MME = morphine milligram equivalents; NSAID = nonsteroidal anti-inflammatory drug; pre = 12 months prior to the back pain index date; post = 12 months after the back pain index date.

Table 4 Characteristics associated with new back pain patients by pain medication intensity levels compared with those with no prescription pain medications

Variables	NSAIDs Odds Ratios	95% CI	Muscle Relaxants Odds Ratios	95% CI	Opioids <600 MME Odds Ratios	95% CI	Opioids ≥600 MME Odds Ratios	95% CI
Female	1.14	(1.02–1.27)	1.12	(0.98–1.27)	0.95	(0.88–1.02)	1.05	(0.96–1.15)
Age 70–79 y	0.91	(0.81–1.03)	0.72	(0.62–0.82)	0.87	(0.79–0.95)	0.84	(0.76–0.94)
Age ≥80 y	0.70	(0.59–0.82)	0.34	(0.28–0.42)	0.65	(0.58–0.73)	0.72	(0.63–0.82)
Income low	0.98	(0.84–1.14)	1.14	(0.96–1.36)	1.11	(1.00–1.24)	1.45	(1.29–1.64)
Income middle	0.99	(0.89–1.11)	1.05	(0.92–1.20)	1.09	(1.00–1.18)	1.20	(1.09–1.32)
Midwest	0.85	(0.73–0.99)	0.89	(0.75–1.05)	0.91	(0.82–1.01)	0.92	(0.82–1.04)
Northeast	0.83	(0.73–0.95)	0.76	(0.65–0.88)	0.69	(0.62–0.76)	0.57	(0.51–0.64)
West	0.73	(0.63–0.84)	0.50	(0.42–0.60)	0.83	(0.75–0.91)	0.88	(0.79–0.98)
Plan type middle coverage	1.01	(0.75–1.37)	0.71	(0.46–1.08)	1.11	(0.89–1.38)	1.22	(0.95–1.56)
Plan type other	0.99	(0.87–1.13)	0.90	(0.77–1.06)	1.06	(0.96–1.16)	1.11	(1.00–1.24)
HCC 0.50 to <1.20	0.97	(0.86–1.09)	1.04	(0.90–1.19)	1.10	(1.00–1.20)	1.18	(1.06–1.31)
HCC 1.20 to <2.80	0.61	(0.52–0.73)	0.80	(0.66–0.97)	1.12	(1.00–1.26)	1.26	(1.11–1.44)
HCC ≥2.8	0.41	(0.24–0.70)	0.71	(0.41–1.22)	1.26	(0.97–1.65)	1.85	(1.42–2.42)
Physical therapy (post)	1.37	(1.24–1.52)	1.18	(1.04–1.33)	1.35	(1.25–1.46)	1.65	(1.51–1.81)
Fall/hip fracture (post)	1.30	(0.97–1.73)	0.87	(0.58–1.32)	1.56	(1.28–1.91)	1.27	(1.01–1.60)
Sleep medications (post)	1.17	(0.99–1.39)	1.25	(1.02–1.52)	1.42	(1.26–1.60)	2.06	(1.82–2.33)
Opioids (pre)	1.19	(1.04–1.36)	1.20	(1.03–1.40)	1.91	(1.74–2.09)	11.86	(10.84–12.98)
Steroid injection (pre)	1.63	(1.42–1.88)	1.11	(0.91–1.34)	1.30	(1.16–1.46)	1.74	(1.55–1.95)

Reference categories for regression variables included male, age 65–69 years, income high, South, plan type high coverage, HCC <0.50, physical therapy none, fall/hip fracture none, sleep medication none, opioids none, steroid injection none.
CI = confidence interval; HCC = Hierarchical Condition Category; MME = morphine milligram equivalents; pre = 12 months prior to the back pain index date; post = 12 months after the back pain index date.

Table 5 Characteristics associated with recurring back pain patients by pain medication intensity levels compared with those with no prescription pain medications

Variable	NSAIDs		Muscle Relaxant		Opioids <600 MME		Opioids ≥600 MME	
	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI
Female	1.13	(1.00–1.28)	1.15	(0.97–1.36)	1.03	(0.93–1.13)	1.15	(1.04–1.26)
Age 70–79 y	0.90	(0.78–1.03)	0.74	(0.62–0.88)	0.93	(0.83–1.05)	0.84	(0.75–0.93)
Age ≥80 y	0.72	(0.60–0.87)	0.36	(0.27–0.47)	0.86	(0.75–1.00)	0.65	(0.56–0.74)
Income low	1.16	(0.98–1.38)	1.06	(0.84–1.33)	1.08	(0.94–1.24)	1.33	(1.17–1.51)
Income middle	1.03	(0.91–1.18)	1.06	(0.89–1.25)	1.05	(0.95–1.16)	1.14	(1.04–1.26)
Midwest	0.73	(0.62–0.87)	0.76	(0.61–0.95)	0.82	(0.72–0.95)	0.87	(0.77–0.99)
Northeast	0.87	(0.75–1.02)	0.50	(0.40–0.62)	0.68	(0.60–0.78)	0.59	(0.52–0.66)
West	0.61	(0.52–0.72)	0.60	(0.52–0.72)	0.72	(0.63–0.82)	0.84	(0.75–0.95)
Plan type middle coverage	1.25	(0.90–1.74)	1.05	(0.90–1.74)	1.00	(0.75–1.33)	1.22	(0.94–1.58)
Plan type other	0.95	(0.81–1.12)	0.89	(0.81–1.12)	0.98	(0.87–1.12)	0.97	(0.87–1.10)
HCC 0.50 to <1.20	0.93	(0.81–1.07)	0.98	(0.81–1.07)	1.09	(0.97–1.23)	1.30	(1.16–1.46)
HCC 1.20 to <2.80	0.71	(0.59–0.86)	1.14	(0.59–0.86)	1.01	(0.88–1.17)	1.55	(1.35–1.77)
HCC ≥2.8	0.26	(0.12–0.54)	1.41	(0.12–0.54)	1.20	(0.86–1.68)	1.69	(1.26–2.26)
Physical therapy (post)	1.43	(1.27–1.61)	1.62	(1.27–1.61)	1.73	(1.57–1.91)	1.31	(1.20–1.44)
Fall/hip fracture (post)	1.10	(0.71–1.70)	0.81	(0.71–1.70)	1.78	(1.32–2.40)	1.60	(1.19–2.15)
Sleep medications (post)	1.42	(1.18–1.70)	1.43	(1.18–1.70)	1.47	(1.27–1.70)	2.29	(2.02–2.61)
Opioids (pre)	1.44	(1.26–1.64)	1.50	(1.26–1.64)	2.42	(2.18–2.67)	20.86	(18.83–23.10)
Steroid injection (pre)	1.54	(1.36–1.75)	1.24	(1.36–1.75)	1.60	(1.44–1.77)	2.06	(1.87–2.26)
Back surgery (pre)	0.90	(0.63–1.29)	0.84	(0.63–1.29)	0.81	(0.61–1.06)	0.48	(0.38–0.60)

Reference categories for regression variables included male, age 65–69 years, income high, South, plan type high coverage, HCC <0.50, physical therapy none, fall/hip fracture none, sleep medication none, opioids none, steroid injection none.
CI = confidence interval; HCC = Hierarchical Condition Category; MME = morphine milligram equivalents; pre = 12 months prior to the back pain index date; post = 12 months after the back pain index date.

adults, who often have back pain prevention options available to them at their worksites [38]. Increased access to physical therapy sessions or nonclinical back pain programs may be warranted.

The use of sleep medications among opioid users (16% among new patients, 21% among recurring patients) should raise concern, especially with new recommendations from the Centers for Disease Control and Prevention (CDC) about the risks associated with combining sleep medications with opioid use [45]. Of note, sleep medication use in the high-dose opioid category included about 20% of new patients and 24% of recurring patients, compared with 10% and 14% using muscle relaxants for new and recurring patients, respectively. There is evidence that opioids are associated with impaired sleep patterns in addition to the problems of sleeping with chronic pain, especially back pain [46]. In line with these recommendations, clinicians should minimize psychoactive medications for sleep and avoid concomitant use of sleep medication with opioids. Recommendations are for nonpharmacological interventions and sleep hygiene programs to avoid prescription sleep medication if possible [46]. Along with sleep problems, severe back pain, as documented in this study with high opioid medication use, is also associated with increased falls. The increase in the likelihood of falls among higher opioid subgroups is consistent with common risk factors for falls, including pain, medications, and functional limitations [26–28]. Fall risk assessments before the use of opioids may help to reduce falls among these patients.

Health care utilization and expenditures were similar for new and recurring back pain patients across the pain medication intensity subgroups. Annual health care expenditures increased as health status deteriorated from no prescription use (about $10,000) to high-dose opioids (about $20,000). As in other studies, poor health and higher numbers of chronic conditions are consistent risk factors for back pain episodes [1,3–5,14,16,17]. We could find no evidence, however, that physical therapy sessions per se increased health care utilization or expenditures (data not shown). Medicare and Medicare Supplement spending was apparently driven by increased IP admissions and ER visits [23], not by increased physical therapy sessions. We had no measure to track the effectiveness of the physical therapy, but as a procedure, physical therapy is a relatively low-cost item [23,25]. The average cost of physical therapy procedures in the year following back diagnoses was about $1,350 for new and recurring back pain patients.

Table 6 Health care utilization and expenditures for new and recurring back pain patients by pain medication intensity levels

Adjusted Estimates	New Back Pain				
	No Pain Drugs	NSAIDS	Muscle Relaxants	Opioids <600 MME	Opioids ≥600 MME
Inpatient admissions (annual), %	9.5	6.4	8.0	18.3	29.2
Difference (from no pain drugs)		−3.1	−1.5	8.8	19.7
95% CI		(−3.0 to −2.9)	(−1.8 to −0.8)	(8.0 to 9.9)	(17.9 to 21.6)
P value		<0.0001	0.09	<0.0001	<0.0001
Emergency room visits (annual), %	26.7	26.0	30.9	45.4	38.4
Difference (from no pain drugs)		−0.7	4.2	18.7	11.7
95% CI		(−1.1 to −0.1)	(3.2 to 5.4)	(18.1 to 19.4)	(11.1 to 12.4)
P value		0.54	0.002	<0.0001	<0.0001
Medical and drug expenditures (annual), $	10,807	9,939	10,303	16,540	20,181
Difference (from no pain drugs)		−868	−505	5,733	9,374
95% CI		(−940 to −785)	(−673 to −313)	(5,402 to 6,084)	(8,827 to 9,954)
P value		0.0006	0.11	<0.0001	<0.0001
Adjusted estimates	**Recurring Back Pain**				
	No Pain Drugs	NSAIDs	Muscle Relaxants	Opioids < 600 MME	Opioids ≥ 600 MME
Inpatient admissions (annual), %	7.5	7.3	9.9	17.3	25.4
Difference (from no pain drugs)		−0.2	2.4	9.8	17.9
95% CI		(−0.5 to 0.2)	(1.4 to 3.9)	(8.6 to 11.1)	(16.1 to 19.7)
P value		0.78	0.02	<0.0001	<0.0001
Emergency room visits (annual), %	22.8	24.6	31.4	40.9	34.1
Difference (from no pain drugs)		1.8	8.6	18.1	11.3
95% CI		(1.1 to 2.6)	(6.8 to 10.6)	(17.0 to 19.1)	(10.7 to 11.9)
P value		0.14	<0.0001	<0.0001	<0.0001
Medical and drug expenditures (annual), $	10,672	10,692	12,770	17,334	20,571
Difference (from no pain drugs)		19	2,098	6,662	9,899
95% CI		(−113 to 168)	(1,647 to 2,606)	(6,220 to 7,135)	(9,363 to 10,467)
P value		0.95	<0.0001	<0.0001	<0.0001

CI = confidence interval; MME = morphine milligram equivalents; NSAIDs = nonsteroidal anti-inflammatory drugs.

Limiting the stratification of back pain patients to the HEDIS definition of musculoskeletal back pain avoided the limitations of survey distribution to identify those with back pain at various levels of self-reported pain. The subset of musculoskeletal back pain patients focuses on those patients who potentially could benefit most from back pain prevention programs. Those patients receiving no prescription pain medications or those on NSAIDs with indications of lower levels of pain could be an initial group of interest. Certainly those in physical therapy programs identifiable from procedure codes could benefit if there were either booster sessions of physical therapy or integration with other exercise programs to increase adherence. Those receiving higher levels of pain medications, indicating higher levels of pain severity, currently have limited options. They are already at high levels of pain medications to manage their pain, and physical therapy may not be appropriate. Back surgery for older adults continues to be an option of last resort and considered with caution. More research is needed to determine the best pain medication and/or physical therapy protocols to improve success rates for these patients [2,47].

Back pain prevention interventions tailored to older adults are limited [32]. Most interventions tested to date are small-scale research studies that may not be scalable to population health management strategies [37,48]. Exercise that includes trunk extensor muscle strengthening and flexibility components have been consistently shown to improve function and generally reduce pain intensity and duration [33,34]. Unfortunately, the exercises that may be recommended in physical therapy sessions have no systematic follow-up by

Table 7 Characteristics associated with new and recurring back patients who received physical therapy

Variables	New Back Patients with Physical Therapy		Recurring Back Patients with Physical Therapy	
	Odds Ratio	95% CI	Odds Ratio	95% CI
NSAIDs	1.37	(1.24–1.52)	1.44	(1.28–1.62)
Muscle relaxants	1.17	(1.03–1.33)	1.64	(1.40–1.92)
Opioids <600 MME	1.36	(1.25–1.46)	1.76	(1.60–1.93)
Opioids ≥600 MME	1.65	(1.51–1.80)	1.32	(1.20–1.45)
Female	1.06	(1.00–1.13)	1.13	(1.06–1.21)
Age 70–79 y	1.06	(0.99–1.14)	1.09	(1.01–1.18)
Age ≥80 y	0.87	(0.79–0.95)	0.93	(0.84–1.02)
Income low	0.59	(0.54–0.64)	0.67	(0.61–0.74)
Income middle	0.73	(0.68–0.78)	0.79	(0.73–0.84)
Midwest	1.06	(0.97–1.15)	1.10	(1.00–1.20)
Northeast	1.23	(1.14–1.33)	1.36	(1.25–1.49)
West	1.14	(1.05–1.24)	1.33	(1.22–1.45)
Plan type middle coverage	0.76	(0.63–0.91)	0.98	(0.82–1.18)
Plan type other	0.89	(0.82–0.96)	0.88	(0.81–0.96)
HCC 0.50 to <1.20	0.95	(0.88–1.02)	1.11	(1.01–1.23)
HCC 1.20 to <2.80	0.97	(0.89–1.06)	0.95	(0.77–1.18)
HCC ≥2.8	0.83	(0.67–1.02)	1.73	(1.46–2.05)
Opioids (pre)	0.80	(0.75–0.86)	0.85	(0.79–0.92)
Steroid injection (pre)	1.59	(1.47–1.73)	1.45	(1.35–1.55)
Back surgery (pre)	n/a	n/a	1.02	(0.94–1.11)

Reference categories for regression variables included medication nonuser, male, age 65–69 years, income high, South, plan type high coverage, HCC <0.50, opioids none, steroid injection none, back surgery none.
CI = confidence interval; HCC = Hierarchical Condition Category; MME = morphine milligram equivalents; NSAIDs = nonsteroidal anti-inflammatory drugs; pre = 12 months prior to the back pain index date; post = 12 months after the back pain index date.

medical professionals (i.e., physical therapists); thus adherence tends to be low [20]. The success of high-dose physical therapy may depend on the motivation of individual patients to continue home-based exercises [20]. Consequently, those with the best outcomes tend to be male, Caucasian, higher educated, and in better health [20]. One community-based exercise program hosted in local fitness centers with programs designed by physical therapists demonstrated high adherence rates [48]. As fitness center membership is a benefit for AARP Medicare Supplement insureds, this type of program could be feasible for this population. The fitness center would offer expertly trained oversight, exercises consistent with physical therapy recommendations, and the advantages of social connections in exercise class formats. Other pain-related interventions that have shown success include mind-body meditation programs and yoga interventions. Yoga programs adapted for older adults, for example, could be offered through fitness center facilities. Both program types have demonstrated lower use of pain medications, reduced pain, and improved function [36,37]. As back pain for older adults is often multidimensional, interdisciplinary programs that include aspects of all of the above options integrated with physical therapy may be needed [24]. This pain medication stratification methodology could augment these prevention strategies by easily identifying levels of pain and health status from administrative databases to guide targeting of program options.

This study has some limitations. The study population of AARP Medicare Supplement insureds may not generalize to all older adults or other Medicare or Medicare Supplement beneficiaries. Back pain was defined from diagnosis codes, which may result in underreporting of back pain if older adults did not seek medical treatments, although our overall prevalence of back pain diagnoses was similar to other studies [1–8]. Physical therapy dose levels were measured, but we had no information on the nature of the sessions or documentation of effectiveness; thus we could not make recommendations concerning physical therapy. We had no measure for over-the-counter (OTC) pain medications, such as acetaminophens or OTC NSAIDs, which are widely used. OTC medication use would have provided a more complete assessment of pain medication use by older adults. Strengths of the study include a relatively large study population that identified new and recurring back pain patients from administrative data and then stratified those populations by pain intensity, potentially serving population health management strategies.

Conclusion

Overall, about 10% of the AARP Medicare Supplement insured study population was identified with new or re-curring musculoskeletal back pain. Of these, 54% were new back pain patients and 46% were recurring back pain patients. Overall utilization of prescription pain medications and physical therapy during the year after diagnosis was similar for new and recurring back pain patients, although recurring back pain patients used higher percentages of high-dose opioids. Health care utilization and expenditures for new and recurring back pain patients demonstrated similar trends, increasing with poorer health status, with increasing pain intensity. This study demonstrates that back pain patients can be effectively stratified using pain medication intensity cate-gories to review treatment patterns and target back pain prevention programs.

Supplementary Data

Supplementary Data may be found online at http://painmedicine.oxfordjournals.org.

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