

## HEALTH SERVICES RESEARCH

# Primary Care Referral of Patients With Low Back Pain to Physical Therapy

## *Impact on Future Health Care Utilization and Costs*

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**Study Design.** A retrospective cohort.

**Objective.** To describe physical therapy utilization following primary care consultation for low back pain (LBP) and evaluate associations between the timing and content of physical therapy and subsequent health care utilization and costs.

**Summary of Background Data.** Primary care management of LBP is highly variable and the implications for subsequent costs are not well understood. The importance of referring patients from primary care to physical therapy has been debated, and information on how the timing and content of physical therapy impact subsequent costs and utilization is needed.

**Methods.** Data were extracted from a national database of employer-sponsored health plans. A total of 32,070 patients with a new primary care LBP consultation were identified and categorized on the basis of the use of physical therapy within 90 days. Patients utilizing physical therapy were further categorized based on timing (early [within 14 d] or delayed) and content (guideline adherent or nonadherent). LBP-related health care costs and utilization in the 18-months following primary care consultation were examined.

**Results.** Physical therapy utilization was 7.0% with significant geographic variability. Early physical therapy timing was associated with decreased risk of advanced imaging (odds ratio [OR] = 0.34, 95% confidence interval [CI]: 0.29, 0.41), additional physician visits (OR = 0.26, 95% CI: 0.21, 0.32), surgery (OR = 0.45, 95% CI: 0.32, 0.64), injections (OR = 0.42, 95% CI: 0.32, 0.64), and opioid medications (OR = 0.78, 95% CI: 0.66, 0.93) compared

with delayed physical therapy. Total medical costs for LBP were \$2736.23 lower (95% CI: 1810.67, 3661.78) for patients receiving early physical therapy. Physical therapy content showed weaker associations with subsequent care.

**Conclusion.** Early physical therapy following a new primary care consultation was associated with reduced risk of subsequent health care compared with delayed physical therapy. Further research is needed to clarify exactly which patients with LBP should be referred to physical therapy; however, if referral is to be made, delaying the initiation of physical therapy may increase risk for additional health care consumption and costs.

**Key words:** primary care, physical therapy, health services research. **Spine 2012;37:2114–2121**

Considering the high prevalence of low back pain (LBP),<sup>1</sup> it is not surprising that the condition accounts for 2.5% to 3% of all physician visits in the United States<sup>2–4</sup> and is responsible for substantial health care spending. Annual direct health care costs were estimated at more than 85 billion dollars nationally in 2005, a 65% increase from 1997.<sup>5</sup> Despite increasing expenditures, the prevalence of chronic, disabling LBP is increasing.<sup>5,6</sup>

Most patients with LBP initially access health care through primary care.<sup>7,8</sup> Decisions in this setting are likely have substantial impact on outcomes and costs.<sup>9</sup> Defining optimal primary care management has proven elusive, and wide variations in practice have been observed for decisions such as medications, imaging, and referrals including physical therapy.<sup>10–12</sup> Practice guidelines generally recommend delaying referral for physical therapy for several weeks following initial consultation.<sup>13,14</sup> The rationale for this recommendation is that most patients recover rapidly, and intervening quickly would waste resources and could impede recovery for some by excessively “medicalizing” the condition.<sup>15,16</sup> Delaying physical therapy is questioned by studies suggesting reduced costs or improved outcomes with early use.<sup>8,17</sup> In practice, many patients are managed with early physical therapy instead of the recommended initial waiting period.<sup>18</sup>

The value of referring newly consulting patients with LBP from primary care to physical therapy likely depends on both the timing of referral as well as the content of care delivered.

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There seems to be a wide variation in physical therapy care provided to patients with LBP.<sup>19,20</sup> Guidelines recommend an active approach with the focus on strategies to help patients maintain and improve activity levels.<sup>21</sup> Adherence to this recommendation has been associated with improved outcomes and lower subsequent health care utilization and costs.<sup>22,23</sup>

Further research is needed to examine implications of the decision to refer new LBP consulters from primary care to physical therapy, particularly the impact of timing and content of care. Purposes of this study were to describe utilization of physical therapy by primary care physicians for patients with a new consultation for LBP and evaluate the impact of the timing and content of physical therapy care on subsequent health care utilization and costs.

## MATERIALS AND METHODS

### Description of the Data Source

The data source for this study was Mercer HealthOnline, a multivendor data warehouse maintained by Mercer Health and Benefits, LLC (San Francisco, CA). The database links claims and demographic data using anonymous coded numbers to protect patient privacy. The database stores up to 3 years of history and is updated monthly *via* an electronic feed from each data supplier. The database currently reflects the combined experience of more than 2 million members of employer-sponsored health plans. Project data had no identifying information. The project was approved by the IRB from Rocky Mountain University of Health Professions.

### Identification of the Study Sample

We identified patients with a new consultation with a primary care physician with a standard LBP diagnosis from November 1, 2007, through January 31, 2009. Date of the new consultation was defined as the primary care index date. A LBP diagnosis was identified when a LBP-related ICD-9 code was the primary diagnosis (see Appendix Table 1, Supplemental Digital Content 1, available at: <http://links.lww.com/BRS/A672>). Patients had to be continuously eligible within the database for 6 months before and 18 months after the index date. Only the first eligible index date for an individual patient was included. Further eligibility requirements were age between 18 and 60 years on the index date, no claims with a LBP-related ICD-9 code for 6 months preceding the index date, a comorbid diagnosis at the index date that could be a nonmusculoskeletal source of LBP (*e.g.*, kidney stones, urinary tract infection, *etc.*) (see Appendix Table 2, Supplemental Digital Content 1, available at: <http://links.lww.com/BRS/A672>), or a prior history of spinal surgery based on the presence of related current procedural terminology (CPT)-4 codes at any time prior to the index date (see Appendix Table 3, Supplemental Digital Content 1, available at: <http://links.lww.com/BRS/A672>).

### Covariate Variables

We recorded the following at the index date: patient's age and sex, copayment for the index visit, employment status (active, retiree, long-term disability [LTD], or other), and geographic

region (Northeast [CT, DC, MA, ME, NH, NJ, NY, PA, RI, VT]; South [AL, AR, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV]; Midwest [IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI]; or West [AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA, WY]). The type of insurance plan was categorized within the database as (1) a health-maintenance-organization plan, which is generally characterized by requirements for in-network services and referral for care through a primary care provider; (2) a preferred provider organization plan, which typically provides more flexibility in choice of providers; (3) a point-of-service plan, which is typically seen as a hybrid of a health-maintenance-organization plan and a preferred provider organization plan with higher copayments for out-of-network services; or (4) a high deductible health plan with low premium costs but high deductibles, or other.

We recorded comorbid health care conditions within a 6-month period preceding the index date. We recorded the total number of unique ICD-9 diagnoses and the number of prescription medications on the basis of unique generic product identifiers. We recorded whether a hospitalization occurred for any reason, if opioids were prescribed, and total costs for all services during the period including inpatient, outpatient, and prescriptions. We identified comorbid conditions that may influence LBP prognosis including mental health (depression, anxiety, or other psychotic disorders), neck/thoracic pain, or fibromyalgia by identifying the relevant ICD-9 codes (see Appendix Table 4, Supplemental Digital Content 1, available at: <http://links.lww.com/BRS/A672>).

### Physical Therapy Utilization

We considered a 90-day period after the primary care index date to identify physical therapy utilization. If a physical therapy visit occurred with a LBP-related ICD-9 during this period the patient was defined as utilizing physical therapy. Patients with both physical therapy and chiropractic utilization during this period were not included in further analyses. Patients utilizing physical therapy within 90 days were categorized as receiving early physical therapy if the initial visit occurred 14 days or earlier from the primary care index date. We selected a 14-day period to represent a time frame that would clearly link the initiation of physical therapy to the primary care index date with low likelihood of intervening treatment. If the visit occurred between 15 and 90 days from the index date, the patient was categorized as receiving delayed physical therapy.

Physical therapy content, associated with all visits, received during the physical therapy episode of care was examined using CPT codes. An episode of care was defined as the number of days between initial and final visits. If no visits occurred for more than 30 consecutive days the episode of care was considered complete. If only 1 physical therapy visit was received, the patient was not included in the analysis of content of care because these patients did not have an adequate number of visits with which to judge the content of the episode of care. We examined CPT codes to determine adherence to the guideline recommendation for active physical therapy

treatment<sup>21</sup> using procedures described elsewhere.<sup>23</sup> Briefly, each CPT code at each visit was categorized as active, passive, or allowed. Active codes were those consistent with guideline recommendations (e.g., therapeutic exercise, self-training management, etc.). Passive codes were those indicating procedures inconsistent with guideline recommendations (e.g., hot/cold packs, ultrasound, etc.). Allowed codes included evaluation and equipment codes. Numbers of active and passive codes were totaled for visits during the first 14 days of the episode of care (phase 1); and beyond 14 days (phase 2). For each phase, the active percentage was calculated as: (number of active codes / (number of active codes + number of passive codes)) × 100%. Adherence required the active percentage within each phase to be 75% or more, and each visit to include 1 or more active code, otherwise the episode of care was considered nonadherent.

### Outcome Variables

We examined an 18-month period beginning with the index date to determine health care utilization and costs. We recorded utilization of the following when related to a LBP ICD-9 code: advanced imaging (magnetic resonance imaging [MRI] or computed tomography [CT]), additional physician visits, lumbar spine injection, major lumbar surgery (discectomy, laminectomy, rhizotomy, or fusion), and opioid medication use. We recorded costs during this period for expenditures in the following categories when related to a LBP ICD-9 code; diagnostic/imaging procedures, physician office visits, surgical/injection procedures, inpatient nonsurgical costs, emergency room visits, and prescription medications. Any other health care costs (including physical therapy) related to a LBP ICD-9 code was recorded. Total LBP-related health care costs were calculated as the sum of all categories. Non-LBP health care costs during the 18-month period were recorded.

### Data Analysis

Descriptive statistics were calculated. Multivariate logistic regression was used to identify factors associated with physical therapy utilization considering all covariates as potential predictors. We further examined descriptive variables, subsequent health care utilization and costs (LBP-related and non-LBP-related) for patients utilizing physical therapy on the basis of the timing (early or delayed) and content (adherent or nonadherent) of care. Utilization outcomes were compared using odds ratios (OR) with 95% confidence intervals (CI). We examined the relationship between total LBP-related costs and physical therapy utilization using multivariate linear regression controlling for all covariates.

## RESULTS

A total of 76,967 continuously eligible patients were identified with a primary care visit for LBP, of whom 32,070 (41.7%) were included (Figure 1). Physical therapy was utilized within 90 days for 2234 patients (7.0%). The mean number of physical therapy visits was 6.4 (SD = 5.1). Both physical therapy and chiropractic was utilized by 157 patients (0.49%). Baseline characteristics are provided in Table 1.

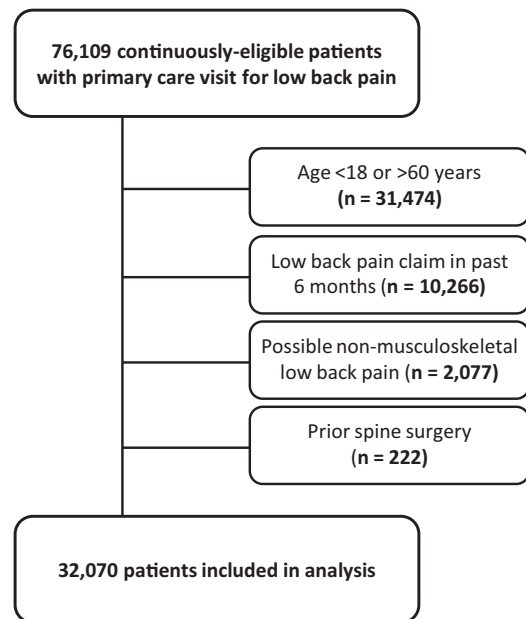


Figure 1. Reasons for exclusion of patients from the analysis.

### Predictors of Physical Therapy Utilization

Predictors of physical therapy utilization were evaluated using 31,482 patients (98.2%) with complete data. Significant predictors were higher index visit copayment (adjusted odds ratio [aOR] = 1.02,  $P = 0.022$ ), not receiving long-term disability (aOR = 0.21,  $P = 0.04$ ), having more diagnosis codes at the index visit (aOR = 1.04,  $P < 0.001$ ), and not having comorbid neck/thoracic pain (aOR = 0.76,  $P < 0.001$ ). Geographic region predicted utilization. With Midwest as the reference, utilization was predicted for patients living in the Northeast (aOR = 1.59,  $P < 0.001$ ) or in the West (aOR = 1.61,  $P < 0.001$ ), and not living in the South (aOR = 0.82,  $P = 0.004$ ).

### Timing of Physical Therapy Utilization

Median time to physical therapy was 14 days (interquartile range: 6, 33). The study categorized 1102 patients (53.1%) as receiving early physical therapy, and 975 patients (46.9%) as receiving delayed physical therapy. Patients receiving early physical therapy were less likely to be taking opioids at index visit ( $P = 0.023$ ). Differences were evident based on insurance plan. Of patients utilizing physical therapy with a preferred provider organization plan ( $n = 1493$ ), a higher percentage received early physical therapy ( $n = 803$ , 53.4%) compared with patients with a health maintenance organization plan ( $n = 159$ ), of whom 71 (44.7%) received early physical therapy ( $P = 0.028$ ). Differences based on geographical region were present. Patients utilizing physical therapy in the Midwest had a higher percentage with early physical therapy ( $n = 189$ , 58.7%) compared with the South ( $n = 274$ , 49.3%) ( $P = 0.007$ ).

### Content of Physical Therapy Initial Management

Of 2234 patients receiving physical therapy, 317 (14.2%) received 1 visit. Of the remaining 1917 patients, 413 (21.5%)

**TABLE 1. Characteristics of Patients With New Consultations in Primary Care With Low Back Pain**

	All Patients (n = 32,070)	Utilized Physical Therapy (n = 2234)	Timing of Physical Therapy (n = 2077)		Content of Physical Therapy (n = 1917)	
			Early (n = 1102)	Delayed (n = 975)	Adherent (n = 413)	Nonadherent (n = 1504)
Age (mean, SD)	43.1 (10.1)	43.6 (9.9)	43.1 (10.2)	44.0 (9.5)	42.5 (10.3)	44.1 (9.7)
Sex (% female)	53.9%	54.2%	56.6%	53.0%	48.4%	56.4%
Index visit copayment (mean, SD)	\$26.56 (28.22)	\$27.84 (30.10)	\$28.55 (31.55)	\$27.33 (28.59)	\$28.93 (\$34.33)	\$27.95 (\$29.43)
<b>Insurance Plan</b>						
PPO	70.5%	72.2%	72.9%	70.8%	71.2%	73.1%
HMO	8.6%	7.6%	6.4%	9.0%	6.5%	7.5%
POS	7.2%	6.3%	6.4%	6.4%	6.5%	6.2%
HDHP	3.0%	3.4%	3.4%	3.6%	5.1%	3.3%
Other	10.6%	10.6%	10.9%	10.3%	10.7%	10.0%
<b>Employment Status</b>						
Active	97.3%	97.0%	96.8%	97.0%	96.9%	96.9%
Retiree	1.8%	2.1%	2.3%	1.8%	1.7%	2.2%
LTD	0.27%	0.090%	0.091%	0.10%	0.24%	0.07%
Other	0.60%	0.90%	0.82%	1.0%	1.2%	0.80%
<b>Geographic Region</b>						
Northeast	16.8%	21.9%	21.8%	22.8%	17.7%	23.9%
West	26.7%	35.4%	35.5%	33.7%	30.0%	36.6%
South	38.6%	27.1%	25.3%	29.5%	32.7%	25.2%
Midwest	18.0%	15.6%	17.4%	13.9%	20.0%	14.4%
Number of diagnosis codes (mean, SD)	6.5 (5.3)	7.1 (5.1)	7.0 (4.9)	7.1 (5.2)	6.8 (5.3)	7.3 (5.1)
Number of prescription medications (mean, SD)	5.5 (5.4)	5.6 (5.4)	5.5 (5.4)	5.7 (5.4)	4.8 (4.7)	5.9 (5.5)
Comorbid mental health condition	9.6%	9.7%	9.5%	9.5%	7.7%	9.4%
Comorbid fibromyalgia diagnosis	2.4%	2.4%	1.7%	3.0%	1.7%	2.6%
Comorbid neck/thoracic spine condition	12.5%	11.1%	9.4%	11.7%	9.0%	11.8%
Narcotic use prior to index visit	31.4%	33.3%	30.5%	35.2%	30.8%	34.0%
Hospitalization prior to index visit	3.7%	3.7%	3.0%	4.6%	3.6%	3.7%
Total medical costs prior to index visit (mean, SD)	\$3193.08 (\$7672.62)	\$3422.01 (\$5403.82)	\$3168.58 (\$4581.94)	\$3574.32 (\$5772.12)	\$2971.61 (\$4795.07)	\$3567.91 (\$5635.93)
Number of physical therapy sessions (mean, SD)		6.4 (5.1)	6.9 (5.6)	5.8 (4.5)	5.3 (3.9)	7.9 (5.1)

PPO indicates preferred provider organization; HMO, health maintenance organization; POS, point-of-service; HDHP, high-deductible health plan; LTD, long term disability; sd, standard deviation.

**TABLE 2. Utilization of Specific Services for Low Back Pain in the 18-Month Period Following the Index Primary Care Visit**

	All Patients (n = 32,070)	Timing of Physical Therapy (n = 2077)		Content of Physical Therapy (n = 1917)	
		Early (n = 1102)	Delayed (n = 975)	Adherent (n = 413)	Nonadherent (n = 1504)
Advanced imaging (MRI or CT)	18.9%	29.4%	54.9%	38.7%	43.9%
Additional physician visits	44.1%	52.6%	81.0%	64.4%	68.8%
Lumbar spine surgery	2.5%	4.7%	9.9%	5.1%	8.1%
Lumbar spinal injections	7.1%	10.1%	21.2%	12.6%	17.8%
Opioid medication use	49.1%	49.1%	55.3%	49.6%	53.2%

*MRI indicates magnetic resonance imaging; CT, computed tomography.*

were categorized as adherent to the recommendation for active treatment, and 1504 (78.5%) were nonadherent. Patients receiving adherent care were more likely to be male ( $P = 0.004$ ) and had fewer prescription medications at the index visit (Table 1). Rates of adherence differed geographically, with higher percentage of patients utilizing physical therapy receiving adherent care in the Midwest (27.4%) and the South (26.0%) than in the Northeast (16.8%) or the West (18.1%) ( $P < 0.05$ ).

**Subsequent Health Care Utilization and Costs**

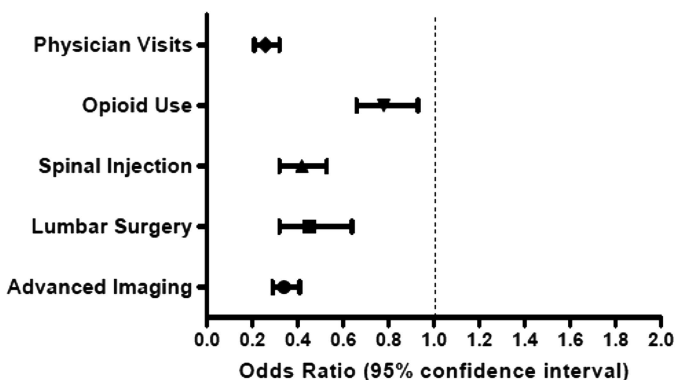
Health care utilization is detailed in Table 2. Compared with delayed physical therapy, patients who received early physical therapy had a decreased likelihood of advanced imaging (OR = 0.34, 95% CI: 0.29, 0.41), additional physician visits (OR = 0.26, 95% CI: 0.21, 0.32), major surgery (OR = 0.45, 95% CI: 0.32, 0.64), lumbar spine injections (OR = 0.42, 95% CI: 0.32, 0.64), and opioid medications (OR = 0.78, 95% CI: 0.66, 0.93) (Figure 2). Relative to patients receiving nonadherent care, those receiving adherent physical therapy had a decreased likelihood of surgery (OR = 0.61, 95% CI: 0.38, 0.98) and receiving injections (OR = 0.66, 95% CI: 0.48, 0.91) (Figure 3). Subsequent health care costs during

the 18-month follow-up period are outlined in Table 3. Compared with patients with delayed physical therapy, total LBP-related costs for patients receiving early physical therapy were an average \$2736.23 lower (95% CI: 1810.67, 3661.78). For patients receiving adherent *versus* nonadherent physical therapy, total LBP-related costs were an average \$1374.30 lower (95% CI: 202.28, 2546.31).

**DISCUSSION**

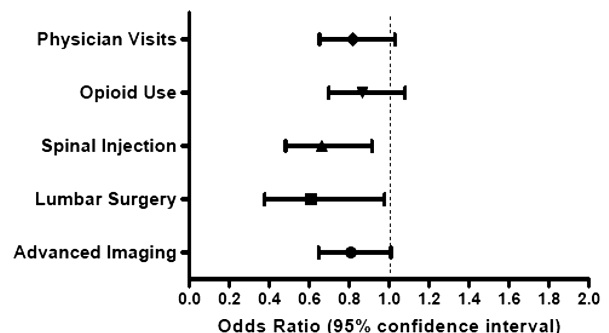
This study evaluated a large sample of patients newly consulting a primary care physician for LBP. Physical therapy utilization was predicted by patient-related variables. Substantial geographic variation was observed. Despite guideline recommendations to delay physical therapy, about half the patients receiving physical therapy did so within 2 weeks. Use of physical therapy was associated with higher LBP-related costs during an 18-month period. Among patients utilizing physical therapy, we found strong associations between the timing of physical therapy and subsequent health care utilization and LBP-related costs. Patients with early physical therapy had a decreased likelihood of advanced imaging, additional physician visits, surgery, injections, and opioid use. We identified weaker associations on the basis of the content of physical therapy care.

**Likelihood of Utilization for Early vs. Delayed Physical Therapy**



**Figure 2.** Likelihood of receiving specific services during the 18-month follow-up period based on timing of physical therapy.

**Likelihood of Utilization for Adherent vs. Non-Adherent Physical Therapy**



**Figure 3.** Likelihood of receiving specific services during the 18-month follow-up period based on content of physical therapy.

**TABLE 3. Costs Incurred During the 18-Month Period Following the Index Primary Care Visit**

	All Patients (n = 32,070)	Timing of Physical Therapy (n = 2077)		Content of Physical Therapy (n = 1917)	
		Early (n = 1102)	Delayed (n = 975)	Adherent (n = 413)	Nonadherent (n = 1504)
Imaging procedures	\$291.12 (5.42)	\$473.32 (63.92)	\$807.20 (42.12)	\$513.84 (46.82)	\$701.14 (52.32)
Physician visits	\$209.54 (1.48)	\$259.62 (9.76)	\$411.76 (11.89)	\$295.52 (14.33)	\$357.15 (9.86)
Surgical/injection procedures	\$740.44 (36.84)	\$1018.88 (170.65)	\$2760.62 (381.27)	\$1445.23 (486.37)	\$1965.72 (229.42)
Inpatient nonsurgical procedures	\$79.28 (11.13)	\$65.00 (30.58)	\$231.79 (64.52)	\$162.31 (90.20)	\$142.99 (37.81)
Emergency room visits	\$19.83 (0.87)	\$26.21 (4.89)	\$25.22 (4.59)	\$24.87 (6.94)	\$28.61 (4.36)
Prescription medication	\$104.23 (3.01)	\$80.41 (10.22)	\$116.83 (11.27)	\$76.43 (9.85)	\$98.85 (9.61)
Other LBP-related costs	\$437.89 (8.11)	\$1225.04 (52.10)	\$1531.3 (67.01)	\$1090.64 (89.06)	\$1651.73 (53.07)
Total LBP costs	\$1882.33 (44.58)	\$3148.49 (228.90)	\$5884.71 (429.92)	\$3608.83 (533.49)	\$4946.18 (277.19)
Non-LBP health care costs	\$7892.53 (108.75)	\$7169.22 (472.39)	\$8430.44 (761.80)	\$7254.82 (1,155.66)	\$7511.44 (402.09)

Values represent mean (standard error).  
LBP indicates low back pain.

Geographic variation in physical therapy utilization is consistent with reports of other LBP interventions including imaging, opioids, surgery, and injections.<sup>24–28</sup> Reasons underlying geographic variation are likely to be numerous and cannot be confirmed from this study. Other research has identified provider density as a factor related to utilization of LBP services.<sup>26</sup> Utilization of MRI has been related to physician ownership of the equipment.<sup>29</sup> We were unable to determine physical therapist density within regions, or the ownership of physical therapy clinics. We found that the highest rates of physical therapy utilization were in the Northeast and the West, with rates more than double for the South. The Northeast is reported to have the lowest rates of surgery and injections for LBP, with the highest utilization of these procedures in the Midwest and the South, respectively.<sup>24,26</sup> Viewed collectively with our results, it does not seem that regional differences are attributable to an overall more aggressive attitude toward management of LBP in certain areas. Instead, it seems that preferred management patterns may differ regionally. Further research should explore this hypothesis and implications of different management patterns on outcomes and costs.

Physical therapy utilization in this sample was low (7%), but consistent with other reports from large national databases.<sup>4,8,30</sup> We found that a majority of patients who went to physical therapy did so quickly (within 2 wk) after the primary care visit. A similar pattern has been reported in Medicare enrollees with a new consultation for LBP,<sup>8</sup> with 8.9% of patients receiving physical therapy within 90 days, of whom 74.2% received care within 4 weeks. It seems that despite recommendations against early referral, when physical therapy is used for patients with LBP it often occurs quickly

after initial consultation. This practice may be justified by emerging evidence. We found that early physical therapy was associated with reduced risk of subsequent surgery, injections, physician visits, opioid use, and advanced imaging, with a corresponding reduction in overall LBP-related medical costs relative to delayed physical therapy. These findings are consistent with those reported for Medicare patients,<sup>8</sup> suggesting similar risks accompanying delayed referral across the age spectrum.

There are several possible explanations for associations between physical therapy timing and outcomes. Early physical therapy attendees may be those with less fear or catastrophizing ideations related to LBP, and these beliefs may be responsible for better outcomes.<sup>31</sup> Consultation with any provider, however, has been related to psychosocial factors such as low mood or diminished self-perception of coping ability,<sup>32,33</sup> suggesting that individuals seeking both primary care and physical therapy are likely to be those lacking confidence in their ability to self-manage. Physical therapy may contribute to promoting a greater sense of self-reliance in managing LBP and confidence in a positive outcome. The importance of developing these attributes of self-efficacy is emerging.<sup>34</sup> If physical therapy assists in developing self-efficacy, it is reasonable to expect it would have greater impact when implemented very early, before negative expectations have become reinforced and entrenched. This hypothesis may also help explain stronger associations between timing and content, of physical therapy care, as the specific activities within physical therapy may not be as important as the positive attitudes it promotes. Alternatively, this finding could reflect the insufficiency of the standard by which we judged the content of care. Randomized trials report that matching specific interventions

to patients with particular clinical characteristics can improve the outcomes of physical therapy for patients with LBP.<sup>35,36</sup> More detailed examination of the content of physical therapy and its adherence to specific clinical decision-making evidence may reveal a greater impact on outcomes.

Contrary to studies showing positive associations between early physical therapy and subsequent health care utilization, early use of MRI or opioids have demonstrated opposite relationships, increasing risks for future utilization.<sup>37–39</sup> Use of these strategies early in the course of care may have detrimental effects of decreasing patients' optimism for recovery or sense of control over symptoms. Several studies have found that providing information on MRI results to patients with acute LBP diminishes patients' sense of well-being.<sup>40,41</sup> The value of early physical therapy may be partly attributable to providing an alternative, or counter-balance, to management strategies that foster a sense of dependency in the patient. Additional research evaluating the factors underlying these observations is needed. However, it is increasingly evident that initial management decisions following a new LBP consultation can have profound implications for outcomes and downstream costs.

Although this study found associations between physical therapy timing and outcomes, use of physical therapy was associated with higher LBP-related costs and increased utilization of surgery and advanced imaging in particular relative to the overall sample. These findings may reflect differences in severity and other important prognostic indicators such as sciatica and psychosocial factors<sup>42</sup> that we were unable to include. It may be that among patients with LBP who are at increased risk of persistent symptoms, early use of physical therapy could reduce overall costs; however, this hypothesis could not be tested in this study. The most cost-effective management strategy would be expected to occur if, after medical red flags or emergency conditions are identified and appropriately referred, patients likely to benefit from physical therapy could be accurately identified by primary care providers and referred early, whereas those at low risk are managed within primary care. Screening tools designed to facilitate identification of patients likely to benefit from early physical therapy have been developed and show some promise.<sup>43</sup>

This study should be considered in the light of additional limitations. Coding errors may have existed within our dataset. We did not include pharmaceutical costs, which contribute a small, but growing percentage of LBP-related costs.<sup>5,44</sup> We did not measure indirect or out-of-pocket costs for treatments such as complementary care, which is common for LBP.<sup>45</sup> We were unable to measure patient-centered outcomes such as pain or satisfaction with care. We only included patients referred from a physician to physical therapy. Almost all states permit direct access to physical therapy without a physician referral, and direct access has been associated with reduced costs compared with physical therapy episodes of care that begin with a physician referral.<sup>46</sup>

## CONCLUSION

Utilization of physical therapy within 90 days for newly consulting patients with LBP was generally low, and varied across

geographic regions. The timing of physical therapy utilization was strongly related to subsequent health care utilization and costs, with early use associated with reduced risks of advanced imaging, surgery, injections, opioid use, and lower overall health care costs compared with delayed use.

## ➤ Key Points

- ❑ This study examined the utilization of physical therapy within 90 days of a new primary care consultation for LBP and associations with subsequent health care utilization, and costs using a national database of employee-based health care insurance plans.
- ❑ Utilization of physical therapy occurred in 7.0% of patients with significant geographic variation.
- ❑ Compared with the entire sample of patients, health care costs were higher for patients utilizing physical therapy.
- ❑ Among patients utilizing physical therapy, early referral (within 14 d of the primary care consultation) was associated with reduced risk of subsequent health care utilization, including advanced imaging, additional physician visits, major surgery, lumbar spine injections, and opioid medications, and lower overall health care costs.

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