Introduction

Neck pain and low back pain (LBP) account for the third-highest category of health care spending in the US, after diabetes and ischemic heart disease.1 Many treatments for LBP are ineffective and potentially harmful. The International Association for the Study of Pain considers overuse of diagnostic imaging, opioids, spinal injections, and surgery to be of low value.2 Despite published guidelines, practice patterns have been slow to change. For example, a 2015 analysis3 found that the use of imaging and other potentially low-value services for LBP remained high after release of the Choosing Wisely recommendations. This cross-sectional study characterizes trends in services for commercially insured patients with LBP over a 9-year period.

Methods

We used administrative claims data from the HealthCore Integrated Research Environment from 2011 to 2019. This study follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline. Because the claims analysis was performed for the purpose of health plan treatment, planning, and operations, an exemption from the New England Research Institute institutional review board was not necessary. Informed consent was not required because the data were made available for analysis in a Health Insurance Portability and Accountability Act-compliant, deidentified research database and did not involve the collection, use, or transmission of individually identifiable data, in accordance with 45 CFR §46.

This cross-sectional study included commercially insured US patients who had repeated claims for LBP at least 8 weeks apart (eTable 1 in the Supplement for criteria) identified from International Classification of Diseases, Ninth Revision and International Statistical Classification of Diseases and Related Health Problems, Tenth Revision codes from 2011 to 2019 (eTable 2 in the Supplement). An index date was set for each patient using the second date from which the individual met the criteria for chronic LBP. Each patient was monitored for 12 months after the index date. Nine mutually exclusive cohorts were defined during the period by limiting observations to each individual’s earliest index date.

For primary outcomes, we focused on utilization of services considered potentially low value by the International Association for the Study of Pain, including emergency department visits, liberal use of diagnostic imaging, opioids, spinal injections, and surgery (the relevant codes are shown in eTable 3, eTable 4, and eTable 5 in the Supplement).2 All-cause inpatient stays, defined as hospitalizations for at least 1 night, were examined. We also described inflation-adjusted (2018 US dollars) per-patient-per-month (PPPM) allowed costs over time.

Outcome utilization and costs were reported for each year. Trends for categorical variables were assessed with the Cochran-Armitage trend test, whereas trends for continuous variables were assessed with linear regression. A significance level of α < .05 (2-sided) was considered for all analyses. All analyses were conducted with SAS Enterprise Guide statistical software version 7.15 (SAS Institute). Data analysis was performed from June 2020 to May 2021.
Results

We identified a total of 2,196,761 unique patients with chronic LBP from 2011 to 2019. During the study period, their mean (SD) age decreased from 46.9 (11.7) years to 45.8 (12.7) years (P for trend < .001), and the sex distribution remained consistent (137,915 women [57.1%] in 2011 and 150,211 women [56.9%] in 2019; P for trend = .16).

The Figure shows trends in utilization and services by year. From 2011 to 2019, the use of inpatient services decreased from 12.4% (29,902 patients) to 9.3% (24,603 patients) (P for trend < .001). Surgery use (4.5% [10,860 patients] vs 3.3% [8,656 patients]; P for trend < .001), opioids (24.9% [59,984 patients] vs 19.4% [51,099 patients]; P for trend < .001), and imaging (73.6% [177,520 patients] vs 59.9% [157,917 patients]; P for trend < .001) also decreased during that period. Epidural injections remained similar (11.4% [25,578 patients] vs 11.4% [30,143 patients]).

The Table shows inflation-adjusted cost trends for services over the time period. Between 2011 and 2019, total PPPM costs decreased from $1,216 to $1,101 (P for trend < .001), and inpatient PPPM costs decreased from $454 to $355 (P for trend < .001). Notable decreases in costs were observed.
with surgery ($166 PPPM to $126 PPPM; $ for trend < .001), opioids ($12 PPPM to $2 PPPM; $ for trend < .001), and imaging ($610 PPPM to $428 PPPM; $ for trend < .001).

Discussion

Among commercially insured patients with LBP, we found a clinically meaningful decrease in use of potentially low-value services.2,3 We observed reductions in the use of surgery, opioids, and imaging over the 9-year period. PPPM costs generally followed patterns of utilization. Previous studies examined similar trends, but in earlier years.3-6

The study was limited by possible miscoding, unknown use of services and medications billed outside of insurance, and unknown pain severity. Trends in the use of potentially low-value services for LBP among commercially insured patients with LBP appear to be moving in a desirable direction.


SUPPLEMENT.

eTable 1. Inclusion Criteria for Sample

eTable 2. ICD-9 and ICD-10 Codes for Low Back Pain

eTable 3. Codes for Selected Medications and Procedures

eTable 4. ICD-9 and ICD-10 Codes for Mental Health Diagnoses

eTable 5. Mental Health Service Codes