



Research Update

Utilization of Inpatient Care in California Workers' Compensation, 2012 - 2022

by Stacy L. Jones

Executive Summary

This report is the latest in a series of CWCI analyses^{1,2,3,4,5,6,7} that use data compiled by the California Department of Health Care Access and Information (HCAI)⁸ to compare the volume and types of inpatient hospitalizations covered by California workers' compensation to those covered by Medicare, Medi-Cal, and private coverage. Key findings show that:

- Workers' compensation continues to represent a very small share of all hospitalizations within the state, accounting for only 0.3 percent of all inpatient discharges during calendar year (CY) 2022, while Medicare accounted for 35.0 percent, Medi-Cal accounted for 31.4 percent, and private coverage accounted for 28.3 percent.
- Workers' compensation is the only payer system that has experienced a continuous, year-over-year decline in discharges over the past 11 years, with the number of inpatient hospitalizations down 51.1 percent from 2012 through 2022.
- Inpatient spinal fusion surgery procedures in workers' compensation have declined 58.8 percent since 2012 but continue to represent a much higher proportion of the inpatient services compared to other payer systems.
- The average length of stay for a spinal fusion is 13.7 percent shorter in workers' compensation than in private coverage, 32.8 percent shorter than in Medicare, and 46.2 percent shorter than in Medi-Cal.
- 62.4 percent of the major joint replacements in workers' compensation were outpatient procedures.

¹ Jones, S. Trends in the Utilization of Inpatient Care in California Workers' Compensation. *CWCI Research Update*. January 2023.

² Jones, S. California Workers' Comp Inpatient Hospitalization Trends, 2010-2020. *CWCI Research Update*. October 2021.

³ Jones, S. California Workers' Comp Inpatient Hospitalization Trends, 2010-2019. *CWCI Research Update*. November 2020.

⁴ Jones, S. California Workers' Comp Inpatient Hospitalization Trends, 2010-2018. *CWCI Research Update*. September 2019.

⁵ Jones, S. California Workers' Comp Inpatient Hospitalization Trends. *CWCI Research Update*. May 2018.

⁶ Jones, S. Inpatient Utilization in California Workers' Compensation: 2008-2014. *CWCI Spotlight Report*. March 2016.

⁷ Jones, S. and David, R. Inpatient Utilization in the California Workers' Compensation System. *CWCI Research Update*. December 2014.

⁸ HCAI was the Office of Statewide Health Planning and Development (OSHPD) prior to Governor Newsom's 2021-2022 budget. <https://hcai.ca.gov/oshpd-becomes-the-department-of-health-care-access-and-information/>

Background and Objectives

In 2012, inpatient hospitalizations were ranked as the number three cost driver in the California workers' compensation system.⁹ Legislative and regulatory reforms enacted that year were specifically designed to raise the quality of care delivered to injured workers and to establish better utilization controls. Those reforms included the removal of the controversial duplicate payment for surgical hardware used in spine surgeries¹⁰ and the expansion of evidence-based medical guidelines for spinal fusions and other surgeries.¹¹

The decade following the enactment of the 2012 reforms was marked by technological advances in medical care, an increase in the number of outpatient facilities in the state,¹² and a growing acceptance that services such as spinal fusions and major joint replacements, which traditionally accounted for a large share of workers' compensation inpatient services, could be safely and efficiently delivered on an outpatient basis.

In light of the changing environment, in 2014 CWCI began conducting and publishing detailed research to monitor inpatient utilization trends in California workers' compensation. This report extends that research series with new data on California hospital discharges through 2022.

Data and Methods

For this study, the author used California inpatient discharge data obtained from HCAI for CY 2012 through CY 2022 inpatient hospitalizations. The public-use database compiled by the HCAI includes detailed information submitted under the Health Data and Advisory Council Consolidation Act by healthcare facilities providing inpatient services in California. The data is grouped by year, based on the patient's discharge date, and includes the type of payer billed, the Medicare Severity Diagnosis-Related Group (MS-DRG) code used to describe the inpatient discharge, the length of stay, and charges. Hospital information includes the facility's name, identification number, and location by county.

The study compares discharge data associated with four payer types (Medicare, Medi-Cal, private coverage, and workers' compensation). The Major Diagnostic Category (MDC) and the Surgery/Medical indicator associated with each MS-DRG as defined by the Centers for Medicare Services (CMS)¹³ were appended to the HCAI records, enabling the author to analyze each type of hospital discharge event.

⁹ Swedlow, A., Ireland, J., Gardner, L. Analysis of Medical and Indemnity Benefit Payments, Medical Treatment and Pharmaceutical Cost Trends in the California Workers' Compensation System. CWCI, June 2012.

¹⁰ Senate Bill 863 removed the fee schedule provision that required separate payment for hardware used in spinal fusion surgeries.

¹¹ Senate Bill 863 mandated implementation of an Independent Medical Review process replacing administrative law judges as arbiters for medical treatment disputes.

¹² Recent data from Definitive Healthcare shows that in 2023, California had 1,210 Ambulatory Surgery Centers (ASCs), the most of any state, and 12.9 percent of the 9,334 active ASCs in the U.S. Definitive Healthcare, March 27, 2023.

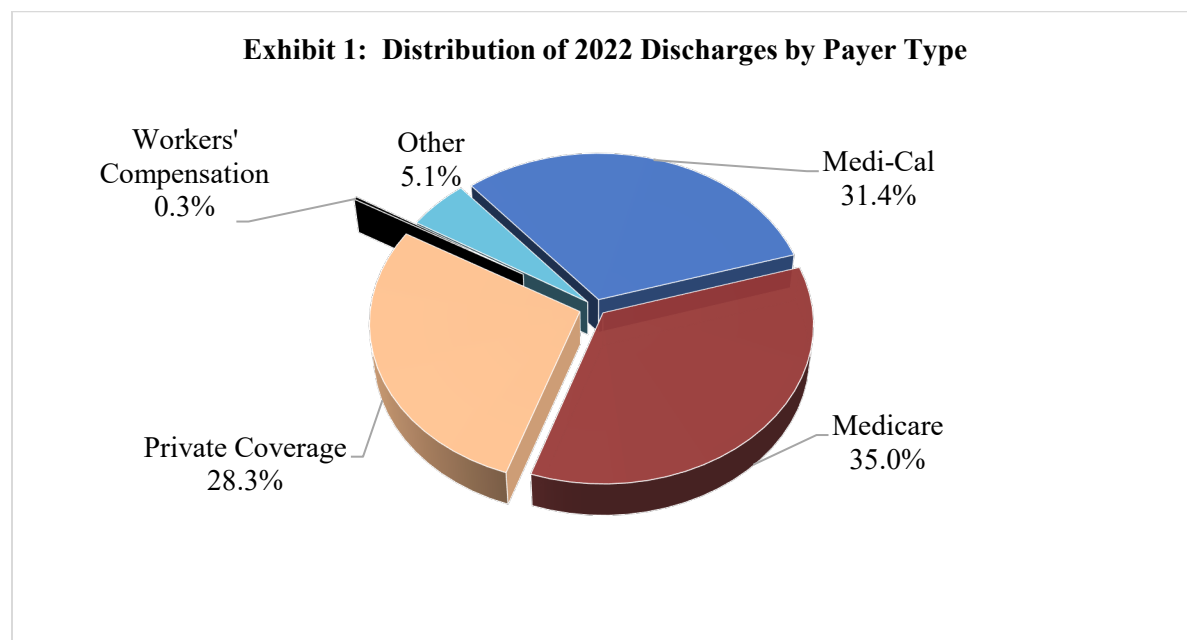
¹³ Center for Medicare and Medicaid Services. List of MS-DRGs Version 37.0.

https://www.cms.gov/icd10m/version37-fullcode-cms/fullcode_cms/P0002.html

In addition to statewide HCAI data, the author also used data from CWCI's Industry Research Information System (IRIS)¹⁴ database to identify major joint replacement and spinal fusion surgeries that were performed in outpatient hospitals or ambulatory surgery centers (ASCs), as well as inpatient hospital settings. After identifying the surgical setting, the author calculated the percentage of spinal fusion or major joint replacement surgeries that were performed in an outpatient setting. That percentage was then applied to the HCAI data to derive an outpatient adjusted trend line.

Results

The newest statewide HCAI data tracks with historical findings from the prior CWCI inpatient hospitalization utilization studies, showing that workers' compensation continues to represent a very small share of all California hospitalizations. Exhibit 1 shows that in CY 2022, patients receiving care under the workers' compensation system continued to account for only 0.3 percent of all inpatient discharges, while Medicare accounted for 35.0 percent, Medi-Cal accounted for 31.4 percent, and private coverage accounted for 28.3 percent. The "Other" payer category noted in Exhibit 1 includes other government programs, self-pay, and indigent care, which combined represented 5.1 percent of CY 2022 discharges.



The "Other" category is excluded from the remainder of this study as are hospitalizations for Maternity and Newborns.¹⁵ Exhibit 2 shows that with the exclusions, injured workers account for 0.4 percent of the inpatient population comprised of workers' compensation, Medicare, Medi-Cal, and private coverage patients. This extremely small share reflects a gradual decrease in share over the past 11 years from 0.9 percent in 2012 to 0.4 percent in 2022.

¹⁴ IRIS is CWCI's proprietary transactional database of insured and self-insured policies and their associated claims.

¹⁵ To achieve a more equitable comparison between the payer type patient populations, discharges associated with pregnancy, childbirth, and newborns, which are non-existent in workers' compensation, have been removed from the MS-DRG comparison data.

Exhibit 2: Discharges by Discharge Year & Payer Type Excluding Maternity & Newborn (Share of Total)					
Discharge Year	Workers' Compensation	Medicare	Medi-Cal	Private	Total
2012	21,505 (0.9%)	1,265,145 (50.0%)	511,165 (20.2%)	731,467 (28.9%)	2,529,282
2013	20,315 (0.8%)	1,255,376 (50.6%)	515,575 (20.8%)	687,940 (27.7%)	2,479,206
2014	18,562 (0.7%)	1,225,359 (47.2%)	687,666 (26.5%)	664,220 (25.6%)	2,595,807
2015	17,532 (0.7%)	1,268,252 (47.3%)	731,602 (27.3%)	663,176 (24.7%)	2,680,562
2016	16,563 (0.6%)	1,278,635 (47.3%)	757,857 (28.0%)	651,033 (24.1%)	2,704,088
2017	15,818 (0.6%)	1,311,254 (47.8%)	772,845 (28.2%)	645,237 (23.5%)	2,745,154
2018	15,495 (0.6%)	1,311,128 (47.9%)	773,136 (28.2%)	637,177 (23.3%)	2,736,936
2019	14,281 (0.5%)	1,336,098 (48.6%)	775,328 (28.2%)	623,695 (22.7%)	2,749,402
2020	11,802 (0.5%)	1,163,155 (48.1%)	697,847 (28.9%)	544,787 (22.5%)	2,417,591
2021	11,135 (0.4%)	1,189,651 (47.2%)	744,424 (29.5%)	574,692 (22.8%)	2,519,902
2022	10,516 (0.4%)	1,247,638 (48.7%)	744,581 (29.1%)	559,309 (21.8%)	2,562,044
2012 - 2022 Net Change	-51.1%	-1.4%	45.7%	-23.5%	1.3%

Exhibit 2 also shows that among the four payer types, workers' compensation is the only one that has experienced a continuous year-over-year decline in discharges over the 11-year span. The data further shows that all four payer types experienced a decline in inpatient hospitalizations during the height of the COVID-19 pandemic in 2020, and that none of them have returned to pre-2020 levels.

Shifts in Medical vs. Surgical Hospitalizations

Inpatient hospitalizations are grouped into two basic categories determined by whether an operating room procedure was performed during the inpatient stay – MS-DRGs that, by definition,¹⁶ include an operating room procedure are included in the Surgical category, while MS-DRGs that do not include the use of an operating room are included in the Medical category.

Exhibit 3 provides a breakdown of the 2021 to 2022 changes in discharge volumes for each payer type by type of hospitalization category (Medical vs. Surgical). During this two-year period, workers' compensation and private coverage discharge volumes for both the Medical and Surgical hospitalization categories decreased, although the percentage decline in Medical discharges was much greater in workers' compensation (-8.9 percent) than in private coverage (-2.7 percent).

¹⁶ Centers for Medicare and Medicaid Services. Defining the Medicare Severity Diagnosis Related Groups (MS-DRGs), Version 37.0. October 2019. [https://www.cms.gov/icd10m/version37-fullcode-cms/fullcode_cms/Defining_the_Medicare_Severity_Diagnosis_Related_Groups_\(MS-DRGs\).pdf](https://www.cms.gov/icd10m/version37-fullcode-cms/fullcode_cms/Defining_the_Medicare_Severity_Diagnosis_Related_Groups_(MS-DRGs).pdf)

Exhibit 3: Change in Discharge Volume by Payer Type and Hospitalization Category* 2021 to 2022					
	Workers' Comp	Medicare	Medi-Cal	Private	Total
Medical	-8.9%	5.8%	0.4%	-2.7%	2.3%
Surgical	-3.9%	2.1%	-1.3%	-2.6%	-0.1%
Total Change	-5.6%	4.9%	0.0%	-2.7%	1.7%

*Excludes pregnancy, childbirth, and newborns

As discussed in CWCI's prior inpatient utilization studies,^{17,18} beginning in 2020, the changes in workers' compensation discharge volumes categorized as Medical were significantly impacted by increases in the number of hospitalizations associated with diseases and disorders of the respiratory system, which were associated with the COVID-19 pandemic.

In addition to the broad categories of Surgical and Medical, inpatient hospitalizations are further classified based on the organ system treated. CMS created 25 mutually exclusive Major Diagnostic Categories (MDCs) to which MS-DRGs are assigned based on associated ICD-10-CM diagnoses codes.¹⁹ Exhibit 4 shows that from 2012 through 2019, diseases and disorders of the respiratory system (MDC 04) represented between 2.5 percent to 3.0 percent of workers' compensation inpatient hospitalizations, but with the sudden introduction of COVID-19 claims into the system, that percentage jumped to 7.4 percent in 2020 and 7.0 percent in 2021 before declining to 3.7 percent in 2022.

Exhibit 4: Top 5 Major Diagnostic Categories for 2022 Workers' Compensation Discharges (As a Percentage of Inpatient Hospitalizations, 2012 - 2022)											
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
MDC 08	64.1%	64.1%	64.0%	64.8%	66.0%	64.4%	62.8%	63.1%	58.5%	58.1%	60.3%
MDC 01	5.3%	4.9%	4.7%	4.9%	5.3%	5.4%	5.8%	6.2%	5.4%	5.7%	6.2%
MDC 21	3.6%	3.8%	3.9%	3.8%	3.7%	3.8%	4.0%	3.8%	4.6%	4.7%	4.8%
MDC 05	4.7%	4.7%	4.6%	4.7%	4.6%	4.5%	4.9%	5.1%	4.4%	4.4%	4.7%
MDC 04	2.5%	2.7%	2.5%	2.9%	3.0%	2.8%	2.8%	2.6%	7.4%	7.0%	3.7%
Total	80.2%	80.1%	79.7%	81.0%	82.5%	80.9%	80.2%	80.8%	80.3%	80.0%	79.6%
MDC Descriptions											
MDC 08 – Diseases & disorders of the musculoskeletal system & connective tissue											
MDC 01 – Diseases & disorders of the nervous system											
MDC 21 – Injuries, poisonings & toxic effects of drugs											
MDC 05 - Diseases & disorders of the circulatory system											
MDC 04 - Diseases & disorders of the respiratory system											

¹⁷ Jones, S.L. Trends in the Utilization of Inpatient Care in California Workers' Compensation. *CWCI Research Update*. January 2023.

¹⁸ Jones, S.L. California Workers' Comp Inpatient Hospitalization Trends, 2010-2020. *CWCI Research Update*. October 2021.

¹⁹ International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) is a system designed for statistical classification of diseases and related health problems. <https://www.cdc.gov/nchs/icd/icd-10-cm.htm>

The decrease in the share of workers' compensation MDC 04 discharges in 2022 led to a shift in the mix of other MDCs, which increased back toward 2019 levels. Diseases and disorders of the musculoskeletal system and connective tissue (MDC 08) remained the predominant diagnostic category with 60.3 percent of the diagnoses in 2022, and MDC 01 (diseases and disorders of the nervous system) returned to its 2019 share of 6.2 percent. The author combined severity levels for the MDC 01 diagnostic groups and calculated the top MS-DRGs with combined severity levels. The MDC 01 diagnoses represent significant injuries to the head (41.5 percent of MDC 01 diagnoses), spinal cord injuries (4.9 percent), and spinal surgeries (11.4 percent) (Exhibit 5).

Exhibit 5: Top 5 Workers' Compensation MDC 01 MS-DRGs with Severity Levels²⁰ Combined (Discharge Year 2022)					
MS-DRG	Workers' Comp	Medicare	Medi-Cal	Private	Total
082, 083, 084, 085, 086, 087	29.8%	8.6%	7.0%	6.4%	7.8%
028, 029, 030	11.4%	0.9%	1.1%	2.3%	1.3%
025, 026, 027	7.2%	5.7%	5.6%	12.8%	7.2%
052, 053	4.9%	0.4%	0.7%	0.7%	0.6%
073, 074	4.5%	3.0%	5.9%	3.3%	3.8%
Total	57.8%	18.6%	20.3%	25.7%	20.7%
MS-DRG Descriptions					
082, 083, 084, 085, 086, 087 - Traumatic stupor and coma					
028, 029, 030 - Spinal procedures					
025, 026, 027 - Craniotomy and endovascular intracranial procedures					
052, 053 - Spinal disorders and injuries					
073, 074 - Cranial and peripheral nerve disorders					

The prevalence of diagnostic categories associated with diseases and disorders of the musculoskeletal system and connective tissue (MDC 08), the nervous system (MDC 01), and injuries, poisonings and toxic effects of drugs (MDC 21), reflected in the combined 71.2 percent of workers' compensation discharges (Exhibit 4) underlies the large share (68.4 percent) of injured worker hospitalizations that are associated with surgical procedures (Exhibit 6). This is essentially the reverse of the proportions for Medical and Surgical hospitalizations experienced by the other three payer types, which ranged between 20.9 percent for Medi-Cal and 31.6 percent for private coverage payers for Surgical services.

Exhibit 6: 2022 Inpatient Utilization, Medical Issue vs Surgical Procedure by Payer Type*					
	Workers' Comp	Medicare	Medi-Cal	Private	Total
Medical	31.6%	75.9%	79.1%	68.4%	75.0%
Surgical	68.4%	24.1%	20.9%	31.6%	25.0%

*Excludes pregnancy, childbirth, and newborns

²⁰ CMS has established lists of diagnosis codes that are defined as either a complication or comorbidity (CC) or a major complication or comorbidity (MCC) which factor into the severity level of the MS-DRG.

[https://www.cms.gov/icd10m/version37-fullcode-cms/fullcode_cms/Design_and_development_of_the_Diagnosis_Related_Group_\(DRGs\).pdf](https://www.cms.gov/icd10m/version37-fullcode-cms/fullcode_cms/Design_and_development_of_the_Diagnosis_Related_Group_(DRGs).pdf)

While 31.6 percent of workers' compensation hospitalizations were non-surgical, two of the top five MS-DRGs for 2022 Medical hospital stays shown in Exhibit 7 reflect services associated with post-surgical care (MS-DRGs 560 and 561). Together these aftercare services represented 8.8 percent of the Medical hospitalizations, while non-surgical medical back problems (MS-DRG 552) represented 7.1 percent of the Medical category.

Exhibit 7: Top 5 MS-DRGs for Workers' Compensation Medical Hospitalizations (Discharge Year 2022)			
MS-DRG	Pct Medical	Pct Total	MS-DRG Description
552	7.1%	2.3%	Medical back problems w/o MCC
560	5.0%	1.6%	Aftercare, musculoskeletal system and connective tissue w/ CC
603	4.1%	1.3%	Cellulitis w/o MCC
561	3.8%	1.2%	Aftercare, musculoskeletal system and connective tissue w/o CC/MCC
871	3.6%	1.1%	Septicemia or severe sepsis w/o mechanical ventilation >96 hours w/ MCC
Total	23.6%	7.5%	

Exhibit 8 shows the top five workers' compensation MS-DRGs for 2022 Surgical hospital stays. Hip or knee replacement surgery (MS-DRG 470) topped the list, with 12.5 percent of all surgical hospitalizations and 8.5 percent of all workers' compensation discharges, while the rest of the top five Surgical MS-DRGs were spinal fusion procedures.

Exhibit 8: Top 5 MS-DRGs for Workers' Compensation Surgical Hospitalizations (Discharge Year 2022)			
MS-DRG	Pct Surgical	Pct Total	MS-DRG Description
470	12.5%	8.5%	Major hip or knee joint replacement or reattachment of lower extremity w/o MCC
455	6.9%	4.7%	Combined anterior/posterior spinal fusion w/o CC/MCC
460	6.5%	4.5%	Spinal fusion except cervical w/o MCC
454	5.0%	3.5%	Combined anterior/posterior spinal fusion w/ CC
473	4.1%	2.8%	Cervical spinal fusion w/o CC/MCC
Total	35.1%	24.0%	

Hospitalizations associated with major hip or knee replacement procedures (MS-DRGs 469 and 470) remained the top inpatient service for workers' compensation at 8.8 percent of total workers' compensation discharges, compared to 1.0 percent for private coverage payers and 1.5 percent for Medicare, and 0.5 percent for Medi-Cal (Exhibit 9). Services associated with back care, including spinal fusion surgeries, non-fusion spinal procedures, and non-surgical back disorders, represented five of the top ten workers' compensation inpatient services.

Exhibit 9: Share of Discharges* ranked by Top 10 Workers' Compensation Discharges – Severity Levels Combined (Discharge Year 2022)				
MS-DRG	Workers' Comp	Medicare	Medi-Cal	Private
469, 470	8.8%	1.5%	0.5%	1.0%
453, 454, 455	8.5%	0.5%	0.1%	0.6%
456, 457, 458, 459, 460	5.1%	0.5%	0.2%	0.7%
471, 472, 473	5.1%	0.3%	0.2%	0.5%
492, 493, 494	4.7%	0.4%	0.8%	0.8%
518, 519, 520	3.9%	0.2%	0.1%	0.5%
559, 560, 561	3.1%	0.9%	0.3%	0.4%
551, 552	2.6%	0.8%	0.5%	0.5%
515, 516, 517	2.3%	0.3%	0.2%	0.4%
483	2.2%	0.2%	0.0%	0.1%
Total	46.3%	5.7%	2.9%	5.6%
MS-DRG Descriptions				
469, 470 - Major hip and knee joint replacement or reattachment of lower extremity				
453, 454, 455 - Combined anterior/posterior spinal fusion				
456, 457, 458, 459, 460 - Spinal fusion except cervical				
471, 472, 473 - Cervical spinal fusion				
492, 493, 494 - Lower extremity & humerus procedures except hip, foot, and femur				
518, 519, 520 - Back & neck proc except spinal fusion				
559, 560, 561 - Aftercare, musculoskeletal system and connective tissue				
551, 552 - Medical back problems				
515, 516, 517 - Other musculoskeletal system and connective tissue				
483 - Major joint/limb reattachment procedure of upper extremities				

*Excludes pregnancy, childbirth, and newborns

CWCI has been tracking and analyzing California workers' compensation spinal fusion trends since 2010, with particular interest on the impact of a mandated reimbursement formula that until 2012 required separate reimbursement for hardware used in spinal fusion surgery.^{21,22,23,24}

²¹ Ireland, J., Swedlow, A., and Ramirez, B. CWCI. Surgical Instrumentation Pass-Through Payments for Back Surgeries in the California Workers' Compensation System. March 2010.

²² Swedlow, A. and Ireland, J. Preliminary Estimate of California Workers' Compensation System-Wide Costs for Surgical Instrumentation Pass-Through Payments for Back Surgeries. *CWCI Research Note*. June 2012.

²³ Jones, S.L. and David, R. Inpatient Utilization in the California Workers' Compensation System. *CWCI Research Update*. December 2014.

²⁴ Jones, S.L. Spinal Fusion Claims in California Workers' Compensation. *CWCI Report to the Industry*. March 2017.

The latest statewide data for workers' compensation shows that the number of inpatient spinal fusion surgery hospitalizations has declined 58.8 percent since 2012, but they continue to represent a much higher proportion of inpatient discharges compared to the other systems, accounting for 18.7 percent of workers' compensation hospitalizations in 2022 compared to 1.3 percent for Medicare, 0.6 percent for Medi-Cal, and 1.8 percent for private coverage payers (Exhibit 10). However, after declining steadily from 2012 through 2020, the number of workers' compensation hospitalizations associated with spinal fusion surgeries increased in 2021 and 2022, so spinal fusion discharges were back up to 18.7 percent of all workers' compensation inpatient discharges in 2022, slightly above the proportion noted in 2017.

Exhibit 10: Volume of Discharges for Implant-Eligible Spinal Surgeries and Percent of Implant-Eligible Spinal Surgeries to All Discharges* by Payer Group (Excludes 028, 029, 030²⁵)				
Discharge Year	Workers' Comp	Medicare	Medi-Cal	Private Coverage
2012	4,784 (22.2%)	13,187 (1.0%)	2,002 (0.2%)	14,740 (1.2%)
2013	4,357 (21.4%)	13,835 (1.1%)	2,122 (0.2%)	14,484 (1.2%)
2014	3,771 (20.3%)	14,767 (1.2%)	3,263 (0.3%)	14,226 (1.2%)
2015	3,476 (19.8%)	15,120 (1.2%)	3,752 (0.3%)	14,071 (1.2%)
2016	3,138 (18.9%)	16,080 (1.3%)	4,379 (0.4%)	13,683 (1.2%)
2017	2,819 (17.8%)	16,051 (1.2%)	4,679 (0.4%)	12,692 (1.1%)
2018	2,696 (17.4%)	16,102 (1.2%)	4,439 (0.4%)	11,975 (1.1%)
2019	2,338 (16.4%)	17,101 (1.4%)	4,703 (0.4%)	11,796 (1.1%)
2020	1,877 (15.9%)	15,391 (1.3%)	4,155 (0.6%)	10,465 (1.9%)
2021	1,958 (17.6%)	15,805 (1.3%)	4,263 (0.6%)	10,609 (1.8%)
2022	1,970 (18.7%)	16,736 (1.3%)	4,174 (0.6%)	10,255 (1.8%)
2012 - 2022 Net Change	-58.8%	26.9%	108.5%	-30.4%

*Excludes pregnancy, childbirth, and newborns

While the volume of inpatient hospitalizations for spinal fusions increased in 2021 and 2022, so too did the number of spinal fusions performed in outpatient hospitals or ASCs. Using Current Procedural Terminology (CPT) codes submitted by primary surgeons, hospitals and ASCs, the author identified spinal fusion services performed in these outpatient settings.

A review of that data revealed that the percentage of workers' compensation spinal fusion procedures performed in outpatient settings increased from less than 1 percent in 2014 to 14.9 percent in 2021 before dipping to 13.3 percent in 2022 (Exhibit 11). The decline in the proportion of spinal fusion surgeries performed on an outpatient basis between 2021 and 2022 may reflect the increase in inpatient services seen in the inpatient data, as well as billing and payment delays resulting in the 2022 data being less complete than the 2021 data.

²⁵ MS-DRGs 028, 029, and 030 may also involve spinal fusion, but they have been excluded since they also include other types of spinal surgery addressing nervous system disorders, such as neurostimulator implantation.

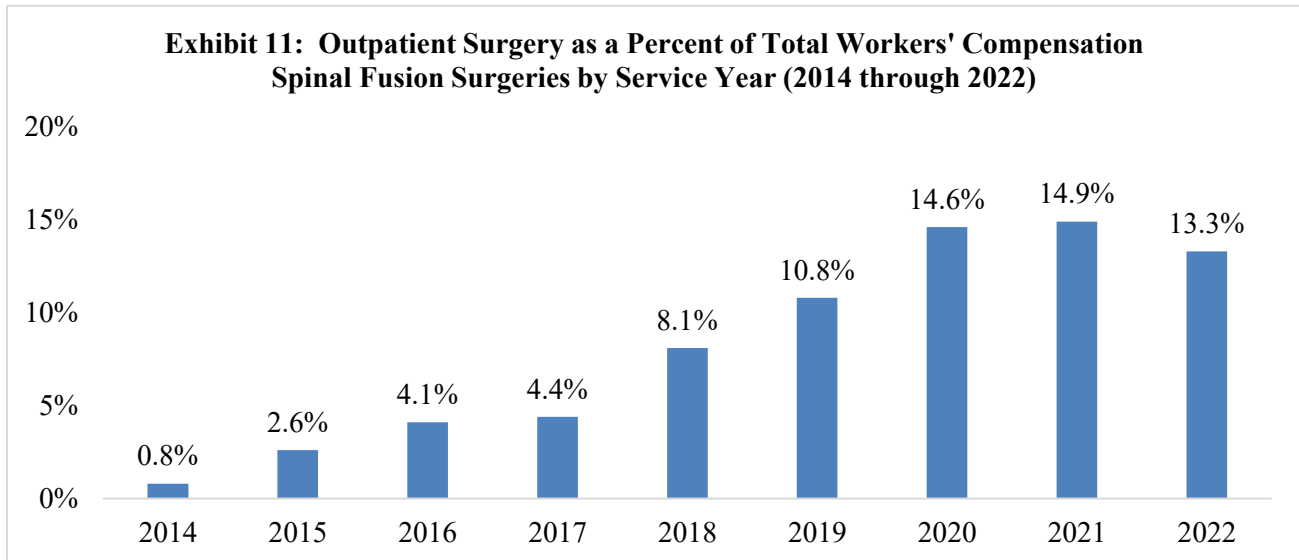
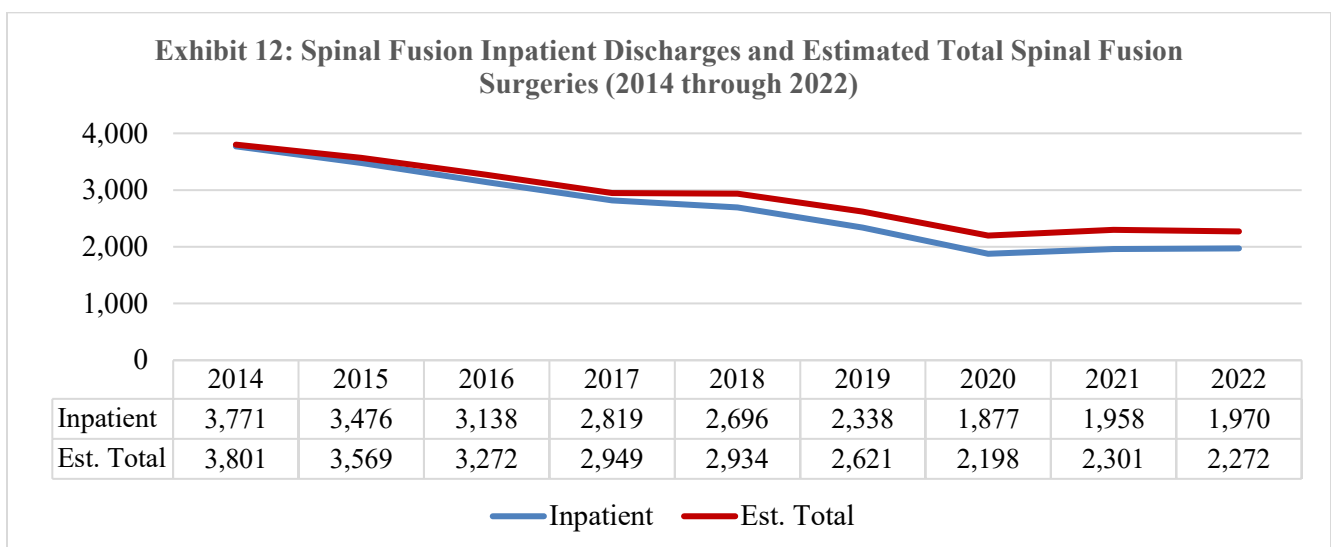


Exhibit 12 shows the trendline for inpatient spinal fusions (HCAI) from 2014 to 2022 and a second trendline that adjusts the results to account for the increase in spinal fusions performed in outpatient settings after Medicare relaxed the reimbursement rules that had required these procedures be performed on an inpatient basis. Medicare's Inpatient-Only list includes services designated as "only approved to be provided in an inpatient setting," but is updated annually to add new procedures and remove procedures considered appropriate in an outpatient hospital setting due to technological advancements and changing procedure protocols. In addition to the Inpatient-Only list required for hospitals, ASCs are limited to a separate list of specific surgical procedures that may be performed in ASCs. California workers' compensation medical payment regulations follow Medicare fee schedules, so these lists are used to determine the appropriate setting for a service. In 2017, Medicare began to remove instrumentation procedures from the Inpatient-Only list and add them to the approved ASC list, which is reflected in the steep growth of outpatient surgeries beginning in 2018 (Exhibit 11) and the decline in inpatient spinal fusions from 2018 to 2020 (Exhibit 12). Overall, the estimated total number of spinal procedures (inpatient and outpatient) declined 40.2% from 2014 to 2022.



Although technological advances and changes in the way procedures may be performed have allowed for the safe provision of spinal fusion procedures on an outpatient basis, an analysis of the average length of stay for inpatient hospitalizations provides some insight into the continued dominance of inpatient hospitalizations for patients undergoing these procedures. Focusing on the most prevalent spinal fusion procedure (combined anterior and posterior spinal fusions) Exhibit 13 shows that in 2022, the average length of stay ranged from 2.9 days when there were no comorbidities or complications (MS-DRG 455) to an average of 8.6 days when a major comorbidity or complication (MCC) was present. Cervical spinal fusions without comorbidities or complications (MS-DRG 473) resulted in the lowest average length of stay for workers' compensation patients, as well as patients covered by Medicare and private coverage. Overall, the average length of stay for spinal fusions in workers' compensation was 13.7 percent shorter than in private coverage, 32.8 percent shorter than in Medicare, and 46.2 percent shorter than in Medi-Cal.

Exhibit 13: Average Length of Stay for Spinal Fusion MS-DRGs (CY 2022 Discharges)					
MS-DRG	WC	Medicare	Medi-Cal	Private	Total
453	8.6	10.6	14.3	10.1	10.9
454	4.4	5.0	6.3	4.4	4.9
455	2.9	2.9	3.6	2.8	2.9
456	18.5	14.0	13.9	11.5	13.4
457	5.9	7.1	9.0	5.9	6.9
458	3.8	3.5	3.7	3.3	3.4
459	8.2	11.4	16.4	10.1	12.0
460	3.4	3.8	4.7	3.4	3.8
471	4.5	9.9	10.6	9.2	9.8
472	2.2	3.6	4.8	2.7	3.4
473	1.5	2.2	2.4	1.8	2.0
Total	3.3	4.9	6.1	3.8	4.6
MS-DRG Descriptions					
453 - Combined anterior and posterior spinal fusion w/MCC					
454 - Combined anterior and posterior spinal fusion w/CC					
455 - Combined anterior and posterior spinal fusion w/o CC/MCC					
456 - Spinal fusion except cervical w/spinal curvature, malignancy, infection or extensive fusions w/MCC					
457 - Spinal fusion except cervical w/spinal curvature, malignancy, infection or extensive fusions w/CC					
458 - Spinal fusion except cervical w/spinal curvature, malignancy, infection or extensive fusions w/o CC/MCC					
459 - Spinal fusion except cervical w/MCC					
460 - Spinal fusion except cervical w/o MCC					
471 - Cervical spinal fusion w/MCC					
472 - Cervical spinal fusion w/CC					
473 - Cervical spinal fusion w/o CC/MCC					

Major Joint Replacement Trends

After spinal fusions, total or partial knee or hip replacement surgeries continue to rank as one of the top inpatient services in workers' compensation. Prior CWCI inpatient utilization studies have focused on MS-DRGs for the initial replacement procedures (MS-DRGs 469 and 470). This analysis of 2022 data includes procedures that involve revision of the joint replacement due to wear, loosening, or infection. Exhibit 14 shows the distribution of 2022 major joint replacement surgeries among the four payer groups, including the primary procedures and revision procedures for each of the four study populations.

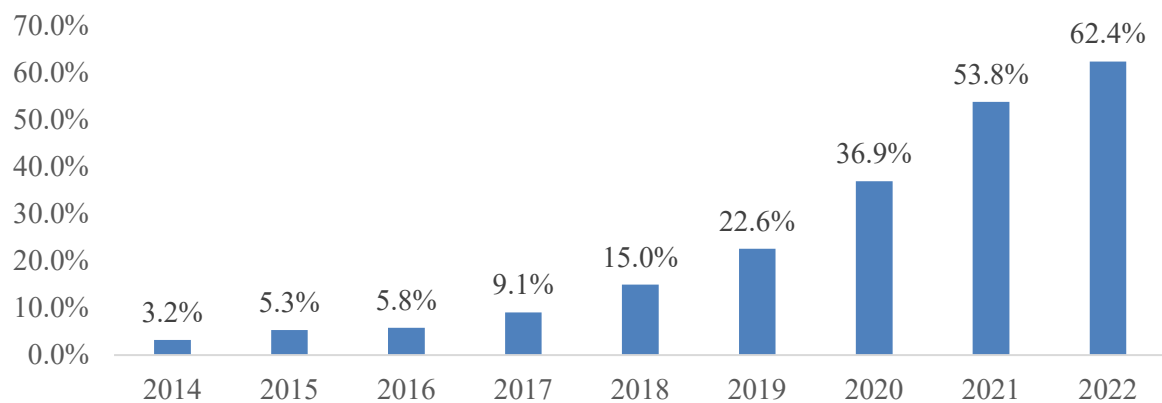
Revision procedures represented 19.6 percent of joint replacement surgeries in workers' compensation, closely matching Medicare's 19.5 percent, while revision surgeries were slightly less prevalent for private coverage patients (17.3 percent) and represented only 12.1 percent of the Medi-Cal joint replacement surgeries (Exhibit 14). The significance of revision rates has been documented in medical literature as representing procedures that "are generally more technically difficult, have higher failure rates, pose greater risk to patients, and are more expensive to the health-care system than primary surgical procedures."²⁶

Exhibit 14: Joint Replacement DRGs Including Revision Procedures (CY 2022 Discharges)					
MS-DRG	Workers' Comp	Medicare	Medi-Cal	Private	Total
470	78.0%	76.3%	84.8%	79.5%	77.9%
468	9.9%	7.1%	3.9%	7.8%	7.0%
467	8.9%	9.6%	6.3%	7.8%	8.9%
469	2.3%	4.2%	3.1%	3.3%	3.8%
466	0.8%	2.9%	1.9%	1.6%	2.4%
Total	100%	100%	100%	100%	100%
MS-DRG Descriptions					
470 - Major hip or knee joint replacement or reattachment of lower extremity w/o MCC					
468 - Revision of hip or knee replacement w/o CC/MCC					
467 - Revision of hip or knee replacement w/ CC					
469 - Major hip or knee joint replacement or reattachment of lower extremity w/ MCC or total ankle replacement					
466 - Revision of hip or knee replacement w/ MCC					

Total knee arthroplasty surgery was included in the Medicare Inpatient-Only list until January 2018 and total hip arthroplasty was removed from the list in January 2020. Total knee arthroplasty surgery was authorized for payment for ASCs effective January 2020, but hip replacement surgery is still allowed only in outpatient or inpatient settings. Allowance for payment of codes representing revision procedures remain on the Inpatient-Only list. Changes to these payment rules are reflected in the increasing percentage of hip or knee replacement surgeries performed in outpatient settings, which has climbed steadily from 3.2 percent in 2014 to 62.4 percent in 2022 (Exhibit 15).

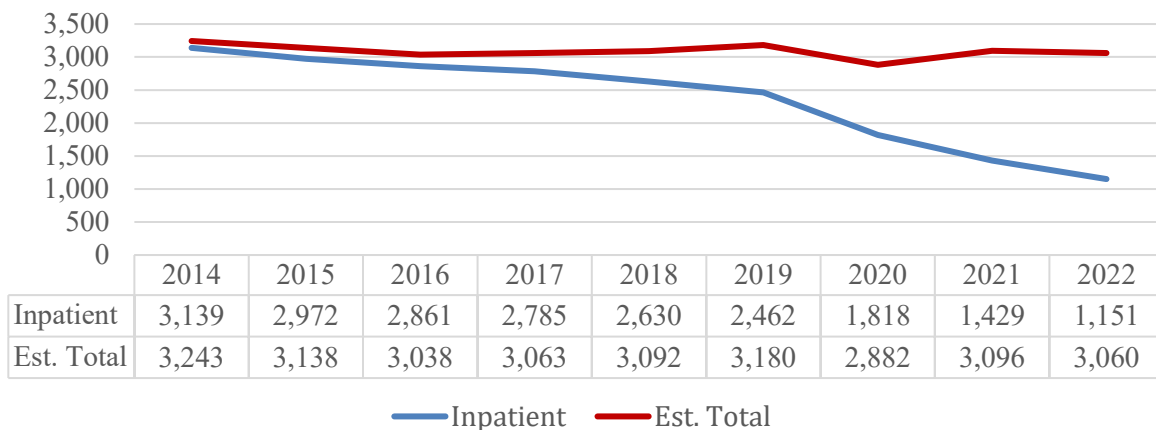
²⁶ Hilibrand, A.S., Rubin, L.E., and Grauer, J.N. Geographic Variations and Trends in Primary and Revision Knee and Total Hip Arthroplasties in the United States. *The Journal of Bone and Joint Surgery*. 2020. <http://dx.doi.org/10.2106/JBJS.OA.19.00051>.

Exhibit 15: Outpatient Surgery as a Percent of Workers' Compensation Total Major Joint Replacement or Revision Surgeries by Service Year (2014 through 2022)



While the volume of major joint replacement surgery inpatient discharges has declined steadily since 2018 (-56.2%), adjusting for the growth in outpatient procedures shows that overall, the estimated number of total major joint replacement surgeries has held steady (Exhibit 16) even with the recent 7.9 percent decline in total claim volume.²⁷

Exhibit 16: Major Joint Replacement Inpatient Discharges and Estimated Total Major Joint Replacement Surgeries (2014 through 2022)



²⁷ The claim volume decline was derived from the Division of Workers' Compensation's WCIS claim system which totaled 635,761 accepted claims in 2021 against the seasonal adjusted 2022 total of 585,403 accepted claims.

Length of Stay

As with spinal fusion surgery, the length of time that a patient is hospitalized is greatly influenced by the type of procedure and presence of comorbidities and/or complications. Exhibit 17 shows the comparative length of stays for primary and revision procedures, with and without comorbidities or complications, for each of the four patient populations.

Discharge data for 2022 shows that overall, the average length of stay for joint replacement or revisions was 2.4 days in workers' compensation patients, 3.8 percent less than the average for Medicare patients, and 21.5 percent less than the average for Medi-Cal patients. A closer look reveals that in workers' compensation, the average hospital stay for joint replacement or revisions ranged from 2.1 days for revisions of hip or knee replacements without comorbidities or complications to 9.4 days for revisions of hip or knee replacements with medical complications or comorbidities.

Among the three other payer groups, the average lengths of stay for joint replacements or revisions showed similar variations based on the absence or presence of comorbidities and/or complications, with average stays ranging from 1.7 to 9.0 days for private coverage patients; 1.9 days to 10.1 days for Medicare patients; and 2.5 to 11.6 days for Medi-Cal patients.

Exhibit 17: Average Length of Stay for Joint Replacement or Revision Discharges (CY 2022 Discharges)					
MS-DRG	Workers' Comp	Medicare	Medi-Cal	Private	Total
466	9.4	10.1	11.6	9.0	10.1
467	4.2	4.5	6.1	4.4	4.6
468	2.1	2.0	3.0	1.9	2.1
469	4.9	4.9	6.8	4.1	4.9
470	2.1	1.9	2.5	1.7	1.9
Total	2.4	2.5	3.0	2.1	2.5
MS-DRG Descriptions					
466 - Revision of hip or knee replacement w/ MCC					
467 - Revision of hip or knee replacement w/ CC					
468 - Revision of hip or knee replacement w/o CC/MCC					
469 - Major hip or knee joint replacement or reattachment of lower extremity w/ MCC or total ankle replacement					
470 - Major hip and knee joint replacement or reattachment of lower extremity w/o MCC					

Top 10 California Hospitals for Inpatient Hospitalizations – All Payers

Of the 442 hospitals that provided inpatient care to California patients during CY 2022, no single hospital served more than 1.4 percent of hospitalized patients. Exhibit 18 provides comparative discharge distributions for the top ten hospitals based on total discharge volume.²⁸

Cedars-Sinai Medical Center in Los Angeles represented 1.4 percent of all 2022 inpatient discharges in the state, and 2.1 percent of all 2022 workers' compensation inpatient discharges, but Cedar-Sinai's workers' compensation patients represented only 0.6 percent of its total inpatient patient population that year.

Exhibit 18: Top 10 Hospitals Based on Total Discharge Volume* for 2022						
Facility Name	WC	Medicare	Medi-Cal	Private	Total	WC as % of All Discharges
Cedars-Sinai Medical Center	2.1%	1.7%	0.6%	1.8%	1.4%	0.6%
Community Regional Medical Center - Fresno	2.1%	1.0%	2.0%	0.8%	1.3%	0.7%
Stanford Health Care	1.0%	1.2%	0.7%	1.6%	1.1%	0.4%
UCSF Medical Center	1.3%	1.0%	0.9%	1.8%	1.1%	0.5%
UC San Diego Health Hillcrest - Hillcrest Medical Center	1.2%	0.9%	1.3%	0.9%	1.0%	0.5%
Los Angeles General Medical Center ²⁹	0.9%	0.4%	2.5%	0.2%	1.0%	0.4%
UC Davis Medical Center	1.6%	0.8%	1.3%	0.9%	1.0%	0.7%
Hoag Memorial Hospital Presbyterian	0.5%	1.2%	0.3%	1.2%	0.9%	0.2%
Grossmont Hospital	1.3%	0.9%	1.2%	0.5%	0.9%	0.6%
Scripps Mercy Hospital	2.6%	1.0%	1.0%	0.5%	0.9%	1.2%
Total	14.5%	10.1%	11.8%	10.2%	10.6%	0.6%

*Excludes pregnancy, childbirth, and newborns

Analysis of distribution data based on each hospital's workers' compensation discharge volume creates a different list of the top ten hospitals (Exhibit 19), with some of the same hospitals remaining but shifting positions, while others dropped out of the top ten rankings, and others like Providence St. Joseph in Orange County and John Muir Medical Center in Contra Costa County moved into the top 10 list.

Scripps Mercy Hospital in San Diego had the highest share of workers' compensation patients in the state (2.6 percent) and these patients represented 1.2 percent of the hospital's total inpatient volume. Chapman Global Medical Center in Orange County served 1.5 percent of the state's hospitalized injured workers in 2022, which represented 7.8 percent of Chapman Global's total inpatient volume for the year.

²⁸ MS-DRGs related to pregnancy, childbirth and newborns were omitted since they do not apply to workers' compensation or Medicare, and represent high volumes for private coverage and Medi-Cal.

²⁹ LAC+USC Medical Center was renamed to Los Angeles General Medical Center in 2023.

Exhibit 19: Top 10 Hospitals Based on 2022 Workers' Compensation Discharge Volume						
Facility Name	WC	Medicare	Medi-Cal	Private	Total	WC as % of All Discharges
Scripps Mercy Hospital	2.6%	1.0%	1.0%	0.5%	0.9%	1.2%
Community Regional Medical Center - Fresno	2.1%	1.0%	2.0%	0.8%	1.3%	0.7%
Cedars-Sinai Medical Center	2.1%	1.7%	0.6%	1.8%	1.4%	0.6%
Providence St. Joseph Hospital	1.8%	0.4%	0.4%	1.1%	0.6%	1.3%
Huntington Hospital	1.6%	0.7%	0.5%	1.2%	0.8%	0.9%
UC Davis Medical Center	1.6%	0.8%	1.3%	0.9%	1.0%	0.7%
Chapman Global Medical Center	1.5%	0.1%	0.1%	0.1%	0.1%	7.8%
Sutter Roseville Medical Center	1.5%	1.0%	0.4%	0.8%	0.8%	0.7%
Cedars-Sinai Marina Del Rey Hospital	1.4%	0.2%	0.1%	0.2%	0.2%	3.2%
John Muir Medical Center - Walnut Creek Campus	1.4%	0.7%	0.3%	0.7%	0.6%	1.0%
Total	17.6%	7.6%	6.6%	8.2%	7.5%	1.0%

Analysis of the discharge distributions based on workers' compensation patients as a share of the hospitals total patient population over time (Exhibit 20) shows that the top five hospitals have remained consistent since 2019, but the percentage of their patients who are injured workers has changed over those four years. Docs Surgical Hospital in Los Angeles experienced a 97.7 percent increase in its workers' compensation discharge volume and Patients' Hospital of Redding's workers' compensation volume decreased by 59.1 percent. It should be noted that Patients' Hospital of Redding also experienced a significant decrease (-78.5 percent) in its total inpatient volume which fell from 158 patients in 2019 to 34 in 2022, when it served only nine injured workers on an inpatient basis.

Exhibit 20: Top 5 Hospitals Based on Workers' Compensation as Share of Hospital's Patient Population During 2022						
Facility Name	2019	2020	2021	2022	Change in WC Volume (2019 - 2022)	Change in Total Volume (2019 - 2022)
Patients' Hospital of Redding	13.9%	22.3%	26.3%	26.5%	-59.1%	-78.5%
Docs Surgical Hospital	18.6%	14.0%	11.7%	19.9%	97.7%	85.6%
Fresno Surgical Hospital	8.3%	11.7%	14.7%	16.2%	-2.1%	-50.0%
Chapman Global Medical Center	7.2%	7.3%	8.7%	7.8%	-8.0%	-15.0%
West Covina Medical Center	3.1%	8.8%	7.7%	7.4%	15.8%	-51.0%

Discussion

The latest HCAI data highlighted in this report show there were 10,516 California workers' compensation inpatient discharges in 2022, down 5.6 percent from 2021. The 2022 result marks the continuation of a steady downtrend that began more than a decade ago and translates to an overall decline of 51.1 percent in the number of workers' compensation inpatient hospitalizations since 2012, far exceeding the changes in inpatient volume noted for Medicare (-1.4 percent), Medi-Cal (+45.7 percent) and private coverage (-23.5 percent) over that same 11-year span.

As was the case with the three other payment systems, the most notable year-over-year change in workers' compensation inpatient volume was in 2020 – the first year of the pandemic – when the number of inpatient hospitalizations within the system declined by 17.4 percent. But, unlike the three other systems, since then workers' compensation inpatient volume has continued to decline, so as of 2022, the California workers' compensation system had 26.4 percent fewer inpatient discharges than in the final pre-COVID year of 2019 (Exhibit 2). That said, the impact of the decline in workers' compensation inpatient discharges on overall inpatient utilization in the state has been negligible, as workers' compensation continues to account for a very small share of inpatient utilization, representing only 0.4 percent of statewide discharges in 2022.

Spinal fusion surgeries remained the leading type of inpatient service provided to California injured workers in 2022, accounting for 18.7 percent of workers' compensation hospital stays (Exhibit 10), up from 17.6 percent in 2021, and a much higher proportion than in Medicare (1.3 percent), Medi-Cal (0.6 percent) and private coverage (1.8 percent). The long-term trend shows the number of workers' compensation inpatient and outpatient spinal surgeries declined by 40.2 percent between 2014 and 2022 (Exhibit 12), and the average lengths of stay associated with inpatient spinal fusions were 13.7 to 46.2 percent shorter than in the other payer groups, but the most recent data show the volume of spinal fusion discharges was relatively steady between 2021 and 2022, due in large part to the continuing shift to more outpatient spinal surgery (Exhibit 12). The number of major joint replacements done as inpatient procedures also saw a steep decline (-56.2 percent) between 2018 and 2022, but that decline was completely offset by the shift from inpatient to outpatient procedures during that time frame (Exhibit 16).

The 2022 hospital data shows that inpatient hospital services in California remain widely distributed across 442 hospitals, with no hospital accounting for more than 1.4 percent of total discharges. Although workers' compensation accounts for a tiny fraction of the total discharges, there is some consolidation of services among the hospitals, with Scripps Mercy (2.6 percent), Cedars-Sinai Medical Center (2.1 percent), and the Community Regional Medical Center – Fresno (2.1 percent) accounting for the largest share of the workers' compensation inpatient care. As noted in prior CWCI studies, a small number of hospitals (primarily surgical hospitals) continue to have a relatively high proportion of injured workers in their patient mix (Exhibit 20).

CWCI will continue to monitor inpatient utilization and its intersection with the growth in outpatient surgery, as well as the types of medical conditions that result in inpatient treatment.

About the Author

Stacy L. Jones is a former Senior Research Associate at the California Workers' Compensation Institute.

Acknowledgements

The author would like to thank CWCI Communications Director Bob Young; CWCI Research Associates Steve Hayes, Robby Bullis, and Adam Russell; CWCI Senior Vice-President of Research and Operations Rena David; and CWCI President Alex Swedlow for their input and technical contributions in the drafting and preparation of this report.

California Workers' Compensation Institute

The California Workers' Compensation Institute, incorporated in 1964, is a private, nonprofit organization of insurers and self-insured employers conducting and communicating research and analyses to improve the California workers' compensation system. Institute members include insurers that collectively write more than 76 percent of California workers' compensation direct written premium, as well as many of the largest public and private self-insured employers in the state. Additional information about CWCI research and activities is available on the Institute's web site (www.cwci.org). The CWCI is not affiliated with the State of California. This material is produced and owned by the Institute and is protected by copyright law. No part of this material may be reproduced by any means, electronic, optical, mechanical, or in connection with any information storage or retrieval system, without prior written permission of the Institute. To request permission to republish all or part of the material, please contact CWCI Communications Director Bob Young (byoung@cwci.org).

CWCI Research Updates are published by the California Workers' Compensation Institute.

1999 Harrison St., Suite 2100, Oakland, CA 94612

510-251-9470

www.cwci.org

Copyright ©2024, California Workers' Compensation Institute. All rights reserved.