



Research Update

Trends in the Utilization of Inpatient Care in California Workers' Compensation

Stacy L. Jones

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Executive Summary

This report is a continuation of CWCI's series of studies that examine inpatient utilization trends using data compiled by the California Department of Health Care Access and Information (HCAI).¹ The analysis compares the volume and types of inpatient hospitalizations covered by workers' compensation to those covered by Medicare, Medi-Cal, and private coverage. Additionally, focusing solely on the data for workers' compensation, the report provides information related to the primary diagnoses underlying major joint replacement surgery discharges, and the mitigating influence of outpatient surgery on the volume of inpatient discharges. Key findings include:

- The number of inpatient hospitalizations for workers' compensation decreased by 48.1 percent between 2012 and 2021.
- Surgical hospitalizations represented 67.2 percent of workers' compensation inpatient stays in 2021.
- The most common surgical hospitalizations in workers' compensation in 2021 were spinal fusions (17.6 percent) and major joint replacements (10.7 percent).
- In 2021, 87.9 percent of all injured workers who underwent knee or hip replacement were diagnosed with primary osteoarthritis.
- Outpatient surgeries are increasing in workers' compensation, with 13.6 percent of spinal fusions and 37.1 percent of major joint replacement surgeries in 2021 performed on an outpatient basis.

Background and Objective

Inpatient hospitalizations account for a small share of California workers' compensation medical services but are associated with more complex injuries or occupational diseases. This latest iteration of CWCI's inpatient hospitalization research series uses data from the HCAI from calendar years (CY) 2012 through 2021 to provide an updated look at the following metrics:

- the volume and distribution of inpatient discharges across payer groups;
- the top 10 Medicare Severity Diagnosis-Related Group (MS-DRG) codes used to describe workers' compensation inpatient discharges;
- the top five medical diagnostic categories describing workers' compensation inpatient discharges;
- the top primary diagnoses associated with major joint replacement surgery; and
- the top five hospitals with the highest proportion of workers' compensation in their payer mix.

¹ 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/>

Data and Methods

For this study, the author used discharge data obtained from HCAI for CY 2012 through CY 2021 inpatient hospitalizations. The public-use database compiled by HCAI includes detailed information submitted under the Health Data and Advisory Council Consolidation Act by health care 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 MS-DRG code, 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 Medical Diagnostic Category (MDC) and Surgery/Medical indicator associated with each MS-DRG as defined by the Centers for Medicare Services (CMS)² were appended to the HCAI records, enabling the author to analyze each type of hospital discharge event. HCAI also provided the primary diagnosis code for the workers' compensation discharges that were associated with major joint replacement surgeries during the 10-year span of the study, enabling a year-over-year comparison of medical conditions that resulted in this type of surgery.

In addition to statewide HCAI data, the author also used data from CWCI's Industry Research Information System (IRIS)³ database to identify major joint replacement and spinal fusion surgeries that were performed in outpatient hospitals or ambulatory surgery centers, as well as inpatient hospital settings. After identifying the surgical setting, the percentage of the spinal fusion or major joint replacement surgeries that were performed in an outpatient setting was calculated. That percentage was then applied to the HCAI data to derive an outpatient adjusted trend line.

Results

As reflected in prior CWCI inpatient hospitalization studies,^{4,5,6,7,8,9} California inpatient hospitalizations paid under the workers' compensation system continued to represent a very small share of all hospitalizations within the state during CY 2021. Exhibit 1 shows that only 0.3 percent of all 2021 hospital discharges were associated with care under workers' compensation, while Medicare accounted for 33.8 percent, Medi-Cal accounted for 31.7 percent, and private coverage accounted for 29.2 percent. The "Other" payer category noted in Exhibit 1 includes other government programs, self-pay, and indigent care, which together represented 5.0 percent of California inpatient discharges in 2021.

² 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

³ IRIS is CWCI's proprietary transactional database of insured and self-insured policies and their associated claims.

⁴ Jones, S.L. California Workers' Comp Inpatient Hospitalization Trends, 2010-2020. *CWCI Research Update*. October 2021.

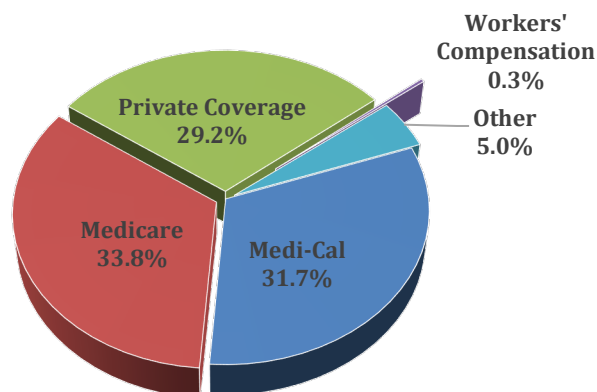
⁵ Jones, S.L. California Workers' Comp Inpatient Hospitalization Trends, 2010-2019. *CWCI Research Update*. November 2020.

⁶ Jones, S.L. California Workers' Comp Inpatient Hospitalization Trends, 2010-2018. *CWCI Research Update*. September 2019.

⁷ Jones, S.L. California Workers' Comp Inpatient Hospitalization Trends. *CWCI Research Update*. May 2018.

⁸ Jones, S.L. Inpatient Utilization in California Workers' Compensation: 2008-2014. *CWCI Spotlight Report*. March 2016.

⁹ Jones, S.L. and David, R. Inpatient Utilization in the California Workers' Compensation System. *CWCI Research Update*. December 2014.

Exhibit 1: Distribution of 2021 Discharges by Payer Type

The remainder of this study will focus on workers' compensation in comparison to the three primary payer groups and will exclude payers in the "Other" category.

Exhibit 2 shows that removing the "Other" payers from the population of discharges does not change workers' compensation's share of the 2021 hospitalizations. After remaining at 0.4 percent of total discharges that included Medicare, Medi-Cal and private coverage from 2017 through 2020, workers' compensation's share fell slightly in 2021 to 0.3 percent, matching the overall share shown in Exhibit 1.

Exhibit 2: MS-DRG Count by Discharge Year and Payer Type

Discharge Year	Workers' Compensation	Medicare	Medi-Cal	Private	Grand Total
2012	21,528 (0.6%)	1,267,438	1,010,989	1,220,113	3,520,068
2013	20,336 (0.6%)	1,257,607	997,994	1,161,439	3,437,376
2014	18,592 (0.5%)	1,227,683	1,165,677	1,146,266	3,558,218
2015	17,557 (0.5%)	1,270,350	1,199,965	1,141,215	3,629,087
2016	16,574 (0.5%)	1,280,718	1,227,738	1,121,137	3,646,167
2017	15,831 (0.4%)	1,313,298	1,221,418	1,110,021	3,660,568
2018	15,529 (0.4%)	1,313,004	1,198,834	1,095,771	3,623,138
2019	14,298 (0.4%)	1,337,724	1,182,664	1,081,645	3,616,331
2020	11,837 (0.4%)	1,174,042	1,087,585	996,531	3,269,995
2021	11,167 (0.3%)	1,201,415	1,128,793	1,037,105	3,378,480
2012 - 2021 Change	-48.1%	-5.2%	11.7%	-15.0%	-4.0%

Before the pandemic began in 2020, workers' compensation and private coverage inpatient stays registered year-over-year declines, while inpatient discharges for Medi-Cal began to rise in 2014, and Medicare discharges began to increase in 2015. After the across-the-board declines in hospitalizations during the COVID-19 health care crisis of 2020, the number of inpatient stays began to rebound in 2021 for all payer groups except workers' compensation, which fell an additional 5.7 percent.

Shifts in Medical vs. Surgical Hospitalizations

Inpatient hospitalizations are grouped into two basic categories – those that include the use of an operating room are identified as Surgical and those that do not involve surgery are categorized as Medical. Exhibit 3 shows the change in the volume of Surgical and Medical hospitalizations for the four payer types between 2020 and 2021. As noted above, unlike the three other systems, the total number of workers' compensation inpatient hospitalizations continued to decline in 2021, with the overall decrease of 5.7 percent fairly evenly distributed between Medical and Surgical hospitalizations.

Exhibit 3: Change in Discharge Volume by Payer Type and Hospitalization Category,* 2020 to 2021					
	Workers' Comp	Medicare	Medi-Cal	Private	Total
Medical	-5.3%	2.5%	7.2%	8.1%	5.0%
Surgical	-5.8%	1.6%	4.9%	0.3%	1.9%
Total Change	-5.7%	2.3%	6.7%	5.5%	4.2%

*Excludes pregnancy, childbirth, and newborns

The hierarchy created to identify inpatient hospitalization events begins with Major Diagnostic Categories (MDCs), which classify patients based on the organ system being treated. Of the 25 mutually exclusive MDCs, workers' compensation patients primarily fall under MDC 08, diseases and disorders of the musculoskeletal system and connective tissue. However, the percentage of workers' compensation inpatient hospitalizations classified as MDC 04 (diseases & disorders of the respiratory system) nearly tripled in 2020 (the first year of the pandemic) and remained at an elevated level in 2021, reflecting the persistence of COVID-19 in the workers' compensation patient population.

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

As shown in Exhibit 5, in 2021 half of the MDC 04 hospitalizations paid under workers' compensation or private coverage were for respiratory infections and inflammation (MS-DRGs 177, 178, and 179). However, a larger share of the workers' compensation MDC 04 hospitalizations involved medical conditions related to trauma with pneumothorax (collapsed lung) (MS-DRGs 199, 200, and 201) and major chest trauma (MS-DRGs 183, 184, and 185). Together, these six MS-DRGs accounted for 17.3

percent of the workers' compensation MDC 04 diagnosis related groups versus less than 5 percent for the other payer groups.

Exhibit 5: Top Five Workers' Comp MDC 04 MS-DRGs with Severity Levels Combined (CY 2021)				
MS-DRGs	Workers' Comp	Medicare	Medi-Cal	Private
177, 178, 179	50.3%	38.4%	39.8%	50.1%
207, 208	11.4%	10.2%	10.6%	9.0%
199, 200, 201	10.4%	1.6%	2.3%	2.9%
183, 184, 185	6.9%	1.6%	1.0%	1.2%
189	3.3%	9.9%	8.9%	6.1%
Total	82.3%	61.7%	62.6%	69.3%
MS-DRG Descriptions				
177, 178, 179 – Respiratory infections & inflammations				
207, 208 – Respiratory system diagnosis w/ventilator support				
199, 200, 201 – Pneumothorax				
183, 184, 185 – Major chest trauma				
189 – Pulmonary edema & respiratory failure				

Although the number of inpatient hospitalizations in workers' compensation continued to decrease in 2021 (Exhibit 3), surgical admissions remained far more prevalent than in other payer systems. Exhibit 6 shows that 67.2 percent of all injured worker hospitalizations in 2021 were for surgical treatment of a medical disease or disorder, compared to 31.5 percent for private coverage, 24.7 percent for Medicare, and 21.1 percent for Medi-Cal.

Exhibit 6: 2021 Inpatient Utilization, Medical Issue vs Surgical Procedure by Payer Type*					
	Workers' Comp	Medicare	Medi-Cal	Private	Total
Medical	32.8%	75.3%	78.9%	68.5%	74.6%
Surgical	67.2%	24.7%	21.1%	31.5%	25.4%

*Excludes pregnancy, childbirth, and newborns

With the exception of respiratory infections, which represented 10.3 percent of the non-surgical hospitalization admissions, the most common workers' compensation Medical hospitalizations were related to back problems (6.2 percent) or aftercare associated with prior surgery or infection complications (septicemia or severe sepsis) (Exhibit 7).

Exhibit 7: Top Five MS-DRGs for Workers' Compensation Medical Hospitalizations (Discharge Year 2021)			
MS-DRG	% Medical	% Total	MS-DRG Descriptions
177	10.3%	3.4%	Respiratory infections & inflammations w/MCC
552	6.2%	2.0%	Medical back problems w/o MCC
871	4.6%	1.5%	Septicemia or severe sepsis w/o mv >96 hours w/MCC
560	4.5%	1.5%	Aftercare, musculoskeletal system & connective tissue w/CC
561	3.5%	1.1%	Aftercare, musculoskeletal system & connective tissue w/o CC/MCC
Total	29.1%	9.5%	

Hospitalizations for surgery continued to account for more than two-thirds of the workers' compensation inpatient stays in 2021 (Exhibit 6) and the top three MS-DRGs were unchanged from 2019 and 2020. The 2021 discharge data show that after joining the top five rankings in 2020, MS-DRG 454 (combined anterior/posterior spinal fusion with CC) overtook MS-DRG 483 (major joint/limb reattachment procedure of upper extremities) as the fourth most prevalent surgical diagnostic grouping (Exhibit 8).

Exhibit 8: Top Five MS-DRGs for Workers' Compensation Surgical Hospitalizations (Discharge Year 2021)			
MS-DRG	% Surgical	% Total	MS-DRG Descriptions
470	15.8%	10.6%	Major hip and knee joint replacement or reattachment of lower extremity w/o MCC
460	7.3%	4.9%	Spinal fusion except cervical w/o MCC
455	6.4%	4.3%	Combined anterior/posterior spinal fusion w/o CC/MCC
454	4.7%	3.2%	Combined anterior/posterior spinal fusion w/CC
483	3.6%	2.4%	Major joint/limb reattachment procedure of upper extremities
Total	37.7%	25.3%	

Combining the severity levels associated with diagnostic groupings provides a clearer picture of the top diagnostic groupings for workers' compensation hospitalizations.¹⁰ Exhibit 9 compares the top ten workers' compensation discharges when severity levels are combined to the values for the other three payer types. While the top ten diagnostic groups based on combined severity levels represented 47.4 percent of the 2021 workers' compensation discharges, these diagnostic categories represented just 15.2 percent of the Medi-Cal discharges, 18.2 percent of the private coverage discharges, and 21.6 percent of the Medicare discharges.

In 2021, major joint replacements continued as the top diagnosis-related group for workers' compensation hospitalizations, followed by MS-DRGs for spinal fusion surgeries, distinguishing workers' compensation from all other payer types. Aftercare services (MS-DRGs 559, 560, and 561) joined the top ten diagnostic categories, while MS-DRGs 551 and 552 (medical back problems) dropped out of the top ten in 2021.

¹⁰ MS-DRGs are severity adjusted to account for different resource needs and outcomes for the same diagnosis group. Adjustments include Major Complications or Comorbidities (MCC), Complications or Comorbidities (CC), and without MCC or CC.

Exhibit 9: Top Ten Workers' Compensation Discharges by Volume Severity Levels Combined (Discharge Year 2021)				
MS-DRGs	Workers' Comp	Medicare	Medi-Cal	Private Coverage
469, 470	10.7%	1.7%	0.5%	1.4%
453, 454, 455	7.7%	0.5%	0.1%	0.6%
456, 457, 458, 459, 460	5.4%	0.5%	0.2%	0.7%
471, 472, 473	4.5%	0.3%	0.2%	0.5%
492, 493, 494	4.1%	0.4%	0.7%	0.8%
518, 519, 520	3.7%	0.2%	0.1%	0.5%
177, 178, 179	3.5%	4.5%	4.2%	5.6%
559, 560, 561	2.9%	0.9%	0.3%	0.4%
483	2.4%	0.3%	0.0%	0.1%
870, 871, 872	2.4%	12.3%	8.7%	7.6%
Total	47.4%	21.6%	15.2%	18.2%
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, femur				
518, 519, 520 - Back & neck procedures except spinal fusion				
177, 178, 179 - Respiratory infections & inflammations				
559, 560, 561 - Aftercare, musculoskeletal system & connective tissue				
483 - Major joint/limb reattachment procedure of upper extremities				
870, 871, 872 - Septicemia or severe sepsis				

Considering that major joint replacements (MS-DRGs 469 and 470) continue to rank as the top diagnosis related groups, the author requested additional data from HCAI for these codes. Using the primary diagnosis code submitted for each hospital record assigned to MS-DRGs 469 or 470, the author identified the top diagnoses for the major joint replacement discharges in 2021 and calculated the percentages for discharge years 2016¹¹ through 2021.

For presentation purposes, the author combined unilateral and bilateral knee and unilateral and bilateral hip categories. Primary osteoarthritis of the knee(s) accounted for 73.2 percent of the major joint replacement discharges in 2021, which is a 16-percentage point increase from 2016 (Exhibit 10). The percentage of discharges associated with hip replacements resulting from primary osteoarthritis was more stable over the six-year period, ranging from 13.7 percent in 2016 to a high of 16.6 percent in 2020.

¹¹ Effective October 2015, the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) replaced ICD-9. The author compared discharge year data after the transition to ICD-10 to maintain definitional consistency.

Primary osteoarthritis is the most common form of arthritis affecting adults and the elderly in clinical practice, and it is one of the leading causes of disability worldwide.¹² Aboulenain and Saber noted three major processes involved in disease development, including mechanical wear-and-tear, structural degeneration, and joint inflammation.

In contrast to the underlying processes for primary osteoarthritis, post-traumatic osteoarthritis develops after an acute direct trauma to the joints.¹³ While the data show that primary osteoarthritis of the knee or hip accounted for between 70.9 percent of primary diagnoses in 2016 and 87.9 percent in 2021, over the same 6-year span post-traumatic osteoarthritis of the knee or hip only accounted for between 7.4 percent and 10.4 percent of the major joint replacement diagnoses in workers' compensation.

Exhibit 10: Discharge Year Comparison of Top Primary Diagnoses Submitted for MS-DRGs 469 and 470 – Based on Discharges in 2021						
Primary Diagnosis	2016	2017	2018	2019	2020	2021
Primary osteoarthritis, knee	57.2%	69.5%	70.7%	69.1%	69.6%	73.2%
Primary osteoarthritis, hip	13.7%	13.2%	14.8%	16.2%	16.6%	14.6%
Subtotal	70.9%	82.7%	85.5%	85.3%	86.2%	87.9%
Post-traumatic osteoarthritis, knee	8.6%	8.9%	7.3%	6.5%	6.0%	7.4%
Post-traumatic osteoarthritis, hip	1.3%	1.5%	1.1%	1.2%	1.3%	1.8%
Subtotal	9.9%	10.4%	8.5%	7.8%	7.4%	9.2%
Total	80.9%	93.1%	93.9%	93.1%	93.6%	97.1%
ICD-10 Diagnosis Codes						
Primary osteoarthritis, knee (M17.0 - M17.12)						
Primary osteoarthritis, hip (M16.0 - M16.12)						
Post-traumatic osteoarthritis, knee (M17.2 - M17.32)						
Post-traumatic osteoarthritis, hip (M16.50 - M16.52)						

Combining the discharges for MS-DRGs representing the different vertebral areas and surgical access routes (anterior and posterior) shows that spinal fusion surgery continued to be the leading reason for all workers' compensation hospitalizations in 2021, as was the case in each of the prior inpatient utilization studies.

Although the number of workers' compensation spinal fusions has declined 59.1 percent since 2012, the volume did increase 4.3 percent in 2021, as 1,958 injured workers received spinal fusions compared to 1,877 in 2020, the first year of the pandemic. Spinal fusions still accounted for 17.6 percent of all workers' compensation inpatient discharges in 2021, compared to 1.3 percent for Medicare, 0.6 percent for Medi-Cal, and 1.8 percent for private coverage (Exhibit 11).

¹² Aboulenain S, and Saber AY. *Primary Osteoarthritis*. StatPearls Publishing. Updated May 9, 2022. <https://www.ncbi.nlm.nih.gov/books/NBK557808/>

¹³ Punzi L, Galozzi P, Luisetto R, Favero M, Ramonda R, Oliviero F, Scanu A. *Post-traumatic arthritis: overview on pathogenic mechanisms and role of inflammation*. RMD Open. September 6, 2016. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5013366/>

Exhibit 11: Volume of Discharges for Implant-Eligible Spinal Surgeries and Percent of Implant-Eligible Spinal Surgeries to All Discharges by Payer Group (Excludes 028, 029, and 030¹⁴)				
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%)
'12 - '21 Net Change	-59.1%	19.9%	112.9%	-28.0%

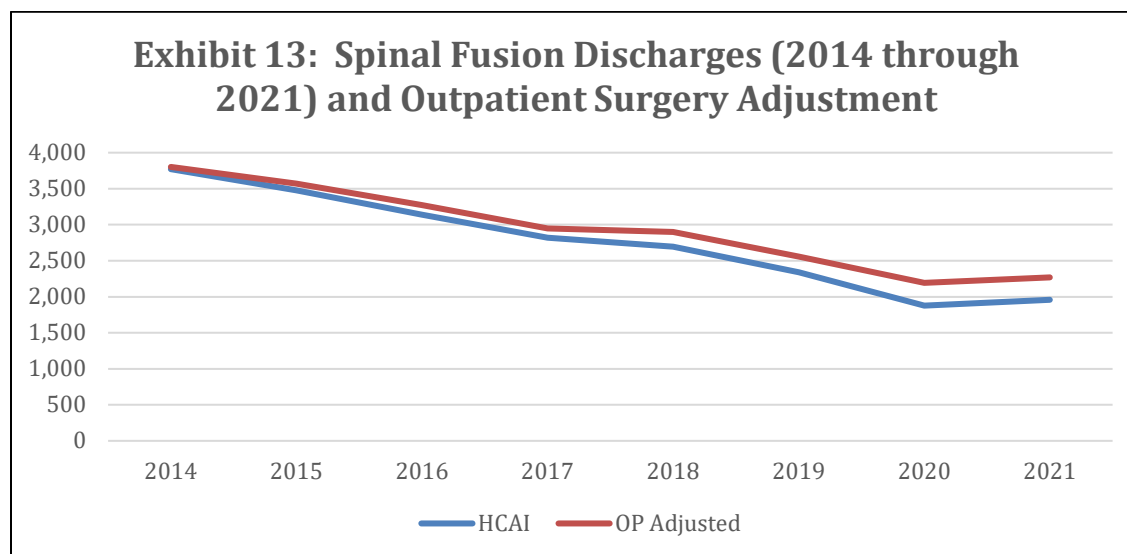
The decline in the number of spinal fusion surgeries seen in the workers' compensation inpatient data is somewhat offset by an increase in the number of spinal fusion surgeries that are performed on an outpatient basis. The author augmented the HCAI inpatient data with data from CWCI's IRIS database. After identifying spinal fusion services, the facility bills associated with the surgical events were identified by name and place of service. The percentage of the total spinal fusion services performed on an outpatient basis (outpatient hospital or ambulatory surgery center) was then calculated and that percentage was applied to the HCAI inpatient records.

The results, noted in Exhibit 12, show the percentage of workers' compensation spinal fusion surgeries provided on an outpatient basis has risen dramatically in recent years, increasing from 0.8 percent in 2014 to 13.6 percent in 2021.

Exhibit 12: Workers' Compensation Outpatient Surgery as a Percent of Total Spinal Fusion Surgeries by Service Year 2014 – 2021	
Year of Service	Percent Outpatient
2014	0.8%
2015	2.6%
2016	4.1%
2017	4.4%
2018	7.0%
2019	8.5%
2020	14.4%
2021	13.6%

¹⁴ 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 13 shows the trend in spinal fusion services beginning in 2014 with a second trend line reflecting the outpatient adjustment. The adjusted data confirms the downward trajectory of spinal fusion surgeries but shows the decrease to be somewhat muted by the increase in outpatient surgeries.



Although the development of minimally invasive surgical techniques and advancements in technology have enabled more complex surgeries to be performed in an outpatient setting, Medicare will not pay the facility (outpatient hospital or ASC) for surgeries that it has deemed as Inpatient Only.¹⁵ Since the California workers' compensation fee schedules governing payment of inpatient hospital, outpatient hospital, and ASC charges are based on Medicare fee schedules, facilities may encounter difficulties receiving timely payment for Inpatient Only surgeries provided in an outpatient setting.

In addition to patient characteristics (e.g., comorbidities complicating surgical care or recovery), potential payment issues may influence the number of spinal fusions that are performed in outpatient versus inpatient settings. Medicare annually analyzes data for non-Medicare patients and receives public comment from medical professionals to determine whether surgery codes should be removed from the Inpatient Only list. The trend line in Exhibit 13 reflects the changes in the Inpatient Only list and the list of spinal fusion procedures that may be performed in outpatient hospital settings or ASCs.

¹⁵ The Inpatient Only list is a list of services designated by Medicare as only appropriate to be furnished in a hospital inpatient setting. In addition, the Medicare ASC fee schedule includes a specific list of surgical procedures that may be performed in ASCs.

Average Length of Stay for Spinal Fusions

Using length of stay (LOS) information provided by hospitals in the HCAI data, the author calculated the average LOS for each of the 11 spinal fusion MS-DRGs. Exhibit 14 shows the overall results across all four payer groups and compares the results for workers' compensation to those of the three other groups. It is not surprising that the average LOS for MS-DRGs that indicate the presence of major complications or comorbidities (MCC) are longer for each of the payer groups.

The LOS for MS-DRG 453 (combined anterior and posterior spinal fusion with MCC) was 11 days compared to 3 days for MS-DRG 455 (combined anterior and posterior spinal fusion without CC/MCC). Cervical spinal fusion without CC/MCC has the shortest LOS, averaging two days for each payer group.

Exhibit 14: Average Length of Stay for Spinal Fusion MS-DRGs (CY 2021 Discharges)					
MS-DRG	WC	Medicare	Medi-Cal	Private	All
453	11	10	16	10	11
454	5	5	6	5	5
455	3	3	4	3	3
456	13	13	18	10	13
457	5	7	9	6	7
458	3	4	4	4	4
459	11	10	12	9	10
460	4	4	4	3	4
471	6	10	9	8	9
472	3	4	4	3	3
473	2	2	2	2	2
Total	4	6	7	5	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

Total knee arthroplasty (CPT 27447) was removed from the Inpatient Only list in 2018, after which the procedures began to appear more frequently in the outpatient facility data. In workers' compensation, the percentage of major joint replacement surgeries performed on an outpatient basis increased from 0.2 percent in 2014 to 37.1 percent in 2021, with significant jumps occurring in 2018, 2020, and 2021 (Exhibit 15).

Exhibit 15: Workers' Compensation Outpatient Surgery as a Percent of Total Major Joint Replacement Surgeries by Service Year 2014-2021	
Year of Service	Percent Outpatient
2014	0.2%
2015	1.0%
2016	1.5%
2017	3.1%
2018	12.2%
2019	14.1%
2020	25.5%
2021	37.1%

Exhibit 16 shows the trend in major joint replacements reported in the inpatient data, with the outpatient adjustment trend line showing how the trend would have looked if outpatient surgeries continued to be provided on an inpatient basis.

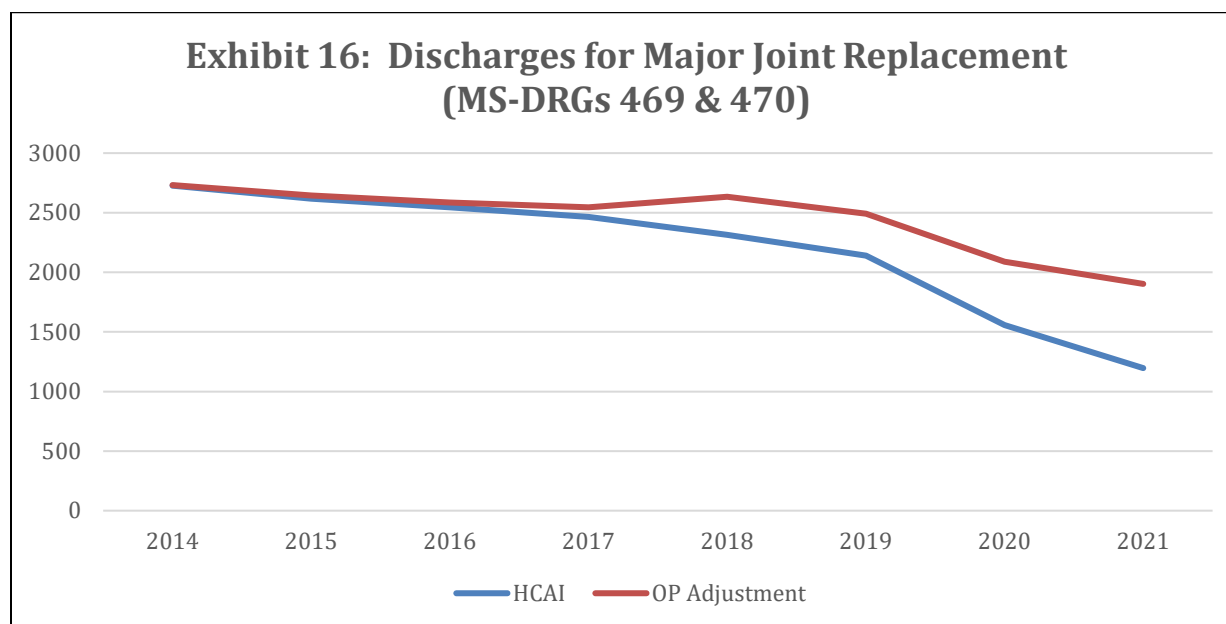


Exhibit 17 shows the average LOS for major joint replacement MS-DRGs, and as was the case with spinal fusions, the LOS associated with major joint replacements with complications or comorbidities were much longer than those in which there were no complicating medical conditions.

Exhibit 17: Average Length of Stay for Major Joint Replacement (CY 2021 Discharges)					
MS-DRG	Medicare	Medi-Cal	Private	WC	All
469	5	5	4	6	4
470	2	2	2	2	2
Total	3	3	2	2	3
MS-DRG Descriptions					
469 - Major hip & knee joint replacement or reattachment of lower extremity w/MCC or total ankle replacement					
470 - Major hip & knee joint replacement or reattachment of lower extremity w/o MCC					

Top Ten California Hospitals for Inpatient Hospitalizations – All Payers

Inpatient care in California is dispersed across a large number of facilities throughout the state, as shown in the distribution of discharges for the top ten hospitals (Exhibit 18). No hospital represented more than 1.4 percent of the 2021 discharges and the total share for the top ten hospitals was only 10.7 percent.¹⁶

Exhibit 18: Top Ten Hospitals Based on Total Discharge Volume* for 2021						
Hospital Name	WC	Medicare	Medi-Cal	Private	Total	WC as % of Hospital Discharges
Cedars-Sinai Medical Center	2.2%	1.8%	0.6%	1.8%	1.4%	0.7%
Community Regional Medical Center-Fresno	2.2%	1.0%	1.9%	0.8%	1.2%	0.8%
UCSF Medical Center	1.1%	1.0%	0.9%	1.7%	1.1%	0.4%
Stanford Health Care	1.0%	1.1%	0.7%	1.5%	1.1%	0.4%
UCSD Health Hillcrest - Hillcrest Medical Center	1.3%	1.0%	1.3%	0.9%	1.0%	0.5%
University Of California Davis Medical Center	1.4%	0.9%	1.3%	1.0%	1.0%	0.6%
LAC+USC Medical Center	0.8%	0.4%	2.6%	0.2%	1.0%	0.4%
Grossmont Hospital	1.4%	1.0%	1.3%	0.5%	0.9%	0.7%
Hoag Memorial Hospital Presbyterian	0.5%	1.2%	0.3%	1.2%	0.9%	0.2%
Scripps Mercy Hospital	2.1%	1.0%	1.0%	0.5%	0.9%	1.1%
Total	14.0%	10.3%	11.8%	10.1%	10.7%	

*Excludes pregnancy, childbirth, and newborns

¹⁶ 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.

The distribution across hospitals for Medicare, Medi-Cal, and private coverage ranged between 10.1 percent and 11.8 percent, while the concentration of hospitalizations under workers' compensation was greater with the top ten hospitals representing 14.0 percent of the total workers' compensation discharges. Considering that workers' compensation represents only a very small share of all inpatient hospitalizations, it follows that the injured worker patient population for each of the top ten hospitals was also very small – ranging between 0.2 percent and 0.8 percent.

Top 10 Hospitals Based on Workers' Compensation Discharges

In addition to identifying the top ten hospitals based on total volume, the author also identified the top ten hospitals based on their share of workers' compensation patients. Data in Exhibit 19 shows that the top ten hospitals represented 16.7 percent of total workers' compensation admissions, with much smaller shares for other payer groups (between 7.2 percent for private coverage and 8.0 percent for Medicare).

Exhibit 19: Top Ten Hospitals Based on 2021 Workers' Compensation Discharge Volume						
Hospital Name	WC	Medicare	Medi-Cal	Private	Total	WC as % of All Discharges
Cedars-Sinai Medical Center	2.2%	1.8%	0.6%	1.8%	1.4%	0.7%
Community Regional Medical Center-Fresno	2.2%	1.0%	1.9%	0.8%	1.2%	0.8%
Scripps Mercy Hospital	2.1%	1.0%	1.0%	0.5%	0.9%	1.1%
Providence St. Joseph Hospital	1.5%	0.5%	0.4%	0.8%	0.5%	1.2%
Cedars-Sinai Marina Del Rey Hospital	1.5%	0.2%	0.1%	0.2%	0.2%	3.8%
John Muir Medical Center-Walnut Creek	1.5%	0.7%	0.3%	0.7%	0.6%	1.2%
Chapman Global Medical Center	1.5%	0.1%	0.0%	0.1%	0.1%	8.7%
Grossmont Hospital	1.4%	1.0%	1.3%	0.5%	0.9%	0.7%
Sutter Roseville Medical Center	1.4%	1.0%	0.4%	0.8%	0.8%	0.8%
UC Davis Medical Center	1.4%	0.9%	1.3%	1.0%	1.0%	0.6%
Total	16.7%	8.0%	7.3%	7.2%	7.6%	

In contrast to the small share of hospitalizations for workers' compensation shown in Exhibits 18 and 19, there are some hospitals that have a larger workers' compensation patient population. More than one-quarter (26.3 percent) of the discharges for physician-owned, Patients' Hospital of Redding were for workers' compensation in 2021 (Exhibit 20).

Exhibit 20: Top Five Hospitals Based on Workers' Compensation as Share of Hospital's Inpatient Population During 2021					
Hospital Name	2019	2020	2021	Change in WC Volume ('19-'21)	Change in Total Volume ('19-'21)
Patients' Hospital of Redding	13.9%	22.3%	26.3%	40.9%	-25.3%
Fresno Surgical Hospital	8.3%	11.7%	14.7%	6.2%	-40.0%
Docs Surgical Hospital	18.6%	14.0%	11.7%	40.9%	123.7%
Chapman Global Medical Center	7.2%	7.3%	8.7%	-6.9%	-22.2%
West Covina Medical Center	3.1%	8.8%	7.7%	94.7%	-20.6%

Patients' Hospital of Redding experienced an overall decrease in discharge volume of 25.3 percent between 2019 and 2021, while its workers' compensation patient volume increased by 40.9 percent. It is noted that three of the top five hospitals based on workers' compensation volume are surgical hospitals, which is likely related to the higher proportion (67.9 percent) of surgery admissions for workers' compensation (Exhibit 6).

Discussion

The latest statewide inpatient hospital data shows that workers' compensation continued to represent a very small share of inpatient utilization in calendar year 2021. Comparing the discharge volume from 2012 to 2021 shows the number of workers' compensation hospitalizations is down 48.1 percent versus a 4.0 percent decline in total hospitalizations statewide (Exhibit 2). Across-the-board decreases were experienced by all payer groups in 2020, when hospitals were severely challenged by the onset of the COVID-19 pandemic, however workers' compensation is the only payer group that continued to experience a decrease in inpatient hospitalizations in 2021, as medical discharges declined by 5.3 percent from the 2020 level and surgical discharges declined by 5.8 percent. The 2021 decreases followed 10.2 percent and 20.4 percent decreases in medical and surgical hospitalizations from 2019 through 2020, as reported in CWCI's 2021 Research Update *California Workers' Comp Inpatient Hospitalization Trends, 2010-2020*.

After combining the results for all spinal fusion MS-DRGs, this study found that spinal fusion surgery was still the number one reason injured workers received services on an inpatient basis in 2021, accounting for 17.6 percent of workers' compensation hospital stays (Exhibit 11). Despite the decrease in total workers' compensation hospitalizations between 2020 and 2021, the volume of spinal fusion discharges increased from 1,877 in 2020 to 1,958 in 2021. This increase is also reflected in the Exhibit 13 trend line for spinal fusion discharges, with the outpatient adjustment following the same downward pattern and the 2021 increase from the 10-year low noted in 2020.

The increase in spinal fusion surgeries in 2021 may be the result of procedures that were delayed during the COVID-19 health care crisis in 2020, though the 2021 data did not show an increase in the number of major joint replacement procedures. Major hip and knee joint replacement surgical discharges accounted for 10.7 percent of workers' compensation hospitalizations in 2021 (Exhibit 9), which is down from the 13.2 percent in 2020.¹⁷ The primary diagnosis data that was submitted by hospitals for major joint replacement surgery (MS-DRGs 469 and 470) indicate that the overwhelming medical condition leading to injured worker knee or hip replacements is primary osteoarthritis rather than post-traumatic conditions. Exhibit 10 shows that primary osteoarthritis, which is often referred to as a disease of wear-and-tear and aging, accounted for 87.9 percent of the medical conditions resulting in replacement surgery, compared to 9.2 percent for post-traumatic osteoarthritis.

The 2021 discharge data shows that the inpatient hospital services are widely distributed across 439 hospitals, with no hospital accounting for more than 1.4 percent of total discharges (Exhibit 18). Although workers' compensation accounts for a tiny fraction of the total discharges, there is slightly more consolidation of services among the hospitals, with Community Regional Medical Center – Fresno and Cedars-Sinai Medical Center each serving 2.2 percent of the workers' compensation inpatient

¹⁷ Jones, S.L. California Workers' Comp Inpatient Hospitalization Trends, 2010-2020. *CWCI Research Update*. October 2021.

population. As noted in prior CWCI studies, there continues to be a small number of hospitals (primarily surgical hospitals) that have a higher proportion of injured workers in their patient mix. Notably, injured workers account for 26.3 percent of the patient mix for physician-owned Patients' Hospital of Redding.

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 Senior Research Associate at the California Workers' Compensation Institute.

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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% 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 website (www.cwci.org).

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1333 Broadway, Suite 510
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