California Workers' Compensation Institute
Research Abstract

Clinical Severity in Workers' Compensation Inpatient Care

July 2001

Can inpatient medical treatment under workers' compensation be fairly compared to care provided under other health care systems such as group health or Medicare? Or, is clinical severity greater for work-related injuries, requiring greater utilization or more complex medical resources to get workers back on the job?

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About CWCI

The California Workers' Compensation Institute was incorporated in 1964 as a private, nonprofit organization of insurers and self-insured employers conducting and communicating research and analysis to improve the operation of the California workers' compensation system. Most CWCI research is derived from operating data collected from member companies specifically for the Institute. Additional information about CWCI research and activities is available on the Institute's web site (www.cwci.org).

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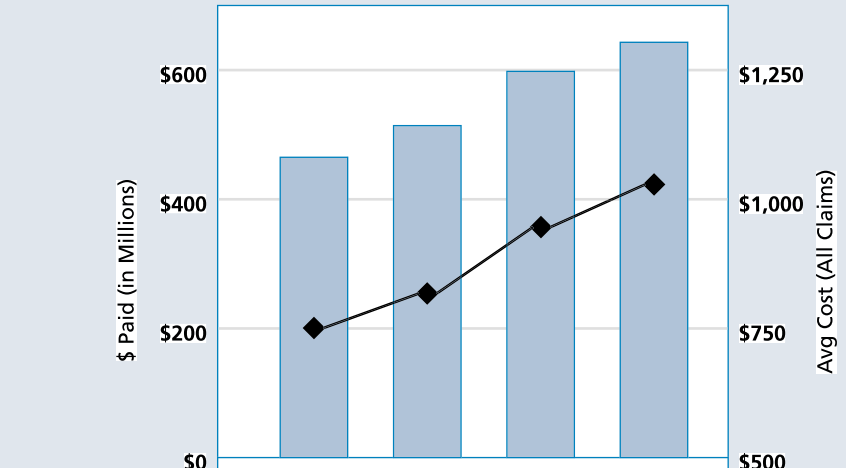
Introduction

The rising cost of medical treatment in the California workers' compensation system has been an increasing concern in recent years as the growth of those costs has accelerated. Even though claim frequency was declining, the Workers' Compensation Insurance Rating Bureau reports that total medical costs grew about 25 percent from just under $2 billion in 1996 to more than $2.5 billion in 1999. At the same time, hospital costs, which account for one out of every four workers' compensation medical dollars paid, increased at an even faster rate. Aggregate hospital costs jumped 38 percent (from $465 million to $643 million) from 1996 to 1999, and the average amount paid to California hospitals per workers' compensation injury rose from $751 to $1,029. (Chart 1).

In California, the issue of hospital payments has recently taken center stage as the state is preparing to revise its workers' compensation Inpatient Hospital Fee Schedule (IHFS), which was mandated by the state legislature in 1993 and first introduced in 1999 as a means of controlling inpatient treatment costs.

Chart 1: Growth in Workers' Compensation Hospital Costs



	1996	1997	1998	1999
Hospital ($M)	$465	$514	$595	$643
Avg Cost/Claim	$751	$815	$948	$1,029

Source: WCIRB

Since the state implemented the IHFS in 1999, hospitals have become more and more concerned that reimbursement for inpatient services are not aligned with costs. The medical community asserts that work injuries are much more clinically severe than injuries treated under other systems and the level of care required in workers' compensation is much more resource intensive than in the group health or Medicare systems.

In testimony before the Division of Workers' Compensation last year, hospital representatives reported that the financial pressures from inadequate reimbursement for certain procedures forced many hospitals to turn away patients, resulting in long waiting periods for injured workers needing those procedures. There also were reports that entire hospital chains were reconsidering whether or not they could afford to service workers' compensation patients at all.

Available information on injured workers is often limited to administrative data (claims data, medical payment transactions, etc.) that does not contain severity measures. The lack of available information on clinical severity left room for development of the widely held (yet unproven) notion that workers' compensation patients are sicker, require more medical resources, and therefore are more expensive to treat. This assumption is grounded in the belief that the return-to-work objective of workers' compensation requires more intense treatment and a more accelerated rehabilitation effort than other systems. The challenge for researchers has been to figure out how to measure the clinical severity of workers' compensation claims so that it can be compared with the clinical severity of claims paid under other systems.

Identifying Workers' Compensation Inpatient Admissions

Fortunately, available data on the inpatient services rendered to injured workers do provide clues that researchers can use to tell whether clinical severity and the demands on hospital resources are greater in workers' compensation than in other systems.

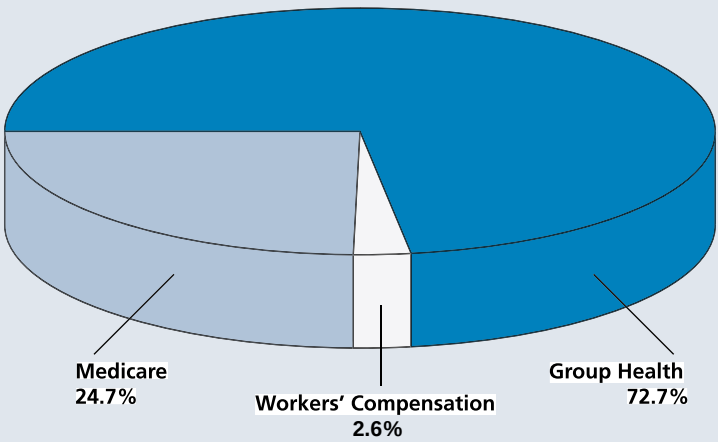
For this analysis, the Institute reviewed data on all 1998 California hospital admissions reported by health care facilities to the Office of Statewide Health Planning and Development (OSHPD). OSHPD maintains these data in a public database, with all admissions

categorized into one of over 500 Diagnostic Related Groups (DRGs) – a standard classification system developed by the federal Health Care Financing Administration (HCFA). The OSHPD database contains detailed information on patient characteristics (age, sex, type of health plan coverage, etc.), type of hospital, all major diagnosis and procedure codes, length of stay in the hospital and charge data. In addition, the database contains a rating of the clinical severity of each hospital admission, as assigned by the 3M Company's All-Payor Related Diagnosis Related Group (APR-DRG) system.

Methodology

The OSHPD discharge database used in this study contains information on all 1998 inpatient hospital admissions for workers' compensation, group health and Medicare in California – over 1 million admissions in total. Chart 2 shows the percentage breakout among the three payor sectors.

Chart 2: Admissions by Sector



OSHPD 1998 Data N = 1,030,854

To assure that the study focused on typical workers' compensation hospitalizations, the Institute used the OSHPD discharge data to target the 150 most frequent DRGs among California workers' compensation patients. Together, these 150 diagnosis categories encompassed 95 percent of all workers' compensation inpatient hospital admissions.

The OSHPD database provides a rich source of detailed information on inpatient hospital care. To gauge severity, the research examined and compared data for workers' compensation, group health, and Medicare along several dimensions:

- Scheduled and unscheduled admissions
- Surgical and medical admissions
- Number of diagnostic surgical procedures
- Discharge type
- DRG relative weight
- Length of stay
- Clinical severity score

Although this analysis focused on admissions from the top 150 workers' compensation DRGs, there are, nevertheless, significant differences among the three payors with respect to the distribution of cases across these 150 DRGs. For instance, back injuries are much more prevalent among injured workers, representing more than one-third of all workers' compensation inpatient admissions, but less than 5 percent of group health admissions and 2 percent of the Medicare admissions. (See ICIS Says "Financial Impact of Proposed Inpatient Fee Schedule Revision," CWCI, March 2001) The distribution of cases across DRGs is known as "case mix".

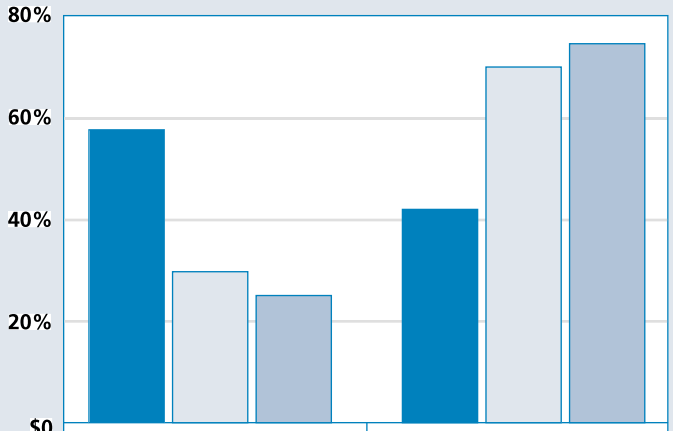
Failure to control for differences in case mix can create false impressions and distort the results of an analysis. So, in addition to simply comparing the three systems using unadjusted data for the various severity measures, the Institute also ran case-mix-adjusted comparisons, adjusting the relative prevalence of each DRG in the group health and Medicare sectors to that in the workers' compensation sector. This neutralized the differences in DRG mix and leveled the playing field among the three sectors. Thus, after adjusting for case mix, the severity results for each sector were based on equivalent proportions of back injuries, etc. Because workers' compensation cases were the basis for the comparison among the three sectors, the unadjusted and case-mix-adjusted values for workers' compensation presented in Charts 8 – 10 are the same.

Unadjusted Results

Scheduled and Unscheduled Admissions

The first measure examines the two ways in which a patient is admitted into a hospital: unscheduled and scheduled admissions. Unscheduled admissions include cases where a patient enters the hospital through the Emergency Room — where the hospital admission was not pre-planned. Scheduled admissions represent a scheduled appointment for inpatient surgery or observation.

Chart 3: Admission Type by Sector



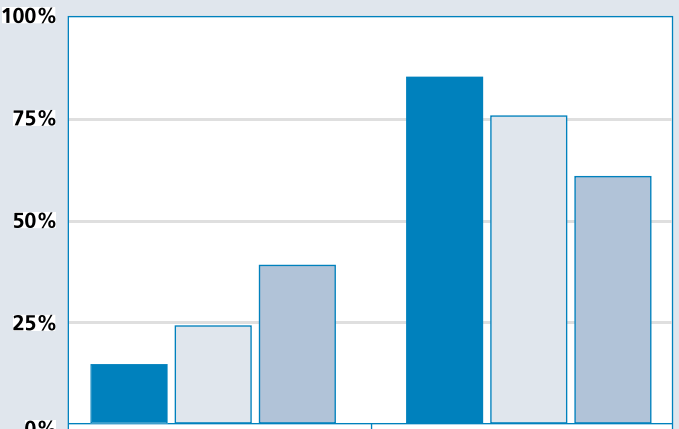
	Scheduled	Unscheduled
Workers' Comp	57.8%	42.1%
Group Health	29.8%	70.2%
Medicare	25.1%	74.8%

Among the three payor systems, workers' compensation has the highest proportion of scheduled admissions — 58 percent versus just under 30 percent of group health admissions and 25 percent of Medicare admissions. While admission type is not a direct measure of clinical severity, this OSHPD data element does indicate that injured workers are less likely than group health or Medicare patients to require immediate, emergency hospitalization, and more likely to have a planned admission.

Surgical and Medical Admissions

Another factor to consider is the type of treatment rendered after the patient is admitted to the hospital. Inpatient admissions can be categorized into two basic groups: those that require surgery (surgical admissions) and those that do not (medical admissions).

Chart 4: Surgical and Medical Admissions by Sector



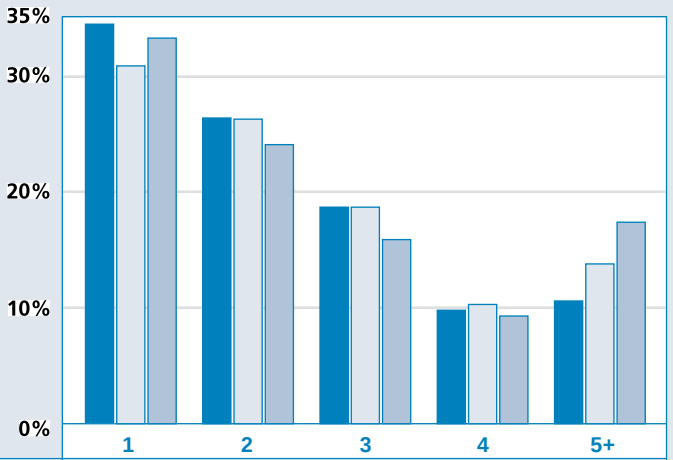
	Medical Admissions	Surgical Admissions
Workers' Comp	14.4%	85.6%
Group Health	24.0%	76.0%
Medicare	39.0%	61.0%

The OSHPD data show that surgical admission levels are significantly higher for workers' compensation (Chart 4). About 86 percent of the workers' compensation inpatient hospital admissions in the sample did, in fact, have surgery, compared to 76 percent of the group health admissions and 61 percent of the Medicare admissions. A medical admission by itself, however, does not necessarily imply a simpler, less severe case. Patients are often admitted to a hospital with complex, severe medical conditions such as pneumonia and do not have surgery. To get a better grasp of the clinical severity of the admissions, the Institute took a closer look at the kinds of surgery performed under each of the three sectors, and the level of resources used in those surgeries.

Number of Surgical Procedures

One of the most direct measures of resource use is the number of surgical procedures performed on a patient. OSHPD data captures up to 24 different hospital-based surgical procedures for every admission. In order to analyze differences in payor sectors, the Institute separated all surgical admissions into five categories based on the number of surgical procedures noted at the time of discharge: admissions with one, two, three, four, and five and greater procedures.

Chart 5: Number of ICD-9 Procedures by Sector



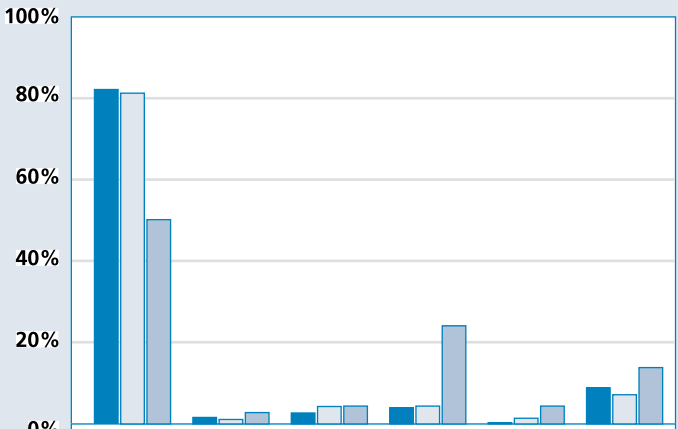
	1	2	3	4	5+
Workers' Comp	34.5%	26.4%	18.7%	9.8%	10.6%
Group Health	30.9%	26.3%	18.7%	10.3%	13.8%
Medicare	33.3%	24.1%	15.9%	9.3%	17.4%

Among the three sectors, workers' compensation had the highest proportion of cases involving only one surgical procedure, and the lowest percentage of cases involving five or more procedures (Chart 5). Thus, the distributions for number of surgical procedures indicate surgical intervention is less intensive in workers' compensation than in either group health or Medicare.

Discharge Type

Discharge type relates to how a patient leaves the hospital. The vast majority of workers' compensation and group health patients leave the hospital through a routine discharge, while only about half of the Medicare patients leave via routine discharge. On the other hand, Medicare patients are much more likely to be discharged through a transfer to another facility (Chart 6), most notably long-term care facilities.

Chart 6: Discharge Type by Sector



	Routine (Home)	Transfer w/in	Transfer Other	Transfer LTC	Died in Hospital	Other
Workers' Comp	82.5%	1.6%	2.7%	4.0%	0.3%	8.9%
Group Health	81.6%	1.1%	4.3%	4.4%	1.4%	7.2%
Medicare	50.4%	2.8%	4.4%	24.2%	4.4%	13.9%

The most striking difference among the three sectors in terms of discharge type is in the category of "deaths" in the hospital. Looking at the same DRGs across the three sectors, the Institute found the proportion of admissions in which patients die in the hospital is roughly five times greater in group health than in workers' compensation (1.4 percent vs. 0.3 percent). And, of course, the death rate for Medicare admissions is several times higher than that of workers' compensation. It is clear that compared to the two other sectors, workers' compensation has a significantly lower incidence of deaths in the hospital.

DRG Weight

Every admission falls into one of more than 500 Diagnosis Related Groups. To reflect how expensive a given admission is to treat, the Health Care Financing Administration calculates a specific DRG weight for each category. Again, the DRG weight is a number reflecting the complexity of each admission. For example, a heart transplant, arguably the most complicated procedure, has a DRG weight of 19.0, whereas a straightforward labor and delivery admission has a DRG weight of about 0.4.

The table below shows the unadjusted average DRG relative weights for hospital admissions under the three payor sectors.

Sector	Relative Weight
Workers' Compensation	1.4657
Group Health	1.2181
Medicare	1.4407

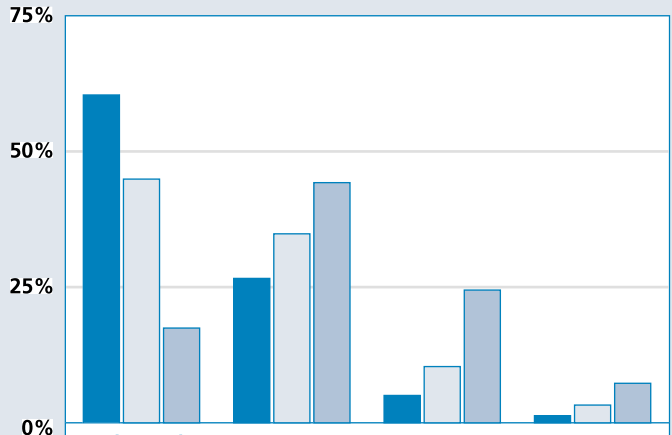
The unadjusted relative weight for workers' compensation shows a significantly higher score when compared to group health and a marginally higher score than Medicare. This result is driven by the different mix of cases within the top 150 DRGs. For example, the research found the top admissions in workers' compensation are orthopedic back fusions – expensive, complicated procedures that drive up the relative weight of workers' compensation admissions. In contrast, for group health, the most common DRGs are related to labor and delivery, and for Medicare they are largely cardiac catheterization and orthopedic surgeries. As noted in the next section, the case-mix-adjusted results are markedly different.

Severity

To assign clinical severity, OSHPD uses the 3M Company's APR-DRG Severity Grouper – a sophisticated software program used by several state agencies as the standard method to categorize the resource requirements of an inpatient admission. The software analyzes demographic and clinical aspects of the patient discharge record, including — but not limited to — diagnoses, surgical procedure(s), age and sex of the patient.

The APR-DRG system ranks each hospitalization using a score of 1 to 4. One is the lowest level of clinical severity – minor; two is moderate; three is major; and four is extreme – the most life threatening hospital admissions.

Chart 7: All Admissions:
Unadjusted APR-DRG Severity Score by Sector



	1 (Minor)	2 (Moderate)	3 (Major)	4 (Extreme)
Workers' Comp	64.7%	28.5%	5.4%	1.4%
Group Health	48.1%	37.3%	11.1%	3.5%
Medicare	18.7%	47.4%	26.2%	7.8%

Workers' compensation has by far the lowest percentage (1.4 percent) of inpatient hospital admissions in the "extreme" category (Chart 7). At the other end of the severity spectrum, workers' compensation has the highest proportion of "minor" inpatient admissions. Nearly two out of three workers' compensation admissions

fall into the minor category, compared to less than half of the group health admissions and less than one in five Medicare admissions.

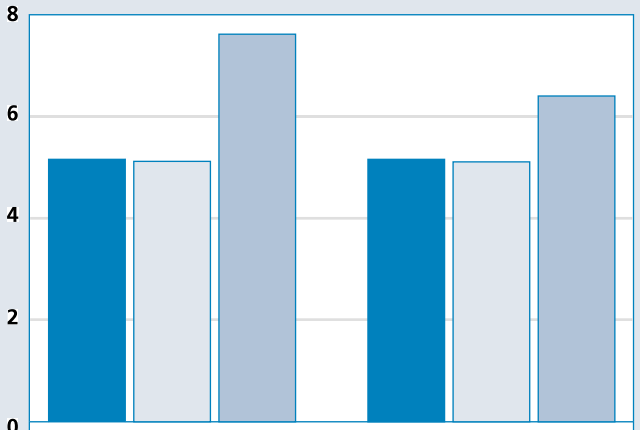
Averaging the 4-point scale across all the admissions for each sector shows that workers' compensation has an average severity score of 1.4; group health a 1.7; and Medicare a 2.2.

Case-Mix-Adjusted Results

Average Length of Stay

The length of time a patient stays in the hospital is a standard measure of the resource and clinical complexity of an admission. Chart 8 displays the unadjusted and case-mix-adjusted results for average length of stay.

Chart 8: All Admissions:
Case-Mix Adjusted Average Length of Stay



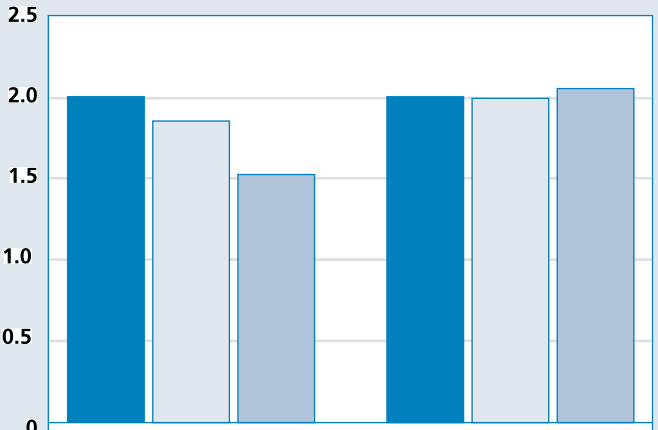
	Unadjusted	Case-Mix Adjusted
Workers' Comp	5.18	5.18
Group Health	5.14	5.13
Medicare	7.65	6.43

In both the unadjusted and case-mix-adjusted results for average length of stay, workers' compensation admissions were statistically similar to group health and significantly shorter than Medicare.

Average Number of Diagnostic Surgical Procedures

Without accounting for the differences in case mix among the three sectors, it appears that workers' compensation utilizes more procedures on average than either group health or medicare. However, after adjusting for case mix, the study found that there is no significant difference in the average number of surgical procedures among the three sectors (Chart 9). (The significant swing of 35 percent in the Medicare unadjusted to adjusted results underscores the importance of the case mix adjustment.)

Chart 9: All Admissions:
Case-Mix Adjusted Average Number of ICD-9 Procedures



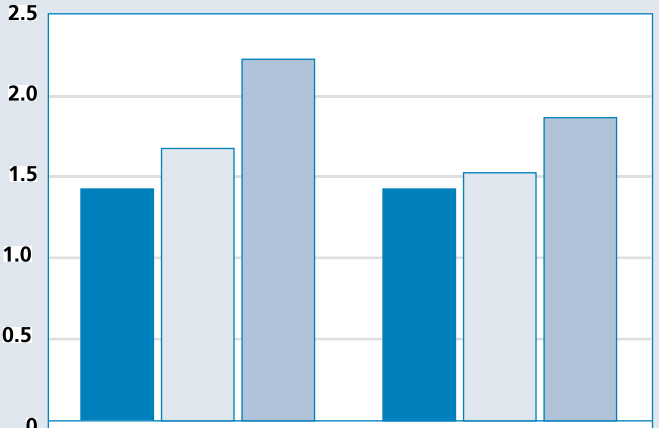
	Unadjusted	Case-Mix Adjusted
Workers' Comp	2.01	2.01
Group Health	1.86	2.00
Medicare	1.53	2.06

APR-DRG Severity Score

The case mix adjusted results using the APR-DRG 4-point severity scale (Chart 10) show workers' compensation admissions yield the lowest severity score (1.43) compared to group health (1.53) and Medicare (1.87).

Thus, on both the unadjusted and case-mix-adjusted basis, the APR-DRG severity scale confirms that workers' compensation inpatient admissions are less clinically severe than either group health or Medicare admissions.

Chart 10: All Admissions: Case-Mix Adjusted APR-DRG Severity



	Unadjusted	Case-Mix Adjusted
Workers' Comp	1.43	1.43
Group Health	1.68	1.53
Medicare	2.23	1.87

Summary

This study utilized multiple measures of severity to examine the assertion that a workers' compensation patient is somehow more clinically severe or more resource-intensive than a patient in the group health or Medicare sectors. The results show just the opposite. That is, for a comparable population of admissions, workers' compensation patients are less clinically severe and require fewer clinical resources than either group health or Medicare patients. As policymakers continue to debate appropriate reimbursement levels for workers' compensation inpatient services, this research provides objective data that can be used to establish a "fair price" for one of the major medical cost drivers in the California system.

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