RESEARCH UPDATE

Prescribing Patterns of Schedule II Opioids in California Workers' Compensation

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EXECUTIVE SUMMARY

Recent studies have documented the rapid growth and widespread use of Schedule II opioid medications in the treatment of workers' compensation injuries. These narcotic drugs are controlled substances with a very high potential for abuse or addiction that have limited FDA-approved medical uses. This study analyzes the prescribing patterns of California workers' compensation medical providers who write Schedule II prescriptions and identifies the specific types and amounts of medications that are being prescribed, the types of injuries involved, and the amounts paid for these drugs. The results show that a relatively small percentage of medical providers are responsible for the vast majority of Schedule II opioid prescriptions and the associated payments, with 3 percent of the prescribing physicians accounting for 55 percent of all Schedule II prescriptions, 62 percent of all morphine equivalents and 65 percent of all associated payments in the study sample. Furthermore, the top 10 percent of injured workers receiving Schedule II morphine equivalents obtained their prescriptions from an average of 3.3 different physicians, compared to an average of 1.9 doctors for all claims, and their average levels of morphine equivalents per claim are consistent with an increased risk for overdose and addiction. The study also found that nearly half of the Schedule II opioid prescriptions in California workers' compensation are for minor back injury claims, a treatment regimen that the American College of Occupational and Environmental Medicine describes as "typically not useful in the sub-acute and chronic phases." These results underscore the need for additional research, investigation and serious consideration of statutory and/or regulatory policy enforcement and reform.

BACKGROUND

The recent acceleration in the rate at which prescription narcotics are used in the United States has become a significant public health emergency. A recent report by the National Center on Addiction and Substance Abuse at Columbia University found that 15.1 million Americans, more than 6 percent of this country's adult population, admit to abusing prescription drugs -- more than all other forms of drug abuse combined.[1] Furthermore, the study noted that between 1998 and 2008, hospitals nationwide reported a 400 percent increase in admissions related to prescription narcotic abuse and a 200 percent increase in prescription narcotic deaths. While the use of all prescription medications rose 61 percent during that time, the use of Schedule II opioids, which include Oxycodone, Fentanyl Citrate, Morphine, Methadone, Hydromorphone and Oxymorphone, increased by 380 percent. In addition, a 2011 report by the Center for Disease Control and Prevention noted that in 2007, drug-induced deaths had become more common than alcohol-induced or firearm-related deaths in the United States, that the increase in drug abuse and related deaths was associated with "prescription opioid painkillers and psychotherapeutic drugs being prescribed more widely by physicians," and that these drugs had "supplanted illicit drugs as the leading cause of drug-related overdose deaths."[2]

The federal government's growing concern about the risks associated with these drugs is expressed in a recent report from The Department of Health and Human Services Office of the Inspector General, which states that "Schedule II drugs have a high potential for abuse, have an accepted medical use with severe restrictions, and may cause severe psychological or physical dependence if abused."[3] Similarly, a recent General Accounting Office (GAO) analysis found that all of the states that it had observed lacked a comprehensive fraud prevention framework for controlled substances, and recommended that the Centers for Medicare and Medicaid Services (CMS) issue guidance to states for improved oversight of controlled substances in Medicaid.[4] The GAO report also noted additional areas of abuse, including physician-prescribed controlled substances in excess of medical need, and patient sale of the drugs "on the street." Recently, the increasing supply and demand curve for Schedule II opioids has been associated with the rise of criminal activity at the point of service, as pharmacies have reported a sharp increase in Schedule II opioid related armed robberies.[5]

The high rate of soft-tissue injuries among injured workers,[6] coupled with the lack of group-health style utilization and cost controls (co-payments, deductibles, contractual limits and pharmaceutical formularies) is associated with a high degree of treatment variability, including the off-label use of Schedule II narcotics.[7] National studies have documented the growing reliance on prescription narcotics to treat injured workers. For example, an August 2009 study by the Washington State Division of Labor and Industry (DLI) estimated that the volume of opiate prescriptions in that state's workers' compensation program had increased 50 percent between 1999 and 2007,[8] while a subsequent study by the National Council of Compensation Insurance (NCCI) estimated that narcotic medications accounted for 25 percent of all workers' compensation drug costs nationwide and that the use of these drugs increases as claims age.[9]

CWCI research on opioids in California workers' compensation began with a 2008 study that measured the use of opioids in more than 166,000 work injury claims for back conditions with no spinal cord involvement.[10] After adjusting the claim sample to control for injured worker employment and demographic differences, the authors found that the graduated use of opioids in these back injury cases was associated with delayed recovery, escalating medical costs and an increased likelihood of litigation. These results are consistent with Webster's findings linking a high incidence of opioid use with a greater number of lost-time days for occupational low back pain[11] and add to a growing body of scientific literature suggesting that:

1) at higher levels of use, opioids can adversely impact an injured worker's activity level and sense of self-efficacy; and

2) prolonged administration of narcotic pain medications may impede, rather than facilitate, an injured worker's recovery from occupational back injuries.

As a follow up to its 2008 analysis, in September of 2009 CWCI released a related study on post-reform pharmaceutical utilization and reimbursement.[12] The Institute's 2009 study documented the dramatic increases in the use of Schedule II drugs (over 95 percent of which were opioids or opioid combinations) between 2002 and the third quarter of 2008 – a trend that began to accelerate after 2005. That study revealed that Schedule II medications had grown from less than 1 percent of all California workers' compensation prescriptions filled in 2005 to nearly 6 percent of the prescriptions filled during the first nine months of 2008, while the average amount paid for a Schedule II prescription had increased 64 percent to nearly $280 per prescription. In an update to that analysis published last year, Institute researchers found that between 2005 and 2009, reimbursements for Schedule II drugs had increased from 3.8 percent to 23.6 percent of total prescription drug payments in the California workers' compensation system.[13]

This study builds on prior research by examining several additional factors related to the use of Schedule II opioids among the injured worker population in California. First, the study classifies the types of injuries with a treatment regimen that includes Schedule II opioid prescriptions. Second, the study explores the prescribing patterns of the California workers' compensation medical providers who prescribe these medications by identifying the most commonly prescribed Schedule II opioids, as well as the average number of prescriptions and the average morphine equivalent doses prescribed per claim and per medical provider. The study also examines the distribution of Schedule II opioid payments in the California workers' compensation system, highlighting the results for those claims that involve the greatest amounts of these drugs, and for the physicians who write the greatest number of Schedule II opioid prescriptions.

DATA

This research utilized a special administrative data sample obtained from California workers' compensation pharmaceutical bills contributed by pharmacy benefit management (PBM) organizations. The data included the prescribing physician's name and Drug Enforcement Agency (DEA) number, the prescribed medication, the billed and paid amounts per prescription, the National Drug Code (NDC),[14] and other descriptive details about the drugs. Additional drug classification data included drug therapy class, drug group class, drug source and DEA classification. Detailed information on each prescription included the quantity and dosage of each prescription.

Similar opioids produce variable responses among patients, not only because individual tolerances to these drugs vary, but because opioids differ in analgesic potency. For example, 10 milligrams of oral oxycodone is as potent as 15 milligrams of oral morphine. These doses are considered equianalgesic. The analgesic effect of opioids also varies depending on how the drug is administered. For example, 15 milligrams of oral morphine has an analgesic effect equal to 5 milligrams of morphine administrated parenterally. To adjust for variations in the analgesic potency of Schedule II drugs, the authors applied equianalgesic dose conversion factors to the dosage information to calculate the morphine equivalent dosage level for each prescription. (The morphine equivalent conversion table can be found in Appendix 1.) The authors also utilized additional data, including diagnosis classifications, compiled from the California Workers' Compensation Institute's Industry Claims Information System (ICIS).[15] ICIS includes data on both open and closed workers' compensation claims from a broad sample of workers' compensation insurance carriers and self-insured employers from various industry sectors.

The claim sample for the study consisted of 16,890 California workers' compensation claims with dates of injury between January 1993 and December 2009, each of which had a payment record in the PBM data set for at least one Schedule II opioid prescription. These claims included records on 233,276 Schedule II opioid prescriptions paid under 256 distinct NDCs, with fill dates between January 2005 and December 2009. (A complete list of drugs identified in the study can be found in Appendix 2.) Aggregate payments for the Schedule II opioid prescriptions in the study sample totaled $86.1 million. There were 9,174 prescribing physicians associated with the 16,890 claims, and 42 percent of the claims in the sample had more than one prescribing physician. A primary diagnosis code and diagnostic category was derived for each claim in the study sample by a clinical grouper.[16]

There were limitations associated with the data used in this study. The available data had no information on pre-injury health care status and limited non-occupational injury co-morbidity details, so the degree to which such underlying medical conditions may have impacted the course of treatment and medical rationale to prescribe Schedule II therapies is unknown.

RESULTS

Percentage of Schedule II Opioid Claims, Prescriptions and Payments by Diagnosis Category

Table 1 shows the top 12 diagnosis categories in California workers' compensation for which Schedule II opioids are prescribed, noting the proportion of total Schedule II claims, Schedule II prescriptions, and Schedule II payments that fall into each diagnosis category.

The top 12 diagnosis groups accounted for 90.8 percent of all claims that had at least one Schedule II opioid prescription, 95.3 percent of the opioid prescriptions, and 96.2 percent of the total dollars paid for the opioids. Medical back problems without spinal cord involvement – typically sprains and strains – accounted for 35.7 percent of the work injury claims that involved Schedule II opioids, as well as 47.1 percent of the prescriptions and 50.2 percent of the payments for these medications, making this the number one diagnosis category in California workers' compensation for Schedule II opioids.

Table 1. Distribution of Claims, Schedule II Prescriptions and Schedule II Payments by Diagnosis Category -- Claims With at Least One Schedule II Opioid Prescription

Diagnosis Category	Percent of Schedule II Opioid Claims	Percent of Schedule II Opioid Prescriptions	Percent of Schedule II Opioid Payments
Medical Back Problems w/o Spinal Cord Involvement	35.7%	47.1%	50.2%
Spine Disorders w/ Spinal Cord or Root Involvement	11.3%	15.1%	16.1%
Cranial & Peripheral Nerve Disorders	5.0%	6.8%	6.5%
Degenerative, Infective & Metabolic Joint Disorders	9.3%	6.1%	5.4%
Other Injuries, Poisonings & Toxic Effects	5.5%	5.9%	6.8%
Ruptured Tendon, Tendonitis, Myositis & Bursitis	6.0%	3.6%	2.7%
Sprain of Shoulder, Arm, Knee or Lower Leg	6.8%	3.2%	2.8%
Wound, Fracture of Shoulder, Arm, Knee or Lower Leg	6.3%	2.7%	1.6%
Other Mental Disturbances	1.2%	1.7%	1.5%
Other Diagnoses of Musculoskeletal System	1.5%	1.4%	1.1%
Head & Spinal Injury w/o Spinal Cord Involvement	1.1%	0.9%	0.7%
Carpal Tunnel Syndrome	1.1%	0.8%	0.7%
Subtotal: Top 12 Diagnosis Categories	**90.8%**	**95.3%**	**96.2%**
All Other Diagnosis Categories	9.2%	4.7%	3.8%
Total	**100.0%**	**100.0%**	**100.0%**

Provider & Claim Outcomes For Physicians Ranked by Volume of Schedule II Opioid Prescriptions

The prescription data used in this study included the name and the DEA number of each medical provider who prescribed a Schedule II opioid, so the authors were able to identify those physicians in the sample who prescribed the highest volume of these drugs. Table 2 shows the cumulative percentage of California workers' compensation Schedule II prescriptions, morphine equivalents and payments for the top 10 percent of opioid prescribing medical providers and for the other 90 percent of prescribing physicians.

The results show that in the California workers' compensation system, a relatively small percentage of medical providers are responsible for the vast majority of Schedule II opioid prescriptions, morphine equivalents and the associated payments. For example, out of the 9,174 Schedule II opioid prescribing physicians in the study sample, the top 1 percent (93 physicians) accounted for nearly one third of the prescriptions, 41 percent of the morphine equivalents and 42 percent of the associated payments; the top 3 percent (276 physicians) accounted for 54.9 percent of the prescriptions, 62.4 percent of the morphine equivalents and 64.7 percent of the payments; and the top 10 percent (917 physicians) accounted for 79 percent of the prescriptions, 87 percent of the morphine equivalents and 88 percent of the dollars paid for these drugs.

Table 2. Percent of California WC Schedule II Prescriptions & Payments & Avg # of Schedule II Opioid Prescriptions Per Claim (Top 10% of Schedule II Prescribing Physicians)

Physician Ranking Based on # of Schedule II Scripts Written*	Cumulative Percent of All Schedule II Opioid Prescriptions	Cumulative Percent of All Schedule II Opioid Morphine Equivalents	Cumulative Percent of All Schedule II Opioid Payments
Top 1.0%	33.1%	41.0%	42.4%
Top 2.0%	46.2%	53.6%	55.8%
Top 3.0%	54.9%	62.4%	64.7%
Top 4.0%	61.3%	69.0%	70.8%
Top 5.0%	66.0%	74.1%	76.3%
Top 6.0%	69.7%	77.9%	80.1%
Top 7.0%	72.7%	80.9%	83.1%
Top 8.0%	75.2%	83.3%	85.1%
Top 9.0%	77.3%	85.3%	86.8%
Top 10.0%	79.2%	86.8%	88.2%
All Other Physicians	20.8%	13.2%	11.8%
Total	**100.0%**	**100.0%**	**100.0%**

* Each percentile includes approximately 93 physicians, so the top 1% represents 93 physicians, the top 2% represents 186 physicians, the top 3% represents 279 physicians, etc.

Tables 3A and 3B provide more detailed data on claim and provider-level outcomes results based on the volume of morphine equivalent doses of Schedule II opioids prescribed to injured workers. Table 3A breaks out the results for doctors ranked by their total volume of Schedule II opioid prescriptions, showing the data for doctors in the 1st through 10th percentiles, while Table 3B shows the results for all Schedule II opioid prescribing physicians, grouped into percentile ranges (1st through 10th, 11th through 20th, all the way up to the 100th percentile).

Once again, the data show that a relatively small number of physicians account for the vast majority of the Schedule II opioid prescriptions. For example, in this study sample the top one percent of Schedule II opioid prescribing physicians (93 physicians) had an average of more than 53 workers' compensation claims in which they prescribed Schedule II opioids, with each of these claims averaging 15.5 Schedule II opioid prescriptions, 66,451 milligrams of morphine equivalents, and $7,343 in payments for these drugs. That translates to an average of 3.55 million morphine equivalent milligrams of Schedule II opioids prescribed to injured workers by each of these 93 physicians, resulting in total payments averaging $392,667 for the Schedule II drugs prescribed by each of these doctors. Again, this means that the top 1 percent of the Schedule II prescribing physicians accounted for 41 percent of the morphine equivalents in the sample, and the Schedule II opioid prescriptions they wrote resulted in $36.5 million in payments, or 42 percent of the $86 million in Schedule II payments noted in the study.

Table 3A. Claim-Level and Provider-Level Outcomes
(Top 10 Percent of Opioid Prescribers Based on Total Number of Schedule II Opioid Prescriptions)

	Schedule II Opioid Claim-Level Outcomes			Schedule II Opioid Provider-Level Outcomes		
Physician Percentile Ranking	Avg # of Schedule II Opioid Prescriptions per Claim per MD	Avg Mgs of Morphine Equivalents per Claim per MD	Avg Schedule II Opioid Payments per Claim per MD	Total # of Schedule II Opioid Claims per MD	Total Mgs of Morphine Equivalents per MD	Total Schedule II Opioid $ Paid per MD
1st	15.5	66,451	$7,343	53.5	3,553,351	$392,667
2nd	11	36,183	$4,193	29.6	1,071,496	$124,164
3rd	10.9	38,195	$4,137	20.1	766,374	$83,002
4th	9.1	32,480	$3,209	17.6	570,663	$56,382
5th	8.6	31,863	$3,730	13.7	436,487	$51,091
6th	11	38,452	$4,117	8.5	326,638	$34,973
7th	8.4	28,266	$3,050	8.9	252,873	$27,289
8th	7.8	25,006	$2,316	8.1	203,276	$18,828
9th	6.6	22,280	$1,980	8.2	183,270	$16,285
10th	7.4	20,207	$1,910	6.5	131,020	$12,384

Table 3B. Claim-Level and Provider-Level Outcomes
(All Schedule II Opioid Prescribers Based on Total Number of Prescriptions)

	Schedule II Opioid Claim-Level Outcomes			Schedule II Opioid Provider-Level Outcomes		
Physician Percentile Ranking	Avg # of Schedule II Opioid Prescriptions per Claim per MD	Avg Mgs of Morphine Equivalents per Claim per MD	Avg Schedule II Opioid Payments per Claim per MD	Total # of Schedule II Opioid Claims per MD	Total Mgs of Morphine Equivalents per MD	Total Schedule II Opioid $ Paid per MD
1st-10th	11.4*	42,905*	$4,677*	17.5	749,545	$81,706
11th-20th	5.5	13,879	$1,345	4.8	67,037	$6,494
21st-30th	3.6	7,764	$793	3	23,435	$2,394
31st-40th	2.3	4,303	$393	2.3	9,967	$910
41st-50th	1.8	2,698	$248	1.7	4,642	$427
51st-60th	1.4	1,922	$181	1.4	2,707	$255
61st-70th	1.1	1,369	$133	1.1	1,495	$145
71st-80th	1	1,217	$113	1	1,217	$113
81st-90th	1	1,022	$99	1	1,022	$99
91st-100th	1	1,232	$132	1	1,232	$132
Overall Average	**7.2**	**24,831**	**$2,669**	**3.5**	**87,397**	**$9,393**

* Revised May 9, 2011.

These prescribing patterns are in sharp contrast to those of all opioid prescribing physicians, who averaged 3.5 claims in which these drugs were prescribed, and each of those claims averaged 7.2 prescriptions, 24,831 total milligrams of morphine equivalents, and $2,669 in payments for those drugs. Thus, on average each opioid prescribing physician was associated with total Schedule II opioid payments of $9,393.

Furthermore, the average morphine equivalent dose for Schedule II prescriptions written by physicians in the top 1 percent is 4,287 mg (66,451mg/15.5 prescriptions) versus 3,449 mg (24,831 mg/7.2 prescriptions) for all Schedule II prescriptions written by workers' compensation physicians, a 24 percent relative difference per prescription. Thus, the highest volume prescribing physicians not only prescribe more Schedule II opioids, they also prescribe more potent dosages of these drugs.

Claim Outcomes: Claims Grouped by Total Morphine Equivalents

When claims with at least one Schedule II opioid prescription are ranked by the number of morphine equivalents prescribed during the study period, similar outcomes emerge, with a relatively small number of claims accounting for most of the Schedule II prescriptions, morphine equivalents and the associated dollars paid. Table 4A shows the results for claims at the first through the 10th percentile levels, and Table 4B shows the outcomes for all Schedule II opioid claims grouped into broader percentile ranges, with the claims ranked by the total morphine equivalents prescribed during the study period. As noted in Table 4A, the top 1 percent of claims in this study sample with Schedule II opioids (169 claims) had an average of 3.2 prescribing physicians, with each of these claims

Table 4A. Average Number of Prescribing Physicians, Prescriptions, Morphine Equivalents & Paid Dollars (Top 10 Percent of Claims Ranked by Volume of Morphine Equivalents)

	Average Claim-Level Outcomes			
Percentile Claim Ranking by Total # of Morphine Equivalents	Schedule II Opioid Prescribers per Claim	# of Schedule II Opioid Prescriptions per Claim	Total Morphine Equivalents per Claim	$ Paid per Claim
1st	3.2	90.9	1,173,620	$123,122
2nd	3.4	70.4	566,915	$54,171
3rd	3.6	67.0	398,906	$38,254
4th	3.4	58.8	312,057	$31,623
5th	3.4	57.9	254,807	$23,913
6th	3.4	51.9	214,554	$19,020
7th	3.2	46.8	184,852	$16,644
8th	3.3	44.5	160,033	$13,735
9th	3.3	45.3	141,761	$13,639
10th	3.1	40.9	126,270	$11,284

Table 4B. Average Number of Prescribing Physicians, Prescriptions, Morphine Equivalents & Paid Dollars (All Schedule II Opioid Claims Ranked by Volume of Morphine Equivalents)

	Average Claim-Level Outcomes			
Percentile Claim Ranking by Total # of Morphine Equivalents	Schedule II Opioid Prescribers per Claim	# of Schedule II Opioid Prescriptions per Claim	Total Morphine Equivalents per Claim	$ Paid per Claim
1st-10th	3.3	57.4	353,377	$34,541
11th-20th	3.0	31.5	73,214	$7,955
21st-30th	2.5	18.7	27,523	$3,929
31st-40th	2.2	12.7	11,221	$2,579
41st-50th	1.9	7.3	4,600	$1,131
51st-60th	1.6	3.9	2,144	$442
61st-70th	1.3	2.3	1,121	$178
71st-80th	1.2	1.8	660	$114
81st-90th	1.1	1.2	385	$48
91st-100th	1.0	1.2	183	$73
Overall Average	**1.9**	**13.8**	**47,471**	**$5,102**

averaging 90.9 Schedule II opioid prescriptions, 1,173,620 milligrams of morphine equivalents, and $123,122 in payments for these drugs. This means that the top 1 percent of claims with Schedule II prescriptions accounted for 25 percent of the morphine equivalents in the sample and $20.8 million in payments, or 24.1 percent of the $86 million in Schedule II payments in the study.

Table 4B shows that the 10 percent of the claims with the highest level of morphine equivalents averaged 57.4 prescriptions during the study period, 353,377 morphine equivalents and total Schedule II opioid payments of $34,541. These claims also average 3.3 different physicians prescribing Schedule II opioids for the injured worker. Once again, these results are in sharp contrast to the results for all Schedule II opioid claims, which average 13.8 prescriptions for these drugs, 47,471 morphine equivalents, 1.9 prescribing physi-cians, and total Schedule II opioid payments of $5,102.

DISCUSSION

This analysis expands on the results of prior studies that documented a viral-like growth in the use of Schedule II drugs in California workers' compensation by providing a link to the specific prescribing patterns of a relatively small proportion of physicians treating injured workers. Notably, the study finds that the top 3 percent of the physicians who prescribe Schedule II opioids in California workers' compensation write more than half of all the prescriptions and are associated with two-thirds of all Schedule II opioid payments in the system, and that the top 1 percent of injured workers who are prescribed Schedule II opioids consume 25 times the morphine equivalents of the average injured worker who is prescribed this type of medication. The levels of morphine equivalents for the top percentile of prescribing physicians and injured workers are consistent with the 2010 study findings from Dunn,[17] which found an increased risk for overdose and addiction at these levels. Furthermore, among the study sample of injured workers who were prescribed Schedule II opioids, the top 10 percent who received the most Schedule II morphine equivalents had 3.3 prescribing physicians compared to an average of 1.9 prescribing physicians for all claims. The sample also notes that almost half of Schedule II opioid prescriptions and more than half of the payments are for claims involving minor back problems, a treatment regimen that the American College of Occupational and Environmental Medicine's Insights describes as "typically not useful in the sub-acute and chronic phases."[18]

More research lies ahead. The authors will next examine differences in ancillary and other treatment services between high- and low-frequency Schedule II prescribers. Future research will also analyze physicians with high and low Schedule II prescription frequency by morphine equivalent doses per day, week, month and year at specific intervals following the date of injury and the association to injured worker outcomes.

Concern over inappropriate use of Schedule II drugs has reached the tipping point and action to improve oversight and management of opioid-based pain management therapies is planned at both regional and national levels. The GAO suggests that an oversight approach "should consist of three crucial elements: (1) preventive controls; (2) detection and monitoring; and (3) investigations and prosecutions." The National Alliance for Model State Drug Laws (NAMSDL)[19] provides technical assistance for the Prescription Drug Monitoring Program (PDMP)[20], a statewide electronic database of prescription data administered by regulatory, administrative or law enforcement agencies. As of October 2010, 34 states have an operational PDMP and in a 2006 review, Simeone[21] noted an association between the PDMP and the reduced per capita supply of prescription pain relievers and stimulants and reduced probability of abuse of these drugs. He suggested that states which are proactive in their approach to regulation are more effective in reducing the per capita supply of prescription pain relievers and stimulants than states which are reactive in their approach to regulation.[22] Other supply-side control mechanisms include self-regulation and monitoring by the physician community, enhanced payor controls, federal and state consideration of targeted prohibitions for non-FDA approved "off-label" pharmaceutical use, and other strategies. In July 2009, California's Division of Workers' Compensation implemented a new Chronic Pain Medical Treatment Guideline[23] into the Workers' Compensation Medical Treatment Utilization Schedule. In addition, in March 2010, Washington State enacted legislation to curb inappropriate use of narcotics for chronic, non-cancer pain management.[24]

For centuries, the physicians' code of conduct has sensitized practitioners to their patients' pain and suffering, yet compelled them to "do no harm." Public policy research can highlight associations between variables and outcomes, but cannot show motive or prove cause and effect. The lack of detail on how, when and why medical decisions are made to prescribe Schedule II opioids for FDA-approved and off-label use at the exaggerated levels noted above underscores the need for additional research, investigation and serious consideration of statutory and/or regulatory policy enforcement and reform.

APPENDICES

Appendix 1. Schedule II Morphine Equivalent Conversion Table*

Drug	Oral/Parenteral Route	Equianalgesic Dose
Oxycodone	Oral	10 MG
Fentanyl	Parenteral	0.19 MG
Morphine	Oral	15 MG
Methadone	Oral	10 MG
Hydromorphone	Oral	4 MG
Oxymorphone	Oral	5 MG
Levorphanol	Oral	2 MG
Meperidine	Oral	150 MG
Codeine	Oral	100 MG

* There is considerable individual variability in the analgesic response to opioids among individuals. Therefore equianalgesic tables are estimates. This table is a compilation of several tables from various sources including the Pain Management Society, the EPEC project (Education for Physicians on End-of-Life Care) and The Massachusetts General Hospital.

Appendix 2. List of Schedule II Drugs Identified in the Study Sample

Drug	Generic/Brand Name	% of Scripts	% of Payments
Oxycodone	OXYCONTIN	19.4%	34.9%
	OXYCODONE AND ACTAMINOPHEN	14.6%	3.7%
	OXYCODONE HCL	8.2%	2.8%
	ENDOCET	1.7%	0.3%
	OXYCODONE AND ASPIRIN	0.3%	0.1%
	ROXICET	0.7%	0.0%
	ROXICODONE	0.2%	0.1%
	PERCOCET	0.1%	0.1%
	ENDODAN	0.1%	0.0%
	PERCODAN	0.1%	0.0%
	COMBUNOX	0.1%	0.0%
	OXYFAST	0.0%	0.0%
	TYLOX	0.0%	0.0%
	Subtotal	**45.4%**	**42.0%**
Fentanyl Citrate	ACTIQ LOZENGE	1.4%	9.2%
	ORAL TRANSMUCOSAL FENTANYL CITRATE	1.1%	8.3%
	FENTORA	0.4%	2.2%
	Subtotal	**2.9%**	**19.7%**
Transdermal Patch	FENTANYL TRANSDERMAL SYSTEM	12.9%	12.2%
	DURAGESIC TRANSDERMAL PATCH	4.5%	7.4%
	Subtotal	**17.4%**	**19.6%**

Appendix 2. List of Schedule II Drugs Identified in the Study Sample

Drug	Generic/Brand Name	% of Scripts	% of Payments
Morphine	AVINZA	6.2%	5.8%
	MORPHINE SULFATE	6.0%	2.7%
	KADIAN	4.1%	4.2%
	MS CONTIN TABLETS	0.6%	0.9%
	ORAMORPH	0.1%	0.2%
	Subtotal	**17.0%**	**13.7%**
Oxymorphone	OPANA OXYMORPHONE HCL	2.4%	2.8%
	OPANA	0.0%	0.0%
	Subtotal	**2.4%**	**2.8%**
Hydromorphone	HYDROMORPHONE HCL	3.8%	0.9%
	DILAUDID	0.4%	0.2%
	DILAUDID HYDROMORPHONE HCL	0.1%	0.1%
	Subtotal	**4.3%**	**1.2%**
Methadone	METHADONE	9.8%	0.7%
	METHADOSE	0.2%	0.0%
	DOLOPHINE HCL	0.0%	0.0%
	Subtotal	**10.0%**	**0.7%**
Levorphanol Tartrate	LEVORPHANOL TARTRATE	**0.3%**	**0.1%**
Merperidine	MEPERIDINE HCL	0.2%	0.0%
	DEMEROL	0.1%	0.0%
	MEPERITAB	0.0%	0.0%
	Subtotal	**0.3%**	**0.1%**
Codeine	CODEINE SULFATE	**0.0%**	**0.0%**
TOTALS		**100%**	**100%**

END NOTES / REFERENCES

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ABOUT CWCI

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.

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