



**EXPOSING A
SILENT GATEWAY
TO PERSISTENT OPIOID USE**
A CHOICES *Matter* STATUS REPORT

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Introduction

This is the second annual report based on research to identify and better understand the populations most at risk from exposure to prescription opioids. This research also provides an assessment of the progress that has been made in reducing the use of prescription opioids among at-risk populations since our initial 2017 benchmark study *United States for Non-Dependence*.

The purpose of this ongoing research effort is to examine the impact that federal and state response initiatives are having on opioid prescribing, and to continue to educate patients and prescribers about opioid risks.

IQVIA Institute for Human Data Science (formerly QuintilesIMS) conducted the research for this current report, as well as the previous 2017 report, examining national and state-by-state opioid prescribing trends and the role that opioid-based postsurgical pain management plays in contributing to the nation's opioid drug crisis. In addition to analyzing the number of pills prescribed to

patients, this year's study also looks at the strength of the medications prescribed by calculating the morphine milligram equivalents (MME) to get a fuller understanding of the risks these treatments pose to patients.

This report also includes results from a separate ongoing research effort exploring postsurgical patients' and surgeons' attitudes and behaviors related to the use of opioid pain medications. Wakefield Research conducted the *2018 Choices Matter Survey* as well as a 2016 survey that found patients self-reported far higher rates of opioid addiction and dependence than had previously been known.

IQVIA Institute for Human Data Science and Wakefield Research conducted the research independently with funding from Pacira Pharmaceuticals, Inc.

Key Findings

1

OPIOIDS TO TREAT POSTSURGICAL PAIN CONTINUE TO BE OVERPRESCRIBED

In 2017, surgery patients were prescribed nearly 100 to 200 pills to help treat pain from four common procedures ranging from rotator cuff repair and hip replacement to knee replacement and sleeve gastrectomy. On average, patients across all seven surgical procedures examined were prescribed 82 opioid pills to help manage postsurgical pain, a slight drop from the 85 pills patients undergoing the same surgical procedures received in 2016. Findings from the *2018 Choices Matter Survey*, a national survey conducted among 500 U.S. adults who had a soft tissue or orthopedic surgery within the past 12 months, and 200 U.S. orthopedic or soft tissue surgeons, may shed light on why overprescribing persists: nearly two-thirds of surgeons report frequently feeling pressure to prescribe more opioids than they think is necessary to treat their patients' pain.



2

HIGH POTENCY OPIOIDS POSE RISKS FOR ORTHOPEDIC SURGERY PATIENTS

More than one-half of orthopedic surgery patients received opioids that are more potent than typically recommended by the Centers for Disease Control and Prevention (CDC) based on morphine milligram equivalency (MME); one-in-four were prescribed extremely high daily doses of opioids (90 MME or more) that the CDC advises be avoided due to overdose risks.

3

SURGERY LEADS TO LONG-TERM USE OF OPIOIDS, PUTTING PATIENTS AT RISK OF ADDICTION AND DEPENDENCE

Nearly 9% of surgical patients in 2017 became newly persistent opioid users who continued to take opioids three to six months following surgery; that number climbed as high as 17% for patients undergoing certain surgeries. Alarming, the *2018 Choices Matter Survey* showed that 12% of patients who had surgery in the past year self-reported becoming addicted to or dependent on opioids following surgery.

4 POSTSURGICAL OPIOID TREATMENTS POSE THE GREATEST RISK TO WOMEN

Women are 40% more likely than men to become newly persistent users of opioids following surgery. While 11.3% of women continued to use opioids three to six months after surgery in 2017, just 8.1% of men became long-term users of these medications. Among persistent users, women were prescribed 15% more opioids than men.



5 PERSISTENT OPIOID USE SPIKED AMONG FEMALE MILLENNIALS

While all other age and gender groups saw a decline in their persistent use year over year, the number of millennial women (18-34 years old) who became persistent users rose 17% from 2016 to 2017. The most pronounced gender differences in persistent use were also seen in this age group, with more than 10% of millennial women becoming persistent opioid users compared to some 6% of men that age. Additionally, alarming findings from the *2018 Choices Matter Survey* show that 18% of millennials report they became addicted to or dependent on opioids following surgery.

6 OPIOID OVERPRESCRIBING LEADS TO UNUSED PILLS AVAILABLE FOR MISUSE OR ABUSE

Findings from the *2018 Choices Matter Survey* show that nearly one-in-five surgical patients admit refilling opioid prescriptions even though they no longer needed the drug to manage their pain. Almost 90% of patients with leftover opioid pills didn't properly dispose of them, with many keeping them in their homes and some sharing them with family or friends. Nearly half of 40-54 year-old patients with leftover pills kept them in their home. This is an age group that typically has teenage children – one of the most at-risk groups for misusing or abusing opioids.

7 ENOUGH OPIOIDS WERE PRESCRIBED IN 2017 TO PROVIDE EVERY AMERICAN WITH 32 PILLS

While Alabama saw a decrease in prescribing in 2017, it remained the top state in the nation for opioid prescribing, with enough opioids dispensed for every resident to have 65 pills each. Patients in Tennessee received the highest daily dosages of opioids in the nation when converted to MME, putting them at greater risk of overdose.

Methodology

THE IQVIA INSTITUTE FOR HUMAN DATA SCIENCE

conducted this retrospective analysis based on IQVIA's National Prescription Audit (NPA)[®], National Sales Perspectives (NSP)[®] to assess prescriptions, sales and drug quantities within therapeutic categories. Data was selected using a proprietary IQVIA coding system, Uniform System Classification (USC) and the Anatomical Therapeutic Classification (ATC) codes. Analyses by geography were conducted using IQVIA's Xponent[®] service. These analyses were for the entire U.S. market and were not specific to any surgeries.

The PharMetrics Plus[™] Database was used to analyze opioids administered to patients for the following surgical procedures: hernia, total knee replacement, colectomy, hysterectomy, total hip replacement, sleeve gastrectomy and rotator cuff surgery. The PharMetrics Plus dataset contains adjudicated medical and pharmacy claims across the U.S. The study analyzed presurgical and postsurgical opioid prescribing and captured claims from Jan. 1, 2015 to Dec. 31, 2017 to account for a 12-month presurgical and a one-year postsurgical period. The PharMetrics Plus analysis included a sample of 89,935 patients ages 18-64 who were both opioid-naïve prior to surgery and received an opioid during the perioperative surgical period.

The seven surgeries selected for the surgical dataset represent a sampling of surgeries often used by clinical and health policy researchers. It includes outpatient and inpatient procedures, as well as surgeries that require holistic management for adequate recovery, including rehabilitation and pain management. The sample also includes a variety of soft tissue and orthopedic procedures. For the PharMetrics Plus analysis, to determine opioid-naïve patients and newly persistent users of opioids, the analysis followed the methodology established in a study conducted by Brummett et al. and published in the April 12, 2017 volume of the *Journal of the American Medical Association* (JAMA).

Opioid-naïve patients were defined as patients who had no opioid prescriptions in the presurgical

period, which was defined as 366 days to 30 days prior to the surgery date. The perioperative surgical period, during which opioid exposure occurred, was defined as 30 days prior to the surgery date to 14 days post-discharge. Patients were then tracked from 15 days post-discharge through 366 days. Patients receiving a prescription for an opioid 90 days to 180 days post-discharge were considered newly persistent opioid users. Patients were categorized based on a grouping of opioid products and analyzed by gender, age and the number of patients receiving prescriptions for opioids in the postsurgical period.

Analyses of patients' anonymous prescriptions over time were conducted using IQVIA's Longitudinal (LRx) Insights. These analyses included reflecting patients' use of opioids when normalized for the potency of the specific drug relative to morphine, and the prescribing intensity of the prescriptions they received in duration and/or number of doses. These normalizations were reflected in morphine milligram equivalents (MME)/day. By linking anonymous patients from the LRx data to anonymous patients identified as having had one of the target surgeries from PharMetrics Plus, the study demonstrates the potency and intensity of opioid prescribing for the surgical patients studied. Prescription opioids were followed 24 months before and 24 months after surgery. MME were calculated at the molecule, form and strength level, and divided by days' supply at a prescription level, to determine MME per day per prescription. MME factors used in the calculation are based on publicly available factors from the Centers for Disease Control and Prevention (CDC). High doses of prescription opioids are defined by the CDC as greater than or equal to 90 MME/day; the study considered between 50 to 89.9 MME/day to be moderate doses of opioids, low doses of opioids were between 0 to 49.9 MME/day.

WAKEFIELD RESEARCH

conducted a survey among 500 U.S. adults who had soft tissue or orthopedic surgery in the 12 months prior to the fielding of the poll and 200 U.S. orthopedic or soft tissue surgeons. The survey was fielded between Aug. 9 and Aug. 16, 2018, using an online survey.

Results of any sample are subject to sampling variation. For the interviews conducted in this particular study, the chances are 95 in 100 that a survey result does not vary, plus or minus, by more than 4.4 percentage points for the patients sample and 6.9 percentage points for the surgeons sample from the result that would be obtained if interviews had been conducted with all persons in the universe represented by the sample.

PAUL SETHI, M.D.

Orthopedic Surgeon at Orthopaedic & Neurosurgery Specialists (ONS) and President of the ONS Foundation for Clinical Research and Education, provided additional commentary to this report.

America's Evolving Opioid Epidemic

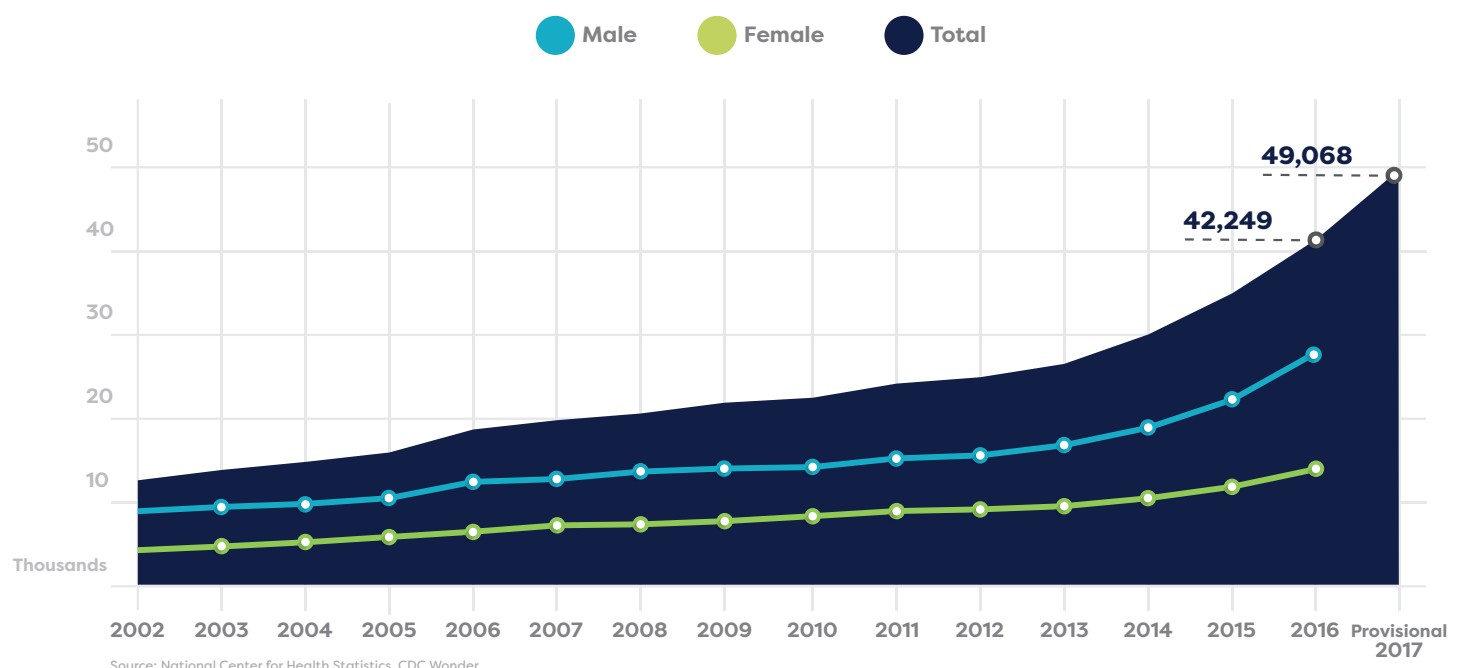
Since reaching its peak in 2012 when 282 million opioid prescriptions were dispensed to Americans, the number of opioids prescribed to patients has been on the decline.ⁱ But the opioid crisis continues to rage on. Nearly one-third of Americans say they know someone who is or has been addicted to either illegal or prescription opioids.ⁱⁱ Overdose deaths from opioids soared from 21,000 in 2010 to nearly 50,000 in 2017ⁱⁱⁱ and it's estimated that another 510,000 American lives will be lost in the next decade as a result of this epidemic.^{iv}

While many overdose deaths are now caused by illegal opioids such as heroin and street

versions of fentanyl, prescription opioids are overwhelmingly the initial source of addiction. In fact, nearly 80% of heroin users began by abusing prescription pain medications.^v

In the battle to stem the opioid crisis, a number of federal and state regulations, payer reimbursement controls and medical guidelines have been put in place to restrict the amount and duration of opioids prescribed. In spite of these important initiatives, this report reveals that progress to reduce prescribing varies widely geographically and demographically, with overprescribing of opioids still posing a serious risk to many vulnerable populations.

National Overdose Deaths Number of Deaths Involving Opioids



Snapshot of Opioid Prescribing Across the Nation

According to the IQVIA analysis, the number of opioid pills prescribed in the U.S. dropped 11% from 2016 to 2017.

Despite this decline, the number of opioids prescribed to Americans remains disturbingly high

10.5 BILLION OPIOID PILLS WERE DISPENSED IN 2017, ENOUGH FOR EVERY MAN, WOMAN AND CHILD TO HAVE 32 OPIOID PILLS EACH.

Snapshot of Opioid Prescribing Across the Nation

36 pills
for every American in
2016

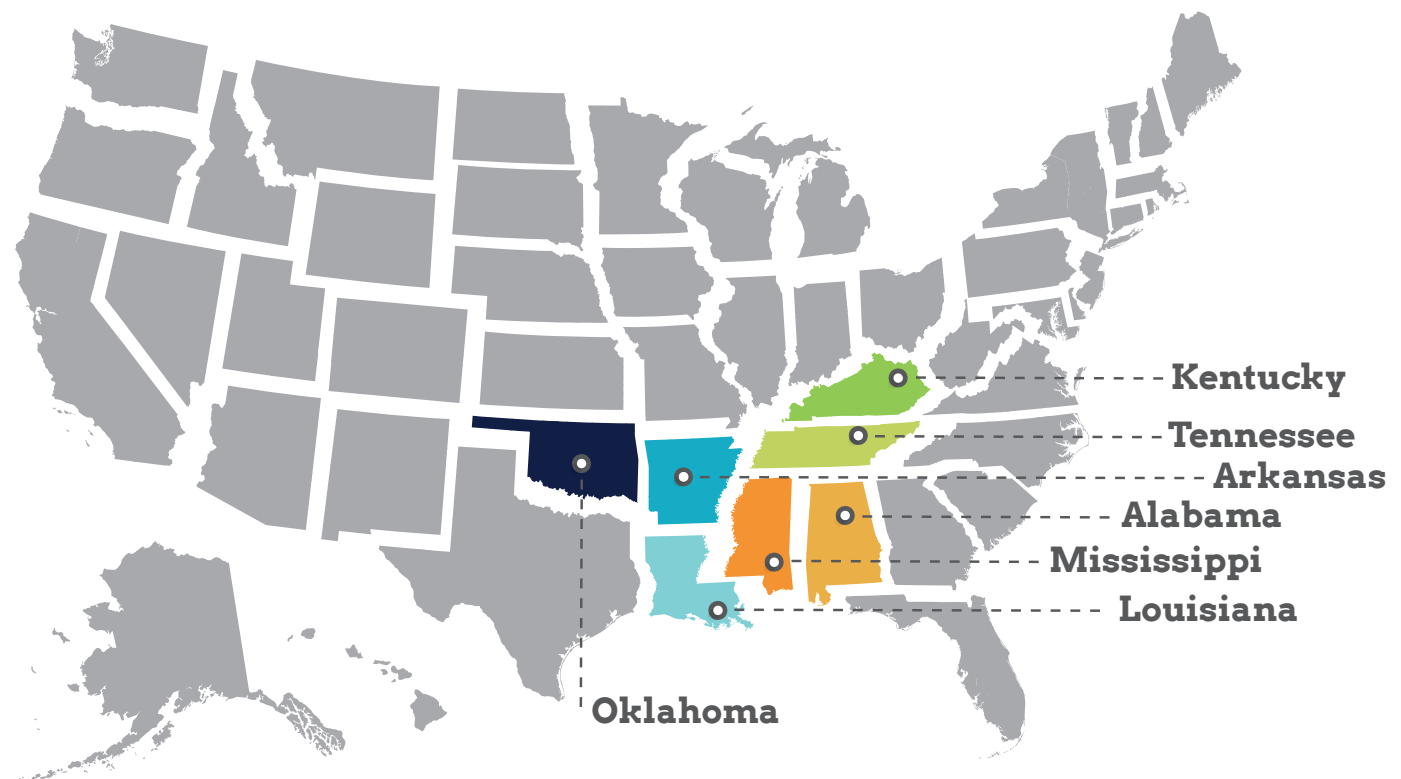


32 pills
for every American in
2017

Geographic Trends

Every state in the nation saw a reduction in opioid use in 2017, although there were wide variations in how steep those declines were, as well as how many opioid prescriptions and pills were dispensed.

WHILE ALABAMA SAW A 10% DECREASE IN PER CAPITA OPIOID PRESCRIBING IN 2017, IT REMAINED THE NUMBER ONE STATE IN THE NATION FOR OPIOID PILLS PER PERSON, WITH ENOUGH OPIOIDS DISPENSED FOR EVERY RESIDENT TO HAVE 65 PILLS EACH.



Seven states still had enough opioid prescriptions written in 2017 for **every citizen in the state to have his or her own prescription.**

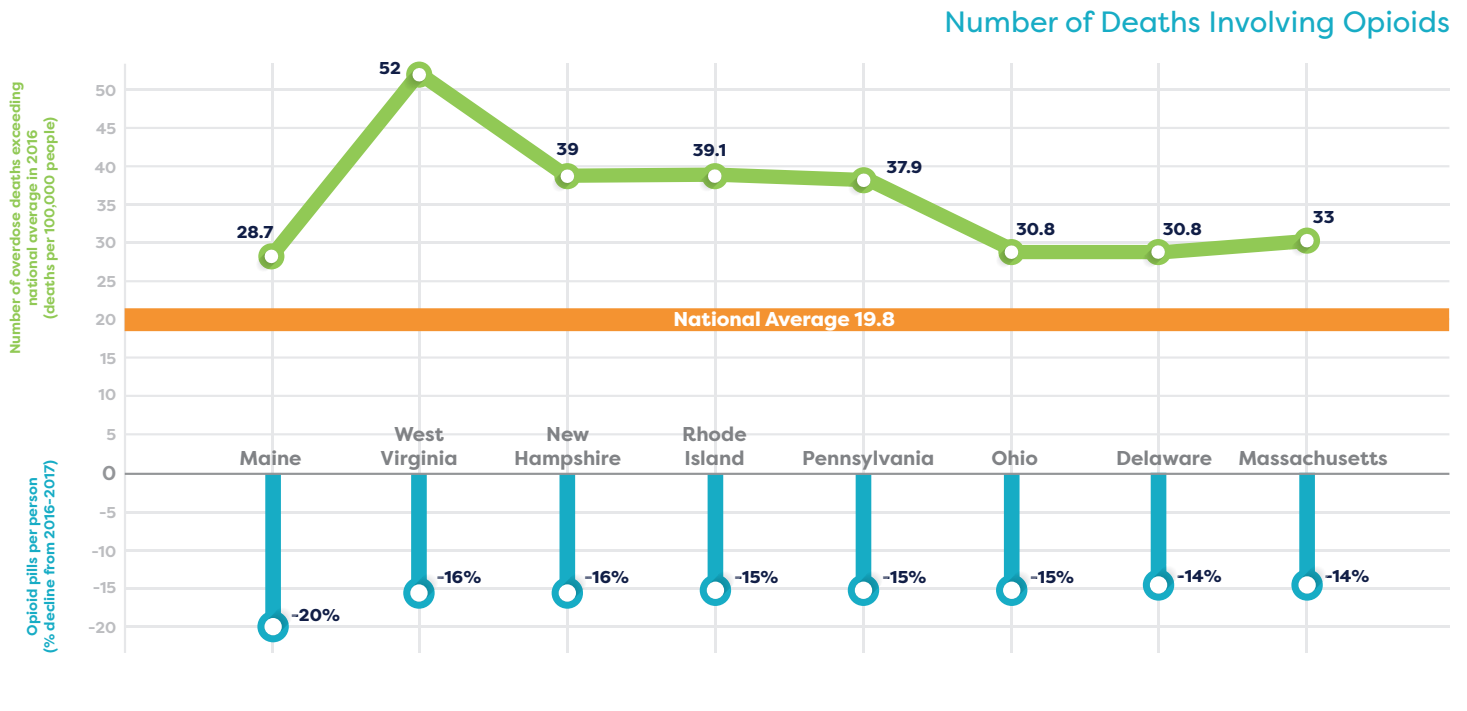
Tennessee and Arkansas also experienced reductions in per capita opioid prescribing (down 11% and 6%, respectively). But, as was the case in 2016, they joined Alabama as the top three states in the country with the highest number of opioid pills per person. Hawaii's per capita pill rate was 23 pills per person, the lowest number in the nation for two years in a row.

Addressing Overdose Deaths

In 2016, the average overdose death rate in the U.S. was 19.8 deaths per 100,000 people.^{vi}

STATES THAT HAVE EXPERIENCED HIGHER OVERDOSE DEATH RATES THAN THE NATIONAL AVERAGE ARE ALSO THE ONES THAT MADE THE MOST SIGNIFICANT STRIDES IN REDUCING PRESCRIPTION OPIOID USE,

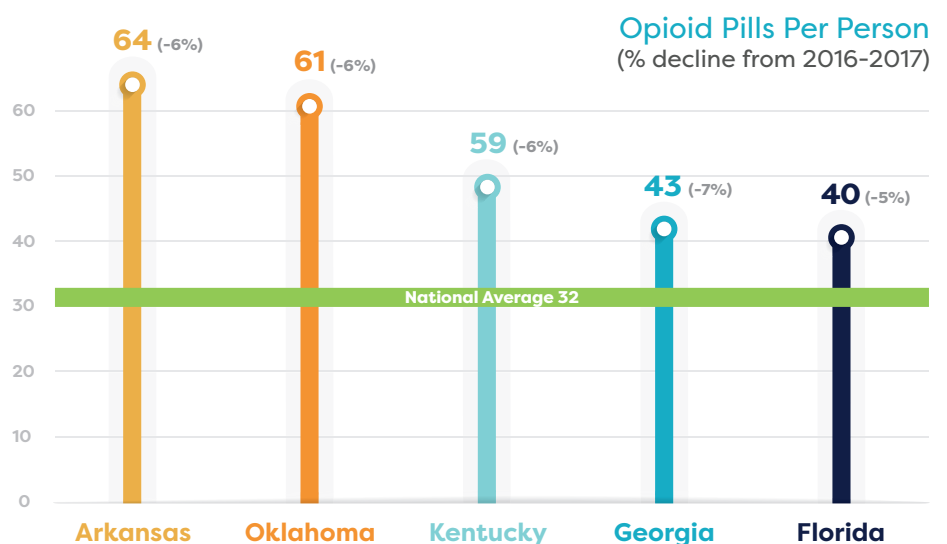
showing some of the steepest declines in the number of per capita opioid pills prescribed in 2017 compared to 2016.



States Lagging Behind the Nation

While progress has been made in reducing the use of opioids nationwide,

THE STATES WITH THE LOWEST DECREASES IN PILLS PER CAPITA IN 2017 HAD A HIGHER NUMBER OF OPIOID PILLS PER RESIDENT THAN THE NATIONAL AVERAGE OF 32 PILLS.

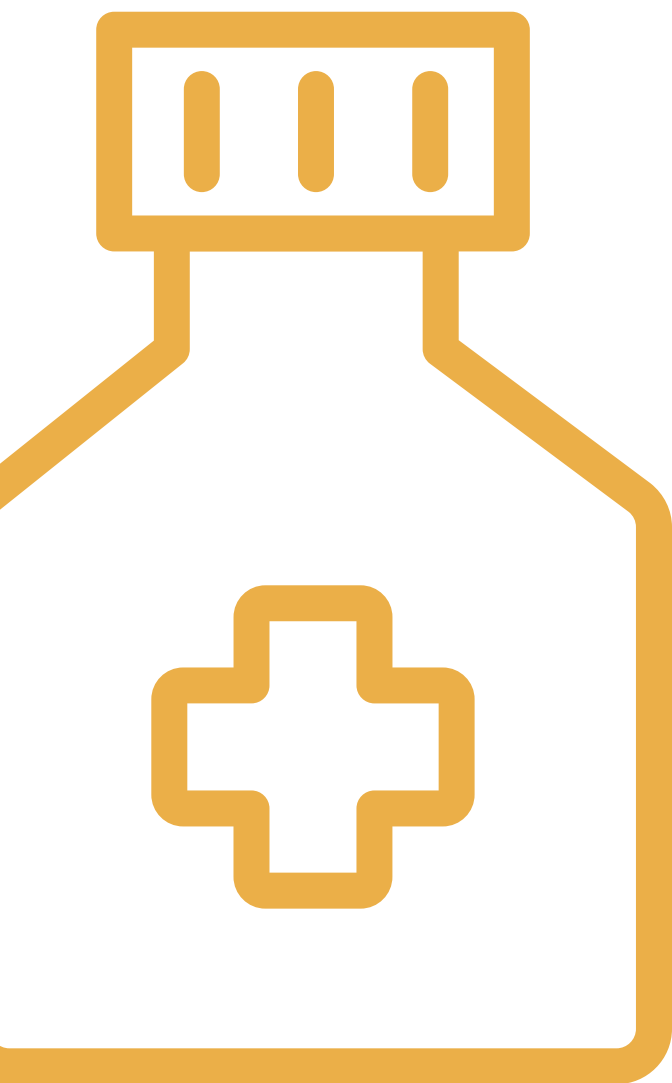


Dangers Beyond the Pill Count

In the past few years, several states have focused much of their regulatory efforts on limiting the number of days' supply of first-time opioid prescriptions, with seven days being the most common restriction.^{vii} While these rules have reduced the number of pills dispensed to patients, less has been done to curb the use of higher-strength opioids. The number of pills patients are taking doesn't tell the whole story. Even while those pill numbers are declining, patients may still be at high risk given the strength and dose of the opioid. The higher the dose or the more potent the opioid, the more potentially dangerous or addictive it is.

TENNESSEE IS NOT ONLY A STATE WITH ONE OF THE HIGHEST PER PERSON PILL COUNTS, IT'S ALSO THE STATE WHERE PATIENTS ARE BEING PRESCRIBED THE HIGHEST DAILY DOSAGES OF OPIOIDS IN THE NATION...

when measured in morphine milligram equivalents (MME). Patients are either getting high-strength opioids like hydromorphone or high daily doses of lower strength opioids like hydrocodone; both put patients in danger of overdose.



The Role of Opioids in Treating Postsurgical Pain

Managing pain after surgery has often been overlooked as a contributing factor to the opioid epidemic even though it is frequently the first time patients are exposed to these types of medications. In recent years however, a number of leading medical organizations have provided support and prescribing guidelines for the use of a multimodal pain management approach that utilizes non-opioid options such as non-steroidal anti-inflammatory drugs (NSAIDs), acetaminophen and local anesthetics including long-acting formulations, as well as non-drug methods to reduce or eliminate the need for opioids to treat pain during and after surgery.

The IQVIA analysis shows that educational efforts and clinical guidance are having some effect in reducing the use of opioids for postsurgical pain; however, there is far more that needs to be done to eliminate overprescribing of these drugs. The challenges are made apparent by findings from the *2018 Choices Matter Survey*.

AMONG THE SURGEONS POLLED, NEARLY TWO-THIRDS REPORT FREQUENTLY FEELING PRESSURE TO PRESCRIBE MORE OPIOIDS THAN THEY BELIEVE THEIR PATIENTS ACTUALLY NEED.

Wanting to ensure a patient's pain is treated to their satisfaction should be a surgeon's concern; but a balanced approach is required to minimize opioid overprescribing that inadvertently puts patients and their communities at risk. Surgical patients are acutely aware of the dangers that come with opioids; according to the *2018 Choices Matter Survey*

ALMOST ALL PATIENTS POLLED (93%) FEEL THAT OPIOIDS TAKEN FOLLOWING SURGERY CAN LEAD TO ADDICTION OR DEPENDENCE.



“Pain management and patient satisfaction go hand-in-hand. Opioids are often overprescribed out of an abundance of caution for patient comfort during the postsurgical recovery period—but now we see this carries unintended consequences. Alternative medications are critical for not only controlling pain after surgery, but also in reducing reliance on opioids.”

PAUL SETHI, M.D.

While there is some evidence that limiting access to prescription opioids can lead some patients to resort to street drugs such as heroin, that is not a major concern when it comes to treating acute pain from surgery. A recent study by Stanford University researchers found that while

curtailing the number of opioid pills for patients with chronic pain could in fact lead to a greater number of overdose deaths from illicit opioid use, reducing the prescribing of opioids for acute pain would have the opposite effect by preventing overdose deaths over time.^{viii}

Prevalence and Overprescribing of Opioids in Surgeries

The IQVIA analysis found that while some progress has been made in reducing the use of opioids to treat postsurgical pain and the resulting number of newly persistent opioid users, those strides have been limited.

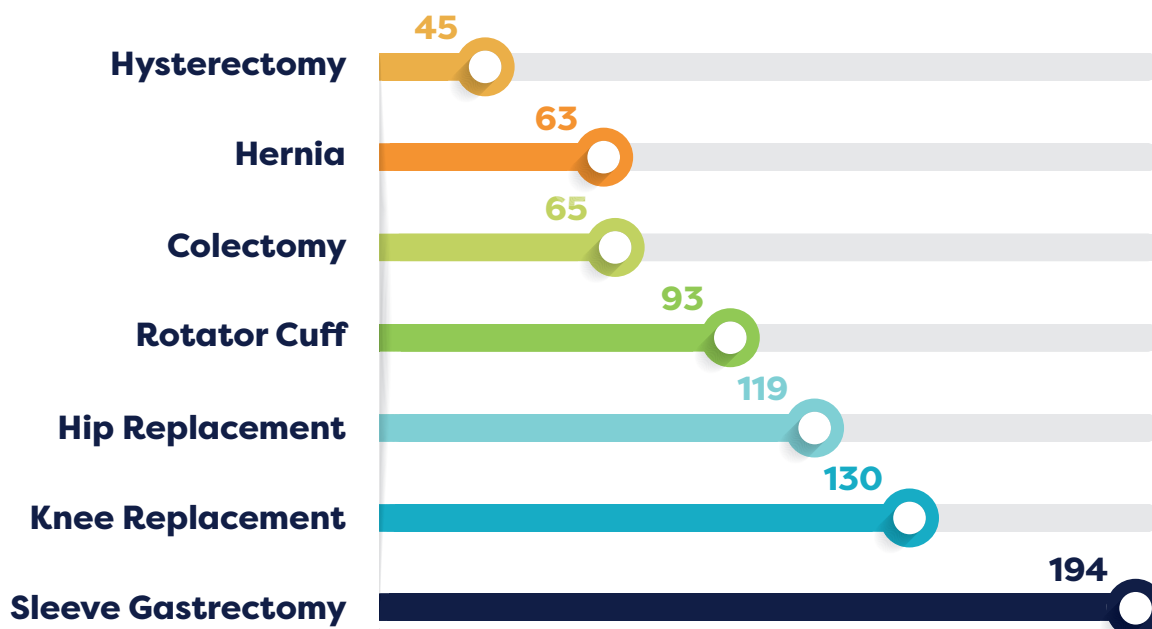
Examining opioid use in patients undergoing seven different surgeries in 2017, the analysis found that

THE AVERAGE NUMBER OF OPIOIDS PATIENTS RECEIVE IN THE PERIOPERATIVE PERIOD VARIES WIDELY DEPENDING ON THE SURGERY PERFORMED— FROM A LOW OF 45 PILLS DISPENSED TO HYSTERECTOMY PATIENTS TO A HIGH OF 194 PILLS USED BY PATIENTS UNDERGOING A WEIGHT LOSS PROCEDURE CALLED A SLEEVE GASTRECTOMY. ON AVERAGE PATIENTS RECEIVED 82 OPIOID PILLS TO HELP MANAGE POSTSURGICAL PAIN...

down slightly from the 85 pills prescribed during the same surgical period in 2016.

Average Number of Opioid Pills

Prescribed to Help Treat Pain After Surgery



High Potency Opioids Pose Risks for Orthopedic Patients

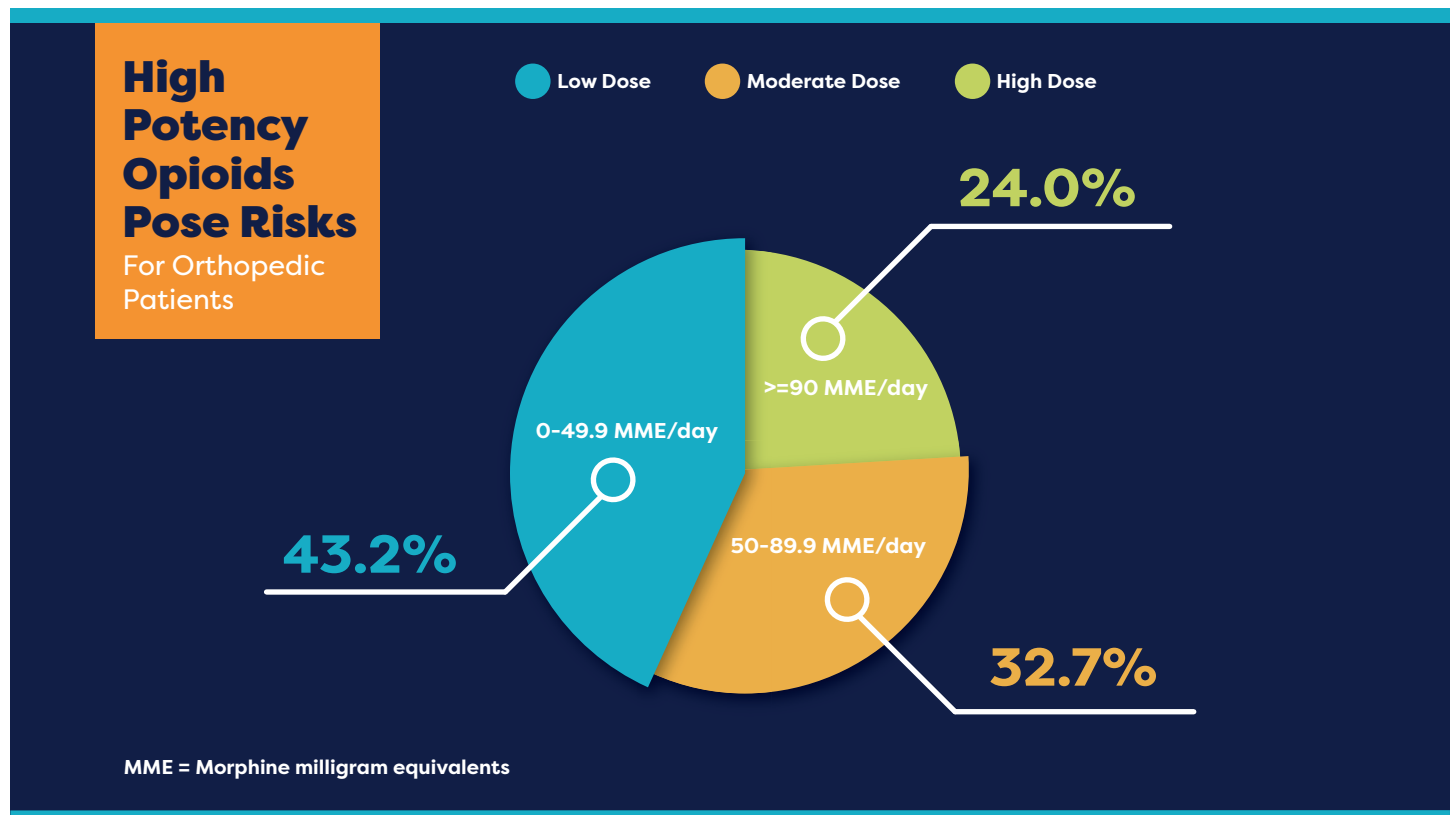
Using MME per day, the potency of the opioids prescribed to patients was also assessed. The IQVIA analysis showed that patients having orthopedic surgeries received far more potent opioids than patients undergoing soft tissue procedures. In fact, more than 50% of patients undergoing knee and hip replacements, as well as rotator cuff surgery were prescribed opioids equal or greater to 50 MME per day, far higher than the 20 MME per day recommended by the Centers for Disease Control and Prevention (CDC) and considered amounts that pose significant overdose risks. Even more disturbing,

ONE-IN-FOUR PATIENTS WERE GIVEN OPIOIDS EQUAL OR GREATER TO 90 MME PER DAY, DOSES CONSIDERED SO STRONG THAT THE CDC RECOMMENDS AVOIDING THEM BECAUSE PATIENTS TAKING THOSE AMOUNTS ARE TEN TIMES MORE AT RISK OF AN OVERDOSE DEATH.^{ix}



“Orthopedic patients often suffer from pain well before their surgery; therefore, many patients may already be taking opioids to manage their condition. Prior opioid use, coupled with the fact that orthopedic procedures can be quite painful, may lead clinicians to prescribe higher doses of opioids after surgery to ensure that patients’ pain is adequately controlled.”

PAUL SETHI, M.D.





“Patients are often told by different professionals along the care continuum to, ‘stay ahead of pain,’ which may cause some to refill opioid prescriptions prematurely, just in case they need them. This is a cycle we need to break – and can break – by relying more heavily on non-opioid medications before, during and after surgery, and relegating opioids to a ‘last resort’ option for pain that cannot otherwise be controlled.”

PAUL SETHI, M.D.

Unused Opioids Threaten Families and Communities

Overprescribing opioids not only puts patients at risk, but also those around them. Of the people who misused or abused opioids in 2017, 97% used prescription opioids and more than half obtained them from a friend or relative. According to the *2018 Choices Matter Survey*, nearly

9 IN 10 SURGERY PATIENTS WITH LEFTOVER OPIOID PILLS ADMIT THAT THEY HAVEN'T PROPERLY DISPOSED OF THEM EITHER BY KEEPING THEM IN THEIR HOME, GIVING THEM TO FAMILY OR FRIENDS TO HELP MANAGE THEIR PAIN OR IMPROPERLY DISCARDING THE MEDICATIONS.

In fact, nearly one-in-five surgical patients report refilling an opioid prescription even though they no longer need the drug to manage their pain.

Instead, they want them just in case they or their family or friends need them in the future or because they are addicted or dependent.

Especially concerning is that

ALMOST HALF OF 40-54 YEAR-OLD PATIENTS WITH LEFTOVER PILLS KEPT THEM IN THEIR HOME.

This is an age group that typically has teenage children – one of the most at-risk groups for misusing or abusing opioids.

When Surgery Leads to Long-Term Opioid Use

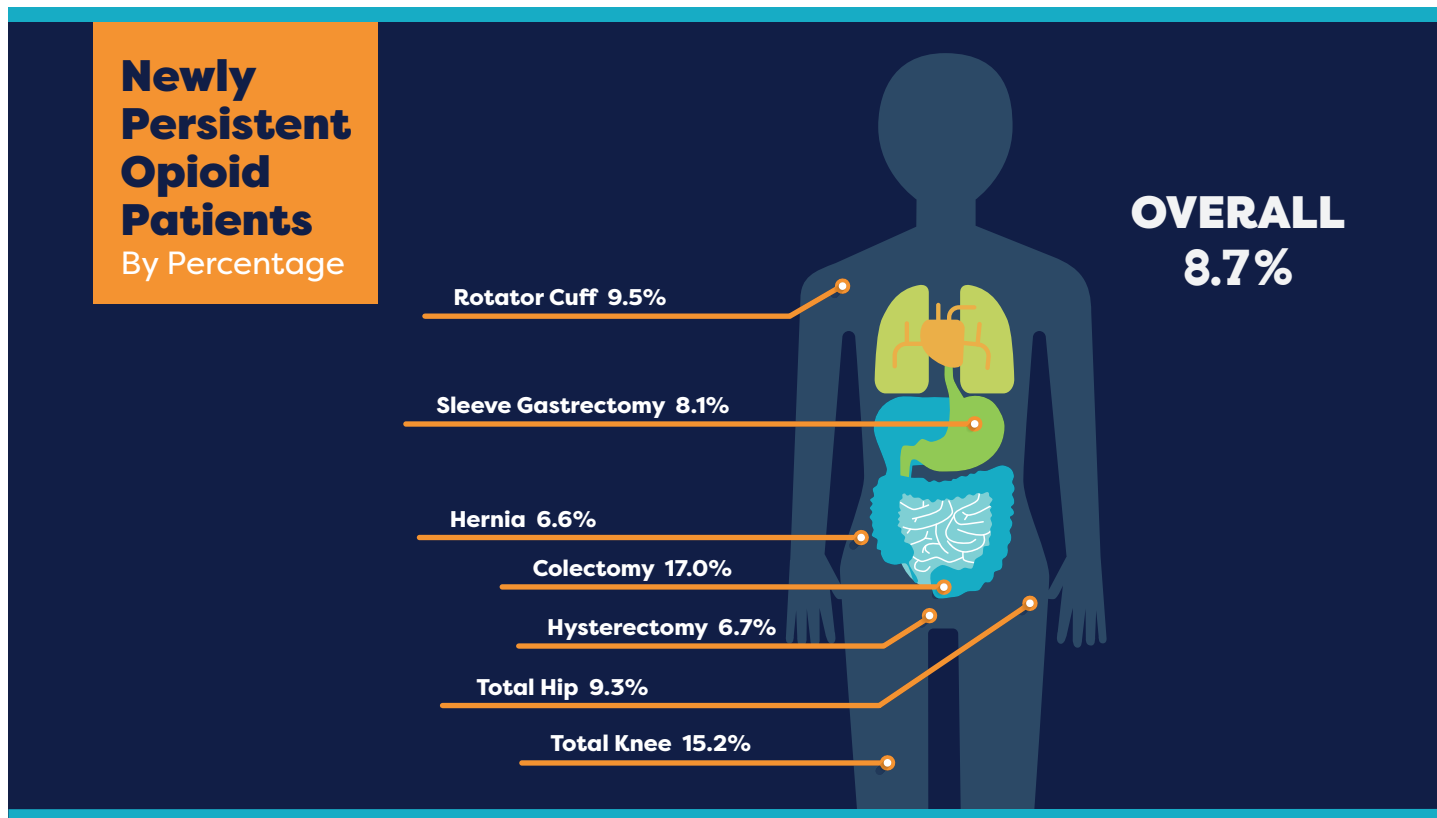
To help address the opioid crisis, medical organizations have called on clinicians to assess patient risk when prescribing opioids for surgery patients and to provide opioid alternatives in high-risk populations. While risk factors most often considered are history of substance abuse and mental health status, the findings in this report reveal additional demographic characteristics and surgery-specific factors that can put patients at risk when opioid treatments are involved.

Exposing patients to higher quantities of opioids than necessary puts them at greater risk for long-term use of the drug that can lead to addiction or dependence. This analysis found that

NEARLY 9% OF SURGICAL PATIENTS WHO HAD NOT BEEN TAKING OPIOIDS PRIOR TO THE PERIOPERATIVE PERIOD BECAME PERSISTENT USERS

who continued to take these drugs at least three to six months after the surgical procedure; that number climbs as high as 17% for patients undergoing certain types of operations.

Considering the seven surgeries in the analysis, the procedures that put patients most at risk of persistent opioid use and for which newly persistent patients receive the highest number of pills are colectomies, an operation that removes a portion of the colon, followed by total knee replacement surgeries. In 2017, 17% of patients became newly persistent users after undergoing a colectomy and 15.2% of knee replacement patients went on to long-term use of opioids.



While the IQVIA analysis looked at newly persistent patients using adjudicated medical and pharmacy claims, the *2018 Choices Matter Survey*, which included a more generalized population of surgery patients, finds that

12% OF PATIENTS WHO HAD A SOFT TISSUE OR ORTHOPEDIC OPERATION IN THE PAST YEAR SELF-REPORTED THAT THEY HAD BECOME ADDICTED TO OR DEPENDENT ON OPIOIDS FOLLOWING SURGERY.

Gender and Age Differences in Opioid Persistence Following Surgery

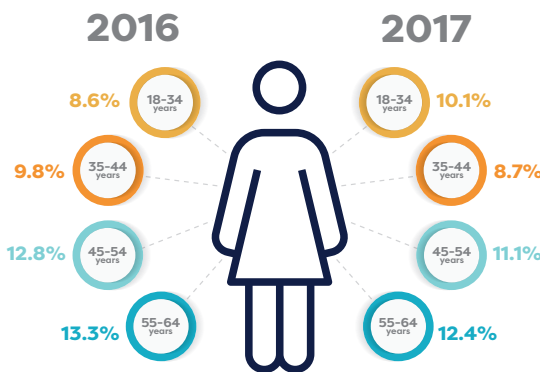
The IQVIA analysis shows that women are far more susceptible to becoming newly persistent users of opioids than men. Although men and women on average were prescribed similar amounts of opioids help to treat postsurgical pain,

40% MORE WOMEN CONTINUED TO USE THEM AT LEAST THREE TO SIX MONTHS AFTER SURGERY...

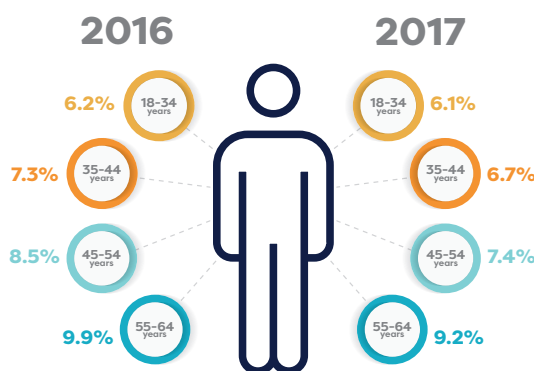
when looking at surgeries performed on both females and males (six out of the seven procedures).

While 11.3% of women became persistent users of opioids, just 8.1% of men went on to long-term use of these medications.

Percent of Newly Persistent Women by Age Group*



Percent of Newly Persistent Men by Age Group*



*Among the six gender-neutral surgeries.

WOMEN WHO BECAME PERSISTENT USERS OF OPIOIDS RECEIVED 15% MORE OPIOID PILLS THAN MEN WHO USED THEM LONG-TERM.

Females who had total knee replacement operations were prescribed the greatest number of opioids postoperatively (304 pills) among all persistent users in 2017.

The most pronounced differences between women and men occurred among newly persistent users ages 18-34 (10.1% vs 6.1%), a shift from 2016 when the most extreme gender differences were found among patients ages 45-54.

Although there was a modest number of millennials (18-34 years old) included in the analysis compared to other age groups since many of the surgeries are more prevalent among older individuals, the findings reveal concerning trends in females of that age.

THE NUMBER OF MILLENNIAL WOMEN WHO BECAME PERSISTENT OPIOID USERS ROSE 17% FROM 2016 TO 2017 WHEN ALL OTHER AGE AND GENDER GROUPS SAW DECLINES IN THEIR PERSISTENT USE.

The largest decrease in persistent use was seen among both men and women ages 45-54, dropping approximately 13% from 2016 to 2017.

**THE 2018 CHOICES MATTER SURVEY
ALSO RAISES ALARMS ABOUT
OPIOID RISKS FOR MILLENNIALS,
WITH 18% OF THEM REPORTING
THEY BECAME ADDICTED TO OR
DEPENDENT ON OPIOIDS FOLLOWING
SURGERY COMPARED TO 12% OF
PATIENTS OVERALL.**

According to the CDC, the rate of drug overdose deaths among millennials has spiked in recent years, up nearly 50% between 2014 and 2016;^{xi} and as many as one-in-five fatalities among millennials now involves an opioid.^{xii}



Looking Ahead: The Need For Guidelines to Reduce Opioid Overprescribing

There is no single approach that can effectively address the opioid crisis which has robbed so many Americans of their jobs, relationships and lives. What we do know is that preventing addiction or dependence by reducing exposure to opioids is a critical part of the solution. Since opioid addiction or dependence most often begins with a prescription, the fewer opioids prescribed, the less risk they pose to patients and their communities.

One of the hurdles to achieving this aim has been a lack of prescribing guidelines for treating postsurgical pain. Because pain is such an individual experience, making it difficult to standardize its assessment and treatment from patient to patient and across varying procedures, there has been a reluctance to provide specific guidance with respect to opioid prescribing. This has left surgeons mainly on their own in determining the appropriate quantity and strength of opioids needed to address their patients' pain. As this report reveals, the absence of clear guidelines has led to tremendous variation in prescribing patterns and a great deal of overprescribing that can lead to persistent opioid use, addiction and dependence among patients, as well as unused pills that can be misused or abused by others.

Some strides have recently been made in clarifying appropriate prescribing quantities for surgery based on a study by researchers at Johns Hopkins Medicine published in the *Journal of the American College of Surgeons* that defines how many opioid pills are appropriate to prescribe to treat postsurgical pain for 20 different procedures. These specific pill counts offer critical guardrails and protections for surgeons and patients. They help relieve the pressure surgeons often feel to prescribe more opioids than patients actually need and help set patient expectations on the amount of opioids they'll be prescribed.

The Johns Hopkins guidelines are a good first step. However, a much broader effort is required to develop and distribute evidence-based, procedure-specific pain management protocols that both minimize opioid exposure during surgery and reduce prescribing in the postoperative setting.

Surgery has been a long-ignored gateway to persistent opioid use, dependence and addiction. It's time to provide surgeons the tools and resources they need to make prescribing decisions that will adequately treat patients' pain while minimizing opioid risks.

Appendix

STATE	PILLS PER CAPITA 2016	PILLS PER CAPITA 2017	PERCENT DECREASE
Alabama	72	65	-10%
Tennessee	70	62	-11%
Arkansas	68	64	-6%
Oklahoma	65	61	-6%
Kentucky	63	59	-6%
West Virginia	62	52	-16%
Michigan	60	53	-12%
Nevada	59	53	-10%
Indiana	58	52	-10%
Missouri	57	52	-9%
Louisiana	57	52	-9%
South Carolina	56	51	-9%
Mississippi	55	49	-11%
Idaho	54	50	-7%
North Carolina	54	47	-13%
Kansas	54	50	-7%
Delaware	49	42	-14%
Oregon	49	42	-14%
Ohio	48	41	-15%
Arizona	47	41	-13%
Maine	46	37	-20%
Georgia	46	43	-7%
Montana	46	40	-13%
Pennsylvania	46	39	-15%
Utah	46	42	-9%
Wyoming	42	38	-10%

STATE	PILLS PER CAPITA 2016	PILLS PER CAPITA 2017	PERCENT DECREASE
Florida	42	40	-5%
Washington	42	37	-12%
New Mexico	41	35	-15%
Wisconsin	40	34	-15%
Iowa	40	36	-10%
Nebraska	39	36	-8%
South Dakota	39	36	-8%
Virginia	37	31	-16%
Alaska	37	34	-8%
New Hampshire	37	31	-16%
Texas	37	34	-8%
Maryland	37	33	-11%
Illinois	36	33	-8%
Vermont	36	32	-11%
Colorado	36	32	-11%
Rhode Island	33	28	-15%
Connecticut	32	28	-13%
North Dakota	31	27	-13%
New Jersey	30	26	-13%
California	30	27	-10%
New York	30	26	-13%
Massachusetts	29	25	-14%
Minnesota	28	25	-11%
Hawaii	26	23	-12%
District of Columbia	23	21	-9%

References

- ⁱ IMS Health data according to <https://www.cnn.com/2017/09/18/health/opioid-crisis-fast-facts/index.html>
- ⁱⁱ <https://www.psychiatry.org/newsroom/news-releases/nearly-one-in-three-people-know-someone-addicted-to-opioids-more-than-half-of-millennials-believe-it-is-easy-to-get-illegal-opioids>
- ⁱⁱⁱ <https://www.drugabuse.gov/related-topics/trends-statistics/overdose-death-rates>
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