RegenMed

WHITE PAPER

CIRCLE DATASETS FOR REGIONAL OPIOID ABATEMENT PROGRAMS

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INTRODUCTION

The national landscape of opioid use and the associated clinical response has reached a critical inflection point in 2026. The convergence of multi-billion dollar legal settlements, mandatory federal value-based care models, and the emergence of sovereign data frameworks represents a fundamental shift from reactive harm reduction to proactive, upstream abatement.

Within the specific domain of orthopedic surgery—a field historically identified as a primary gateway for persistent opioid use—the implementation of structured observational protocols and "opioid-sparing" clinical pathways is no longer a secondary consideration but a core requirement for fiscal and clinical viability. This White Paper examines the financial resources, clinical statistics, socio-economic drivers, and data-driven infrastructure necessary to establish a permanent standard for opioid abatement in musculoskeletal care.

NATIONAL SETTLEMENT FUND

Background

The financial foundation for the current era of opioid abatement is derived from an intricate series of global settlements involving pharmaceutical manufacturers, distributors, and retail pharmacy chains. These agreements, many of which were finalized between 2021 and 2025, have created a restricted pool of public health funding that is unparalleled in its scale and duration. As of early 2026, the total estimated national settlement amount exceeds $57 billion. This capital is not distributed as a single injection but is structured as a long-horizon revenue stream designed to sustain public health infrastructure through at least 2038.

The distribution mechanism for these funds is primarily governed by the "85% Rule," a core stipulation in the national settlement agreements which mandates that at least 85% of all proceeds must be utilized for approved opioid remediation efforts. The remaining 15% is typically reserved for administrative oversight and the reimbursement of legal fees incurred during the litigation phase. This structure creates a mandatory focus on abatement, effectively turning the settlement payouts into a specialized form of restricted public health funding.

Summary Settlement Funding Table

Settlement Category	Primary Entities	Total National Value (Estimated)	Disbursement Horizon	Key Target Beneficiaries
National Distributors	McKesson, Cardinal Health, Cencora	$21.515 Billion	18 Years (through 2039)	States, Counties, Cities, Tribal Nations
Primary Manufacturers	Johnson & Johnson (Janssen)	$5.15 Billion	9 Years	States and local subdivisions
Retail Pharmacies	CVS, Walgreens, Walmart	$13.52 Billion	6 to 15 Years	National and local abatement funds
Secondary Manufacturers	Teva, Allergan	$6.65 Billion	10 to 13 Years	Comprehensive remediation projects
Bankruptcy Trusts	Purdue Pharma, Mallinckrodt, Endo	$8.3 Billion (approx.)	Performance-dependent	Master Disbursement Trusts (MDT)
Remnant Defendants	Regional/Specialty distributors	$720 Million	8 to 11 Years	Specific local government sign-ons
Marketing Agencies	McKinsey & Co, Publicis Health	$1.26 Billion	5 Years	State-level mitigation and prevention

State and County Allocation Models

In terms of local impact, individual states manage the allocation of these funds through diverse models. For instance, Michigan is projected to receive approximately $1.8 billion total, with 50% directed to the state and 50% sent directly to county and local governments. Missouri expects approximately $894 million through 2038, with a similar split where 60% remains at the state level and 40% is distributed to participating local governments. Tribal nations are also integrated into this financial architecture, with approximately $665 million in dedicated funding for prevention, treatment, and recovery services specific to tribal members.

The temporal nature of these funds is a critical consideration for health infrastructure planning. While initial payments have been substantial, the annual installments are expected to plateau or decrease in the final decade of the 18-year term. This necessitates the development of sustainable infrastructure rather than one-time expenditures.

Comparative Analysis of Funded Remediation Programs

The utilization of settlement funds since 2022 reveals a hierarchy of priorities among state and local governments. Approved programs generally fall into four primary categories: prevention, treatment, recovery, and harm reduction. However, the actual expenditure data shows a heavy leaning toward reactive crisis management over upstream clinical intervention.

In Missouri, analysis of state-share expenditures between 2022 and 2024 shows that 57% of funds were directed toward medical care and housing support, while 40% funded "crisis mitigation" such as first responder training and naloxone distribution. Pro-active prevention, which includes community education and surgical abatement, represented only 1% of the total spend during that period.

Summary Table

Program Expenditure Category	Typical Funded Interventions	Clinical Objective	Strategic Timing
Direct Treatment	MAT access, detoxification, hospital care	Stabilization of diagnosed OUD	Post-Crisis
Recovery Support	Transitional housing, peer coaching	Prevention of relapse	Long-term Maintenance
Harm Reduction	Naloxone kits, fentanyl test strips	Prevention of fatal overdose	Immediate Crisis
Crisis Mitigation	First responder training, court programs	Reducing social/legal impact	Systemic Response
Upstream Prevention	Surgical abatement, prescriber education	Preventing initial dependency	Pre-Entry (Clinical)

Innovation and Improvement Programs

There is an emerging trend in 2025 and 2026 toward "Innovation and Improvement" projects. These initiatives focus on preventing Opioid Use Disorder (OUD) at the point of surgical entry—a high-risk environment for opioid-naïve patients. By funding regional clinical navigators (Surgical Abatement Coordinators) and digital registries, counties aim to move beyond "pill collection" and toward "pill aversion."

ORTHOPEDIC OPIOID PRESCRIPTION

Orthopedic surgeons are responsible for approximately 7.7% of all opioid prescriptions in the United States and are the initial prescribers for an estimated 8.8% of opioid-naïve patients who later develop chronic dependence. The variability in prescribing patterns across different musculoskeletal procedures is significant, reflecting the differing levels of surgical invasiveness and the historical culture of each orthopedic sub-specialty.

Longitudinal Prescribing Patterns by Anatomic Region

While overall national opioid prescriptions dropped by 52% between 2012 and 2024, the orthopedic sector has seen a more nuanced shift. In shoulder surgery, there was a consistent downtrend in Morphine Milligram Equivalents (MMEs) between 2014 and 2020, with mean 90-day MMEs for total shoulder arthroplasty (TSA) decreasing by 57%.

However, total joint arthroplasty (TJA) data from 2018 to 2022 shows that average MMEs for total knee arthroplasty (TKA) increased from 24 to 33 at certain institutions, suggesting that some orthopedic sectors were late to adopt "opioid-sparing" protocols.

Orthopedic Procedure Category	Mean 90-Day MME (Baseline)	Mean 90-Day MME (Recent)	Percent Change	Risk Profile
Total Shoulder Arthroplasty	1348.93 (2014)	582.98 (2020)	-57%	Moderate-High
Rotator Cuff Repair	922.89 (2014)	427.36 (2020)	-54%	Moderate
Total Knee Arthroplasty	26 (2018)	35 (2022)	+34%	High
Total Hip Arthroplasty	23 (2018)	27 (2022)	+17%	Moderate

Spinal Fusion (Multi-level)	High Baseline	Persistent use	Low reduction	Extremely High

Spine Surgery

Spine surgery stands out as the highest-risk domain for persistent use. Spine patients are statistically more likely to use opioids prior to their surgical evaluation compared to non-spine patients and are significantly less likely to discontinue their prescriptions on time postoperatively. Of the 50 most common orthopedic procedures, 8 of the 10 surgeries with the highest rates of long-term opioid use are spine procedures.

Geographic and Regional Disparities

The volume and duration of opioid prescriptions are also heavily influenced by regional medical culture. Surgeons in Southern states write the highest number of prescriptions (nearly 1.4 million in 2017) and provide the longest durations, averaging 13.0 days per fill. In contrast, Western states average 10.4 days. These regional variations often correlate with broader public health outcomes; for example, the Ohio Valley (West Virginia, Ohio, and Kentucky) reports some of the highest per capita costs associated with opioid overdose and OUD.

THE IMPACT OF SOCIAL DETERMINANTS OF HEALTH

The transition from acute postoperative pain management to chronic opioid dependency is not solely a function of surgical technique or drug potency. SDOH—the conditions in which people live, learn, work, and play—are increasingly recognized as primary predictors of persistent opioid use in orthopedic patients.

Socio-Economic Vulnerability and Prolonged Use

The Social Vulnerability Index (SVI) has been shown to have a statistically significant association with the duration of postoperative opioid filling. Patients with higher SVI scores—indicating greater socio-economic vulnerability—tend to fill their last opioid prescription much later than those with lower scores. This suggests that social instability, rather than the surgery itself, often prevents the timely tapering of narcotics.

SDOH Table

SDOH Characteristic	Impact on Opioid Use/Dependency	Odds Ratio (OR) or Statistical Link
Employment Status	Not employed / On disability	OR 5.38 for dependency vs. full-time
Insurance Type	Medicaid vs. Private	OR 4.26 for persistent use
Income Level	Median income <$60,000	2.3x higher risk of chronic use
Race	Black/African American vs. White	6.3x higher risk in some ortho spine cohorts
Psychosocial Factors	Pre-existing anxiety or depression	OR 2.1 for persistent use
Geography	Inner Regional vs. Major City	OR 12.26 for long-term use in Australia study

Spine

In orthopedic spine patients, the impact of SDOH is even more pronounced. Patients who are not employed or are on disability are five times more likely to be chronic opioid users than those with full-time employment. Furthermore, patients with Medicaid insurance have a 4x higher risk of persistent use compared to those with private insurance. This "vulnerability gap" highlights the need to capture ingest SDOH markers, such as the Community Deprivation Index, to risk-stratify patients before they enter the surgical episode.

MEDICALLY UNNECESSARY POST-SURGICAL DEPENDENCY, ADDICTION

Medically unnecessary dependency refers to the persistent use of opioids beyond the physiological healing period—typically defined as 90 days post-surgery. In the United States, approximately 10.5% of previously opioid-naïve patients develop persistent use following elective surgery. For orthopedic-specific populations, this rate is often higher.

Prevalence of New Persistent Use by Procedure

A major report on "Plan Against Pain" found that 12% of patients who underwent soft tissue or orthopedic operations in 2018 reported becoming addicted or dependent after surgery. This represents a significant increase from previous years and emphasizes that surgery remains a "long-ignored gateway" to addiction.

Total Knee Arthroplasty (TKA): TKA patients report some of the highest rates of later misuse, with approximately 15.2% of patients developing persistent dependency. Some US studies have reported that up to 41.2% of TKA patients are still taking opioids at 90 days postoperatively.

Spinal Fusion: The risk in spine surgery is exceptionally high. Prevalence of persistent use after spinal surgery is estimated at 23.6% in naïve patients. In certain long-term cohorts (2001–2015), post-surgical opioid dependence in degenerative scoliosis surgery reached 47.8%.

Total Hip Arthroplasty (THA): THA patients generally have a lower risk than TKA or spine patients, with an estimated 9.3% reporting later dependency.

Rotator Cuff Repair (RCR): Approximately 9.5% of RCR patients develop new persistent use.

The mechanism for this dependency is often "surplus" availability. It is estimated that patients consume only about 50% of the opioids they are prescribed after surgery. In TKA, 88% of patients are prescribed more pills than they require, leading to a massive reservoir of unused narcotics.

HEALTHCARE COSTS AND THE NATURE OF OPIOID-RELATED BURDEN

The economic burden of opioid use disorder (OUD) is vast, affecting not only the individual patient but also their household and the broader healthcare system. In 2023, the total cost of the illicit opioid epidemic to the U.S. was estimated at $2.7 trillion, equivalent to nearly 10% of the national GDP.

Per-Patient Healthcare Costs

For a patient diagnosed with OUD following a surgical episode, the additional annual costs to the healthcare system are approximately $19,000. These costs are primarily borne by private insurers and Medicaid. However, the "total cost per case" of OUD—when including lost productivity and reduced quality of life—is estimated at $221,219.

Summary Costs Table

Cost Component	Annual Cost per Patient (2024 USD)	Nature of the Expense
Direct Healthcare	$14,705 - $19,000	ED visits, inpatient stays, OUD treatment
Lost Productivity	$14,707 - $23,500	Absenteeism, reduced labor force participation
Criminal Justice	$6,961	Police, court proceedings, incarceration
Quality of Life	$183,186 - $234,478	Monetized value of health loss and suffering
Fatal Overdose Cost	$13.0 M per life	Value of a Statistical Life (VSL)

Household Use and "Leakage"

A critical and often under-reported cost is the impact of "household leakage." Legally prescribed opioids that are not consumed by the patient frequently remain in home medicine cabinets, providing an opportunity for diversion. In 2023, 39% of Americans who misused pain medication obtained it from a friend or relative. This social network diversion is a primary pathway into misuse for adolescents; most teens who use narcotics recreationally obtain them from friends with valid prescriptions.

The impact on children is also significant. Over a nine-year period, the exposure of children under the age of 5 to prescription opioids increased annually by 93%. These "hidden" costs—pediatric poisoning, household addiction, and social network spread—are the

primary targets of an important "Pills Averted" metric.

ACCURACY OF PRESCRIPTION RECORDS

The primary mechanism for tracking legal opioid distribution is the State Prescription Drug Monitoring Program (PDMP). While these systems have been implemented in almost every state, their accuracy and clinical utility remain inconsistent.

PDMP Record Integrity and Usage Gaps

Research into PDMP data shows that while the reported "days' supply" is accurate approximately 90% of the time, the systems fail to capture critical "off-system" behaviors.

Low Clinician Compliance: Mandated PDMP review—checking the database before writing a prescription—is often low. In one study of 35,461 patients, a PDMP review was documented for only 13% of second opioid prescriptions.

Missing Payment Data: Many PDMPs do not accurately track the method of payment. "Cash-pay" prescriptions—often used to bypass insurance-based quantity limits—are a known blind spot in current surveillance.

Data Update Lags: PDMPs often experience lags in data updates, and many clinicians find the interface difficult to use without full Electronic Health Record (EHR) integration. Only 33% of hospital-based physicians report high satisfaction with EHR-PDMP integration.

Prescription Fragmentation: Patterns like "split-billing" (where one prescription is billed to two different payers) can further complicate the accuracy of administrative claims studies.

Street Leakage and the "Medicine Cabinet" Problem

"Leakage" onto the street of legally prescribed pills primarily occurs through informal diversion rather than organized crime. It is estimated that 40% of postoperative opioid prescriptions are never properly disposed of. Because clinicians often fail to provide detailed tapering instructions—87% provide only general "as needed" advice—patients are

left with a surplus of narcotics.

This surplus is the source of the 39% of drugs obtained from family and friends. The street value and potency of these diverted pills (frequently 50–90 MMEs) pose a serious overdose risk to the community, as these dosages are more than double the CDC's recommended 20 MME limit.

CIRCLES OPIOID ABATEMENT OBSERVATIONAL PROTOCOLS

The Circles Platform provides a structural alternative to legacy "big data" models by utilizing clinical hypotheses developed in active practice. For an orthopedic Opioid Abatement Circle to be successful across musculoskeletal procedures, the Observational Protocol (OP) should capture a broader range of behavioral and performance data.

Essential Data Clusters for Orthopedic Protocols

A standardized protocol for Hip, Shoulder, and Spine surgery should include the following beyond basic demographics and range of motion (ROM).

Pre-Operative Psychological Indicators

Pain Catastrophizing Score (PCS-4): Measuring thoughts like "It's never going to get better".

Veterans RAND 12 (VR-12): Tracking baseline emotional vs. physical health.

Peri-Operative Protocol Specifics

Adherence to "Opioid-Sparing" Analgesia: Documentation of Gabapentinoids, Suzetrigine, Meloxicam, and specific nerve blocks (Adductor canal, IPACK).

Tourniquet Duration and Pressure: Significant in TKA for predicting postoperative "swelling-induced" pain.

Behavioral Misuse Identifiers

Euphoria Experience: Explicitly asking if the patient experienced "euphoria" (9.5% of patients report this).

Non-Severe Use: Tracking if the patient continues taking pills when pain is "insufficient to deserve such intervention".

Diversion Attestation: Questions regarding the gifting or selling of leftover medication.

Long-Term Longitudinal Outcomes

Forgotten Joint Score-12: Measuring the "healthy state" where a patient is no longer aware of the surgical site.

Work and Activity Resumption: Tracking the return to full-time labor, which is a primary mediator of long-term stability.

Procedure-Specific Behavioral Data

For Spine Surgery, the protocol should emphasize "Restraint" and "Integration" markers. This includes documenting whether surgery was treating pathology rather than just "MRI abnormalities" and tracking the use of interventional pain and rehabilitation pathways.

For Shoulder Surgery, the protocol should track scapular-focused exercise adherence and real-time neuromuscular control, as these are effective non-pharmacological alternatives for pain management.

EXTERNAL DATA VALIDATION OF ABATEMENT SUCCESS

To establish the success of an Opioid Abatement Program, the Circles Platform must demonstrate that its clinical outcomes have a measurable impact on the surrounding community. This requires ingesting high-quality external data to serve as a comparative benchmark.

Critical External Data Sources

The following datasets are the most important for validating that a particular MSK Circle is actually reducing the regional opioid burden.

CDC WONDER / National Vital Statistics System (NVSS)

Purpose: Validating regional trends in fatal overdose mortality.

Metric: Comparing the local "Pills Averted" dashboard against the monthly provisional overdose death release for the same county.

State All-Payer Claims Databases (APCDs)

Purpose: Longitudinal analysis of individual patients across all insurance types.

Metric: Tracking the "total cost of the episode" and long-term healthcare utilization of Circle patients vs. regional averages.

CMS TEAM Model Data (Transforming Episode Accountability Model):

Purpose: Mandatory federal quality reporting for 30-day episodes.

Metric: Ingesting the Composite Quality Score (CQS), specifically readmission rates, safety events, and complication markers.

SUDORS (State Unintentional Drug Overdose Reporting System)

Purpose: Understanding the specific substances involved in regional overdoses.

Metric: Identifying if diverted "surgical-grade" opioids (Oxycodone/Hydrocodone) are present in regional fatalities vs. illicit fentanyl.

Social Vulnerability Index (SVI) / Community Deprivation Index

Purpose: Benchmarking success against socio-economic risk factors.

Metric: Proving that the abatement program is effective even in "high vulnerability" census tracts.

VERIFICATION THROUGH "PAY-FOR-SUCCESS"

The ingestion of this data allows for a "pay-for-success" disbursement model pursuant to which capital is released only when the Circle Platform can verify through external

benchmarks that it has reached a specified opioid-free milestone and significantly reduced Medicare Part B utilization (e.g., averting the standard 24 PT sessions).

This ensures total accountability for the use of settlement funds, moving beyond simple grant reporting and toward verifiable public health ROI.

THE STRATEGIC FUTURE OF OPIOID ABATEMENT IN ORTHOPEDICS

The opioid crisis is no longer a problem of liability, but one of governance and data integrity. As federal response funding from SAMHSA and other agencies becomes increasingly unstable in 2025 and 2026, the long-horizon settlement funds (averaging 18 years) become the primary financial backbone for public health stability.

For orthopedic practices, the implementation of the Circles Platform represents a defensive and offensive strategy: it protects patient outcomes, reduces the $221,000 per-patient cost of OUD, and ensures compliance with mandatory CMS mandates like the TEAM Model.

By utilizing a sovereign data model that favors the physician-source and the patient, the Circles Platform can generate the auditable real-world evidence required to prove that a high percentage opioid-free recovery is not just a clinical goal, but a verifiable regional success in the national abatement effort.

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