Providence Health Care
St. Paul's Hospital

Opioid Stewardship Program

Three Year Program Report | January–December 2022

BRITISH COLUMBIA CENTRE ON SUBSTANCE USE
Networking researchers, educators & care providers

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Executive Summary

In the midst of the overdose crisis within British Columbia (BC) and in response to the longstanding prescription opioid crisis, the St. Paul's Hospital (SPH) Opioid Stewardship Program (OSP) was established in January 2020. The goal of the OSP is to improve opioid prescribing at SPH to reduce adverse events, long-term dependence and avoid future opioid misuse, while maintaining or improving pain management for individuals receiving opioids during their acute admission. This is the first OSP within the Providence Health Care (PHC) and the Vancouver Coastal Health (VCH) authority geographical areas, and the third within BC. Following its inaugural year, the program secured sustained funding from PHC beginning in 2021.

In the third year of the program, the OSP has continued to provide audit and feedback and consultation services to numerous clinical programs at SPH. Other initiatives at SPH have included a number of educational presentations, clinical trainee rotations, patient and provider satisfaction evaluations, and continued convening of the established Opioid Stewardship Advisory Committee (OSAC).

Through our audit and feedback approach, the third year of the OSP provided a total of 2400 recommendations for improving opioid prescribing among 725 patient encounters. This represents a 19% increase from the number of recommendations offered in year 2. Examples of the most common recommendations provided include: stopping as needed (PRN) opioids (17%), patient education (16%), and adjusting opioid dosage (13%). In total, the program has demonstrated continued success with 96% of recommendations offered being accepted and integrated into clinical practice (equal from 96% in year 2).

In addition to the program's clinical activities, a number of educational initiatives have been undertaken to improve opioid prescribing. More specifically, the OSP team has successfully delivered presentations at 8 educational events to increase awareness of the program and disseminate results regarding its effectiveness. The range of educational events is substantial and spans across a number of clinical groups within the hospital (e.g., orthopedic surgery fellow training, general surgery nursing rounds pharmacist education sessions).

Furthermore, the OSP team has been actively participating in research and quality improvement initiatives. Examples of these include: evaluation of opioid use following discharge from general surgery and assessing the impact of electronic health record implementation on opioid prescribing. We have also continued our overarching research project evaluating the impact of the OSP on high-risk opioid prescribing.

Finally, the SPH Opioid Stewardship Advisory Committee, a group of interdisciplinary health care providers at SPH, convened 3 times throughout the year to review system level changes that may be required to optimize opioid prescribing in the hospital setting. Activities have included submitting requests to modify PowerPlans containing unsafe opioid and benzodiazepine orders as well as requesting changes to regional medication administration policies to allow for safer use of subcutaneous opioid medications.

To date, the OSP has demonstrated tremendous success at improving patient care and safety with regards to opioid prescribing in the hospital setting. Such success could not have occurred without the incredible support of all of the staff at SPH and their commitment to improving patient care. The OSP team are committed to ensuring that the changes we make today have an equally substantial, positive impact moving forward.

This report describes key indicators for the third year (e.g., January–December 2022) of the St. Paul's Hospital Opioid Stewardship Program.

St. Paul's Hospital

Opioid Stewardship Program

January 2022 – December 2022

Objective

To improve opioid prescribing practices to reduce adverse events and long-term dependence and avoid future misuse, while maintaining or improving pain management for individuals receiving opioids during their acute admission.

Program Activities

Clinical Activities
- Consultations
- Audit & Feedback

Education
- Presentations
- Guideline Development

Quality Improvement, Research & Evaluation
- Research Projects
- Quality Improvement Initiatives

In the third year...

13,146
patient encounters identified to be potentially prescribed opioid inappropriately

1,804
screened patient encounters that were reviewed

3,280
identified patient encounters that were screened

725
reviewed patient encounters that were offered an intervention

2,400
recommendations were provided by the OSP

96%
recommendations accepted

(n=2400)

5
most common recommendations

17% stop as-needed opioids

16% patient education

13% adjust opioid dosage

13% add or increase non- opioid pain medication

4% stop/decrease non- opioid medications

62%
opioid naïve

(n=5670)

52%
>60 years

(n=5670)

Background

Prescription opioid misuse and illicit use has become an increasing problem globally and is linked to an array of negative consequences including addiction, overdose and mortality.[1–3] Canada, the second highest opioid consumer in the world after the United States, demonstrated rates of prescription opioid use tripling over the past decade alone.[1,4,5] As rates of opioid prescribing increase, so too has the development of opioid misuse, addiction and prescription opioid related overdose deaths, as well as other related morbidities.[6–9]

Hospitals are a major contributor to the prescription opioid epidemic and related harms. Hospitals that use opioids most frequently have been shown to have increased rates of adverse drug events (ADEs) which can also have a negative impact on length of stay and related costs.[10-12] Past research has also documented inappropriate opioid prescribing practices in hospitals that can lead to various harms in the community, such as the development of opioid dependence and opioid use disorder, overdose, or opioid-induced hyperalgesia.[9, 13-15]

Despite this evidence, there have been relatively few initiatives put in place to target opioid prescribing within hospitals. Prescribing stewardship programs in the past have broadly focused on other medications, notably antimicrobial prescribing which has resulted in reduced antimicrobial use, reduced C. difficile infections, and significant cost savings.[16,17] From the small number of hospital-based opioid stewardship programs in North America, preliminary results show cost-savings, a reduction in opioid-associated rapid response calls and code blues, and successful interventions and consultations related to pain medication reconciliation.[18,19]

Opioid Stewardship at St. Paul's Hospital

The SPH OSP was implemented in January 2020. The clinical team consists of a clinical pharmacy specialist and an addiction medicine physician. The SPH OSP is the third OSP within acute care in the Lower Mainland and in Canada. Other programs within Canada are focused on community prescribing. Furthermore, the SPH OSP is the only acute care program that includes both a physician and a pharmacist along with a significant research program running concurrently with the clinical program.

SPH is an optimal location for an inpatient opioid stewardship program as it is an acute care, teaching, and research hospital servicing the heart of downtown Vancouver. Every day, hundreds of patients are admitted for care at SPH and at least half of these patients are prescribed an opioid medication. SPH has a number of world class surgical programs (e.g. cardiac, colorectal, vascular, and orthopedic surgery) which often involve the prescribing of opioid medications. It is also a centre for internal medicine, urban health, and mental health services for downtown Vancouver which provides care for structurally vulnerable patients who may be more likely to have opioid addiction. With Vancouver being at the epicentre of North America's overdose crisis, SPH has an important opportunity to lead clinical practice locally and beyond by demonstrating a commitment to improve opioid prescribing to reduce adverse events and long-term dependence.[20]

In the third year of the program, the primary goal of the OSP remains to improve opioid prescribing, utilization, and monitoring at SPH in order to prevent or reduce adverse events, risk of inappropriate long-term use and dependence, and to improve or maintain adequate pain control for SPH patients.

This is accomplished through:

1. Clinical activities including implementation of a prospective audit and feedback intervention as well as clinical consults;
2. Quality improvement and research initiatives including evaluation of the program and outcomes as well as collaborative projects around opioid use in various departments; and
3. Education including development of clinical tools, presentations to various departments and health disciplines.

OSP Team Members

Clinical Team

The clinical team consists of the Opioid Stewardship Clinical Pharmacy Specialists (Dr. Felicia Yang from January to September, Dr. Arielle Beauchesne from October onwards) and the Opioid Stewardship Physician Lead (Dr. Seonaid Nolan). Together, they work on the front line providing audit and feedback and clinical consultations, as well as education to SPH staff, review/development of clinical guidelines and protocols, and dissemination of program data. Dr. Nolan also collaborates with Dr. Lianping Ti as part of the Research Team.

Felicia Yang
PharmD

Arielle Beauchene
PharmD

Seonaid Nolan
MD

Operational Team

The operational team consists of Dr. Michael Legal (Pharmacy Manager) and Dr. Steven Shalansky (SPH Pharmacy Clinical Coordinator). They support the program by providing overall direction, logistics, and pharmacy management.

Michael Legal
PharmD

Steven Shalansky
PharmD

Research Team

The research component of the OSP is led by Drs. Lianping Ti (Research Scientist at the BC Centre on Substance Use [BCCSU]) and Seonaid Nolan (Clinician Scientist at the BCCSU and holder of UBC's Steven Diamond Professorship in Addiction Care Innovation). They work to conduct research and evaluation initiatives related to review of the OSP, as well as research related to opioid prescribing in hospital settings.

Lianping Ti
PhD

Seonaid Nolan
MD

"A helpful voice to add to advocacy for patients to decrease opioid use for pain that is unlikely to benefit from opioids"

Opioid Stewardship Advisory Committee (OSAC)

The OSAC was developed by the OSP in order to bring together representatives from major stakeholder groups to provide advisory support, as well as to disseminate information from the OSP to their respective practice areas. Current OSAC members include:

- Dr. Rupinder Brar (Regional Addiction Program)
- Elizabeth Dogherty (Addictions Medicine, Nursing)
- Naomi Watt (Addictions Medicine, Nursing)
- Dr. Joan Ng (Addiction Medicine, Pharmacy)
- Dr. Renee Janssen (Addiction Medicine, Internal Medicine)
- Dr. Andrew Kestler (Emergency Department)
- Stephanie Chan (Medication Safety, Pharmacy)
- Teresa Hsieh (Medication Safety, Pharmacy)
- Isabel Diogo (Medication Safety, Nursing)
- Derreck Lee (Medication Safety, Nursing)
- Courtney Symes (Medication Safety, Nursing)
- Dr. Geoffrey Cundiff (Obstetrics and Gynecology)
- Dr. Tamim Umran (Orthopedic Surgery)
- PJ Matras (Acute Pain Service)
- Dr. Ainsley Sutherland (Acute Pain Service)
- Dr. Michael Legal (Pharmacy)
- Dr. Steve Shalansky (Pharmacy)
- Leslie McBain (Patient and Family Engagement)
- Dr. Felicia Yang (Opioid Stewardship)
- Dr. Arielle Beauchesne (Opioid Stewardship)
- Dr. Seonaid Nolan (Opioid Stewardship)
- Dr. Lianping Ti (BC Centre on Substance Use)

Program Activities

Overview

The program activities of the OSP can be divided into three sections: 1) clinical activities, 2) education, and 3) research and quality improvement. Below, activities and preliminary findings from each of the sections are described in detail.

Clinical Activities

Audit and Feedback

Consultations

Education

Presentations

Development and review of guidelines

Quality Improvement, Research and Evaluation

Quality Improvement Initiatives

Research Projects

Audit and Feedback Program

Audit and feedback is an evidence-based strategy to improve professional practice. It involves the review of specific professional performance (in this case opioid prescribing) then provision of feedback to the healthcare provider on opportunities to improve prescribing based on available guidelines and literature. The SPH OSP utilizes a screening list of patients on opioids (as described below) to identify those who would most benefit from re-assessment and intervention. Audit and feedback in opioid stewardship is often more time-intensive compared to other audit and feedback strategies (e.g. antimicrobial stewardship) as pain is multi-factorial and subjective, thus requiring a more in depth assessment with the patient to determine the most optimal areas for adjustment and improvement.

As an initial screening, the OSP clinical team extracts daily reports from pharmacy of patients who have been admitted to SPH (excluding emergency department, critical care areas, and palliative care unit) and have an active opioid order. Patients are then further assessed if they are not followed by another consulting service specializing in opioid prescribing (e.g. acute pain service [APS], addiction medicine consult team [AMCT], palliative care team). Full details regarding the screening process are included on the following page.

Screening Process

STEP 1: Computer generated report

Pharmacy generates a daily report of patients receiving opioids, acetaminophen, NSAIDs, antiepileptics, and antidepressants at SPH

STEP 2: Computer algorithm

Patients are removed if: (1) they are without an opioid order; (2) they have a PCA/epidural (followed by APS); (3) have an opioid order from an AMCT attending physician; or (4) they are admitted by the palliative care service

High risk opioid orders are flagged.

STEP 3: Manual Screening: Patients screened

OSP team then manually remove any remaining patients followed by AMCT, APS, and Palliative Care and identifies a final list of patients eligible for inclusion in the OSP.

STEP 4: Manual Assessment: Patients included

OSP pharmacist triages the final list according to the number of high-risk opioid orders (e.g., a patient with 4 high-risk opioid orders would be seen preferentially over a patient with 1)

STEP 5: Manual Assessment: Patients receiving recommendations

OSP team reviews full patient electronic health record and may speak to patient and care team, if felt appropriate, and provides recommendations on improving opioid prescribing

* Abbreviations: NSAID – non-steroidal anti-inflammatory drug, SPH – St. Paul's Hospital, PCA – patient-controlled analgesia, APS – acute pain service, AMCT – addictions medicine consult team

Screening Steps

STEP 1: Computer Generated Report

An initial screening list is compiled by the OSP Clinical Pharmacy Specialist using the Cerner electronic health record and includes all patients that are prescribed opioids or other target medications (e.g. antidepressants, anticonvulsants, benzodiazepines, zopiclone, acetaminophen, NSAIDs) who reside on an inpatient ward at SPH (excluding critical care and palliative care units).

STEP 2: Computer Algorithm

A separate screening algorithm then removes any patients without an opioid order, those with patient-controlled analgesia (PCA) or epidural orders (as a marker of APS involvement), and orders written by an attending physician from the addiction medicine consult team (AMCT).

Following this, the screening algorithm then identifies the number and type of high-risk opioid orders for each patient. The 13 criteria used to identify a high-risk opioid order were developed based on a comprehensive literature review and consultation with physicians with expertise in chronic pain and addiction management. These include:

Patient-related Risk Factors:

1. Use of opioid medication in a patient who is opioid naïve
2. Use of opioid medication in a patient with personal history of depressive disorder, anxiety disorder, and/or post-traumatic stress disorder
3. Use of opioid medication in a patient greater than 60 years old

Prescription-related Risk Factors:

4. Use of parenteral opioids when orders suggest the patient is receiving a normal diet and taking nutrition orally
5. High frequency opioid prescribing (<4 hours)
6. Multiple different opioids prescribed concomitantly for regular and as needed (PRN) use
7. Regular dosing of an opioid prescribed for PRN use
8. Long-acting opioid prescriptions within the first 5 days of a patient's hospital stay
9. High daily dose of an opioid, defined as a prescribed daily dose of 90 morphine milligram equivalent (MME) or greater
10. Long duration of opioid prescribing, defined as a patient on opioids on or beyond day 5 of hospitalization
11. Concurrent opioid and sedative (e.g. benzodiazepine) prescription
12. No adjunctive order for non-opioid analgesics including acetaminophen, NSAIDs, and/or medication for neuropathic pain (where appropriate)
13. Use of an opioid medication where naloxone administration was required in the last 24 hours

Of note, there are other evidence-based criteria that increase the risk of opioid-related adverse events (e.g. renal and hepatic impairment, history of or active substance use disorder) that we were unable to include due to limitations with our screening list. However, these are assessed during STEP 4 by the Opioid Stewardship Clinical Team.

STEP 3: Manual Screening: Patients Screened

The OSP Team manually screens through the list and patient charts to remove additional patients followed by AMCT, APS, and palliative care.

STEP 4: Manual Assessment: Patients Included

The OSP pharmacist triages the final list of patients according to the number of high risk opioid orders (i.e. a patient with 4 high-risk opioid orders would be seen preferentially over a patient with 1).

Based on a preliminary review of the electronic health record, patients are identified who may benefit from an intervention to optimize opioid prescribing.

STEP 5: Manual Assessment: Patients Receiving Recommendations

Patients identified in STEP 4 then receive a full clinical assessment from the opioid stewardship pharmacist (including full review of electronic health record and often times discussion with the patient and clinical team) to determine how analgesic therapy can be optimized to improve or maintain pain management while improving opioid safety.

For patients who would benefit from an intervention, recommendations are delivered in any combination of the following four ways: (1) documenting a note in the patient's electronic medical record; (2) speaking to the patient; (3) speaking to the attending physician; and/or (4) speaking to the ward pharmacist. Multiple actions may be done for the same assessment (i.e. speaking to physician and documenting in note).

Review of Audit and Feedback Statistics

This section summarizes the baseline demographics, risk factors, and opioids ordered for patients exposed to opioids at SPH from January 01, 2022 to December 31, 2022. The patients included in this analysis are from "STEP 2: Computer Algorithm" of the screening process listed on page 10.

Furthermore, this section will also provide details regarding all patients screened for and assessed by the OSP as well as the number and type of recommendations and acceptance rate of these recommendations between January and December 2022.

Patient Baseline Demographics

Below, we have described patient characteristics, patient's admitting clinical service, and patient's history of opioid use prior to hospital admission among a total of 5,671 unique patients who were exposed to opioids between January and December 2022. These patients were identified by pharmacy's daily generated report (and prior to manual screening by the OSP team). Many patients appeared on multiple daily reports during their hospital stay, but only the data from the first day is included in this review of patient baseline demographics.

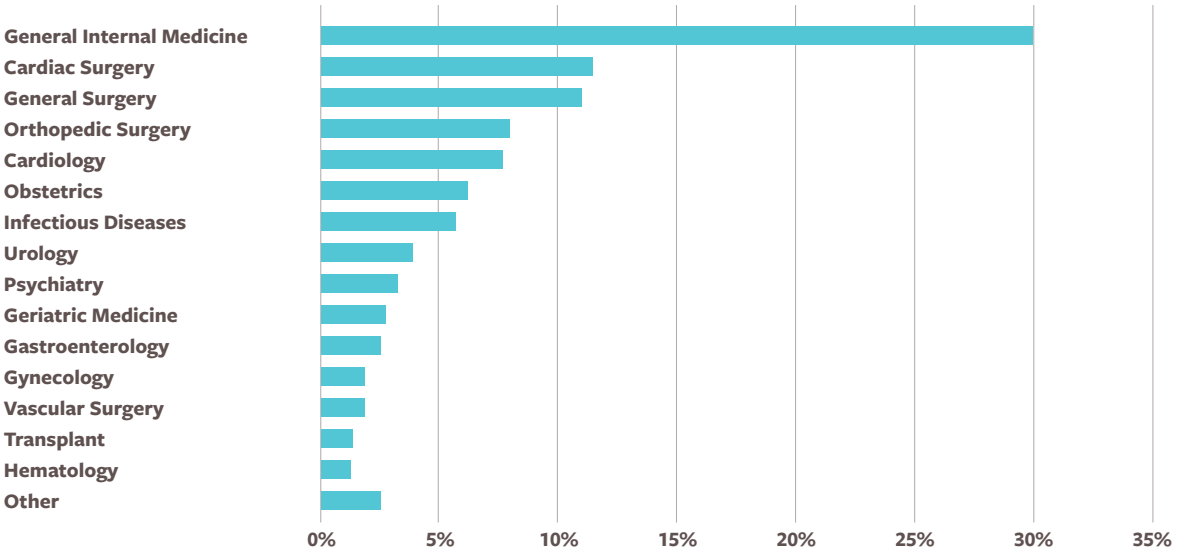
Age and Sex

Of the 5,671 unique patients exposed to opioids from January to December 2022: 45% were female and 55% were male. The mean age was 56 years for females, 60 years for males.

Admitting Clinical Service

Patients prescribed opioids (n=5,671) were under the care of a variety of clinical services at SPH. The largest proportion of patients were admitted to General Internal Medicine (30%), Cardiac Surgery (11%), and General Surgery (11%). It is important to note that some of these patients may be prescribed opioid agonist therapy for opioid use disorder and would have been excluded from further assessment by the OSP during the next step of the screening process. Also, the distribution of patients prescribed opioids by various services does not necessarily reflect suboptimal prescribing practices on these services, rather it may relate to the volume of patients admitted under these services.

Figure 1: Admitting Clinical Service of Patients Prescribed Opioids at SPH (n=5,671)



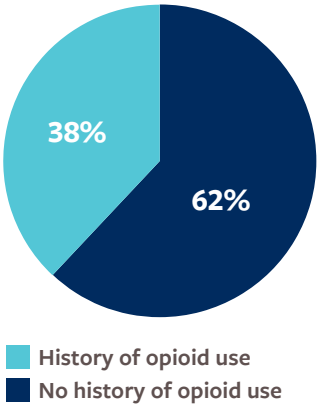
* Other includes: Plastic Surgery, Critical Care, Pain Medicine, Nephrology, Hematology, Otolaryngology, Neurology, and Ophthalmology.

Opioid Use Prior to Admission

History of opioid prescription within 30 days prior to hospital admission was collected as a marker of whether the patient was opioid naïve or not. This information was collected for nearly all patients included in the dataset, with the exception of dates where the data was not available (n=5,670). The majority of patients (62%) were opioid naïve at the time of hospital admission.

Patients prescribed opioids who are previously opioid naïve are at higher risk of adverse events from opioids due to a lack of tolerance. This provides an opportunity for the OSP to provide recommendations to encourage safer use of opioids. Patients who do have a history of opioid use often times have a complex pain history, escalated doses of opioids in community, and may be at higher risk for poorly managed acute pain in hospital. There is an opportunity for the OSP to intervene and provide recommendations to improve acute pain management (including liaising with our pain teams) and reduce inappropriate, long-term use of opioids for both patient populations.

Figure 2: 30-day Opioid Use of Patients Receiving Opioids at SPH (n=5,670)



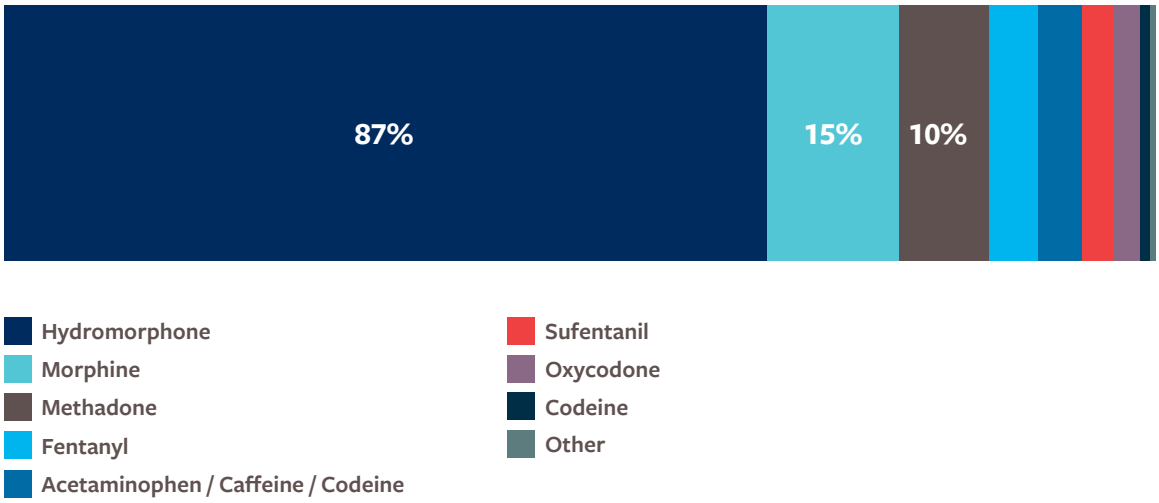
Review of Opioid Orders

Below, we have reported on active opioid orders among unique patients exposed to opioids from January to December 2022 that were included in the OSP screening list. Key indicators included: type of opioid(s) prescribed, whether opioids were prescribed regularly or as needed, and route(s) of administration.

Type of Opioid Prescribing

Numerous formulations of opioids were prescribed for patients at SPH. Hydromorphone was the most common opioid prescription and the majority of patients received hydromorphone during their hospital stay (87%) with morphine as the second most common (15%). Patients could have multiple opioids prescribed; thus, the sum of the percentages is greater than 100%.

Figure 3: Type of Opioid Prescribed (n=5670)



*Other category includes: Acetaminophen-Codeine, Oxycodone-Acetaminophen, Meperidine, Opium-Belladonna, Tramadol, Diacetylmorphine, and Tapentadol.

Frequency of Opioid Prescribing

The majority of patients (69%) were exclusively prescribed as needed (PRN) opioids, 31% received a mixture of both PRN opioids and regularly prescribed opioids, while none were prescribed only regularly scheduled opioids.

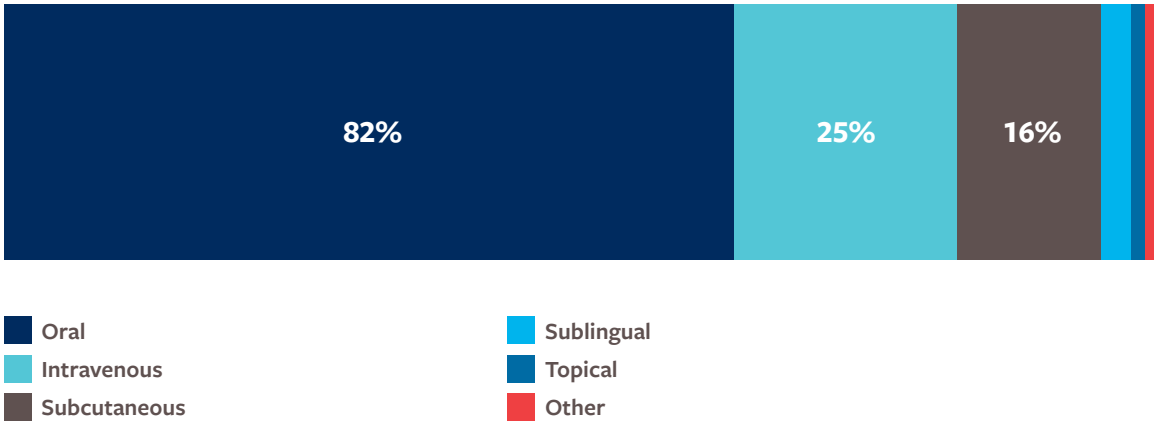
As the majority of opioids are prescribed as needed, this presents an opportunity to reduce or discontinue opioids that are no longer required (to avoid inappropriate long-term use or exposure) or to optimize pain control by recommending a change to a regularly scheduled regimen for patients that require it.

Route(s) of Administration for Opioid Prescribing

For patients exposed to opioids, the majority of patients were prescribed at least one opioid with an oral administration route (82%). About a quarter of patients (25%) were prescribed an intravenous opioid and 16% had a subcutaneous opioid order. Patients could have multiple treatment routes; thus, the sum is greater than 100%.

Although the most common route of opioid prescribing is oral, several patients were still receiving parenteral opioids. This may represent an example of inappropriate use if patients were able to take an oral formulation. Accordingly, an opportunity arises for the OSP to intervene and reduce the unnecessary use of parenteral opioids which have been associated with increased risk of adverse events and medication errors.

Figure 4: Opioid Routes of Administration (n=5,669)

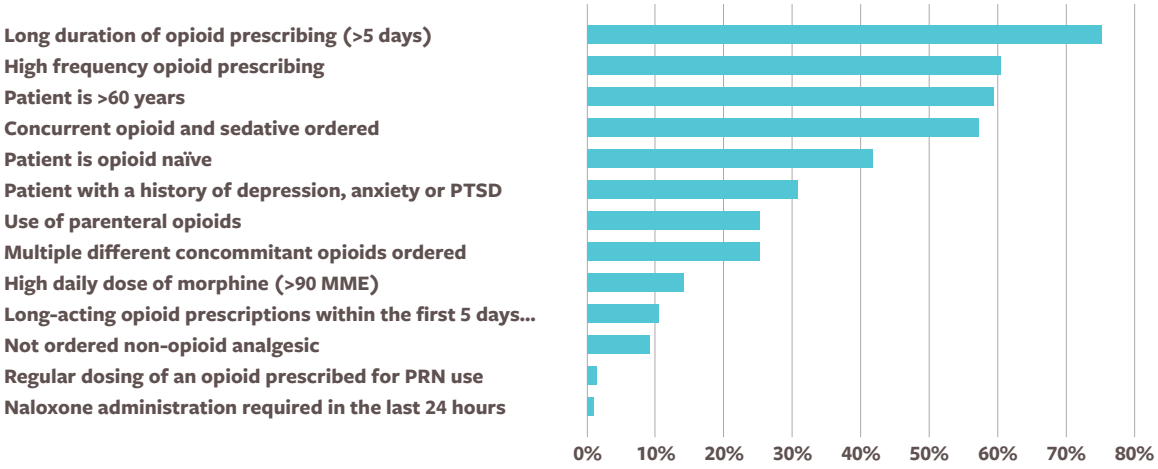


* Other category includes: Intramuscular, NG-tube, PEG-tube, J-tube, NJ-tube, ND-tube, OG-tube, rectal, and buccal

Identified Risk Factors

The screening algorithm identified risk factors for 13,146 patient encounters among 5,595 unique patients exposed to opioids between January to December 2022 (data was unavailable for n = 74 patients). The most common risk factors identified included: long duration of opioid prescribing (76%; risk factor #10 above), high frequency opioid prescribing (61%; risk factor #5 above), and use of opioid medication in a patient greater than 60 years old (60%; risk factor #3 above).

Figure 5: Identified Risk Factors for Patients Receiving Opioids at SPH (n=13,146)

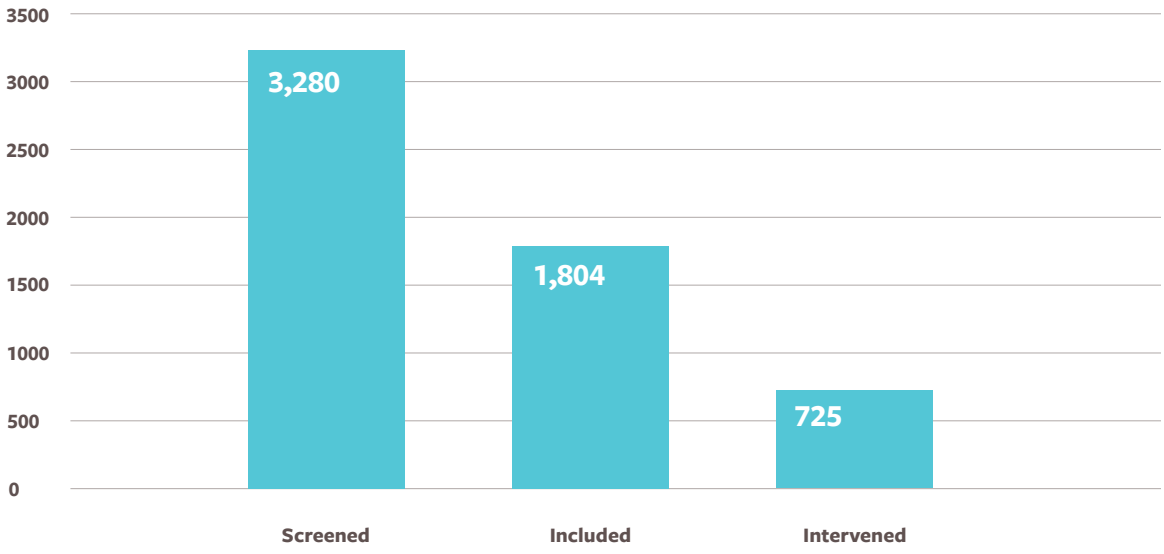


A number of the most common risk factors are modifiable and can be intervened on to reduce the risk of adverse events. Additional risk factors such as patient being opioid naïve or age >60 years further increase risk of adverse events and allow for opportunities for the OSP to provide targeted interventions to those who would benefit most. The most common risk factor (i.e., long duration of opioid prescribing) is also associated with increased risk of long-term dependence and provides a major opportunity for intervention that could have a long-term impact beyond acute care.

Patient Screening and OSP inclusion

In the third year of the program, the OSP clinical team screened 3,280 patient encounters from 1,666 unique patients who were exposed to opioids (STEP 3: Manual Screening: Patients Screened). The number of "patient encounters" reflects that some patients were assessed multiple times during the course of their admission or over repeat admissions. Of these, 1,804 patient encounters from 1,039 unique patients met the criteria for inclusion (i.e. admitted to a non-critical care unit and not followed by addiction medicine, acute pain, or palliative care services) and received further assessment to determine if intervention to improve opioid prescribing was required (STEP 4: Manual Assessment: Patients Included). A subset of 725 patient encounters for 459 unique patients resulted in recommendations for interventions being offered (STEP 5: Manual Assessment: Patients Receiving Recommendations).

Figure 6: Patient Encounters Screened, Included, and Interventions Offered by OSP (n=1,666 unique patients)



"Easily accessible and helpful with incredibly complex patients."

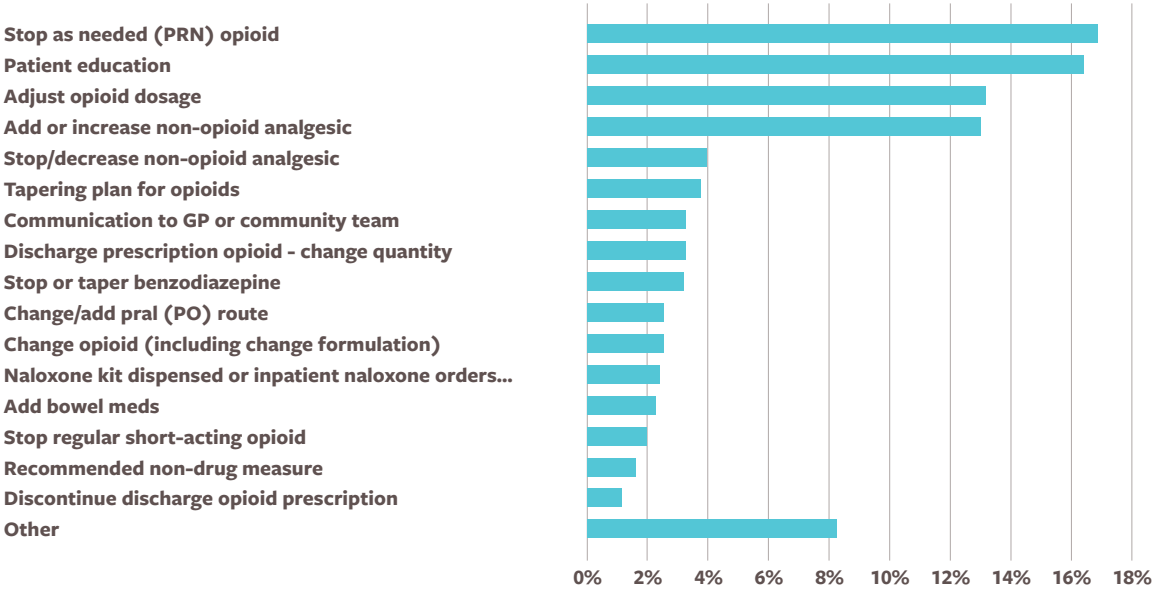
Recommended Interventions and Acceptance Rate

Below, we have reported on the different intervention recommendations, acceptance rate of these recommendations, and number of consultations received.

Type of Recommended Intervention

Of the 725 patient encounters from 459 unique patients that the OSP clinical team assessed, a total of 2,400 interventions were recommended. The three most common were: stopping as needed PRN opioids (17%), patient education (16%), and adjusting opioid dosage (13%).

Figure 7: Types of Interventions Provided by the OSP (n=2,400)



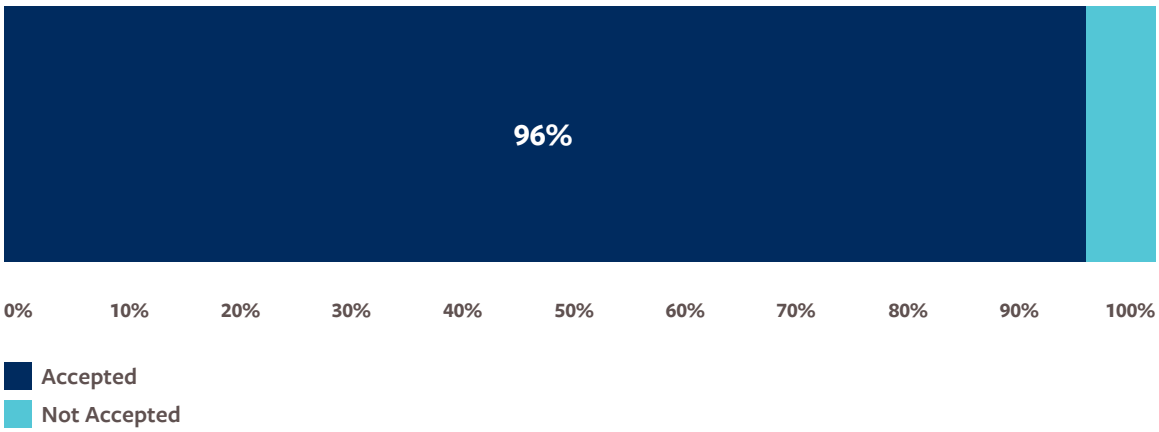
* Other category includes: Naloxone kit assessed but not given because patient already has kit, change discharge prescription opioid, refer to AMCT, refer to APS, refer to palliative care, stop or taper zopiclone, stop regular long-acting opioid and switch to a different opioid

The most common recommendations are indicative of the general overall approach to improving opioid prescribing through optimizing non-opioid analgesia, educating patients on the use of opioid medications and associated adverse effects, and reducing or discontinuing opioids where appropriate. The recommendations correspond to the most common risk factors described above (i.e. long-duration of opioid prescribing may lead to discontinuation of PRN opioid, use of opioid in opioid naïve patient or patient > 60 years of age may lead to adjustment in dose).

Acceptance Rate of Recommended Interventions

In the third year of the OSP, we offered a total of 2,400 recommended interventions. The overall acceptance rate of OSP recommendations for this period was 96%. Of the 4% of recommended interventions that were not accepted (n=85), 24% were not accepted by the patient, and 16% were not accepted by the prescribing physician (or their team). Reasons for not accepting were not provided for the remaining 60%. Instances of patient non-acceptance were often due to concern for worsened control or escalation of pain. Similarly, prescribers may also have been hesitant to make adjustments to opioid regimen due to perceived severity of pain and fear of destabilizing patients. These cases often required further education and collaborative care between the patient, prescriber and the OSP

Figure 8: Overall Acceptance Rate of Recommended Interventions (n=2,400)

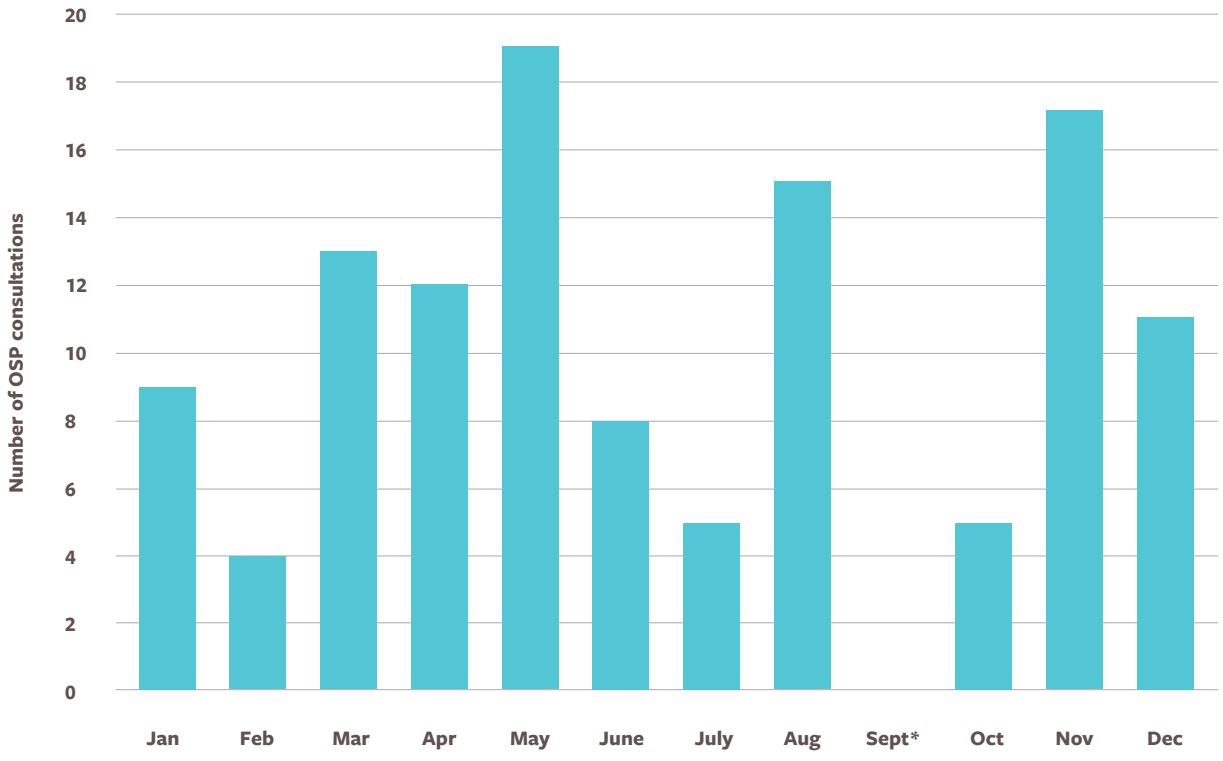


"They were there. I didn't feel so alone and overwhelmed they were here to guide me and reassure me."

Consultations

The total number of consultations the OSP received over year three of this project was 118. This figure is equal to the previous year and shows that the program has had sustained uptake. The number of consultations remained relatively constant throughout the year, from a low of 4 in February 2022 to a high of 19 in May 2022 averaging at about 10 consultations per month. This not only indicates increased awareness about the OSP, but also increased appetite among clinicians to involve the program in patient management. These consultations are generally more complex and help the OSP identify patients at higher need of an assessment in a timelier manner than through general screening. It is our hope to further increase awareness of the program, increase consultations, and increase impact of the OSP on providing recommendations for patients who would most benefit from it. As the OSP is one of a number of consult services available at SPH in regards to opioid prescribing (in addition to the Acute Pain Service, Addiction Medicine Consult Team, and Palliative Care Service) we also anticipate that we may continue to act as a bridge to facilitate appropriate consultations to other services for more comprehensive, targeted interventions and longitudinal follow-up.

Figure 9: Number of Consultations the OSP Received (n=118)



*OSP program was not available during the month of September

Education and Presentations

The OSP has been involved in a number of educational activities to improve the prescribing and use of opioids at SPH in a number of clinical areas including:

Date	Area	Presentation	Approximate number of attendees
March 9, 2022	PHC Acute Nursing Practice Council Meeting	Opioid Stewardship Program	30
May – June 2022	Orthopedic Surgery	Opioid Stewardship and Post-Operative Analgesia using Cerner (one-on-one meetings with staff surgeons and learners)	17
May 24, 2022	PHC Nurse Educator and Clinical Nurse Leader Meeting	Opioid Stewardship Program	15
July 25, 2022	Orthopedic Surgery	Orientation for new orthoepedic surgery fellows	10
August 24, 2022	Orthopedic Surgery	Opioid Stewardship and Pain Management	10
August 26, 2022, September 7, 2022	Pharmacy	Impact of Cerner on Opioid Prescribing at SPH	15
September 22, 2022	Pharmacy	Opioid Stewardship Principles (Clinical Pearls in Practice for SPH pharmacists)	20

Quality Improvement and Research

The OSP has been involved in a number of initiatives and quality improvement projects around opioid prescribing at SPH.

Procedural PowerPlan Discontinuation

Through audit and feedback, the OSP has found that patients who undergo various procedures are often left with inappropriate orders for opioids and/or benzodiazepines from PowerPlans meant for procedural use only. These orders place patients at risk of adverse events from receiving medications inappropriately outside of procedural sedation (especially if patients are receiving other CNS depressants). Furthermore, the extraneous orders result in cluttering of the medication administration record (MAR) and increased risk of errors with other medications. Examples include IV fentanyl and IV midazolam from the GI Endoscopy Procedural Sedation Module as well as lorazepam from the Peripherally Inserted Central Catheter (PICC) Insertion module.

In collaboration with the gastroenterology team, the OSP was successful in requesting automatic 24 hour discontinuations to be added to all medications in the GI Endoscopy Procedural Sedation PowerPlan, including IV fentanyl and IV midazolam. The OSP was also able to collaborate with the IV Therapy team to advocate for PICC insertion workflow changes allowing for timely discontinuation of benzodiazepine orders to minimize inappropriate exposure.

Post-Operative Pain Management PowerPlan Review – Department of Orthopedic Surgery

Through audit and feedback, the OSP has identified several unsafe medication orders within the Orthopedic Post-Operative Pain and Symptom Management PowerPlan used for orthopedic surgery patients across all Cerner sites. These include the use of high dose opioids for opioid-naïve patients, and inappropriate use of long-acting opioids for acute pain, placing patients at higher risk of opioid-related adverse events.

In collaboration with the SPH Acute Pain Service and with endorsement from the Department of Orthopedic Surgery, the OSP has successfully submitted a request for this PowerPlan to be redesigned in order to improve opioid prescribing. System changes are anticipated to be implemented by Spring 2023.

To address existing knowledge gaps and system deficits, one-on-one education was also completed with staff members and learners of the Department of Orthopedic Surgery to review general opioid stewardship principles and safe prescribing practices.

Inappropriate Administration of Subcutaneous Opioids

Subcutaneous opioids are routinely ordered either ad-hoc or as part of PowerPlans for use as an alternative to oral opioids in patients who are unable to tolerate oral intake. Prior to Cerner implementation, subcutaneous opioid orders included clear comments that they are not to be given in addition to oral opioids. However, these order comments have been removed with implementation of Cerner and are no longer attached to any ad-hoc or PowerPlan subcutaneous opioid orders.

Since this change, several Patient Safety and Learning System (PSLS) incidents relating to patients inappropriately receiving opioids concurrently via both oral and subcutaneous routes have been recorded. These incidents have demonstrated increased risk of adverse effects and negative outcomes related to inappropriate subcutaneous opioid use.

In collaboration with the Medication Safety team and Professional Practice, the OSAC has successfully requested system changes to include appropriate order comments to all subcutaneous opioid orders available on Cerner (ad-hoc and within PowerPlans). These changes have been endorsed by all Cerner sites and will be implemented in 2023.

Opioid Post-Operative Discharge Prescriptions from General Surgery

The provision of post-operative opioid discharge prescriptions contributes to excess opioid reservoir in the community, representing a significant risk for misuse and diversion.[21] Previous studies have shown that a large proportion of patients discharged from surgical units receive more opioids than they require and typically do not dispose properly of leftover opioids.[22, 23] In collaboration with the SPH Department of General Surgery, the OSP undertook an exploratory analysis of post-surgical discharge opioid prescriptions and consumption patters among patients discharged from the general surgery service.

Overall, a median of 10 MME was consumed in the 24 hours preceding discharge.
Significant discordance was observed between the amount of opioid prescribed versus consumed at a median of 8 days post-discharge (150 MME [IQR 112–168] vs. 22.5 MME [IQR 0–58], $p<0.001$), likely resulting in excess opioids being available in the community. Among patients who consumed at least one dose of opioid, a median of 113 MME (IQR 75-150 MME) of unused medication remained in their possession once the medication was stopped. Few participants indicated they appropriately disposed of excess opioids, while some indicated they were keeping supply for future use.

The results highlight the need for interventions to improve discharge opioid prescribing, which may include direct prescriber education and implementation of a discharge opioid prescribing pathway utilizing individual patient consumption patterns. In 2023, the OSP will meet with surgeons within the SPH Department of General Surgery to discuss the results and brainstorm and implement interventions to improve discharge opioid prescribing using this data. Additional knowledge translation will be completed including conference presentations of the data and submission of a formal manuscript for publication.

Opioid Post-Operative Discharge Prescriptions from Orthopedic Surgery

Similar to the General Surgery study described above, this study is a collaborative effort between the OSP and the Department of Anesthesiology. Previous studies have shown that a large proportion of patients discharged from surgical units receive more opioids than they require and typically do not dispose properly of these leftover opioids after acute pain resolves. To assess appropriatness of discharge opioid prescriptions within the SPH Department of Orthopedic Surgery, there will be two phases of the study:

1. Chart review to compare the discharge prescriptions to opioid use and requirements in hospital prior to discharge.
2. Patients will be contacted after discharge to determine the amount of their opioid prescription utilized, how effective it was for pain management, any adverse effects they experienced, and how they stored and disposed of their remaining opioids.

This project will help inform future opioid prescribing within the Department of Orthopedic Surgery, determine if there are any target areas for improvement and/or establishment of standardized protocols, and provide baseline data for any future comparison. Data collection will take place during in Fall/Winter 2022 and data analysis is expected to be completed in Spring 2023.

Impact of Cerner on Opioid Prescribing

In November 2019, SPH underwent a transition from paper-based charting to a fully electronic health record system (Cerner Millenium). Along with this transition came various changes to how opioids are ordered within the hospital, including removal of automatic 7-day stop dates and the new availability of multiple opioids within PowerPlans (replacing the historical Pre-Printed Orders). To investigate the impact of Cerner on opioid prescribing at SPH, the OSP undertook a retrospective point-prevalence study comparing opioid orders over two week periods pre- and post-Cerner implementation. A similar study was conducted by the antimicrobial stewardship group which allowed for successful re-implementation of automatic stop dates to antibiotic orders following their removal during Cerner implementation.

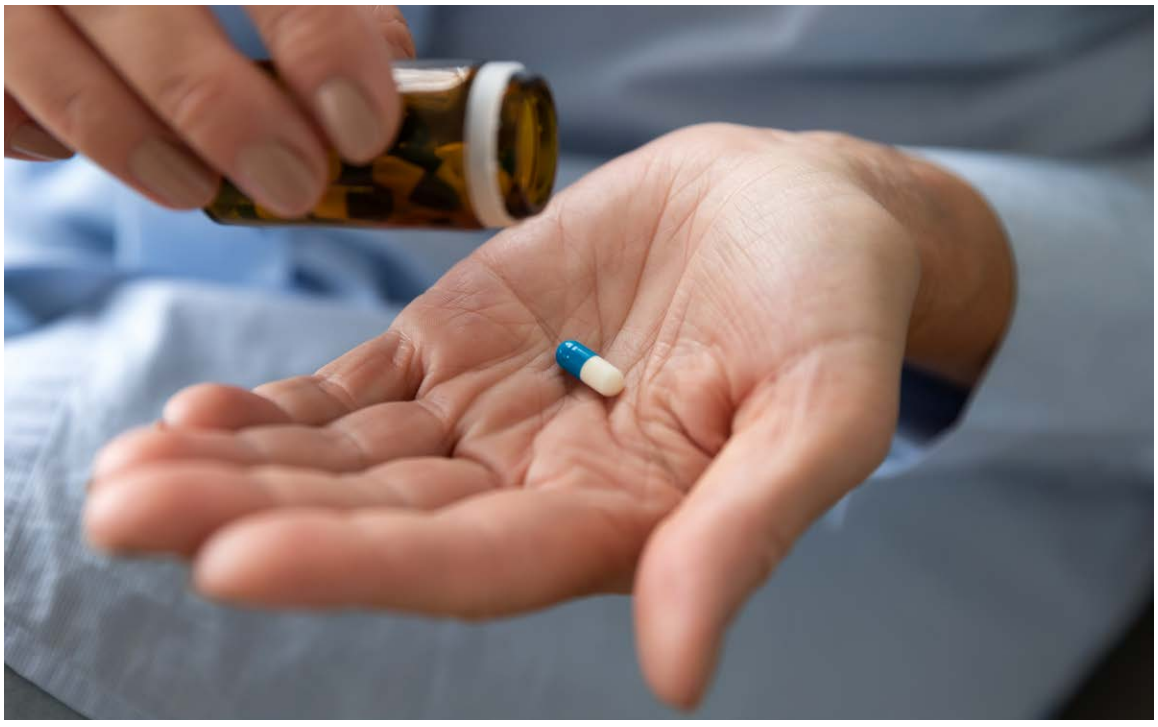
There were no significant differences identified in median duration of opioid prescriptions pre-Cerner (2 days [IQR 1.5–7]) vs. post-Cerner (2 days [IQR 0–6]). Although not statistically significant, the number of opioid orders prescribed to patients post-Cerner was 23.7% higher compared to pre-Cerner. The median quantity of opioids received per patient was also higher in the post-Cerner group (10 MME [IQR 1–24.8] vs. 5.7 MME [1.6–19.3]). When comparing opioid prescribing and consumption beyond 7 days of admission, there was a higher proportion of patients with active opioid prescriptions in the post-Cerner group (41.3% vs. 23.8%). Despite this, fewer patients in the post-Cerner group required/received opioids beyond 7 days of admission compared to the pre-Cerner group (80% vs. >95%).

Although statistical significance was not reached, these results highlight several potential changes in opioid prescribing at SPH since the implementation of Cerner that may increase patients' opioid exposure. As the number of individual opioid orders has increased, so too has opioid consumption and the number of opioid orders remaining active beyond 7 days of admission. These changes may be due to the availability of PowerPlans that allow for increased use of multiple opioids, and the elimination of automatic 7-day stop dates for opioid orders. The OSP plans to utilize this data to further pursue system changes to streamline opioid orders in PowerPlans and to advocate for re-implementation of automatic stop dates for select opioid orders.

Opioid Stewardship Program Beyond Year 3

The third year of the OSP held continued success and uptake for the program. Importantly, the OSP received guaranteed funding for continued operations from PHC in the Fall of 2021. The OSP maintained its strong focus on education, teaching, and knowledge translation.

In the fourth operational year of the program, the OSP will continue to engage in knowledge translation to increase awareness of the OSP at SPH including rounds, conferences, and other educational presentations. A large focus will be on system-level change to improve opioid prescribing across multiple health authorities, given the expansion of the Clinic & Systems Transformation project and increase in number of sites operating on the Cerner electronic health record system. The team will also work to continue to scale up the OSP within PHC and to support the creation of other OSP or OSP-like programs in other regional hospital settings.



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SPH Pharmacy

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Opioid Stewardship Advisory Committee

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Clinical Systems Transformation group

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