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Patient risk screening to improve transitions of care in surgical opioid prescribing: a qualitative study of provider perspectives

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ABSTRACT

Introduction In patients undergoing surgical procedures, transitions in opioid prescribing occur across multiple providers during the months before and after surgery. These transitions often result in high-risk and uncoordinated prescribing practices, especially for surgical patients with prior opioid exposure. However, perspectives of relevant providers about screening and care coordination to address these risks are unknown.

Methods We conducted qualitative interviews with 24 surgery, primary care, and anesthesia providers in Michigan regarding behaviors and attitudes about screening surgical patients to inform perioperative opioid prescribing in relation to transitions of care. We used an interpretive description framework to topically code interview transcripts and synthesize underlying themes in analytical memos.

Results Providers believed that coordinated, multidisciplinary approaches to identify patients at risk of poor pain and opioid-related outcomes could improve transitions of care for surgical opioid prescribing. Anesthesia and primary care providers saw value in knowing patients' preoperative risk related to opioid use, while surgeons' perceptions varied widely. Across specialties, most providers favored a screening tool if coupled with actionable recommendations, sufficient resources, and facilitated coordination between specialties. Providers identified a lack of pain specialists and a dearth of actionable guidelines to direct interventions for patients at high opioid-related risk as major limitations to the value of patient screening.

Discussion These findings provide context to address risk from prescription opioids in surgical transitions of care, which should include identifying high-risk patients, implementing a coordinated plan, and emphasizing actionable recommendations.

INTRODUCTION

Opioid-related morbidity and mortality continues to escalate in the USA.^{1–4} Perioperative opioid prescribing is associated with unique risks for both opioid naïve and exposed patients. Among opioid naïve patients, up to 10% develop new persistent opioid use, or the continued use of opioids more than 90 days after surgery.⁵ Although surgeons prescribe the majority of opioids during the first 3 months after surgery, care transitions occur at 9–12 months after surgery, and prescribing occurs

WHAT IS ALREADY KNOWN ON THIS TOPIC?

⇒ Preoperative opioid exposure is correlated with poor perioperative outcomes, particularly due to opioid-related harms and poor pain control. Although perioperative care pathways could mitigate these risks, little is known regarding provider perspectives of care coordination.

WHAT DOES THIS STUDY ADD?

⇒ This qualitative study of providers in anesthesia, primary care, and surgery explores the barriers and facilitators of perioperative care management for patients with opioid exposure, and opportunities for improvement.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY?

⇒ Our findings suggest that efficient screening tools to identify opioid-related risk, preoperative care coordination, and the creation of standardized guidelines could improve the coordination of perioperative care for patients with opioid exposure undergoing surgery.

across specialties, including primary care, internal medicine subspecialties, and pain physicians.⁶ For patients with current or prior long-term opioid use or opioid use disorders (OUD), thoughtful care transitions are critical to ensure safe prescribing and adequate pain management.

Despite increased awareness of excessive perioperative opioid prescribing, challenges in care coordination persist for many reasons. A qualitative analysis of care transitions for opioid prescribing showed that while current practices involve passive transitions of care, ideal practices would involve active transitions with direct provider-to-provider communication.⁷ To date, most studies have focused on optimizing the care of opioid-naïve patients instead of opioid-exposed patients, whose care involves greater complexity and risk.⁸ Prior research suggests that most patients on long-term opioid therapy have a usual prescriber, but few return to this prescriber within 3 months of surgery, and nearly 75% encounter high-risk and uncoordinated prescribing practices.⁹ High-risk prescribing of opioids strays from existing best



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practice guidelines and instead may involve multiple prescribers, overlapping opioid and/or benzodiazepine prescriptions, new long acting opioid prescriptions, or new dose escalations.^{10 11} Strategies to stratify patients based on opioid-related risk could improve transitions of care, and integrate the need for improved communication, knowledge, and technology to optimize opioid prescribing.¹² However, most tools that screen for opioid-related risk were developed for use in primary care settings, and are not tailored to Surgical care, in which care is episodic and key considerations include delivery of a safe anesthetic and perioperative pain management.^{5 13} Moreover, the roles of key perioperative care specialists, including surgery, anesthesia, and primary care providers, in screening and care coordination are not well understood.

This study aimed to explore providers' current practices and challenges in managing surgical patients' opioid-related risks, providers' views on best practices to reduce patients' opioid-related risks, and what additional resources providers identified as necessary. We interviewed surgeons, anesthesia providers, and primary care physicians, mostly at a large academic healthcare system, to compare perspectives within and between specialties. These perspectives provide the qualitative data of this study. Transitions of care in surgical opioid prescribing is a multifaceted clinical subject that involves complex factors at the healthcare system, provider, and patient levels. Qualitative methods are well suited to explore context-sensitive questions such as the diverse ways providers make decisions in care, what best supports these care decisions, and how their efforts to achieve best practices may fail.¹⁴ Qualitative research can provide a more contextualized and nuanced understanding of the subject of perioperative transitions of care in opioid prescribing than a purely quantitative approach could provide. In this project, we seek to provide contextualized insights from a single system quality improvement study that other systems may find illuminating when trying to understand the problem in relation to their own system's unique resources and constraints.

METHODS

This study is reported in accordance with the Journal Article Reporting Standards for Qualitative research.¹⁵ We conducted interviews with providers in anesthesia, surgery, and primary care (internal medicine, family medicine, and/or pain medicine) specialties. Participants were purposively sampled based on expertise and involvement in perioperative care, and surgeons were recruited to represent a variety of subspecialties (general, acute care, obstetrics and gynecology, vascular, orthopedic, and neurological surgery). Most participants (90%) were known to the investigator team through clinical care and recruited through emails, with the remainder recruited by one email sent to the Michigan Surgical Quality Collaborative (MSQC), a statewide quality initiative. Five participants from anesthesia and one from primary care (25%) were somewhat familiar with the investigator team's work prior to the interviews; the remainder were not. In consultation with local experts, research staff developed specialty-specific semistructured interview guides (see online supplemental digital content) that addressed, with respect to opioid use and risks: characteristics of the provider's patient population, current practice for identifying and preoperatively optimizing patients with opioid-related risks, current attitudes concerning availability of and need for additional resources, current practice and attitudes about screening patients for opioid-related risks, and attitudes about a proposed screening tool.

The study team comprised faculty, staff, and students affiliated with the Michigan Opioid Prescribing Engagement Network where prior research has focused on postoperative opioid prescribing. Five members of the research team conducted interviews, and 47% of interviews were conducted with two interviewers present. No incentives were given. Participants gave verbal consent to audio recording before the start of each interview and interviews were in person at providers' worksites (83%) or at the MSQC conference (13%) apart from one interview conducted by phone. The majority (87%) of interviews were audiorecorded, transcribed, and deidentified; the remainder (13%) were summarized by the interviewer in notes taken concurrently with the interview due to audiorecording failures.

Our approach to analysis was informed by interpretive description, a constructivist framework for applied qualitative inquiry. The interpretive description framework has been used in previous qualitative studies to contextualize topics of pragmatic clinical importance from participants' perspectives.^{16 17} In keeping with this approach, the analysis process was iterative. The study team met periodically to discuss developing themes and sampling strategy. Data were summarized at the individual level of analysis and abstracted to a framework matrix.¹⁸ Three study team members employed analytical memoing to further synthesize the data at the specialty level of analysis and produced a preliminary report.¹⁹ Taking an information power approach to sample size assessment, the sample was determined to be adequate to meet the study's exploratory and pragmatic goal of eliciting a diversity of views among specialties.²⁰ As is customary in qualitative research, prevalence is reported broadly rather than as percentages since the sample was designed to explore themes and generate hypotheses, not for generalizability.^{17 21} Transcripts were imported to MAXQDA 2018 (VERBI Software, 2017) and three study team members coded the dataset using broad a priori codes based on the interview domains with coding reviewed and finalized by a qualitative sociologist (JM). These findings were further synthesized in a second round of analytical memoing by three study team members to identify points of consensus and divergence within and between specialties and to finalize themes.

RESULTS

Twenty-four participants completed interviews between June and October 2019. Two who worked in a similar role at the same location were interviewed together for a total of 23 interview events. Interview length ranged from 16 to 51 min with a mean of 31 min. All participants worked in the same large academic health system with the exception of a nurse anesthetist and two surgeons who worked in three private, non-profit teaching hospitals in Michigan. Twenty-one of the 24 providers were physicians and 3 were advanced practice providers (physician assistant or certified registered nurse anesthetist). Nine of 24 participants reported holding multiple subspecialties. Two of four primary care providers commonly care for patients with chronic pain and two of four anesthesia physicians are subspecialty trained in pain medicine (table 1). Years in practice ranged from 2 to 35 with a mean of 13 years.

Defining high-risk patients

We found no clear, consistent set of criteria, mechanisms, conceptions of risk type, or patient categories that providers considered in the context of perioperative opioid prescribing and pain control. When asked, in the context of perioperative

Table 1 Participant characteristics

	n (%)
Total	24 (100)
Male	15 (63)
Female	9 (34)
Provider type	
Physicians	21 (88)
Advanced practice providers	3 (13)
Anesthesiology	7 (29)
Physician	4
Physician assistant	2
Certified registered nurse anesthetist	1
Surgery*	13 (54)
General	5
Trauma/burn	5
Orthopedics	2
Gynecology	2
Neurosurgery	2
Primary care/usual prescribers*	4 (17)
Family medicine	3
Internal medicine	2
Chronic pain management	2
Integrative medicine	1

*Subspecialty counts exceed specialty totals due to providers with multiple subspecialties.

opioids, what constitutes a high-risk patient, respondents cited a wide variety of criteria without consensus within or across specialties. The following example illustrates the plurality of criteria in mind for one surgeon:

There's the combination of anxiety, depression, and then if they've sought out opioids from multiple different providers over time, without anyone shepherding it. And, if it seems like the opioids are being used for the wrong kind of pain and the duration of therapy they've been on. (Participant 5)

Criteria related to opioid use cited by respondents included history of OUD, buprenorphine use, history of overdose or relapse, current long-term opioid use, high-dose opioid use, or high-frequency opioid use. Four providers considered any patient currently taking opioids in any amount as high risk. Several respondents emphasized potential undiagnosed OUD based on opioid use patterns such as multiple prescribers,

opioids used for an inappropriate type of pain, quantities used not matching objective examination, listed allergies to other narcotics, more pain described than expected for the complaint, or 'opioid seeking behavior'.

Comorbid conditions cited as potential risk criteria included sleep apnea, obesity, past or current chronic pain, risk of poor pain control, long recovery after prior surgery, prior pain service referrals, use of benzodiazepine or other sedatives, history of any substance use disorder (SUD), history of preadolescent sexual abuse, history of post-traumatic stress (particularly in relation to chronic pain), risky behaviors, poor coping, anxiety, depression, suicidal ideation, or other significant psychiatric history. Additional criteria included family history of SUD and surgical procedures with high postoperative pain expectations.

Implicit in these diverse risk criteria are multiple conceptions of risk type, with responses pointing to six distinct conceptions of risk type including: (1) challenging pain management, (2) higher or increasing opioid use in general, (3) overdose, (4) new persistent opioid use, (5) relapse of OUD, and (6) exacerbation of current known or undiagnosed OUD. The first type implies a concern for inadequate pain control whereas the remaining five imply a concern for patients ultimately consuming too many opioids. Many of the respondents explicitly or implicitly addressed more than one type of risk, with many of the risk criteria cited being applicable to more than one risk type. For example, the criteria of risky behaviors, family history of SUD, and history of sexual abuse could potentially relate to any of the above types of risk. In another example, the surgeon who asserted that, 'Pretty much anyone on opioids prior to surgery is a high-risk patient' (Participant 6) could be referring to three of the five risk types (excluding new persistent opioid use or relapse of OUD). In terms of patient categories, the first three types of risk listed above could potentially apply to any category of patient. The fourth type applies only to opioid-naïve patients, the fifth only to patients in recovery from OUD, and the sixth only to patients with OUD. Figure 1 maps the relationships between these patient categories, risk types, and risk criteria.

Lastly, two respondents said opioid-related risks were not taken into consideration within their practice:

These are not the risks I worry about. And maybe it's inappropriate. I never worry about us being able to treat their pain. We overdo that if anything, and I don't think about risks of dependence prep. (Participant 4, Emergency General and Trauma Surgery)

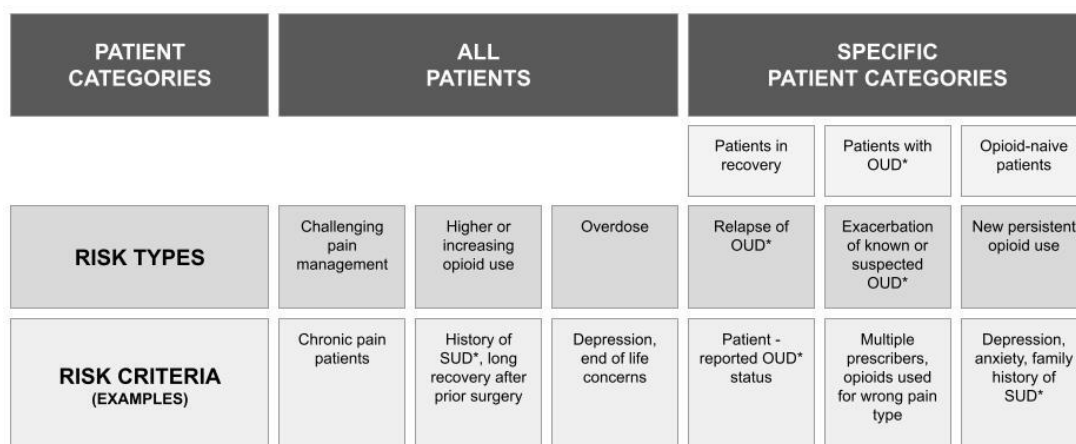


Figure 1 Opioid-related perioperative risk types, corresponding patient categories, and examples of potential risk criteria. *OUD, opioid use disorder; SUD, substance use disorder.

Box 1 Summary of defining high-risk patients with illustrative quotes by specialty**Anesthesia**

"I think a patient with previous OUD is a high-risk patient. The patient currently taking opioids is a high-risk patient. I think patients with comorbidities are high risks—sleep apnea, severe obesity. Concomitant use of benzodiazepines is a high-risk patient.... And large, painful operations." (Participant 17)

"But really it comes down to risky behaviors, and coping mechanisms. I think someone with poor coping skills is the highest risk." (Participant 19)

Surgery

"The high risk would be someone that already has either a history of addiction to something, or a family history of addiction. And because I think those patients are much higher risk – particularly opioids, but almost any addiction, is going to put them into a higher risk category." (Participant 1)

"Sometimes you miss a little subset. And that's the people who, they're not in recovery, or don't see themselves as being 'in recovery', but they had prolonged narcotic use after a previous surgery, maybe years ago. I consider them high risk." (Participant 23)

Usual prescribers/Primary care

"The strongest predictor is a history of any other use disorder.... And usually there is also just the element of knowing the patient too. I assume that most people can run into problems, but I do think that some are riskier than others." (Participant 12)

"I think it's based on patient history. I don't know that I have a cutoff-off point in my mind." (Participant 14)

Box 1 provides additional illustrative quotes.

Current practices to address patient risk

Providers were then asked to describe what specific their role is in addressing opioid-related risk and what resources they use to do so. Box 2 details illustrative quotes. Across specialties, providers cited record reviews (including electronic medical records and the statewide Prescription Drug Monitoring Program database), patient questionnaires and interviews, and sometimes urine drug screenings as mechanisms to identify surgical patients' current and/or past opioid exposure.

While the Michigan Opioid Start Talking form is state-mandated, no providers specifically mentioned using this form to educate patients on the risks of opioid use. No perioperative providers described proactively communicating with their surgical patients' usual prescribers or Primary Care providers about opioid exposure, although one Primary Care provider identified that communication with the surgeon is something that is helpful. Some Anesthesia providers reported that they do not interact with patients until the day before or day of surgery, at which time they would check for opioid use. Three surgeons noted that information on opioid exposure is typically obtained by someone other than themselves but under their direction, for example a resident, physician assistant, nurse, or medical assistant.

Across and within specialties, providers varied widely in describing their role in addressing surgical patients' opioid-related risk, ranging from no role to taking primary responsibility. Several anesthesia providers left discussion of opioid-related risk

Box 2 Current practices to address opioid risk**Anesthesia**

"I think we are very often the ones who recognize concomitant benzodiazepine use and other comorbidities, and we're recommending intranasal naloxone at discharge, and have that conversation with the patients." (Participant 19)

"I can provide them, and their provider, with guidance on how to manage this opioid in the perioperative period. But my role—I cannot prescribe, or I cannot re-choose medication. My role is advisor." (Participant 18)

"[Anesthesiologists] don't really do anything different with those patients unless the surgeon has called to say, 'Hey, this is going to be super tough' or the patient is on suboxone.... The time that we give ourselves to interact with patients before they actually have surgery, the window's so short that it needs to be much longer than that to create anything that is meaningful for patients." (Participant 22)

Surgery

"Everybody's got their own plan because everyone is totally different with weird problems that we're always scratching our heads trying to figure out." (Participant 4)

"I would say that we consider ourselves one of the primary people to assess risk. We would hope that if we missed it, it could potentially get caught at the pre-op visit, but I don't depend on that. I think it's our job as a surgeon because we, the surgeons, at least in this health care system, are the ones that manage post-op pain or at least the acute post-op pain. I think it's our job to screen." (Participant 8)

"I still feel that it is my responsibility to talk to that patient, ask them the proper questions. Because it is ultimately my responsibility if they end up with persistent use. That's on me." (Participant 23)

"I would say the most effective way you could use [(risk stratification)] is to put that in the hands of the Primary Care people who are doing the referring. Which is easy for me to say because that's not me." (Participant 20)

Usual prescribers/Primary care

"If I have someone who has chronic pain of some kind or I'm treating an acute pain that is going to need a surgical procedure for it, I'm probably thinking less about preparing them for surgery in some way. I am thinking more about 'how I am going to manage your pain adequately until you get to that procedure.'" (Participant 14)

"I like hearing from the surgeon about what level of pain do patients typically have from this surgery and what's typical need of opioids both in quantity and duration following the surgery.... I would say it's more often coming from the surgeon's direction, but that may be somewhat reflective of my particular role in the University.... I mean certainly I don't remember that ever happening before I started doing Pain Medicine work." (Participant 12, Chronic Pain specialist)

to the surgical team unless the patient specifically asked them about associated risks. Those who took primary responsibility described the following themes: setting realistic pain expectations, maximizing use of non-opioid adjuncts, counseling on preoperative tapering of opioids, recommending naloxone at discharge, or flagging risk factors such as complex procedures, comorbidities, and benzodiazepine use. For example:

If I'm prescribing their opioids, then I usually taper them to the lowest amount; get them on adjuncts. We'll do a combination of interventions, and adjunct escalation, and weaning, and just expectation setting. (Participant 19, Anesthesiology)

Some of these actions might require coordination with the usual prescriber (eg, primary care provider), a pain service, or the anesthesiologist on the day of surgery.

Among surgeons, two did not address opioid risk and one left it to other members of the surgical or anesthesia teams. As a neurosurgeon put it, 'We try our hardest not to concern ourselves with their pain meds, I'll be honest with you. We let everyone else manage it. We do our surgeries and we stick to our area of expertise and let them stick to theirs' (Participant 11). At the other extreme, two surgeons considered themselves to be primarily responsible for addressing risk. No pattern by subspecialty was discerned. A majority of surgeons said they educate all patients about pain expectations after surgery, some using preprinted material. Several said they also discuss expectations about postoperative weaning of prescribed opioids.

While primary care providers described a potential role in completing the preoperative history and physical exam and responding to any potential patient concerns, particularly their chronic pain or SUD patients, they did not identify a potential role in preoperative screening for opioid exposure or potential OUD. As one said, 'Since I'm not the one deciding if somebody needs surgery, I'm probably not actually involved in that process' (Participant 14). Some noted that they frequently do not learn of their patient's surgery until after it is finished, at which point they then have a role in addressing any postsurgical opioid-related outcomes. If made aware of surgery in advance, primary care providers may proactively discuss potential concerns and pain expectations with the surgeon. A provider who commonly sees opioid exposed, chronic care patients described recommending preoperative tapering and maximizing use of non-opioid adjuncts prior to surgery.

Current challenges in addressing patient risk

Perioperative care coordination

In order to inform intervention, providers were asked what current challenges they experience when caring for patients at risk for poor opioid-related outcomes. These challenges were grouped by timeframe into the preoperative and postoperative settings, and illustrative quotes are detailed in **box 3**. Preoperative challenges cited include difficulty with preoperative taper, access to pain specialists, coordination across providers and institutions, and setting patient expectations regarding pain control. Postoperative challenges include poor pain control, coordination of care, and access to pain specialists for postsurgical pain management. One usual prescriber/primary care provider described the challenges associated with the preoperative taper of a complex patient on chronic opioids due to poor pain control, and subsequent challenges of the patient returning to their care after opioids prescribed by the surgeon expired. This process of returning to primary care postoperatively relates to the challenge of coordination of care described by both primary care providers and anesthesiologists. One anesthesiologist described the complexity of coordination between specialists and across institutions as the largest challenge they face in developing a pain control plan for a patient with potential or known OUD.

Availability of pain specialty care

The majority of surgeons and anesthesiologists identified challenges in connecting patients with pain specialists with expertise

Box 3 Summary of challenges associated with current practices

Difficulties of preoperative tapering

"The lack of awareness of how to taper and manage the opiates in the perioperative period. While they can manage their opiates outside in the community, but surgery with its challenges, it's very difficult to manage these patients." (Participant 18, Anesthesia)

Coordination of care

"I think the coordination of care piece is the biggest challenge, particularly when they have surgery outside the system. Trying to communicate with other institutions around what is a good plan for this patient. They may be completely unaware—I don't even think they ask if the patient has a controlled substance agreement with a clinic." (Participant 19, Anesthesia)

Access to pain specialists

"I have a lot of trouble preoperatively, finding physicians in our healthcare clinic, meaning the Pain system, that are able to wean them off of the opioid... they seem to be too busy to be able to handle that volume. And then postoperatively, I have trouble getting our Pain physicians to see these patients and help manage their chronic opioid use after surgery, to kind of wean them down to where they were before. And I have a hard time figuring out in the patient's communities where they come from, what Pain providers are around for them." (Participant 5, Surgery)

Setting patient expectations

"One challenge I've really appreciated is sort of the level of expectation... In managing pain, I think we really have to say to patients that we are trying to optimize their management to make sure they are comfortable, but [(zero pain is)] not what would be expected." (Participant 21, Anesthesia)

Poorly controlled pain

"Their pain is more difficult to manage. They require opioids in the perioperative period. I worry about them postoperatively, especially with comorbid conditions such as sleep apnea. There have been times I've pushed for someone to be admitted overnight for pain control or for closer monitoring." (Participant 17, Anesthesia)

Stigma

"A lot of our patients who have come in and are chronic opioid users sort of feel like there's some sort of conspiracy against them in the system. A lot of people say, 'I go into the ED and they have flagged me. They know that I've come in and asked for opioids, and they don't do anything and blow off all of my pain.' I think patients already perceive that, I hate to use a word as strong as discrimination, but there's stigma and that people are aware of this, so I think it is important we don't add into that." (Participant 9, Surgery)

in optimizing preoperative opioid weaning who would then continue to follow these patients in the postoperative setting. This involved both an access issue, as Pain specialists were described as too busy to handle the volume, and also a process, timing, and coordination of care issue, as referrals would need to be placed by providers well in advance of the planned surgery. More broadly, the combination of challenges with coordination

of care and access to specialists was described by one anesthesiologist as the lack of a clear delineation of who is responsible for the preoperative optimization of a patient at risk.

Expectations and stigma

Setting patient expectations and aligning them with a realistic portrayal of pain control was identified as a challenge by providers in anesthesia, primary care, and surgery. While setting patient expectations with counseling was identified as an ideal practice, providers found this to be challenging, particularly in the setting of chronic pain. This was identified as a difficult conversation both prior to and after surgery. Similar to setting pain expectations, providers of all types described the particular challenge of inadequately controlled pain in their opioid-exposed patients. This challenge was described across all specialties: usual prescribers/primary care providers in the preoperative setting with patients experiencing increased levels of chronic pain during a preoperative taper, anesthesiologists in the operative setting grappling with poorly controlled pain requiring increased dosages coupled with limited effectiveness of medications, and finally by surgeons in the setting of poorly controlled postoperative pain.

Three providers discussed different aspects of stigma related to opioids as a challenge. For example, a surgeon described that patients with an existing diagnosis of OUD may perceive their care to be suboptimal and that they may be inappropriately denied pain medication due to provider stigmatization. One anesthesiologist suggested that the stigma of OUD may lead to providers inadequately controlling pain out of an exaggerated fear of causing a relapse. In contrast, one surgeon stated that another challenge in connecting high-risk patients to appropriate resources may be resistance from patients themselves who feel hesitant to disclose opioid use due to perceptions of provider biases. Furthermore, one surgeon mentioned that if a screening tool was developed, it should be standard practice to screen all patients, not only a known high-risk population, to avoid stigmatization of any group.

Resources needed and ideal practices to address opioid risk

Multiple providers suggested streamlining perioperative opioid management with a clear pathway. In anesthesia, participants recommended a perioperative pain clinic staffed with a team whose specific role would be to follow patients both preoperatively and postoperatively. When describing this perioperative clinic, anesthesia providers placed value on administrative and nurse staffing support. Similarly, a primary care provider described the need for a robust pain management clinic staffed with providers trained in the complex management OUD and chronic pain. Three surgeons cited needs specific to patient screening. They recommended a systematic preoperative screening process that does not rely on surgeons, identifies patients with low pain thresholds and provides clarity on specific thresholds warranting preoperative inpatient treatment to taper or stabilize opioids. Multiple providers expressed that while a screening tool may be helpful in identifying patients at risk, the question of how to manage these patients would remain a challenge. Four participants noted needs related to clarifying and standardizing pain management, such as clarity about who to contact, standardized protocols for peri-operative pain management, and standard and dedicated post-operative pain management supports and services. The need for ideal practices to be standardized is exemplified by the quote:



Figure 2 Model of desired elements of a preoperative optimization process for opioid exposed patients.

My experience with opioid legislation tells me we need to hard-wire this. It needs to be, so you take the human element out and there's just no other way to do business. And so ordered steps need to be locked down. And we need guardrails in place that make it impossible to do the wrong thing... We can make a clinic, have a great plan, but at the end of the day it can all be undone by one team member who just goes about it their own way. (Participant 19, Anesthesiology)

When further describing the need for increased perioperative management with a dedicated clinic, providers described a clinic with (1) ample providers with relevant expertise, (2) sufficient administrative support, (3) longitudinal care, (4) an approach informed by history of trauma, (5) improved access, and (6) a focus on patient education, as modeled in [figure 2](#).

Additional resource needs identified increased patient education on perioperative pain and non-opioid management, along with more nurse training on how to counsel patients in pain expectations. Usual prescribers/Primary Care providers reported a need for more pain management resources and communication of a clear plan from the surgical team for post-operative management of both any preexisting pain and the expected course of any surgical pain. Across all specialties, providers generally expressed the need for a clearly defined, accessible, and knowledgeable team comprised of providers with relevant expertise in opioids and pain management. See [box 4](#) for illustrative quotes.

DISCUSSION

New persistent opioid use after surgery is common and is associated with known patient-level predictors.⁵ Furthermore, preoperative opioid use is associated with higher healthcare utilization, including longer hospital stay, higher rates of discharge to rehabilitation facilities, and higher rates of readmission.²² This study is one of the first to explore the complex interplay of factors at the level of the healthcare system, provider, and patient, and examine perspectives and experiences across disciplines that are integrally involved in perioperative care. Qualitative methods are well suited to explore context-sensitive questions such as

Box 4 Resources needed and ideal practices to address opioid risk

Systematic approach

"Some systematic way that people were screened that didn't rely on busy Surgeons that may or may not think about it, then I think that definitely would be helpful. And certainly, if there were more standard support systems both within the department and outside of the department for postoperative pain management" (Participant 8, Surgery)

Patient education training

"Our nurses do a pretty good job at assessing things like whether or not somebody is having a postoperative complication and that's why they're having an exacerbation of pain, vs 'this is opioid seeking behavior that is not necessarily corresponding to the degree of pain I would expect after surgery,' but I think they would probably benefit from some sort of training on how to counsel patients on what is normal." (Participant 9, Surgery)

Dedicated resources for care coordination

"A perioperative optimization clinic! Basically, a home for these patients that liaises between their usual prescribers, the Surgeon, the Anesthesiologist, back to their usual prescribers. Where they can both on-ramp and off-ramp or off-ramp and on-ramp. Basically a home where they can move to for a period of time or around the time of surgery and then be handed back over appropriately." (Participant 17, Anesthesia)

"A much more robust substance use disorder clinic—really a Pain management clinic that does stuff outside of procedures. I think a space really of people highly trained to understand the complexity of opioid use disorder overlapping with chronic pain." (Participant 14, Primary Care)

Improved access to Pain specialists in the community setting

"It would be really helpful to have somebody with expertise in this. Locally, we have a couple of options that sometimes are available and sometimes are not. It also depends on insurance sometimes, but around the state it can be really hard, especially if they come from the rural areas." (Participant 6, Surgery)

A multidisciplinary approach

"We can figure out if their bones are healing or if the implants look good, but I can't sit down with someone and help them cope with their disability very well. That's just not in my wheelhouse, so some type of mental health expert would be useful for the majority of my patients." (Participant 7, Surgery)

the diverse ways providers make decisions in care, what best supports these care decisions, and how their efforts to achieve best practices may fail.¹⁴ Although prior studies have examined transitions of care in postoperative opioid prescribing, the current study offers insight regarding the need for preoperative screening and postoperative care pathways in the setting of opioid exposure and the presence of risk factors for pain-related and opioid-related outcomes after surgery.⁷

In this qualitative study of providers caring for patients perioperatively, we observed that providers across the specialties of anesthesia, primary care, and surgery identified multiple types of opioid-related risks ranging from the opioid-naïve, to those with OUD, or those with chronic pain. Across and within

specialties, provider perspectives varied widely when describing their role in addressing surgical patients' opioid-related risk, ranging from no role to taking primary responsibility. Participants in this study were asked for their perspectives on the use of a hypothetical screening tool to identify patients at risk for poor opioid-related outcomes. Most providers favored the use of a screening tool, but only if the tool was coupled with other resources, such as actionable recommendations and facilitated coordination between specialties. Although not explicitly mentioned by providers in this study, another likely challenge will involve the use of different electronic health record systems across health systems and difficulties sharing and integrating clinical information for surgical patients.

Participants in this study describe a variety of challenges, including lack of clarity about which provider is responsible for perioperative opioid management, how to best transition care between provider types, and the need for improved access to perioperative optimization clinic. When describing resources needed to address opioid risk, multiple providers suggested a streamlined perioperative opioid management pathway that involves a multidisciplinary, systematic approach, with dedicated resources for care coordination. This provider perspective on the value of a streamlined pathway adds contextual insights to existing expert consensus literature on enhanced recovery programs and the perioperative surgical home as a way to minimize opioid related complications.^{23 24} Leading institutions (eg, Johns Hopkins, Toronto General Hospital, Duke) have applied this framework by creating specialized, multidisciplinary clinics for opioid-exposed surgical patients. While innovative, the dedicated providers, space, and extensive resources involved are expensive and difficult to scale beyond large academic health systems. In contrast, care coordination initiatives that are informed by diverse stakeholder perspectives, leverage local resources, and are based on best evidence derived from patient reported outcomes could provide better pain management for opioid-exposed patients.²⁵ Such strategies have been effectively applied among diverse providers, settings, and conditions to improve outcomes for complex patients.²⁶

Another best practice identified by providers in this study is an increased focus on patient education. Previous research has shown that patient education, for example, an organized discussion of goals of postoperative pain management, providing information about proper usage and disposal of opioids, and discussion of alternative methods for pain control can lead to reductions in postoperative opioid use.^{22 27} While this was identified as an area for improvement, setting patient expectations and aligning them with a realistic portrayal of pain control was identified as a challenge by providers across all included specialties. Many questions remain regarding perioperative patient education, including who is best suited to deliver patient education, what method best serves patients, and what the optimal timing of patient education may be.²⁸ Certainly, the care coordination initiatives and multidisciplinary clinics described above provide a reasonable space and time for the education to occur.

Another finding of this study is the provider perspective on a need for more pain specialists and improved access to them. The United States has less than 6000 physicians specializing in pain and pain management, representing one pain specialist per nearly 61,000 people in the country.²⁹ While pain specialists play an important role in treating pain, the inadequate supply of and access to pain specialists causes the burden of management to fall on primary care providers, surgeons, and anesthesia providers. This was identified by our participants

as a major challenge. While some have advocated for pain physicians' involvement in the treatment of OUD, many pain physicians do not view this as within their scope of care.³⁰ Access to pain specialists via telemedicine is one promising avenue for expanding access and better supporting both preoperative consultation as well as postoperative management, however, the extent to which this existing model can be scaled is unclear. One cross-sectional study in Canada of using an eConsult service to improve access to pain specialists found that high-value referrals improved communication between primary care providers and specialists while lessening long wait times and improving access for chronic pain patients.³¹

Limitations

A limitation of this study is that the majority of participants work in a single, large, academic healthcare system and therefore the generalizability of findings beyond this setting is uncertain. However, the lack of consensus within one healthcare system underscores the significant challenges that may exist in creating an integrated system to reduce opioid-related risks in perioperative care. In addition, the sample size was limited, both per specialty and overall. In particular, since two of the four primary care providers commonly treat opioid-exposed chronic pain patients, their perspectives may not be representative of the majority of primary care providers. The heterogeneity of views we found across our small sample of surgical subspecialties suggests that further study is warranted. Due to multiple interviewers, certain interview questions lacking precision, and audio recording failures, data were not always consistent and complete which may have introduced unknown biases and error to the findings.

CONCLUSIONS

During surgical care, there is a critical need for a standardized, multidisciplinary approach to perioperative opioid management incorporating resources for improved patient education, improved provider communication across specialties, expanded access to pain specialists and optimization clinics, and tools to identify patients at high risk for poor outcomes culminating in actionable steps for intervention. Moving forward, this analysis will inform the development of a perioperative transitions of care pathway, which could pave the way for additional models in identifying other chronic patient conditions leading to increased surgical quality and patient safety.

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REFERENCES

- Gladden RM, O'Donnell J, Mattson CL, et al. Changes in Opioid-Involved Overdose Deaths by Opioid Type and Presence of Benzodiazepines, Cocaine, and Methamphetamine - 25 States, July-December 2017 to January-June 2018. *MMWR Morb Mortal Wkly Rep* 2019;68:737-44.
- Gomes T, Tadrous M, Mamdani MM, et al. The burden of Opioid-Related mortality in the United States. *JAMA Netw Open* 2018;1:e180217.
- Scholl L, Seth P, Kariisa M, et al. Drug and Opioid-Involved Overdose Deaths - United States, 2013-2017. *MMWR Morb Mortal Wkly Rep* 2018;67:1419-27.
- Wilson N, Kariisa M, Seth P, et al. Drug and Opioid-Involved Overdose Deaths - United States, 2017-2018. *MMWR Morb Mortal Wkly Rep* 2020;69:290-7.
- Brummett CM, Waljee JF, Goesling J, et al. New persistent opioid use after minor and major surgical procedures in US adults. *JAMA Surg* 2017;152:e170504.
- Klueh MP, Hu HM, Howard RA, et al. Transitions of care for postoperative opioid prescribing in previously Opioid-Naïve patients in the USA: a retrospective review. *J Gen Intern Med* 2018;33:1685-91.
- Klueh MP, Sloss KR, Dossett LA, et al. Postoperative opioid prescribing is not my job: a qualitative analysis of care transitions. *Surgery* 2019;166:744-51.
- Vu JV, Cron DC, Lee JS, et al. Classifying preoperative opioid use for surgical care. *Ann Surg* 2020;271:1080-6.
- Lagisetty P, Bohnert A, Goesling J, et al. Care coordination for patients on chronic opioid therapy following surgery: a cohort study. *Ann Surg* 2020;272:304-10.
- Dowell D, Haegerich TM, Chou R. CDC Guideline for Prescribing Opioids for Chronic Pain - United States, 2016. *MMWR Recomm Rep* 2016;65:1-49.
- Yang Z, Wilsey B, Bohm M, et al. Defining risk of prescription opioid overdose: pharmacy Shopping and overlapping prescriptions among long-term opioid users in Medicaid. *J Pain* 2015;16:445-53.
- Navis A, George MC, Scherer M, et al. What physicians need to implement safer opioid prescribing: a qualitative study. *J Opioid Manag* 2019;15:479-85.
- Meltzer EC, Rybin D, Saitz R, et al. Identifying prescription opioid use disorder in primary care: diagnostic characteristics of the current opioid misuse measure (Comm). *Pain* 2011;152:397-402.
- Lee JS, Parashar V, Miller JB, et al. Opioid prescribing after curative-intent surgery: a qualitative study using the theoretical domains framework. *Ann Surg Oncol* 2018;25:1843-51.
- Levitt HM, Bamberg M, Creswell JW, et al. Journal article reporting standards for qualitative primary, qualitative meta-analytic, and mixed methods research in psychology: the APA publications and communications board Task force report. *Am Psychol* 2018;73:26-46.

- 16 Thorne S, Kirkham SR, MacDonald-Emes J. Interpretive description: a noncategorical qualitative alternative for developing nursing knowledge. *Res Nurs Health* 1997;20:169–77.
- 17 Thorne S. *Interpretive description: qualitative research for applied practice*. Second, 2016.
- 18 Averill JB. Matrix analysis as a complementary analytic strategy in qualitative inquiry. *Qual Health Res* 2002;12:855–66.
- 19 Birks M, Chapman Y, Francis K. *Memoing in qualitative research: probing data and processes*. , 2008: 13, 68–75.
- 20 Malterud K. Qualitative research: Standards, challenges, and guidelines. *The Lancet* 2001;358:483–8.
- 21 Braun V, Clarke V. *Using thematic analysis in psychology*. , 2006: 3, 77–101.
- 22 Odom-Forren J, Brady J, Sloan PA. Perianesthesia patient education for the promotion of opioid stewardship. *J Perianesth Nurs* 2021;36:108–15.
- 23 Edwards DA, Hedrick TL, Jayaram J, et al. American Society for enhanced recovery and perioperative quality initiative joint consensus statement on perioperative management of patients on preoperative opioid therapy. *Anesth Analg* 2019;129:553–66.
- 24 Vetter TR, Kain ZN. Role of the perioperative surgical home in optimizing the perioperative use of opioids. *Anesth Analg* 2017;125:1653–7.
- 25 McDonald KM, Sundaram V, Bravata DM. AHRQ Technical Reviews. In: *Closing the quality gap: a critical analysis of quality improvement strategies (Vol. 7: care coordination)*. Rockville (MD): Agency for Healthcare Research and Quality (US), 2007.
- 26 Gorin SS, Haggstrom D, Han PKJ, et al. Cancer Care Coordination: a Systematic Review and Meta-Analysis of Over 30 Years of Empirical Studies. *Ann Behav Med* 2017;51:532–46.
- 27 Stepan JG, Sacks HA, Verret CI, et al. Standardized perioperative patient education decreases opioid use after hand surgery: a randomized controlled trial. *Plast Reconstr Surg* 2021;147:409–18.
- 28 Dunn LK, Sun EC. Mind over matter: reducing perioperative opioid use through patient education. *Anesth Analg* 2020;130:556–8.
- 29 U.S. Census Bureau PD. *AMA physician Masterfile (December 2017) and annual estimates of the resident population by single year of age and sex for the United States: April 1, 2010, to July 1, 2017*, 2018.
- 30 Bicket MC, Durbhakula S. One prescription for the opioid crisis: require buprenorphine waivers for pain medicine fellows. *Reg Anesth Pain Med* 2019;44:1094–7.
- 31 Liddy C, Smyth C, Poulin PA, et al. Improving access to chronic pain services through eConsultation: a cross-sectional study of the Champlain base eConsult service. *Pain Med* 2016;17:pnw038–1057.