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Original Research Article

Factors that influence discharge opioid prescribing among bariatric surgeons across Michigan

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ABSTRACT

Background: Opioid prescribing following bariatric surgery has been a focus due to its association with new persistent opioid use (NPOU) and worse outcomes. Guidelines have led to a reduction in opioids prescribed, but there remains variation in prescribing practices.

Methods: We conducted interviews with 20 bariatric surgeons across Michigan. Transcripts were analyzed using descriptive content analysis.

Results: At the *patient* level, surgeons described the role of surgical history and pain tolerance. At the *provider* level, surgeons discussed patient dissatisfaction, reputation, and workload. At the *institution* level, surgeons discussed colleagues, resources, and administration. At a *collaborative* level, surgeons described the role of evidence and performance measures. There was lack of consensus on whether NPOU is a problem facing patients undergoing bariatric surgery.

Conclusion: Despite efforts aimed at addressing opioid prescribing, variability exists in prescribing practices. Understanding determinants that impact stakeholder alignment is critical to increasing adherence to guideline-concordant care.

1. Introduction

New persistent opioid use (NPOU) is a common post-operative complication for patients undergoing bariatric surgery with 4–9% of opioid naive patients developing iatrogenic opioid dependence following their index operation.[1–8] For patients undergoing bariatric surgery, NPOU is associated with significantly worse physiologic and psychological outcomes, including decreased weight loss, decreased patient satisfaction, and less improvement in psychological wellbeing.[9] Despite increased awareness of the link between post-operative opioid prescriptions and NPOU, opioids remain the cornerstone of pain management following bariatric surgery.[9–11]

Currently, there are several evidence-based guidelines to inform discharge opioid prescribing following bariatric surgery.[12–14] In the state of Michigan, there are targeted programs and initiatives aimed at reducing opioid prescribing among providers through the use of guidelines as well as a modifier 22 linked to opioid prescribing at discharge.[15] One example of these guidelines includes the implementation of a pain control optimization pathway, which leverages multi-modal analgesic management and patient education by Michigan OPEN.[16] The introduction of such guidelines has increased awareness of excessive opioid prescribing and the effectiveness of opioid alternatives for post-operative pain management, and has resulted in recommendations that prescriptions for post-operative opioids be reduced after bariatric surgery.[15,17] Despite these successes, however, variation remains in the number of opioids prescribed by surgeons following bariatric surgery. Furthermore, there is evidence that these guidelines may be set too high for some patients (e.g., opioid-naïve or those who do not take anything after surgery) and too low for others (e.g., opioid-exposed or other risk fathers).[17,18] Although a growing body of research suggests the need for stakeholder buy-in for adherence to guidelines,[19–21] there is currently a paucity of studies examining the beliefs that guide bariatric surgeons' opioid prescription practices.

In this context, we conducted a qualitative study of bariatric

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surgeons across Michigan to explore beliefs and practices in discharge opioid prescriptions. Understanding the factors underlying this variation may be another way to improve opioid prescription practices.

2. Methods

2.1. Study design

Our team conducted a qualitative study to better understand discharge opioid prescribing beliefs and practices among bariatric surgeons across Michigan. NPOU was defined as a previously opioid-naïve patient who self-reported opioid use one year after surgery. The guide was piloted for content validity, presentation, and clarity of information by two bariatric surgeons (Table 1). Additional questions and were added to explore the topics raised. These data were not included in the final analysis. This study was deemed exempt by the University of Michigan's Institutional Review Board.

Table 1
Factors influencing discharge prescribing practices.

Tell me about the demographics of bariatric surgery patients at your hospital.	• Do you think that your patients are pretty similar to the broader population of patients undergoing bariatric surgery? • If not, what do you think makes your patients different from the average bariatric surgery patient (e.g., certain patients have higher pain levels; insurance status)? • In what ways, if any are bariatric patients different from other surgical patients?
Can you walk me through the steps you take in managing pain in bariatric surgery patients?	• In what ways, if any, has your pain management strategy changed over the last few years? • What educational or administrative resources, if any, do you use to manage patient pain? • What policies, if any, does your practice have regarding refilling opioid prescriptions?
Can you tell me about any patient level factors that are considered when making decisions about managing pain?	• If uniform strategy, how did you come to that? • If patient specific factors, what are those factors and how do you decide how many pills to give (e.g., overall health, previous opioid use, social/emotional support) ?
Walk me through the process that happens if a patient calls asking for a refill.	
Tell me about practice guidelines that exist for managing post-surgical pain.	• Tell me about guidelines that exist for how much surgeons should prescribe for certain procedures. • Tell me about any education or guidelines you have you received in managing pain. • Do you think there is consistency in how opioids are prescribed in your institution? What about in the state of MI?
In your opinion, how big of an issue is NPOU in the bariatric surgery population? Outside of the bariatric population?	
Would it surprise you to know that over 6% become NPU? Would you sense it is a bigger or a smaller problem?	• What do you think accounts for differences in these rates (e.g., provider level factors, patient level factors)? • What do you know about the NPOU rate at your institution, in particular? • What factors do you feel contribute to this problem? • How do we address this problem?
Any advice to other providers on how to manage pain in bariatric patients?	
Is there anything we haven't covered that you think would be important for us to know?	

2.1.1. Interview participants

Using convenience sampling, 20 surgeons were recruited via email from bariatric programs across Michigan. Surgeons received participation credit for the surgeon engagement measure on the pay-for-performance index.

2.2. Interview procedures

Surgeons verbally consented to participate before the interview. Individual interviews were conducted by an anthropologist (CAV) with experience in qualitative research. Interviews were conducted over the phone or zoom from April to August 2021. None of the surgeons was acquainted with the interviewer. The interviews lasted 30–45 min and were digitally recorded, transcribed verbatim, and de-identified. Observations from each interview were included in the analysis. We continued to interview until data saturation was reached, defined as the time when no new themes or major dimensions of themes were identified.[22] Transcripts were not returned to surgeons for review.

2.2.1. Analysis

Descriptive content analysis was used to analyze transcripts, allowing for a comprehensive summary of an area of interest that can be particularly useful in providing detailed accounts of a phenomenon of interest.[23,24] Two members of our research team (CAV and APE) read three transcripts to identify an initial set of codes. Meetings were held to determine which codes were similar enough to be grouped together, or distinct enough to remain on their own. These conversations were iterative until agreement was reached. This preliminary codebook was used to code two additional transcripts. A revised draft of the codebook was created until it was agreed that no new ideas were emerging, and the coders reported no difficulties in applying the codebook to the excerpts. Definitions were created and revised throughout the coding process to promote consistency across coders. Two coders then independently coded the remaining transcripts. Our team included members with a range of training and experience, credentials, and backgrounds. Transcripts were coded using MAXQDA 2018.

3. Results

Twenty bariatric surgeons were included in this study (Table 2). Surgeon participants were between the ages of 34–79 (median 47) and had been in practice for <1–40 years (median 14.2). Most participants (95%) were men and white/non-Latinx (85%). Surgeons were recruited from 17 sites across Michigan, with the majority practicing in urban areas (90%) and teaching institutions (100%). Adjusted morphine milligram equivalent (MMEs) prescribed in 2020 ranged between −1.1 and 123.4 (median 62.4). The adjusted NPOU ranged from 1 to 21% (median 4.58%).

Surgeons identified factors that influenced their discharge opioid prescription practices at the *patient*, *provider*, *institution*, and *collaborative* levels. Notably, there was a lack of consensus on whether NPOU is problematic in patients undergoing bariatric surgery. Themes with illustrative quotes are displayed in Tables 3–6.

3.1. Is NPOU a problem?

There was significant variation in response to the question of whether NPOU was a problem for patients undergoing bariatric surgery. In some instances, surgeons asserted that, *"I don't think it's an issue."* (116), while others acknowledged it as a problem but not for their patients. Still others found it to be a significant issue facing patients undergoing bariatric surgery, both inside and outside of their patient

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Table 2
Participant characteristics.

Category		N	%
Identified Gender	Female	1	5%
	Male	19	95%
Age	30–39	4	20%
	40–49	9	45%
	50–59	5	25%
	60–69	1	5%
	70–79	1	5%
Identified Race	White	16	80%
	Black	2	10%
	Middle Eastern	1	5%
	Middle Eastern and North African	1	5%
Years in Practice	≤5	4	20%
	6–10	5	25%
	11–15	3	15%
	16–20	4	20%
	>20	4	20%
[a]Type of Practice	Teaching	20	100%
	Private	1	5%
	Community	1	5%
Community	Urban	18	90%
	Rural	2	10%
[b]Adjusted MME Average 2020	0–30	3	15%
	31–60	6	30%
	61–90	8	40%
	>90	3	15%
[b]Adjusted NPOU % 2020	<2%	4	20%
	2–5%	12	60%
	>5%	4	20%

[a] Multiple practice sites.
[b] These data were collected through the Michigan Bariatric Surgical Collaborative, a statewide quality improvement collaborative focused on improving outcomes for patients undergoing bariatric surgery. The collaborative creates and reports risk and reliability adjusted values of MME's prescribed. Statistical risk adjustments are made at the patient level by taking into account patient factors (i.e., age, sex, race/ethnicity, etc.) as well as comorbidities (i.e., hyperlipidemia, high blood pressure, etc.). Reliability adjustment is also employed which takes into account either surgeon or site (depending on which level we are reporting at) and this will account for the patient mix at the surgical center/of the surgeon and/or any actions (specified or unspecified, but mostly unspecified) taken by the site or surgeon to reduce the amount of opioids they prescribe.

population. *"It's a huge problem. It certainly transfers dependencies, transferring addictions … or even smoking, alcohol, and narcotic new use."* (114).

3.2. Prescribing practices

When asked to describe their approach to discharge opioid prescriptions, some surgeons described how they were moving towards not prescribing opioids for post-operative pain, *"In the last six weeks, I haven't given out any narcotics."* (102). Others asserted sending patients home with 6–15 pills. When surgeons who routinely prescribed opioids were asked about efforts to decrease narcotics to zero, some described the *"strangeness"* of not giving out any narcotics after surgery without considering the context of the patient. Although most surgeons articulated an awareness of the guidelines that informed opioid prescribing practices, it was most often in connection with performance measures and not the evidence that connected prescribing practices to NPOU or worse patient outcomes.

At some sites, discharge opioid prescription protocols were standardized and out of the surgeon's control, with every patient receiving the same amount. At other sites, this process was individualized based on patient factors, including the operation that the patient received, *"The sleeve seems to be a little bit more sore just because of the extraction site. Those I may send with 10-12 tablets of Norco."* (114).

In some instances, surgeons asserted prescribing the same number of opioids to every patient. Others preferred the use of other nonsteroidal

Table 3
Is NPOU a problem?

"The bariatric population we know probably has a higher risk than the general population for new persistent opioid use, so we'll keep doing our best to help prevent that from becoming a problem, at least in my regional area here." (103)
"I'm going to say that now it's really not that big of an issue for us. Again, if patients are getting opioids, it's not from our practice or because they had surgery with us. They are getting them from other sources so I do feel pretty good about that." (106)
"I think I probably downplay it just because I personally don't see it that much, but even if I had patients that were using it afterward, it's kind of hard to know since you tend to lose a lot of follow-up after the first year or two anyway." (110)
"I think new persistent opioid use is a really interesting phenomenon. I think we've impacted it, but maybe it hasn't been all of our impact. In other words, what causes it? That's the first question, right?" (111)
"Oh, well again I know the data. So, it's definitely a problem. Now, and it ranks kind of middle of the pack with other post-surgical conditions as far as new persistent use. I think we've seen it come down a good bit since implementation of some of these kind of reduced opiate prescribing practices. But yeah, that's what is tough. I couldn't tell you in my own patients what proportion have new persistent use." (112)
"That's a tough question. I think statistically it's certainly not the majority but when it happens, it is a huge problem, and it is a big strain on the medical system as a whole." (ID 113)
"I would like to think that it's not, but I know I'm probably underestimating it because we know there is going to be a certain percentage of patients who do have a new addiction to narcotics after surgery." (117)
"With my bariatric patients it's not been a problem." (119)
"It's not. Yeah, for the patient who has never been on an opioid, almost all of these patients get by with very few, frequently you'll have patients who say I've never even filled the script. So, I don't think there's any real persistent use. The people that we have the problems with are the ones that were already on the medication who want more, want stronger." (120)
"I don't believe it's a problem, to be honest with you. Again, coming from a different culture, I think also now we are doing exactly the opposite of what we were doing before, and this is – again, we don't have a happy medium. Now we are focusing – you should never do this, people are giving zero narcotics, people are – come on, guys! We can't be just normal people?" (121)

Table 4
Prescribing practices.

"And over the last several months we've made a push to go down to 8 pills of 5 mg of oxycodone." (104)
"In my practice it's not uncommon at all for patients to never use a narcotic after surgery, either in-patient or post-operatively and actually I still prescribe them or I at least give them prescription for because it's so difficult to manage that if they do need it once they're home and you don't have a way to, you can't like call in those types of medications." (105)
"If they do want any pain medication, usually, like the most we will send them home are the eight of the 5 mg oxycodone at this point." (110)
"Honestly, I don't send anybody home with narcotics anymore." (111)
"I give them seven pills of oxycodone and I tell them because some of them ask, well that's kind of a strange number, you know seven, and I say, well, we track this, which we do, at our weight loss center. So, when I first started, I was giving about 15 pills of Norco actually before we really started tracking it and when I switched to oxycodone, I was still giving them 10–15 pills and we found that most patients took somewhere in the range of 0–4, so I've started giving 7 and I have yet to have had somebody call me and ask me for more. I say it's there, it's available to you if you absolutely need it but that's sort of the typical scenario." (113)
"They go home with Norco 5/325s, 10 tablets. I would say on average patients are taking about half of those tablets. Gastric bypass patients tend to use them all compared to sleeve patients." (115)
"I don't know if it's, like I said, ten tablets. It probably could be a little bit less. But it's certainly not much more than the patients need. So, I think it also meets what national society recommends right now. So, I think, I am comfortable there. Patients are comfortable there. So, yeah, we'll see, I might make some additional changes, but probably not tremendously more. We'll see." (116)
"So sent a patient home with a prescription it's going to be a total of 6 doses." (117)
"We do, but I can't quite quote what it is. I mean we – honestly, we want to be – we want to prescribe less than three days' worth of pain medication. Honestly, I don't know where that's coming from, might be a hospital-wide thing." (119)
"We probably will give up to ten. This is a new thing in the last few months, maybe last year or so, 12 months or so. Other than this, we don't really have actual protocol, you know." (121)

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Table 5
Managing refills.

"I said, "Because I don't have a good reason for you to have to need extra pain medicine, so you need to come in and let me take a look at you to make sure there's nothing going on," and that's usually enough to get them to not come in. They usually don't want to." (102)
"We pretty much have a policy that, you know, within three weeks after surgery we would not fill anybody's prescriptions for opioids, unless they could show that they had a surgical pain issue. So that patient would have to be seen, or you know, maybe seen in the ER, have a CAT scan or they have, you know, evidence of a surgical complication." (106)
"Oh, I don't refill them." (109)
"I would say usually over the phone unless I had concerns that it was, you know, severe pain or something that I needed to physically evaluate." (110)
"Yeah, so the inquiries go not to our PAs, they actually go to our clinic nurses who then contact us directly for refills. I can say with pretty good confidence, that I've not had a post bariatric surgery patient approach me for refills. Pretty confident that I haven't had any." 112)
"So, all of our patients will leave the hospital with a wrist band and a card with a phone number on it. That phone number goes to the nursing station on the bariatric floor and then the nurse will contact either the operating surgeon or the bariatric surgeon on call and they provide us the patient's name, surgery date, and a phone number to contact that patient back. So, we get various calls for various reasons. Some of those are pain and so that's sort of the process about if they have pain postoperatively, that's how they contact us. Then sort of take it on a case-by-case basis. Do they need a quicker follow-up appointment? Or kind of what else needs to be done, but it's a very individualized process." (113)
"Yeah, so if it's on the weekend it's going to go either straight to myself or [redacted]. And so, you get a phone call from the answering service that this patient is in pain, so basically the process would be you'd have a conversation with them to determine whether or not it was something that really needs a narcotic, maybe they just need ice packs, heat, maybe they need to be on five days of Neurontin, maybe they need to come in and be seen on Monday. So, I would say probably one in ten of those patients that call that you actually log in to the computer and send them over some pain medication." (115)
"Usually, our medical assistant would take that phone call from the patient. They typically reach out to the surgeon that did the surgery. With the electronic medical record, it's gotten a lot easier to refill those prescriptions." (117)
"And if it's actual pain and I'm available I could have them come by to see me in the office, you know. If it sounds like they really need something at that time, you know, I'll send it in." (119)

anti-inflammatory drugs, muscle relaxers, non-opioid pain relievers, and abdominal binders as effective ways to manage pain. Finally, in some instances, surgeons asserted that what they prescribed was based on insurance coverage. For example, one surgeon described their preference for prescribing Tylenol and Celebrex, but that coverage was difficult to obtain.

3.3. Managing refills

Although most surgeons asserted that there were few refill requests for patients undergoing bariatric surgery, the processes in place to manage these requests varied. While some providers required an office visit before fulfilling a request, others managed this process over the phone. Additionally, some surgeons asserted that they would only offer non-narcotic alternatives to patients. While others stated that they would offer a refill prior to requiring an in-person visit from the patient.

3.4. Factors influencing beliefs and practices

In exploring the determinants of this variation in beliefs and practices, surgeons described

Patient-, provider-, institution-, and collaborative-level factors.

Patient Level.

At the patient level, surgeons discussed how surgical history, patient demographics, previous medication use, addiction history, and the subjective nature of pain influenced discharge opioid prescription practices.

Table 6
Factors influencing discharge prescribing practices.

Patient Level	*"You can kind of tell with people, even if they have no history of using any pain medication or narcotic pain medication in the past, you can kind of get a sense of what patients you have that are going to request additional narcotics or are going to have more issues of pain control postoperatively, and it's a little bit of a hard thing to pinpoint. But I would certainly guess that mental health and psychosocial support all kind of play a role in that."* (110)
	"I mean I think it can come in psychiatric diagnoses, history of any kind of substance abuse. I mean I think there's some definite predictors of new persistent use. But that being said, it should influence in a positive direction what you do perioperatively, like how much you're giving. So why there still continues to be such wide variation in what people are giving in the time of surgery is a little befuddling." (112)
	"I think when you have guidelines, it works for the majority of the patient; but always, there will be exceptions that you have to bend the guidelines either way." (114)
	"But it's likely going to be a gastric bypass patient more so than sleeve patient requesting a refill. They have a few more incisions that are bigger that require closure of the port site, so they tend to have a little bit more discomfort." (115)
	"So obviously everyone's experience of pain is not the same. That goes back to the whole Joint Commission, pain being the fifth vital sign. Pain is not an objective measurement; it's a subjective measurement so it's really hard to quantify." (117)
	"Usually, younger patients sometimes they will be tough. And some patients with chronic pain issue and then they will also be challenging somehow." (121)
Provider Level	*"A lot of people get in a grind of you do the same thing because it works. And sometimes when literature comes out, you kind of look at it and go, "Yeah, but mine works anyways. It's not big enough for me to make a change."* (102)
	"But I'd say 80% of the time there can be influences based on prescribing habits of the actual person doing the prescribing. So, I think that's probably the majority of what creates that variation." (104)
	"I mean I guess if it works for them then great, then maybe I should be doing it too. Personally, I'm retiring in two months and to start a new program – okay, I'm at the point where it doesn't really matter." (107)
	"I can't imagine that anyone would – I can because surgeons are obstinate, but like you know, why you would think your patients are so different that you can't just prescribe fewer opioids." (112)
	"Where I did my training, we were one of the pilot sites for the ENERGY Program so I really carried over a lot of that into starting my practice and so I always sort of try to limit the amount of narcotic just little things like not doing a routine swallow study, not doing routine drains, not doing routine foleys, sort of multimodal pain management and discussing with them preoperatively, kind of expectations, I think just really kind of helps." (113)
Institutional Level	*"And I've almost found it like the path of least resistance to send people with, like a paper script for, you know, five oxycodone or something like that, that they can fill if they need to. Unfortunately, like, even if they don't fill it, then that counts as basically they've been prescribed that medication. So, I am not opposed to going down on it, or it's just sort of a matter of like, what kind of phone contact and outpatient contact that's going to generate for us because a lot of that I have to do myself."* (110)
	"The sort of interesting thing from our own internal data is that the more pills that are prescribed, the more pills they take. So that's what kind of gave me sort of the idea to just cut the amount down to seven because the vast majority, like I said, were taking between zero and four opioid pills and that's five of oxycodone in my practice. But if we looked at the earlier data, if we were prescribing them that 15 then they were taking 8 or 9, so whatever that's worth." (113)
	"Yeah, so I think it probably has to do with the process of the program of how they're prescribing the medication. Are refills always being granted, is there a process in place for how they're dealing with that? So, I think it's probably more – some practices it may just be easier for those refills just to go out because it's easier to just refill the medication and you don't have to bother the surgeon. With our practice we have a lot of support. Nurse practitioners to help manage it, so I think that's understood." (115)
	"It's the system. Like the system is literally teaching the patient and the system by itself is like, again, you give them too much from this candy and they want it ... It's just wrong. It all starts with the system,

(*continued on next page*)

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Table 6 (*continued*)

	and we spoiled our patients. Literally. Again, when you practice in different countries you see it. If you get the patient used to not giving them anything, or very small – like I used to give them 20 or 30, they will look at me like why I am doing this. I'm a bad doctor, I don't care, you know. And then I'd say, no, I do care. But then I start hearing this because, again, the hospitals will be up against me, the patient will start rating me bad. The whole system was wrong. And we're stuck in it, unfortunately, until we have a disaster after disaster after disaster and then people start saying, well, let's give the nurses and the physician more rules to resist the patient's satisfaction. And then we started seeing more aggressive physician. They would say, no, I can't do it. I'm sorry, you need a pain specialist to do it. I can't do it. My excuse is what, do you know? I'm not allowed to do it. I can't. It's not that I should not, it's I can't. Again, the explanation is wrong because if I say anything else the patient will go and rate me bad and, again, we still need a lot of time to break that cycle. But it's happening." (121)
Collaborative Level	*"It was by shaming of the Michigan Bariatric. When you see your name kind of on the highest, I wasn't the highest, but I was certainly probably on the top 30 percentile of narcotic prescribers, you are like, Ew, geez, something I'm doing wrong or something I'm doing unnecessarily. And that prompt me to just, I mean, immediately after I saw those numbers, I cut by 50%. And then slowly, I have been titrating down based on the patient's need and how many they used."* (114)
	"We also participate with another collaborative, MSQC … similar type of concept, and so a lot of the information as far as the recommendations for narcotic prescribing were coming from that, and so we just kind of extend that to our bariatric population as well." (117)
	"Well, you come in and you give more than three days of pain medication. That's going to be a demerit and you're not following the rules or the guidelines of the society or the government or the program, and so you're in a quagmire. You know what do you do? I mean you've got to treat this patient. They're telling you they have pain. I have to treat that, and at the same time I'm getting penalized for overprescribing. It's a problem, and I mean that has to be addressed because it's not real. You know MBSC – you go to the conference and say, well, you know a combination of – you know my patients, they get no pain medicine, I mean they don't get any opioids. They go home and we give them some other medication that replace that and get zero pain management. I couldn't practice like that, so that's another perspective. That's a different type of patient, and that's what I mean by the distribution of patients. It has to do with people that have been exposed to different socioeconomic status, and they're going to react differently, and that's something that happens so you can't just generalize and say we all do this, and these are the rules of engagement, and you have to follow them, and if you don't follow them, you're going to get a demerit." (118)
	"Well, you know, I think probably up until this was all being addressed at the MBSC, we were giving 20. That was a pretty standard number of pain pills. And so, you know, watching and listening to what other groups were doing, if we can get this number down, I think it's the better thing to do." (120)

> *"You'll have a lady who has given birth four times, probably doesn't need anything. A young man may require a lot of pain medication. Everybody's perception is different."* (120)

Surgeons also described variations in how they managed patients with previous histories of opioid use. Some surgeons asserted consulting specialists early, obtaining approval before surgery, and adhering to any pain plan in place. Some surgeons reported prescribing the same number of pills that they would for any other patient, but sent the patient back to the specialist for any additional requests. Others stated that rather than prescribing opioids, they would send the patient back to the specialist who originally prescribed the opioid. Finally, some surgeons followed up with patients to identify patient-reported opioid use, which influenced how many opioids future patients were sent home by providing them with an accurate assessment of how many pill patients were taking.

3.5. Provider level

At the provider level, some surgeons described negative repercussions if the pain was left unmanaged.

> *"I cannot just send him without medication … They will go home without anything or will go with three pills, and then they will call my office, their primary care office. The primary will be very angry because we do not care … Patients will swear they will never come back to me."* (121)

Surgeons also discussed how factors such as experience, years in practice, and training influenced their approach to discharge opioid prescribing – with those earlier in their career bringing forward ideas that were addressed in their training, while those later in their career asserted being close to retirement as a reason not to change practice. Others discussed how their involvement with influenced their approach to pain management.

3.5.1. Institutional level

At the institutional level, other bariatric surgeons influenced practice patterns, with some describing consistency among providers as facilitators for adopting practices. Surgeons also described variations in the resources available at their institutions. At some institutions, the task of prescribing pain medication was delegated to someone else on the care team, alleviating the potential burden when making decisions about managing pain. At other institutions, the surgeon was the main point of contact for patients and had some hesitation in reducing the narcotics prescribed due to the potential for increased workload.

> *"We have limited staff, and so if we cut it down too much, are we going to be bombarded with calls … You are weighing all the things. you are weighing the burden on your staff, dissatisfaction with patients, all that has to come into play."* (115)

Additionally, surgeons articulated receiving pressure from their institution to reduce MMEs. For some, this was considered positive and helped to ensure that they were not outliers. For others, this practice was viewed as not delivering patient-centered care. Finally, surgeons in lower volume programs sometimes expressed frustration that for surgeons not at high-volume sites, even a few extra medications resulted in them being over on MMEs, potentially impacting their ability to obtain pay-for-performance.

3.6. Quality improvement collaborative

Most surgeons described groups like the Michigan Bariatric Surgical Collaborative as being at the forefront of conversations on discharge opioid prescriptions and provided evidence that guided their practice patterns. Many asserted that knowing where they stood against their peers encouraged them to not be outliers. *"You get to see your data up against everybody else's and it's eye-opening."* (113).

However, for some, these metrics were not seen as reflective of the variation in their patient populations and articulated a need for more support at sites where patient demographics were not reflective of the average, such as those with a high percentage of patients who utilized Medicaid and Medicare.

> *"I'm punished because I'm overprescribing on patients that have a whole different perspective in terms of their pain needs … If you are giving opioids, then you are not meeting the standard of care, and I mean you cannot judge it like that."* (118)

4. Discussion

Surgeons identified factors that influence their discharge opioid prescription practices at the patient, provider, institution, and collaborative levels. Notably, there was a lack of consensus on whether NPOU is problematic in patients undergoing bariatric surgery. Understanding the

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determinants that impact stakeholder alignment and proficiency on this topic is critical to the development of tailored interventions aimed at increasing adherence to guideline-concordant care.

A robust body of literature points to the fact that standardization increases adherence to evidence-based practices, which are associated with better treatment outcomes. Despite the known benefits of adhering to these practices, variations remain in providers' adherence to evidence-based guidelines. Interventions that attempt to address this variation often assume that a lack of awareness of guidelines is the main reason for non-adherence.[25] However, as our data highlight and previous research suggests, this assumption is often reductionist and fails to consider the multitude of other factors that impact not only practice but behavior change.[26] As our data highlight, the reasons for non-adherence are often complex. For example, in some cases, guideline nonadherence may be intentional if surgeons perceive that the recommended opioid prescription will not sufficiently treat the patient's pain. Building on previous research, surgeons from this study asserted a belief that their patients are different; therefore, adhering to strict guidelines or reducing opioid prescribing any further would be detrimental to patient care.[26,27] To further improve practices around discharge opioid prescribing, we need to understand the reasons for non-adherence by exploring contexts and understanding that strategies that work in one setting may be less useful in other settings where factors influencing behavior are different.[25]

In our study, we found that despite being aware of the guidelines, surgeons' beliefs about whether NPOU was a problem for patients undergoing bariatric surgery were quite varied. As previous research suggests, surgeons' recognition of a problem may have a direct influence on their adherence to guidelines.[25,28] Further, even with guidelines in place, opioid prescribing is not often patient-centered, leading to overprescribing for most patients and under prescribing for others.[6,29] This could be, at least in part, due to the complexity of patient risk factors that also underlie NPOU. Therefore, surgeons may be more or less likely to follow the guidelines for opioid stewardship for the community based on their own beliefs about how their actions contribute to the problem. One potential means to address this is to create a mechanism that tracks patient-reported opioid use and then use it as a baseline for each individual hospital or clinic. This would complement many of the guidelines in this space, including the Michigan Pain-control Optimization Pathway and Michigan Open Guidelines.[16,30] This would not only help in the creation of additional evidence on potential differences based on patient factors, but could also serve as a way of flagging patients that may need more attention or follow-up. As previous research suggests, even where evidence exists, surgeons tend to rely on anecdotes more than evidence.[31] Greater insight into context-specific situations will allow for greater anecdotal evidence that decisions are often based on. This will allow surgeons to not only adjust their own discharge opioid prescribing practices, but also smooth transitions of care across providers for patients with ongoing pain management needs outside of the 3-month post-operative period, which is typically considered the window of acute post-operative pain.[32]

To facilitate this process, we must also address a second major factor in adherence to guidelines: the variation that exists in institutional resources and the need to further support surgeons from less resourced institutions. In our study, surgeons pointed out how variation in resources impacted their approach to discharge opioid prescriptions. For example, bariatric surgeons from higher-resourced institutions often acknowledge having other team members in place that oversaw screening calls from patients regarding post-operative concerns or refill requests. In contrast, surgeons at less resourced institutions discussed being the main contact for patients and their pain. In these instances, surgeons described their discharge prescribing practices as a way of mitigating inconvenience for patients (who were often described as having greater needs), as well as additional workload for themselves. This problem is not specific to bariatric surgery and is likely experienced in other elective and/or preference-sensitive conditions. For example, the practice of "convenience prescribing" opioids to patients in advance of elective inguinal hernia repair is associated with a significantly increased risk of NPOU after surgery.[33] While beneficial, a potential limitation of large-scale quality improvement projects is that they are often making population-level recommendations, ignoring the fact that individual surgeons and institutions have different access to resources. If we are committed to population health, we must ensure that we are drafting and implementing guidelines with provisions for less-resourced hospitals. In other words, we must view the establishment of these guidelines through an equity lens. As previous research has highlighted, we should rely on systems rather than individual clinicians.[25] But what are the implications of these initiatives when the resources available at hospitals vary? For guidelines to be equitably adopted, we need to address the factors that impact the ability of surgeons to adhere.

We acknowledge that our study has some limitations that should be considered. We employed convenience sampling instead of purposeful sampling to avoid an undue burden on the population with limited availability. Future studies should incorporate a purposeful approach that allows us to connect outcomes. The data generated from this study is specific to bariatric surgeons in Michigan and is not likely to be representative of views from bariatric surgeons across the country. We acknowledge that our study population was rather homogenous. However, it is worth noting that this sample is reflective of surgeons and practices that are part of MBSC (86% male, 90% teaching, 90% urban, 73% white). Additionally, variation is complicated, and surgeon behavior represents only one dimension of the mechanisms that underlie variation. Future studies should focus on the perspectives of other providers who are filling out prescriptions and talking to patients at discharge (e.g., clinic staff, residents/fellows, NP/PAs/RNs). Finally, the patient level factors presented are based on perspectives of the surgeons. Future studies should focus on the voice of patients.

5. Conclusion

Despite efforts aimed at addressing opioid prescriptions, variability exists in prescribing practices and beliefs among bariatric surgeons across Michigan. To address this variation and develop further guidelines aimed at opioid discharge practices, we must closely consider the contexts and factors that may impact stakeholder alignment and proficiency.

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Declaration of competing interest

No conflicts of interest, use of off-label or unapproved drugs or products, or use of previously copyrighted material.

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