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Opioid misuse and dependence screening practices prior to surgery.

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Abstract

Background: A majority of surgical patients are prescribed opioids for pain management. Many patients have pre-existing chronic pain managed with opioids and/or opioid use disorders (OUD) which can complicate peri-operative management. Patients who use opioids prior to surgery are at increased risk of developing OUD after surgery. To date, no studies have examined the prevalence of opioid screening and electronic medical record (EMR) documentation prior to surgery.

Materials and methods: A 40-item survey was administered to 268 patients at their first post-operative care visit at a single tertiary academic center from October 2017–July 2018. A chart review of a random sample of 100 patients was performed to determine provider opioid screening prevalence in the pre-surgical setting. Log-binomial models were used to calculate prevalence ratios (PR) to determine provider role (surgeon, advanced practice clinicians, surgical trainee) association with opioid screening documentation. Exploratory qualitative interviews were conducted with surgical providers to identify barriers to screening and screening documentation.

Results: Only 7% of patients were screened preoperatively for opioid use. A total of 38% of patients self-reported that they had used opioids in the past year. Of that group, only 3% had screening by a surgical provider prior to surgery documented in their EMR. Provider role was not associated with likelihood of opioid screening (surgeon versus trainee, PR =1.2, 95% CI 0.2–8.5) (surgeons versus APCs, PR=1.05, 95% CI 0.17–8.53). EMRs were discordant with patient survey results for patients with no ICD-10 codes for opioid use. The most common perceived barriers to pre-operative screening were insufficient clinic time; logistics of who should screen/not required as part of their clinical workflow; not perceiving screening as a priority; and lack of expertise in the area of chronic opioid use and OUD.

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Author Contributions:

HT, LH, SS, KS, VV, LG, CP crafted the research question, hypothesis, and study design. HT, LH, SS created the survey. HT, LH, SS, KS, VV, LG, CP collected the data. HT performed the data analysis while LH, KS, VV, LG, and CP provided critical interpretation of the data. HT drafted the manuscript. LH, SS, KS, VV, LG, and CP provided essential revisions to the manuscript. All authors approved the final draft of the manuscript.

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Conclusion: Pre-operative screening for opioid use is uncommon and EMRs are often discordant with patient self-reported use. Efforts to increase pre-operative screening will need to address barriers screening practices and increasing health system support by incorporating screening into the clinical workflow and adding it to documentation templates.

Keywords

Opioids; screening; education; prescribing providers

Introduction

Surgeons commonly prescribe opioids for pain management after surgery and account for at least 10% of all opioids prescribed in the United States (US)¹. The prescribing practices of surgeons have been under scrutiny as nearly 100 million Americans undergo surgery each year¹. Prior studies have shown over-prescribing of opioids among surgical patients is common²⁻⁶. An estimated 3–11% of opioid-naïve patients who use opioids after surgery will transition to chronic use and this risk is even higher in patients with prior or existing opioid use^{2, 3, 5, 7}.

Amidst the worsening U.S. opioid epidemic, providers are being encouraged to tailor opioid prescribing to individual patient needs. While the CDC guidelines⁸ are intended for primary care physicians managing chronic pain, many of the tenets are applicable to prescribing for acute pain. For example, screening for prior opioid use can assess both tolerance and potential risk of developing dependence⁹. However, to date, no studies have examined the rate of, or barriers to, routine screening by surgeons.

Public health interventions have done much to decrease rates of alcohol and tobacco use in past decades including changing the conversation surrounding their use and seeking treatment¹⁰. In many instances of social issues including as is the case for alcohol and tobacco, public health campaigns can help reframe the issue of misuse and dependence in a way that allows for patients to seek treatment options and receive necessary care¹¹. Therefore, when looking at opioids and patient's self-reporting of opioids, other substance misuse such as tobacco and alcohol act as an important control¹². Providers are also more accustomed to asking about alcohol and tobacco and so it is more likely to be found in the medical record¹³. However, the stigma surrounding opioid misuse and dependence^{11, 14, 15} can prevent surgical and other providers from screening and properly prescribing pain management options for their patients.

The objectives of this study were to 1) assess how often patients were pre-operatively screened for prior opioid use in the past year, 2) compare patient-reported opioid, tobacco, and alcohol use with EMR documentation, and 3) explore barriers and facilitators to routine pre-operative screening for opioids. We hypothesized that routine screening is rarely done and that one contributing factor is that electronic medical records (EMR) are often inaccurate in describing a history of opioid misuse or abuse for a patient. To test this, we used socially accepted substance use of alcohol and tobacco as controls and examined the consistency between patient-reported tobacco and alcohol use with recorded values in the EMR. To put our findings in context, we conducted exploratory interviews with surgeons,

advanced practice clinicians (APCs), and surgical trainees to identify potential barriers to routine screening.

Materials and methods

Study Design

We conducted a mixed-methods study to 1) determine how frequently patients are pre-operatively screened for opioid use, 2) whether patient-reported use of opioids, alcohol, and tobacco match EMRs, 3) explore potential barriers and facilitators to routine pre-operative opioid screening. The University of Utah Institutional Review Board approved this study.

At the University of Utah, we have been prospectively collecting patient-reported data on post-operative satisfaction, pain management, and opioid use since October 2017. Patients who underwent general, vascular, and plastic surgery operations are asked to complete a 40-item survey instrument at their first post-operative clinic visit. Patient are also asked about potential risk factors for developing chronic opioid use after surgery such as pre-operative opioid use, mental health disorders, smoking, and alcohol use. Our completion rate is 91.7% as patients are asked to complete the survey while they are waiting for providers in the clinic rooms. Patient responses are stored in a Research Electronic Data Capture (REDCap) database¹⁶. The pain management survey was developed through an iterative process in collaboration with survey design experts at the University of Utah Center for Clinical and Translational Science (CCTS). At the time of this study, we had survey data on 268 patients.

Chart review

We selected a random sample of 100 charts for in-depth review. The sampled patient list of medical record numbers was linked to patient's electronic medical records and a complete chart review was then performed by a single reviewer (HT). Pre-operative clinical notes, anesthesia notes, and history and physical documents were systematically reviewed for documentation of pre-operative screening for opioid use. As a teaching institution, all notes are cosigned by attending surgeons. However, for our analysis, we assigned the role of the provider to the person who first wrote the note (trainee, APC, or surgeon). Notes written by medical students were considered to be written by the surgeon.

Patients were identified as having been screened for opioid use if there was any documentation in the pre-operative clinical record describing discussions held with the patient regarding opioid use, or if patients were categorized with chronic opioid use/dependence ICD-10 codes (F11.21; F11.2). Alcohol and tobacco use were also gathered from the EMR by use of ICD-10 codes (F10; F17.2). Patients with a pain management plan were considered to have been screened. Provider and patient sex were recorded.

Chart review data was then compared with patient's self-reported responses for pre-operative opioid use along with more socially desirable substance abuse controls of tobacco, and alcohol use. This was done to ensure that the social stigma surrounding opioids did not create a barrier for discussion between patient and provider in acknowledging these social habits.

Statistical analysis

Descriptive statistics were performed on continuous and categorical variables to characterize the study population. Univariate associations were produced using chi-squared or Fisher's exact tests. For our primary objective to assess if providers documented opioid misuse in their patient's electronic medical record (EMR), we used log-binomial models to generate adjusted prevalence ratios (aPR) adjusting for provider age and sex. Data analysis was completed using Stata 15.1 software (College Station, TX).

Provider interviews

Exploratory qualitative interviews were conducted from a purposive sample with five surgical providers in the Department of Surgery at the University of Utah in order to better understand provider perspective regarding pre-operative screening for opioid use and identify barriers associated with screening. Providers consisted of two surgeons with more than a five-year history at the facility, a senior level general surgery resident, and two advanced practice clinicians with five and twenty years of experience, respectively. Providers were asked about their pre-operative opioid screening practices. Questions included whether they screen patients and if so, where do they document a patient's pre-operative opioid use; how they decide who to screen; provider and organizational barriers to screening and documentation; and how a history of pre-operative opioid use guides their clinical decision making for pain management options for their patients following surgery.

Results

Demographics

The demographics of the 100 patients sampled for chart review are shown in Table 1. Male and female patients were equally represented. The median patient age was 56 years old [IQR: 40–67]. The most common surgical specialties of the operations performed were vascular surgery (35%), breast (plastic) surgery (30%), and colorectal surgery (26%). A total of 87 patients had data for the primary endpoint of opioid use with 33 (38%) patients affirming that they used opioids in the past year. A total of 24 (24%) patients acknowledged alcohol use. Another 3 (3%) patients reported tobacco use. Out of 94 patients that responded to the question about chronic pain, 36 (37%) answered affirmatively (Table 1, Figure 1).

Pre-operative screening for opioid use

Ninety-three percent of patient's charts lacked documentation of pre-operative screening. No patient had an ICD-10 code related to opioid abuse/misuse/dependence in their charts. Of the seven patients who were pre-operatively screened for opioids, 3 (43%) reported opioid use in the past year. Of the 93 patients who were not screened, 35 (37%) reported opioid use in the past year (Figure 1).

The 100 patients were seen by 39 unique providers. A slight majority of providers were female (56%). No provider consistently documented screening for opioid misuse in all of their patients. Provider sex was also not associated with screening (males, 41%, females, 52%). Trainees were the largest group (43%) of providers followed by APCs (30%) and surgeons (27%). Provider role was not associated with likelihood of opioid screening

(surgeon versus trainee, PR =1.2, 95% CI 0.2–8.5) (surgeons versus APCs, PR=1.05, 95% CI 0.17–8.53).

Concordance/Agreement between patient-reported substance use and EMRs.

Again, 38% of patients self-reported opioid use in the past year while no patients had opioid misuse documented in the EMR. A total of 25% of those who self-reported no alcohol had EMR documentation to the contrary. Only two patient's EMR charts did not have alcohol use documented even though the patients self-reported alcohol use in the survey. Likewise, 40% of patients self-reported that they did not use tobacco; however, there was disagreement between the survey and chart since their EMR included tobacco use. No patients acknowledged tobacco use in the survey that wasn't also confirmed in the EMR, though the EMR reported that 16% more patients had tobacco use (Figure 2).

In qualitative interviews with surgical providers, the most common perceived barriers to routine pre-operative screening were not having sufficient time; lack of clarity about who is responsible for screening; screening not being part of their clinical workflow; and lack of pre-defined prompts or consistent location to document in charting templates (Table 2). Providers acknowledged that they screen only when they suspect opioid misuse in their patients and they did not have a systematic screening process built into their workflow. One APC reported that the stigma surrounding opioids prevents providers from documenting misuse in the patient's chart. They felt that if OUD were perceived as any other chronic condition such as hypertension or diabetes mellitus, then providers could have more upfront and open conversations with their patients. Overall, providers acknowledged that while they felt comfortable prescribing opioids, they were uncomfortable screening or providing a diagnosis of OUD and felt the responsibility should be with other providers. Surgeons reported that screening and documentation of opioid misuse was not within their scope of practice. Nor did they feel that they had the clinical expertise to make such a diagnosis.

Discussion

In our current study, we found that patients are rarely screened pre-operatively for opioids patient self-reported use of opioids, as well as substance abuse controls of alcohol, and tobacco does not match with the EMR; and surgical providers report significant barriers to routine pre-operative screening for opioids. Only 7% of patients had documented screening for pre-operative opioid use. There were significant discrepancies between patient reported opioid, alcohol, and tobacco use with what was recorded in the EMR. Providers identified time, cost, logistics, unsure who and how to screen and document, and expertise in pain management specialization as key reasons for not documenting screening in a patient's chart before surgery.

Our study found that nearly a third of patients used opioids in the year prior to surgery, but screening by providers was rare. Failure to identify patients with prior opioid use can lead to the higher than expected inpatient dosing of opioids which is associated with increased rates of mortality, respiratory depression and failure, and myriad other surgical complications^{17, 18}. A lack of screening can also have the unintended result of putting a patient back into a dependence situation after having previously overcome OUD. There has

been improved effort to identify chronic opioid use and misuse in patients in general¹⁹; however, the surgical environment is a key area where patients are receiving exposure to opioids and there is a lack of data on screening for opioid use and dependence.

In the patient sample, patients that were screened were on average older (61 years) and not a younger group as is typically seen in the opioid epidemic mortality population^{6, 20, 21}. During qualitative interviews, providers acknowledged that they screened patients for opioid misuse based on clinical suspicion or review of concurrent medications instead of just targeting a particular age group. When we looked at substance abuse controls that were deemed to be more socially acceptable than opioids, there was a discrepancy in acknowledgement for alcohol (16%) or tobacco use (40%) in a self-reported survey by patients even though it was documented by providers in the EMR. This could represent an error in the medical record or a change in behavior over time, but could also represent a lack of willingness for patients to acknowledge these habits. However, the fact that patients were more willing to acknowledge social habits with providers when asked directly, as seen in this study, could indicate a need for providers to screen for opioid misuse in their patients and not rely on patients to offer up that information prior to surgery or to depend on the EMR for accurate or up to date documentation of the condition^{22–25}. Furthermore, Goodyear et al., 2018 described how social stigma surrounding opioid misuse can have an effect on the delivery of patient care¹¹. Patients may not be willing to offer up this information and receive proper pain management unless providers carefully assess patients for opioid misuse and dependence. Green et al. showed a positive predictive value of ICD9/10 codes at 81% in classifying opioid overdoses and encouraged the use of the EMR to monitor opioid overdoses²⁴, but there seems to be a disconnect between screening for and giving patients a diagnosis of opioid misuse.

In exploratory qualitative interviews, surgical providers identified a number of barriers to pre-operative screening for opioids. Providers were comfortable prescribing opioids but hesitant to label patients as chronic opioid users or with OUD. They felt these diagnoses were outside of their clinical expertise. However, when asked if they refer to a pain management team before surgery, providers responded that time, costs, and logistics usually prevented them from doing so. This may represent a system-level opportunity to integrate routine screening with referrals to pain management services pre-operatively. Surgical providers felt that other providers should perform screening and assist in the management of patients using opioids chronically or with OUD. This is similar to a diagnosis of hypertension or diabetes, where surgical providers may provide management during an acute period of time after surgery, but transition ongoing management to primary care providers.

There are limitations to this study. This research was conducted at a single academic tertiary center and our findings may not be generalizable to other surgical settings or populations. Anecdotal evidence from discussions with many surgeons suggests though that lack of routine opioid screening is common. Also, since the rates of screening were so low, we could not examine the factors associated with screening. Providers reported that they screen patients they consider high-risk as well as whether there are predictors associated.

Conclusions

Many patients either have a past medical history of opioid misuse or are currently using opioids prior to surgery. This puts them at risk for either peri-operative complications or inadequate pain management. However, screening for pre-operative opioid misuse is rarely done. In addition, EMRs may not accurately reflect ongoing opioid, alcohol and tobacco use and need to be routinely updated. Significant barriers to routine pre-operative screening exist, notwithstanding the risks associated with not screening patients. Additional research is needed to understand barriers and generate buy-in from surgical providers and health systems, before effective implementation of opioid misuse screening and documentation in surgical patients can occur.

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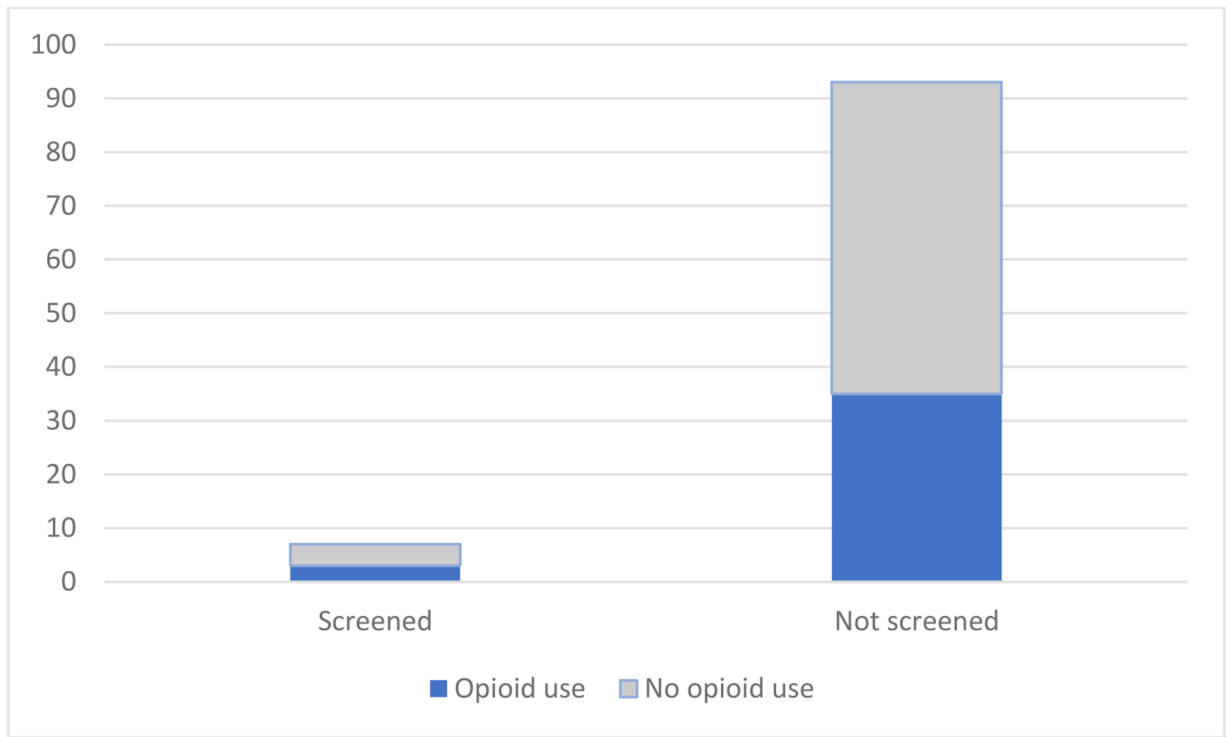


Figure 1:
Pre-operative screening for opioid use

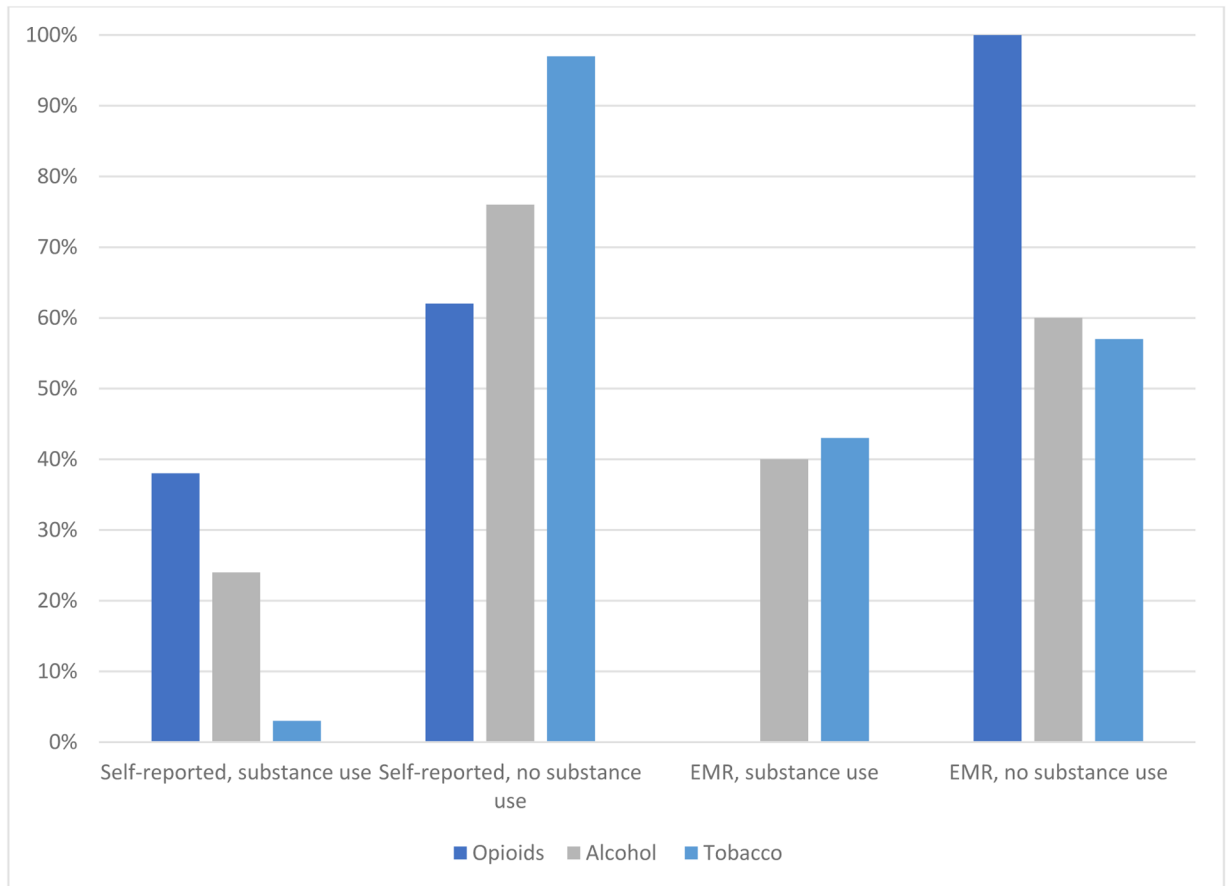


Figure 2:
Comparison of patient self-reporting versus EMR documentation of opioid, alcohol, and tobacco use

Table 1:

Patient demographics

Demographics	Responses	N= (%)
Patient gender		
Males	N=100	51 (51%)
Females		49 (49%)
Patient age	N=100	Median 56 (IQR 40–67)
Surgical specialty		
Breast (plastic surgery)	N=100	30 (30%)
Cancer (not other categories)		6 (6%)
Colorectal		26 (26%)
General		3 (3%)
Vascular		35 (35%)
Self-reported Opioid use in the past year		
Yes	N=87	33 (38%)
No		54 (62%)
Self-reported Chronic pain		
Yes	N=94	36 (37%)
No		58 (59%)

Table 2.

Surgical provider perspectives on pre-operative screening for opioids use

Theme	Quote
Barriers	<p>Provider: "Time, cost, logistics are all barriers to screening for opioid misuse."</p> <p>Provider: "Barriers are: that nothing is documented, patients are not up front about their opioid use, our Utah controlled substance database doesn't follow out of state folks who may have misuse issues."</p> <p>Provider: "I think if all providers felt this was like any other condition such as DM, HTN... it would get mentioned in all documentation where it is relevant to discuss."</p>
Unclear who should screen	<p>Provider: "Unsure where to document, not an expert in the area, sensitive to putting this in the chart without out proper workup and expertise."</p> <p>Provider: "I screen based on a history of abuse concern for additional abuse."</p> <p>Provider: "I don't have a system for [screening]."</p>
Not within surgical scope of practice/lack of expertise	<p>Provider: "Typically I have those with more expertise manage the pain."</p> <p>Provider: "I think we sometimes are not sure where or how to respectfully document [opioid misuse]."</p> <p>Provider: "Most physicians do not want to place that label [opioid misuse] on a patient without being 100% sure."</p>

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