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The Opioid Crisis

THE OPIOID CRISIS

The prescription opioid crisis: role of the anaesthesiologist in reducing opioid use and misuse

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Summary

Reports of strategies to prevent and treat the opioid epidemic are growing. Significant attention has been paid to the benefits of opioid addiction research, clinical prescribing, and public policy initiatives in curbing the epidemic. However, the role of the anaesthesiologist in minimising opioid use and misuse remains underexplored. For many patients with an opioid use disorder, the perioperative period represents the source of initial exposure. As perioperative physicians, anaesthesiologists are in the unique position to manage pain effectively while simultaneously decreasing opioid consumption. Multiple opportunities exist for anaesthesiologists to minimise opioid exposure and prevent subsequent persistent opioid use. We present a global strategy for decreasing perioperative opioid use and misuse among surgical patients. A historical perspective of the opioid epidemic is presented, together with an analysis of opioid supply and demand forces. We then present specific temporal strategies for opioid use reduction in the perioperative period. We emphasise the importance of preoperative identification of patients at risk for long-term opioid use and misuse, review the evidence supporting the opioid sparing capacity of individual multimodal analgesic agents, and discuss the benefits of regional anaesthesia for minimising opioid consumption. We describe postoperative and post-discharge tools, including effective multimodal analgesia and the role of a transitional pain service. Finally, we offer general institutional strategies that can be led by anaesthesiologists, identify gaps in knowledge, and offer directions for future research.

Keywords: anaesthesia; conduction; analgesics; narcotic; opioid-related disorders; perioperative medicine; multimodal analgesia; regional anaesthesia

An estimated 2 million individuals in the USA have an opioid-use disorder.[1] Based on recent data, an estimated 90 people die in the USA each day as the result of an overdose involving an opioid (about one person every 15 min).[2] Unintentional opioid overdose now exceeds motor vehicle accidents as the leading cause of death attributable to injury in the USA by a factor of 1.5.[3] The economic costs of the opioid crisis as a result of increased healthcare and substance abuse treatment costs, lost productivity, and criminal justice costs are estimated at nearly $80 billion annually.[4]

The perioperative period is an important source of new persistent opioid use. The rate of new persistent opioid use for

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US adult surgical patients without opioid use in the year before surgery is ~6% (*vs* 0.4% in a non-operative control cohort).[5] Opioid overprescription occurs regularly after surgery amongst almost all surgical specialties[6] with 42–71% of all the opioid tablets obtained by surgical patients going unused.[7] Unused postoperative prescription opioids may be an important source for diversion/non-medical use.[7,8]

By virtue of their position in the perioperative care of surgical patients, anaesthesiologists might play a central role in addressing the opioid epidemic and reducing overall opioid consumption.[9] There are many strategies or approaches to decrease the preoperative, intraoperative, and postoperative use of opioids. For example identification and optimisation of patients at risk of long-term opioid dependence; use of a perioperative multimodal non-opioid analgesia regimen, including regional blocks, paracetamol, and NSAIDs[10,11]; establishing standardised pathways of perioperative care; and institutional support of regulatory and compliance interventions might all decrease perioperative opioid consumption while providing effective analgesia and protecting patients from long-term opioid use and misuse.[12] Here, we provide an overview of these perioperative strategies for decreasing opioid use and place these in context of the overall opioid crisis in the USA. Similar approaches will be applicable to other regions as the opioid crisis spreads.

Opioid supply and demand

There are multiple concurrent inputs into the opioid epidemic and no one input can be considered the sole cause (Fig. 1). It is likewise difficult to determine the relative influence of each factor and how factors interact to contribute to the overall problem.

Regulatory bodies appear to have unintentionally played a role in the increased availability and prescribing of opioids. In 2001, The Joint Commission, a US-based organisation that accredits most US healthcare organisations and programmes, set standards that emphasised the monitoring and treatment of pain as the 'fifth vital sign'. This increased emphasis on pain surveillance and treatment resulted in a dramatic increase in opioid administration and opioid-related adverse events,[13] and has recently come under question.[14] At the same time, the Food and Drug Administration (FDA) approved Oyxcontin® (oxycodone) as a sustained-release preparation, marketed as an opioid with low abuse potential. The misconception that Oxycontin® was safe, effective, and less addictive contributed directly to increased sales and prescribing.[15] Medicaid, a US joint federal and state programme that covers medical costs for people with limited income and resources, may have also unintentionally contributed to the opioid epidemic. In the early 2000s, expansion of Medicaid allowed greater access to opioid prescriptions, although its role in contributing to the epidemic is somewhat controversial.[16] A database analysis of Medicaid enrollees with opioid prescriptions noted an average of 6.3 opioid prescriptions per person, with 40% having at least one indicator of potential inappropriate use.[17]

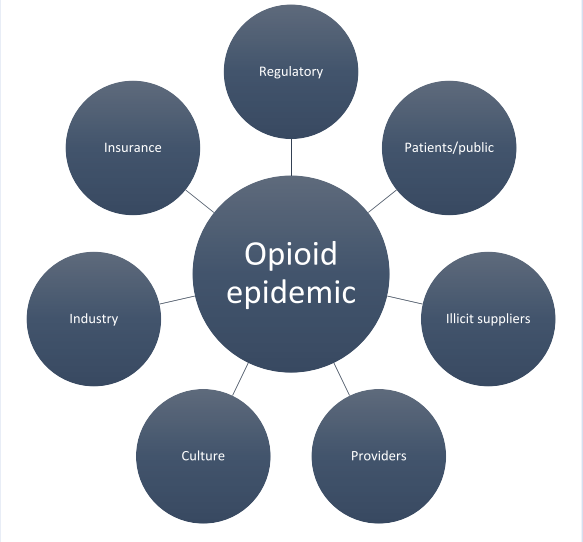

Fig 1. Inputs into the opioid epidemic. Various factors contribute to the current opioid epidemic. These are not specific to the perioperative period.

Healthcare providers have contributed to the opioid epidemic in part by increasing availability of these medications.[18] Opioid prescriptions have increased markedly with totals more than doubling from 43.8 million to 89.2 million from 2000 to 2010.[19] Opioids are among the most prescribed medications in the USA, and certain formulations initially designed for chronic cancer pain are increasingly prescribed for non-cancer pain.[19] This is driven largely by overreliance on opioids for treating acute pain,[20] and the overprescribing of opioids in postsurgical patients.[21] In addition, it has been proposed that US healthcare providers often have inadequate knowledge of appropriate opioid dispensing/dosing, opioid-related adverse events or non-opioid analgesic alternatives, and often prescribe greater amounts of opioids than needed.[21] Historically, prescribers were led to believe that opioids can be prescribed with only a minimal risk of abuse. The now infamous letter to the *New England Journal of Medicine* by Porter and Jick[22] suggested that addiction was rare with long-term opioid therapy. This highly cited and misinterpreted letter has been proposed to have directly contributed to the opioid crisis by falsely allaying concerns about the risks of opioid addiction.[23] Finally, although rare, there are reports of healthcare providers who illegally prescribe or dispense opioids without a legitimate medical purpose (so-called 'pill mills').[24]

The pharmaceutical industry and aggressive advertising to both consumers and providers have also been identified as contributors to the opioid epidemic.[25] The promotion of Oxycontin® by Purdue Pharma demonstrates the effectiveness of such marketing campaigns. From 1996 to 2001, Purdue conducted conferences across the USA to recruit physicians and pharmacists to become part of their national speaker bureau. Sales representatives were incentivised to sell Oyxcontin™ and used manipulative marketing practices to influence physician prescribing.[25] In addition to these tactics, Purdue claimed that the risk of addiction from Oxycontin® was extremely low,[25] and it thus became the most prevalent prescription opioid of abuse in the USA.[15]

Insurance and reimbursement issues may have also contributed to the opioid epidemic in the USA. With increasing pressure to care for more patients in less time, providers report limited capacity for counselling and education regarding safe opioid use. A lack of insurance coverage for non-opioid pain therapies is another contributing factor. Insurance companies have been accused of failing to apply

evidence-based criteria to discourage opioid overuse and encourage safer, non-opioid analgesic alternatives.[26] A recent report in the popular press concluded that insurance companies often make the approval process for non-opioid analgesics so onerous that physicians often have no other option than to prescribe opioids.[27] Therapies for non-opioid multidisciplinary approaches to pain control (such as transcutaneous electrical stimulation, physical therapy, acupuncture) are not consistently covered by insurance, and when denied, may lead to an overreliance on opioids.

Patient expectation of a pain-free surgical experience coupled with a cultural expectation of convenience and ease of obtaining healthcare have also been proposed as factors in the epidemic.[28] Americans utilise the most opioid dose equivalents per capita among all countries in the world,[29] and this is likely, at least in part, related to these expectations. Public opinion of healthcare providers may further influence prescribing patterns and the willingness of providers to distribute opioids to patients. Many hospitals utilise patient satisfaction surveys such as Press Ganey, which is considered to be a leading provider for evaluating patient experience. Patients receiving prescription opioids are more likely to be highly satisfied with their care.[30] In addition, pain scores have been found to correlate with patient satisfaction,[31] and patient expectations of having 'no pain' may lead to increasing frequency and dosage of prescribed opioids.[14]

An allied public health crisis that must be addressed in the USA is the heroin epidemic. Over the past several years, there has been an increase in the heroin supply coming into the USA[32] in parallel with marked increases in both heroin and prescription opioid use. Indeed, the incidence of exclusive heroin use has doubled from 2008 to 2014.[32] Over the past 30 yr, the purity of heroin has dramatically increased (from ~10% in 1980 to ~40% by 2000), while the price has decreased (from more than $3200 per gram in 1981 to ~$600 per gram in 2012).[33] The links between the opioid and heroin epidemics are complex, but it has been proposed that a substantial proportion of patients addicted to heroin initially abused prescription opioids and later transitioned to heroin abuse.[32]

Perioperative opioid prescriptions are an important source of new opioid use, and surgical patients are frequently prescribed more medication than they require.[34–36] Overprescribing and a lack of awareness and patient education regarding proper disposal have led to the increased availability of opioids which, in turn, has become a source for diversion and misuse.[34] Indeed, a substantial proportion of non-medical opioid use has been linked to individuals obtaining prescribed medications from a friend or relative.[37] The diversion of regulated pharmaceuticals from legal sources to illicit marketplaces further contributes to the opioid supply. Opioid diversion has been identified as a factor contributing to rising rates of prescription drug abuse since the mid-1990s.[38] Diverted drugs mostly come from 'doctor shoppers', inappropriate prescribing practices by physicians, and improper dispensing by pharmacists.[38]

The anaesthesiologist as part of the solution

Anaesthesiologists can intercede at several points in the perioperative period to limit both the supply of and demand

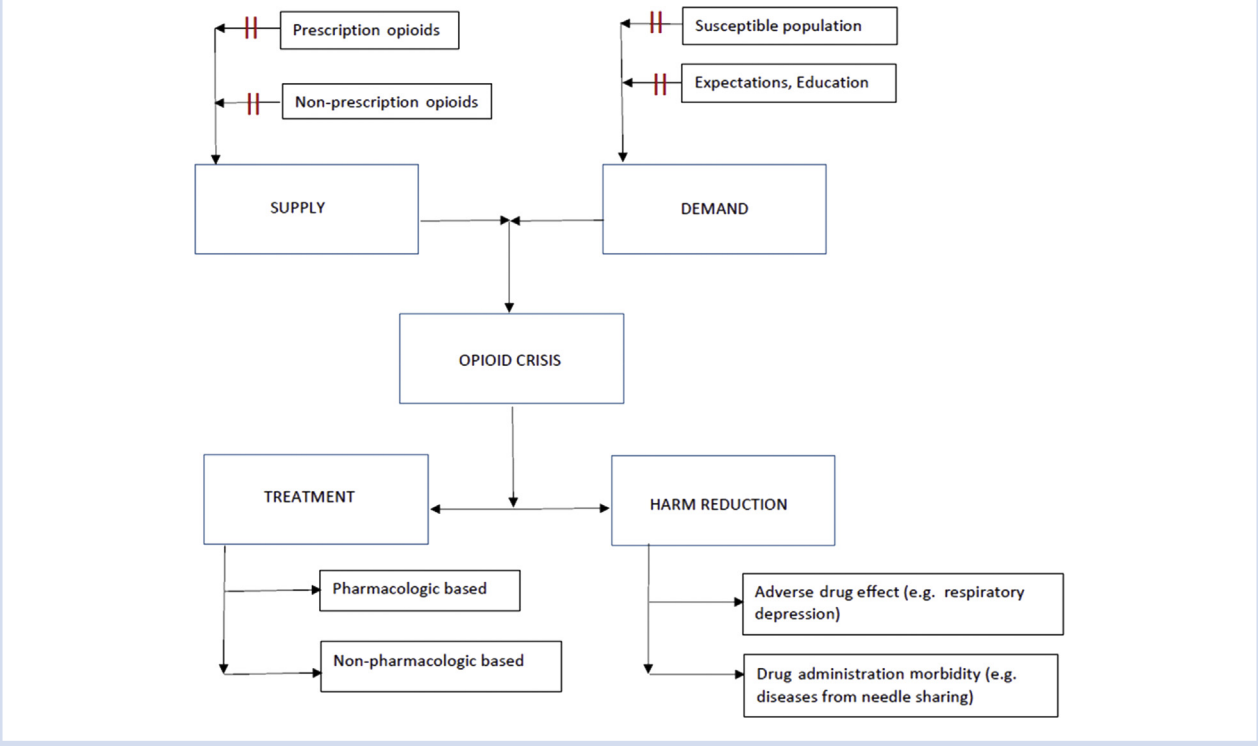

Fig 2. Potential role of anaesthesiologists in addressing the opioids crisis. Possible areas of intervention for anaesthesiologists in decreasing perioperative opioid use.

for opioids (Fig. 2). The overall perioperative goals for the anaesthesiologist are to provide adequate analgesia to facilitate patient recovery after surgery and minimise the amounts of opioids used while achieving these goals. A comprehensive multimodal analgesic regimen (concurrent use of primarily non-opioid analgesic agents and techniques) tailored to the patient and surgical procedure may potentially decrease the significant risks of harm associated with opioid use[39] including increased perioperative morbidity, length of hospital stay, readmission, and overall hospital costs.[40,41] Opioids should ideally be the last analgesic administered in opioid-naïve patients (i.e. used when all other non-opioid agents/techniques have failed) and used in the lowest dosage and for the shortest time possible.

Preoperative management

Patient education and expectation setting represents an early opportunity for positive intervention. Tempering patient expectations for pain management after surgery, educating patients on what to expect after surgery and how pain can be managed with non-opioid options, and educating patients and their families on the dangers of opioid analgesics may potentially decrease the demand for opioids in the perioperative period. Information regarding risks of sharing medications, long-term dependence or addiction, and methods for safe storage and disposal are key aspects of educating patients regarding opioid use. Preparing patients for anticipated pain and providing information about an analgesic plan has been associated with better clinical outcomes in various settings.[42,43]

The presence of preadmission use of opioids is associated with worse perioperative outcomes[44,45] and the preadmission weaning of opioids in those taking opioids before surgery may improve perioperative outcomes. Many studies have suggested a generally consistent association between preoperative chronic opioid use and worsened postoperative outcomes including higher levels of pain and opioid consumption, increased hospital length of stay, worsened postoperative function, prolonged recovery, greater resource utilisation, and higher incidence of complications.[46–48] Preoperative reduction of opioid use before surgery resulted in improvements in both disease-specific and generic measures of health outcomes compared with patients who did not wean.[40]

Identification of patients who are at higher risk for long-term opioid use may theoretically allow for preoperative interventions to decrease postoperative long-term opioid use.[49] Observational studies indicate that the presence of depression and greater catastrophising may be predictors of long-term opioid use even in opioid-naïve patients.[50,51] Risk factors independently associated with new persistent opioid use after surgery include preoperative tobacco use, alcohol and substance abuse disorders, mood disorders, anxiety, and preoperative pain disorders. These patients may take opioids long-term not for surgical (incisional) pain control, but to treat emotional pain and affective distress.[5,50,51] Adherence (*vs* non-adherence) to antidepressant medications is associated with opioid cessation in non-cancer pain and as such, tapering opioids may be more successful when depression is treated to remission.[52] Of note, the use of antidepressants facilitates long-term smoking cessation[53] and the endogenous opioid system is involved in the rewarding effects of nicotine, which may be similar to that for opioids.[54]

In the immediate preoperative period (day of surgery), administration of analgesics [e.g. paracetamol, cyclooxygenase 2 (COX-2) inhibitors, gabapentinoids] before surgery may be associated with a decrease in postoperative pain and opioid use. The preoperative administration of paracetamol is associated with reduced postoperative pain scores, opioid consumption, and postoperative nausea and vomiting (PONV).[55] There are several meta-analyses suggesting a benefit of preoperative COX-2 inhibitors in decreasing postoperative pain, opioid consumption, and PONV.[56,57] COX-2 inhibitors have a minimal effect on platelet function, and a meta-analysis found no increased risk of perioperative bleeding with their use.[58] Meta-analyses indicate that a single dose of a gabapentinoid administered before surgery can decrease postoperative pain and opioid consumption, but increase postoperative sedation, dizziness, and visual disturbances.[59,60] More recent data question the clinically relevant beneficial effect of preoperative gabapentinoids, especially when added to multimodal analgesia due in part to the low quality of available evidence.[61] Furthermore, a long-term abuse potential of gabapentin has been well documented.[62]

Intraoperative management

There are many analgesic agents and techniques that can be used to decrease perioperative opioid use. The specific combination of non-opioid analgesic agents and techniques will depend on surgical (e.g. site of surgery, surgical approach) and patient (e.g. presence of comorbidities or medical contraindications) factors.

Use of a regional anaesthetic-analgesic technique has been shown to decrease perioperative opioid use. The majority of nerve blocks used for peripheral regional anaesthesia are associated with a reduction in postoperative pain or opioid consumption.[63] The use of intrathecal morphine without a local anaesthetic results in decreases in opioid requirement intraoperatively and up to 48 h after surgery, especially after abdominal surgery.[64] For laparoscopic procedures, meta-analyses[65,66] indicate that use of transversus abdominis plane (TAP) blocks can be a valuable technique for providing superior analgesia and decreasing postoperative opioid consumption. It should be noted that local anaesthetics from TAP blocks can lead to detectable systemic concentrations that exceed commonly accepted thresholds of local anaesthetic systemic toxicity.[67]

When possible, the use of a regional analgesic catheter technique may be preferable to allow continuation of local anaesthetic infusions to provide superior analgesia *vs* opioid alone regimen and decrease postoperative opioid use.[68] In cases where regional analgesic catheters are not available, the addition of additives to the single-shot block can prolong the duration of analgesia and decrease postoperative opioid use.[69,70] Wound infiltration with local anaesthetics reduces both pain and opioid consumption for some surgical procedures,[71,72] and administration of a continuous infusion of local anaesthetics via wound catheters can decrease opioid consumption, but without any significant decrease in pain scores.[73]

Total intravenous anaesthesia (TIVA) may also be associated with reduced perioperative opioid use and opioid-related side-effects. In a randomised controlled trial (RCT), patients undergoing bariatric surgery who received an opioid-free TIVA with propofol, ketamine, and dexmedetomidine (*vs* general anaesthesia with volatile anaesthetics and opioids) had a large

reduction in the relative risk of PONV.[74] Perioperative ketamine administered in subanaesthetic doses may decrease opioid requirements in the first 24 h after surgery,[75] but improved postoperative analgesia was not observed in a recent large muticentre trial.[76]

Perioperative adjuvant analgesic agents such as magnesium and lidocaine infusions may also reduce postoperative pain and opioid use. Several systematic reviews indicate that the use of perioperative i.v. lidocaine results in less postoperative pain and opioid consumption and earlier return of gastrointestinal function after open surgical procedures.[77–79] Most studies included in these meta-analyses of i.v. lidocaine use noted no side-effects, although some studies noted mild headache, lightheadedness, and dry mouth.[77–79] A meta-analysis of RCTs of perioperative magnesium infusion suggests a decrease in postoperative pain and opioid consumption without any increase in dizziness, headache, or cardiovascular side-effects.[80]

Postoperative management

Use of a multimodal analgesia regimen is the key to decreasing opioid consumption in the postoperative period. Several meta-analyses suggest that the perioperative use of NSAIDs results in significant reductions in pain scores and opioid consumption.[81–83] Compared with opioids alone, NSAIDs (including COX-2 inhibitors) added to opioids provide superior analgesia and an opioid-sparing effect that is associated with a decrease in some opioid-related adverse effects such as PONV and sedation.[84] There are numerous meta-analyses examining the use of paracetamol for treatment of postoperative pain.[85–87] Like that seen with NSAIDs, paracetamol added to opioids produces superior analgesia and an opioid-sparing effect that is associated with reduced PONV.[88] Concurrent administration of paracetamol and NSAIDs results in an additive, if not synergistic, analgesic effect.[89]

Continuation of regional analgesia catheters utilising a local anaesthetic-based regimen may reduce postoperative opioid use. Likewise, continuation of i.v. infusions of either ketamine or lidocaine after operation may decrease postoperative opioid use, although the optimal parameters (i.e. duration, dose) for these agents are not certain. Use of dextromethorphan, an N-methyl-D-aspartate receptor antagonist, for postoperative pain has been reported and systematic reviews suggest that administration of perioperative dextromethorphan may reduce both opioid consumption and pain scores after surgery.[90,91]

Post-discharge management

Compared with the amount of data available examining multiple analgesic agents and techniques to decrease perioperative opioid use, there is relatively much less evidence to guide clinicians in decreasing opioid use after hospital discharge. It is clear that opioids are not regularly prescribed in a patient- or procedure-specific manner to postoperative patients, and opioid overprescribing occurs regularly after surgery amongst almost all surgical specialties.[6,7,35] A systematic review noted that 67–92% of surgical patients reported unused opioids and 42–71% of all opioid tablets obtained by surgical patients went unused.[7] These unused opioids are easily accessible for unintended purposes, as 73–77% of patients reported that their prescription opioids were not stored in locked containers.[7]

One of the difficulties in determining the appropriate amount of opioids to prescribe a particular postoperative surgical patient is the lack of large-scale data on post-discharge pain trajectories and opioid usage for the typical patient. Accurately determining the pain trajectories for specific surgical procedures may allow clinicians to optimise analgesic regimens.[92] Applying pain-related interventions, particularly those of a pain-related cognitive and affective nature, in patients identified as having a high pain trajectory may result in a reduction in pain intensity and pain disability.[93]

There is similarly a lack of specific guidance on postoperative weaning of opioid and non-opioid analgesics in the postoperative period. Available guidelines provide general recommendations (e.g. clinicians provide education to all patients and primary caregivers on the pain treatment plan, including tapering of analgesics after hospital discharge),[94] but there is a lack of granularity in specific weaning parameters for individual patients or surgical procedures. Nevertheless, a multimodal approach using primarily non-opioid analgesics similar to that administered in the postoperative period may be sufficient for most patients after hospital discharge.

Postoperative clinics coordinated by anaesthesia providers may be instrumental in the weaning of opioids and other analgesics in the postoperative period.[95,96] One example of this is the Toronto General Hospital's Transitional Pain Service, which focuses on mitigating the transition from acute to chronic pain and provides a post-discharge pain treatment plan including weaning from opioid medications after assessment for opioid addiction risk and a signed opioid agreement contract.[97]

General strategies for decreasing opioid consumption

The preceding discussion highlights multiple opportunities for anaesthesiologists to provide opioid-minimising interventions to patients undergoing surgery. These opportunities have been successfully translated into clinical pathways of care in a variety of surgical subspecialties—most prominently, for joint arthroplasty.[98]

Pathways of care, enhanced recovery after surgery, and the perioperative surgical home

Clinical pathways have been consistently associated with improved analgesia and opioid-sparing effects when administered as bundles of care at discreet intervals during the surgical episode.[99] More modern perioperative care models, such as enhanced recovery pathways (ERP),[100] enhanced recovery after surgery (ERAS), and the Perioperative Surgical Home,[101] rely on anaesthesiologists as the 'integrators' of care, coordinating and delivering evidence-based interventions to positively affect outcomes. A shared theme of these care models is to balance analgesia with opioid- and harm-reduction strategies across the perioperative period. Indeed, multimodal opioid-minimising analgesia has been proposed as a key element behind ERAS success in improving the physiology of recovery after painful surgery.[102]

Despite evidence linking ERPs to opioid-sparing benefits,[10] there are minimal data to associate care models with post-discharge prescribing. Further, there is a paucity of published protocols that include guidelines for post-discharge opioid prescribing. This is a missed opportunity which is

highlighted in a recent before-and-after study of the impact of a colorectal ERP pathway. Although there was a significant increase in the use of opioid-free anaesthesia and multimodal analgesia, the pathway had no impact on post-discharge opioid prescribing practices.[103] Before recommendations can be included within pathways of care, more research is required to establish procedure-specific pain trajectories and the quantity and duration of opioids (together with non-opioid multimodal analgesic agents) required to achieve adequate analgesia. Ultimately, institutional-based guidelines for post-operative opioid prescribing should be incorporated into perioperative pathways of care.

Institutional strategies for decreasing opioid consumption

Anaesthesiologists are well positioned to guide rational opioid prescribing, oversee patient and practitioner education programs, and leverage health information technology (HIT) to reduce overprescribing. Each of these measures has been associated with opioid use reduction and improvements in safe opioid use and prescribing.[104] Reports[105–107] and consensus guidelines[108] that establish average opioid requirements by surgical procedure are emerging. Recent data support the use of procedure-specific guidelines as a mechanism to curtail inappropriate prescribing—by ~50% in one series.[109] An allied benefit of standard prescribing tools is that discussions surrounding expected opioid use and duration become less emotionally charged and aid patient interaction and rapport. The American Academy of Orthopaedic Surgeons has endorsed standardised prescribing as a strategy to 'depersonalise' discussion with patients, and facilitate conversation about risk, benefit, and appropriateness of opioids in recovery.[110] Research guiding the appropriate amounts of post-discharge opioid use is likely to yield variable results for individual patients and institutions performing the same procedure. There have been recent calls for anaesthesiologists to partner with surgical colleagues to establish local limits on prescribing throughout the perioperative period.[111]

Provider and patient education

Prescriber awareness of the risks and benefits of opioid analgesia has been proposed to lead directly to reductions in harmful prescribing.[112] Despite broad public attention to the opioid epidemic, many practicing physicians received little or no training during medical school or residency on these topics.[113] There is an opportunity and a responsibility for the institution to assume this role. Structured continuing medical education programs incorporating the evidence for safe opioid prescribing with methods for choosing and monitoring controlled substances have been described and are associated with positive changes in opioid prescribing habits.[109,114]

Patient education interventions are also effective for changing behaviours and improving clinical outcomes after surgery.[115,116] Patient education (emphasising the dangers of sharing medications, risk of long-term dependence or addiction, and methods for safe storage and disposal) regarding the risks of therapy has long been recommended as part of opioid prescribing.[117] However, there are minimal data to evaluate the effectiveness of patient education, what content should be included, or how education interventions should be delivered. We recently described our institution's anaesthesiologist-led program for patient and prescriber education, directed toward minimising opioid prescribing after elective orthopaedic surgery.[104] Evaluation of the program across subspecialties is in process, but early reports indicate a significant reduction in opioid prescribing.[109] Similar gains have been reported for structured educational interventions in other surgical specialties.[118,119]

HIT is increasingly applied in an attempt to improve the quality, efficiency, and safety of healthcare.[120] Reports using HIT to target safe opioid use often describe simple, yet highly effective and scalable interventions. For example, implementing a clinician dashboard improved practitioner adherence to institutional opioid prescribing protocols.[121] Lowering prescription defaults in the electronic medical record system led to a 15% reduction in opioid prescribing.[122] Finally, the use of smart phones and secure applications can be used to manage 'pill counts' and protect against drug diversion for patients on opioid or buprenorphine maintenance therapy.[123] The use of HIT also supports regulatory requirements for prescribing. A leading example is the Prescription Drug Monitoring Program (PDMP), a state-mandated requirement in most regions of the USA that provides data regarding all controlled substance prescriptions for individual patients. Accessing electronic real-time information about patients' prescription opioid status using the PDMP has been linked to reductions in the opioid quantity prescribed, and in high-risk opioid prescribing.[124,125] Although encouraging, factors other than checking the PDMP can influence prescriber behaviour.[126]

Role of the chronic pain specialist

Our discussion has focused on the role of the perioperative anaesthetist and their potential role in addressing the opioid crisis. Although beyond the scope of this article, it is important to note that chronic pain specialists are an integral part in addressing the opioid crisis. With their extensive knowledge of analgesics and experience in multimodal, multidisciplinary pain management, chronic pain specialists are a natural choice to lead efforts in setting policies, regulations, and guidelines at the departmental, institutional, and national levels. Pain specialists are also well positioned to identify patients at high risk of problematic analgesic and sedative use.[127]

Conclusions

The opioid epidemic has taken an enormous personal and economic toll. The causes and inputs into the increased opioid supply and demand are complex and often interrelated. Although the perioperative period may play a relatively small role in the overall opioid crisis, surgical patients are an important source of new chronic opioid users and unused prescription opioids. Anaesthesiologists can play a central role in addressing the opioid epidemic and reducing overall opioid consumption. There are many perioperative strategies that may reduce in-hospital opioid administration, although these need to be combined with other post-discharge strategies or care pathways to provide effective long-term reductions in opioid consumption.

Authors' contributions

Substantial contribution to conception and design, acquisition of data, or analysis and interpretation of data; drafting the

article or revising it critically for important intellectual content; final approval of the version to be published; and agreement to be accountable for all aspects of the work thereby ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved: all authors.

Declaration of interest

The authors declare that they have no conflicts of interest.

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