

Role of the Perioperative Surgical Home in Optimizing the Perioperative Use of Opioids

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Several federal agencies have recently noted that the United States is in the midst of an unprecedented “opioid epidemic,” with an increasing number of opioid-related overdoses and deaths. Providers currently face 3 population-level, public health challenges in providing optimal perioperative pain care: (1) the continued lack of overall improvement in the excessive incidence of inadequately treated postoperative pain, (2) minimizing or preventing postoperative opioid-related side effects, and (3) addressing current opioid prescribing patterns, and the accompanying problematic surge in prescription opioid diversion, misuse, abuse, addiction, and overdose. In the Perioperative Surgical Home model, anesthesiologists and other pain medicine specialists are uniquely qualified and positioned to develop, implement, and coordinate a comprehensive perioperative analgesic plan, which begins with the formal preoperative patient assessment and continues throughout the postdischarge, convalescence period. The scope and practice of pain management within the Perioperative Surgical Home should thus (a) expand to include routine preoperative patient-level pain-risk stratification (including the chronic use of opioid and nonopioid analgesics), (b) address the multitude of biopsychosocial factors that contribute to interpatient pain variability, and (c) extend and be well coordinated across all 4 phases of the surgical pain experience (preoperative, intraoperative, postoperative, and postdischarge). Specifically, safe and effective perioperative pain management should include a plan of care that is tailored to the individual patient’s underlying disease(s), presence of a chronic pain condition and preoperative use of opioids, and the specific surgical procedure—with evidence-based, multimodal analgesic regimens being applied in the vast majority of cases. An iteratively evolutionary component of an existing institutional Perioperative Surgical Home program can be an integrated Transitional Pain Service, which is modeled directly after the well-established prototype at the Toronto General Hospital in Ontario, Canada. This multidisciplinary, perioperative Transitional Pain Service seeks to modify the pain trajectories of patients who are at increased risk of (a) long-term, increasing, excessive opioid consumption and/or (b) developing chronic postsurgical pain. Like the Perioperative Surgical Home program in which it can be logically integrated, such a Transitional Pain Service can serve as the needed but missing linkage to improve the continuum of care and perioperative pain management for elective, urgent, and emergent surgery. Even if successfully and cost-efficiently embedded within an existing Perioperative Surgical Home, a new perioperative Transitional Pain Service will require additional resources. (Anesth Analg 2017;XXX:00–00)

L'enfer est plein de bonnes volontés ou désirs [Hell is full of good wishes or desires]

Saint Bernard of Clairvaux (c. 1150)

Like the US health care system in which it has been positioned, the Perioperative Surgical Home (PSH) continues to evolve.¹ Nevertheless, the PSH remains essentially a highly collaborative, interdisciplinary, comprehensive, and innovative model of care.^{2–4}

A well-coordinated and well-integrated PSH model can more consistently and effectively guide the patient through the entire surgical continuum (“the patient’s surgical

journey”), from the initial decision to undergo surgery and needed preoperative medical optimization and prehabilitation, through the intraoperative and immediate postoperative care, and well into the posthospital discharge and rehabilitation phase.^{2,4,5}

Key characteristics of any PSH model are a significantly expanded scope of perioperative services, extended clinical timeframe, reduced variability, integrated transitions of care, patient-clinician shared decision-making about surgery versus its alternatives, and patient-centeredness.^{2,6}

The PSH is well positioned to serve as the required “integrator” for achieving and leveraging the Institute for Healthcare Improvement Triple Aim of (1) improving the individual experience of care, (2) improving the health of populations, and (3) reducing per capita costs of care, for surgical patients.⁷ Moreover, with its patient-centric team approach, effective coordination of care, robust communication among providers, rigorous outcomes data analysis, and continuous quality improvement, the PSH can further advance the still nascent efforts at perioperative population health management.⁸

As we will discuss here, optimizing the perioperative use of opioids is another tangle and opportune way that

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the PSH can (a) identify, implement, and sustain applicable evidence-based “best practices,” (b) promote perioperative population health management, and ultimately, (c) achieve the continued 3 vital and interdependent goals of the Institute for Healthcare Improvement Triple Aim.

BACKGROUND AND RATIONALE

As noted in 2015 by a multidisciplinary panel of the American Academy of Pain Medicine (AAPM)⁹: “The practice of acute pain medicine is once again gaining attention as megatrends converge.” This AAPM panel attributed this phenomenon to several key factors⁹—all of which are directly applicable to the role of the PSH in optimizing the perioperative use of opioids:

- As health care systems seek to provide highest-quality yet most cost-efficient care, any means to decrease complications, facilitate recovery, shorten hospital and postacute care lengths of stay, and mitigate hospital readmissions after surgery are being emphasized.
- Acute pain control after the 70 million annual surgical procedures in the United States represents likely “low-hanging fruit” for cost savings.
- Acute pain control is a key component of many contemporary clinical care pathways—including enhanced recovery after surgery protocols.
- Reliance on unimodal intravenous and/or oral opioids is associated with major and sometimes fatal side effects—mandating a concerted effort to administer instead equally, if not more effective, yet safer, multimodal, opioid-sparing analgesic regimens.
- Better postoperative acute pain control may reduce the risk of chronic postsurgical pain.
- Effective acute pain management can increase patient satisfaction and decrease total longer-term health care costs.

It is worth noting that conspicuously missing from this AAPM panel findings were the 2 very important domains of the patient engagement and patient experience and the vital efforts needed to enhance them.

In June 2016, the US Department of Health and Human Services rather alarmingly stated, “Our nation is in the midst of an unprecedented opioid epidemic. More people died from drug overdoses in 2014 than in any year on record, and the majority of drug overdose deaths (more than 6 of 10) involved an opioid.”¹⁰ The US Centers for Disease Control and Prevention simultaneously issued a series of 12 evidence-based recommendations for (primary care) clinicians who are prescribing opioids for chronic pain outside of active cancer treatment, palliative care, and end-of-life care (Figure 1).¹¹ These US Centers for Disease Control and Prevention recommendations likely can be validly extrapolated to acute-on-chronic pain management, including in the postoperative setting, and chronic postsurgical pain.

PERIOPERATIVE OPIOIDS—POPULATION HEALTH—INDIVIDUAL PATIENT WELL-BEING

As insightfully observed by Kharasch and Brunt,¹² surgeons, anesthesiologists, and hospitalists currently face 3 population-level, public health challenges in providing optimal

CDC Recommendations

- **Determining when to initiate or continue opioids**
 1. Opioids are not first-line therapy
 2. Establish goals for pain and function
 3. Discuss risks and benefits
- **Opioid selection, dosage, duration, follow-up & discontinuation**
 4. Use immediate-release opioids when starting
 5. Use the lowest effective dose
 6. Prescribe short durations for acute pain
 7. Evaluate benefits and harms frequently
- **Assessing risks and addressing harms**
 8. Use strategies to mitigate risk
 9. Review prescription drug monitoring program (PDMP) data
 10. Use urine drug testing
 11. Avoid concurrent opioid and benzodiazepine prescribing
 12. Offer treatment for opioid use disorder

Figure 1. US CDC series of evidence-based recommendations for prescribing opioids.¹¹ CDC indicates Centers for Disease Control and Prevention.

perioperative pain care: (1) the continued lack of overall improvement in the excessive incidence of inadequately treated postoperative pain, (2) minimizing or preventing postoperative opioid-related side effects, and (3) addressing current opioid prescribing patterns, and the accompanying problematic surge in prescription opioid diversion, misuse, abuse, addiction, and overdose.

In opioid-naïve patients, a number of surgical procedures are associated with an increased risk of subsequent chronic opioid use in the postoperative period.^{13,14} In a large population-based retrospective cohort study, approximately 3% of previously opioid naïve patients continued to use opioids for more than 90 days after major elective surgery.¹⁴ Male sex, age older than 50 years, and a preoperative history of drug abuse, alcohol abuse, depression, benzodiazepine use, or antidepressant use have been associated with subsequent chronic postoperative opioid use in another diverse cohort of surgical patients.¹³

Management of the chronic opioid-tolerant patient who comes to surgery is especially vexing.¹⁵ When opioids are administered in the immediate postoperative period, differential tolerance to analgesia versus respiratory depression can occur.¹⁶ Surgical patients who were receiving chronic opioids for pain control preoperatively, especially at high doses, should be assumed to have developed less tolerance to opioid-induced respiratory depression than to analgesia.¹⁶ While the dose required to reach this equianalgesic effect will likely be much greater in the opioid-tolerant patient, an equianalgesic opioid dose administered perioperatively will cause more respiratory depression in opioid-tolerant than in opioid-naïve patients. “In other words, contrary to what intuitively would seem to be the case, the opioid-tolerant patient is at an increased risk for respiratory depression when his or her postoperative pain is treated adequately with opioids.”¹⁶

DELIVERING COMPREHENSIVE PAIN MANAGEMENT WITHIN THE PSH

In the PSH model, anesthesiologists and other pain medicine specialists are uniquely qualified and positioned to develop, implement, and coordinate a comprehensive perioperative analgesic plan, which begins with the formal preoperative patient assessment and continues throughout the postdischarge, convalescence period.^{15,17}

Transitional Pain Service: The Missing and Needed Linkage

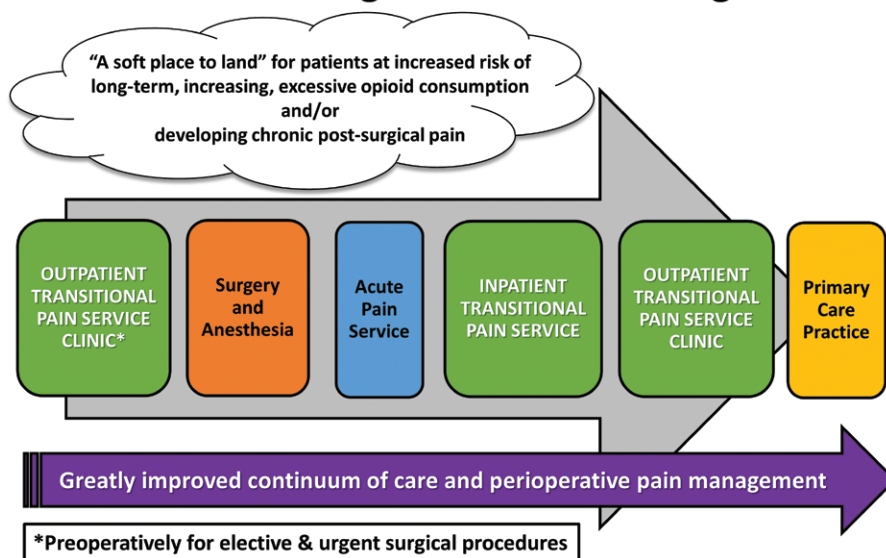


Figure 2. The integrated, patient-centered role of a perioperative Transitional Pain Service.

The scope and practice of pain management within the PSH should thus (a) expand to include routine preoperative patient-level pain-risk stratification (including the chronic use of opioid and nonopioid analgesics), (b) address the multitude of biopsychosocial factors that contribute to interpatient pain variability, and (c) extend and be well coordinated across all 4 phases of the surgical pain experience (preoperative, intraoperative, postoperative, and postdischarge).^{15,17,18}

Specifically, safe and effective perioperative pain management should include a plan of care that is tailored to the individual patient’s underlying disease(s), presence of a chronic pain condition and preoperative use of opioids, and the specific surgical procedure—with evidence-based, multimodal analgesic regimens being applied in the vast majority of cases.^{11,15,17,19,20} Such a patient-tailored, opioid-sparing, multimodal analgesic regimen has been effectively defined and consistently applied in reported PSH models.^{21–24}

Strategies for clinicians to mitigate perioperative opioid misuse and abuse include not only a comprehensive patient assessment but also applying pain-related “universal precautions,” which specifically include the use of multimodal analgesia and abuse-deterrent opioid formulations, urine toxicology screening, participation in prescription drug monitoring, and risk evaluation and mitigation strategy programs.²⁵

Furthermore, as recently posited by Irvine et al,²⁶ more routine point-of-care genotypic testing (egg, of the polymorphic CYP2D6 allele) can help bridge the gap between standardized care and precision medicine. When this commercially available genotypic testing becomes more assuredly available at the bedside and widely covered by payers, this measured, individualized approach would be equally applicable in the acute, chronic, acute-on-chronic, and chronic postsurgical pain patient.

ROLE OF A TRANSITIONAL PAIN SERVICE

An iteratively evolutionary component of an existing institutional PSH program can be an integrated Transitional Pain

Service, which is modeled directly after the well-established prototype at the Toronto General Hospital, a 471-bed, major urban, teaching, and safety-net hospital in Ontario, Canada.²⁷

Like the existing PSH program in which it can be logically integrated, such a Transitional Pain Service can serve as the needed but missing linkage to improve the continuum of care and perioperative pain management for elective, urgent, and emergent surgery. A longitudinal Transitional Pain Service focuses on any at-risk, but especially vulnerable and underserved surgical patients, who otherwise are often left to their own devices to obtain adequate perioperative pain control (Figure 2).

A standardized set of criteria can be established for referral to and patient participation in a perioperative Transitional Pain Service. These criteria include a history of a chronic pain diagnosis, previous or current psychological comorbidities, and consuming large amounts of opioids either preoperatively or postoperatively (Figure 3).^{27–29}

This Transitional Pain Service can comprehensively address the problem of chronic pain patients preoperatively and the problem of postsurgical pain and persistent opioid use after surgery, both immediately postoperatively while in the hospital and postdischarge in an intensive outpatient setting for up to 3 months after surgery (Figure 4).²⁷ For these complex pain patients, the conventional pharmacopeia (including gabapentinoids and tricyclic and serotonin-norepinephrine reuptake inhibitor antidepressants) is combined with perioperative psychological treatment and holistic alternative medicine modalities (e.g., acupuncture).

This multidisciplinary, perioperative Transitional Pain Service seeks to modify the pain trajectories of patients who are at increased risk of (a) long-term, increasing, excessive opioid consumption and/or (b) developing chronic postsurgical pain.^{28,30} This multidisciplinary team is optimally comprised of a pain medicine specialist, internal medicine hospitalist, addiction medicine specialist, pain psychologist, licensed social worker, and advanced practice registered

nurse. The Transitional Pain Service team very importantly communicates and coordinates its activities with the other PSH team members.

The implementation of such a fully integrated perioperative Transitional Pain Service—whose multifaceted objectives are to optimize pain control; to monitor and appropriately wean patients off a high-dose opioid, an extended-release opioid, and other narcotic medications; to prevent unnecessary hospital readmissions postdischarge; and to reduce the substantial direct health-related costs and disability associated with the development of chronic postsurgical pain—can benefit its patients, health care system, and larger community.^{28,29}

FINANCING A PERIOPERATIVE TRANSITIONAL PAIN SERVICE

Even if successfully and cost-efficiently embedded within an existing PSH, a new perioperative Transitional Pain

Service will require additional resources. How will an organization finance these additional resources necessary for a Transitional Pain Service?

The potential economic impact of the PSH model will not be fully realized until value-based reimbursement, with its substantial financial risk-sharing and gain-sharing, becomes fully implemented by governmental and commercial payers.^{3,7} This also applies to an integrated Transitional Pain Service.

Nevertheless, in creating an organizational Pro-Forma (business plan) for a perioperative Transitional Pain Service, 2 primary sources of revenue exist. Inpatient and outpatient professional fees and outpatient facility fees (if its outpatient clinic is hospital-based) for the provided conventional Evaluation and Management (E/M) services represent 1 source. The advanced practice registered nurses and/or physician assistants staffing the Transitional Pain Service practice “at the top of their professional license”—with a 1:3 to 1:4 ratio of collaborating physician to advanced practice provider.

An equally if not more important second revenue source for a perioperative Transitional Pain Service is cost-containment in the form of (a) decreased inpatient length of stay and (b) reduced 60-day postdischarge emergency department visits and hospital readmissions for inadequate pain control and/or opioid-related complications. For example, by facilitating more timely hospital discharge and thus maintaining inpatient bed capacity for additional elective and nonelective surgery patients, a perioperative Transitional Pain Service can be credited a per diem amount (egg \$2150 per day in reduced length of stay).

A small community hospital may be hard-pressed to mobilize the comprehensive services and personnel required to successfully implement a full-scale perioperative Transitional Pain Service. A viable option could be (a) to build upon its likely existing inpatient internal medicine-based hospitalist service and anesthesiology-based acute pain service and (b) to subcontract with a local chronic pain medicine specialist (who already

Transitional Pain Service Consult Criteria

- (1) Current or recent history of chronic pain diagnosis;
- (2) Previous or recent drug misuse or abuse;
- (3) Previous or recent psychological comorbidities;
- (4) Current or recent high-dose chronic opioid therapy;
- (5) Extended-release opioid, methadone, buprenorphine;
- (6) Consuming excessive amounts of postoperative opioids (> 90 mg of morphine milligram equivalents/day);
- (7) Followed by the Acute Pain Service for an extended period of time for poorly managed pain; OR
- (8) Otherwise referred by an attending surgeon

Figure 3. Prototypic standardized set of criteria for referral to and patient participation in a perioperative Transitional Pain Service.²⁷

Transitional Pain Service (TPS) Workflow

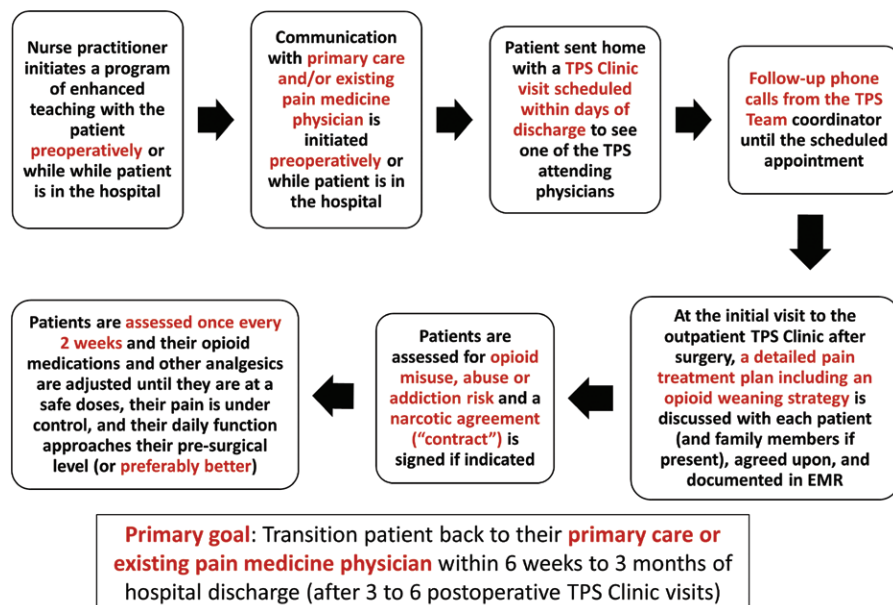


Figure 4. The integrated process flow map of a prototypic perioperative Transitional Pain Service.^{27–29}

may be a major prescriber of chronic opioids in the community). This more limited-scale program could be patterned after the Acute Pain Service Out-Patient Clinic implemented at the Helsinki University Hospital.³¹ However, ultimately, as with other major comorbidities, the high-risk chronic opioid patient may not be an appropriate surgical candidate at a heavily resource-constrained, small community hospital.

CONCLUSIONS

By all accounts, the field of perioperative medicine is a logical component and vital to the future of the specialty of anesthesia.³²⁻³⁴ We posit that perioperative medicine, and with it, the evolving and overarching PSH model, should include the ways and means to provide equally effective and consistently safe opioid-sparing multimodal analgesia across the entire perioperative continuum—thereby, helping to stem the increasingly adverse impact of postoperative misuse and abuse of opioids in the United States. While the cost-effectiveness (value-based utility) of a perioperative Transitional Pain Service has yet to be fully demonstrated by its original development team at Toronto General Hospital or at any other institution, the service holds promise to achieve the above vital goals. ■■

DISCLOSURES

Name: Thomas R. Vetter, MD, MPH.

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Contribution: This author helped write and revised the manuscript.

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