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A call for implementation of transitional pain services within the perioperative setting: Using a commercial digital telehealth platform to overcome barriers

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## Purpose

Pain is a prevalent condition amongst U.S. adults, with estimates ranging from 11% to 40%<sup>1</sup>. Pain patients often seek surgical intervention to relieve their pain<sup>2</sup>; however, 80% continue to experience postoperative chronic pain<sup>3</sup>, which can have subsequent complications, such as dependence on opioids, restrictions in mobility and daily living activities, anxiety and depression<sup>4</sup>. Although these population-estimates provide rationale for more pain-related services, there is limited understanding of who will go on to develop chronic pain<sup>5</sup>. Thus, necessary pain-related services may be reaching perioperative patients too late.

One promising program called transitional pain services (TPS) aims to identify perioperative patients at risk of developing chronic pain and subsequent complications and provides continuity of care through the surgical journey<sup>6</sup>. During TPS, the patients receive preoperative preparation (e.g., anxiety reduction, surgical expectations) and postoperative pain management, particularly focusing on pain resolution, improvement of quality of life, and tapering off postoperative opioids<sup>7</sup>. Additionally, patients experience secondary benefits, such as improved mood (e.g., reduction in anxiety and depression symptoms) and lower cost of care (e.g, hospital visits and opioid-related costs)<sup>8,9</sup>.

Despite awareness of the positive impact that TPS has on chronic pain reduction and associated opioid use, hospitals seem slow to implement such services<sup>10</sup>. Although TPS staffing models can widely range as needed, the upfront and yearly costs associated with personnel to effectively deliver this care (~\$2 million to ~\$7 million) can be a deterrent<sup>9,10</sup>. Furthermore, patients may experience personal barriers to engaging with TPS appointments, such as transportation to appointments and pain-related mobility issues<sup>11,12</sup>.

With the advent of telehealth platforms, one solution to incorporating TPS widely may be to provide it digitally through a commercial digital platform that specializes in virtual-TPS (vTPS)<sup>13</sup>. This would shift the financial incentives and barriers for the hospital to the commercial platform, and allow patients who are otherwise limited by physical accessibility to maintain appointments from the safety and comfort of their own homes. Therefore, we provide recommendations on vTPS methodology delivered through a commercial digital platform, and provide preliminary data highlighting how these recommendations are being practically implemented.

## Methods

The methodology from the commercial digital platform focuses on three main recommendations: the staffing model, the interventions employed, and the duration and content of the patient engagement and experience. The commercial vTPS staffing model consists of the anesthesiologists involved in the patient's surgery, addiction medicine physicians, clinicians with experience in pain management, licensed therapists and/or psychologists, and patient advocates that coordinate care. These multidisciplinary providers should integratively deliver comprehensive pain management surgical patients at risk for chronic pain and opioid use after surgery.

vTPS engagement should occur during three phases of perioperative care: (1) preoperative period up to 1 month before surgery, (2) surgical hospitalization, and (3) postoperative period up to 3 months. Preoperatively, we suggest that patient eligibility and risk for chronic pain and chronic opioid dependency after surgery be established through digital risk calculator. The risk calculator will consider the relative risk of chronic Preoperative content should comprise virtual patient education on surgery preparedness, reduction of patient anxiety, and preparation for opioid use and management after surgery. During hospitalization, the patient advocate should virtually communicate with the patient and provide care coordination. Postoperatively, the patient should receive regularly scheduled virtual interventions by licensed therapists or psychologists for the acute recovery period of 4 weeks, and then receive virtual maintenance interventions for the longer recovery period for at least up to 3 months. This timeline allows for ongoing support until the patient is completely off opioids, their pain is adequately controlled, and there are no behavioral health issues complicating postoperative recovery.

Throughout the vTPS journey, both pharmacological and non-pharmacological interventions should be supported and used. Pharmacological interventional support should focus on the conscientious inclusion of the patient in the opioid weaning process before and/or after surgery. Non-pharmacological interventions should include digital health applications to monitor pain and other behavioral health signals, sensory therapies (visual, distraction, and relaxation techniques), and cognitive behavioral therapies including psychotherapy and counseling. Furthermore, non-pharmacological interventions should augment the direct pharmacological interventions prescribed by the surgeons.

## Results

We delivered vTPS to a veteran patient population at a major VA hospital. We present preliminary findings on three veterans who completed the vTPS journey. Patients were opioid naive (i.e., no opioid exposure 30-days prior to consent and until surgery).

The patients were recruited from a cohort of total joint arthroplasty (TJA) patients receiving surgical care at a VA hospital. Around 44% of TJA patients experience pain postoperatively, with around 15% reporting severe or extremely severe pain<sup>14,15</sup>. After consent, patients were matched with licensed therapists associated with the vTPS program. Patients received surgery preparedness care using cognitive behavioral therapy protocols for anxiety for 4 weeks preoperatively. Furthermore, patients were informed that they would be guided in tapering off

postoperatively prescribed opioids with their matched therapist. After the TJA, patients received psychological pain management care using cognitive behavioral therapy protocols for pain for 4 weeks after the TJA. Patient also engaged in a 90-day postoperative follow-up. Patients received cognitive and behavioral tools to employ at home in the duration between the acute and longer recovery periods. During the preoperative and postoperative care, and follow-up appointment, patients also responded to validated surveys on depression (PHQ-9), anxiety (GAD-7), pain (KOOS-Pain), quality of life (KOOS-QoL), pain catastrophizing (PCS), and reported overall opioid use.

During the preoperative period, on average, patients reported minimal depression (PHQ-9 = 3) and anxiety (GAD-7 = 3.5) symptoms. On the KOOS surveys (ranging from 0 to 100, with 0 representing extreme problems and 100 representing no problem), patients reported moderately high pain (KOOS-Pain = 44.5%) and poor QoL (KOOS-QoL = 31.5%). On average, patients reported above average, but not clinically significant, pain catastrophizing (PCS = 25). Because all patients were opioid naive, there were no opioid dosages to report.

After surgery, patients reported use of postoperative prescribed opioids ranging from 15 MME to 30 MME. At the end of the postoperative vTPS journey, on average, patients reported no depression (PHQ-9 = 0) or anxiety (GAD-7 = 0) symptoms. On the KOOS surveys, patients reported no pain (KOOS-Pain = 100%) and moderate problems with QoL (KOOS-QoL = 56%). On average, patients reported no pain catastrophizing (PCS = 0). All patients reported no opioid use (0 MME). Thus, patients experienced a 100% reduction in depression and anxiety symptoms, 124% improvement in pain symptoms, 78% improvement in QoL, and 100% reduction in pain catastrophizing.

## Conclusions

Initial findings from the implementation of a commercial telehealth platform to deliver vTPS to veterans from a major VA hospital indicate that patients experience complete reduction in opioid use, pain, pain catastrophizing, and anxiety and depression symptoms, along with improved QoL. These results indicate that a vTPS program is feasible for providing care for patients who are at increased risk for developing chronic postoperative pain and persistent postoperative opioid use. With more data supporting the need for healthcare systems to offer enhanced perioperative care through a high-quality pain management program, we urge a concerted and organized effort by clinicians, patients, and other stakeholders to prioritize TPS and vTPS to deliver perioperative care.

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