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A multisociety organizational consensus process to define guiding principles for acute perioperative pain management

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ABSTRACT

The US Health and Human Services Pain Management Best Practices Inter-Agency Task Force initiated a public–private partnership which led to the publication of its report in 2019. The report emphasized the need for individualized, multimodal, and multidisciplinary approaches to pain management that decrease the over-reliance on opioids, increase access to care, and promote widespread education on pain and substance use disorders. The Task Force specifically called on specialty organizations to work together to develop evidence-based guidelines. In response to this report's recommendations, a consortium of 14 professional healthcare societies committed to a 2-year project to advance pain management for the surgical patient and improve opioid safety. The modified Delphi process included two rounds of electronic voting and culminated in a live virtual event in February 2021, during which seven common guiding principles were established for acute perioperative pain management. These principles should help to inform local action and future development of clinical practice recommendations.

INTRODUCTION

There is an opportunity to improve acute perioperative pain management by supporting comprehensive multimodal and opioid-sparing approaches. Although the national reduction of prescription opioid medications is an important safety goal, improving the acute pain experience and outcomes for surgical patients across the vast spectrum of clinical scenarios is a self-standing priority.

In 2017, mandated by the Comprehensive Addiction and Recovery Act (P.L. 114–198), the US Health and Human Services (HHS) Pain Management Best Practices Inter-Agency Task Force initiated a public–private partnership which led to the publication of its report in 2019.[1] For both acute and chronic pain management, the report emphasized the need for individualized, multimodal, and multidisciplinary approaches that decrease the over-reliance on opioids, increase access to care, and promote widespread education on pain and substance use disorders to eliminate stigma.[2] A critical gap highlighted in the report is the presence of inconsistencies and fragmentation in the current paradigm of pain care, and the Inter-Agency Task Force called on specialty organizations and associations to generate evidence-based guidelines that promote 'coordinated and collaborative care.'[1] In response, medical specialty societies, both individually or in partnership, have provided some clinical guidance on safe opioid prescribing and acute pain management.[3–5] To date, there has been no large-scale, multisociety collaborative effort involving all specialties involved in surgical care to develop common guidelines for perioperative pain management.

With this goal in mind, leaders within the American Society of Anesthesiologists (ASA) began planning a multiorganizational Pain Summit to establish a coordinated effort around the recommendations in the 2019 HHS Best Practices report. Over the course of several months, this process culminated in a live virtual meeting in February 2021 during which seven common guiding principles were established for acute perioperative pain management. This article provides a detailed description of the process steps and deliverables associated with this consensus project.

The ideas and recommendations contained herein do not define standard of care and are not intended to replace clinical judgment. In the imperfect setting of limited data, controversial topics, and bias inherent to expert opinion, compliance with these recommendations may not necessarily result in improved outcomes compared with alternative therapies and approaches consistent with personalized medicine.

METHODS

In 2019, ASA leadership appointed a steering committee consisting of the committee chairs,

members and officers of the society directly involved in pain medicine clinical practice and/or scholarship (ERM, DMD, JWS, JTM, MH, and AB) that would be responsible for developing and guiding the consensus process leading up to a live Pain Summit meeting. The steering committee agreed unanimously that all steps in the process including the event itself would be free from industry influence or sponsorship.

ASA solicited nominations for volunteer representatives from other healthcare professional surgical organizations to join the Perioperative Pain Summit Consortium. Surgical specialty organizations, the American Medical Association, and American Hospital Association were contacted by email with a written invitation from the ASA president and chief executive officer. All volunteers were required to submit conflict of interest disclosure forms which were reviewed by the steering committee and ASA staff prior to approving participation. In July 2020, a virtual meeting was conducted to prioritize the establishment of common principles for acute perioperative management in the routine, non-complex (eg, opioid-naïve) adult surgical patient to guide future clinical practice recommendations using a modified Delphi process, with two rounds of electronic voting and culminating in a live virtual pain summit in February 2021.[6] Participants discussed their organizations' ongoing activities related to opioid safety and pain management; current gaps in pain care identified by each organization; potential items for future collaboration related to acute perioperative pain management; and logistical issues related to COVID-19 that could affect participation. All participants were provided details regarding the goals of the process and timeline.

The steering committee then developed an initial long list of potential principles using acute pain topics in the HHS report[1] and the 2016 multisociety management of postoperative pain clinical practice guideline by Chou *et al*.[3] Topics specific to children, establishment of new policies, or advocacy and those not relevant to surgical patients were excluded. By identifying topics in common and harmonizing the language, this long list was narrowed down to a shorter draft list with unanimous agreement by steering committee members (figure 1).

First round

The list of draft principles was distributed to the volunteer representatives of each participating organization other than the ASA in the form of an electronic survey (SurveyMonkey, San Mateo, California, USA). This draft list was prepared by the ASA steering committee, there were no further votes by the ASA in the Delphi rounds. Participants were asked to rate their level of agreement with each item using a Likert scale from strongly agree to strongly disagree (online supplemental appendix). Instructions were as follows: 'These should be weighed as something you either agree or disagree that physicians should be doing. The principles themselves were not meant to recognize gaps/barriers or meant to be interpreted as current practice for your specialty.' Participants were invited to provide free text comments for each item. All responses were collected by ASA staff and provided to the steering committee in anonymized form. A positive response (strongly or somewhat agree) of 75% or greater was defined as consensus,[6] and the rated item was included in the list of principles. A response between 50% and 75% agreement would be considered for revision while a response less than 50% agreement would be excluded. Items that did not achieve consensus, but were not excluded after the first round, were revised based on written feedback by the steering committee and incorporated into the next round's survey (online supplemental appendix).

Second round

All non-ASA participants were given the results of the first round of rating as well as written comments. In the second round, participants were surveyed on the revised set of principles and were also asked a supplemental question regarding feasibility of implementation based on written comments submitted in the first round (online supplemental appendix). All survey responses were collected by ASA staff, anonymized, and provided to the steering committee. Any principle that achieved 75% or greater agreement was accepted into the final list of principles. Any items that still had not achieved consensus but were not excluded for less than 50% agreement after the second round would be discussed at the Pain Summit.

Third round

All participants from all 14 organizations were invited to join a live virtual Pain Summit meeting. The summit was chaired by two members of the steering committee (ERM and DMD), and the discussion was facilitated by another member of the steering committee (JWS). After introductory comments and orientation to the process, each principle was for a preset duration followed by discussion and electronic voting via poll, if applicable.

To inform the discussion after the presentation of each principle, participants were asked to consider the following questions:

1. What have you done that embodies this principle?
2. What are the challenges or barriers?
3. What is the minimum standard?
4. What are some innovations we should embrace that could help us implement or accomplish this across a diverse set of care settings?

Statistical analysis

We defined consensus as a minimum threshold of 75% participant agreement which has been established as an acceptable threshold in previously published Delphi studies.[6] Data were presented as descriptive statistics, primarily number (%) as appropriate.

RESULTS

Thirteen organizations were contacted by the ASA and invited to participate, and 13 (100%) responded positively (table 1). Therefore, 14 organizations were included in total.

First round results

Twelve of 13 organizations (92.3%) completed the survey. Principle 1 achieved consensus with 91.7% agreement. Principles 2–7 achieved consensus with 100% agreement. Table 2 presents the wording of each of the seven principles from first round to second round. Verbatim free text comments submitted by participants are shown in online supplemental table 1. Although participants voted to retain the language in principle 7 despite the focus on non-complex surgical patients, concerns were raised about access to pain specialists (online supplemental table 1).

Second round results

Since consensus was achieved for all seven principles in the first round of voting, the steering committee modified the second-round survey to focus on clarifying questions for principles 1 ('Clinicians should conduct a preoperative evaluation including…') and 4 ('Clinicians should provide patient and family-centered, individually tailored education… and document the plan and goals…') based on the length and complexity of

Reference	Long List	Short List
Chou et al	Patient and family-centered education	Patient and family-centered education
Chou et al	Counseling for children and parents	
Chou et al	Preoperative evaluation including assessment of medical and psychiatric comorbidities, medications, chronic pain, SUD	Preoperative evaluation including assessment of medical and psychiatric comorbidities, medications, chronic pain, SUD
Chou et al	Adjust pain management based on adequacy of pain relief and presence of adverse events	Adjust pain management based on adequacy of pain relief and presence of adverse events
HHS Report	Emphasize individualized treatment as the primary goal and improved pain control, faster recovery, improved rehabilitation	
Chou et al	Use a validated pain assessment tool to track responses to treatments	Use a validated pain assessment tool to track responses to treatments
Chou et al	Offer multimodal analgesia including nonpharmacological interventions	Offer multimodal analgesia including nonpharmacological interventions
HHS Report	Use procedure-specific, multimodal regimens and therapies when indicated in the perioperative period, including various non-opioid medications, ultrasound-guided nerve blocks, analgesia techniques	
HHS Report	Use multidisciplinary and multimodal approaches for perioperative pain control in selected patients at higher risk for opioid use disorder	
Chou et al	Consider transcutaneous electrical nerve stimulation	
Chou et al	Neither recommend nor discourage acupuncture, massage, or cold therapy	
Chou et al	Consider cognitive-behavioral modalities	
Chou et al	Oral instead of IV adminstration of opioids	
Chou et al	Avoid intramuscular route of administration	
Chou et al	IV PCA used when parenteral route is needed	
Chou et al	Avoid routine basal infusion of opioids with IV PCA	
Chou et al	Appropriate monitoring of sedation, respiratory status, and other adverse events when opioids used	
Chou et al	Provide acetaminophen and/or NSAIDs as part of multimodal	
Chou et al	Consider preoperative oral celecoxib	
Chou et al	Consider gabapentinoids as part of multimodal	
Chou et al	Consider IV ketamine as part of multimodal	
Chou et al	Consider IV lidocaine infusions in abdominal surgery	
Chou et al	Consider site-specific local anesthetic infiltration	
Chou et al	Use topical local anesthetics in combination with nerve blocks for circumcision	
Chou et al	Consider site-specific peripheral regional anesthetic techniques	
Chou et al	Use continuous peripheral nerve blocks when the need for analgesia is likely to exceed the duration of effect of single injection	
Chou et al	Consider addition of clonidine as an adjuvant for prolongation of analgesia with single-injection nerve blocks	
Chou et al	Offer neuraxial analgesia for major thoracic and abdominal procedures	
Chou et al	Avoid neuraxial administation of magnesium, benzodiazepines, neostigmine, tramadol, and ketamine	
Chou et al	Appropriate monitoring of patients who receive neuraxial interventions	
Chou et al	Facilities have an organizational structure in place to develop and refine policies for pain management	
Chou et al	Facilities provide clinicians with access to a pain specialist for patients with inadequately controlled postoperative pain or high risk (eg, opioid-tolerant, SUD)	Facilities provide clinicians with access to a pain specialist for patients with inadequately controlled postoperative pain or high risk (eg, opioid-tolerant, SUD)
HHS Report	The perioperative team should be consulted to form a treatment plan that addresses the various aspects that would be necessary for best outcomes for patients with chronic pain	
Chou et al	Facilities using neuraxial and continuous peripheral blocks have policies and procedures to support safe delivery and trained individuals	
Chou et al	Provide education to all patients and caregivers on the pain treatment plan including tapering of analgesics after discharge	Provide education to all patients and caregivers on the pain treatment plan including tapering of analgesics after discharge
HHS Report	Encourage coordinated and collaborative care that allows for best practices and improved patient outcomes	
HHS Report	Encourage the use of guidelines that are informed by evidence and created by specialty organizations and associations	
HHS Report	Encourage Centers for Medicare & Medicaid Services (CMS) and private payers to develop appropriate reimbursement policies to allow for a multimodal approach to acute pain	
HHS Report	Use treatment regimens in the peri-injury setting that include various non-opioid and nonpharmacologic therapies to mitigate opioid exposure	
HHS Report	Encourage public and private stakeholders to develop acute pain management guidelines for common surgical procedures and trauma management	
HHS Report	Increase public awareness of poison control center services as a resource that provides educational outreach programs and materials; referral to treatment facilities; links to take-back facilities; and resources for safe drug storage, labeling, and disposal	
HHS Report	HHS, in partnership with DEA and other federal and state agencies, should increase opportunities for safe drug disposal and drug disposal sites	
HHS Report	Adopt neutralization technologies and methods that may make safe disposal more readily available for opioids and other relevant medications	

Figure 1 Initial long list of potential principles based on the US Health and Human Services pain management best practices Inter-Agency Task force report[3] and the 2016 management of postoperative pain clinical practice guideline by Chou *et al*[3]. By identifying topics in common (themes identified with the same color) and harmonizing the language, this long list was narrowed down to the shorter draft list shown. DEA, drug enforcement agency; HHS, health and human service; IV, intravenous; NSAID, non-steroidal anti-inflammatory drug; PCA, patient-controlled analgesia; SUD, substance use disorder.

Table 1 Organizational participants in the 2021 Pain Summit and consensus process

Organization	Representative(s)
1. American Hospital Association	Jeffrey T. Mueller, MD, FASA
2. American Medical Association	S. Bobby Mukkamala, MD
3. American College of Surgeons	Michael J. Englesbe, MD, FACS
4. American Academy of Orthopaedic Surgeons	Todd S. Kim, MD
5. American Academy of Otolaryngology-Head and Neck Surgery	Vikas Mehta, MD, MPH, FACS
6. American Association of Neurological Surgeons and the Congress of Neurological Surgeons	Jason M. Schwalb, MD, FAANS, FACS
7. American College of Obstetricians and Gynecologists	Amanda Kallen, MD
8. American Association of Oral and Maxillofacial Surgeons	Deepak G. Krishnan, DDS, FACS
9. American Society of Breast Surgeons	Lisa Wiechmann, MD
10.American Society of Plastic Surgeons	Kent K. 'Kye' Higdon, MD
11.American Society of Regional Anesthesia and Pain Medicine	Jaime L. Baratta, MD
12.American Urological Association	Jennifer Robles, MD, MPH
13.Society of Thoracic Surgeons	Stephen Yang, MD, MAMSE
14.American Society of Anesthesiologists	Steering Committee Asokumar Buvanendran, MD Edward R. Mariano, MD, MAS, FASA David M. Dickerson, MD Joseph W. Szokol, MD, JD, MBA, FASA Jeffrey T. Mueller, MD, FASA Michael Harned, MD Committee Volunteers Padma Gulur, MD Kristopher Schroeder, MD, FASA Karla E.K. Wyatt, MD, MS, FAAP Eric S. Schwenk, MD, FASA Richa Wardhan, MD Ashley M. Shilling, MD Gary Schwartz, MD, FASA Lisa V. Doan, MD Nabil M. Elkassabany, MD, MSCE Iyabo O. Muse, MD, FASA Jean Eloy, MD Shalini Shah, MD Rebecca L. Johnson, MD

these principles. The steering committee recognized that principles 1 and 4, as written, contained multiple parts, so the second-round survey assessed agreement with each component part for each principle: four parts/questions for principle 1 and two parts/questions for principle 4 (table 2). In addition, the second-round survey included questions designed to assess perceptions of feasibility, and barriers to implementation of each principle.

Eleven of 13 organizations completed the survey (84.6%). For principle 1, all four parts achieved 100% agreement. In response to 'This will be a challenge to implement:' 3 (27.3%) answered yes to part 1 (assessment of medical conditions and any concomitant medications); 6 (54.5%) answered yes to part 2 (assessment of psychological conditions, and history of substance use); 1 (9.1%) answered yes to part 3 (assessment of history of chronic pain); and 4 (36.4%) answered yes to part 4 (assessment of previous postoperative treatment regimens and responses, to guide the perioperative pain management plan). Principles 2 and 3 were considered challenging to implement by 5 (45.4%) and 3 (27.3%) respondents, respectively.

Principle 4 was divided into two parts. Part 1 ('Clinicians should provide patient and family-centered, individually tailored education…') achieved 100% agreement, and part 2 ('Clinicians should document the plan and goals for postoperative pain management') achieved 90.9% agreement. Part 1 was considered challenging to implement by 6 (54.5%) of respondents while 1 (9.1%) considered part 2 challenging to implement. Principles 5–7 were considered challenging to implement by 3 (27.3%), 1 (9.1%), and 6 (54.5%) respondents, respectively, with access again identified as an issue for principle 7. Verbatim free text comments from the second round are shown in online supplemental table 2.

Third round results

Including ASA volunteers, organizational representative, and staff support, there were 33 participants in the live virtual Pain Summit held on February 20, 2021, from 10:00 to 13:00 hours Eastern time. After welcome statements and introductions, the goal of the Pain Summit was explicitly stated: to finalize a set of harmonized guiding principles from 14 national medical societies and healthcare organizations on acute perioperative pain management that will benefit routine adult surgical care of the non-complex (eg, opioid-naïve) patient. Prior to the Summit, ASA volunteers and workgroup members from participating organizations worked in collaboration to prepare a set of slides and list of references for each principle. Allocated times for the presentation of each principle and discussion during the Summit were: principle 1 (7 min presentation; 15 min discussion); principles 2, 3, 5, 6, and 7 (5 min presentation; 12 min discussion) and principle 4 (8 min presentation; 15 min discussion). These

Table 2 Draft principles for acute perioperative pain management presented in the first two Delphi rounds

Item	Description of principle (frst round)	Description of principle (second round)
1	Clinicians should conduct a preoperative evaluation including assessment of medical and psychological conditions, concomitant medications, history of chronic pain, substance use, and previous postoperative treatment regimens and responses, to guide the perioperative pain management plan.	(1) Clinicians should conduct a preoperative evaluation including assessment of medical conditions and any concomitant medications. (2) Clinicians should conduct a preoperative evaluation including assessment of psychological conditions, and history of substance use. (3) Clinicians should conduct a preoperative evaluation including assessment of history of chronic pain. (4) Clinicians should conduct a preoperative evaluation including assessment of previous postoperative treatment regimens and responses, to guide the perioperative pain management plan.
2	Clinicians should use a validated pain assessment tool to track responses to postoperative pain treatments and adjust treatment plans accordingly.	Clinicians should use a validated pain assessment tool to track responses to postoperative pain treatments and adjust treatment plans accordingly.
3	Clinicians should offer multimodal analgesia, or the use of a variety of analgesic medications and techniques combined with non-pharmacological interventions, for the treatment of postoperative pain in adults.	Clinicians should offer multimodal analgesia, or the use of a variety of analgesic medications and techniques combined with non-pharmacological interventions, for the treatment of postoperative pain in adults.
4	Clinicians should provide patient and family-centered, individually tailored education to the patient (and/or responsible caregiver), including information on treatment options for management of postoperative pain, and document the plan and goals for postoperative pain management.	(1) Clinicians should provide patient and family-centered, individually tailored education to the patient (and/or responsible caregiver), including information on treatment options for management of postoperative pain. (2) Clinicians should document the plan and goals for postoperative pain management.
5	Clinicians should provide education to all patients (adult) and primary caregivers on the pain treatment plan including proper storage and disposal of opioids and tapering of analgesics after hospital discharge.	Clinicians should provide education to all patients (adult) and primary caregivers on the pain treatment plan including proper storage and disposal of opioids and tapering of analgesics after hospital discharge.
6	Clinicians should adjust the pain management plan on the basis of adequacy of pain relief and presence of adverse events.	Clinicians should adjust the pain management plan on the basis of adequacy of pain relief and presence of adverse events.
7	Facilities in which surgery is performed should provide clinicians with access to consultation with a pain specialist for patients with inadequately controlled postoperative pain or at high risk of inadequately controlled postoperative pain (eg, long-term opioid therapy, history of substance use disorder).	Facilities in which surgery is performed should provide clinicians with access to consultation with a pain specialist for patients with inadequately controlled postoperative pain or at high risk of inadequately controlled postoperative pain (eg, long-term opioid therapy, history of substance use disorder).

times were assigned by the steering committee based on review of the written comments generated during the two electronic survey rounds and the presentation materials prepared and submitted by each principle's workgroup.

Throughout the Pain Summit, participants shared their organizations' recommendations and best practices for disseminating and implementing the principles. There was verbal agreement from Pain Summit attendees that the implementation of these seven principles should be a physician-led initiative but that they apply to all healthcare practitioners. Important themes from the discussion included: the need to address issues of access to pain and addiction medicine specialists; avoidance of stigmatizing language when caring for patients with substance use disorder; and a commitment to patient and caregiver education and shared decision making to individualize pain care. The anticipated barriers to implementation for health systems, clinicians, patients, and regulatory agencies were presented and discussed in detail.

The multiorganizational group affirmed the final seven principles and their wording (figure 2). The Pain Summit concluded with guest remarks by Dr Vanila Singh, immediate former chief medical officer for HHS and former chair of the HHS Best Practices Pain Management Inter-Agency Task Force and a summary of next steps.

DISCUSSION

For the first time, a consortium of multiple healthcare organizations representing physicians and hospitals in the USA involved in surgical care participated in a joint consensus process and Pain Summit to establish seven common guiding principles for acute perioperative pain management. These principles may serve to inform future development of clinical practice recommendations, organizational guidelines, patient care pathways, regulations, and laws pertaining to pain management for the routine, non-complex adult surgical patient.

The virtual format of the Pain Summit and workgroup meetings as well as electronic communication between workgroup members allowed all participants to provide input into the process of developing this set of guiding principles. The timing of this work product is important as elective surgeries have resumed within the USA in the setting of an opioid epidemic that has worsened during COVID-19.[7]

While consensus was achieved early in the process for the principles themselves (what a clinician and organization should do), live discussions at the virtual Pain Summit raised some important concerns and considerations regarding the feasibility of implementation. This 'knowing-doing gap'[8] is well recognized in medicine and represents the failure or delay in knowledge translation from new evidence-based guidance to changes in real life clinical practice. This time lag has been estimated to be 17 years[9] and has been attributed to a variety of factors, both intrinsic and extrinsic.[10] When discussing each principle during the Pain Summit, participants offered the following points relevant to taking the next steps in implementing the acute perioperative pain management principles.

Principle 1: Clinicians should conduct a preoperative evaluation including assessment of medical and psychological conditions, concomitant medications, history of chronic pain, substance use disorder, and previous postoperative treatment regimens and responses, to guide the perioperative pain management plan.

Although there was first round consensus on the multiple aspects of principle 1 pertaining to preoperative evaluation, clarifying questions in the second round demonstrated different

Figure 2 Final guiding principles of acute perioperative pain management established at the 2021 pain Summit.

rates of feasibility assessment by respondents for each of principle 1's four parts. Of note, part 2 (assessment of psychological conditions, and history of substance use) had the highest proportion of participants who rated it as challenging to implement. Unfortunately, substance use disorder is a common comorbid condition in patients who suffer from preexisting pain.[11] While taking a medical history, performing a physical examination, and reviewing current medications are routinely performed during a preoperative assessment, a comprehensive pain history is not currently standard practice. A thorough pain history should include pain characteristics, pain medications, treatment history for pain and/or substance use disorder, underlying psychological disorders, quality of life, functional status, and expected risk of postoperative pain.[12–14] Opioid tolerance and opioid risk should be assessed before surgery using tools such as the American Society for Enhanced Recovery (ASER) opioid-naïve, exposed, and tolerant+ criteria and current pain medications confirmed via an online prescription drug monitoring program.[15 16] Preoperative optimization of psychological,[17 18] medical, and physical conditions elicited in the pain history is necessary along with development of a perioperative pain management plan including appropriate follow-up. The ASER Joint Consensus Statement suggests a risk-based approach to perioperative pain management.[15] Incorporation of a structured pain assessment, psychological history, and physical examination into the electronic health record and development of in-person and telehealth screening tools and algorithms for preoperative assessment clinics may improve adherence with implementation of principle 1.

Principle 2: Clinicians should use a validated pain assessment tool to track responses to postoperative pain treatments and adjust treatment plans accordingly.

The implementation of validated pain assessment tools should occur well in advance of surgery, allowing patients to become familiar with the structure and utilization of these assessments. Early education with pain scales in the preoperative process will also facilitate identification of patients with significant preexisting painful conditions and enable perioperative pain

management planning with patients and caregivers consistent with shared decision making. The consistent use of pain scales following surgery can help identify patients at elevated risk for developing persistent post-surgical pain; tailor and optimize multimodal interventions; facilitate a personalized approach to a patient's perioperative trajectory; and guide opioid administration when indicated. Important components of pain assessment include intensity, location, temporal aspects, quality, and modifiers.[19–21] Since pain is still defined by subjective experience, patient self-report is the most accurate source of information. Commonly available assessment tools include vital signs, behavioral scales, Visual Analog Scale, Numeric Rating Scale (NRS), Verbal Categorical Rating Scales, and Faces Pain Rating Scales for non-verbal patients.[19–21] NRS is a validated, simple and widely used pain assessment tool with which patients rate their pain between 0 (no pain) and 10 (worst pain possible), but it is of limited value when used as the sole pain assessment.[22] The synchronization of NRS with functional variables to assess the impact of pain on an individuals' ability to complete activities of daily living, participate in physical therapy or determine the progression of functional status postsurgery, combines both subjective and objective information. Functional activity and pain scales, such as the Functional Pain Scale, patient-reported outcomes measurement information system (PROMIS) Pain Interference domain, and Defense and Veterans Pain Rating Scale (DVPRS),[23–27] may be prudent for patients in which other assessment tools are problematic or limited or when the goals of pain management are primarily focused on functional improvements. Application and validation of assessment tools for outpatient surgery or postdischarge were also identified as potential areas for improvement.

Principle 3: Clinicians should offer multimodal analgesia, or the use of a variety of analgesic medications and techniques combined with non-pharmacological interventions, for the treatment of postoperative pain in adults.

A relatively low proportion of participants considered principle 3 challenging to implement, which may reflect the widespread adoption of enhanced recovery protocols.[28–31] Many of the existing clinical practice guidelines specifically recommend the use of multimodal analgesia to improve perioperative pain management and minimize opioid-related adverse effects.[3 4 32 33] Large database studies suggest that each non-opioid agent added to a patient's multimodal regimen can incrementally decrease perioperative complications.[34] Local anesthetics in the form of local infiltration analgesia by surgeons, regional analgesic techniques, or intravenous infusion are an essential element of any multimodal analgesic protocol.[3 4 29] Use of non-steroidal anti-inflammatory drugs, when no contraindications exist, decrease perioperative opioid consumption and pain with the greatest magnitude of effect[34] and appear to be additive when combined with acetaminophen.[35] Both classes of drugs should be considered first-line routine medications for all levels of pain and given to surgical patients on a scheduled basis in the absence of contraindications. Opioids continue to have a role in acute perioperative pain management, when used appropriately and starting with the lowest effective dose, but primarily in combination with non-pharmacological and non-opioid modalities.[29] Similarly, certain non-opioid systemic analgesics, such as ketamine and gabapentinoids, can be administered when indicated.[29 36] Current evidence does not support the routine use of perioperative gabapentinoids in patients who are not already taking them at baseline.[37]

Principle 4: Clinicians should provide patient and family-centered, individually tailored education to the patient (and/or responsible caregiver), including information on treatment options for managing postoperative pain, and document the plan and goals for postoperative pain management.

Principle 4 achieved 100% agreement in the first round, but second round clarification questions revealed differential rates of perceived feasibility for the two individual parts.

Elucidating and managing patient and caregiver expectations, especially for outpatients, is an important factor in acute perioperative pain management but can also be challenging.[3 38–40] Setting realistic expectations for postoperative pain and recovery will help patients and caregivers understand what is normal and what falls outside the usual recovery process. Educational materials in printed or online formats need to be written at the sixth grade reading level[41] and should consider patients' linguistic, cultural, and religious backgrounds. Resources should include information on a wide range of analgesic options,[3 42] emphasizing multimodal analgesia, and defining the role of referrals to specialized clinics (eg, chronic pain, addiction medicine) for advanced preparation prior to the day of surgery or for continuing care postoperatively. One suggestion from the Pain Summit for developing an individually tailored educational program is to connect upcoming patients with those who have had the same surgery and have gone through the process successfully to include valuable first-hand experience and advice. Only one organizational participant perceived a barrier to implementing documentation of the plan and goals of care. This may be due to the accessibility of note templates within electronic medical record systems.

Principle 5: Clinicians should provide education to all patients (adult) and primary caregivers on the pain treatment plan, including proper storage and disposal of opioids and tapering of analgesics after hospital discharge.

An international consensus group has recommended provision of patient education specific to opioid safety: storage, tapering, and disposal.[33] Approximately 75% of patients have reported storing opioids in unsecured locations, and less than 30% of patients report plans to properly dispose of unused opioids.[43] In addition, despite authorized drop-off resources provided by the Drug Enforcement Administration, law enforcement agencies, and pharmacies, many patients are unaware of their options for disposal of surplus medications.[44] Opioid prescriptions with higher pill counts are associated with prolonged opioid use.[45] The combination of opioid overprescription, improper storage, and easy accessibility leading to diversion or accidental use have been associated with serious adverse consequences such as overdose and death.[46] Coordinated clinician education strategies at the institutional, organizational, state, and national levels are important to mitigate opioid overprescription. Procedure-specific opioid prescribing recommendations for clinicians are available from the Michigan Opioid Prescribing Engagement Network (https://michigan-open.org/) and the Pain Alleviation Toolkit (https://www.asahq.org/pain-toolkit) developed by ASA and the American Academy of Orthopaedic Surgeons. Institutional efforts to integrate these guidelines into the electronic medical record and computerized order sets is key to successful implementation and adherence.[47] In addition to these efforts, patient and caregiver education is critical for avoiding opioid-related harm.[33] Online patient educational resources are available from the American College of Surgeons (https://www.facs.org/education/opioids/patient-ed). Prescribing clinicians should also provide patients with information regarding options for safe opioid disposal.[44] Patient education on safe tapering strategies after surgery was included in the 2016 clinical practice guideline,[3] but the availability of online educational materials specifically on this topic is limited.[41] Individualized prescriptions and

tapers based on each patient's prior 24-hour inpatient opioid use at the time of discharge have been described and may decrease the incidence of prolonged opioid use.[48 49]

Principle 6: Clinicians should adjust the pain management plan based on adequacy of pain relief and presence of adverse events.

When implementing a pain management plan, a standardized approach that starts with nonp-harmacological and non-opioid medications and proceeds with stepwise escalation based on pain trajectory and response to treatment similar to a suggested revision of the WHO analgesic ladder is recommended.[50] Similar to principle 2, the use of a validated pain assessment tool[19–21] should be continued into the postoperative period tool to gauge the effectiveness of the pain management plan. For surgical patients, a tool such as the Brief Pain Inventory, PROMIS Pain Interference domain, or DVPRS may be recommended to assess the severity of pain and its impact on functional status[24 25 27 51] although concerns were raised regarding feasibility of implementation. For consistency, the same tool should be used daily to evaluate patients' responses to postoperative pain treatments and make appropriate modifications based on goals of recovery. In addition to assessing the pain score, the pattern of pain, onset, location, quality, intensity, aggravating/relieving factors, and adverse effects of pain medications should be documented. With certain drug classes like opioids, a preemptive approach that anticipates common side effects and makes available as-needed symptom relief medications is preferred.

Principle 7: Clinicians should have access to consultation with a pain specialist for patients who have inadequately controlled postoperative pain or are at high risk of inadequately controlled postoperative pain at their facilities (eg, long-term opioid therapy, history of substance use disorder).

Facilities, healthcare practitioners, patients, and caregivers should jointly commit to safe pain care. Despite applying recommended practices for acute perioperative pain management, patients may still experience inadequate pain relief.[52 53] Pain trajectories may be influenced by patient and procedural factors and are not currently predictable prior to surgery.[16 54–59] Patients with greater than expected postoperative pain may be at higher risk of persistent postsurgical pain[60]; therefore, these patients should have access to consultation with an acute pain medicine specialist. Despite not being the focus of this Pain Summit, the care of patients at high risk for inadequately controlled pain in the perioperative period (ie, history of substance use disorder, opioid-tolerant, chronic pain)[61 62] was considered important by consortium participants and will be the subject of future collaborative work. One promising model of care is the transitional pain service which bridges the gap between acute postoperative recovery and the return to routine primary and preventative care.[63–67] This type of service may offer the potential benefit of early detection and intervention related to greater than expected postoperative pain amplitude, duration, and opioid use as well as preoperative consultation.[28 63] It is important to note that principle 7 was identified by participants as one of the most challenging to implement, primarily due to access to specialists. For facilities and geographical locations where specialist consultation is not readily available on site, remote alternatives should be explored as the use of telehealth has rapidly increased during the COVID-19 pandemic.[68]

Future directions

The establishment of this multisociety consortium of healthcare organizations dedicated to advancing acute perioperative pain management is an important first step. While the seven principles may influence the development of future clinical practice recommendations and guidelines, ongoing challenges will be implementation and adherence. At the 2021 Pain Summit, representatives from these 14 professional societies and healthcare organizations affirmed their commitment to continue working together to disseminate the principles, further assess barriers to their implementation within their own memberships, and develop interventions and share best practices to facilitate adoption. In addition, more detailed clinical guidance is needed for acute perioperative pain management in complex surgical patients (eg, patients with substance use disorder, chronic pain, opioid tolerance) and special populations (eg, children, elderly). Finally, despite many recent advances, there continue to be unwarranted variations[69 70] and disparities in acute pain care delivery in the USA.[71–73] Therefore, not all patients are receiving the best evidence-based care they deserve, thus emphasizing that this consortium and all clinicians involved in acute perioperative pain management still have a great deal of work to do.

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