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TITLE:

The Anesthesia Provider's Role in Reducing Risk of Relapse in Surgical Patients with Substance Use Disorder

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Certified Registered Nurse Anesthetists face the challenge of administering anesthesia and managing perioperative pain in a growing population of patients with substance use disorders (SUDs) including Opioid Use Disorder (OUD), Alcohol Use Disorder (AUD), and addiction to illicit or prescription drugs. Chronic opioid abuse can cause opioid tolerance, allodynia, and hyperalgesia, further complicating acute pain management. The associated physiological changes in patients recovering from SUDs, as well as potentiating a relapse in the perioperative period, pose unique challenges for the anesthesia provider.¹

Opioid abuse affects more than 2 million Americans and accounts for almost 100 deaths per day in the United States.¹ Over-prescription of opioids is a major contributor to opioid misuse after surgery,² with 61% of prescribed opioids remaining unused. This equates to 4.5 days of unnecessary opioid coverage,³ increasing the possibility for diversion, long-term dependence, and addiction. Individuals in recovery from substance abuse face relapse rates of up to 90%¹ and are at risk of a lethal overdose due to loss of opioid tolerance.¹

Relapse is the biggest fear of SUD patients in recovery⁸ and undergoing a surgical procedure places these individuals at an increased risk for relapse due to the associated pain and psychological distress.⁸ Individuals with SUDs may be at

risk for opioid induced hyperalgesia (OIH), increasing their sensitivity to pain⁴ and possibly causing the patient to self-medicate by illicit means.⁹ Anesthesia providers must be aware of the high probability of relapse in the perioperative period and extensive forethought must be given to manage surgical discomfort¹⁰ and minimize this risk.

CRNAs play an integral role in relapse prevention by understanding the spectrum of recovery and relapse and optimizing pain management. The objective of this systematic review is to appraise techniques by anesthesia providers to reduce the risk of relapse in surgical patients recovering from substance abuse.

METHODOLOGY

A search of the literature was conducted using PubMed, CINAHL, Google Scholar, and Cochrane databases. Fifteen articles met inclusion criteria for this review as described in Figure 1 and were evaluated using the John Hopkins Research Evidence Appraisal Tool. The selection included 10 RCT's¹⁰⁻¹⁹, 2 opinion articles^{20,21}, 2 retrospective studies^{2,8}, and 1 systematic review²². The studies consisted of 2,376 participants with 62.2% being male (gender was not disclosed in 2 studies^{13, 26} with a combined 486 participants). None of the articles listed ASA physical status.

RESULTS

Substance use disorders (SUD) require multimodal treatment for recovery including pharmacological interventions and behavioral support mechanisms.^{1,23} Psychosocial treatment is an essential component of comprehensive substance abuse treatment.²⁴ Avoidant strategies and frequent use of 12-step programs significantly reduced the rate of relapse.²⁵ This review identified non-pharmacological measures to aid in relapse prevention.

Existing Approaches to Caring for Recovering SA Patients

The AANA published practice considerations for the SUD patient recommends a thorough pre-anesthesia assessment to determine the types of substances abused, time of last use, and known triggering events²¹. Part of the assessment can include the length a patient is in recovery as it inversely correlates with relapse rates, while the number of relapses positively correlates with relapse risk.¹ Prior to surgery, reasons for prior relapse should be identified by the patient and avoided.¹ The AANA guideline further recommends regional anesthesia and multimodal techniques to mitigate a patient's fear of uncontrolled pain and possible relapse²¹. The CRNA can educate the patient on all the methods of opioid-free pain relief available and which might be appropriate for their particular surgery.

Predictors of abstinence from substance abuse includes active behavioral change and in addition to eliminating exposure to the drug.²⁵ In a study of cocaine abusers, the single significant predictor of abstinence at the 1-year follow-up was participation in 12-step/ self-help meetings.²⁵ Exposure to cognitive behavior therapy led to more engagement in drug avoidant activities such as attending 12-step meetings, reducing use of other drugs, and avoiding drug-using friends. In addition, incorporating healthy lifestyle changes such as exercise and spending time with family and non-drug users significantly increased abstinence in the post-treatment follow-up.²⁵ Engaging activity in the prefrontal cortex areas of the brain showed to reduce drug cravings in the short term.²⁶

Screening Tools

The ComfortCare program was developed from studies examining patients in recovery from OUD. The first element of the ComfortCare tool is preoperative screening and education.¹ Patients in recovery from SUDs will present in one of four stages of recovery: 1) acute intoxication/ not in recovery/ acute withdrawal; 2) in early treatment; 3) receiving medication-assisted-therapy (MAT); or 4) in drug free recovery.¹ The key principle of the Comfort Care Model is to identify patients at risk before planned procedures in the preoperative anesthesia clinic (PAC).¹ The ComfortCare model provides a guide for the anesthesia provider to develop an anesthesia care plan in the form of a ComfortSafe Pyramid.¹ The pyramid emphasizes a multimodal approach to anesthesia starting with opioid free technique ¹

Complementary Techniques

Psychosocial treatment is an essential component of recovery from SUD.²⁴ Mindfulness Based Relapse Prevention (MBRP) techniques reduces the risk of relapse in patients with substance abuse disorders.^{11,12,27-30} MBRP increases awareness and acceptance of the disorder, changes the relationship of prior experiences, and decreases cravings.^{28,29} MBRP targets negative thought processes such as rumination and cravings, which play a role in relapse.¹¹ This is accomplished through meditative practice and transitioning from reacting to stressful situations like someone has in the past to mindfully responding with an awareness of the present moment.

Non-pharmacological methods to reduce pain are essential to integrate into the plan of care for patients with a SUD history. They include application of cold and heat, massage, acupuncture, guided-imagery, deep breathing, music, family presence, and animal therapy.¹ Kayaoglu et. al found passive music therapy reduced stress levels and sixth-month relapse rates.¹⁴

Pharmacologic Techniques

A combination of non-opioid medications can be used perioperatively to reduce or avoid opioid administration.¹

Non opioid analgesics, anti-inflammatories, anti-epileptics, caffeine, and NMDA antagonists are adjuvants for use in the perioperative period.¹ Non-steroidal anti-inflammatory adjuvants include Acetaminophen, Ibuprofen, and Celecoxib.¹ Anti-epileptic medications including Gabapentin and Pregabalin and¹ NMDA antagonists including Dextromethorphan and Ketamine.¹ In addition to treating pain, certain medications may also aid in reduction in the desire to abuse alcohol or drugs. Gabapentin,²¹ baclofen¹⁶, and ketamine¹⁷ are pharmacological interventions shown to reduce relapse rates. Abstinence rates for baclofen after 6 months were 62% compared to 10% when patients were prescribed benfotiamine.¹⁶ Continuous perioperative infusions of ketamine, lidocaine, and esmolol have shown to reduce post operative opioid use.¹ Patients receiving ketamine infusions during surgery had a greater percentage of abstinence at 6-months compared to a placebo group site.¹⁷ patients in recovery from OUD may take buprenorphine and it is unclear whether buprenorphine should be discontinued prior to surgery. One study on buprenorphine concluded it should be continued perioperatively.²² Goel et. al demonstrated parturients taking buprenorphine or methadone undergoing cesarean section received less opioid analgesics and more Non-Steroidal Anti-inflammatory Drugs (NSAIDs).²² Additional adjuvants for non-opioid analgesia include Dexmedetomidine, Clonidine, Caffeine, Duloxetine, Lidocaine, and Esmolol.¹

Discussion

Based on the findings of our literature review, anesthesia providers should continue with multimodal and regional anesthesia techniques in combination with stress-reduction techniques to eliminate the need for use of narcotics on patients in recovery whenever possible. This should be the standard of care and a good starting point once a patient in recovery has been identified. Use of the ComfortSafe Pyramid provides a multimodal approach to anesthesia and analgesia and can be used alongside recommendations to reduce the risk of relapse.¹

Early screening methods for patients in recovery would benefit the healthcare provider in identifying at-risk patients and recommending therapies and activities preoperatively to

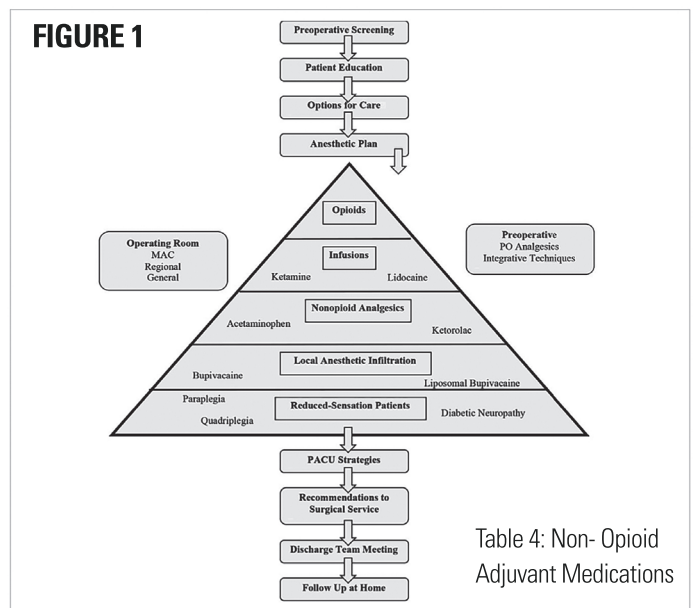


Figure. ComfortCare Pyramid. Abbreviations: MAC, monitored anesthesia care; PACU, post-anesthesia, care unit; PO, by mouth. Adapted from Myers J, Compton P. Addressing the potential for perioperative relapse in those recovering from opioid use disorder. *Pain Med.* 2017, Nov 22, p 3.

strengthen a patient's program of recovery prior to surgery. A systematic support for patients in recovery from preoperative assessment to discharge is recommended. Formulating a plan preoperatively to include the primary team, patient, and patient's support system is crucial to support the patient through the perioperative experience. It is important to discuss options for opioid-free anesthesia and non-pharmacological pain reduction and implement multimodal and regional anesthesia where applicable. Finally, having a clear plan to support the patient's program of recovery after surgery may help reduce the risk of relapse.

Conclusion

Patients in recovery from SUDs have a high rate of relapse complicated by chronic pain and lower tolerance for pain.^{1,10} High levels of psychological distress can increase the risk of relapse.³⁴ The perioperative period can increase the overall perception of stress and pain for patients in recovery undergoing surgery, increasing their risk for relapse. Anesthesia providers must be educated and equipped with the appropriate tools to identify and intervene on behalf of patients and function as advocates for patients in recovery.

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