

Perioperative Considerations for Patients Utilizing Cannabinoid-based Medicines and Products

To ensure patient safety throughout the perioperative period, optimize surgical outcomes, and create a positive experience for patients, it is essential that clinicians, caregivers and patients have a comprehensive understanding of the perioperative considerations for patients utilizing cannabinoid-based medicines and products.

Pre-operative considerations:

Should all patients requiring anesthesia be screened for cannabinoid use preoperatively? If so, what information should be obtained?

Yes. Clinicians should screen for cannabinoid use during the preoperative evaluation. "All patients should be questioned about cannabinoid use, dose and frequency, route of administration, and time of last use....Cannabinoids can produce significant physiologic changes and can potentially interact with anesthetics that can lead to complications. Drug screening by laboratory analysis of urine, saliva, blood, or hair generally detects only THC or carboxy-THC and is not recommended unless clinically indicated, such as for acute intoxication." (Shah) Perioperative clinicians should also evaluate patients for acute intoxication, and elective surgery in patients who have altered mental status or impairment of decision-making capacity due to acute cannabis intoxication should be postponed. (Shah) "Practitioners should be aware of cannabinoid interactions with other medications, anesthetics, and physiologic changes." (Shah)

Does THC consumption affect gastric emptying?

Yes. According to a double blind randomized controlled study of human volunteers, gastric emptying of solid food was slowed due to THC administration - from an average of 30 minutes to 120 minutes. This, in turn, may impact the administration of anesthesia and increase the risk of aspiration. (Horvath, McCallum)

Can smoking marijuana in the pre-operative period help with bronchodilation?

Laboratory studies have shown that vaporized or ingested THC may lead to bronchodilation and decreased airway resistance, BUT smoking marijuana can lead to airway hyperreactivity, similar to what is often seen with tobacco cigarette smoking. Considering that marijuana burns at higher temperatures than tobacco, marijuana smoking may be more irritating to airways. (Alexander)

Is marijuana use associated with an increased or decreased risk of thromboembolism?

According to literature reviews, the use of marijuana is associated with an increased risk of thromboembolism. However, there is evidence that cannabinoids have an anticoagulant effect, as well. In addition, some cannabinoids (including THC and CBD) interact with anticoagulant agents such as warfarin, and increase the INR. These factors should be considered prior to performing neuraxial blocks and placing invasive lines in patients who consume cannabinoid-based products. (Ladha)

Intra-operative considerations:

Do regular marijuana smokers who are undergoing anesthesia require higher doses of Propofol for the insertion of a laryngeal mask airway (LMA)?

Yes. Results of a prospective, randomized, single blinded study, of regular marijuana users showed that higher doses of Propofol were needed to achieve loss of consciousness, adequate jaw relaxation and depression of airway reflexes for insertion of an LMA. (Flisberg)

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On average, do patients who consume marijuana require more fentanyl, more midazolam, and more Propofol to be adequately sedated for an endoscopic procedure compared to patients who do not consume marijuana?

Yes. According to a study evaluating the sedation requirements of Colorado patients undergoing an endoscopic procedure, patients who smoked or ingested marijuana on a daily or weekly basis required 14% more fentanyl, 20% more midazolam and 220% more Propofol. (American Osteopathic Assoc.)

Some patients presenting for surgery may admit to using “Spice” or “K2” or other non-FDA approved synthetic cannabinoids. Do “Spice” and “K2” alter coagulation?

Yes. Both “Spice” and “K2” may cause persistent bleeding. The prothrombin time and the INR may be elevated. Bleeding caused by these synthetic cannabinoids is NOT ameliorated by the administration of vitamin K or fresh frozen plasma. (Alexander)

Smoking and vaporizing marijuana may induce an increase in heart rate. Is smoking marijuana associated with other cardiac electrical effects?

Yes. THC may increase catecholamine levels and therefore may theoretically increase the likelihood of dysrhythmias. Various cardiac electrical effects have been described in observational studies. Atrial fibrillation was one of the more commonly reported dysrhythmias, and other arrhythmias reported include atrial flutter, atrioventricular block/asystole, sick sinus syndrome, ventricular tachycardia, and Brugada pattern. (DeFilippis)

The smoking of marijuana is associated with increased myocardial oxygen demand and decreased oxygen delivery (due to the presence of carboxyhemoglobin). What medicines commonly administered by anesthesiologists can potentially further stress the heart?

Drugs that increase heart rate (ketamine, atropine, pancuronium, and epinephrine) can lead to an increase in cardiac oxygen demand. (Ladha)

Marijuana-induced psychosis can present as what other intra-operative or post-operative conditions/diagnoses?

Marijuana-induced psychosis can present with fever, hypertension, and tachycardia leading to the consideration of malignant hyperthermia, serotonin syndrome, intoxication with Ecstasy (aka Molly), neuroleptic malignant syndrome or thyrotoxicosis. (Alexander)

Post-operative considerations:

Patients are often instructed not to smoke marijuana for a few days prior to surgery. How readily do withdrawal symptoms develop?

In the case of chronic marijuana smokers, withdrawal symptoms can develop after just 1 day of not smoking marijuana. Of note, not only do females develop dependence more rapidly with prolonged use, but females also have more severe withdrawal symptoms.

There are no general guidelines to treat the symptoms of marijuana withdrawal, but it has been reported that benzodiazepines and synthetic THC products (dronabinol, nabilone) used for the treatment of chemotherapy induced nausea and vomiting may help alleviate some of the symptoms. (Alexander)

Do opioid antagonists impact the effects of cannabinoids?

Yes. For example, it has been shown that the administration of opioid antagonists blocks some of the effects of THC. (Tapley)

Some cannabinoid-based medicines are used to treat chemotherapy-induced nausea and vomiting (n/v). Have cannabinoid-based medicines been shown to be effective in the treatment of post-op n/v?

The results of studies indicate that neither nabilone or intravenous THC is effective for post-op n/v. Even premedication with nabilone was ineffective at treating post-op n/v. (Tapley) Of note, a 2020 retrospective cohort study showed an association between chronic cannabinoid use and a 20% increase in incidence of post-op n/v. (Suhre)

Does the chronic use of (THC-containing) cannabis prior to surgery impact postoperative pain control?

Yes, it may. Chronic use of THC may worsen postoperative pain, increase postoperative opioid use and precipitate the development of postoperative hyperalgesia. (Suhre)

“Cannabis Use Disorder” (CUD) has increased in prevalence over the last decade. Is active cannabis use disorder associated with a change in overall perioperative morbidity, mortality, length of stay, or costs?

According to a retrospective population-based cohort study of 4,186,622 patients undergoing elective surgery in the US, active CUD is not associated with a change in overall perioperative morbidity, mortality, length of stay, or costs. However, active CUD is associated with a meaningful increase in the risk of postoperative myocardial infarction. (Goel)