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ASMBS guidelines/statements

Cannabis use before and after metabolic and bariatric surgery: literature review

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Abstract As accessibility and legalization of cannabis rise throughout the United States (US), programs have sought guidance about whether its use should be considered a contraindication or, if not a contraindication, what recommendations patients should receive regarding appropriate use before and after metabolic and bariatric surgery (MBS). In this review, medical, nutritional, pharmacological, and psychological considerations are presented by a multidisciplinary group of members of the American Society for Metabolic and Bariatric Surgery (ASMBS). Research suggests several risks associated with long-term cannabis use in the general population, but research in the MBS population, specifically, is limited. Cannabis use is not associated with most postoperative complications but is associated with mental health concerns and disordered eating in patients who have undergone MBS. Research regarding weight loss outcomes is mixed, with most studies showing no significant association. Severe cannabis use appears to have more clinical significance than mild to moderate use, as it is associated with longer lengths of stay and medical complications. While an active cannabis use disorder is considered a contraindication, requiring treatment and abstinence before proceeding with surgery, the state of the literature is not strong enough to suggest that occasional or medical cannabis use is an absolute contraindication to MBS. Decisions about cannabis protocols should be made at the MBS program level, and patients should be fully informed about the risks of ongoing use. (Surg Obes Relat Dis 2025;21:345–353.)

Keywords: Metabolic and bariatric surgery; Obesity; Cannabis; ASMBS

Preamble

The following paper is authored by a multidisciplinary group of members of the American Society for Metabolic and Bariatric Surgery (ASMBS) with the purpose of informing metabolic and bariatric surgery (MBS) programs of the current assessment and management of patients who use cannabis. As accessibility and legalization of cannabis continue to rise throughout the United States (US),

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programs have sought guidance about whether its use should be considered a contraindication (similar to the use or misuse of other substances with abusive potential) or, if not a contraindication, what recommendations patients should receive regarding appropriate use before and after MBS.

In this review, medical, nutritional, pharmacological, and psychological considerations are presented. They are derived from limited empirical literature in the MBS field specifically and from broader research about the risks of cannabis use more generally. This statement may be revised in the future as additional evidence becomes available.

Background

What is cannabis?

"Cannabis" is defined as a substance derived from the plant female genus, *Cannabis sativa* or *Cannabis indica*. The plant contains over 100 distinct cannabinoid compounds, the most prominent of which is Δ9-tetrahydrocannabinol (THC) and cannabidiol (CBD) [1]. THC has the most potent psychoactive effects, whereas CBD is considered non psychoactive [1]. The anxiolytic properties of CBD can potentially offset the psychoactive properties of THC, thus the ratio of THC to CBD in cannabis products plays a role in feelings of intoxication [1]. Further, different cannabis strains have varying concentrations of THC, CBD, and other cannabinoids; therefore, they have different potential psychoactive and therapeutic effects [2].

Routes of administration have diversified in recent years. Inhaled routes include smoking combusted cannabis materials traditionally through a cannabis cigarette (i.e., joint or blunt) or a device in which smoke is filtered through water before it is inhaled (i.e., water pipe or bong). Vaporizers (i.e., vape-pens or e-cigarettes), electronic devices which heat cannabis concentrates or oils with aerosolized water to high temperatures, have become increasingly popular in recent years [3]. A newer vaporization-based route of administration is "dabbing," in which flash-vaporized cannabis concentrates are inhaled through a modified water pipe heated with a blow torch [3]. Noninhaled routes of administration include "edibles" such as cannabis-infused foods, lozenges, and drinks; alcohol-based liquid cannabis extracts (i.e., tinctures); ingested or sublingual pills; transdermal topical products (e.g., balms, lotions); and rectal suppositories [3].

Legality

As of April 2024, cannabis is classified as a Schedule I substance in the United States under the Controlled Substance Act, and is considered illegal from a federal standpoint. However, state laws vary regarding legality of use for medical and/or recreational purposes, cultivation, distribution, and quantities allowable for possession. Currently, 24 states, two territories, and the District of Columbia have legalized recreational cannabis use. The majority of jurisdictions that have legalized recreational cannabis use have also legalized both commercial distribution and personal cultivation of cannabis products. Further, 38 states have legalized cannabis for medical use [4]. Inconsistencies between legality at the federal and state levels pose challenges for hospital systems and medical providers, who must balance risks of contravening federal regulations with 1) state laws and 2) rights of patients with certain qualifying medical conditions [5]. Depending on state laws, medical providers may not legally prescribe, but may recommend or certify medical cannabis use [5].

Another layer of legal complexity was added by the Agricultural Improvement Act of 2018, which legalized hemp (containing less than .3% THC) and its derivatives, including CBD [6]. This bill helps to explain why CBD products can be purchased in various commercial retail settings and even online, including in states that have not legalized recreational cannabis. Despite the widespread availability of CBD foods, beverages and supplements, they exist in a legal grey area without regulation by the Food and Drug Administration, and therefore, aren't held to safety or purity standards [7]. Highlighting this concern, a recent pharmacologic study tested a large sampling of commercially available CBD products for label accuracy and the presence of contaminants such as heavy metals, residual solvents, and pesticides. The authors found that one-third of the products were mislabeled, and a substantial fraction was contaminated. The majority of mislabeling had to do with the actual CBD potency exceeding the label claim; in fact, one of the tested products contained over 500% of the labeled CBD content [7]. These quality control issues and lack of regulatory oversight of commercially available CBD products raise health and safety concerns.

By contrast, medical cannabis is prescribed or recommended for certain qualifying medical conditions (e.g., multiple sclerosis, cancer, chronic pain, epilepsy) and is sold in dispensaries licensed by the state and subject to state safety regulations. For example, medical grade cannabis is synthesized to be free of pollutants and tobacco. It is also subject to state regulations regarding labeling of products, including the name of the plant strain, laboratory analyses with cannabinoid profiles, and other details that would assist the user in understanding the dosing and degree of psychoactive versus therapeutic effects. Further, many states place limits on how much cannabis can be purchased over a certain period of time. For example, Ohio provides definitions of "whole day units" for each authorized form of medical cannabis (e.g., 1/10 oz of dry plant material, or 110 mg of THC within edibles or tinctures) and dictates limits on how much can be collectively purchased over a 90-day period (e.g., 9 oz of dry plant material, or 9.9 mg of THC within edibles or tinctures).

Moreover, cannabis is used recreationally in localities where it is or is not legalized. A systematic review of the impact of cannabis legalization revealed that its use increases following legalization, particularly in young adults, perinatal users, and certain clinical populations such as individuals with pain, cancer, and inflammatory bowel disease [8].

Prevalence

The Substance Abuse and Mental Health Services Administration (SAMHSA) reported cannabis as the most commonly used illicit substance (defined federally) in the US, with 18.7% of Americans reporting use [9]. Young adults aged 18-25 appear to be the most frequent users with up to 35% having reported using it at least once in the past year. Regarding adolescents, over 1.6 million 12 to 17 year-olds (6.5% of the U.S. population) reported current use of cannabis [10]. The prevalence of past-year cannabis use varies widely by location, with the Western United States seeing the highest prevalence, but all U.S. geographic regions have seen statistically significant increases in cannabis use over time [11].

Of those who use cannabis, a subset will develop a cannabis use disorder (CUD). According to the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5), a diagnosis of CUD requires the endorsement of 2 or more of 11 specified symptoms within a 12-month period (Table 1) [12]. Clinically significant impairment and/or distress resulting from cannabis use are also required for a diagnosis. In 2016, it was estimated that 22.1 million people met criteria for CUD globally; this equates to approximately 1 in 10 “ever users.” [13,14]

Multiple studies have reported on substance misuse, including cannabis use, in persons presenting for MBS.

Table 1
DSM-5-TR criteria for cannabis use disorder [12]

Diagnostic criteria for cannabis use disorder
Criterion: A problematic pattern of cannabis use leading to clinically significant impairment or distress, as manifested by at least 2 of the following, occurring within a 12-month period:
1. Cannabis is often taken in larger amounts or over a longer period than was intended
2. There is a persistent desire or unsuccessful efforts to cut down or control cannabis use
3. A great deal of time is spent in activities necessary to obtain cannabis, use cannabis, or recover from its effects
4. Craving, or a strong desire or urge to use cannabis
5. Recurrent cannabis use resulting in a failure to fulfill major role obligations at work, school, or home
6. Continued cannabis use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of cannabis
7. Important social, occupational, or recreational activities are given up or reduced because of cannabis use
8. Recurrent cannabis use in situations in which it is physically hazardous
9. Cannabis use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by cannabis
10. Tolerance, as defined by either of the following:
a. A need for markedly increased amounts of cannabis to achieve intoxication or desired effect.
b. Markedly diminished effect with continued use of the same amount of cannabis.
11. Withdrawal, as manifested by either of the following:
a. At least 3 of the following signs and symptoms develop within approximately 1 wk after cessation of cannabis use that has been heavy and prolonged (i.e. - usually daily or almost daily use over a period of at least a few mo):
i. Irritability, anger, or aggression
ii. Nervousness or anxiety
iii. Sleep difficulty (e.g. - insomnia, disturbing dreams)
iv. Decreased appetite or weight loss
v. Restlessness
vi. Depressed mood
vii. At least one of the following physical symptoms causing significant discomfort:
a) Abdominal pain
b) Shakiness/tremors
c) Sweating
d) Fever
e) Chills
f) Headaches
b. Cannabis (or a closely related substance) is taken to relieve or avoid withdrawal symptoms.
Severity specifiers
Specify current severity based on the following guidelines:
1. Mild: Presence of 2 or 3 symptoms
2. Moderate: Presence of 4 or 5 symptoms
3. Severe: Presence of 6 or more symptoms

DSM-5-TR = Diagnostic and Statistical Manual of Manual of Mental Disorders-5-Text revision (APA, 2013).

Using the most validated and reliable assessment of psychopathology, including substance misuse, Sarwer and colleagues found that 6% of people seeking MBS report active alcohol or other substance use disorders, including cannabis misuse in 2.61% [15]. Lifetime history of substance use disorders is much higher and seen in up to one-third of persons who present for MBS [15,16].

While these data are believed to be both valid and reliable, differences in the legality of cannabis across different states, variability in assessment measures, and likely underreporting of use, lead to questions about the generalizability of those findings. For example, 26% of individuals who underwent MBS in a state where cannabis is legal reported past or current use [17]. This compares to 6.2% of participants seeking MBS in a state where only medical cannabis was legalized, of which nearly half (47.9%) did not admit to using but were identified from preoperative toxicology screenings [18]. Similarly, another study found that 5% of patients tested positive for cannabis on toxicology screens despite the setting being independent of the presurgical evaluation [15]. It is likely that underreporting is even more common when patients do not want to report use for fear of jeopardizing their ability to qualify for surgery.

While the weight loss experienced by most patients after MBS is associated with reports of decreased pain and improved quality of life, which could theoretically decrease the perceived need for cannabis, it appears to be used by many patients following surgery. Vidot et al. studied 50 patients (mean age of 28 years) at least 1-year postsurgery and found that 32.1% had used cannabis within the last 30 days, and 67.9% reported use within the last year [19]. It should be noted that cannabis prevalence rates in this study may be higher than in the general MBS population, given the younger age and greater racial or ethnic diversity of the sample. In another study of 765 patients (mean age of 44 years) between 6 months and 4 years postsurgery, 14.5% used cannabis postoperatively, most commonly edibles, and most often solely for recreational purposes [20]. Although there are still limited data on estimates of pre- and postsurgical cannabis use, it appears that estimates of possurgical use are higher than presurgical use. Possible explanations include minimizing self-reported use prior to surgery, increases in legalization over time, and using cannabis as an alternate means of coping post-surgery.

Medical and pharmacologic considerations

General health risks

General health risks of cannabis use are dependent on several factors, including the type of cannabis product, the route of administration (i.e., smoked, vaped, dabbed, topical, edible, sublingual, etc.), and the device used (bong, joint, vape pen, blunt, etc.). Smoking or vaping cannabis generally leads to a faster onset of psychoactive effects but for a shorter duration, compared to higher potency edible products, which can be accidentally overused due to the delayed onset of effects [21]. A systematic review of routes of administration among youth and young adults in the United States and Canada revealed that while smoking remained the most frequent route of administration, this appeared to decline in recent years, and the prevalence of vaping increased [21]. Given lack of regulation, recreational cannabis use is thought to pose higher or less certain health risks compared to that of medical cannabis [2]. Therefore, some MBS programs have created protocols which distinguish between medical and recreational use, such as requiring medical users to submit documentation of their prescription cards and requiring recreational users to quit [22].

Regarding the cardiovascular system, cannabis use is associated with arrhythmias, vasodilation, myocardial infarction, transient hypertension, tachycardia, syncope, dizziness, and stroke [23,24]. There is a correlation between the potency of THC consumed and the risk of tachycardia and adverse cardiovascular events, with higher doses leading to increased risk [24]. Although cardiovascular risk appears to be most pronounced in those with existing cardiovascular pathology, life-threatening cardiovascular disease has been reported even in young and otherwise healthy cannabis users [23]. Mittleman et al. reported that the risk of triggering a myocardial infarction was elevated nearly 5-fold within 1 hour of smoking cannabis [25]. Therefore, those at highest risk of cardiovascular events are those who are acutely intoxicated (i.e., currently under the influence of the substance and experiencing physical and psychological reactions), and delay of nonemergent surgery is advised. Cardiovascular effects of cannabis can vary based on dosage and timing of exposure, potency, formulation of the product, route of administration, and concurrent use of other drugs.

The pulmonary effects of chronic cannabis smoking mirror those of chronic tobacco smoking, with an increased risk of chronic bronchitis, pneumonia, and other respiratory infections [26]. As with most body systems, the relationship between pulmonary issues and long-term cannabis smoking is unknown. However, it is noted that short-term exposure (i.e., immediately after inhalation) produces bronchodilation [27]. Thus, to preserve airways perioperatively, patients should be cautioned against inhaled cannabis formulations. Indeed, the "ASMBS Position Statement on Preoperative Patient Optimization Before Metabolic and Bariatric Surgery" indicated that while research is nascent, a clinical approach used by some programs is to advise patients to convert from inhaled to ingestible formulations [28]. However, a timeline for cessation of inhaled cannabis has not been established.

Regarding gastrointestinal effects, whereas cannabis may alleviate or prevent nausea in new users, chronic, daily use can lead to cannabinoid hyperemesis syndrome (CHS). Symptoms include severe and persistent nausea, vomiting, and abdominal pain, which may lead to dehydration, esophagitis, esophageal tears, and electrolyte imbalances in an already at-risk population [29]. CHS has not been researched within the MBS population, but given the overlap of symptoms with common complaints in the immediate postoperative period, clinicians should inquire about cannabis use for differential diagnosis when patients post-MBS present with symptoms of vomiting. Treatment of CHS includes cannabis cessation, intravenous fluid replacement, anti-emetics, and taking hot showers or baths [28].

MBS perioperative concerns

Postoperative complications and readmissions

Research regarding cannabis and postsurgical complications in the MBS population is limited. A retrospective study by Shockcor et al. compared 30-day complication rates among 73 cannabis users and 1103 nonusers. While cannabis users had significantly lower follow-up rates than nonusers at 6 months and 2 years postsurgery, no significant differences were found in readmission, reoperation, infection, thromboembolic, or bleeding events [18]. Similar results were found by Bauer et al., who noted no difference in postoperative infections among the 434 users and nonusers studied [30]. Worrest et al. compared complication rates among 798 nonusers, 225 previous users, and 84 active users at an institution in Oregon, where recreational cannabis had been legalized for over 5 years [17]. Researchers found that the overall complication rate was low, and there were no significant differences between groups in overall 30-day complication rates. Two exceptions were noted, with current cannabis users who underwent the sleeve gastrectomy requiring more outpatient intravenous infusions than previous users and nonusers, and current cannabis users had significantly more reoperations within 30 days postsurgery. Authors speculated that increased pain and anxiety surrounding surgery among cannabis users may help to explain such differences.

Whereas aforementioned MBS studies compared complications among cannabis users versus nonusers, a more recent study by Shah et al. specifically examined the effect of CUD on postoperative outcomes [31]. In this large retrospective study of 713,290 patients post-MBS drawn from the 2016 National Inpatient Sample, 1870 (.26%) participants were identified as having a CUD (i.e., abuse of cannabis despite impairments in physical, psychological, or social function) based on ICD-10 coding. Those with CUD tended to be younger and were more frequently male compared to those without CUD. A composite outcome variable for "medical complications" was defined as having experienced one or more of the following: cardiac arrest, venous thromboembolism, pulmonary embolism, respiratory arrest, pneumonia, sepsis, stroke, and/or urinary/renal complications. In contrast to other studies that failed to find significant associations between cannabis use and MBS complications, Shah et al. did find that CUD was associated with longer length of stay and medical complications. These findings are aligned with results from another recent nationwide cohort study, in which 12,422 inpatient hospitalizations after 11 major elective surgeries (i.e., cholecystectomy, colectomy, inguinal hernia repair, femoral hernia repair, mastectomy, lumpectomy, hip arthroplasty, knee arthroplasty, hysterectomy, spinal fusion, and vertebral discectomy) from the 2016–2019 National Inpatient Sample were analyzed for potential associations between CUD and a composite outcome variable for "medical complications" (defined similarly as the aforementioned study) [32]. Potnuru et al. found that CUD was associated with increased risk of perioperative complications, increased risk of inpatient mortality, and higher hospital resource utilization/costs despite similar lengths of stay [32]. Although this latter study did not include MBS hospitalizations, taken together with Shah et al.'s MBS study [31], it appears that CUD is cause for concern in elective surgeries. Shah and colleagues speculated that the presence of severe cannabis use may have more significant clinical implications than mild to moderate use, which highlights the need for nuanced cannabis use assessment [31].

Effect of cannabis use on postoperative pain management

While research has studied the effects of preoperative cannabis use on postoperative pain management, few studies have focused on the MBS population. One study focused on patients undergoing MBS examined the effects of preoperative cannabis use on perioperative outcomes in 434 patients following MBS [30]. Thirty-six patients (8.3%) were classified as regular cannabis users, defined as at least one use per month. When compared to the nonuser cohort, the total perioperative opioid use was significantly higher in the cannabis user group. It is notable that in this study, the cannabis users reported nonstatistically lower daily average pain scores (scale: 0–10) when compared to nonusers, yet still had higher total perioperative opioid use.

Studies in other surgical populations have found similar relationships. For example, Jefferson et al. observed 73 patients following orthopedic surgery to determine the effects of prior cannabis use on the need for rescue analgesia postoperatively [33]. Forty-two cannabis users, defined as any patient who reported cannabis use within 2 years of the study, and 31 nonusers were included. Notably, 27 patients in the user group reported cannabis use within 14 days of surgery. Cannabis users required a significantly higher average dose of supplemental pethidine (meperidine) compared to nonusers. Pain scores were described by the mean pain intensity difference at the first postoperative hour ($MPID_1$) after surgical anesthesia effects subsided. The $MPID_1$ was significantly higher in the cannabis user group compared to nonusers.

Methodologic limitations, such as variable definitions of cannabis use and potential underreported confounders (e.g., baseline opioid use, preexisting chronic pain diagnosis), make it difficult to draw firm conclusions from these studies. However, all studies demonstrated a general increase in perioperative opioid use in patients who reported cannabis use; early post-operative pain scores were also higher in cannabinoid users. Given the available evidence, providers should consider preoperative cannabis use as a risk factor for potential increased opioid requirements in the postoperative period.

Nutritional considerations

Both THC and CBD influence appetite, with THC being known to stimulate appetite while CBD is believed to suppress hunger [34]. Vidot et al. found that postoperative cannabis usage was associated with disordered eating, namely loss of control of food intake [19]. In that same study, authors measured “food addiction” using the Yale Food Addiction Scale, which models questions after diagnostic criteria for substance dependence (e.g., loss of control, unsuccessful attempts to quit overeating, too much time spent to obtain food, skipping important activities for food, etc.). They found that food addiction was significantly increased in patients who were active users compared to those who had never used cannabis [19]. Similarly, Miller-Matero et al. found that any postoperative cannabis use was associated with an increased likelihood of engaging in graze eating and eating in response to depression [20]. For patients using cannabis frequently (at least once per week), use was additionally associated with binge eating, loss of control eating, and night eating [20]. Authors of this study postulated that more frequent and prolonged stimulation of cannabinoid receptor 1 could help to explain the relationship between cannabis use and maladaptive eating behaviors among those using this substance regularly [20]. Of note, the majority of participants in this sample were using edible cannabis, which, as noted above, has a longer duration of action and could therefore influence eating behaviors to a greater degree than with other routes of administration.

While there may be concern that cannabis use could negatively influence weight loss by increasing appetite and risk of disordered eating, the available research is mixed. Most studies have not found significant associations between cannabis use and postsurgical weight loss. Shockcor et al. found no significant difference in weight loss between cannabis users and nonusers at 3 weeks, 3 months, 6 months, 1 year, or 2 years following MBS [18]. Similarly, Worrest et al. found that neither past nor current cannabis users experienced less weight loss than nonusers at 30 or 60 days postoperative [17]. Bauer et al. also found that weight loss was not statistically significant between groups of users and nonusers at 90 days following surgery [30]. Despite no difference in weight loss, it was noted, however, that presurgery BMI was higher for users of cannabis than nonusers in both studies [17,18]. Most recently, in contrast to other findings, Miller-Matero et al. found that while presurgical cannabis use was not associated with postsurgical weight loss between 1 and 4 years postsurgery, patients who reported cannabis use up to 4 years after surgery had a lower %EWL and a greater likelihood of weight reoccurrence [35]. In this latter study, patients who were using cannabis regularly (at least weekly) had the lowest likelihood of having a successful weight loss outcome. Because weight recurrence tends to occur beyond 2 years post-surgery, the longer timeframe of follow-up in Miller-Matero et al.’s study may explain their contrasting findings [35].

Although data are limited surrounding nutrition and cannabis use among individuals seeking MBS, extant research suggests that postoperative screening for cannabis use is needed, including a thorough evaluation of the type of product, frequency of use, and perceived impact on eating behaviors.

Psychological considerations

Associations between cannabis use and mental health

The trend toward legalization of recreational cannabis, along with increases in potency and decreases in risk perception, has raised concerns regarding the negative consequences of cannabis use, including the development of CUD in both adolescents and adults. As noted previously, cannabis use among youth is not uncommon [10]. Research suggests that those who begin using cannabis prior to age 18 years are at increased risk for developing CUD [36]. The relationship between cannabis use and mental health outcomes is complex, but it appears that adolescent cannabis exposure and adverse neuropsychiatric outcomes are strongly associated [37].

In adults, CUD is comorbid with other substance use disorders and psychiatric conditions [12]. High rates of alcohol use disorder (>50%) and tobacco use disorder (53%) have been observed in individuals with past-year or lifetime CUD [12]. These individuals may also meet criteria for major depressive disorder (11%), bipolar I disorder (13%), or any anxiety disorder (24%) [12].

Though the existing literature suggests a relationship between cannabis use and certain mental health conditions, interpretation of these results is limited by variable assessment of cannabis use (typically limited to frequency and a single modality of use – smoking), reliance on self-report, underreporting of potential confounding variables, issues with study design (e.g., lack of randomization, appropriate control group, or long-term follow-up), small sample sizes, and questions of temporality [38].

Within the last decade, there have been several reviews on the adverse health effects of cannabis use. One such review, based primarily on cohort studies, noted a 2-fold increase in suicidality (suicidal ideation and suicide attempt) among "regular" (defined in epidemiologic studies as daily or near-daily use) cannabis users [13]. The authors noted they were unable to draw clear conclusions about the link between cannabis use and depression due to probable confounding [13]. Volkow et al.'s review cited a "medium" level of confidence in the effects of cannabis use on depression or anxiety, noting that causality has not been established [39].

According to a National Academies review, there is moderate evidence that cannabis use is associated with increased risk for the development of depression and social anxiety disorder—but not other anxiety disorders [38]. Limited evidence exists for an association between cannabis use and increased severity of post-traumatic stress disorder (PTSD) and anxiety symptoms. The review also supported a dose-response effect of cannabis use on suicidality (moderate evidence) [38]. High quality research on the association between cannabis use and the development of PTSD or the course of depressive disorders was found to be lacking [38].

Results for bipolar disorder appear to be more complicated. The magnitude of the relationship between cannabis use and increased symptoms of mania and hypomania among individuals diagnosed with bipolar disorders appears to be strongest among regular users and decreases (or becomes nonsignificant) when alcohol and other substances are included in statistical models [38]. "This suggests that the constellation of behaviors that includes the use of cannabis, alcohol, and other substances might all play roles in the risk for bipolar disorders, with those different roles being difficult to disentangle." [38]

Evidence appears to be strongest for an association between cannabis use and psychotic symptoms or disorders (e.g., schizophrenia, schizophreniform disorder, schizoaffective disorder), particularly among individuals with a genetic predisposition [38]. A 2014 review rated confidence in the relationship between cannabis use and schizophrenia, specifically, as "medium." [39] A more recent review, which synthesized data across five fair-to-high quality systematic reviews, suggested a "moderate to large" dose-dependent association between cannabis use and the development of a psychotic disorder. [38]

Though not meeting the threshold for a mental health diagnosis, acute adverse effects of cannabis use—particularly among naïve users—may include symptoms of anxiety, paranoia, suicidal thoughts, and/or panic [13,40]. These are likely to be exacerbated by higher THC content [13] and may account for up to 25–30% of cannabis-related emergency department visits [40]. Similar experiences, including anxiety and depression, may also be reported by patients with cannabis withdrawal. [41]

Medical cannabis for mental health conditions

A systematic review of the limited research in this area concluded there is "tentative" support for use of CBD in reducing social anxiety; mixed evidence for the use in individuals with schizophrenia; and limited evidence for use in individuals with PTSD or attention-deficit/hyperactivity disorder (ADHD) [42]. There appears to be no benefit of THC on depression or CBD on mania [42]. A more recent scoping review on the use of CBD in psychiatric disorders noted "promising preliminary findings" for psychotic symptoms and anxiety but concluded "there is currently not enough high-quality evidence to suggest the clinical use of CBD for any psychiatric disorder," [43] as did Hill et al. [44].

Despite limited evidence for its efficacy in treating mental health disorders, anxiety (14.2%) and PTSD (13.0%) are among the most common patient-reported qualifying conditions for medical cannabis in the United States [45]. In patients who had undergone sleeve gastrectomy, anxiety/stress (16.1%) and depression (12.9%) were among the top 5 most-cited reasons for using cannabis [46]. Unlike traditional psychotropic medication management, medical cannabis prescription does not require close monitoring and follow-up. In Ohio, for example, any physician holding a full, unrestricted MD or DO license and who completed 2 hours of continuing education about cannabis treatment can apply for a certificate to recommend (CTR) [47]. Physicians with CTRs "may recommend up to a 90-day supply of medical marijuana with three refills (totaling 360 days)" [47].

Cannabis, mental health, and MBS

Research that has examined the relationship between cannabis use, mental health, and MBS is limited. In one study that analyzed data from the Michigan Bariatric Surgery Collaborative clinical registry, patients who reported cannabis use at baseline and/or 1-year follow-up were more likely to smoke cigarettes, screen positive for AUD, and endorse more severe depressive symptomatology than nonusers [48]. Another study found that although postoperative cannabis use (between 6 months and 4 years postoperative) was not associated with increased depression, it was significantly correlated with increased anxiety [20].

Other research examining MBS outcomes among cannabis and combination (cannabis plus opioids) users found that 60% of cannabis users reported mild to moderate anxiety and 20% endorsed moderate symptoms of depression before surgery [49]. Combination users were more likely to report preoperative anxiety or depression and scored significantly higher than cannabis only users on a depression measure after surgery [50].

Among postoperative patients presenting for inpatient substance use treatment, 12.5% were using cannabis [50]. Taken together, these findings highlight the importance of preoperative screening (for a nonexhaustive list of cannabis use screening measures, see Supplementary Table 1) and education regarding the risks of substance use after surgery, in conjunction with continuous monitoring of mental health and substance use throughout the perioperative and postoperative periods.

Conclusion

Based upon research suggesting medical, nutritional, pharmacologic, and psychological risks associated with long-term cannabis use in the general population, the healthiest and safest course of action for active cannabis users is to quit. However, research in the MBS population, specifically, is quite limited. The few studies that are available are challenged by varying definitions of cannabis use, lack of distinction in route of administration, concentration of THC versus CBD, medical versus recreational use, and other clinically relevant factors. Existing research suggests that cannabis use is not associated with most postoperative complications but is associated with mental health concerns and disordered eating in patients who have undergone MBS. Research regarding weight loss outcomes is mixed, with most studies showing no significant association, but one longer follow-up study showing that cannabis (particularly when used regularly) is a risk factor for suboptimal weight loss. Further, severe cannabis use appears to have more clinical significance than mild to moderate use, as it is associated with longer lengths of stay and medical complications. While an active CUD is considered a contraindication, requiring treatment and abstinence before proceeding with surgery, the state of the literature is not strong enough to suggest that occasional or medical cannabis use is an absolute contraindication to MBS. Decisions about cannabis protocols should be made at the MBS program level, and patients should be fully informed about the risks of ongoing use.

Summary of considerations

- Prevalence of cannabis use is increasing in the general population, with the highest prevalence in adolescents and young adults, and many current users continue to use cannabis post-MBS.
- As with all other substances, patients should be screened for an active cannabis use disorder, which poses increased psychological and medical risk, and those meeting criteria for CUD should seek substance abuse treatment.
- In addition to routine screening based on patients' verbal self-report, toxicology screenings may be needed to confirm abstinence in the preoperative period, given the potential for underreporting.
- Cannabis users should be advised to obtain products from licensed state dispensaries that are subject to safety regulations, instead of by illegal and riskier means.
- To optimize respiratory function, patients should be cautioned against inhaled formulations.
- Given that those at the highest risk of cardiovascular events are those who are acutely intoxicated, it is advised that MBS not be performed during a period of intoxication.
- Clinicians should be aware that preoperative cannabis use is a risk factor for potential increased opioid requirements in the postoperative period.
- Because estimates of postsurgical cannabis use appear higher than presurgical use, all patients should be screened after surgery regardless of history.
- As there may be a dose-dependent relationship between cannabis use and eating behaviors, patients who use cannabis frequently postsurgery should be screened regularly for eating disorders.
- Preoperative education regarding the risks of cannabis should be provided to patients, along with regular monitoring of mental health, maladaptive eating behaviors, and substance use postoperatively.

Disclosure

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Supplementary data

Supplementary material associated with this article can be found, in the online version, at https://doi.org/10.1016/j.soard.2024.12.006.

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