Cannabis Perioperative Considerations for OMS Sedation

Evidence-Based Management for the Oral Surgeon

Keshav Kumar DDS, MD

Division of Oral & Maxillofacial Surgery

Keck Medicine of USC
Herman Ostrow School of Dentistry of USC

California Association of Oral & Maxillofacial Surgeons Conference

May 3 | Los Angeles, CA

Objectives

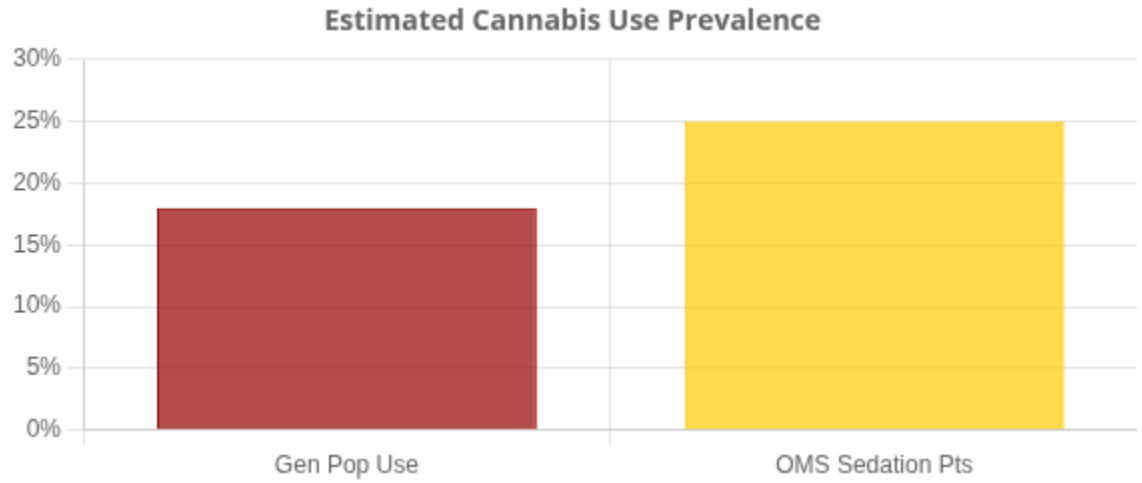
- Define THC vs CBD, routes of administration, and relevant perioperative pharmacology
- Apply evidence-based screening protocols and risk stratification pre-operatively
- Anticipate intra-operative anesthetic dose adjustments and hemodynamic changes
- Optimize post-operative management including pain control, PONV, withdrawal, and discharge planning
- Summarize current evidence and identify knowledge gaps in OMS literature

[Cite: ASRA 2023; JOMS 2023–2024]

Why This Matters in OMS

Prevalence in OMS

Cannabis use is common and legalization increases exposure in the OMS patient population.



Impact on Sedation

> *"Cannabis use prompts need for more anesthesia during surgery, increases pain and postoperative opioid use."*
>
> — ASA News Release 2020

Critical Considerations

- Patient safety & team workflows
- Medicolegal informed consent challenges
- Poly-substance use interactions

Cannabis Basics: THC vs CBD

THC

Delta-9-tetrahydrocannabinol

- **Primary Psychoactive Component**
- Partial Agonist at CB1 & CB2 Receptors
- Adverse Effects: Tachycardia, Euphoria, Anxiogenic at high doses
- Metabolism: CYP2C9 & CYP3A4

VS

CBD

Cannabidiol

- **Non-Intoxicating**
- Anxiolytic / Anti-inflammatory / Anticonvulsant
- Drug Interactions: Potent CYP3A4 & UGT Inhibitor
- Note: Products vary widely in THC:CBD ratios; labeling is often inconsistent

Routes and Pharmacokinetics

Inhaled / Vaped

- **Rapid Onset:** Effects within minutes, ideal for acute titration
- **Peak Effect:** 30 minutes to 2 hours
- **Bioavailability:** 10-35% (highly variable based on depth of inhalation)
- **Duration:** 2-4 hours

Oral / Edible

- **Delayed Onset:** 1-3 hours (erratic absorption)
- **First-Pass Metabolism:** Converts Δ9-THC to 11-OH-THC (more potent/psychoactive)

Metabolism & Elimination

- **Lipophilic Nature:** Rapid redistribution to adipose tissue; tissue half-life can be days to weeks
- **Hepatic Metabolism:** Extensive liver processing via Cytochrome P450 system

THC Metabolism	CBD Metabolism
CYP2C9 & 3A4	CYP3A4 & 2C19

Note: Also involves UGT1A9 & 2B7 glucuronidation pathways (implications for propofol/morphine metabolism)

Physiologic Effects Relevant to Anesthesia

Cardiovascular System

Acute tachycardia & hypertension (onset 1–2 hrs); Myocardial Infarction (MI) risk increases significantly shortly after smoking.

Cite: Mittleman 2001 Circulation; Alexander & Joshi 2019

Respiratory System

Bronchodilation but significant airway hyperreactivity; increased secretions; rare but severe uvular edema.

Cite: Tashkin 1973 NEJM; Mallat 1996 Can J Anaesth

Central Nervous System (CNS)

Altered cognition & memory; anxiety/psychosis at high THC doses; tolerance develops with chronic use;

Section 02

Preoperative Considerations

- Universal Screening & Documentation
- Risk Stratification (CV, Respiratory, CNS)
- Timing & Case Postponement Guidance
- Medication Interactions & Consent

Pre-op Screening: What to Ask

Product Type & Formulation

Smoked, vaped, edible, concentrates (dabs/wax). Ask about THC:CBD ratio if known.

Frequency & Timing

Daily vs. occasional use. Specific time of last use (hours vs. days ago).

Dose & Potency

Estimated mg if edible, number of hits/bowls if inhaled. Medical vs. recreational intent.

Co-Use & Comorbidities

Alcohol, opioids, benzodiazepines, or other substances. Underlying anxiety/psychiatric history

Signs of Acute Intoxication

- Euphoria or inappropriate laughter
- Anxiety, paranoia, or panic attacks
- Impaired judgment or memory
- Conjunctival injection (red eyes)
- Tachycardia (resting HR > 100 bpm)
- Dry mouth (xerostomia)

"Screening for cannabis use is not about judgment; it is about safety. safety. Universal screening allows for appropriate risk stratification and stratification and anesthetic planning."

Assessing Intoxication & Consent

Key Recommendation

If altered mental status or impaired decision-making capacity is present:

POSTPONE ELECTIVE CASE

Standardized Screening

Consider using a validated Cannabis Use Disorder (CUD) screening tool if clinical concern exists regarding frequency or dependency.

Documentation is Critical

Document capacity assessment and specific discussions regarding risks. Align strictly with institutional policy on impaired consent.

"We recommend postponing elective surgery in patients who have altered mental status or impairment of decision-making capacity due to acute cannabis intoxication."

ASRA Pain Medicine Consensus Guidelines 2023

Recommendation 2 • Grade A Evidence

See also: Alexander & Joshi 2019

Cardiovascular Risk Stratification

Acute Post-Smoking Risks (≤2 hours)

> Significant **tachycardia & hypertension** observed; MI risk transiently increased 4.8-fold in the first hour after smoking.

CAD & Angina Considerations

Assess functional capacity carefully. Cannabis use decreases angina threshold; optimize medical status and delay elective surgery if recent use is detected.

Conservative Management Guidelines

For high-risk patients, consider an avoidance window of up to **72 hours** to allow for full hemodynamic stabilization.

Cites: Mittleman MA et al. Circulation 2001; ASRA Guidelines 2023 (Recommendation: delay ≥2h post-smoking); Aronow WS et al. NEJM 1974

Respiratory/Airway Considerations

Chronic Smoking Effects

Airway inflammation and hyperreactivity similar to tobacco smoking; increased secretions and cough reflex.

Recent Inhalation Risks

Acute exposure increases risk of bronchospasm, cough, and rare but severe uvular edema leading to airway compromise.

Optimization Strategy

Optimize reactive airway disease pre-op; have bronchodilators ready; avoid airway irritants during induction.

> *[Cite: Tashkin 1973 NEJM; Mallat 1996 Can J Anaesth; ASRA 2023]*

NPO, Emesis, and Aspiration

Cannabinoid Hyperemesis Syndrome (CHS)

Characterized by cyclic vomiting and abdominal pain. Significant risk for dehydration and electrolyte imbalance.

NPO Reinforcement & Active Symptoms

Strict NPO adherence is critical. Treat any active vomiting or retching aggressively before proceeding with sedation.

Aspiration Risk Considerations

Clinical Pearl: Recent heavy edible use may cause delayed gastric emptying (gastroparesis-like effect), increasing aspiration risk even if NPO guidelines were technically followed.

Source: Alexander JC, Joshi GP. A review of the anesthetic implications of marijuana use. Proc (Bayl Univ Med Cent). 2019;32:364–371; ASRA 2023.USC Oral & Maxillofacial Surgery Program

Should Patients Stop Preoperatively?

ASRA Guidelines

Consensus Guidelines 2023

- **Wait Period:** Delay elective surgery ≥2 hours after smoking (due to acute MI risk/hemodynamics).
- **Screening:** Universal screening for all patients; assess frequency, route, and last use.
- **Medication:** No recommendation for routine tapering; continue FDA-approved cannabinoids.

VS

JOMS Perspective

Editorial & Clinical Opinion 2024

- **Weaning Strategy:** Consider a 6–7 day gradual wean rather than abrupt 1–2 day cessation.
- **Rationale:** Avoid acute withdrawal anxiety and irritability in heavy/chronic users perioperatively.
- **Clinical Focus:** Prioritize patient stability and honest reporting over strict abstinence mandates.

Consensus: Avoid acute intoxication on day of surgery. Continue prescribed cannabinoid medications to maintain baseline.

Cite: ASRA Pain Medicine Consensus Guidelines 2023; Lu et al. "Does Cannabis Affect Your OMS Practice?" JOMS 2024; PAIN 2021 Consensus

Pre-op Drug Interactions to Flag

Significant Enzyme Inhibition

CBD is a potent inhibitor of **CYP3A4** & **CYP2C19** (Phase I) and **UGT1A9** & **UGT2B7** (Phase II)

THC is metabolized via CYP3A4 & CYP2C9; competitive inhibition possible

Increased Sedative/Anesthetic Levels

Inhibition may lead to elevated plasma concentrations of:

Propofol (via UGT1A9 inhibition)
Midazolam (via CYP3A4 inhibition)
Morphine / Lorazepam (via UGT2B7 inhibition)

Anticoagulant & Antiplatelet Potentiation

Displacement from protein binding sites & metabolic inhibition

⚠ **Warfarin:** Check INR pre-operatively (interaction with THC/CBD increases INR)

Section 03

Intraoperative Implications

- Sedation & General Anesthetic Dose Requirements
- Airway Reactivity & Ventilation Strategy
- Hemodynamics & Monitoring
- Drug–Drug Interactions

Conflicting Evidence within JOMS (2023)

Ripperger et al.

J Oral Maxillofac Surg 2023; 81:1460

Finding: INCREASED Requirements

- **Population:** Ambulatory OMS patients under General Anesthesia
- **Outcome:** Cannabis users required significantly higher doses of propofol, midazolam, ketamine, and fentanyl compared to non-users.
- **Implication:** Anticipate higher anesthetic needs and potential tolerance.

Ripperger D, Atte A, Ritto F. Cannabis users require more anesthetic agents... J Oral Maxillofac Surg. 2023 Sep;81(11):1460.

VS

Gangwani et al.

J Oral Maxillofac Surg 2023; 81:527

Finding: NO Significant Difference

- **Methodology:** Comparison based on THC+ urine toxicology at time of sedation.
- **Outcome:** THC presence was NOT associated with higher midazolam, fentanyl, or propofol requirements after adjusting for age, sex, and weight.
- **Implication:** Positive urine screen alone may not predict anesthetic resistance.

Gangwani P, et al. Is recreational marijuana use associated with changes in vital signs... J Oral Maxillofac Surg. 2023 May;81(5):527.

Evidence from Endoscopy and ASA

Endoscopy Case-Control Study (2021)

Cannabis exposure was an **independent predictor** of higher propofol dose requirements for sedation.

Daily cannabis users required significantly higher doses compared to weekly or monthly users, demonstrating a dose-dependent relationship.

[Cite: Imasogie et al., PLoS ONE 2021;16:e0248062]

ASA Tibia Fracture Cohort (2020)

Cannabis users required **more sevoflurane** intra-operatively compared to non-users.

Post-operatively, users reported higher pain scores and had **higher opioid consumption** during hospital admission.

[Cite: ASA News Release 2020; Holmen et al. ANESTHESIOLOGY 2020]

Airway Reactivity and Ventilation

Secretions & Irritation Management

Expect increased secretions and cough with recent smoking. Consider routine administration of antisialagogues (e.g., glycopyrrolate) pre-induction.

Bronchodilator Readiness

Maintain high index of suspicion for bronchospasm. Have beta-agonists (albuterol) readily available intraoperatively.

Airway Technique Considerations

Consider LMA vs. ETT based on procedural risk; prioritize gentle airway manipulation. Avoid airway irritants (desflurane); consider lidocaine nebulization or topicalization to blunt reflexes.

Evidence Basis

Chronic use leads to inflammation similar to tobacco; acute use causes bronchodilation but hyperreactivity remains a concern.

Hemodynamics and Monitoring

Monitor for Tachycardia/HTN

Sympathetic surge common within 1-2 hours of recent use. Consider postponement if unstable or symptomatic.

Anesthetic Depth Management

Maintain adequate depth to blunt sympathetic surges. Standard dosing may be insufficient; titrate to effect.

CAD Risk Stratification

Ensure ischemia monitoring (ST-segment analysis) and readiness to treat demand ischemia in high-risk patients

Myocardial Infarction Risk

Risk of MI is increased nearly 5-fold in the first hour after marijuana smoking.

0-1h	1-2h	>2h
High Risk	Elevated	Baseline

Postpone elective cases if < 2h post-use

University of Southern California
Herman Ostrow School of Dentistry
Division of Oral & Maxillofacial Surgery

Local Anesthetics and Epinephrine

Chronic Users

Dental Local Anesthetic Efficacy

*Difference not statistically significant (P = .073)

Pilot Study Findings: No statistically significant difference in lidocaine success rate between chronic users and non-users.

Onset & Duration: Similar onset times (median 3 min) and duration of anesthesia (approx. 30-32 min).

VS

Acute Intoxication

Interaction with Epinephrine

Sympathomimetic Interaction: Acute THC causes tachycardia; epinephrine in LA may accentuate this effect.

Hemodynamic Risk: Potential for exaggerated tachycardia and hypertension in acutely intoxicated patients.

Management: Use conservative vasoconstrictor dosing (e.g., 1:200k epi or plain LA) if acute use suspected.

Drug-Drug Interactions Intra-op

CYP & UGT Inhibition Mechanisms

CBD inhibits **CYP3A4/2C19** and **UGT1A9/2B7**, potentially increasing plasma levels and prolonging effects of propofol, midazolam, and opioids.

Additive Sedation & Sympathomimetic Effects

Expect **synergistic sedation** with benzodiazepines/opioids. Sympathomimetics (e.g., epinephrine in LA) may dangerously augment cannabis-induced tachycardia.

Titration & Monitoring Strategy

Consider **reduced initial bolus doses** with slower titration. Monitor ventilation closely due to potentiated respiratory depression risk.

[Cite: ASRA 2023 Consensus Guidelines]

Section 04

Postoperative Management

- Pain & Opioid Needs
- PONV Risk & Prophylaxis
- Emergence & Behavioral Issues
- Withdrawal & Counseling

Pain and Opioid Requirements

Increased Acute Postoperative Pain

Cannabis users may report significantly higher pain scores post-operatively and require greater rescue opioid consumption compared to non-users.

Cite: ASA 2020; Alexander & Joshi 2019

Multimodal Analgesia Strategy

Employ a robust multimodal approach to minimize opioid reliance:

- NSAIDs & Acetaminophen (scheduled)
- Local/Regional Anesthesia (long-acting blocks)
- Dexmedetomidine or Ketamine adjuncts as appropriate

Cite: ASRA 2023 Guidelines

[Cite: ASA 2020; Alexander & Joshi 2019; ASRA 2023]

PONV and Antiemetic Strategy

~20%

Increase in PONV Incidence

Retrospective cohort studies indicate chronic cannabinoid use is independently associated with significantly higher rates of postoperative nausea and vomiting.

Clinical Implication

Standard antiemetic prophylaxis may be insufficient for chronic cannabis users. Aggressive, multimodal prevention is warranted.

Multimodal Prophylaxis Bundle

First-Line Agents
Ondansetron (4mg) + Dexamethasone (4-8mg)

Adjuncts for High Risk
Consider Droperidol, Scopolamine patch, or NK-1 antagonists

Hydration & TIVA
Adequate IV hydration; Propofol-based anesthesia (TIVA) reduces risk

Emergence and Behavioral Considerations

Emergence Agitation & Anxiety

Expect increased agitation, combativeness, or anxiety in heavy THC users during emergence. This may be due to acute withdrawal or altered neurotransmitter regulation.

Sleep Disturbances

Cannabis users frequently report disrupted sleep patterns post-operatively. Remind patients this is expected and temporary to manage anxiety.

Clinical Management Strategy

Consider preemptive anxiolysis (judicious midazolam) and ensure a calm, low-stimulation environment during recovery. Set clear expectations with patient and guardian.

Neurobehavioral Impact

- Altered emergence trajectory
- Heightened sensory sensitivity
- Potential for paradoxical reactions
- Increased need for reassurance

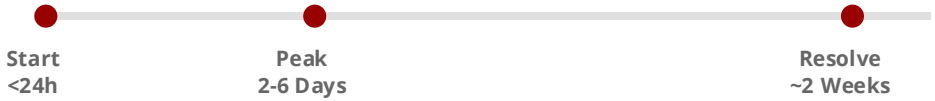
Key Evidence:
"Cannabis users appear to have worse pain after surgery... and may present with anxiety or paranoia."
— Alexander & Joshi, Proc (Bayl Univ Med Cent) 2019

Recent Perspective:
"JOMS study highlights recreational marijuana use may increase sedation requirements and affect recovery behavior."
— J Oral Maxillofac Surg 2024

Withdrawal and Tapering

Withdrawal Syndrome

Clinical Presentation & Timeline



Key Symptoms

Irritability, anxiety, insomnia, anorexia, abdominal pain, tremors, fever/chills

Onset & Duration

Starts within 24h of cessation; peaks at 2-6 days; can persist for weeks

Risk Factors

Heavy daily users, high-potency products, abrupt cessation

VS

ASRA Guidance

Perioperative Management

Routine Tapering?

"Insufficient evidence to recommend routine preoperative tapering"

Cannabinoid Medications

Continue prescribed FDA-approved cannabinoids (e.g., dronabinol, Epidiolex)

Management Strategy

Avoid abrupt cessation in heavy users; treat withdrawal symptoms symptomatically

Cite: Shah S et al. ASRA Pain Medicine Consensus Guidelines. Reg Anesth Pain Med. 2023; Alexander JC, Joshi GP. Proc (Bayl Univ Med Cent). 2019.

Discharge and Counseling

Clear Guidance on Resumption

Avoid resumption on day of surgery. Defer until no residual sedation and bleeding risk has subsided.

Potentiation Warnings

Explicitly warn about additive sedation and respiratory depression when combining cannabis with prescribed opioids or benzodiazepines.

Reinforce Post-Op Plan

Review pain management strategy, antiemetic use, and hydration importance. Provide specific return precautions for hyperemesis symptoms.

> *ASRA 2023 Guidelines emphasize clear communication regarding synergistic effects and safety timelines.*

[Cite: ASRA 2023; ASA patient safety resources]

Clinical Workflow: Screen → Decide → Manage

UNIVERSAL SCREENING
Assess: Type, Frequency, Last Use, Comorbidities

ACUTE INTOXICATION?
Altered mental status / Unstable vitals?

YES

POSTPONE CASE
Verify capacity, document, reschedule

NO

Low-Risk / Infrequent

- Counsel on peri-op abstinence
- Standard anesthetic plan
- Standard pain/PONV protocol

Chronic Heavy User

- Expect ↑ anesthetic needs
- Airway hyperreactivity plan
- Multimodal pain & PONV bundle

CAD / Reactive Airway

- Strict 2-72h abstinence rule
- Invasive monitoring / cardio-stable
- Consider med consult / optimization

[Cite: ASRA 2023 Guidelines; JOMS 2024 Editorial]

Evidence Summary and Gaps

Conflicting Findings

Current Literature in JOMS

High Dose

No Diff

Variability in Study Outcomes

Increased Requirements

Cannabis users required significantly more propofol, midazolam, ketamine, and fentanyl.

Ref: Ripperger et al., JOMS 2023

No Significant Difference

Urine THC+ status at time of IV sedation showed no association with higher medication needs after adjustment.

Ref: Gangwani et al., JOMS 2023

?

Research Gaps

Needs for Future Study

Standardized Prospective Trials

Heterogeneity of Use

Current data often fails to distinguish between product potency, route of administration, and chronicity vs. acute use.

Standardized Metrics Needed

Need prospective OMS-specific trials with defined exposure metrics and safety endpoints (airway, CV, PONV, pain).

Ref: ASRA 2023 Consensus Guidelines

Case 1: Daily Smoker for Third Molars

22-year-old Male

ASA I | 75 kg

Procedure

Extraction of 4 impacted third molars

Anesthetic Plan

Deep Sedation / GA (Propofol/Ketamine)

Cannabis History

Daily inhaled THC (vape & flower); Last use: late last night (approx. 10 hours ago)

Risk Factors

Chronic bronchitis symptoms; high tolerance; anxiety about "waking up"

Pre-operative Strategy

Counseling: Verify abstinence today; confirm no acute intoxication signs (tachycardia, injected conjunctivae).

Expectations: Discuss potential for higher sedative requirements and recall.

Pre-med: Consider oral midazolam if high anxiety; bronchodilator puff if wheezing.

Intra-operative Management

Dosing: Anticipate ↑ propofol (up to 20-30% more) and ketamine requirements.

Airway: Use gentle technique; LMA available if obstruction occurs; have albuterol ready.

Adjuncts: Multimodal analgesia (NSAIDs pre-emptively); local blocks to spare opioids.

Post-operative Care

Pain Control: Higher risk for acute pain; maximize non-opioids; set realistic expectations.

Recovery: Monitor for emergence agitation; calm environment.

Discharge: Clear instruction: NO smoking (dry socket risk) & NO cannabis + opioids

Case 2: CAD Risk and Recent Edible

55-year-old Female

ASA III | 82 kg

Procedure

Dental Implants (Elective)

Anesthetic Plan

Moderate IV Sedation

Cannabis History

Occasional edibles; Last use: 10mg THC edible yesterday evening (~14 hours ago)

Comorbidities

Hypertension (controlled), Coronary Artery Disease (stable angina)

Cardiovascular Risk Assessment

Timing: Outside the 1-2 hour critical window for acute MI risk (Mittleman et al.).

Optimization: Verify BP is controlled pre-op; assess for any active chest pain.

Decision: Proceed if asymptomatic; delay if tachycardia or hypotension present.

Sedation Strategy

Titration: Start low and go slow; edibles can have unpredictable residual effects.

Hemodynamics: Avoid tachycardia (increases myocardial O2 demand); strict BP limits.

Adjuncts: Consider Dexmedetomidine (precedex) to blunt sympathetic response/anxiety.

Post-operative & Discharge

PONV: Edibles may have delayed GI effects; consider dual antiemetics (Zofran + Decadron).

Counseling: Avoid same-day cannabis resumption (orthostasis risk + opioids).

Red Flags: Clear return precautions for chest pain or shortness of breath.

References

JOMS & Oral Maxillofacial Surgery Literature

1. **Ripperger D, Atte A, Ritto F.**
Cannabis users require more anesthetic agents for general anesthesia in ambulatory oral and maxillofacial surgery procedures.
J Oral Maxillofac Surg. 2023;81:1460. PMID: 37783364.

2. **Gangwani P, Lillian D, Dobbins J, et al.**
Is recreational marijuana use associated with changes in the vital signs or anesthetic requirements during intravenous sedation?
J Oral Maxillofac Surg. 2023;81:527.

3. **Lu YH, Mahajan L, Rudy H, et al.**
Does Cannabis Affect Your Oral and Maxillofacial Surgery Practice?
J Oral Maxillofac Surg. 2024; [Epub ahead of print].

4. **AAOMS Clinical Paper.**
Implications of Cannabis Use for Patients Receiving Anesthesia in Oral and Maxillofacial Surgery Practice.
2024.
AAOMS.

Anesthesia Guidelines & Reviews

5. **Shah S, Schwenk ES, Narouze S, et al.**
ASRA Pain Medicine consensus guidelines on the management of the perioperative patient on cannabis and cannabinoids.
Reg Anesth Pain Med. 2023;48(3):97-117.

6. **Alexander JC, Joshi GP.**
A review of the anesthetic implications of marijuana use.
Proc (Bayl Univ Med Cent). 2019;32(3):364–371.

7. **Ladha KS, et al.**
Perioperative Pain and Addiction Interdisciplinary Network (PAIN): Consensus recommendations for perioperative management of cannabis...
Br J Anaesth. 2021;126(1):304-318.

8. **Imasogie N, Rose RV, Wilson A.**
High quantities: Evaluating the association between cannabis use and propofol anesthesia during endoscopy.
PLoS ONE. 2021;16(3):e0248062.

Physiology & Seminal Research