Appendix

TABLE 6. Results of Guidelines Committee Voting

Round 1				
Guidelines Question, Statement, or Recommendation	**Approve**	**Approve with Changes**	**Disapprove**	**Comments**
Question 1. Should all surgical and procedural patients requiring anesthesia be screened for cannabis preoperatively and if so, what information should be obtained?	11	0	0	1. Can be shortened a bit 2. Chronicity and frequency of use, indication (recreational vs medical indication), dose per day (number of joints/mg), last use and its dosage. 3. Suggest greater consistency in how cannabis is referred to – as illicit vs. recreational. Strictly speaking it is no longer accurate to refer to as illicit, as it is not just decriminalized but legal in many jurisdictions (though still not federally) & recreational (at least in the drug policy space) is preferred as a less stigmatizing term. This is an issue throughout the draft.
Question 2. For patients evaluated prior to the day of surgery, such as those seen in a preoperative testing clinic, what evidence exists to guide the decision to continue or stop cannabinoids perioperatively?	5	6	0	1. Some minor grammar corrections needed-no need to repeat mechanism of action in this sedation. Can also be shortened. 2. Pictorial needs legend/time frame 3. Statement 2: A cannabis using patient may have a higher risk of harboring underlying cardiovascular or respiratory disease and cardiovascular events than a non-user. Evidence level: moderate 4. Recommendation 3: add: 5. Anesthesia providers should be aware of cannabinoid use and potential for cardiovascular events. Grade: C, low level of certainty. 6. We need to recommend that cannabis smoking prior to surgery is discouraged (similar to the recommendation in Q5). 7. Currently it only says about educating the patients about harm, but cannabis smoking is no

				different than cigarette smoking and perhaps worse in terms of CO retention. 8. Consider change of language from “cannabis using patient” to “patient who uses cannabis” (may better align with de-stigmatizing language, “people who use drugs” 9. I feel like the Overview sections under 2 and 3 contain a lot of information that is applicable to all of the recommendations – might some of it, editorially, be included instead in an introduction? Just an editorial comment. 10. For recommendation 2 – “he or she can be serially reassessed using a structured approach and by employing validated assessment tools” – I think this part of the recommendation should be removed unless we specify what a “validated assessment tool” is. I do not know what such a tool is and I imagine others might not. 11. Under Pharmacokinetics we state that “Cannabinoid (both THC and CBD) have a rapid peaking of plasma concentration (3-10 minutes) after inhalation…” but under pharmacodynamics we state that “the peak effect seen around 15 to 30 minutes.” I think these statements should be consistent with each other. From the resources that I cite below (Huestis) the peak is more consistent with 3-10 minutes. 12. The statement, “the psychotropic effects seem to reflect the plasma levels” is maybe misleading and is not supported by citation 11 which I believe is what is being cited here. The peak psychotropic effect is at 15-30 minutes but the peak plasma level is 3-10 minutes. This is the issue with cannabis use and driving, psychotropic effects do not correlate with plasma level given its lipophilicity. 13. Citation 11 is written in 2003, I believe a more up to date resource might be useful. (Huestis 2018, Cannabinoid Markers in Biological Fluids and Tissues: Revealing Intake)

				14. As stated later on in the first paragraph "Pharmacodynamics" "There is significant discordance of plasma levels of THC and physiological effects. This is also true of the psychotropic effects which may also be different than the physiologic effects. 15. Should we use the term marijuana use disorder? Should we stick with using one term, cannabis or marijuana throughout the manuscript? 16. Need to explain what assessment tool used to determine mental capacity or just omit language.
Question 3. Under what circumstances should the perioperative physicians, including anesthesiologists, surgeons, hospitalists and consultants, consider postponing elective surgery in patients who use cannabinoids?	7	3	0	1. Needs editorial support- sentence structure/grammar. 2. If we are going to counsel on potential risks of continuing cannabis- there maybe should be a template/figure associated with this….
Question 4. For patients on concomitant cannabis and opioid use preoperatively, should any additional guidance be provided for cessation prior to surgery?	8	3	0	1. Perhaps, it may be wise to incorporate the section on pain in Q2,3 in Q4 2. Consider omission of Low dose medically supervised use…., what about low dose recreational use? What is the distinction. Too MUCH controversy in that portion. 3. Although the evidence suggests that chronic habitual use of higher doses of THC may worsen post-operative pain, increase post-operative opioid use and precipitate the development of post-operative hyperalgesia, we are not able to provide any recommendations on a preoperative wean from cannabis, nor on the time frame or the

				length of taper.
Question 5. What are the specific concerns of chronic cannabinoid use in parturients presenting for labor or cesarean section?	9	2	0	1. My primary concerns stem from question 5 as it seems to have the greatest likelihood of possible unintended repercussions. To be clear, my concerns have to do with the expansive sections reciting evidence rather than with the recommendation itself, which is carefully tailored. 2. As part of my work, I attend a lot of drug policy conferences and have witnessed several panels in which women talk about having their babies taken away from them in the hospital after delivery because of their illicit drug use. There is also a thorny and complicated history surrounding the rights, responsibilities, and policing of pregnant people. The section outlining data for question 5 is much more extensive and expansive than those in the other questions–specifically, there is a lot of data dealing with situations that go far beyond the issue of anesthesia during labor or cesarian section. For example, areas addressed that encourage counseling of women (given valid concerns about the lack of understanding of the risks of cannabis use during pregnancy) seem to deal with situations that precede labor or cesarian delivery. Counseling regarding lactation would be the exception, but would that be done by an anesthesiologist? One way to mitigate potential unanticipated fall out from this guideline is to keep the evidence more tightly focused on the concern being addressed in the question. The discussion seems most relevant from the section on Intra-partum forward. There was one sentence in that section that struck me as odd as written: “Cannabis or cannabinoids cannot be recommended during labor, cesarean delivery or in the immediate post-partum period at this time and the FDA and ACOG recommend avoiding cannabis/cannabinoids during pregnancy and breastfeeding.” Who would be recommending

				cannabis use during pregnancy? My concerns about this section when I read it were amplified by the discussion I witnessed during the meeting, in which there was enough disagreement about the science that things became heated. This discussion might serve as a useful microcosm for anticipating how the guideline will be regarded once it becomes public. Given that the NAM report exists--and appears to take a different position from what is in this paper--it probably makes sense to address it directly if the argument is that the science being recited in this piece reflects an updated review of data that has emerged since the NAM report. Use of cannabinoids cannot be recommended for parturients so the statement is fine. I am concerned with the possibility of withdrawal in the setting of L&D. We should discuss whether to include a comment on this. 3. Should we include. In recommendation: The history of an occasional or 'recreational' use of marijuana likely does not pose a likelihood of a direct clinical interaction with neuraxial anesthesia for labor analgesia or cesarean delivery. This is the bottom line many readers will want.
Question 6. Should the intraoperative doses of anesthetics and analgesics be adjusted in patients who have taken cannabinoids preoperatively obtained?	10	1	0	1. Consider re: EEG recommendation Grade 1, high level of certainty? 2. Statement is fine. I'm tempted to propose something like "depending on the timing and amount of cannabinoid use, the clinician should be prepared for increased or decreased requirements and be guided by clinical presentation."
Question 7. Does acute or chronic cannabis exposure require any adjustment of	11	0	0	Why HIV as the example?

ventilator settings to accommodate for possible V/Q mismatch, smoke inhalation injury, impaired ciliary clearance, or other lung pathology?				
Question 8. Do patients taking perioperative cannabinoids require any special postoperative monitoring? If so, for how long?	8	3	0	1. LOE cannot be a range. 2. Should we alter to include: Recommendations: Based on the currently available evidence of increased post-operative pain scores and hyperalgesia among cannabis users, we recommend utilizing multimodal analgesia, using scheduled acetaminophen, NSAID and regional analgesia if appropriate and using opioids as rescue medication, adjusting postoperative pain medications accordingly. Seems too imprecise. Implies increasing doses post-op. Don't want to recommend automatically ordering. Higher doses of opioids, etc. The cardiovascular/cerebrovascular and resp section needs to be aligned with the one earlier. All of the duplicity should be streamlined. I still question the shivering statement – don't want to propagate unsupported statement from single review article but if there is additional data for this can leave it in. Same recommendations for language update throughout for "patients who use cannabis" rather than "cannabis users" There is no statement/recommendation regarding pulmonary effects. ? This question is difficult as much of the data review overlaps with other questions (cardiac, pulmonary, pain), I agree with the statements/recommendations. Comment on language. I would prefer "pain

				intensity ratings" over "pain scores." While "scores" is in common use, we don't really score pain and for many years after introduction of the 0-10 scale, you would be corrected for calling it a "score."
Question 9. Are there special considerations for concomitant opioid and cannabinoid use and should postoperative opioid prescriptions be adjusted prior to discharge?	7	4	0	1. There needs to be LOE for statements. 2. I think we need to discuss the final recommendation: "There is insufficient and/or inconsistent evidence to make a recommendation regarding cannabinoid use for acute postoperative pain management." The meta-analysis by Stevens and Higgins found no evidence for cannabinoids in acute pain so to me this is good enough evidence to make a slightly stronger statement that we do not recommend cannabinoids for acute postoperative pain. We are not assessing cannabinoids in chronic pain in this document, and the existing evidence seems to definitely lean toward not supporting use in acute pain. 3. There is insufficient and/or inconsistent evidence to make a recommendation regarding cannabinoids use for acute postoperative pain management --The RCT evidence reviewed above, in contrast to the limited retrospective observational data, is fairly consistent in finding that cannabis is NOT effective for the management of acute or post-operative pain and does not appear that inconsistent. What we cannot speak to is the impact of continuation of chronic cannabis use on post-operative pain as this evidence is all observational and limited. 4. We present evidence here that cannabinoids may result in sedation and altered respiratory response. While there isn't clear evidence this has actually caused harm, it gets my attention. It took quite a while to make the association of respiratory events with opioids and other sedatives. We may want to make this point as a cautionary statement that in the absence of overwhelming evidence, there is a signal that

				should be considered in opioid prescribing with concomitant cannabinoids. 5. Statement: There is evidence of increased pain and opioid requirements post-operatively among patients who use cannabis- For clarity – any descriptor for 'use. Cannabis'? Recreational, low dose 10 mg, etc. Chronic use, 1/week, etc.
Question 10. How does cannabis withdrawal symptoms present in the post-operative period and is there evidence for specific treatment?	8	3	0	1. There needs to be LOE for statements and the degree of certainty is for recommendations (not for statements) 2. Edit: Highest risk patients are those consuming high/unknown (add frequency) amounts of THC based products. I agree but think it would be worth mentioning an example of a "validated and reliable scale." It appears that the Cannabis Withdrawal Scale is such a scale so could that be at least mentioned? 3. Dronabinol at low dose is the best choice+ NOT STANDARD OF CARE nor an FDA on-label indication 4. Note: The risk is considered to be less with individuals consuming CBD dominant (>10:1 CBD to THC ration) based products. 5. Moderate level of certainty- I made this change. As we discussed and came to consensus on….we moved from low to moderate- Piomelli was on board with this as we created this section together before he abruptly left.
Round 2				
Question 2. For patients evaluated prior to the day of surgery, such as those seen in a preoperative testing clinic, what evidence exists to guide the decision	**11**	0	0	

to continue or stop cannabinoids perioperatively?				
Question 3. Under what circumstances should the perioperative physicians, including anesthesiologists, surgeons, hospitalists and consultants, consider postponing elective surgery in patients who use cannabinoids?	**11**	0	0	
Question 5. What are the specific concerns of chronic cannabinoid use in parturients presenting for labor or cesarean section?	**10**	1	0	1. Fetal physiologic complications okay – but should keep long-term developmental problems. See https://www.samhsa.gov/marijuana **Baby's health and development:** Marijuana use during pregnancy may cause fetal growth restriction, premature birth, stillbirth, and problems with brain development, resulting in hyperactivity and poor cognitive function. https://www.fda.gov/consumers/consumer-updates/what-you-should-know-about-using-cannabis-including-cbd-when-pregnant-or-breastfeeding : marijuana use during pregnancy may affect fetal brain development 2. as well I suggest adding at end: "specific to pregnancy" Question 5 old statement: "Cannabis use during pregnancy and in the post-partum period has the potential for adverse maternal, fetal, and long-term childhood

				developmental problems. This is in agreement with the statements by ACOG and the FDA." Question 5 new statement: "While cannabis use during pregnancy and in the postpartum period has the potential for adverse maternal and fetal physiological complications and long-term childhood developmental problems, there is CURRENTLY no evidence to suggest that there are any specific implications with neuraxial anesthesia for labor or cesarean section, specific to pregnancy."
Round 3				
Questions 2 and 3. What evidence exists to guide the decision to continue or stop cannabinoids perioperatively and/or postpone elective surgery? (Combined questions 2 and 3)				
Statement 1. Acute effects of cannabis use can result in altered mental status and impairment of decision-making capacity. Hence, the frequency of use and the timing of the last dose of cannabis usage are important. Level of certainty: High	12	0	0	Frequency and timing or estimated dose and timing?
Statement 2. Smoking cannabis can cause increases in heart rate and blood pressure that is prominent within the first 1-2 hours of usage. Level of certainty: High	12	0	0	I generally agree with this statement but there Is evidence in the literature that suggests that there is a paradoxical effect with chronic long term users consuming high doses of cannabis. Benowitz NL, Jones RT (1975) Cardiovascular effects of prolonged delta-9-tetrahydrocannabinol ingestion. *Clin Pharmacol Ther* 18(3):287–297. Latif, Z.; Garg, N. The Impact of Marijuana on the Cardiovascular System: A Review of the Most Common Cardiovascular Events Associated with

				Marijuana Use. *J Clin Med*. 2020, 9, 1925. https://doi.org/10.3390/jcm9061925 Fisher BAC, Ghuran A, Vadamalai V, et al. Cardiovascular complications induced by cannabis smoking: a case report and review of the literature. *Emerg Med J.* 2005;22:679-680. Level of certainty should probably be "LOW" since the evidence stems from a retrospective study. I am happy with moderate LOE if other feel it as well. Not as pleased with this one.
Statement 3. Smoking cannabis may lead to a higher risk of perioperative acute MI within the first 1-2 hours. Level of Certainty: Moderate	11	1	0	
Statement 4. Smoking cannabis may have deleterious effects on airway resistance and respiratory adverse events. Level of Certainty: Moderate	12	0	0	
Statement 5. There is a lack of published data on the perioperative cardiovascular effects following other routes of cannabinoids administration. Level of Certainty:	12	0	0	

Moderate				
Recommendation 1. Patients should be counseled on the potential risks of continued perioperative cannabinoids. Grade B	12	0	0	
Recommendation 2. We recommend postponing elective surgery in patients who have altered mental status or impairment of decision-making capacity due to acute cannabis intoxication. Grade A	12	0	0	
Recommendation 3. We recommend delaying non-emergent surgery for a minimum of 2 hours after cannabis smoking because of increased perioperative risk of acute MI. Grade C	11	1	0	1. True that's the association for acute MI risk periop. 2. Delaying ELECTIVE only 2 h? how about using 'non-emergent' instead of 'elective'? Seems like higher levels of cannabinoids more likely to interact… Do we allow cigarette smoking 2 h before elective surgery?
Recommendation 4. With other cannabinoids routes (non-smoking) of	12	0	0	

administration, consider weighing the risks and benefits before proceeding with elective surgery given the temporal association of cannabis usage and adverse cardiovascular effects. There is a lack of published data to recommend a specific duration. Grade I				
Statement 1. Chronic use of THC may worsen postoperative pain, increase postoperative opioid use and precipitate the development of postoperative hyperalgesia. Level of Certainty: Moderate	11	1	0	1. In my opinion this is not well presented – high Doses of THC (recreational inhalers) are often in a cannabinoid debt by the time they land in the PACU – we see this often, this hypothesis potentially needs to be articulated in a single sentence. In the body of the text in the section so it can be thought of by the anesthesiologist – we use nabilone often here and patents settle down. The statement does not need to change per se, just giving a potential viewpoint. My two cents. 2. The statement is reading to me that there is a lot of uncertainty on the topic. Is it right to say that we have a high degree of certainty that there is a lot of uncertainty? I am not sure if that reads well for a practitioner
Statement 2. Due to the lack of definitive evidence on the topic of concomitant cannabinoids and opioids in the perioperative period, the	11	1	0	UPDATED TO: There is a lack of high-quality evidence describing the risks of concomitant opioids and cannabinoids in the perioperative period and in addition few studies have addressed the benefits and risks of preoperative cannabinoid tapering. We are uncertain of the overall benefit of preoperative cannabinoid tapering. Level of certainty: low

benefits and harms of preoperative cannabinoid tapering are currently unknown. Level of Certainty: High				
Question 8. Are there special considerations for concomitant opioid and cannabinoid use and should postoperative opioid prescriptions be adjusted prior to discharge?				
Recommendation 3. There is insufficient evidence to recommend for or against adjusting postoperative opioid prescriptions in surgical patients who consume cannabinoids. Grade I	11	1	0	1. I cannot disagree but there has to be a qualified caution here. While there is insufficient evidence, I am uncomfortable leaving this without some qualification. Drugs with any sedative effect (even antihistamines), may potentiate the respiratory depressant effects of opioids. In the absence of evidence demonstrating that the combination of opioids and cannabinoids are free of respiratory depression, I think that some "expert opinion" on the general effects of opioids and sedatives should be noted. We have no clear evidence that the combinations safe so we need to be careful with this recommendation. 2. This cannot be grade 1 evidence as there is no definitive evidence.