

CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

Sedative Agents During Medical Procedures: Guidelines

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Authors: Shannon Hill, Suzanne McCormack

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Research Question

What are the evidence-based guidelines regarding the use of sedative agents for medical procedures?

Key Findings

Thirteen evidence-based guidelines were identified regarding the use of sedative agents for medical procedures.

Methods

A limited literature search was conducted by an information specialist on key resources including Medline, the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concepts were sedation and monitoring. Search filters were applied to limit retrieval to guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2015 and March 11, 2020. Internet links were provided, where available.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

Population	Adult and pediatric populations in any setting
Intervention	Sedative agents used for minimal (i.e., anxiolysis), moderate (i.e., conscious sedation), or deep sedation during medical procedures (e.g., short-acting benzodiazepines [e.g. midazolam] alone or in combination with opioid analgesic [e.g., fentanyl, morphine], other sedatives [etomidate, propofol, nitrous oxide])
Comparator	Not applicable
Outcomes	Recommendations regarding best practices before, during, and after sedation (e.g., patient monitoring protocols, recommended safeguards, appropriate patient populations, patient contraindications)
Study Designs	Evidence-based guidelines

Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Normally, health technology assessment reports and systematic reviews are presented first; however, in reports where guidelines are primarily sought, the aforementioned evidence types are presented in the appendix.

Thirteen evidence-based guidelines¹⁻¹³ were identified regarding the use of sedative agents for medical procedures.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

Thirteen guidelines were identified regarding the use of sedative agents for medical procedures.¹⁻¹³ Specific recommendations regarding the best practice for the use of sedatives and procedural recommendations related to before, during, and after sedation were found in nine of the identified guidelines.^{2,5-10,12,13} A summary of the relevant sedation recommendations are presented in Table 2, while pediatric population specific sedation recommendations are presented in Table 3. Guidelines that were identified but did not offer specific recommendations based on the available abstract were not reported.^{1,3,4,11}

Table 2: Summary of Relevant Recommendations

Summary of Recommendations
Celis-Rodriguez, 2019¹
Specific recommendations not available in abstract.
ASoP Committee, 2018²
Recommendations: <ul style="list-style-type: none"> • Pre-existing medical conditions should be used to evaluate risk of sedation for patients undergoing endoscopic procedures (page 334). (QoE: High) • Minimal and moderate sedation using a combination of an opioid and benzodiazepine is recommended for upper endoscopy and colonoscopy procedures (page 334). (QoE: High) • Routine monitoring of blood pressure, oxygen saturation, and heart rate during all endoscopic procedures using sedation is recommended (page 334). (QoE: High) • Capnography monitoring should be considered for deep sedation of patients undergoing endoscopy (page 335). (QoE: Low) • For patients undergoing complex endoscopic procedures, patients with multiple comorbidities, or patients at risk of airway compromise an anesthesia provider-administered sedation should be considered (page 335). (QoE: Moderate) • Propofol-based sedation is recommended to improve patient safety, comfort, procedural efficiency, and successful completion (page 335). (QoE: Low)
Devlin, 2018³
Specific recommendations not available in abstract.
Hinkelbein, 2018⁴
Specific recommendations not available in abstract.
American Society of Anesthesiologists Task Force, 2018⁵

Summary of Recommendations

Patient Evaluation:

- Review patient medical record and identify any abnormalities of major organs, adverse experiences with sedation, history of difficult airway, medications that may interfere with sedation, history of substance use/abuse, previous exposure to sedation agents (page 449).
- Patient physical examination should be conducted (page 449).
- To allow for patient's preparation, perform preprocedural evaluation well enough in advance (page 449).
- Reevaluate the patient before the procedure (page 449).

Pre-procedure Patient Preparation:

- For patients with underlying conditions, consult with a medical specialist before moderate procedural sedation (page 449).
- Inform patients of the benefits, risk, limitations and possible alternatives of moderate sedation before the procedure (page 450).
- Inform patients that fluid or foods should not be consumed for before the day of the procedure (page 450).

Patient Monitoring:

- During moderate sedation, periodically monitor a patient's response to verbal commands (page 450)

Sedative or Analgesic Medications Not Intended for General Anesthesia:

- Sedative and analgesic agents may be used when appropriate for the procedure and each sedative and analgesic agent should be administered individually to achieve results (page 451).

Sedative or Analgesic Medications Intended for General Anesthesia:

- Moderate procedural sedation with sedative or analgesic medication should be provided with care that is consistent for general anesthesia (page 451).

Scottish Dental Clinical Effectiveness Programme, 2017⁶

Preparation for Conscious Sedation:

- To inform the need for sedation and technique suited for sedation, carry out a full assessment of the patient (page 10). **(Expert opinion)**

Conscious Sedation Techniques:

- Sedation techniques should be suited to the age and dental needs of the patient, delivered by a dental sedation team, and environmentally appropriate (page 16). **(Expert opinion)**

Conscious Sedation for Children and Young People:

- All staff involved should be trained and experienced in sedating children or young people and that staffing, equipment, facilities and techniques are appropriate for the patient's age (page 21). **(Expert opinion)**

Recovery and Discharge:

- Patient should be monitored throughout the recovery period until that are deemed fit for discharge (page 24). **(Expert opinion)**

An, 2016⁷

Target Patients for Conscious Sedation:

- Dental patients who have an ASA of 1 or 2 and no behavioral problems, upper airway infections or problems with airway maintenance, gastro-esophageal reflux, or history of allergic reactions to the administered drugs are recommended for conscious sedation (page 258). **(Recommendation Grade: Is recommended; LoE: Clinical experience and expert opinion)**

Patient Monitoring:

- Patients should be monitored by level of sedation, respiration, oxygenation, and time-based regular monitoring during sedation (page 259). **(Recommendation Grade: Is recommended; LoE: One or more RCT, meta-analyses, or SR)**

Summary of Recommendations

Conscious Sedation Records:

- During sedation, sedation scaled and vital signs should be recorded every 5 minutes (page 259). **(Recommendation Grade: Is recommended; LoE: Clinical experience and expert opinion)**
- Drug name, dose, route, time, reason, patient's response after drug administration, and method of oxygen supply should be recorded regarding the drug that was administered (page 259). **(Recommendation Grade: Is recommended; LoE: Clinical experience and expert opinion)**

Discharge Criteria:

- Full conscious state recovery, adequate level of oxygen, normal movement, airway ability, and normal systolic pressure need to be checked after confirming no abnormal symptoms associated with dental procedure (page 259). **(Recommendation Grade: Is recommended; LoE: Observational studies and case reports)**
- Discharge can be considered if vital signs are within normal range; pain, nausea, and vomiting are controlled; after sedation precautions have been explained to the patient; patient is accompanied by a guardian; and no complication associated with dental procedure after sedation (page 259). **(Recommendation Grade: Should be considered; LoE: Clinical experience and expert opinion)**

Kang, 2016⁸

Pre-procedural Preparation and Assessment:

- The dose requirements of propofol may be increased for patients who chronically receive benzodiazepines, barbiturates, anticonvulsant, or alcohol (page 548). **(LoE: Observational trials; Recommendation Grade: May be considered)**
- Propofol can be safely administered in patients with egg allergies (page 548). **(LoE: Observational trials; Recommendation Grade: May be considered)**
- Advantages, risks and alternative options of propofol sedation should be provided to the patient and informed consent for propofol sedation should be obtained (page 549). **(LoE: Observational trials; Recommendation Grade: Should be considered)**
- Propofol sedation should be accessed and maintained intravenously until full patient recovery (page 549). **(LoE: Observational trials; Recommendation Grade: Should be considered)**

Intra-procedural Monitoring and Equipment:

- Continuous pulse oximetry and blood pressure measurements during sedation should be monitored with intervals of a minimum 5 minutes (page 549). **(LoE: At least one case-control or cohort trial without randomization; Recommendation Grade: Is recommended)**
- Capnographic monitoring is required in high-risk patients, intended deep sedation, and long procedures during propofol sedation (page 549). **(LoE: At least one case-control or cohort trial without randomization; Recommendation Grade: Should be considered)**

Level of Sedation:

- Level of sedation should be below deep sedation is possible (page 550). **(LoE: At least one RCT or SR/meta-analysis; Recommendation Grade: Should be considered)**

Surveillance During Recovery and Discharge:

- Following propofol sedation, a minimum recovery time of 30 minutes is required (page 551). **(LoE: At least one case-control or cohort trial without randomization; Recommendation Grade: Should be considered)**
- Following propofol sedation, discharge criteria such as the Modified Aldrete score or PADSS should be used (page 551). **(LoE: At least one RCT or SR/meta-analysis; Recommendation Grade: Is recommended)**

ESGE and ESGENA, 2015⁹

Main Recommendations:

- Before each procedure with NAAP, it is recommended that the type of endoscopic procedure and patient status are assessed. (page 1175). **(Strong recommendation, moderate quality evidence)**
- Patients at risk of airway obstruction, patients who receive narcotic analgesics, or patients anticipated for long lasting procedures should involve an anesthesiologist (page 1175). **(Weak recommendation, low quality evidence)**

Summary of Recommendations

- Capnographic monitoring during NAAP should be considered in high risk patients, deep sedation, and long procedures (page 1175). **(Weak recommendation, high quality evidence)**
- Propofol monotherapy is suggested (page 1175). **(Weak recommendation, high quality evidence)**
- PADSS is suggested to determine patient recovery and to allow discharge (page 1175). **(Weak recommendation, low quality evidence)**
- Before patient discharge, minimum discharge criteria should be fulfilled. Patients should be accompanied by someone and should refrain from driving, drinking alcohol, operating heavy machinery, or engaging in legally binding contracts for 24 hours. Advice should be provided to the patient verbally and in written format (page 1175). **(Strong recommendation, low quality evidence)**

DAS Taskforce, 2015¹⁰

Monitoring of Sedation:

- A clear definition of the patients sedation goals, and goal adaptation in changing situations are recommended (page 23). **(LoE^a: 1b; GoR: Strong recommendation)**
- Sedation and ventilation protocols are recommended for all ICU patients (page 23). **(LoE: 1b; GoR: Strong recommendation)**
- Sedation goals and level of sedation should be documented at least once per shift (page 23). **(LoE: 5; GoR: Strong recommendation)**
- Validated and reliable sources, such as the RASS are recommended (page 23). **(LoE: 1b; GoR: Strong recommendation)**
- To identify under or oversedation, the use of diagnostic devices should be used on patients who are deeply sedated (page 23). **(LoE: 2b, 3b, 2a; GoR: Strong recommendation)**
- In patients with reduced level of consciousness, EEG monitoring should be used to identify non-convulsive seizure activity (page 23). **(LoE: 2b; GoR: Strong recommendation)**

Sedation:

- A target RASS of 0/-1 is recommended for all ICU patients (page 26). **(LoE: 1b, 1b; GoR: Strong recommendation)**
- Sedation should be reserved for patients with special situations/ indications and should not be used generally (page 26). **(LoE: 1b, 1b; GoR: Strong recommendation)**
- Sedation goal, indication, pharmacokinetics, and pharmacodynamics should be considered for the choice of sedative (page 26). **(LoE: 5; GoR: Strong recommendation)**
- Controllable sedatives for ICU patients are recommended (page 26). **(LoE: 2b, 1b, 2b, 1a; GoR: Strong recommendation)**

ASA = American Society of Anesthesiologists; ASoP = ASGE Standards of Practice; ESGE = European Society of Gastrointestinal Endoscopy; ESGENA = European Society of Gastroenterology and Endoscopy Nurses and Associates; GoR: grade of recommendation; ICU = intensive care unit; LoE = level of evidence; NAAP = non-anesthesiologist administration of propofol; QoE = quality of evidence; RASS = Richmond Agitation Sedation Scale; RCT = randomized controlled trial; SR = systematic review

^a LoE score was not specified.

Table 3: Summary of Relevant Recommendations from Pediatric Population Specific Guidelines

Summary of Recommendations	
Duffy, 2020¹¹	
Specific recommendations not available in abstract.	
Ancora, 2019¹²	
Standard of care recommendations: <ul style="list-style-type: none"> • Use nonpharmacological analgesia during invasive ventilation. • Intermittent boluses of opioids should be favoured and administered after pain scores and before invasive procedures. • Do not use morphine infusion in preterm infants under 27 gestational weeks. • Algometric scores should always be used to titrate analgesic drug doses. • Premedication should be used before endotracheal intubation. 	
Harris, 2016¹³	
Sedation Assessment: <ul style="list-style-type: none"> • To take appropriate actions, search for causes of distress or discomfort that are non-pain related (page 979). (GoR^a: D) • Standardized sedation assessment tools, such as the COMFORT behaviour scale, should be used (page 979). (GoR: A) • The level of sedation should be assessed and documented every 4-8 hours along with vital signs (page 979). (GoR: D) 	

GoR = grade of recommendation

^a GoR score was not specified.

References Summarized

Guidelines and Recommendations

1. Celis-Rodriguez E, Diaz Cortes JC, Cardenas Bolivar YR, et al. Evidence-based clinical practice guidelines for the management of sedoanalgesia and delirium in critically ill adult patients. *Med Intensiva*. 2019 Sep 03;03:03. [PubMed: PM31492476](#)
2. Committee ASoP, Early DS, Lightdale JR, et al. Guidelines for sedation and anesthesia in GI endoscopy. *Gastrointest Endosc*. 2018 02;87(2):327-337. [PubMed: PM29306520](#)
3. Devlin JW, Skrobik Y, Gelinas C, et al. Clinical Practice Guidelines for the Prevention and Management of Pain, Agitation/Sedation, Delirium, Immobility, and Sleep Disruption in Adult Patients in the ICU. *Crit Care Med*. 2018 09;46(9):e825-e873. [PubMed: PM30113379](#)
4. Hinkelbein J, Lamperti M, Akeson J, et al. European Society of Anaesthesiology and European Board of Anaesthesiology guidelines for procedural sedation and analgesia in adults. *Eur J Anaesthesiol*. 2018 01;35(1):6-24. [PubMed: PM28877145](#)

5. Practice Guidelines for Moderate Procedural Sedation and Analgesia 2018: A Report by the American Society of Anesthesiologists Task Force on Moderate Procedural Sedation and Analgesia, the American Association of Oral and Maxillofacial Surgeons, American College of Radiology, American Dental Association, American Society of Dentist Anesthesiologists, and Society of Interventional Radiology*. *Anesthesiology*. 2018;128(3):437-479.;
<https://anesthesiology.pubs.asahq.org/article.aspx?articleid=2670190>
See: Appendix I: Summary of Recommendations – Patient Evaluation, page 449; Patient Monitoring, page 450-451; Sedative or Analgesic Medications Not Intended for General Anesthesia, page 451; Sedative or Analgesic Medications Intended for General Anesthesia, pages 451-451.
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<http://www.sdcep.org.uk/published-guidance/sedation/>
See: 3.2 Patient Assessment for Sedation, page 10; 4. Conscious Sedation Techniques, page 16; 5. Conscious Sedation for Children and Young People, page 21; Recovery and Discharge, page 24.
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[PubMed: PM28879313](https://pubmed.ncbi.nlm.nih.gov/28879313/)
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https://www.esge.com/assets/downloads/pdfs/guidelines/2015_s_0034_1393414.pdf
See: Main Recommendations, page 1175.
10. DAS-Taskforce 2015, Baron R, Binder A, et al. Evidence and consensus based guideline for the management of delirium, analgesia, and sedation in intensive care medicine. Revision 2015 (DAS-Guideline 2015) - short version. *Ger Med Sci*. 2015;13:Doc19.
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Pediatric Population Specific Guidelines

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[PubMed: PM30290021](#)
13. Harris J, Ramelet AS, van Dijk M, et al. Clinical recommendations for pain, sedation, withdrawal and delirium assessment in critically ill infants and children: an ESPNIC position statement for healthcare professionals. *Intensive Care Med.* 2016 Jun;42(6):972-986.
[PubMed: PM27084344](#)

Appendix — Further Information

Previous CADTH Reports

14. General Anesthesia and Deep Sedation for Dental Treatments in Children: A Review of Clinical Effectiveness and Guidelines. (*CADTH Rapid response report: summary with critical appraisal*). Ottawa (ON): CADTH; 2017: <https://www.cadth.ca/general-anesthesia-and-deep-sedation-dental-treatments-children-review-clinical-effectiveness-and>
15. Intramuscular versus Intravenous Administration of Analgesics and Sedatives: Comparative Clinical Effectiveness and Guidelines. (*CADTH Rapid response report: summary of abstracts*). Ottawa (ON): CADTH; 2017: <https://www.cadth.ca/intramuscular-versus-intravenous-administration-analgesics-and-sedatives-comparative-clinical>
16. Propofol for Conscious Sedation During Endoscopies: Clinical Effectiveness, Cost-Effectiveness, and Guidelines. (*CADTH Rapid response report: summary of abstracts*). Ottawa (ON): CADTH; 2017: <https://www.cadth.ca/propofol-conscious-sedation-during-endoscopies-clinical-effectiveness-cost-effectiveness-and-0>
17. Moderate Procedural Sedation in Adult Patients: Guidelines. (*CADTH Rapid response report: summary of abstracts*). Ottawa (ON): CADTH; 2016: <https://www.cadth.ca/moderate-procedural-sedation-adult-patients-guidelines-0>
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[PubMed: PM25242022](https://pubmed.ncbi.nlm.nih.gov/25242022/)

Clinical Practice Guidelines

Consensus Guidelines

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Methodology Not Specified in Abstract

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https://www.rcr.ac.uk/system/files/publication/field_publication_files/bfcr182_safe_sedation.pdf
See: 2. Basics of sedation and analgesia, pages 5-9; 4. Immediate pre-procedural preparation, pages 9 and 10; 5. Intra-procedure monitoring and management, pages 10 and 11; 6. Recovery and discharge post-procedure pages 11 and 12; 9. Therapeutic agents, pages 15-17; 10. Complications, pages 18 and 19; 13. Pediatric sedation, pages 22-28.
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[PubMed: PM27129752](#)
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