

AORN Guideline for Care of the Patient Receiving Moderate Sedation/Analgesia
Evidence Table

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
1	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. <i>Anesthesiology</i> . 2018;128(3):437-479.	Guideline	n/a	n/a	n/a	n/a	Guidelines for administration of moderate sedation and analgesia for adults and children. Consensus recommendations of 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.	IVA
2	<i>Non-Anesthesia Provider Procedural Sedation and Analgesia. Policy Considerations.</i> American Association of Nurse Anesthetists. https://www.aana.com/docs/default-source/practice-aana-com-web-documents-(all)/professional-practice-manual/non-anesthesia-provider-procedural-sedation-and-analgesia.pdf?sfvrsn=670049b1_4 . Published 2016. Accessed June 17, 2021.	Expert Opinion	n/a	n/a	n/a	n/a	Provides considerations for policy development for the safe administration of procedural sedation by a non-anesthesia sedation team in a hospital, ambulatory surgical center, or office setting.	VA
3	<i>Nursing: Scope and Standards of Practice</i> . 3rd ed. Silver Spring, MD: American Nurses Association; 2015.	Consensus	n/a	n/a	n/a	n/a	Outlines the expectations of the professional role of the registered nurse. It states the scope of practice and presents the standards of professional nursing practice and their accompanying competencies.	IVB
4	<i>Standards of Perioperative Nursing.</i> AORN, Inc. https://aorn.org/guidelines/clinical-resources/aorn-standards . Accessed June 17, 2021.	Consensus	n/a	n/a	n/a	n/a	The standards of perioperative nursing focus on the process of providing nursing care and performing professional role activities. These standards apply to all nurses in the perioperative setting and were developed by AORN using the American Nurses Association's (ANA) scope and standards of practice for nursing and nursing administration as the foundation.	IVB
5	<i>About nursing licensure.</i> National Council of State Boards of Nursing. https://www.ncsbn.org/licensure.htm . Accessed June 17, 2021.	Expert Opinion	n/a	n/a	n/a	n/a	The purpose of a professional license is to protect the public from harm by setting minimal qualifications and competencies for safe entry-level practitioners. Nursing is regulated because it is one of the health professions that poses a risk of harm to the public if practiced by someone who is unprepared and/or incompetent.	VA
6	<i>Nurse Practice Act Toolkit.</i> National Council of State Boards of Nursing. https://www.ncsbn.org/npa-toolkit.htm . Accessed June 17, 2021.	Expert Opinion	n/a	n/a	n/a	n/a	Each state or territory has a law called the Nurse Practice Act, which is enforced by each nursing board. Nurses must comply with the law and related rules in order to maintain their licenses. The law describes qualifications for licensure, nursing titles that are allowed to be used, scope of practice (what the nurse is allowed to do), and actions that can or will happen if the nurse does not follow the nursing law.	VA

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7	AORN's Perioperative Explanations for the ANA Code of Ethics for Nurses with Interpretive Statements. AORN, Inc. https://aorn.org/guidelines/clinical-resources/code-of-ethics . Published 2017. Accessed June 17, 2021.	Consensus	n/a	n/a	n/a	n/a	The perioperative nurse, by virtue of the nurse patient relationship, has an obligation to provide safe, professional, and ethical patient care. It is important that nurses know how to manage ethical decisions appropriately so that patients' beliefs can be honored without compromising the nurse's own moral conscience. Ethical practice is thus a critical aspect of nursing care, and the development of ethical competency is paramount for present and future nursing practice.	IVB
8	DIPRIVAN (propofol) injectable emulsion, USP. US Food and Drug Administration. https://www.accessdata.fda.gov/drugsatfda_docs/label/2017/019627s066lbl.pdf . Revised April 2017. Accessed June 17, 2021.	Regulatory	n/a	n/a	n/a	n/a	Propofol is limited to use by persons trained in the administration of general anesthesia and not involved in the conduct of the surgical/diagnostic procedure.	n/a
9	Braaten KP, Urman RD, Maurer R, Fortin J, Goldberg AB. A randomized comparison of intravenous sedation using a dosing algorithm compared to standard care during first-trimester surgical abortion. <i>Contraception</i> . 2018;97(6):490-496.	RCT	196 women who underwent first trimester surgical abortion, United States	Algorithm for abortion intravenous sedation dosing (n = 98)	Standard care (n = 98)	Pain with suction curettage (21-point verbal numerical rating scale). Secondary: pain post procedure, need for additional doses of medication, oxygen saturation < 93%, sedation level, adverse events, side effects, patient satisfaction.	An intravenous sedation algorithm did not demonstrate significant benefit for the general population of surgical abortion patients. Providers with less experience titrating intravenous sedation might find it a helpful tool to guide sedation dosing.	IA
10	Clements W, Sneddon D, Kavnoudias H, et al. Randomized and controlled study comparing patient controlled and radiologist controlled intra-procedural conscious sedation, using midazolam and fentanyl, for patients undergoing insertion of a central venous line. <i>J Med Imaging Radiat Oncol</i> . 2018;62(6):781-788.	RCT	40 patients who underwent insertion of a tunneled central line in interventional radiology, Australia	Patient controlled sedation with fentanyl and midazolam (n = 20)	Radiologist controlled sedation administered by a sedation nurse (n = 20)	Pain, sedation, amnesia, patient satisfaction	There were no adverse events. Patient-controlled sedation was not inferior to radiologist-controlled sedation for sedative dose and degree of sedation, with low cost and minimal additional training required for implementation.	IB
11	Han SJ, Lee TH, Park SH, et al. Efficacy of midazolam- versus propofol-based sedations by non-anesthesiologists during therapeutic endoscopic retrograde cholangiopancreatography in patients aged over 80 years. <i>Dig Endosc</i> . 2017;29(3):369-376.	RCT	100 patients over age 80 who underwent ERCP, South Korea	Midazolam and fentanyl (n = 50)	Propofol and fentanyl (n = 50)	Sedation safety (cardiopulmonary events) and efficacy (10-point visual analog scale)	There were no significant difference between midazolam and propofol for safety and efficacy. Although patients in the propofol group needed increased oxygen supply, the prevalence of hypoxia did not differ significantly.	IB

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12	Han SJ, Lee TH, Yang JK, et al. Etomidate sedation for advanced endoscopic procedures. <i>Dig Dis Sci</i> . 2019;64(1):144-151.	RCT	186 patients who underwent advanced endoscopic procedures, South Korea	Sedation with midazolam and fentanyl, with add on dose of etomidate (n = 92)	Sedation with midazolam and fentanyl, with add on dose of propofol (n = 94)	Sedation efficacy measured on 10-point visual analog scale, and safety	All sedatives and analgesics were administered by trained nurses during the procedure. Etomidate was not inferior to propofol sedation for patient satisfaction, although etomidate was associated with fewer cardiopulmonary adverse events.	IB
13	Pastis NJ, Yarmus LB, Schippers F, et al. Safety and efficacy of remimazolam compared with placebo and midazolam for moderate sedation during bronchoscopy. <i>Chest</i> . 2019;155(1):137-146.	RCT	446 patients who underwent flexible bronchoscopy at 30 different sites, United States	Sedation with remimazolam (n = 310)	Placebo (n = 63), Sedation with midazolam (n = 73)	Sedation efficacy and safety	Remimazolam administered under supervision of a pulmonologist was safe and effective during flexible bronchoscopy. The onset of action and neuropsychiatric recovery from remimazolam were shorter than midazolam.	IA
14	Sachar H, Pichetshote N, Nandigam K, Vaidya K, Laine L. Continued midazolam versus diphenhydramine in difficult-to-sedate patients: a randomized double-blind trial. <i>Gastrointest Endosc</i> . 2018;87(5):1297-1303.	RCT	200 patients who underwent elective colonoscopy, United States	Midazolam and fentanyl sedation, with diphenhydramine (n = 100)	Midazolam and fentanyl sedation (n = 100)	Adequacy of sedation as measured with MOAA/S scale	Endoscopists performing moderate sedation should continue midazolam rather than switching to diphenhydramine in patients who do not achieve adequate sedation with usual doses of midazolam and an opioid.	IB
15	Finn RT 3rd, Boyd A, Lin L, Gellad ZF. Bolus administration of fentanyl and midazolam for colonoscopy increases endoscopy unit efficiency and safety compared with titrated sedation. <i>Clin Gastroenterol Hepatol</i> . 2017;15(9):1419-1426.	Nonexperimental	1,665 patients who underwent colonoscopy, United States	n/a	Nurse-directed titration of sedative (n = 966) vs Physician-directed administration of bolus sedative (n = 699)	Sedation and recovery times, medication doses, adverse events, patient satisfaction	Bolus dosing improves endoscopy unit efficiency and safety and decreases the amount of sedative required when compared to titration dosing.	IIIA
16	Goudra B, Nuzat A, Singh PM, Gouda GB, Carlin A, Manjunath AK. Cardiac arrests in patients undergoing gastrointestinal endoscopy: a retrospective analysis of 73,029 procedures. <i>Saudi J Gastroenterol</i> . 2015;21(6):400-411.	Nonexperimental	73,029 patients who underwent endoscopic procedures at a single center over a 5 year period, United States	n/a	n/a	Cardiac arrest and death occurring during the procedure and in the recovery area	The incidence of cardiac arrest and death is about 10 times higher in patients receiving propofol-based sedation compared with those receiving midazolam–fentanyl sedation.	IIIA
17	Goudra B, Singh PM, Gouda G, Borle A, Carlin A, Yadwad A. Propofol and non-propofol based sedation for outpatient colonoscopy-prospective comparison of depth of sedation using an EEG based SEDLine monitor. <i>J Clin Monit Comput</i> . 2016;30(5):551-557.	Quasi-experimental	87 adult patients who underwent colonoscopy, United States	Endoscopist guided non-propofol sedation with midazolam, fentanyl, and diphenhydramine (n = 44)	Nurse anesthetist administered propofol based sedation (n = 43)	Depth of sedation as measured with an EEG-based monitor	The depth of sedation was significantly greater in patients cared for with CRNA-administered propofol compared to gastroenterologist-administered midazolam and fentanyl.	IIB
18	McLemore MR, Aztlan EA. Retrospective evaluation of the procedural sedation practices of expert nurses during abortion care. <i>J Obstet Gynecol Neonatal Nurs</i> . 2017;46(5):755-763.	Nonexperimental	194 women who underwent abortion, United States	n/a	n/a	Time to discharge, time in recovery area	Expert nurses can administer procedural sedation for pain control associated with abortion and are capable of monitoring women and helping them return to baseline status after the procedure.	IIIB

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19	Szczeklik W, Andrychiewicz A, Górka K, Konarska K, Soja J, Sladek K. Flexible bronchoscopy under conscious sedation with midazolam and fentanyl can be safely performed by nonanesthesiologists. <i>Pol Arch Med Wewn.</i> 2015;125(11):869-871.	Nonexperimental	463 patients who underwent flexible bronchoscopy, Poland	n/a	Moderate sedation with fentanyl and midazolam by a nonanesthesiologist	Drug dosing and adverse reactions	Moderate sedation was safely performed by nonanesthesiologists.	IIIB
20	Tu RH, Grewall P, Leung JW, et al. Diphenhydramine as an adjunct to sedation for colonoscopy: a double-blind randomized, placebo-controlled study. <i>Gastrointest Endosc.</i> 2006;63(1):87-94.	RCT	258 patients who underwent colonoscopy, United States	Diphenhydramine intravenously before starting conscious sedation with midazolam and meperidine (n = 130)	Placebo (n = 128)	Anesthetic effect and dosing	IV diphenhydramine given before initiating moderate sedation reduced the doses of midazolam and meperidine required.	IB
21	Kinugasa H, Higashi R, Miyahara K, et al. Dexmedetomidine for conscious sedation with colorectal endoscopic submucosal dissection: a prospective double-blind randomized controlled study. <i>Clin Transl Gastroenterol.</i> 2018;9(7):167.	RCT	80 patients who underwent colorectal endoscopic submucosal dissection, Japan	Dexmedetomidine and meperidine (n = 40)	Placebo and meperidine (n = 40)	Patient satisfaction, pain level, endoscopist satisfaction, rate of patient response, side effects	Dexmedetomidine is an effective medication for conscious sedation that made patients more comfortable and have less pain.	IB
22	Jin EH, Hong KS, Lee Y, et al. How to improve patient satisfaction during midazolam sedation for gastrointestinal endoscopy? <i>World J Gastroenterol.</i> 2017;23(6):1098-1105.	Nonexperimental	456 patients who underwent outpatient endoscopy procedures, South Korea	n/a	Midazolam sedation	Patient sedation expectations and satisfaction	Midazolam is a safe and effective sedative for gastrointestinal endoscopy. Satisfaction with sedation depended on age (≤ 50 years) and procedure time duration. To improve patient satisfaction, active monitoring of sedation status by the endoscopist should be considered for patients who require long procedure time.	IIIB
23	Riachy M, Khayat G, Ibrahim I, et al. A randomized double-blind controlled trial comparing three sedation regimens during flexible bronchoscopy: dexmedetomidine, alfentanil and lidocaine. <i>Clin Respir J.</i> 2018;12(4):1407-1415.	RCT	162 patients who underwent flexible bronchoscopy, Lebanon	Alfentanil (n = 55), Dexmedetomidine (n = 53)	Local anesthesia only (n = 54)	Patient tolerance, level of sedation, safety (pulmonary function, vital signs)	No consistent difference between the 3 regimens. Proposed a patient-tailored protocol as a step towards standardizing sedation practices.	IB
24	AANA-ASA Joint Position Statement Regarding Propofol Administration . American Association of Nurse Anesthetists. https://www.aana.com/docs/default-source/practice-aana-com-web-documents-(all)/professional-practice-manual/aana-asa-propofol-joint-ps.pdf?sfvrsn=f80049b1_4 . Published April 14, 2004. Accessed June 17, 2021.	Position Statement	n/a	n/a	n/a	n/a	Whenever propofol is used for sedation/anesthesia, it should be administered only by persons trained in the administration of general anesthesia, who are not simultaneously involved in these surgical or diagnostic procedures.	IVB

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25	<i>Statement on Safe Use of Propofol.</i> American Society of Anesthesiologists. https://www.asahq.org/standards-and-guidelines/statement-on-safe-use-of-propofol . Amended October 23, 2019. Accessed June 17, 2021.	Position Statement	n/a	n/a	n/a	n/a	When an anesthesiologist is not involved in the care, non-anesthesia personnel who administer propofol should be qualified to rescue patients whose level of sedation becomes deeper than intended.	IVB
26	Wadhwa V, Issa D, Garg S, Lopez R, Sanaka MR, Vargo JJ. Similar risk of cardiopulmonary adverse events between propofol and traditional anesthesia for gastrointestinal endoscopy: a systematic review and meta-analysis. <i>Clin Gastroenterol Hepatol.</i> 2017;15(2):194-206.	Systematic Review w/ Meta-Analysis	27 RCTs	n/a	n/a	n/a	Propofol sedation has a similar risk of cardiopulmonary adverse events compared with traditional agents for gastrointestinal endoscopic procedures. A subgroup analysis did not show any difference in adverse events when propofol was administered by gastroenterologists or nongastroenterologists.	IA
27	Yoon SW, Choi GJ, Lee OH, et al. Comparison of propofol monotherapy and propofol combination therapy for sedation during gastrointestinal endoscopy: a systematic review and meta-analysis. <i>Dig Endosc.</i> 2018;30(5):580-591.	Systematic Review w/ Meta-Analysis	22 RCTs	n/a	n/a	n/a	There was comparable safety and efficacy between propofol used singly or in combination therapy for endoscopy sedation, including no difference in the incidence of respiratory complications, hypotension, arrhythmia, recovery time, procedure duration, patient satisfaction, and doctor satisfaction.	IB
28	Kim EH, Park JC, Shin SK, Lee YC, Lee SK. Effect of the midazolam added with propofol-based sedation in esophagogastroduodenoscopy: a randomized trial. <i>J Gastroenterol Hepatol.</i> 2018;33(4):894-899.	RCT	120 patients who underwent diagnostic EGD, South Korea	Midazolam and propofol (n = 60)	Propofol only (n = 60)	Dose of propofol, adverse events, recovery time, satisfaction (endoscopists, nurses, patients)	Sedation with propofol alone provided a high level of endoscopist and patient satisfaction with low risk for adverse events during diagnostic EGD. Use of midazolam in combination with propofol did not show a benefit.	IB
29	Heo J, Jung MK, Lee HS, et al. Effects of bispectral index monitoring as an adjunct to nurse-administered propofol combined sedation during colonoscopy: a randomized clinical trial. <i>Korean J Intern Med.</i> 2016;31(2):260-266.	RCT	280 patients who underwent screening colonoscopy, South Korea	Expert endoscopist (n = 149) -and- BIS (n = 74) or modified Observer's Assessment Alertness/Sedation Scale (MOAA/S) (n = 75)	Inexperienced endoscopist (n = 131) -and- BIS (n = 67) or modified Observer's Assessment Alertness/Sedation Scale (MOAA/S) (n = 64)	Propofol dose	The mean propofol dose in the BIS group was higher than the MOAA/S group, independent of endoscopist experience level, and thus BIS is not effective for titrating the dose of propofol. The total propofol dose was not significantly different between the endoscopist experience levels. The nurse could use MOAA/S to titrate propofol sedation for colonoscopy regardless of the endoscopists experience level.	IB
30	López Muñoz C, Sánchez Yagüe A, Canca Sánchez JC, Reinaldo-Lapuerta JA, Moya Suárez AB. Quality of sedation with propofol administered by non-anesthetists in a digestive endoscopy unit: the results of a one year experience. <i>Rev Esp Enferm Dig.</i> 2018;110(4):231-236.	Quasi-experimental	595 patients who underwent endoscopy procedures, Spain	Sedation by trained endoscopist-nurse team	n/a	Adverse events, adherence to quality criteria	Nurse and an endoscopist completed the training course for the administration of propofol in digestive endoscopy. Propofol can be administered safely and effectively by a qualified endoscopist-nurse team, in patients with an ASA I-II risk.	IIB

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31	Nonaka M, Gotoda T, Kusano C, Fukuzawa M, Itoi T, Moriyasu F. Safety of gastroenterologist-guided sedation with propofol for upper gastrointestinal therapeutic endoscopy in elderly patients compared with younger patients. <i>Gut Liver</i> . 2015;9(1):38-42.	Nonexperimental	160 patients who underwent endoscopy procedures with gastroenterologist-guided propofol sedation, Japan	n/a	Age <75 and age >75	Therapeutic regimen, circulatory dynamics, discontinuation of propofol	Gastroenterologist-guided propofol sedation in elderly patients can be safely achieved in the same manner as that in younger patients, even for time consuming upper gastrointestinal therapeutic endoscopic procedures.	IIIB
32	Okeke FC, Shaw S, Hunt KK, Korsten MA, Rosman AS. Safety of propofol used as a rescue agent during colonoscopy. <i>J Clin Gastroenterol</i> . 2016;50(8):e77-e80.	Nonexperimental	806 patients who underwent colonoscopy, United States	n/a	Gastroenterologist directed meperidine sedation (n = 403), and the same protocol using propofol as a rescue medication (n = 403)	Adverse events	Use of adjunctive propofol administered by a gastroenterologist was not associated with an increase in adverse events.	IIIB
33	Vargo JJ, Niklewski PJ, Williams JL, Martin JF, Faigel DO. Patient safety during sedation by anesthesia professionals during routine upper endoscopy and colonoscopy: an analysis of 1.38 million procedures. <i>Gastrointest Endosc</i> . 2017;85(1):101-108.	Nonexperimental	1,388,235 patients who underwent EGD or colonoscopy procedures, Clinical Outcomes Research Initiative National Endoscopic Database, United States	n/a	Sedation directed by anesthesia professionals (n = 182,694 Colon/115,320 EGD), endoscopist-directed sedation (n = 697,488 Colon/ 392,732 EGD)	Serious adverse events: CPR, hospital or ED admission, reversal medication, emergency surgery, procedure termination, requiring intervention during procedure, blood transfusion	Use of an anesthesia professional for moderate sedation does not appear to bring a safety benefit to patients undergoing colonoscopy and is associated with increased risk for serious adverse events for ASA I-III patients undergoing EGD.	IIIA
34	Ruiz-Curiel RE, Ydaly BH, Baptista A, Bronstein M. Sedation with propofol in digestive endoscopy administered by gastroenterologists. Experience in a Venezuelan hospital. <i>Rev Esp Enferm Dig</i> . 2018;110(4):246-249.	Nonexperimental	70,696 patients who underwent endoscopy procedures, Venezuela	n/a	Gastroenterologist directed propofol sedation	Complications	The use of propofol sedation in endoscopy is safe and effective when administered and controlled by the endoscopist and nursing staff in properly selected patients.	IIIB

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35	Lapidus A, Gralnek IM, Suissa A, Yassin K, Khamaysi I. Safety and efficacy of endoscopist-directed balanced propofol sedation during endoscopic retrograde cholangiopancreatography. <i>Ann Gastroenterol.</i> 2019;32(3):303-311.	Nonexperimental	501 patients who underwent ERCP, Israel	n/a	Endoscopist-directed propofol sedation	Adverse outcomes: bag mask ventilation, intubation, aborted procedure, hospital admission/change in level of care, death	Endoscopist-directed propofol sedation appears to be safe, efficacious, and feasible for ASA I-III patients undergoing ERCP.	IIB
36	Garewal D, Powell S, Milan SJ, Nordmeyer J, Waikar P. Sedative techniques for endoscopic retrograde cholangiopancreatography. <i>Cochrane Database Syst Rev.</i> 2012(6):CD007274.	Systematic Review	510 participants in 128 studies comparing sedation techniques for ERCP	n/a	n/a	n/a	Only nonanesthesia personnel were involved in administering the sedation. There was no difference in safety for meperidine/midazolam or propofol sedation. Further research is needed to clarify the extent to which anesthesia personnel should be involved in propofol sedation.	IIA
37	Chrissian AA, Bedi H. Bronchoscopist-directed continuous propofol infusion for targeting moderate sedation during endobronchial ultrasound bronchoscopy: a practical and effective protocol. <i>J Bronchology Interv Pulmonol.</i> 2015;22(3):226-236.	Quasi-experimental	31 patients who underwent EBUS bronchoscopy, United States	Continuous propofol infusion protocol	n/a	Adverse events, patient tolerance	Bronchoscopist-directed propofol sedation is effective and practical for moderate sedation during EBUS bronchoscopy.	IIB
38	Schulze M, Grande B, Kolbe M, et al. SafAIRway: an airway training for pulmonologists performing a flexible bronchoscopy with nonanesthesiologist administered propofol sedation: a prospective evaluation. <i>Medicine (Baltimore).</i> 2016;95(23):e3849.	Quasi-experimental	23 pulmonology staff (18 physicians, 5 nurses), Switzerland	Airway management algorithm and training for pulmonologists performing nonanesthesiologist administered propofol for flexible bronchoscopy	n/a	Completion time needed for a competent airway, trainee response to program, perceptions of psychological safety	The airway management algorithm and training for pulmonologists led to improved technical airway management skills, was considered useful by trainees, and raised their perception of psychological safety during training.	IIB
39	Khemasuwan D, Teerapunchaoen K, Griffin DC. Diagnostic yield and safety of bronchoscopist-directed moderate sedation with a bolus dose administration of propofol during endobronchial ultrasound bronchoscopy. <i>J Bronchology Interv Pulmonol.</i> 2018;25(3):181-188.	Nonexperimental	122 patients who underwent EBUS bronchoscopy, United States	n/a	Bronchoscopist-directed propofol sedation by bolus dose	Adverse events, agitation	Bronchoscopist-directed propofol sedation in bolus dosing provided excellent sedation adequacy for EBUS bronchoscopy and a well tolerance safety profile.	IIB
40	Singh H, Poluha W, Cheung M, Choptain N, Baron KI, Taback SP. Propofol for sedation during colonoscopy. <i>Cochrane Database Syst Rev.</i> 2008;(4):CD006268.	Systematic Review w/ Meta-Analysis	n/a	n/a	n/a	n/a	Propofol for sedation during colonoscopy for generally healthy patients can lead to faster recovery & discharge times, increased patient satisfaction without an increase in side effects.	IA

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41	Vargo JJ, Cohen LB, Rex DK, Kwo PY; American Association for the Study of Liver Diseases; American College of Gastroenterology; American Gastroenterological Association; American Society for Gastrointestinal Endoscopy. Position statement: nonanesthesiologist administration of propofol for GI endoscopy. <i>Gastroenterology</i> . 2009;137(6):2161-2167.	Position Statement	n/a	n/a	n/a	n/a	The administration of propofol and standard sedation by nonanesthesiologists is comparable in regards to safety and efficacy.	IVA
42	<i>Statement on Granting Privileges for Administration of Moderate Sedation to Practitioners Who Are Not Anesthesia Professionals</i> . American Society of Anesthesiologists. https://www.asahq.org/standards-and-guidelines/statement-of-granting-privileges-for-administration-of-moderate-sedation-to-practitioners . Reaffirmed October 26, 2016. Accessed June 17, 2021.	Position Statement	n/a	n/a	n/a	n/a	Statement to assist health care organization to develop a program for the delineation of clinical privileges for practitioners who are not anesthesia professionals to administer sedative and analgesia drugs to establish a level of moderate sedation.	IVB
43	<i>Statement on the Anesthesia Care Team</i> . American Society of Anesthesiologists. https://www.asahq.org/-/media/sites/asahq/files/public/resources/standards-guidelines/statement-on-the-anesthesia-care-team.pdf?la=en&hash=9674E540AB92E575C1FD8AB9B48159F7656B9AEB . Last Amended October 23, 2019. Accessed June 17, 2021.	Position Statement	n/a	n/a	n/a	n/a	Anesthesiologists supervising resident physicians in training and/or directing qualified nonphysician anesthesia providers in the provision of anesthesia care. The physician may delegate monitoring and appropriate tasks while retaining overall responsibility for the patient.	IVB
44	Heneghan S, Myers J, Fanelli R, Richardson W, et al. Guidelines for Office Endoscopic Services. <i>Society of American Gastrointestinal Endoscopic Surgeons (SAGES)</i> . https://www.sages.org/publications/guidelines/guidelines-for-office-endoscopic-services/ . Approved November 2008. Accessed June 17, 2021.	Guideline	n/a	n/a	n/a	n/a	This guideline provides recommendations for endoscopy in office setting. To ensure that patients having endoscopy in an office setting have the appropriate level of safety and quality, standards of care need to be set and met.	IVB
45	ASGE Standards of Practice Committee; Early DS, Lightdale JR, Vargo JJ 2nd, et al. Guidelines for sedation and anesthesia in GI endoscopy. <i>Gastrointest Endosc</i> . 2018;87(2):327-337.	Guideline	n/a	n/a	n/a	n/a	This article evaluates the strength of evidence in the medical literature to provide guidelines for the use of sedation and anesthesia across all levels of sedation during GI endoscopic procedures and is an update of 3 previous ASGE documents.	IVA

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REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
46	<i>ACR-SIR Practice Parameter for Sedation/Analgesia</i> . American College of Radiology/Society of Interventional Radiology. https://www.acr.org/-/media/acr/files/practice-parameters/sed-analgesia.pdf . Revised 2020. Accessed June 17, 2021.	Guideline	n/a	n/a	n/a	n/a	Practice parameter to assist physicians in the safe administration of sedation/analgesia & monitoring patients receiving sedation/analgesia outside the OR.	IVB
47	Coté CJ, Wilson S; American Academy of Pediatrics; American Academy of Pediatric Dentistry. Guidelines for monitoring and management of pediatric patients during and after sedation for diagnostic and therapeutic procedures. <i>Pediatrics</i> . 2019;143(6):e20191000.	Guideline	n/a	n/a	n/a	n/a	The purpose of this updated report is to unify the guidelines for sedation used by medical and dental practitioners; to add clarifications regarding monitoring modalities, particularly regarding continuous expired carbon dioxide measurement; to provide updated information from the medical and dental literature; and to suggest methods for further improvement in safety and outcomes.	IVB
48	Chang B, Kaye AD, Diaz JH, Westlake B, Dutton RP, Urman RD. Interventional procedures outside of the operating room: results from the National Anesthesia Clinical Outcomes Registry. <i>J Patient Saf</i> . 2018;14(1):9-16.	Nonexperimental	12,252,846 patients who underwent procedures, National Anesthesia Clinical Outcomes Registry database, United States	n/a	Procedure location: OR or nonoperating room anesthesia (NORA) location	Complications, morbidity, mortality	NORA procedures have lower morbidity and mortality rates than OR procedures, contrary to some previously published studies. However, there were increased complication rates in both the cardiology and radiology locations. Providers must ensure proper monitoring of patients, and NORA locations need to be held to the same standard of care as the main operating room.	IIIA
49	<i>Guidelines for Office-Based Anesthesia</i> . American Society of Anesthesiologists; https://www.asahq.org/standards-and-guidelines/guidelines-for-office-based-anesthesia . Last amended October 23, 2019. Accessed June 17, 2021.	Guideline	n/a	n/a	n/a	n/a	The guideline assists anesthesia personnel who are considering the practice of ambulatory anesthesia in the office setting.	IVB
50	Woodward ZG, Urman RD, Domino KB. Safety of non-operating room anesthesia: a closed claims update. <i>Anesthesiol Clin</i> . 2017;35(4):569-581.	Nonexperimental	10,357 closed claims, Anesthesia Closed Claims Project database, United States	n/a	Procedure location: OR or nonoperating room anesthesia (NORA) location	Complications	NORA malpractice claims more often involve death and substandard care when compared with the OR setting. Clinicians must always be prepared for emergencies, because complications can be exceedingly difficult to manage in the NORA environments.	IIIA
51	Bhavani S. Non-operating room anesthesia in the endoscopy unit. <i>Gastrointest Endosc Clin N Am</i> . 2016;26(3):471-483.	Expert Opinion	n/a	n/a	n/a	n/a	Success in the planning and implementation of a NORA involves not only the proper selection of a location to provide the care but also the proper selection of an anesthetic technique, proper preprocedure evaluation, preprocedural optimization of comorbidities as appropriate, and appropriate selection of the provider.	VA
52	Bouhnguel JT, Preiss DA, Urman RD. Implementation and use of anesthesia information management systems for non-operating room locations. <i>Anesthesiol Clin</i> . 2017;35(4):583-590.	Expert Opinion	n/a	n/a	n/a	n/a	Many out of the OR environments suffer from a variety of limitations and constraints, hindering our ability to provide the highest and safest level of anesthesia care. Automated documentation, real-time decision aids, and remote real-time surveillance facilitates intraoperative workflow while potentially improving the quality of anesthesia care delivered and overall patient safety.	VA

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53	Brovman EY, Preiss D, Urman RD, Gross WL. The challenges of implementing electronic health records for anesthesia use outside the operating room. <i>Curr Opin Anaesthesiol</i> . 2016;29(4):531-535.	Expert Opinion	n/a	n/a	n/a	n/a	Anesthesia in nonOR settings continues to grow because of increasing procedure complexity and patient morbidity.	VA
54	Karamnov S, Sarkisian N, Grammer R, Gross WL, Urman RD. Analysis of adverse events associated with adult moderate procedural sedation outside the operating room. <i>J Patient Saf</i> . 2017;13(3):111-121.	Nonexperimental	52 cases of moderate sedation safety incidents, United States	n/a	n/a	Adverse events, severity of patient harm	Patients with higher BMI had increased rates of hypoxemia and intubation. Advanced age was associated with oversedation, hypoxemia, and reversal agent use. Women were more likely to experience oversedation, hypotension, prolonged bag-mask ventilation, and reversal agent use.	IIIB
55	Wong T, Georgiadis PL, Urman RD, Tsai MH. Non-operating room anesthesia: patient selection and special considerations. <i>Local Reg Anesth</i> . 2020;13:1-9.	Literature Review	n/a	n/a	n/a	n/a	Anesthesia delivery in NORA settings should be held with the same high-quality standards as that within the operating room.	VA
56	Yeh T, Beutler SS, Urman RD. What we can learn from nonoperating room anesthesia registries: analysis of clinical outcomes and closed claims data. <i>Curr Opin Anaesthesiol</i> . 2020;33(4):527-532.	Literature Review	n/a	n/a	n/a	n/a	Oversedation and subsequent inadequate oxygenation/ventilation account for the majority of malpractice claims. Conclusions from the current literature emphasize the importance of complying with monitoring standards and having well prepared providers to improve patient outcomes in nonoperating room locations.	VA
57	<i>Office Based Anesthesia: Position Statement</i> . American Association of Nurse Anesthetists. https://www.aana.com/docs/default-source/practice-aana-com-web-documents-(all)/professional-practice-manual/office-based-anesthesia.pdf?sfvrsn=503136ab_4 . Accessed June 17, 2021.	Position Statement	n/a	n/a	n/a	n/a	There are some unique and specific responsibilities that should be considered prior to administration of anesthesia in the office setting. When considering an office based practice, anesthesia professionals should determine if there are appropriate resources to manage the various levels of anesthesia for the planned surgical procedures and the condition of the patient.	IVB
58	<i>Statement on Nonoperating Room Anesthetizing Locations</i> . American Society of Anesthesiologists. https://www.asahq.org/standards-and-guidelines/statement-on-nonoperating-room-anesthetizing-locations . Reaffirmed October 17, 2018. Accessed June 17, 2021.	Guideline	n/a	n/a	n/a	n/a	These guidelines apply to procedures intended to be performed in locations outside an OR and should be adhered to in all nonoperating room settings.	IVB
59	<i>Sedation in Children and Young People: Sedation for Diagnostic and Therapeutic Procedures in Children and Young People</i> . National Institute for Health and Care Excellence. https://www.nice.org.uk/guidance/cg112/evidence/full-guideline-136287325 . Updated February 2019. Accessed June 17, 2021.	Guideline	n/a	n/a	n/a	n/a	Recommendations for infants, children and young people (under 19 years) receiving sedation by any technique for painful or non-painful diagnostic or therapeutic procedures.	IVA
60	Cohen LB, Delegge MH, Aisenberg J, et al. AGA institute review of endoscopic sedation. <i>Gastroenterology</i> . 2007;133(2):675-701.	Guideline	n/a	n/a	n/a	n/a	Review standardizes the practice of endoscopic sedation within the USA.	IVB

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61	Dumonceau JM, Riphaus A, Schreiber F, et al. Non-anesthesiologist administration of propofol for gastrointestinal endoscopy: European Society of Gastrointestinal Endoscopy, European Society of Gastroenterology and Endoscopy Nurses And Associates Guideline—updated June 2015. <i>Endoscopy</i> . 2015;47(12):1175-1189.	Guideline	n/a	n/a	n/a	n/a	This Guideline is an official statement of the European Society of Gastrointestinal Endoscopy (ESGE) and the European Society of Gastroenterology and Endoscopy Nurses and Associates (ESGENA). It addresses the administration of propofol by non-anesthesiologists for gastrointestinal (GI) endoscopy.	IVA
62	Guideline for a safe environment of care. In: <i>Guidelines for Perioperative Practice</i> . Denver, CO: AORN, Inc; 2021:109-144.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for clinical and alert alarms.	IVA
63	Guideline for medication safety. In: <i>Guidelines for Perioperative Practice</i> . Denver, CO: AORN, Inc; 2021:463-502.	Guideline	n/a	n/a	n/a	n/a	Provides guidance to perioperative team members for developing, implementing, and evaluating safety precautions that may assist with decreasing medication errors throughout the six phases of the medication use process.	IVA
64	<i>Documenting Anesthesia Care: Practice and Policy Considerations</i> . American Association of Nurse Anesthetists. https://www.aana.com/docs/default-source/practice-aana-com-web-documents-(all)/professional-practice-manual/documenting-anesthesia-care.pdf?sfvrsn=ac0049b1_6 . Published 2016. Accessed June 17, 2021.	Consensus	n/a	n/a	n/a	n/a	This document provides considerations for facilities in the development of policy to promote accurate documentation of care for clear communication, quality improvement activities and reimbursement.	IVB
65	<i>Clinical Practice Guideline: Moderate Sedation and Analgesia</i> . Association of Radiologic & Imaging Nursing. https://www.arinursing.org/ARIN/assets/File/public/practice-guidelines/h_Moderate_Sedation_and_Analgesia.pdf . Revised 2009. Accessed June 17, 2021.	Guideline	n/a	n/a	n/a	n/a	Provides recommendations for radiologic and imaging nurses who administer moderate sedation/analgesia.	IVB
66	<i>2019-2020 Perianesthesia Nursing Standards, Practice Recommendations and Interpretive Statements</i> . Cherry Hill, NJ: American Society of PeriAnesthesia Nurses; 2018.	Guideline	n/a	n/a	n/a	n/a	The perianesthesia practice standards provide a framework for the care of a diverse patient population in all perianesthesia settings.	IVB
67	American Geriatrics Society 2019 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. <i>J Am Geriatr Soc</i> . 2019;67(4):674-694.	Guideline	n/a	n/a	n/a	n/a	Older adults who receive sedatives and analgesics, especially opioids and benzodiazepines, are at higher risk for overdose, severe sedation-related adverse events (eg, respiratory depression, death), falls, fractures caused by falls, cognitive impairment, induced or worsened delirium, and worsened dementia. Additionally, meperidine may have a higher risk of causing neurotoxicity, including delirium, than other opioids in older adults.	IVA

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68	Wiggins M, Arias F, Urman RD, et al. Common neurodegenerative disorders in the perioperative setting: recommendations for screening from the Society for Perioperative Assessment and Quality Improvement (SPAQI). <i>Perioper Care Oper Room Manag.</i> 2020;20:100092.	Guideline	n/a	n/a	n/a	n/a	To help perioperative clinicians understand behavioral signs of neurodegenerative disorders and prompt additional monitoring, the SPAQI worked with experts in dementia, neuropsychology, geriatric medicine, neurology, and anesthesiology to provide a summary of cognitive and behavioral considerations for patients with select neurodegenerative disorders.	IVB
69	Alvarez-Nebreda ML, Bentov N, Urman RD, et al. Recommendations for preoperative management of frailty from the Society for Perioperative Assessment and Quality Improvement (SPAQI). <i>J Clin Anesth.</i> 2018;47:33-42.	Guideline	n/a	n/a	n/a	n/a	The SPAQI convened experts in the fields of gerontology, anesthesiology, and preoperative assessment to outline practical steps for clinicians to assess and address frailty in elderly patients.	IVB
70	Yeo H, Kim W, Park H, Kim H. Variables influencing the depth of conscious sedation in plastic surgery: a prospective study. <i>Arch Plast Surg.</i> 2017;44(1):5-11.	Nonexperimental	97 patients who underwent plastic surgical procedures, South Korea	n/a	n/a	BIS monitoring; AST, ALT, creatinine, and glucose levels.	Older patients tended to have a greater depth of sedation, whereas patients with greater alcohol intake and females had a shallower depth of sedation.	IIIB
71	Tetzlaff JE, Maurer WG. Preprocedural assessment for sedation in gastrointestinal endoscopy. <i>Gastrointest Endosc Clin N Am.</i> 2016;26(3):433-441.	Expert Opinion	n/a	n/a	n/a	n/a	The goals for preprocedural preparation for sedation during GI endoscopy are determined by the specific procedure planned, the GI pathology, other comorbidity, the goals of the sedation, and some anticipated complications.	VA
72	Urman RD, Moucharite M, Flynn C, Nuryyeva E, Ray CE Jr. Impact of respiratory compromise in inpatient interventional radiology procedures with moderate sedation in the United States. <i>Radiology.</i> 2019;292(3):702-710.	Nonexperimental	525,151 patients who underwent inpatient interventional radiology procedures, Premier Discharge Database, United States	n/a	n/a	Respiratory compromise, use of reversal agent, CPR, intubation	Respiratory compromise in interventional radiology procedures with moderate sedation contributes to worse clinical outcomes and higher costs. Respiratory compromise risk factors including long-term opioid therapy or active substance abuse, age 65 years or older, and sleep apnea should be preassessed and used to help guide intraprocedural monitoring to prevent respiratory compromise, improve patient outcomes, and reduce costs.	IIIA
73	Horwitz G, Roncari D, Braaten KP, Maurer R, Fortin J, Goldberg AB. Moderate intravenous sedation for first trimester surgical abortion: a comparison of adverse outcomes between obese and normal-weight women. <i>Contraception.</i> 2018;97(1):48-53.	Nonexperimental	20,381 patients who underwent first trimester surgical abortion, United States	n/a	n/a	Supplemental oxygen administration, reversal agent, anesthesia-related adverse events, intraoperative loss of consciousness	With appropriate clinical screening, obese women can safely receive moderate intravenous sedation for first trimester surgical abortion in an outpatient clinical setting. Restrictions on moderate intravenous sedation based on BMI alone may be unnecessary.	IIIA

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74	Patel R, Clayton S, Quintero E, Gill J. Chronic opioid users are more difficult to sedate than alcoholics and controls. <i>South Med J</i> . 2015;108(12):744-747.	Nonexperimental	239 patients who underwent colonoscopy, United States	n/a	Chronic use of alcohol (n = 49), marijuana (n = 15), benzodiazepines (n = 10), opioids (n = 18), polysubstance (n = 26); control (n = 121)	Mean dose of fentanyl and midazolam	Chronic opioid users required higher doses of sedation with fentanyl and midazolam than alcohol users.	IIIB
75	Flisberg P, Paech MJ, Shah T, Ledowski T, Kurowski I, Parsons R. Induction dose of propofol in patients using cannabis. <i>Eur J Anaesthesiol</i> . 2009;26(3):192-195.	RCT	60 male patients, Australia	Five induction doses of propofol (1.5, 2, 2.5, 3 or 3.5mg/kg), with 6 patients receiving each of the 5 doses in both the control and comparison group	Cannabis users (n = 30), Nonusers (n = 30)	BIS <60, loss of consciousness	Cannabis use increases the dose of propofol required for induction with a laryngeal mask insertion.	IB
76	Twardowski MA, Link MM, Twardowski NM. Effects of cannabis use on sedation requirements for endoscopic procedures. <i>J Am Osteopath Assoc</i> . 2019;119(5):307-311.	Nonexperimental	250 patients who underwent EGD or colonoscopy procedures, United States	n/a	Cannabis users (n = 25), Nonusers (n = 225)	Dose of sedative	People who regularly used cannabis required a significantly higher amount of sedation for endoscopic procedures. Assessing cannabis use preoperatively can be an important tool to assess medication needs, plan patient care, and anticipate possible risks of increased dosage requirements.	IIIC
77	Huson HB, Granados TM, Rasko Y. Surgical considerations of marijuana use in elective procedures. <i>Heliyon</i> . 2018;4(9):e00779.	Literature Review	n/a	n/a	n/a	n/a	Marijuana may present anesthetic concerns, including arrhythmias, myocardial infarction, stroke, pulmonary obstruction, thromboembolism, or bleeding.	VB
78	Karam K, Abbasi S, Khan FA. Anaesthetic consideration in a cannabis addict. <i>J Coll Physicians Surg Pak</i> . 2015;25 Suppl 1:S2-S3.	Case Report	n/a	n/a	n/a	n/a	Case report of a 35 year old, ASA II, chronic cannabis user and cigarette smoker who was tachycardic and had increased narcotic dose requirements. Cannabis may interact with anesthetic drugs and effect the cardiovascular system, respiratory system and central nervous system.	VB
79	Woo M, Andrews CN. Implications of cannabis use on sedation for endoscopic procedures. <i>Gastrointest Endosc</i> . 2019;90(4):656-658.	Organizational Experience	University of Calgary, Canada	n/a	n/a	n/a	In this organization, long term cannabis users had an increased requirement for sedation and experienced paradoxical agitation with adjunct anticholinergic medications.	VC
80	Wong J, An D, Urman RD, et al. Society for Perioperative Assessment and Quality Improvement (SPAQI) consensus statement on perioperative smoking cessation. <i>Anesth Analg</i> . 2020;131(3):955-968.	Consensus	n/a	n/a	n/a	n/a	Perioperative health care personnel should provide smoking cessation interventions as early as possible and encourage postoperative abstinence to improve surgical outcomes.	IVB

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81	Jeong S, Lee HG, Kim WM, et al. Increase of paradoxical excitement response during propofol-induced sedation in hazardous and harmful alcohol drinkers. <i>Br J Anaesth</i> . 2011;107(6):930-933.	Nonexperimental	190 patients who underwent orthopedic knee joint surgery, South Korea	n/a	Hazardous and harmful drinkers (n = 94) and no hazardous drinkers (n = 91) [Dropout=5]	Paradoxical excitement severity	Hazardous and harmful alcohol drinkers experienced more frequent and severe paradoxical excitement during propofol-induced moderate sedation than social drinkers.	IIIB
82	Apfelbaum JL, Hagberg CA, Caplan RA, et al. Practice guidelines for management of the difficult airway: An updated report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. <i>Anesthesiology</i> . 2013;118(2):251-270.	Guideline	n/a	n/a	n/a	n/a	Guideline for the management of the difficult airway.	IVA
83	American Society of Anesthesiologists Task Force on Perioperative Management of Patients with Obstructive Sleep Apnea. Practice guidelines for the perioperative management of patients with obstructive sleep apnea: an updated report by the American Society of Anesthesiologists Task Force on Perioperative Management of Patients with Obstructive Sleep Apnea. <i>Anesthesiology</i> . 2014;120(2):268-286.	Guideline	n/a	n/a	n/a	n/a	Purpose is to improve the perioperative care and reduce the risk of adverse outcomes in patients with OSA who receive sedation, analgesia, or anesthesia for diagnostic or therapeutic procedures under the care of an anesthesiologist.	IVA
84	Chung F, Memtsoudis SG, Ramachandran SK, et al. Society of Anesthesia and Sleep Medicine Guidelines on Preoperative Screening and Assessment of Adult Patients with Obstructive Sleep Apnea. <i>Anesth Analg</i> . 2016;123(2):452-473.	Guideline	n/a	n/a	n/a	n/a	Recommendations for screening and assessment of adult surgical patients for obstructive sleep apnea. Institutions should develop protocols for care of patients with known or suspected OSA including type of anesthesia, choice of medications, postop analgesia regimens, monitoring, and referral to reduce complications and ensure the best possible patient outcome.	IVA
85	Zhou C, Chung F, Wong DT. Clinical assessment for the identification of the potentially difficult airway. <i>Periop Care Oper Room Manag</i> . 2017;9:16-19.	Literature Review	n/a	n/a	n/a	n/a	Every patient should be assessed preoperatively for potentially difficult airways in order to facilitate planning and preparation. Airway assessment includes a focused history and airway examination.	VA
86	Kara D, Bayrak NA, Volkan B, Uçar C, Cevizci MN, Yildiz S. Anxiety and salivary cortisol levels in children undergoing esophago-gastro-duodenoscopy under sedation. <i>J Pediatr Gastroenterol Nutr</i> . 2019;68(1):3-6.	Nonexperimental	204 children, Turkey	n/a	119 children who underwent EGD and 85 age and sex matched controls	Salivary cortisol levels, anxiety	Increased anxiety in pediatric patients before EGD resulted in increased propofol doses, which increased the duration of the procedure.	IIIB

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87	Practice guidelines for preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration: application to healthy patients undergoing elective procedures: an updated report by the American Society of Anesthesiologists Task Force on Preoperative Fasting and the Use of Pharmacologic Agents to Reduce the Risk of Pulmonary Aspiration. <i>Anesthesiology</i> . 2017;126(3):376-393.	Guideline	n/a	n/a	n/a	n/a	Recommendations for preoperative fasting.	IVA
88	ASGE Standards of Practice Committee; Lightdale JR, Acosta R, Shergill AK, et al. Modifications in endoscopic practice for pediatric patients. <i>Gastrointest Endosc</i> . 2014;79(5):699-710.	Guideline	n/a	n/a	n/a	n/a	Recommendations for moderate sedation of pediatric patients who require endoscopy.	IVA
89	<i>AORN Position Statement on Care of the Older Adult in Perioperative Settings</i> . AORN, Inc. https://aorn.org/guidelines/clinical-resources/position-statements . Published 2015. Accessed June 17, 2021.	Position Statement	n/a	n/a	n/a	n/a	Perioperative RNs provide patient-centered care and develop interventions for older adults by taking into consideration the changes associated with aging and by understanding that age alone puts older adults at risk for perioperative complications.	IVB
90	Arias F, Wiggins M, Urman RD, et al. Rapid in-person cognitive screening in the preoperative setting: test considerations and recommendations from the Society for Perioperative Assessment and Quality Improvement (SPAQI). <i>J Clin Anesth</i> . 2020;62:109724.	Guideline	n/a	n/a	n/a	n/a	SPAQI convened experts in neuropsychology, geriatric medicine, and anesthesiology to conduct a review of the literature and compile a comprehensive list of cognitive screening tools used within primary care and preoperative settings.	IVB
91	<i>Optimal Resources for Geriatric Surgery: 2019 Standards</i> . Chicago, IL: American College of Surgeons; 2019.	Consensus	n/a	n/a	n/a	n/a	Standards of the Geriatric Verification Quality Improvement Program. Includes recommendations for preoperative geriatric vulnerability screening.	IVB
92	<i>A Position Statement on the Older Adult</i> . American Society of PeriAnesthesia Nurses. https://www.aspan.org/Portals/6/docs/ClinicalPractice/PositionStatement/Current/PS_5.pdf?ver=2021-01-12-150828-397 . Revised October 2019. Accessed June 17, 2021.	Position Statement	n/a	n/a	n/a	n/a	Perianesthesia RNs should demonstrate competency in recognizing older adult age-specific pathophysiology to maximize the patient's health state and adapt to prevent complications.	IVB
93	Acosta A, Garzon MP, Urman RD. Screening and diagnosing frailty in the cardiac and noncardiac surgical patient to improve safety and outcomes. <i>Int Anesthesiol Clin</i> . 2019;57(3):111-122.	Literature Review	n/a	n/a	n/a	n/a	Identification of frail patients in the preoperative period has valuable implications across the perioperative spectrum.	VA
94	<i>A Position Statement on the Pediatric Patient</i> . American Society of PeriAnesthesia Nurses. https://www.aspan.org/Portals/6/docs/ClinicalPractice/PositionStatement/Current/PS_6.pdf?ver=2021-01-12-150828-537 . Revised October 2019. Accessed June 17, 2021.	Position Statement	n/a	n/a	n/a	n/a	Perianesthesia RNs are responsible for recognizing the implications of age-related pathophysiologic and anatomical differences with the pediatric patient.	IVB

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95	ASA Physical Status Classification System. American Society of Anesthesiologists . https://www.asahq.org/standards-and-guidelines/asa-physical-status-classification-system . Amended December 13, 2020. Accessed June 17, 2021.	Expert Opinion	n/a	n/a	n/a	n/a	The ASA Physical Status Classification System has been in use for over 60 years. The purpose of the system is to assess and communicate a patient's pre-anesthesia medical co-morbidities. The classification system alone does not predict the perioperative risks, but used with other factors (eg. type of surgery, frailty, level of deconditioning), it can be helpful in predicting perioperative risks.	VA
96	Seligson E, Beutler SS, Urman RD. Office-based anesthesia: an update on safety and outcomes (2017-2019). <i>Curr Opin Anaesthesiol</i> . 2019;32(6):756-761.	Literature Review	n/a	n/a	n/a	n/a	Common inclusion and exclusion criteria for office-based procedures.	VA
97	Prakash S, Mullick P. Airway management in patients with burn contractures of the neck. <i>Burns</i> . 2015;41(8):1627-1635.	Literature Review	n/a	n/a	n/a	n/a	Burn contractures limit neck extension and present a challenge for airway management.	VA
98	Lee A, Fan LT, Gin T, Karmakar MK, Ngan Kee WD. A systematic review (meta-analysis) of the accuracy of the Mallampati tests to predict the difficult airway. <i>Anesth Analg</i> . 2006;102(6):1867-1878.	Systematic Review w/ Meta-Analysis	n/a	n/a	n/a	n/a	The Mallampati tests have limited accuracy for predicting difficult airway when used alone.	IIIA
99	Cozowicz C, Chung F, Doufas AG, Nagappa M, Memtsoudis SG. Opioids for acute pain management in patients with obstructive sleep apnea: a systematic review. <i>Anesth Analg</i> . 2018;127(4):988-1001.	Systematic Review	n/a	n/a	n/a	n/a	OSA-related increased pain perception and enhanced opioid sensitivity could predispose patients with OSA to a higher risk for opioid-induced respiratory depression (ORID) without overdosing. Notably, the initial 24 hours after opioid administration appear to be most critical with regard to life-threatening ORID.	IIIA
100	Szeto B, Vertosick EA, Ruiz K, et al. Outcomes and safety among patients with obstructive sleep apnea undergoing cancer surgery procedures in a freestanding ambulatory surgical facility. <i>Anesth Analg</i> . 2019;129(2):360-368.	Nonexperimental	5,721 patients who underwent surgery at a freestanding ambulatory surgical center for cancer, United States	n/a	Patients at moderate or high risk for OSA (n = 526)	Transfer to main hospital, urgent care center visit, hospital readmission within 30 days, length of stay, discharge time	Patients with moderate-risk, high-risk, or diagnosed OSA can safely undergo outpatient and advanced ambulatory oncology surgery without increased health care burden of extended stay or hospital admission and avoiding adverse postoperative outcomes.	IIIB
101	Joshi GP, Ankichetty SP, Gan TJ, Chung F. Society for Ambulatory Anesthesia consensus statement on preoperative selection of adult patients with obstructive sleep apnea scheduled for ambulatory surgery. <i>Anesth Analg</i> . 2012;115(5):1060-1068.	Consensus	n/a	n/a	n/a	n/a	Consensus statement for the selection of patients with OSA scheduled for ambulatory surgery.	IVA
102	Memtsoudis SG, Cozowicz C, Nagappa M, et al. Society of Anesthesia and Sleep Medicine Guideline on Intraoperative Management of Adult Patients with Obstructive Sleep Apnea. <i>Anesth Analg</i> . 2018;127(4):967-987.	Guideline	n/a	n/a	n/a	n/a	Recommendations for intraoperative care of patients with OSA, including airway management, anesthetic medication effects, and choice of anesthesia type.	IVA

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REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
103	Moos DD, Prasch M, Cantral DE, Huls B, Cuddeford JD. Are patients with obstructive sleep apnea syndrome appropriate candidates for the ambulatory surgical center? <i>AANA J</i> . 2005;73(3):197-205.	Expert Opinion	n/a	n/a	n/a	n/a	ASCs should develop policies and procedures for patients with OSA and remain conservative in their approach.	VA
104	Abrishami A, Khajehdehi A, Chung F. A systematic review of screening questionnaires for obstructive sleep apnea. <i>Can J Anaesth</i> . 2010;57(5):423-438.	Systematic Review	n/a	n/a	n/a	n/a	The Wisconsin and the Berlin questionnaires had the highest sensitivity and specificity for predicting the existence of obstructive sleep apnea. The STOP and the STOP-Bang questionnaires had the highest methodological validity, reasonable accuracy, and easy-to-use features. Based on these findings, the authors recommend the use of the STOP and STOP-Bang questionnaires to screen surgical patients for obstructive sleep apnea.	IIIA
105	Cho J, Choi SM, Park YS, Lee CH, Lee SM, Lee J. Snoring during bronchoscopy with moderate sedation is a predictor of obstructive sleep apnea. <i>Tuberc Respir Dis (Seoul)</i> . 2019;82(4):335-340.	Nonexperimental	517 patients who underwent flexible bronchoscopy, South Korea	n/a	n/a	Snoring, STOP-Bang score	Two-thirds of patients undergoing bronchoscopy with moderate sedation were at risk of OSA based on the screening questionnaire. Snoring during bronchoscopy was highly predictive of patients at high risk of OSA.	IIIB
106	May AM, Kazakov J, Strohl KP. Predictors of intraprocedural respiratory bronchoscopy complications. <i>J Bronchology Interv Pulmonol</i> . 2020;27(2):135-141.	Nonexperimental	223 patients who underwent flexible bronchoscopy, United States	n/a	n/a	Intraprocedural complications, STOP-Bang score	Respiratory complications during bronchoscopy was common. STOP-Bang was not associated with increased immediate bronchoscopy complication risk.	IIIB
107	Raveendran R, Wong J, Chung F. Morbid obesity, sleep apnea, obesity hypoventilation syndrome: are we sleepwalking into disaster? <i>Perioper Care Oper Room Manag</i> . 2017;9:24-32.	Literature Review	n/a	n/a	n/a	n/a	Facilities should have a policy for preoperative assessment, intraoperative and postoperative management of obese patients with sleep disordered breathing, including OSA and obesity hypoventilation syndrome.	VA
108	Chung F, Yegneswaran B, Liao P, et al. Validation of the Berlin questionnaire and American Society of Anesthesiologists checklist as screening tools for obstructive sleep apnea in surgical patients. <i>Anesthesiology</i> . 2008;108(5):822-830.	Quasi-experimental	177 patients who underwent polysomnography, Canada	Screening with the Berlin questionnaire, ASA checklist, and STOP questionnaire.	n/a	Apnea-hypopnea index	The screening tools demonstrated a moderately high level of sensitivity for OSA screening. The STOP questionnaire and ASA checklist were able to identify the patients who were likely to develop postoperative complications.	IIA
109	Ramachandran SK, Kheterpal S, Consens F, et al. Derivation and validation of a simple perioperative sleep apnea prediction score. <i>Anesth Analg</i> . 2010;110(4):1007-1015.	Nonexperimental	43,576 adult patients who underwent anesthesia, United States	n/a	3,884 patients who had a documented diagnosis of OSA	P-SAP score	The P-SAP score predicts diagnosis of OSA with dependable accuracy across mild to severe disease.	IIIA
110	Terry KL, Disabato J, Krajccek M. Snoring, Trouble Breathing, Un-Refreshed (STBUR) screening questionnaire to reduce perioperative respiratory adverse events in pediatric surgical patients: a quality improvement project. <i>AANA J</i> . 2015;83(4):256-262.	Organizational Experience	Pediatric hospital, United States	n/a	n/a	n/a	The STBUR screening questions embedded in the medical record significantly improved identification of patients at risk for perioperative respiratory adverse events, allowing modification of perioperative management toward safer practices.	VA

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111	Willard CE, Rich AN, Broome ME, Silva SG, Muckler VC. Nasal ventilation mask for prevention of upper airway obstruction in patients with obesity or obstructive sleep apnea. <i>AANA J.</i> 2019;87(5):395-403.	Organizational Experience	Academic health system, United States	n/a	n/a	n/a	Developed and implemented use of a nasal ventilation mask for patients with obstructive sleep apnea or obesity undergoing moderate or deep sedation for EGD and colonoscopy procedures. The nasal ventilation mask offered supportive ventilation and had the ability to provide positive pressure assistive breaths.	VA
112	Chittle MD, Oklu R, Pino RM, et al. Sedation shared decision-making in ambulatory venous access device placement: effects on patient choice, satisfaction and recovery time. <i>Vasc Med.</i> 2016;21(4):355-360.	Nonexperimental	198 patients who underwent ambulatory vascular interventional radiology procedures, United States	n/a	n/a	n/a	Patients were educated about sedation options then given the choice of undergoing the procedure with local anesthetic only, minimal sedation, or moderate sedation. The patients had variable preferences for sedation and venous access device placement, which the researchers identified as an opportunity for shared decision making to empower patients to select the option most aligned with their goals.	IIIB
113	McCain JD, Stancampiano FF, Bouras EP, et al. Creation of a score to predict risk of high conscious sedation requirements in patients undergoing endoscopy. <i>Gastrointest Endosc.</i> 2020;91(3):595-605.	Nonexperimental	1,464 patients who underwent EGD or colonoscopy, United States	n/a	Sedation failure (n = 488) and control (n = 976)	High conscious sedation requirements (HCSR) score	Significant associations with sedation failure were identified for age, sex, nonclonazepam benzodiazepine use, opioid use, and procedure type (EGD, colonoscopy, or both). The HCSR risk score can be a useful tool when discussing sedation options with patients before endoscopy.	IIIB
114	<i>Actionable Patient Safety Solutions (APSS): Moderate sedation.</i> Patient Safety Movement. https://patientsafetymovement.org/clinical/surgical-and-procedural-safety/moderate-sedation/ . Accessed June 17, 2021.	Expert Opinion	n/a	n/a	n/a	n/a	This document provides a blueprint that outlines the actionable steps organizations should take to successfully improve outcomes for patients undergoing moderate sedation and summarizes the available evidence-based practice protocols.	VA
115	Kreienbühl L, Elia N, Pfeil-Beun E, Walder B, Tramèr MR. Patient-controlled versus clinician-controlled sedation with propofol: systematic review and meta-analysis with trial sequential analyses. <i>Anesth Analg.</i> 2018;127(4):873-880.	Systematic Review w/ Meta-Analysis	n/a	n/a	n/a	n/a	Patient-controlled sedation in low- to medium-risk middle-aged nonobese patients had no impact on the risk of oxygen desaturation and significantly less use of rescue interventions for sedation-related adverse events. Patient-controlled sedation may not be suitable for every patient, and that the patient must be able and willing to use a pump device and take responsibility for their own sedation.	IA
116	Pambianco D, Niklewski P. Computer-assisted and patient-controlled sedation platforms. <i>Gastrointest Endosc Clin N Am.</i> 2016;26(3):563-576.	Literature Review	n/a	n/a	n/a	n/a	Use of patient-controlled sedation in endoscopy procedures produced differing results in patient satisfaction. They supported medication and patient selection as key elements to successful use of patient-controlled sedation.	VC
117	Southerland WA, Beight LJ, Shapiro FE, Urman RD. Decision aids in anesthesia: do they help? <i>Curr Opin Anaesthesiol.</i> 2020;33(2):185-191.	Literature Review	n/a	n/a	n/a	n/a	Patients who will undergo anesthesia may benefit from using a tool (ie, patient decision aid) to support patient-centered care delivery and shared decision making. The benefits to the patient may include feeling better informed; having more knowledge; and having less anxiety, depression, and decisional conflict.	VA

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118	<i>Standards for Basic Anesthesia Monitoring.</i> American Society of Anesthesiologists. https://www.asahq.org/standards-and-guidelines/standards-for-basic-anesthetic-monitoring . Last affirmed December 13, 2020. Accessed June 17, 2021.	Guideline	n/a	n/a	n/a	n/a	Standard for basic anesthesia monitoring to include patient oxygenation, ventilation, circulation and temperature.	IVB
119	<i>Clinical Practice Guideline: Capnography.</i> Association of Radiologic and Imaging Nursing . https://www.arinursing.org/ARIN/assets/File/public/practice-guidelines/Capnography_CPG_Final_031918.pdf . Accessed June 17, 2021.	Guideline	n/a	n/a	n/a	n/a	Advancements in technology such as capnography, the monitoring of the partial pressure of expired carbon dioxide, provide nurses with a means to ensure the improvement of care delivery, provide a safe environment, and effectively achieve successful procedural sedation.	IVB
120	<i>AORN Position Statement on Perioperative Registered Nurse Circulator Dedicated to Every Patient Undergoing an Operative or Other Invasive Procedure.</i> AORN, Inc. https://aorn.org/guidelines/clinical-resources/position-statements . Revised March 2019. Accessed June 17, 2021.	Position Statement	n/a	n/a	n/a	n/a	At a minimum, one perioperative RN circulator should be dedicated to each patient undergoing an operative or other invasive procedure and should be present during that patient's entire intraoperative experience.	IVB
121	<i>Statement on the Use of Sedation and Analgesia in the Gastrointestinal Endoscopy Setting.</i> Society of Gastroenterology Nurses and Associates, Inc. https://www.sгна.org/Portals/0/Practice/Sedation/Sedation_FINAL.pdf?ver=2017-10-09-110940-983 . Revised 2017. Accessed June 17, 2021.	Position Statement	n/a	n/a	n/a	n/a	SGNA supports the position that registered nurses trained and experienced in gastroenterology nursing and endoscopy can administer and maintain moderate sedation and analgesia by the order and supervision of a physician.	IVB
122	Klare P, Reiter J, Meining A, et al. Capnographic monitoring of midazolam and propofol sedation during ERCP: a randomized controlled study (EndoBreath Study). <i>Endoscopy</i> . 2016;48(1):42-50.	RCT	238 patients who underwent ERCP with midazolam and propofol sedation, Germany	Capnographic monitoring (n = 121)	Standard monitoring (n = 117)	Hypoxemia, bradycardia, hypotension, sedation quality	Apnea was more frequently detected with capnographic monitoring.	IA
123	Barnett S, Hung A, Tsao R, et al. Capnographic monitoring of moderate sedation during low-risk screening colonoscopy does not improve safety or patient satisfaction: a prospective cohort study. <i>Am J Gastroenterol</i> . 2016;111(3):388-394.	Quasi-experimental	966 patients who underwent colonoscopy, United States	End-tidal CO2 monitoring (n = 501)	No End-tidal CO2 monitoring (n = 465)	Sedation safety, patient satisfaction, scoped by validated PROcedural Sedation Assessment Survey, cost	Routine capnography did not improve safety or patient satisfaction, but did increase cost, so it may be reserved for patients at higher risk for adverse events during colonoscopy, which is a low-risk procedure.	IIA

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124	Committee on Quality Management and Departmental Administration. <i>Continuum of Depth of Sedation: Definition of General Anesthesia and Levels of Sedation/Analgesia</i> . American Society of Anesthesiologists. https://www.asahq.org/standards-and-guidelines/continuum-of-depth-of-sedation-definition-of-general-anesthesia-and-levels-of-sedationanalgesia . Last amended October 23, 2019. Accessed June 17, 2021.	Expert Opinion	n/a	n/a	n/a	n/a	Description of the levels of sedation from minimal sedation to general anesthesia.	VA
125	Jokelainen J, Mustonen H, Kylänpää L, Udd M, Lindström O, Pöyhiä R. Assessment of sedation level for endoscopic retrograde cholangiopancreatography—a prospective validation study. <i>Scand J Gastroenterol</i> . 2018;53(3):370-375.	Quasi-experimental	200 patients who underwent ERCP, Finland	Patient controlled sedation (n = 66)	Propofol sedation (n = 133)	Depth of sedation: bispectral index (BIS), modified Richmond Agitation/Sedation Scale (mRASS), modified Ramsay Sedation Scale (mRSS), modified Observer Assessment of Alertness and Sedation (mOAAS)	A limitation of using the sedation scales was that they required the patient to respond to verbal or tactile stimuli, which impaired the ERCP procedure. Therefore, the researchers suggested that BIS monitoring may be preferable in the clinical setting because the information is collected directly from the electroencephalogram rather than requiring the patient to respond.	IIB
126	Park SW, Lee H, Ahn H. Bispectral index versus standard monitoring in sedation for endoscopic procedures: a systematic review and meta-analysis. <i>Dig Dis Sci</i> . 2016;61(3):814-824.	Systematic Review w/ Meta-Analysis	n/a	n/a	n/a	n/a	Total propofol consumption was significantly lower with BIS monitoring and recommended use of BIS monitoring as a safe and effective method for avoiding unnecessary administration of propofol during endoscopic procedures.	IA
127	Nisbet AT, Mooney-Cotter F. Comparison of selected sedation scales for reporting opioid-induced sedation assessment. <i>Pain Manag Nurs</i> . 2009;10(3):154-164.	Nonexperimental	96 medical-surgical nurses, United States	n/a	3 sedation scales: Inova Health System Sedation Scale, Richmond Agitation and Sedation Scale, Pasero Opioid-Induced Sedation Scale	Reliability, validity, nurses' ratings	Changes in a patient's condition can be communicated with a valid, reliable, and easy-to-use sedation scale (eg, the Pasero Opioid-Induced Sedation Scale). Use of an objective scale facilitates timely recognition of advancing sedation and appropriate nursing actions of dose reduction, escalation of care, team communication, and management of treatment options.	IIIB

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128	Öztaş S, Aka Aktürk Ü, Alpay LA, et al. A comparison of propofol-midazolam and midazolam alone for sedation in endobronchial ultrasound-guided transbronchial needle aspiration: a retrospective cohort study. <i>Clin Respir J.</i> 2017;11(6):935-941.	Nonexperimental	274 patients who underwent EBUS-TBNA procedures, Turkey	n/a	Sedation with propofol-midazolam (n = 152), and midazolam (n = 122)	Diagnostic yield, complication rates	Both sedation-types for performing EBUS-TBNA showed similar diagnostic value and complication rates. Propofol requires with an accompanying anesthesiologist, therefore, it increases cost.	IIB
129	Ter Bruggen FFJA, Eralp I, Jansen CK, Stronks DL, Huygen FJPM. Efficacy of dexmedetomidine as a sole sedative agent in small diagnostic and therapeutic procedures: a systematic review. <i>Pain Pract.</i> 2017;17(6):829-840.	Systematic Review	n/a	n/a	n/a	n/a	In the adult studies, dexmedetomidine yielded significantly lower pain levels compared to the other sedatives and significantly more patient satisfaction. In studies on children, more favorable results concerning respiratory safety and the level of adequate sedation were found compared to the control sedatives.	IA
130	Zhong L, Shen K, Zhai S, et al. Application of sedation-agitation scale in conscious sedation before bronchoscopy in children. <i>Medicine (Baltimore).</i> 2019;98(1):e14035.	Quasi-experimental	422 pediatric patients who underwent bronchoscopy, China	Sedation with midazolam dose adjusted based on sedation agitation scale (n = 218)	Control group that was not evaluated by the sedation agitation scale (n = 204)	Dose, adverse reactions, operating time, number of participants	The Sedation Agitation Scale was a useful tool to guide individualized administration of midazolam to achieve ideal sedative effect and reduce adverse reactions.	IIB
131	American Association for Study of Liver Diseases; American College of Gastroenterology; American Gastroenterological Association Institute; et al. Multisociety sedation curriculum for gastrointestinal endoscopy. <i>Gastrointest Endosc.</i> 2012;76(1):e1-e25.	Guideline	n/a	n/a	n/a	n/a	Recommendations provide a framework for a complete and programmatic approach to the training of procedure sedation.	IVB
132	<i>Depth of anaesthesia monitors – bispectral index (BIS), E-Entropy and Narcotrend-Compact M.</i> National Institute for Health and Care Excellence (NICE). https://www.nice.org.uk/guidance/dg6/documents/depth-of-anaesthesia-monitors-eentropy-bis-and-narcotrend-diagnostics-consultation-document . Published November 21, 2012. Accessed June 17, 2021.	Guideline	n/a	n/a	n/a	n/a	Recommendations for evaluation and implementation of depth of anesthesia monitors.	IVB
133	Conway A, Sutherland J. Depth of anaesthesia monitoring during procedural sedation and analgesia: a systematic review and meta-analysis. <i>Int J Nurs Stud.</i> 2016;63:201-212.	Systematic Review w/ Meta-Analysis	n/a	n/a	n/a	n/a	Use of monitoring devices for adults reduced the amount of propofol administered but did not reduce adverse events cause by oversedation or reduce recovery duration.	IA

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134	Gelfand ME, Gabriel RA, Gimlich R, Beutler SS, Urman RD. Practice patterns in the intraoperative use of bispectral index monitoring. <i>J Clin Monit Comput.</i> 2017;31(2):281-289.	Nonexperimental	55,210 patients who underwent surgery, United States	n/a	Intraoperative use of BIS monitoring	Age, sex, BMI, ASA physical status, anesthesia provider type, inhalation anesthetics, total IV anesthesia, airway type, emergency status, case duration, surgical specialty	BIS monitoring was more likely to be used for complex procedures. These procedures included those for older adult patients, patients with a higher ASA physical status classification, and patients with extremes of BMI; procedures that used total intravenous anesthesia, a long-acting paralytic agent, or an endotracheal tube; emergency surgery; longer procedures; and procedures in certain surgical services.	IIIA
135	ASGE Technology Committee; Gottlieb KT, Banerjee S, Barth BA, et al. Monitoring equipment for endoscopy. <i>Gastrointest Endosc.</i> 2013;77(2):175-180.	Expert Opinion	n/a	n/a	n/a	n/a	Reviews of existing, new, or emerging monitoring equipment that have an impact on the practice of GI endoscopy.	VA
136	Impact of clinical alarms on patient safety: A report from the American College of Clinical Engineering Healthcare Technology Foundation. <i>J Clin Eng.</i> 2007;32(1):22-33.	Expert Opinion	n/a	n/a	n/a	n/a	Patients have experienced injuries and near misses because alarms were turned off or inaudible.	VB
137	ASGE Standards of Practice Committee; Chandrasekhara V, Early DS, Acosta RD, et al. Modifications in endoscopic practice for the elderly. <i>Gastrointest Endosc.</i> 2013;78(1):1-7.	Guideline	n/a	n/a	n/a	n/a	Provides guidance regarding endoscopic practice issues in the elderly. Recommends administering fewer sedatives and analgesics at a slower rate with lower initial and cumulative doses.	IVA
138	Childers RE, Williams JL, Sonnenberg A. Practice patterns of sedation for colonoscopy. <i>Gastrointest Endosc.</i> 2015;82(3):503-511.	Nonexperimental	1,385,436 patients who underwent colonoscopy, Clinical Outcomes Research Initiative endoscopic database, United States	n/a	n/a	Dose of midazolam, diazepam, fentanyl, meperidine, diphenhydramine, promethazine, and propofol used for sedation during colonoscopy	Progressively less sedation was used in older patients.	IIIA
139	Nemeth M, Jacobsen N, Bantel C, Fieler M, Sümpelmann R, Eich C. Intranasal analgesia and sedation in pediatric emergency care—a prospective observational study on the implementation of an institutional protocol in a tertiary children's hospital. <i>Pediatr Emerg Care.</i> 2019;35(2):89-95.	Nonexperimental	100 pediatric patients who required acute pain therapy or urgent analgesia/sedation, Germany	n/a	n/a	Quality of analgesia/sedation, time to onset, adverse events	Intranasal midazolam was effective and safe for acute pain therapy and urgent analgesia/sedation.	IIIB

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140	Conway A, Rolley J, Sutherland JR. Midazolam for sedation before procedures. <i>Cochrane Database Syst Rev.</i> 2016;(5):CD009491.	Systematic Review w/ Meta-Analysis	n/a	n/a	n/a	n/a	There is inconsistent evidence that oral midazolam decreased anxiety during procedures compared with placebo. Intranasal midazolam did not reduce the risk of incomplete procedures, although anxiolysis and sedation were observed.	IA
141	Gentz R, Casamassimo P, Amini H, Claman D, Smiley M. Safety and efficacy of 3 pediatric midazolam moderate sedation regimens. <i>Anesth Prog.</i> 2017;64(2):66-72.	Quasi-experimental	650 pediatric patients who underwent dental procedures, United States	Nasal midazolam alone	Oral midazolam alone and oral midazolam in combination with other sedative/analgesic	Procedural success, complications	Midazolam, given orally, intranasally, or in combination with other sedatives, was effective with minimal postoperative complications.	IIB
142	Alp H, Elmaci AM, Alp EK, Say B. Comparison of intranasal midazolam, intranasal ketamine, and oral chloral hydrate for conscious sedation during paediatric echocardiography: results of a prospective randomised study. <i>Cardiol Young.</i> 2019;29(9):1189-1195.	RCT	217 children who underwent transesophageal echocardiogram, Turkey	Intranasal ketamine (n = 72), intranasal midazolam (n = 73)	Oral chloral hydrate (n = 72)	Intensity, onset, and duration of sedation, success of procedure, side effects	All three agents provide adequate sedation for successful transthoracic echocardiography. Intranasal midazolam has a more rapid onset of sedation while intranasal ketamine has a shorter duration of sedation. Intranasal ketamine can be used safely with fewer side effects in children undergoing transthoracic echocardiography.	IB
143	Stephen MC, Mathew J, Varghese AM, Kurien M, Mathew GA. A randomized controlled trial comparing intranasal midazolam and chloral hydrate for procedural sedation in children. <i>Otolaryngol Head Neck Surg.</i> 2015;153(6):1042-1050.	RCT	82 children who underwent auditory brainstem response testing, India	Intranasal midazolam with oral placebo (n = 41)	Oral chloral hydrate with placebo nasal spray (n = 41)	Safety and efficacy	Intranasal midazolam is safe and efficacious for pediatric procedural sedation.	IB
144	Tsze DS, Ieni M, Fenster DB, et al. Optimal volume of administration of intranasal midazolam in children: a randomized clinical trial. <i>Ann Emerg Med.</i> 2017;69(5):600-609.	RCT	96 children who underwent laceration repair, United States	Intranasal midazolam	Doses 0.2mL (n = 32), 0.5mL (n = 33), 1mL (n = 31)	Time to onset, procedural distress, time to procedure start, deepest level of sedation, adverse events, clinician and caregiver satisfaction	There was a slightly shorter time to onset of minimal sedation when a volume of administration of 0.5 mL was used compared with 1 mL, but all 3 volumes of administration produced comparable clinical outcomes.	IB
145	Malia L, Laurich VM, Sturm JJ. Adverse events and satisfaction with use of intranasal midazolam for emergency department procedures in children. <i>Am J Emerg Med.</i> 2019;37(1):85-88.	Nonexperimental	112 pediatric patients who underwent laceration repair with intranasal midazolam, Canada	n/a	n/a	Fasting times, complications, provider and caregiver satisfaction	Short NPO of both solids and liquids are safe for the use of intranasal midazolam. Additionally, parent and provider satisfaction scores were high.	IIIB
146	Mellion SA, Bourne D, Brou L, et al. Evaluating clinical effectiveness and pharmacokinetic profile of atomized intranasal midazolam in children undergoing laceration repair. <i>J Emerg Med.</i> 2017;53(3):397-404.	Quasi-experimental	62 pediatric patients who underwent laceration repair with intranasal midazolam, United States	Atomized intranasal midazolam	n/a	Pharmacokinetic parameters, anxiety, use of adjunct medications, success of procedure, adverse events	Atomized intranasal midazolam is a safe and effective anxiolytic to facilitate laceration repair. The plasma concentration was >90% of the maximum from 5 to 17 min, suggesting this as an ideal procedural timeframe after intranasal midazolam administration.	IIB

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147	Ashley PF, Chaudhary M, Lourenço-Matharu L. Sedation of children undergoing dental treatment. <i>Cochrane Database Syst Rev.</i> 2018;(12):CD003877.	Systematic Review w/ Meta-Analysis	n/a	n/a	n/a	n/a	There is some moderate-certainty evidence that oral midazolam is an effective sedative agent for children undergoing dental treatment.	IA
148	Khodadad A, Afliatoonian M, Jalilian R, et al. Comparison of oral midazolam with intravenous midazolam for sedation children during upper gastrointestinal endoscopy. <i>Acta Med Iran.</i> 2016;54(9):576-582.	RCT	119 pediatric patients who underwent endoscopy, Iran	Oral midazolam (n = 59)	IV midazolam (n = 60)	Time to sedation, resistance to separation from parents, comfort during endoscopy	Oral midazolam reduced patients' anxiety during separation from parents, which lead the easy use of endoscopy and comfort of patients during endoscopy as compared with IV midazolam. Oral or IV midazolam were not able to put most patients in deep sedation level.	IB
149	Sado-Filho J, Viana KA, Corrêa-Faria P, Costa LR, Costa PS. Randomized clinical trial on the efficacy of intranasal or oral ketamine-midazolam combinations compared to oral midazolam for outpatient pediatric sedation. <i>PLoS One.</i> 2019;14(3):e0213074.	RCT	84 pediatric patients who underwent dental procedures, Brazil	Intranasal ketamine and midazolam (n = 28)	Oral ketamine and midazolam (n = 28), Oral midazolam (n = 28)	Behavioral rating scale, success of sedation, adverse events	All three regimens provided moderate dental sedation with minor adverse events, with marked variability in the behavior of children during dental treatment.	IB
150	Chopra R, Marwaha M. Assessment of buccal aerosolized midazolam for pediatric conscious sedation. <i>J Investig Clin Dent.</i> 2015;6(1):40-44.	Quasi-experimental	35 pediatric patients who underwent dental procedures, India	Oral midazolam via buccal spray	n/a	Behavior score, acceptance of drug	Buccal aerosolized midazolam can be used successfully for pediatric conscious sedation.	IIB
151	Blumer S, Peretz B, Zisman G, Ratson T. Effect of sedation with midazolam and time to discharge among pediatric dental patients. <i>J Clin Pediatr Dent.</i> 2017;41(5):384-387.	Nonexperimental	120 pediatric patients who underwent dental procedures, Israel	n/a	Conscious sedation with midazolam orally (n = 81) or rectally (n = 39)	Behavior	The time to discharge post-midazolam sedation correlated to the child's age and weight and total amount of administered midazolam. Sedation negatively affected behavior in 43.6% of the cases.	IIIB
152	Cao Q, Lin Y, Xie Z, et al. Comparison of sedation by intranasal dexmedetomidine and oral chloral hydrate for pediatric ophthalmic examination. <i>Paediatr Anaesth.</i> 2017;27(6):629-636.	RCT	141 pediatric patients who underwent ophthalmic examinations, China	Intranasal dexmedetomidine (n = 71)	Oral chloral hydrate (n = 70)	Successful examination, quality of eye position, intraocular pressure, onset time, duration of exam, recovery time, discharge time, side effects	Intranasal dexmedetomidine produced better sedation and better image quality for ophthalmic examinations in small children than oral chloral hydrate.	IB
153	Li BL, Zhang N, Huang JX, et al. A comparison of intranasal dexmedetomidine for sedation in children administered either by atomiser or by drops. <i>Anaesthesia.</i> 2016;71(5):522-528.	RCT	279 pediatric patients who underwent transthoracic echocardiography, China	Intranasal dexmedetomidine via mucosal atomization device (n = 137)	Intranasal dexmedetomidine via drops from a syringe (n = 142)	Successful sedation, complications	Both modes of dexmedetomidine administration were safe and effective, although increasing age of the child was associated with a decreased likelihood of successful sedation.	IB

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154	Xie Z, Shen W, Lin J, Xiao L, Liao M, Gan X. Sedation effects of intranasal dexmedetomidine delivered as sprays versus drops on pediatric response to venous cannulation. <i>Am J Emerg Med</i> . 2017;35(8):1126-1130.	RCT	106 pediatric patients who underwent elective ophthalmic surgery, China	Intranasal dexmedetomidine via mucosal atomization device (n = 57)	Intranasal dexmedetomidine via drops from a syringe (n = 49)	Response to peripheral IV 30min after administration, acceptance of intranasal medication, onset time, needle insertion time, adverse events	Intranasal dexmedetomidine by spray offers better sedation effects to reduce responses to IV cannulation than drops.	IB
155	Yuen VM, Li BL, Cheuk DK, et al. A randomised controlled trial of oral chloral hydrate vs. intranasal dexmedetomidine before computerised tomography in children. <i>Anaesthesia</i> . 2017;72(10):1191-1195.	RCT	196 pediatric patients who underwent CT, China	Intranasal dexmedetomidine spray and placebo oral syrup (n = 88)	Oral chloral hydrate syrup and placebo nasal spray (n = 108)	Efficacy and complications	Successful sedation of children before CT studies is similar after oral chloral hydrate or intranasal dexmedetomidine. Dexmedetomidine was associated with better behavior and less GI side effects (vomiting).	IC
156	Uusalo P, Guillaume S, Siren S, et al. Pharmacokinetics and sedative effects of intranasal dexmedetomidine in ambulatory pediatric patients. <i>Anesth Analg</i> . 2020;130(4):949-957.	Quasi-experimental	50 pediatric patients who underwent MRI, Finland	Intranasal dexmedetomidine	n/a	Sedation score, pharmacokinetic variables	Dexmedetomidine is relatively rapidly absorbed after intranasal administration and provides clinically meaningful but short lasting sedation in pediatric patients.	IIB
157	Mekitarian Filho E, Robinson F, de Carvalho WB, Gilio AE, Mason KP. Intranasal dexmedetomidine for sedation for pediatric computed tomography imaging. <i>J Pediatr</i> . 2015;166(5):1313-1315.	Nonexperimental	60 pediatric patients who underwent CT, United States	n/a	Intranasal dexmedetomidine via mucosal atomizer device	Depth of sedation, adverse events, time to sedation, discharge time	Atomized intranasal dexmedetomidine can produce successful CT imaging conditions within 13 minutes of administration, with discharge home within 90 minutes of the initial dose.	IIIC
158	Fenster DB, Dayan PS, Babineau J, Aponte-Patel L, Tsze DS. Randomized trial of intranasal fentanyl versus intravenous morphine for abscess incision and drainage. <i>Pediatr Emerg Care</i> . 2018;34(9):607-612.	RCT	20 pediatric patients who underwent abscess I&D in ED, United States	Intranasal fentanyl (n = 10)	IV morphine (n = 10)	Observational Scale of Behavioral Distress-Revised, self-reported pain, treatment failure, patient and parental satisfaction	Intranasal fentanyl was noninferior and potentially superior to IV morphine for reducing procedural pain and distress.	IB

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159	Adelgais KM, Brent A, Wathen J, et al. Intranasal fentanyl and quality of pediatric acute care. <i>J Emerg Med</i> . 2017;53(5):607-615.	Quasi-experimental	1,702 pediatric patients treated in ED and urgent care, United States	Mucosal Atomizer Device Nasal for Intranasal Fentanyl (n = 233)	IV opioid (n = 1,469)	Time from medication order to administration, time from dose to discharge, time to analgesia, ED length of stay, pain score, frequency of repeat dosing, frequency of reversal agent administration, documented oxygen desaturation of <90%	Intranasal Fentanyl improved timeliness and had equivalent effectiveness and safety when compared to IV opioid administration in the pediatric ED setting.	IIB
160	Chen M, Hill GM, Patrianakos TD, Ku ES, Chen ML. Oral diazepam versus intravenous midazolam for conscious sedation during cataract surgery performed using topical anesthesia. <i>J Cataract Refract Surg</i> . 2015;41(2):415-421.	RCT	156 patients older than 65 years who underwent cataract surgery, United States	Oral diazepam (n = 73)	IV midazolam (n = 83)	Intraoperative pain, anxiety, undesired movement, poor cooperation	Patients who received oral diazepam had less frequent undesired movement during surgery, although there was not a significant difference in cooperation, pain, or anxiety.	IB
161	Rignell L, Mikati M, Wertsén M, Hägglin C. Sedation with orally administered midazolam in elderly dental patients with major neurocognitive disorder. <i>Gerodontology</i> . 2017;34(3):299-305.	Nonexperimental	61 patients (age 62 to 93 years) who underwent dental procedures with oral midazolam, Sweden	n/a	n/a	Dose, degree of acceptance of dental treatment, number of possible interacting drugs	Sedation with oral midazolam was safe and effective in dental treatment of persons with major neurocognitive disorders (eg, memory problems, loss of intellectual abilities) who had a history of difficulty tolerating treatment.	IIIB
162	Ryu DS, Lee DW, Choi SC, Oh IH. Sedation protocol using dexmedetomidine for third molar extraction. <i>J Oral Maxillofac Surg</i> . 2016;74(5):926.e1-926.e7.	RCT	240 patients who underwent third molar extraction, South Korea	Intranasal dexmedetomidine (n = 80), IV dexmedetomidine (n = 80)	Local anesthesia only (n = 80)	Amount of agent used, visual analog scale (VAS) pain score, adverse events, VAS score of patient satisfaction, bispectral index	Although sedation was slightly deeper with the IV route, both IV and intranasal routes of dexmedetomidine administration were effective and safe for sedation in outpatient surgical procedures.	IB

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163	Rozario L, Sloper D, Sheridan MJ. Supplemental oxygen during moderate sedation and the occurrence of clinically significant desaturation during endoscopic procedures. <i>Gastroenterol Nurs</i> . 2008;31(4):281-285.	RCT	389 patients who underwent endoscopic procedures, United States	Experimental group (n = 194) received low-flow oxygen at 2 L/minute before the administration of moderate sedation	Control group (n = 195) did not routinely receive oxygen unless an episode of desaturation (ie, oxygen saturation \leq 95%) occurred	Desaturation episodes	In the control group, 138 (70.8%) of the patients experienced a desaturation event compared with 24 (12.4%) in the experimental group. The experimental group was 98% less likely than the control group to experience any episode of desaturation. The researchers concluded that their results supported the routine use of supplemental oxygen at 2 L/minute to prevent desaturation during endoscopy procedures with moderate sedation.	IB
164	Hung A, Marshall J, Barnett S, Falchuk ZM, Sawhney M, Leffler DA. Risk factors and outcomes of reversal agent use in moderate sedation during endoscopy and colonoscopy. <i>J Clin Gastroenterol</i> . 2016;50(3):e25-e29.	Nonexperimental	45 cases of reversal agents (ie, naloxone, flumazenil) being used during a 6-year period that included 42,119 EGD procedures and 88,016 colonoscopies performed at a large teaching hospital, United States	n/a	n/a	Prevalence of reversal agent use, demographics, risk factors for use	Events triggering reversal use were oxygen desaturation, respiration changes, hypotension, and bradycardia. The patients who had a higher amount of reversal use were older, were female, had a higher ASA physical status classification, and had a higher Mallampati score.	IIIB
165	Yonel Z, Asuni A, Taneja P. Defining over-sedation: literature review and national survey of dental hospitals within the United Kingdom. <i>SAAD Dig</i> . 2016;32:28-33.	Literature Review	n/a	n/a	n/a	n/a	A clear definition of over sedation is needed to provide clarity when flumazenil is to be administered.	VB
166	Folland L, Brown E, Boyle C. A review of the use of flumazenil for the reversal of midazolam conscious sedation in dentistry. <i>SAAD Dig</i> . 2017;33:13-17.	Literature Review	n/a	n/a	n/a	n/a	Flumazenil is a safe drug to use for the reversal of midazolam induced conscious sedation although the evidence surrounding its use is limited.	VB
167	Standards for Perioperative Nursing in Australia. Vol 1-2. 16th ed. Adelaide, SA: <i>Australian College of Operating Room Nurses</i> ; 2020.	Guideline	n/a	n/a	n/a	n/a	Recommendations for discharge of patients from the PACU.	IVB
168	<i>Discharge After Sedation or Anesthesia on the Day of the Procedure: Patient Transportation With or Without a Responsible Adult. Position Statement and Policy Considerations.</i> American Association of Nurse Anesthetists. https://www.aana.com/docs/default-source/practice-aana-com-web-documents-(all)/professional-practice-manual/discharge-after-sedation-or-anesthesia-on-the-day-of-the-procedure.pdf?sfvrsn=ed4a5bb1_2 . Published 2018. Accessed June 17, 2021.	Position Statement	n/a	n/a	n/a	n/a	Policy considerations for outpatient or same-day surgical settings regarding discharge planning specific to patient transportation.	IVB

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169	42 CFR 416: Ambulatory surgical services. Electronic Code of Federal Regulations. https://www.ecfr.gov/cgi-bin/text-idx?node=pt42.3.416&rgn=div5 . Accessed June 17, 2021.	Regulatory	n/a	n/a	n/a	n/a	CMS Conditions for Coverage	n/a
170	42 CFR 482: Conditions of participation for hospitals. Electronic Code of Federal Regulations. https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=2bc06578c2ca4ab54fadf46e1fc4dfda&ty=HTML&h=L&mc=true&n=pt42.5.482&r=PART . Accessed June 17, 2021.	Regulatory	n/a	n/a	n/a	n/a	CMS Conditions of Participation	n/a
171	Veselis RA, Pryor KO, Reinsel RA, Li Y, Mehta M, Johnson R Jr. Propofol and midazolam inhibit conscious memory processes very soon after encoding: an event-related potential study of familiarity and recollection in volunteers. <i>Anesthesiology</i> . 2009;110(2):295-312.	RCT	55 healthy volunteers, United States	Five experimental groups that received sequential doses of a placebo (n = 11), thiopental (n = 11), propofol (n = 10), midazolam (n = 12), or dexmedetomidine (n = 11)	n/a	Continual recognition task, delayed recognition task, EEG testing	The medications increased reaction times and impaired memory on the continual recognition task equally, except for midazolam which had a greater effect. Via different mechanisms, both propofol and midazolam impair familiarity and recollection processes in recognition from long-term memory. Propofol and midazolam impaired recognition of event-related potentials from long-term memory but not working memory.	IA
172	Watkins TJ, Bonds RL, Hodges K, Goettle BB, Dobson DA, Maye JP. Evaluation of postprocedure cognitive function using 3 distinct standard sedation regimens for endoscopic procedures. <i>AANA J</i> . 2014;82(2):133-139.	RCT	96 patients who underwent colonoscopy, United States	Propofol plus fentanyl (n = 30); midazolam plus fentanyl (n = 31)	Propofol alone (n = 31)	Postprocedure cognitive function, complications requiring provider interventions	Propofol alone resulted in the least impact on postoperative cognitive dysfunction at 24 & 48 hours post-op and limits the number of provider interventions.	IB
173	Padmanabhan U, Leslie K, Eer AS, Maruff P, Silbert BS. Early cognitive impairment after sedation for colonoscopy: the effect of adding midazolam and/or fentanyl to propofol. <i>Anesth Analg</i> . 2009;109(5):1448-1455.	RCT	200 patients who underwent colonoscopy, Australia	Propofol plus midazolam (n = 57), propofol plus fentanyl (n = 42)	Propofol alone (n = 96) [5 protocol violations dropped out]	Cognitive function at discharge, operating conditions, procedure time, recovery time, recall, patient satisfaction	There was significant cognitive impairment at discharge, but the addition of midazolam and or fentanyl did not result in more impairment. The use of the adjuvants improved the ease of colonoscopy without increasing the complication rate or prolonging early recovery time.	IC

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174	Dumonceau JM, Riphaut A, Beilenhoff U, et al. European curriculum for sedation training in gastrointestinal endoscopy: position statement of the European Society of Gastrointestinal Endoscopy (ESGE) and European Society of Gastroenterology and Endoscopy Nurses and Associates (ESGENA). <i>Endoscopy</i> . 2013;45(6):496-504.	Position Statement	n/a	n/a	n/a	n/a	The Curriculum is based on national guidelines and curricula for training in sedation and management of its complications and apply to all sedation practices for gastrointestinal endoscopy.	IVB
175	Tran TT, Beutler SS, Urman RD. Moderate and deep sedation training and pharmacology for nonanesthesiologists: recommendations for effective practice. <i>Curr Opin Anaesthesiol</i> . 2019;32(4):457-463.	Literature Review	n/a	n/a	n/a	n/a	Moderate sedation providers should be aware of hypotension, apnea, hypoventilation, and hypoxia that can develop and they should be able to manage the patient under these circumstances.	VA
176	Da B, Buxbaum J. Training and competency in sedation practice in gastrointestinal endoscopy. <i>Gastrointest Endosc Clin N Am</i> . 2016;26(3):443-462.	Literature Review	n/a	n/a	n/a	n/a	Instruction in endoscopic sedation includes theoretical and practice-based components. Critical skills needed to safely perform sedation include preprocedural assessment, informed consent, sedation administration, intraprocedure and postprocedure monitoring, adverse event management, and safe discharge.	VB
177	Kost M. Nursing considerations for procedural sedation and analgesia: part 1. <i>Am Nurse Today</i> . 2019;14(5):6-11.	Expert Opinion	n/a	n/a	n/a	n/a	Preparing for procedural sedation requires a thorough patient assessment, awareness of potential red flags, and a firm grasp of pharmacologic and reversal agents.	VA
178	Jensen JT, Savran MM, Møller AM, Vilmann P, Hornslet P, Konge L. Development and validation of a theoretical test in non-anesthesiologist-administered propofol sedation for gastrointestinal endoscopy. <i>Scand J Gastroenterol</i> . 2016;51(7):872-879.	Nonexperimental	91 participants representing novices, intermediates and experienced, Denmark	n/a	Training course on nurse-administered propofol sedation	Multiple choice questionnaire containing 86 questions	Data supported the validity of the multiple choice questionnaire. The NAPS-specific course with pre-course testing adds theoretical knowledge to already well-prepared participants.	IIIB
179	Brady M, Kinn S, Stuart P. Preoperative fasting for adults to prevent perioperative complications. <i>Cochrane Database Syst Rev</i> . 2003;(4):CD004423.	Systematic Review w/ Meta-Analysis	n/a	n/a	n/a	n/a	There was no evidence to suggest that decreasing the amount of time that fluids were allowed before surgery increased the risk of aspiration, regurgitation, or morbidity compared with the traditional fasting policy of nothing by mouth after midnight. Drinking water before surgery resulted in significantly lower gastric volumes. The fasting policy should be based on an appraisal of the evidence and a patient risk assessment (eg, history of gastrointestinal disease, autonomic neuropathy, pregnancy, older age).	IA
180	Green SM, Leroy PL, Roback MG, et al. An international multidisciplinary consensus statement on fasting before procedural sedation in adults and children. <i>Anaesthesia</i> . 2020;75(3):374-385.	Consensus	n/a	n/a	n/a	n/a	Algorithm for fasting that allows each patient's aspiration risk to be stratified in the pre-sedation assessment using evidence-based factors related to patient characteristics, comorbidities, the nature of the procedure, and the nature of the anticipated sedation technique.	IVA

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181	Brady M, Kinn S, Ness V, O'Rourke K, Randhawa N, Stuart P. Preoperative fasting for preventing perioperative complications in children. <i>Cochrane Database Syst Rev.</i> 2009;(4):CD005285.	Systematic Review w/ Meta-Analysis	n/a	n/a	n/a	n/a	There was no evidence to suggest that children at normal risk of aspiration who are denied oral fluids for up to 6 hours before surgery have any benefit in gastric volume or pH compared to children who are allowed unlimited fluids up to 2 hours before surgery.	IA
182	Shaukat A, Malhotra A, Greer N, MacDonald R, Wels J, Wilt TJ. Systematic review: outcomes by duration of NPO status prior to colonoscopy. <i>Gastroenterol Res Pract.</i> 2017;2017:3914942.	Systematic Review w/ Meta-Analysis	n/a	n/a	n/a	n/a	The incidence of aspiration requiring hospitalization during colonoscopy with moderate or deep sedation was very low. No study found that shorter fasting times were associated with an increased aspiration risk.	IIIA
183	Mason KP, Green SM, Piscevoli Q; International Sedation Task Force. Adverse event reporting tool to standardize the reporting and tracking of adverse events during procedural sedation: a consensus document from the World SIVA International Sedation Task Force. <i>Br J Anaesth.</i> 2012;108(1):13-20.	Consensus	n/a	n/a	n/a	n/a	Developed a tool to standardize sedation adverse event reporting and tracking. The tool has a five-step process requiring the identification of a sedation event and description of the adverse event, the intervention performed, the outcome, and the severity of the event.	IVB
184	Lee DH, Woo JH, Hong SE. Judicial precedent-based clinical practice guidelines of propofol in sedative esthetic surgery. <i>Aesthetic Plast Surg.</i> 2018;42(3):891-898.	Case Report	n/a	n/a	n/a	n/a	13 malpractice claims of propofol sedation in esthetic surgery in South Korea. The number of claims owing to propofol sedation after esthetic surgery is increasing. Close monitoring during the operation, immediate reaction to an event and thorough medical records were main factors that influenced the judgement.	VB
185	Jani SR, Shapiro FE, Gabriel RA, et al. A comparison between office and other ambulatory practices: analysis from the National Anesthesia Clinical Outcomes Registry. <i>J Healthc Risk Manag.</i> 2016;35(4):38-47.	Nonexperimental	179,618 office-based anesthesia cases and 4,627,379 ambulatory cases, National Anesthesia Clinical Outcomes Registry, United States	n/a	n/a	Patient and procedural characteristics	Although office and ambulatory settings are often grouped together, there are statistically significant differences in patient demographics, procedure types, and reported adverse events. Among these reports, inadequate postoperative pain control and nausea/vomiting are the most common issue. More serious events such as death, cardiac arrest, and vision loss occurred but were rare.	IIIB
186	Ranum D, Beverly A, Shapiro FE, Urman RD. Leading causes of anesthesia-related liability claims in ambulatory surgery centers. <i>J Patient Saf.</i> 2017. doi: 10.1097/PTS.0000000000000431.	Nonexperimental	944 anesthesia closed claims and lawsuits, The Doctors Company, United States	n/a	n/a	Injury severity category, nature of injury, nature of allegation, contributing factors identified, contributing comorbidities, claim value	Analysis of ASC and hospital OR claims demonstrates significant differences and several common sources of liability. These include improving strategies for thorough screening, preoperative assessment and risk stratifying of patients, incorporating routine dental and airway assessment and documentation, diagnosing and treating perioperative pain adequately, and improving the efficacy of communication between patients and care providers.	IIIB

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187	Ward DS, Williams MR, Berkenbosch JW, et al. Evaluating patient-centered outcomes in clinical trials of procedural sedation, part 2 safety: Sedation Consortium on Endpoints and Procedures for Treatment, Education, and Research Recommendations. <i>Anesth Analg</i> . 2018;127(5):1146-1154.	Consensus	n/a	n/a	n/a	n/a	Recommendations for core and supplemental measures to improve the integration of safety data across studies.	IVB
188	Nguyen TT, Baker B, Ferguson JD. Allergic reaction to ketamine as monotherapy for procedural sedation. <i>J Emerg Med</i> . 2017;52(4):562-564.	Case Report	n/a	n/a	n/a	n/a	16 year old male who experienced an allergic reaction associated with the administration of intravenous ketamine for procedural sedation.	VB
189	Stone AB, Jones MR, Rao N, Urman RD. A dashboard for monitoring opioid-related adverse drug events following surgery using a national administrative database. <i>Am J Med Qual</i> . 2019;34(1):45-52.	Expert Opinion	n/a	n/a	n/a	n/a	Opioid-related adverse drug events (ORADE) include a range of complications, from respiratory arrest to ileus and urinary retention. Researchers developed a database to facilitate ORADE quality improvement initiatives in US hospitals.	VA
190	Jones MR, Karamnov S, Urman RD. Characteristics of reported adverse events during moderate procedural sedation: an update. <i>Jt Comm J Qual Patient Saf</i> . 2018;44(11):651-662.	Nonexperimental	83 moderate sedation procedures cases in which safety incidents were reported, United States	n/a	n/a	Type of adverse event, severity of harm	The most common adverse events were oversedation/apnea, hypoxemia, and aspiration.	IIIB
191	Stone AB, Brovman EY, Greenberg P, Urman RD. A medicolegal analysis of malpractice claims involving anesthesiologists in the gastrointestinal endoscopy suite (2007-2016). <i>J Clin Anesth</i> . 2018;48:15-20.	Nonexperimental	58 closed malpractice claims involving anesthesiologists in the endoscopy suite, United States	n/a	n/a	Factors for each case, payment, severity score	Oversedation was a contributing factor to most adverse events.	IIIB
192	Lemay A, Shyn PB, Foley R, Beutler SS, Silverman SG, Urman RD. A procedural sedation quality improvement audit form tool for interventional radiology. <i>J Med Pract Manage</i> . 2015;30(6 Spec No):44-47.	Organizational Experience	Large teaching hospital, United States	n/a	n/a	n/a	Developed an audit tool to evaluate safety, effectiveness, and communication during the use of procedural sedation for interventional radiology procedures.	VA