

## ASMBS guidelines/statements

# Multisociety clinical practice guidance for the safe use of glucagon-like peptide-1 receptor agonists in the perioperative period

Tammy L. Kindel, M.D., Ph.D.<sup>a,\*</sup>, Andrew Y. Wang, M.D.<sup>b</sup>, Anupama Wadhwa, M.D.<sup>c,d</sup>, Allison R. Schulman, M.D., M.P.H.<sup>e</sup>, Reem Z. Sharaiha, M.D., M.Sc.<sup>f</sup>, Matthew Kroh, M.D.<sup>g</sup>, Omar M. Ghanem, M.D.<sup>h</sup>, Shauna Levy, M.D., M.S.<sup>i</sup>, Girish P. Joshi, M.D.<sup>c</sup>, Teresa L. LaMasters, M.D.<sup>j</sup>, representing the American Gastroenterological Association, American Society for Metabolic and Bariatric Surgery, American Society of Anesthesiologists, International Society of Perioperative Care of Patients with Obesity, and the Society of American Gastrointestinal and Endoscopic Surgeons

<sup>a</sup>Department of Surgery, Medical College of Wisconsin, Milwaukee, Wisconsin

<sup>b</sup>Division of Gastroenterology and Hepatology, University of Virginia, Charlottesville, Virginia

<sup>c</sup>Department of Anesthesiology and Pain Management, University of Texas, Southwestern Medical Center, Dallas Texas

<sup>d</sup>Outcomes Research Consortium, University of Texas, Houston, Texas

<sup>e</sup>Division of Gastroenterology and Hepatology, University of Michigan, Ann Arbor, Michigan

<sup>f</sup>Department of Medicine, Weill Cornell Medical College, New York, New York

<sup>g</sup>Digestive Disease Institute, Cleveland Clinic, Cleveland, Ohio

<sup>h</sup>Department of Surgery, Mayo Clinic, Rochester, Minnesota

<sup>i</sup>Department of Surgery, Tulane University, New Orleans, Louisiana

<sup>j</sup>UnityPoint Clinic, University of Iowa, West Des Moines, Iowa

Received 30 August 2024; accepted 31 August 2024

**Keywords:** Glucagon-like peptide 1 receptor agonist; Gastroparesis; Procedure; Aspiration; Guidelines

## Scope of problem and purpose

Glucagon-like peptide-1 receptor agonists (GLP-1RAs) have revolutionized the care of patients with metabolic disease due in part to the agonists' unique combination of effects, including decreasing hyperglycemia and enhancement of satiety [1,2]. GLP-1, a naturally secreted polypeptide, acts

on the GLP-1R in multiple organs, including the pancreas, brain, heart, kidney, and stomach [3]. In the gastrointestinal tract, GLP-1 signals are part of the "ileal brake," increasing gastric emptying time.

An increasing safety concern has developed amongst providers regarding the perioperative use of GLP-1RA due to delayed gastric emptying and subsequent residual gastric contents on the day of the procedure despite traditional fasting [4–6]. There have been reports of pulmonary aspiration of gastric contents in patients on GLP-1RAs undergoing procedural sedation and/or general anesthesia [7–9]. Further, GLP-1RAs induce common side effects of nausea, vomiting, abdominal pain, and constipation, which may complicate the diagnosis and treatment of preoperative and postoperative disease states that share these symptoms [10].

Despite limited data to construct evidence-based guidelines, multiple clinical organizations have recognized the need to provide practice guidance regarding the use of

This paper was jointly developed by Surgery for Obesity and Related Disorders (SOARD), Clinical Gastroenterology (CGH) and Hepatology, Surgical Endoscopy and jointly published by Elsevier Inc and Springer Science+Business Media, LLC, part of Springer Nature. The articles are identical except for minor stylistic and spelling differences in keeping with each journal's style. Either citation can be used when citing this article.

\*Correspondence: Tammy L. Kindel, M.D., Ph.D., Department of Surgery, Medical College of Wisconsin, 8700 Watertown Plank Rd, Milwaukee, WI 53226.

E-mail address: [tkindel@mcw.edu](mailto:tkindel@mcw.edu) (T.L. Kindel).

<https://doi.org/10.1016/j.soard.2024.08.033>

1550-7289/© 2024 The Author(s). Published by Elsevier Inc on behalf of American Society for Metabolic and Bariatric Surgery (ASMBS), and American Gastroenterological Association (AGA) and by Springer Science+Business Media, LLC, part of Springer Nature on behalf of Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

GLP-1RAs in the perioperative period [4,11,12]. There have been inconsistencies in these clinical care documents, leading to uncertainty with providers on how to provide safe, effective, and disease-equitable surgical and procedural care to patients taking GLP-1RAs. Therefore, the purpose of this clinical practice guide is to offer unified, multisociety guidance for safely managing patients needing GLP-1RA therapy regardless of indication, which currently includes type 2 diabetes, overweight and obesity, and heart failure, during the periprocedural period.

## Recommendations

### Recommendation 1

Use of GLP-1RAs in the perioperative period should be based on shared decision-making of the patient with procedural, anesthesia, and prescribing care teams balancing the metabolic need for the GLP-1RA with individual patient risk. This can be achieved by developing multidisciplinary protocols/procedures appropriate for individual practices.

- a) Care teams should consider the following variables as elevating the risk of delayed gastric emptying and aspiration with the periprocedural use of GLP-1RA:
  1. *Escalation phase*: The escalation phase, versus the maintenance phase, is associated with a higher risk of delayed gastric emptying with GLP-1RA usage [10–13].
  2. *Higher dose*: The higher the dose of GLP-1RA, the more likely the risk of gastrointestinal side effects [10–13].
  3. *Weekly dosing*: Gastrointestinal side effects are more common with weekly compared to daily formulation compounds [14].
  4. *Presence of gastrointestinal symptoms*: Symptoms suggestive of delayed gastric emptying and intestinal transit times may include nausea, vomiting, abdominal pain, dyspepsia, and constipation [5].
  5. *Medical conditions beyond GLP-1RA usage which may also delay gastric emptying*: Patients on GLP-1RA should be evaluated for other medical conditions which may exacerbate gastrointestinal symptoms and delay gastric emptying, such as but not limited to bowel dysmotility, gastroparesis, and Parkinson's disease.

The assessment for these risk factors should occur with enough advance time prior to surgery to allow adjustments in preoperative care if indicated, including diet modification and evaluation of the feasibility of medication bridging if GLP-1RA discontinuation is indicated.

- b) GLP-1RA therapy may be continued preoperatively in patients without elevated risk of delayed gastric emptying and aspiration based on Recommendation

1a. When an elevated risk of delayed gastric emptying and aspiration exist, withholding of GLP-1RAs should be balanced with the surgical and medical risk of inducing the potential for a hazardous, metabolic disease state, like hyperglycemia. Further, bridging therapy off a GLP-1RA may be resource-intensive, cost or insurance prohibitive, and risk other adverse side effects like hypoglycemia. Finally, withholding GLP-1RA perioperatively only for patients with the diseases of overweight and obesity, without an indication as described in Recommendation 1a, could constitute overweight and obesity bias, which should be avoided.

- c) If the decision to hold GLP-1RAs is indicated given an unacceptable safety profile following shared decision-making in the preoperative period, the duration to hold therapy is unknown [7]. At this time, it is suggested to follow the original guidance of the American Society of Anesthesiologists, holding the day of surgery for daily formulations, and a week prior to surgery for weekly formulations [4]. All patients should still be assessed on the day of procedure for symptoms suggestive of delayed gastric emptying.

### Recommendation 2

The safe use of GLP-1RAs in the perioperative period should include efforts to minimize the aspiration risk of delayed gastric emptying. This can be achieved by preoperative diet modification and/or altering anesthesia plan to consider rapid sequence induction of general anesthesia for tracheal intubation.

- a) Preoperative diet modification (preoperative liquid diet for at least 24 hours, as performed in patients undergoing colonoscopy and bariatric surgery) can be utilized in patients when there is concern for delayed gastric emptying based on clinical symptom review as described in Recommendation 1a [5,11,15].
- b) When clinical concern for retained gastric contents exists on the day of the procedure, point-of-care gastric ultrasound could be used to assess aspiration risk. This technology may be clinically limited based on institutional resources, interuser variability, and credentialing requirements [4,16].
- c) When clinical concern for retained gastric contents exists or is confirmed on the day of the procedure, providers should engage patients in a shared decision-making model and consider the benefits and risks of rapid sequence induction of general anesthesia for tracheal intubation to minimize aspiration risk versus procedure cancellation [4,11].

Safe continuation of surgery and gastrointestinal endoscopy, and prevention of procedure cancellation, for patients on GLP-1RAs can be prioritized following the recommendations above, as would occur for other patient populations with gastroparesis.

## Conclusion

While there has been an exponential increase in the clinical use of GLP-1RAs for various metabolic disease states in the past several years, little evidence exists to guide the best approach to managing these therapeutics perioperatively. This document may need modification with future generations of antiobesity medications, including dual and triple agonists, and as additional evidence on the periprocedural management of these therapeutics is developed. However, at this time based on pharmacology and clinical experience, the following recommendations may be applied for current medications containing a GLP-1RA. For this reason, this multisociety clinical practice document should be considered guidance and not an evidence-based guideline, focusing on shared decision-making and balancing safety processes with therapeutic metabolic need for the safe continuation of surgical and procedural care in patients taking GLP-1RAs.

## Acknowledgments

This document was approved by the American Gastroenterological Association Institute Governing Board in May 2024, the American Society for Metabolic and Bariatric Surgery Board of Directors in May 2024, the International Society of Perioperative Care of Patients with Obesity Board of Directors in April 2024, and the Society of American Gastrointestinal and Endoscopic Surgeons Board of Directors in June 2024. The American Society of Anesthesiologists Administrative Council affirmed the value of this document in May 2024.

## Disclosures

*Tammy Kindel and Anupama Wadhwa have no disclosures. Girish Joshi has received honoraria for consultation from Merck Sharpe and Dohme Inc. and Vertex Pharmaceuticals. Teresa LaMasters has received honoraria for consulting and speaking from WL Gore, Intuitive Surgical, Novo Nordisk, and Ethicon Endosurgical. Shauna Levy is a consultant for Novo Nordisk. Omar Ghanem is a consultant for Medtronic and Olympus. Allison Schulman is a consultant for Apollo Endosurgery, Boston Scientific, Olympus, MicroTech, and Fractyl. Andrew Wang discloses owning publicly traded stock in GE HealthCare Technologies and Pfizer. Reem Sharaiha is a consultant for Boston Scientific, Intuitive Surgical, and Olympus. Matthew Kroh is a*

*consultant for Intuitive Surgical, Levita, and Momentis, and on the advisory board for Endolumix, Kintsugi, Medtronic and FastPathway.*

## Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

## References

- [1] Blundell J, Finlayson G, Axelsen M, et al. Effects of once-weekly semaglutide on appetite, energy intake, control of eating, food preference and body weight in subjects with obesity. *Diabetes Obes Metab* 2017;19:1242–51.
- [2] Nauck MA, Wollschläger D, Werner J, et al. Effects of subcutaneous glucagon-like peptide 1 (GLP-1 [7-36 amide]) in patients with NIDDM. *Diabetologia* 1996;39:1546–53.
- [3] Deacon CF, Nauck MA, Toft-Nielsen M, Pridal L, Willms B, Holst JJ. Both subcutaneously and intravenously administered glucagon-like peptide I are rapidly degraded from the NH<sub>2</sub>-terminus in type II diabetic patients and healthy subjects. *Diabetes* 1995;44:1126–31.
- [4] Joshi GP, Abdelmalak BB, Weigel WA, et al. American Society of Anesthesiologists consensus-based guidance on preoperative management of patients (adults and children) on glucagon-like peptide-1 (GLP-1) receptor agonists. Available from: <https://www.asahq.org/aboutasa/newsroom/news-releases/2023/06/american-society-of-anesthesiologists-consensus-based-guidance-on-preoperative-management-of>. Accessed February 10, 2024.
- [5] Silveira SQ, da Silva LM, de Campos Vieira Abib A, et al. Relationship between perioperative semaglutide use and residual gastric content: a retrospective analysis of patients undergoing elective upper endoscopy. *J Clin Anesth* 2023;87:111091.
- [6] Sherwin M, Hamburger J, Katz D, et al. Influence of semaglutide use on the presence of residual gastric solids on gastric ultrasound: a prospective observational study in volunteers without obesity recently started on semaglutide. *Can J Anaesth* 2023;70:1300–6.
- [7] Joshi GP. Anesthetic considerations in adult patients on glucagon-like peptide-1 receptor agonists: gastrointestinal focus. *Anesth Analg* 2024;138(1):216–20.
- [8] Gulak MA, Murphy P. Regurgitation under anesthesia in a fasted patient prescribed semaglutide for weight loss: a case report. *Can J Anesth* 2023;70:1397–400.
- [9] Klein SR, Hobai IA. Semaglutide, delayed gastric emptying, and intraoperative pulmonary aspiration: a case report. *Can J Anesth* 2023;70:1394–6.
- [10] Sorli C, Harashima SI, Tsoukas GM, et al. Efficacy and safety of once-weekly semaglutide monotherapy versus placebo in patients with type 2 diabetes (SUSTAIN 1): a double-blind, randomised, placebo-controlled, parallel-group, multinational, multicentre phase 3a trial. *Lancet Diabetes Endocrinol* 2017;5(4):251–60.
- [11] Hashash J, Thompson CC, Wang AY. AGA rapid clinical practice update on the management of patients taking GLP-1 receptor agonists prior to endoscopy: communication. *Clin Gastroenterol Hepatol* 2023;22(4):705–7.
- [12] AASLD/ACG/AGA/ASGE/NASPGHAN Multisociety Statement. No data to support stopping GLP-1 agonists prior to elective endoscopy. Available from: <https://gastro.org/news/gi-multi-society-statement-regarding-glp-1-agonists-and-endoscopy>. Accessed February 10, 2024.
- [13] Camilleri M, Carlson P, Dilmaghani S. Prevalence and variations in gastric emptying delay in response to GLP-1 receptor agonist liraglutide. *Obesity* 2024;32(2):232–3.

- [14] Ahmann AJ, Capehorn M, Charpentier G, et al. Efficacy and safety of once-weekly semaglutide versus exenatide ER in subjects with type 2 diabetes (SUSTAIN 3): a 56-week, open-label, randomized clinical trial. *Diabetes Care* 2018;41:258–66.
- [15] Hiramoto B, McCarty T, Lodhia N, et al. Quantified metrics of gastric emptying delay by glucagon-like peptide-1 agonists: a systematic review and meta-analysis with insights for peri-procedural management. *Am J Gastroenterol* 2024;119(6):1126–40.
- [16] Sen S, Potnuru PP, Hernandez N, et al. Glucagon-like peptide-1 receptor agonist use and residual gastric content before anesthesia. *JAMA Surg* 2024;159(6):660–7.