

# The Effect of GLP-1 Receptor Agonist Medications on Fasting Gastric Volume

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## INTRODUCTION

- Glucagon-like peptide-1 (GLP-1) agonists have increased in popularity after the FDA approved the long-acting compounds for weight loss in 2021<sup>1</sup>
- GLP-1 agonists mimic an endogenous incretin hormone resulting in increased insulin secretion, decreased glucagon secretion, delayed gastric emptying, and decreased peristalsis (figure 1)<sup>1</sup>
- Concerns for aspiration leading to pneumonia, pneumonitis, and airway obstruction have increased in patients taking GLP-1 agonists<sup>2</sup>

## PICOT

- In adult patients, 18 years and older, what is the effect of GLP-1 agonists (semaglutide, liraglutide) compared to no GLP-1 agonists on gastric content volume (measured in mL) at  $\geq 8$  hours fasting?

## METHODS

- PubMed and MEDLINE were systematically searched from date range 2000-2024
- Keywords: *GLP-1, glucagon like peptide 1, gastric volume, fasting*
- Limitations: English, humans, adults 18+ years
- Search yielded 60 results. Best evidence articles meeting inclusion criteria were 2 randomized controlled trials, 1 observational study, 1 prospective study, and 1 case report
- IRB/IACUC approval does not apply to this evidence-based project.

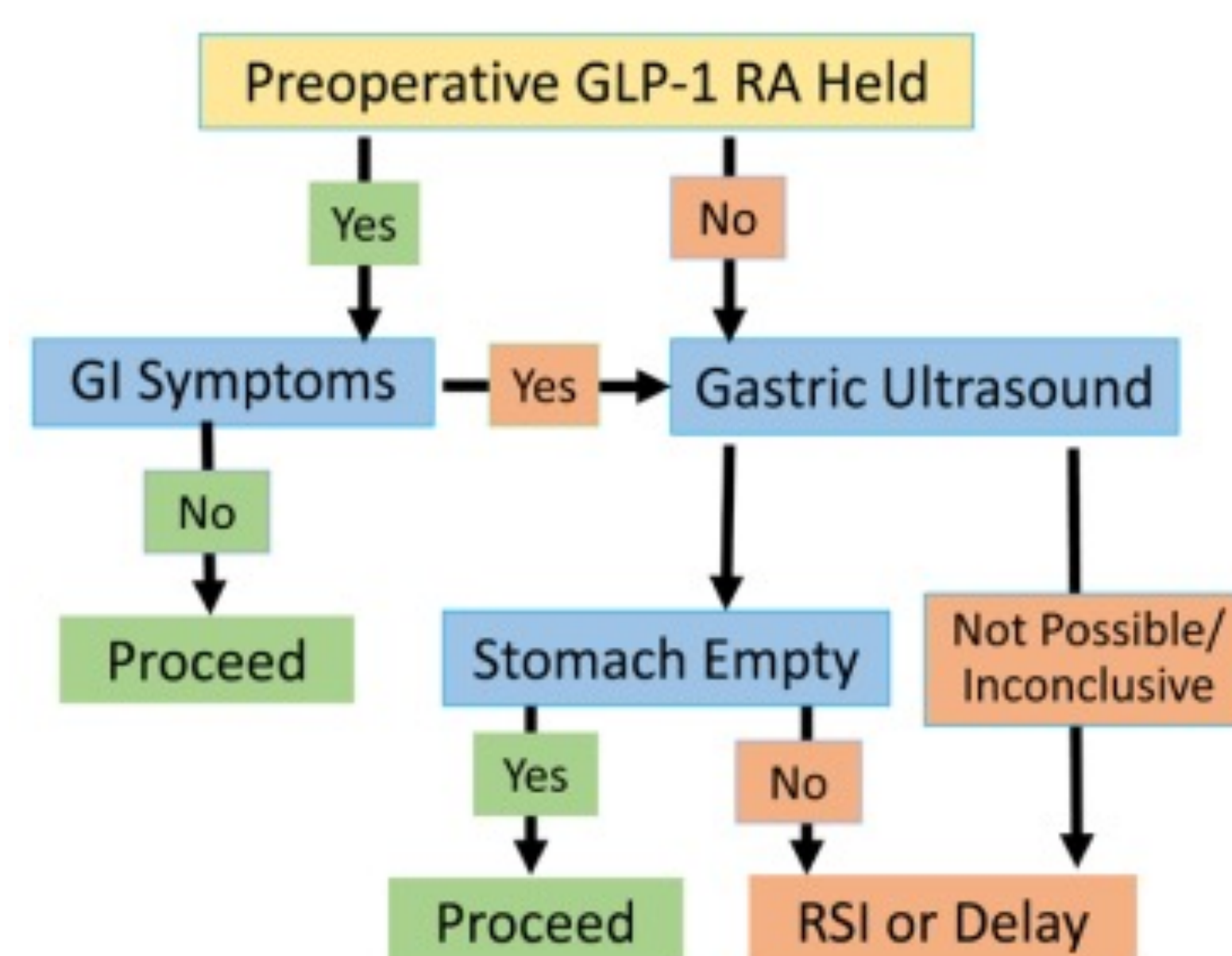


Figure 2. Perioperative Fasting Guidelines For Patients Taking a GLP-1 Agonist<sup>8</sup>

# GLP-1 receptor agonists significantly increase fasting gastric volumes

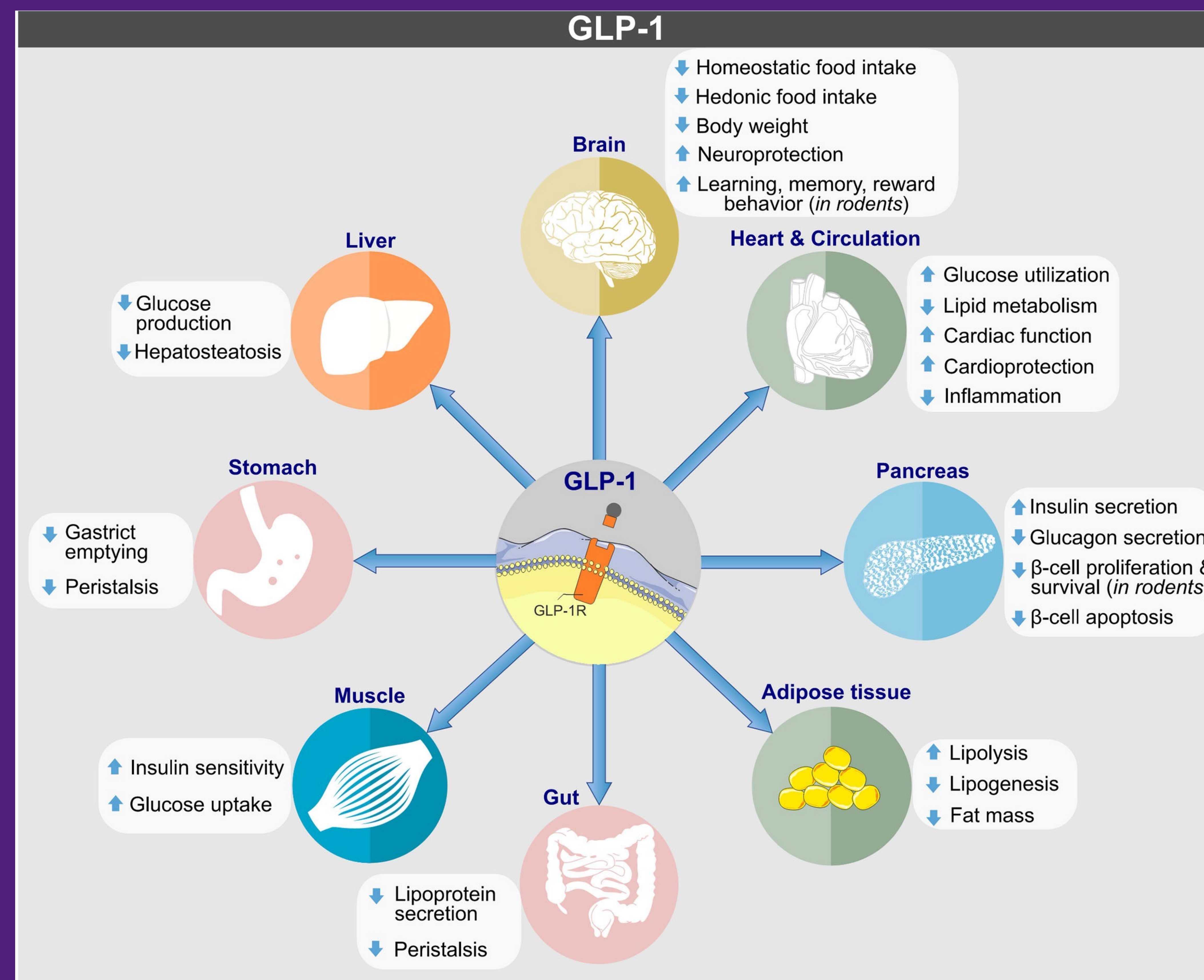


Figure 1. Physiologic Actions of GLP-1 on Different Organs and Tissues<sup>1</sup>



## REVIEW of LITERATURE/ CRITICAL APPRAISAL

Author, Study, Design	Population, Fasting Time	Intervention, Dose	Key Findings
Silveira et al, 2023 Retrospective Observational Study	N = 404, 9.3 hours liquids, 14.5 hours solids	Semaglutide unknown dose	Semaglutide increased fasting gastric volumes. ( $P < .001$ ) > 0.8 mL/kg fluid content
Maselli et al, 2022 Randomized Controlled Trial	N = 136, Unknown	Liraglutide 3 mg	Liraglutide increased fasting gastric volumes. ( $P = .01$ ). 191.5 mL vs 221.2 mL
Halawi et al, 2017 Randomized Controlled Trial	N = 40, Unknown	Liraglutide 3 mg	Liraglutide increased time to 1/2 gastric emptying of solids but volume not statistically significant.
Sherwin et al, 2023 Prospective Study	N = 20, >10 hours	Semaglutide 0.25-0.75 mg	Semaglutide increased fasting gastric content. ( $P = .005$ ) > 1.5 mL/kg fluid content
Gulak et al, 2023 Case Report	48-year-old female, 8 hours liquid, 20 hours solids	Semaglutide 0.5 mg	Regurgitation of 200 mL clear gastric content after induction of general anesthesia.

Table 1. Literature Review Evaluating GLP-1 Effect on Fasting Gastric Volumes.

## SYNTHESIS

- GLP-1 agonists significantly increased fasting gastric volumes and/or solids compared to placebo in 3 of 4 studies (table 1)<sup>3-6</sup>
- The effect of dosage amount and duration of treatment with a GLP-1 agonist on fasting gastric volumes and/or solids is unknown<sup>3-6</sup>

## RECOMMENDATIONS for PRACTICE / CONCLUSIONS

- Patients who have not held preoperative GLP-1 agonists for 7 days should receive a gastric ultrasound (figure 2)<sup>8</sup>
- RSI or surgical case delay should be considered in patients who have not held GLP-1 agonists and show gastric content using ultrasound >1.5 mL/kg<sup>8,9</sup>
- Further research is needed to strengthen what is known regarding the relationship between GLP-1 agonist dosage amounts, fasting times, and gastric volumes