

# Focus on POCUS: A GLP Overview and Emphasis on Utilizing Ultrasound to Mitigate Risk Amid Uncertain GLP-1 Guidance

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## Introduction

- **Type 2 diabetes mellitus** (T2DM) is rapidly increasing worldwide, with 589 million individuals affected in 2024.
- **Glucagon-like peptide-1 receptor agonists** (GLP-1 RAs) have become widely prescribed for glycemic control and weight management.
- While these therapies provide significant benefits, their effect of **delaying gastric emptying** raises important **concerns in the perioperative setting**.
- Delayed gastric emptying is associated with an increased risk of **pulmonary aspiration** during anesthesia. Suggestions from the **American Society of Anesthesiologists** reflect this **uncertainty**, with guidance allowing continuation in low-risk patients but suggesting liquid diets for higher-risk groups.
- **Gastric point-of-care ultrasound** (POCUS) has emerged as a practical tool to **assess aspiration risk** by directly visualizing gastric contents.
- **Purpose:** This review highlights the physiologic effects of **GLP-1 RAs**, their perioperative implications, and the role of gastric **POCUS** in improving anesthesia decision-making and patient safety.

| System              | GLP-1 RA Effects                        | Perioperative Concern                                    |
|---------------------|-----------------------------------------|----------------------------------------------------------|
| Pancreas            | ↑ Insulin secretion, ↓ Glucagon release | Rare hypoglycemia                                        |
| Stomach / Intestine | ↓ Gastric emptying, ↓ Motility          | Increased aspiration risk during anesthesia              |
| Brain               | ↑ Satiety, ↓ Appetite                   | Contributes to weight loss; may alter nutritional status |
| Kidneys             | Possible ↑ Natriuresis, Modulates RAAS  | Minimal direct perioperative impact                      |

**Table 1.** Key physiologic and gastrointestinal effects of GLP-1 receptor agonists and their perioperative implications.

## Results

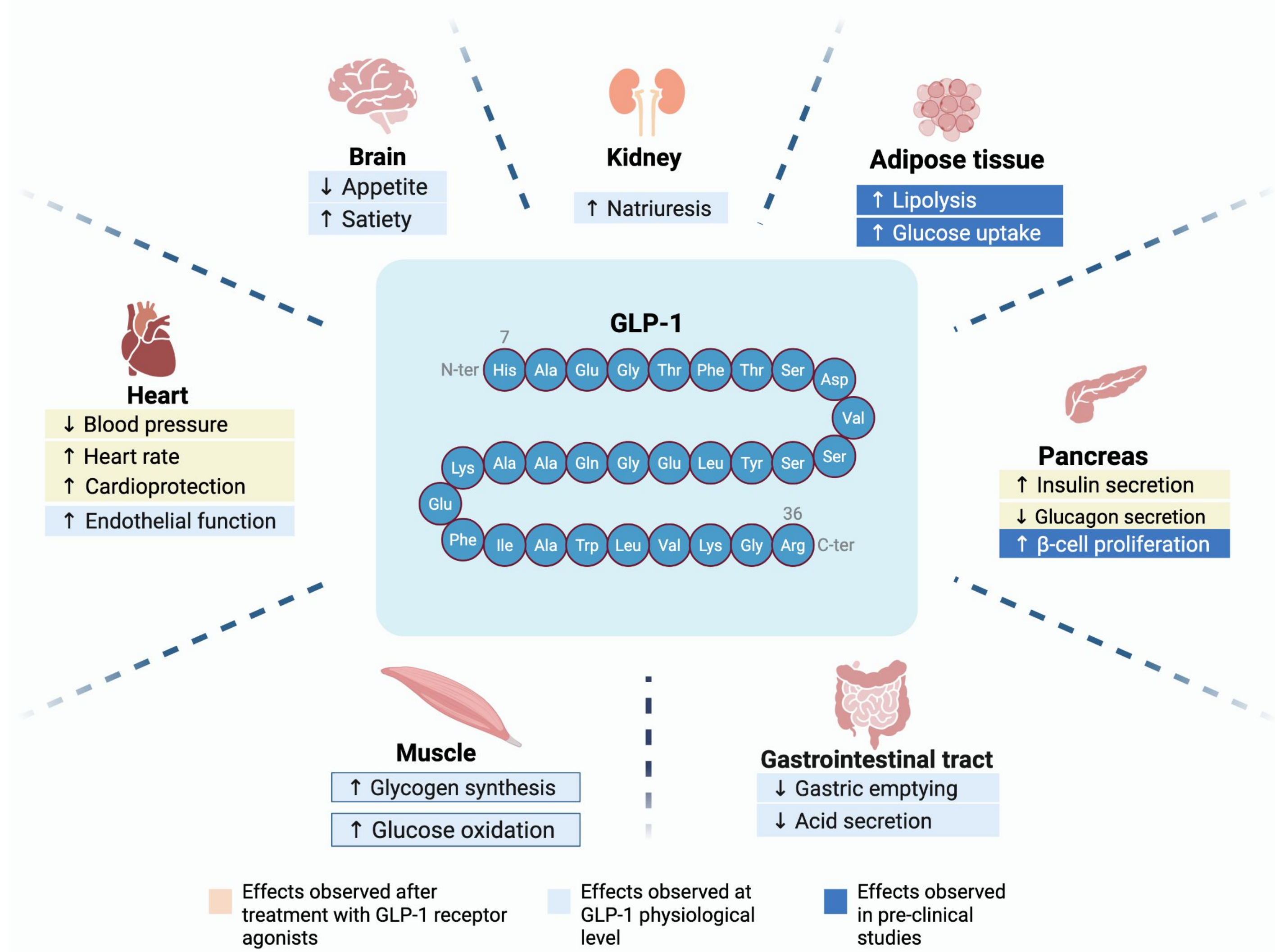


**Figure 1.** Systemic effects of GLP-1 receptor agonists across major target organs.

- **Dose & Duration Effects:** Long-acting GLP-1 RAs (e.g., semaglutide, tirzepatide) are more strongly associated with retained gastric solids than shorter-acting formulations.
- **Study Data:** Observational data show GLP-1 RA users have ~10× higher rates of gastric residue compared to non-users.
- **Cohort Evidence:** Retrospective analysis of >200,000 patients undergoing orthopedic surgery found that stopping GLP-1 RAs 7 days before surgery lowered risk, but 14 days showed the lowest complication rates.
- **POCUS Utility:** Ultrasound can differentiate low-risk (empty or small-volume fluid) from high-risk (solids or large-volume fluid) gastric states and is validated across obese, obstetric, diabetic, and pediatric populations.

## Results (Continued)

- **POCUS provides a grading framework** (Grade 0: empty, Grade 1: low-volume fluid, Grade 2: high-risk solids/fluid).
- **Aspiration events**, while uncommon, **can have severe consequences**; case reports describe regurgitation and airway compromise even after >10 hours of fasting.
- Standard fasting and medication-holding guidelines **are not protective for all patients**, supporting the role of **individualized ultrasound assessment**.

## Conclusions

- **GLP-1 RAs are increasingly prescribed** and provide clear **therapeutic benefits**, but they raise perioperative **aspiration concerns** due to delayed gastric emptying.
- Current fasting and medication withholding strategies **do not consistently prevent aspiration risk**.
- During this period of uncertainty, gastric **POCUS is a practical tool** to improve perioperative decision-making and patient safety during procedures.
- Future studies are needed to refine aspiration risk stratification and optimize management strategies for patients on GLP-1 RAs.

## References



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