Ophthalmic Anesthesia Society

Perioperative Conundrums

To Proceed or not to proceed

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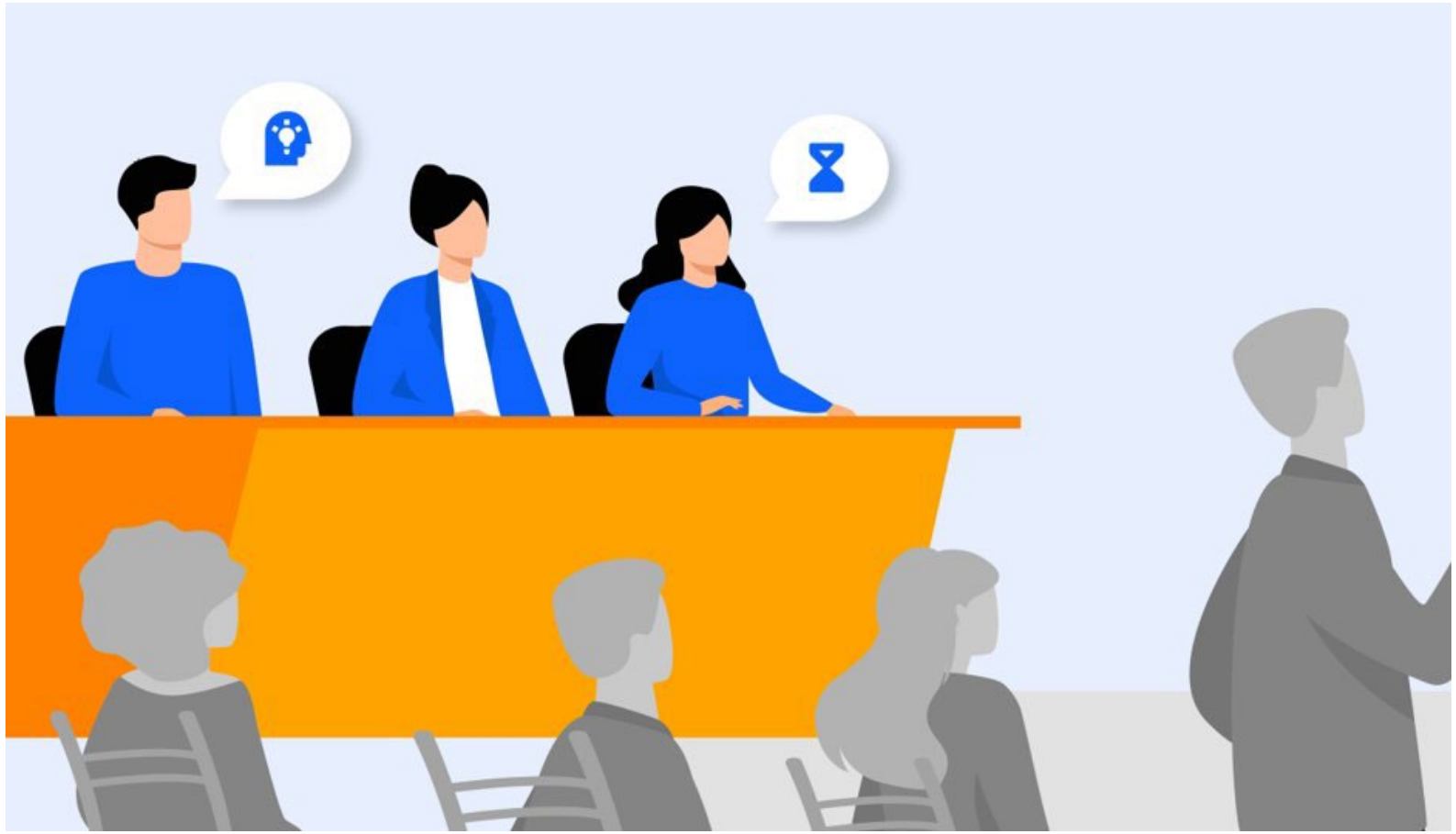
Tina Tran, MD (moderator)

Let's meet our panelists

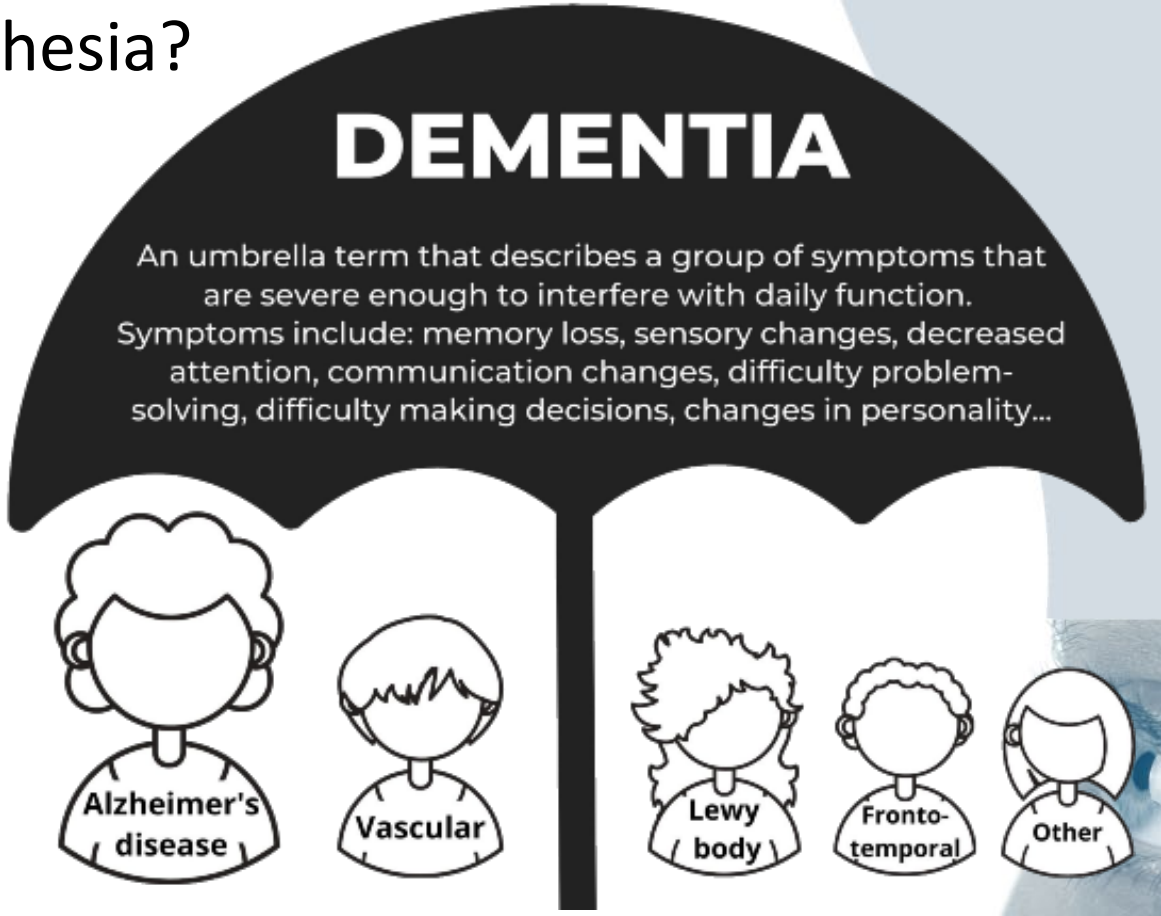


Consent to proceed?

- 80 yo female scheduled for elective cataract surgery
- She has no acute changes in her medical co-morbidities
- She has a diagnosis of dementia
- Surgeons obtained consent from patient as she was alert and oriented with an appropriate understanding of the surgery
- She was cooperative with eye examinations in clinic

Discussion point

- What addition information would you need?
- How would you administer anesthesia?



Day of surgery

- The anesthesia provider meets the patient to discuss the anesthesia plan
- She asks “Why am I here?”
- With prompting from her daughter, she states she is having something do to her left eye.
- Her daughter has documents stating she is the medical power of attorney and can make decisions for her mother IF a physician writes that she is unable to make her own medical decisions

Discussion/decisions points

- How would you proceed?
- Is a person diagnosed with dementia able to give informed consent and/or sign legal medical documents?
- How would management differ if she had mild, moderate or severe dementia?
- How would management differ if she has vaxing/waning dementia with moments of “clarity”?
- Who could/should sign the document to state that the patient is unable to make medical decisions?

Considerations

- Availability of power of attorney to be physically present or available by phone
- Coordination of schedule of patient and POA
- Risk of falls and need for assistance with daily living and self care with continued poor vision

Mental capacity vs competence

- Capacity: describes a functional state that can change or fluctuate
- Competence: a legal term. Only a judge has the authority to determin

Workplace dangers/threats

The evening prior to day of surgery, you are informed a voicemail was left overnight on a patient councilor phone threatening gun violence.

How do you proceed?

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Panel discussion/audience participation

- What is the appropriate flow of information when a threat to the workplace has been made?
- What information should be given to the other patients who arrive for their surgeries?
- What is the role of security resources?

Diabetes, obesity, general anesthesia, and ophthalmic surgery….OH MY!

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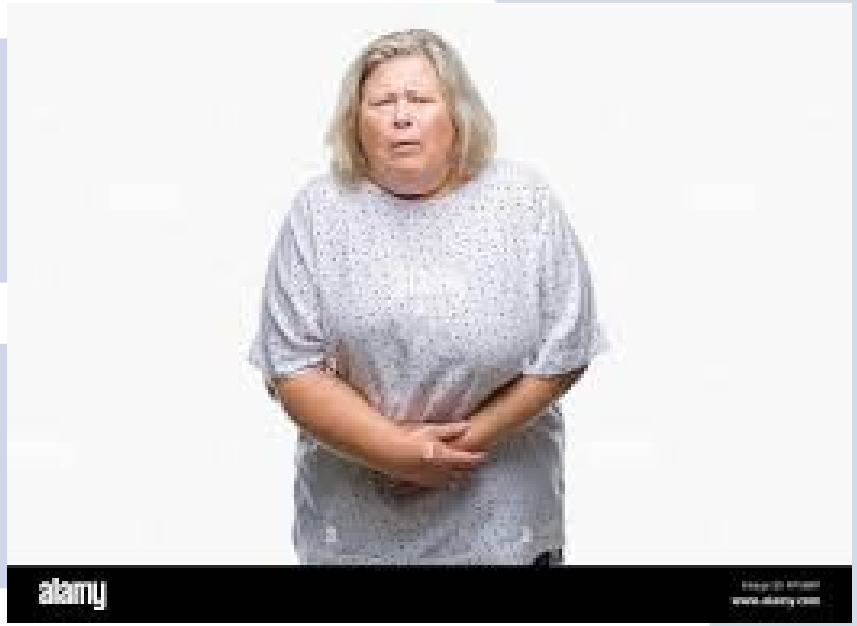
60 yo patient with PMH of obesity (BMI 39), labile diabetes on oral and injectable medications, HTN, anxiety, and GERD

Started on SQ Ozempic ~ 6 months ago



Losing weight, less insulin use

Increase in GERD symptoms, started on medications

On DOS, patient stated that she was not given instructions to stop Ozempic. Did not need to stop for prior surgeries.

GERD controlled with meds but still has mild symptoms

Today has nausea, liked due to NPO and anxiety

Wants deep sedation or general anesthesia, concerns for involuntary movement

Surgeon states MAC/mild sedation is ok

Decision/discussion point

What additional information would you need?

What conversation would you have with the patient and surgeon?

How does depth of anesthesia affect your decision?

Ask the audience

01

A. Postpone the case for 7 days from last SQ Ozempic dose

02

B. Proceed with local analgesia only

03

C. Proceed with mild sedation

04

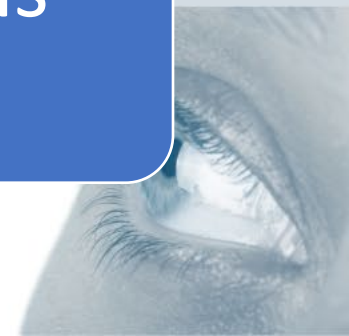
D. Proceed with GA with aspiration precautions

Collaborative discussion

You and the surgeon agree to postpone the elective surgery

Patient states she is willing to accept all the risks

She has very limited resources and it took her 9 months to align her resources for surgery today



Decision

No ultrasound probe at the ASC (unable to perform gastric ultrasound)

After discussion with patient, surgeon and anesthesiologist, the anesthesia team agrees to proceed

Decision/discussion point

What additional interventions/preparation are needed?

How would you proceed?

Uneventful intraoperative course

- Intubated without issue
- Case finished in 30 mins

Conclusion of case

How do you emerge the patient?

After the patient is emerged and prior to discharge, what information would you provide for her recovery at home?

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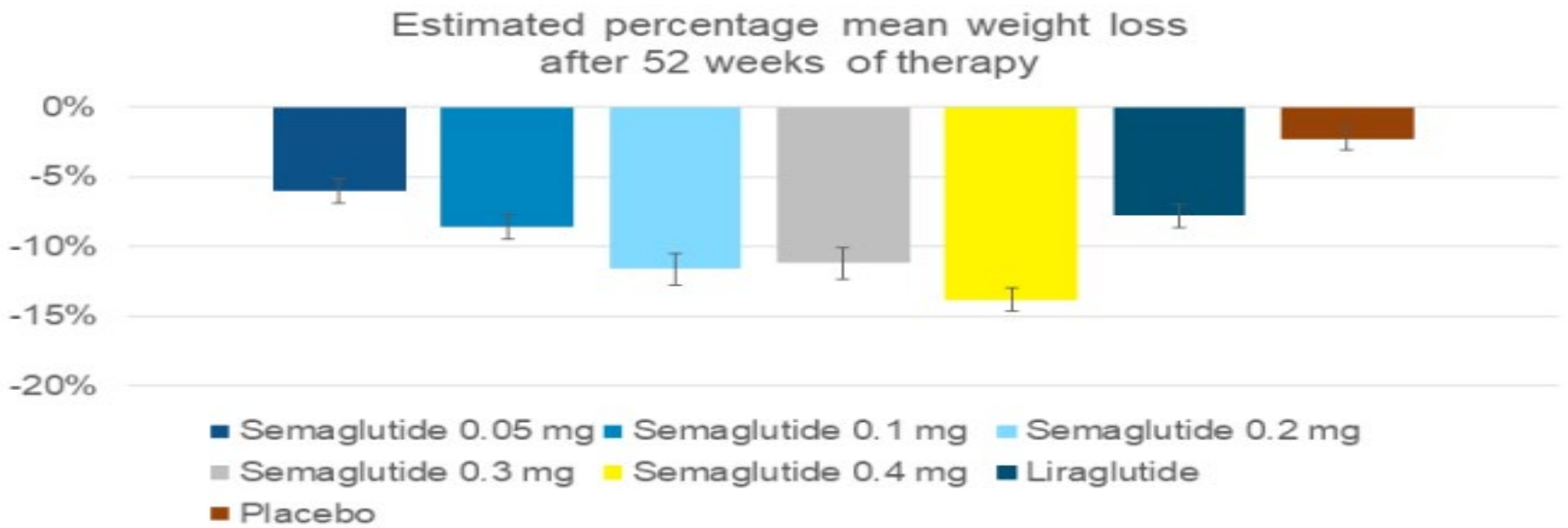
GLP-1 & GIP Receptor Agonists

Class/Main Action	Name	Dose Range	Considerations
GLP-1 RA - Glucagon Like Peptide Receptor Agonist **"Incretin Mimetic"** • Increases insulin release with food • Slows gastric emptying • Promotes satiety • Suppresses glucagon	exenatide (Byetta)	5 and 10 mcg BID	**Side effects for all:** Nausea, vomiting, weight loss, injection site reaction. Report signs of acute pancreatitis (severe abdominal pain, vomiting), stop med. Increase dose monthly to acheive targets. **Black box warning:** Thyroid C-cell tumor warning (avoid if family history of medullary thyroid tumor). *Significantly reduces risk of CV death, heart attack, and stroke. †Approved for pediatrics 10-17 yrs Lowers A1c 0.5 – 1.6% Weight loss of 1.6 to 6.0 kgs
	exenatide XR† (Bydureon)	2 mg 1x a week Pen injector - Bydureon BCise	
	liraglutide (Victoza)*†	0.6, 1.2 and 1.8 mg daily	
	dulaglutide* (Trulicity)	0.75, 1.5, 3.0 and 4.5 mg 1x a week pen injector	
	lixisenatide (Adlyxin)	10 mcg 1x a day for 14 days 20 mcg 1x day starting day 15	
	semaglutide* (Ozempic)	0.25, 0.5, 1.0 and 2.0 mg 1x a week pen injector	
	(Rybelsus) Oral tablet	3, 7, and 14 mg daily in a.m. Take on empty stomach w/H2O sip	
GLP-1 & GIP Receptor Agonist Activates receptors for GLP-1 (see above) & Glucose-dependent Insulinotropic Polypeptide (GIP).	Tirzepatide (Mounjaro)	2.5, 5.0, 7.5, 10, 12.5 and 15 mg 1x a week prefilled single dose pen Increase dose by 2.5 mg once monthly to reach targets.	**Side effects include:** Nausea, diarrhea, injection site reactions. Avoid if family history medullary thyroid tumor. Report pancreatitis or acute gallbladder problems. Lowers A1C ~ 1.8 - 2.4% Weight loss of ~ 5.4 – 10 kgs

Glucagon-like peptide-1 analogues promote weight loss in obese, non-diabetic individuals

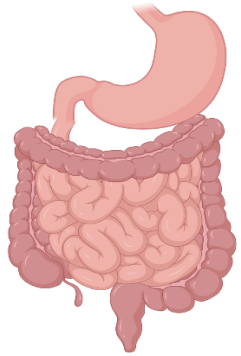
A randomized, double-blind, controlled, phase 2 study (N=957)



O'Neil *et al.* The Lancet 2018

PACE-CME

GLP-1 or GLP-1R Agonists

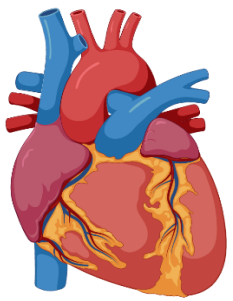


GI Tract

↓ Gastric emptying
↓ GI motility
↑ Acid secretion

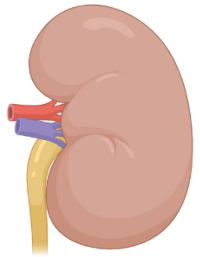
Brain

↓ Appetite
↑ Satiety
↑ Energy expenditure



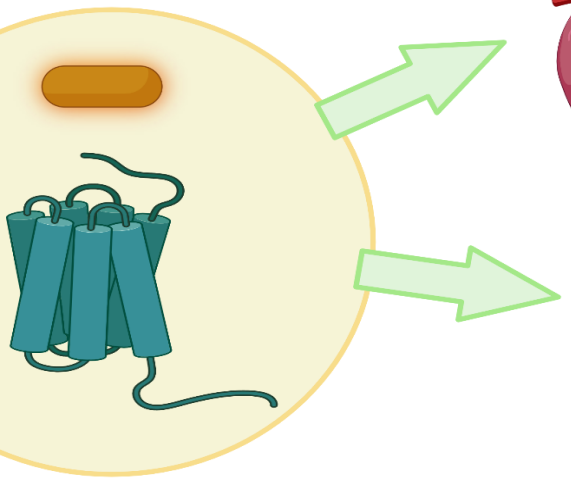
Heart

↓ Blood pressure
↑ Heart rate
↑ Myocardial contractility

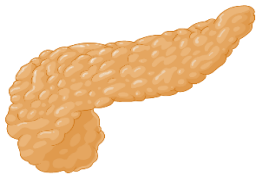


Kidney

↑ Natriuresis



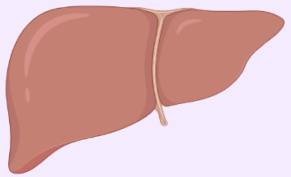
Pancreas



↓ Glucagon secretion
↑ Insulin secretion
↑ Insulin biosynthesis
↑ β-cell proliferation

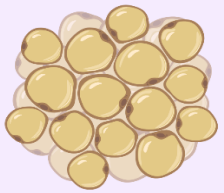
↑ Insulin Sensitivity

Liver



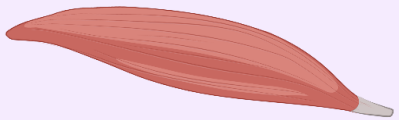
↓ Hepatic glucose production

Adipose tissue



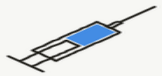
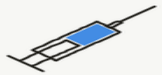
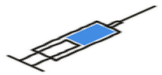
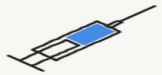
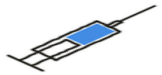
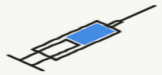
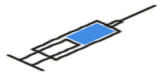
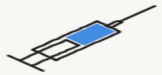
↑ Lyposis
↑ FFA synthesis
↑ Glucose uptake

Muscle

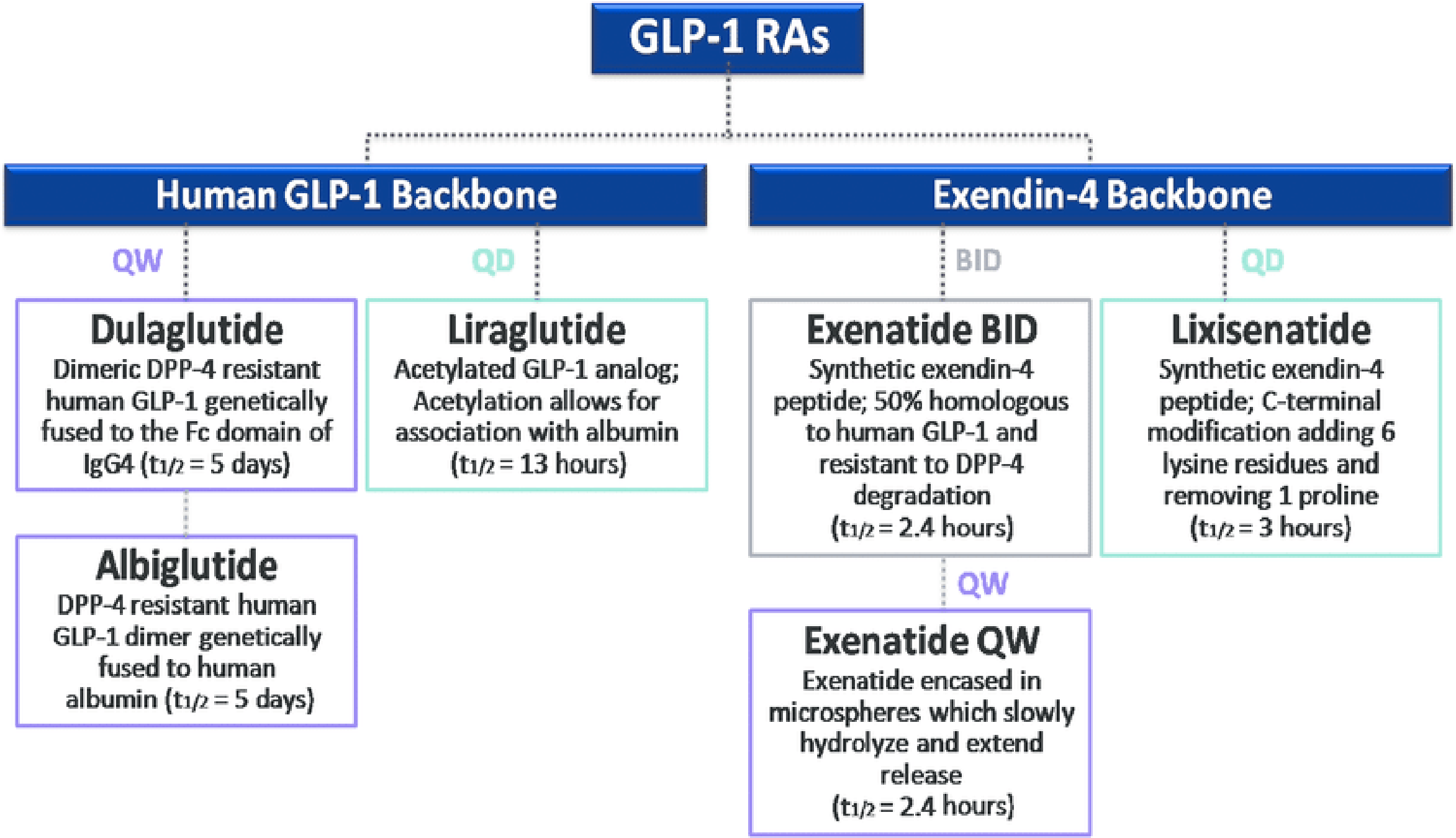


↑ Glycogen synthesis
↑ Glucose oxidation

GLP-1 Agonist Drugs Comparison

	DOSAGE	DOSAGE FORM	APPROVED FOR	WHO CAN TAKE IT?	OTHER BENEFITS
Ozempic (SEMAGLUTIDE)	1 WEEKLY		TYPE 2 DIABETES	ADULTS	HEART, KIDNEYS, WEIGHT LOSS
Rybelsus (SEMAGLUTIDE)	1 DAILY		TYPE 2 DIABETES	ADULTS	WEIGHT LOSS
Wegovy (SEMAGLUTIDE)	1 WEEKLY		WEIGHT LOSS	12+ → KIDS + ADULTS	N/A
Trulicity (DULAGLUTIDE)	1 WEEKLY		TYPE 2 DIABETES	10+ → KIDS + ADULTS	HEART, KIDNEYS, WEIGHT LOSS
Victoza (LIRAGLUTIDE)	1 DAILY		TYPE 2 DIABETES	10+ → KIDS + ADULTS	HEART, KIDNEYS, WEIGHT LOSS
Saxenda (LIRAGLUTIDE)	1 DAILY		WEIGHT LOSS	12+ → KIDS + ADULTS	N/A
Byetta (EXENATIDE)	2 DAILY		TYPE 2 DIABETES	ADULTS	WEIGHT LOSS
Bydureon BCise (EXENATIDE)	1 WEEKLY		TYPE 2 DIABETES	10+ → KIDS + ADULTS	WEIGHT LOSS
Mounjaro (TIRZEPATIDE)	1 WEEKLY		TYPE 2 DIABETES	ADULTS	WEIGHT LOSS

GoodRx Health


GLP-1 RAs
Human GLP-1 Backbone
Exendin-4 Backbone
QW
QD
BID
QD
Dulaglutide
Dimeric DPP-4 resistant human GLP-1 genetically fused to the Fc domain of IgG4 (t1/2 = 5 days)
Liraglutide
Acetylated GLP-1 analog; Acetylation allows for association with albumin (t1/2 = 13 hours)
Exenatide BID
Synthetic exendin-4 peptide; 50% homologous to human GLP-1 and resistant to DPP-4 degradation (t1/2 = 2.4 hours)
Lixisenatide
Synthetic exendin-4 peptide; C-terminal modification adding 6 lysine residues and removing 1 proline (t1/2 = 3 hours)
Albiglutide
DPP-4 resistant human GLP-1 dimer genetically fused to human albumin (t1/2 = 5 days)
QW
Exenatide QW
Exenatide encased in microspheres which slowly hydrolyze and extend release (t1/2 = 2.4 hours)

GLP-1 RA	Recommended dose	Dose adjustment	Precautions and warnings
Lixisenatide	Starting dose: **10 mcg s.c. OD for 14 days** Maintenance dose: **20 mcg s.c. OD on day 15.**	**All GLP-1 RA** **Impaired renal function:** ▪ eGFR <30 ml/min/1.73 m^2: **discontinue.** **Hepatic impairment:** ▪ If severe: **discontinue**	**All GLP-1 RA** ▪ ↑Risk of hypoglycaemia in combination with insulin or sulphonylurea. ▪ Acute pancreatitis. ▪ Dehydration ▪ Cholelithiasis and cholecystitis ▪ Severe gastrointestinal disease and severe gastroparesis
Liraglutide	Starting dose - **0.6 mg s.c. OD** The dose should be increased to **3.0 mg s.c. OD** in increments of 0.6 mg with at least once-weekly intervals.		
Semaglutide	Starting dose - **0.6 mg s.c. OD.** The dose should be increased to **1.8 mg OD** in increments of 0.6 mg with at least once weekly intervals.		
Albiglutide	**30 -50 mg s.c. once weekly**		
Exenatide	**2 mg s.c. once weekly**		

Does depth of anesthesia matter?

Based on recent anecdotal reports, there are concerns that delayed gastric emptying from GLP-1 agonists can increase the risk of regurgitation and pulmonary aspiration of gastric contents during general anesthesia and deep sedation.[12-14]

Silveira SQ, da Silva LM, Abib ACV, 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.

Kobori T, Onishi Y, Yoshida Y, et al. Association of glucagon-like peptide-1 receptor agonist treatment with gastric residue in an esophagogastroduodenoscopy. J Diabetes Investig. 2023; 14: 767-73.

Klein SR, Hobai IA. Semaglutide, delayed gastric emptying, and intraoperative pulmonary aspiration: A case report. Can J Anesth. 2023. DOI: 10.1007/s12630-023-02440-3.

ASA recommendations:
Day or week prior to the procedure

- Hold GLP-1 agonists on the day of the procedure/surgery for patients who take the medication daily.

- Hold GLP-1 agonists a week prior to the procedure/surgery for patients who take the medication weekly.

ASA recommendations: Day of the procedure

- Consider delaying the procedure if the patient is experiencing GI symptoms such as severe nausea/vomiting/retching, abdominal bloating or abdominal pain and discuss the concerns of potential risk of regurgitation and aspiration with the proceduralist or surgeon and the patient.

- Continue with the procedure if the patient has no GI symptoms and the GLP-1 agonist medications have been held as advised.

- If the patient has no GI symptoms, but the GLP-1 agonist medications were not held, use precautions based on the assumption the patient has a “full stomach” or consider using ultrasound to evaluate the stomach contents. If the stomach is empty, proceed as usual. If the stomach is full or if the gastric ultrasound is inconclusive or not possible, consider delaying the procedure or proceed using full stomach precautions.

- Discuss the potential risk of regurgitation and aspiration of gastric contents with the proceduralist or surgeon and the patient.

ASA recommendations

Full stomach precautions also should be used in patients who need urgent or emergency surgery.

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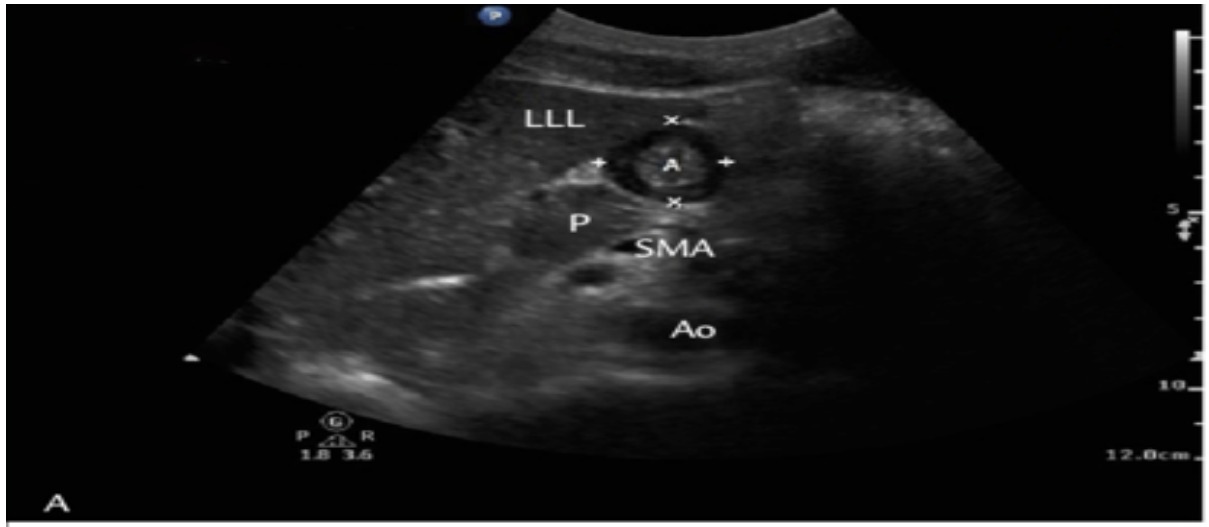
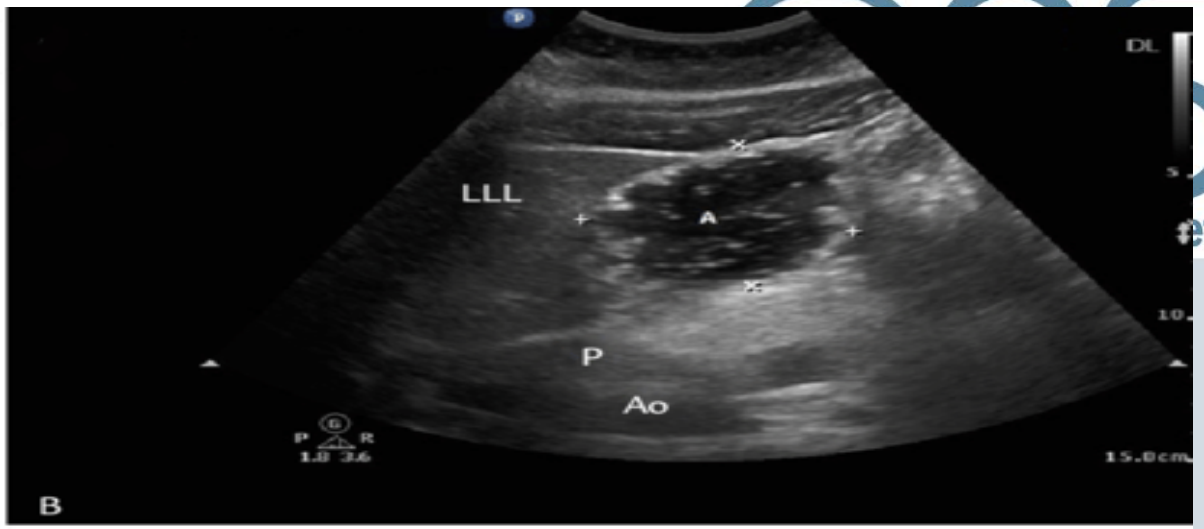
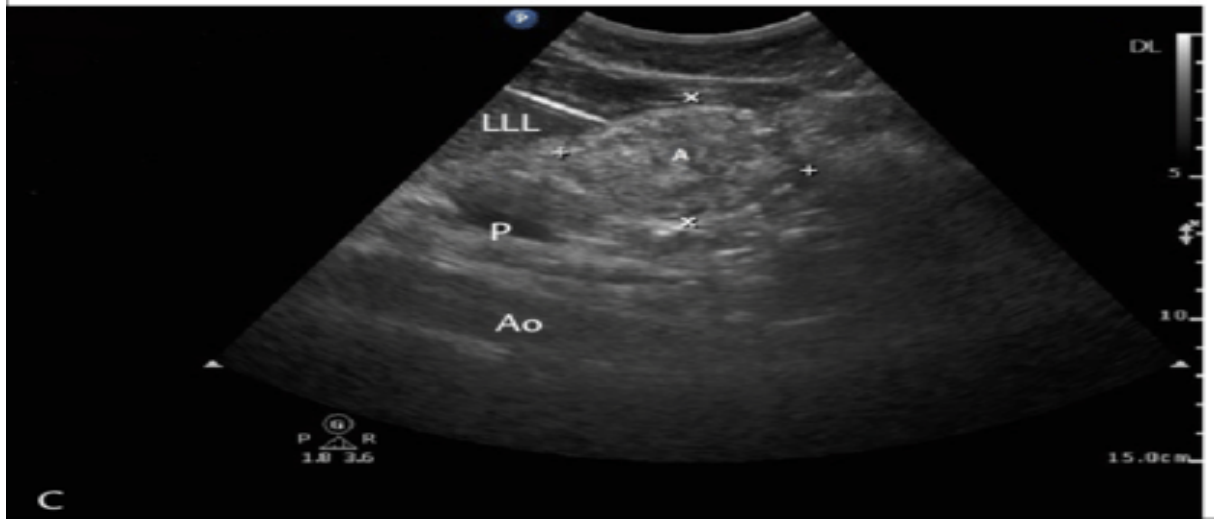
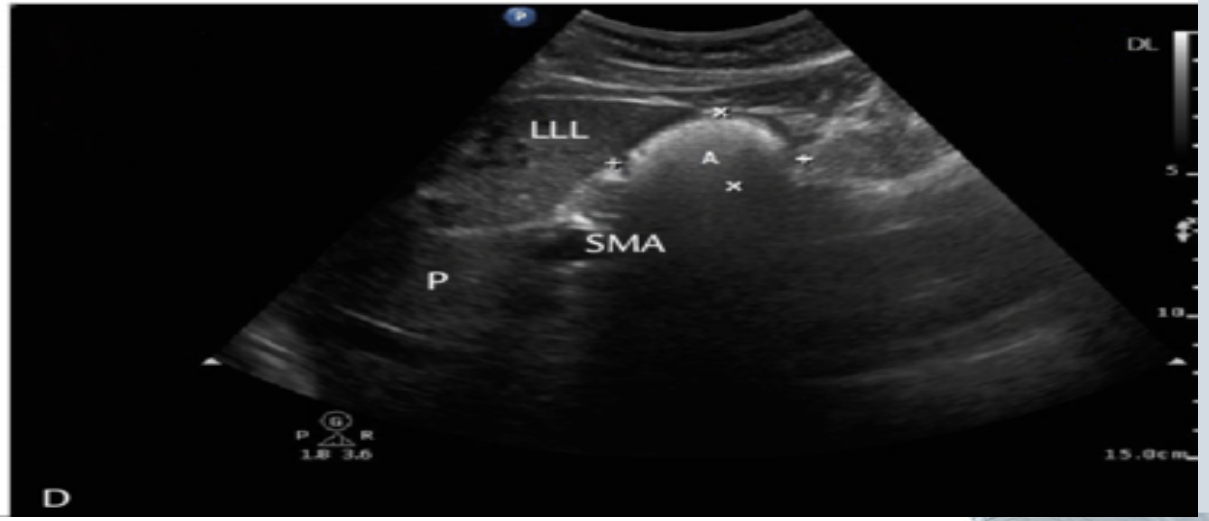
Gastric Ultrasound









A. Gastric antrum with an empty stomach. The antrum appears small and empty, with a " bull's eye " appearance.
B. Gastric antrum after ingestion of a clear fluid. Small gas bubbles giving the appearance of a " starry night. "
C. Gastric antrum after ingestion of milk. The antrum appears round and distended.
D. Gastric antrum 10 minutes after ingestion of solid food, resembles " frosted glass.

A.gastric antrum; LLL: left lobe of the liver; P: pancreas; SMA: superior mesenteric artery; Ao: Aorta.

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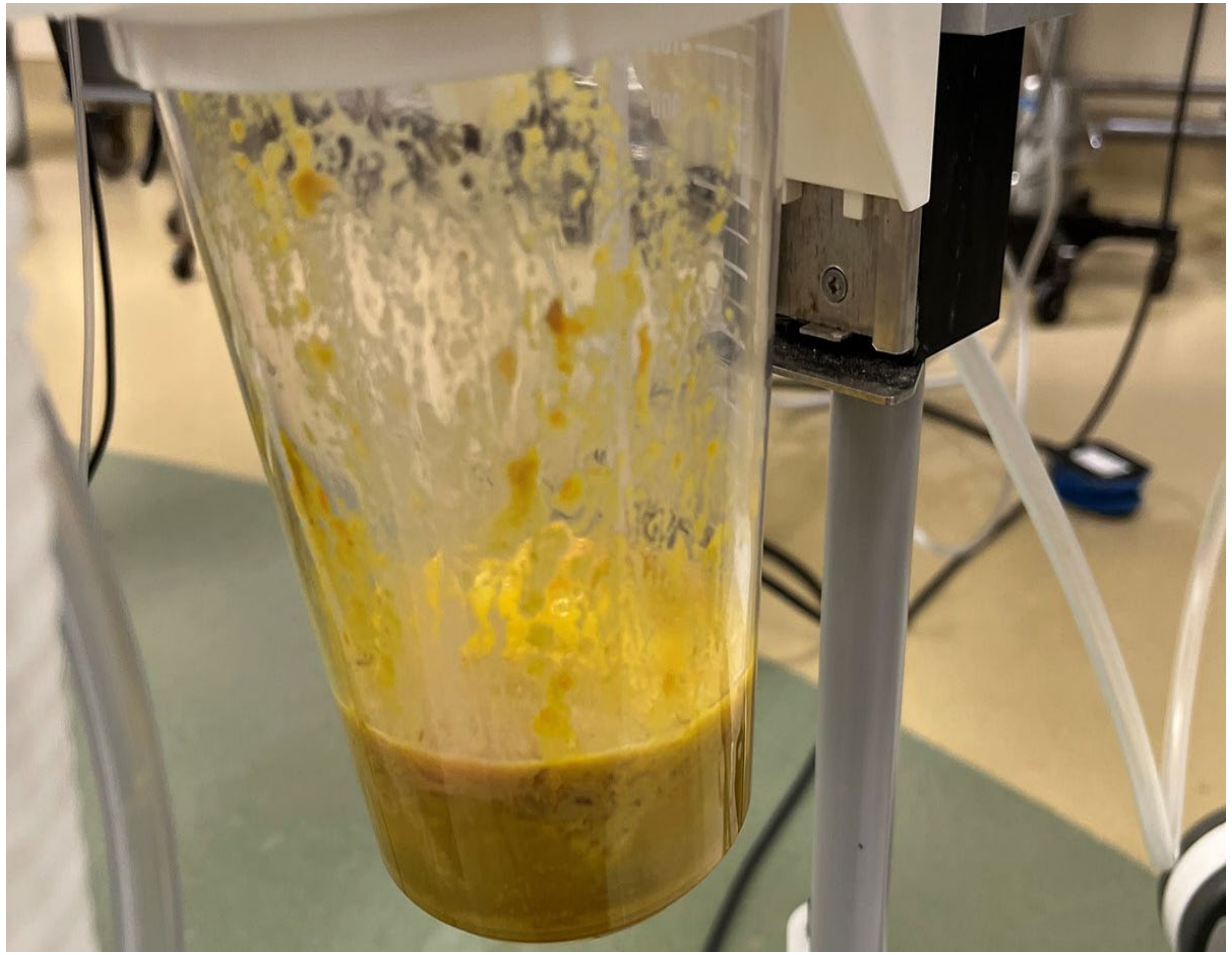

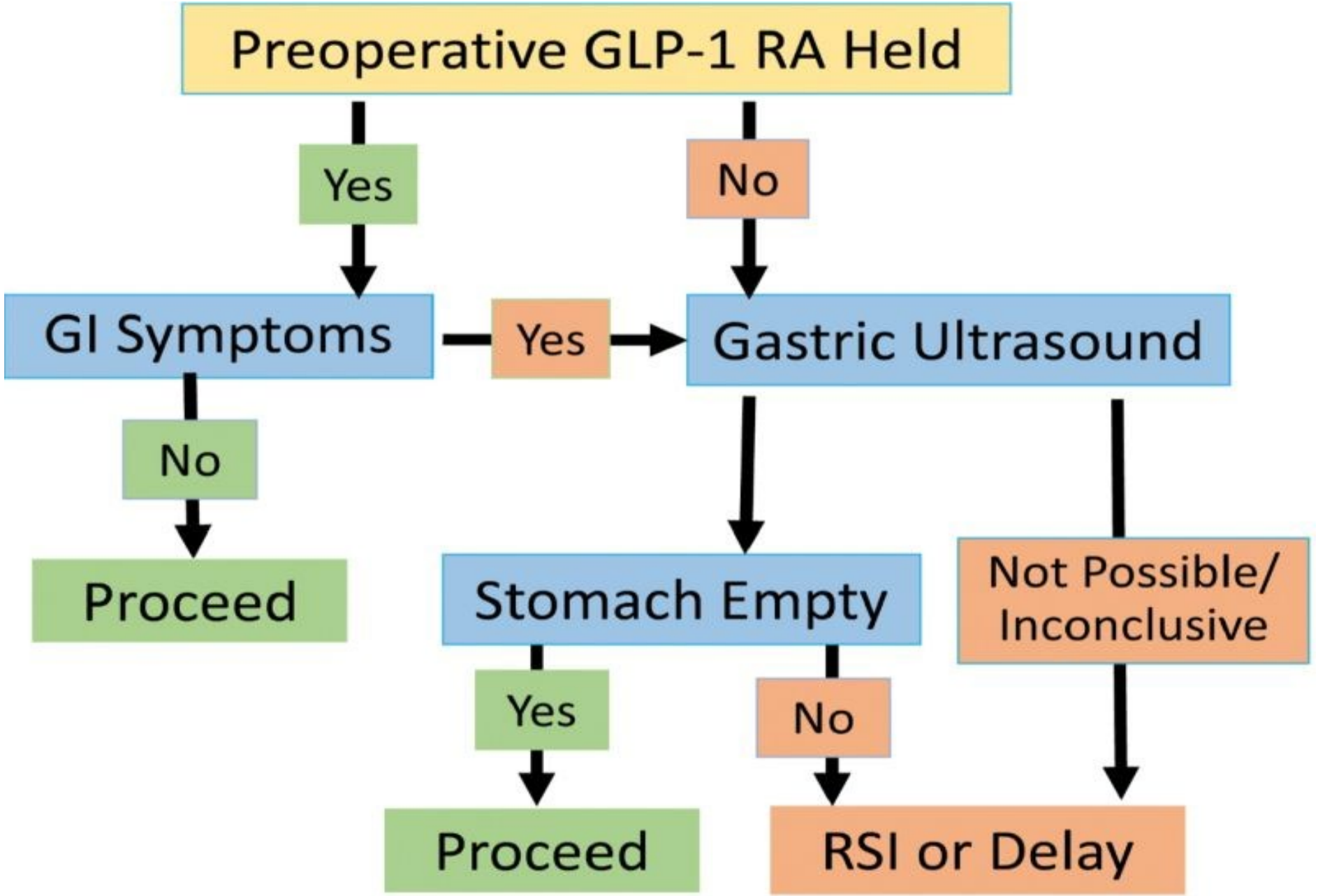

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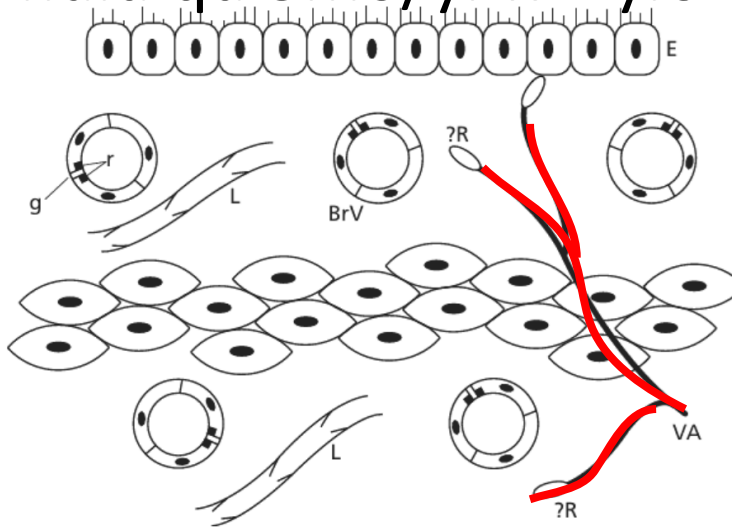
“I’ve had a tickle in my throat for the past 4 days”

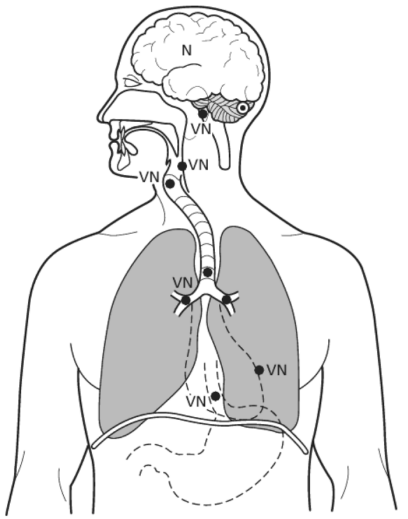
Interview & Assessment

- Onset and Duration
  - Acute < 3 weeks: Likely viral URI
  - Chronic > 8 weeks
- Sick exposures
- Quality
  - “honking” or “barking,” absent at night
- Associated phlegm production
- Nocturnal absence of cough
- Bronchitis: dullness on percussion, bronchial breathing, crackles

Physiology of a cough

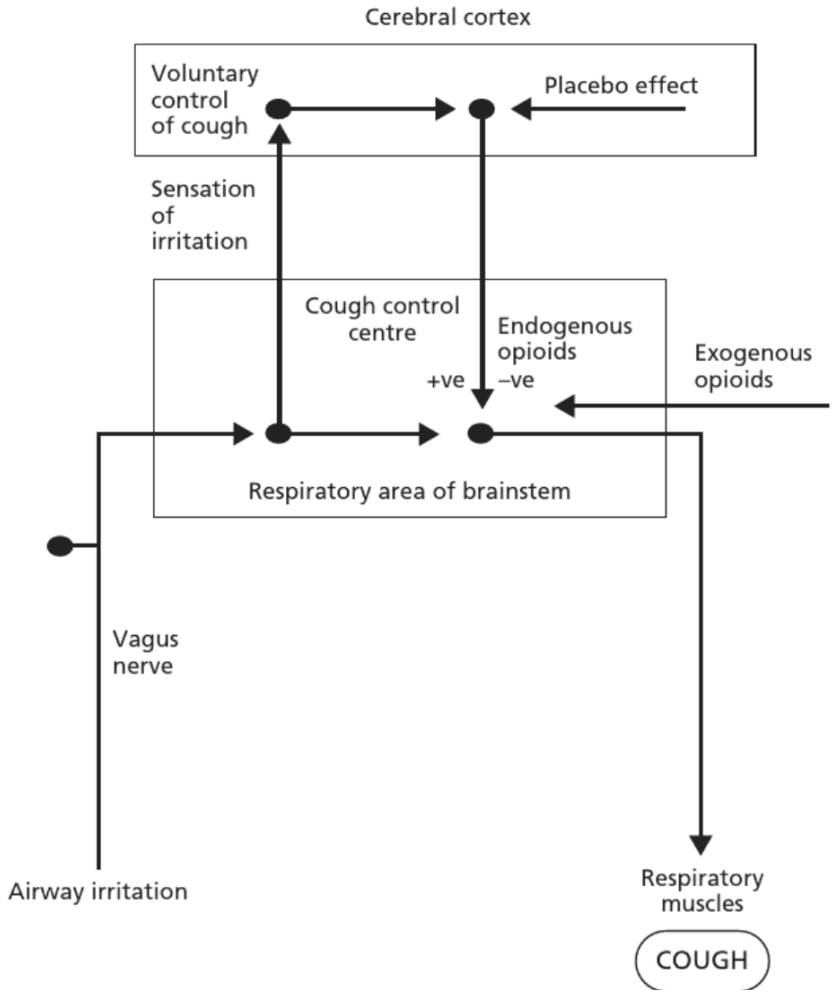
- Presenting symptom of > 100 respiratory clinical conditions
  - Post-nasal drip, GERD, asthma, bronchitis
- Chronic bronchitis: expectoration of fluid qd 3mo/yr x 2 yrs
- Is genesis of cough the “cause?”
- Vagal afferent innervation





Chung, K. Fan, John G. Widdicombe, and Homer A. Boushey. *Cough Causes, Mechanisms, and Therapy*. Malden, Mass: Blackwell Pub., 2003. Print.

Reflexive and Voluntary Cough



Cough model to illustrate reflex and voluntary control mechanisms. Irritation of airway receptors may cause reflex cough via a brainstem control area. A sensation of irritation may cause cough via higher centres such as the cerebral cortex. Cough can be voluntarily initiated and inhibited via the cerebral cortex that influences cough by two pathways: via the brainstem and via a descending pathway to the spinal cord. Cough can also be inhibited by endogenous or exogenous opioids. Cough associated with common cold may be a mixture of both voluntary and reflex cough.

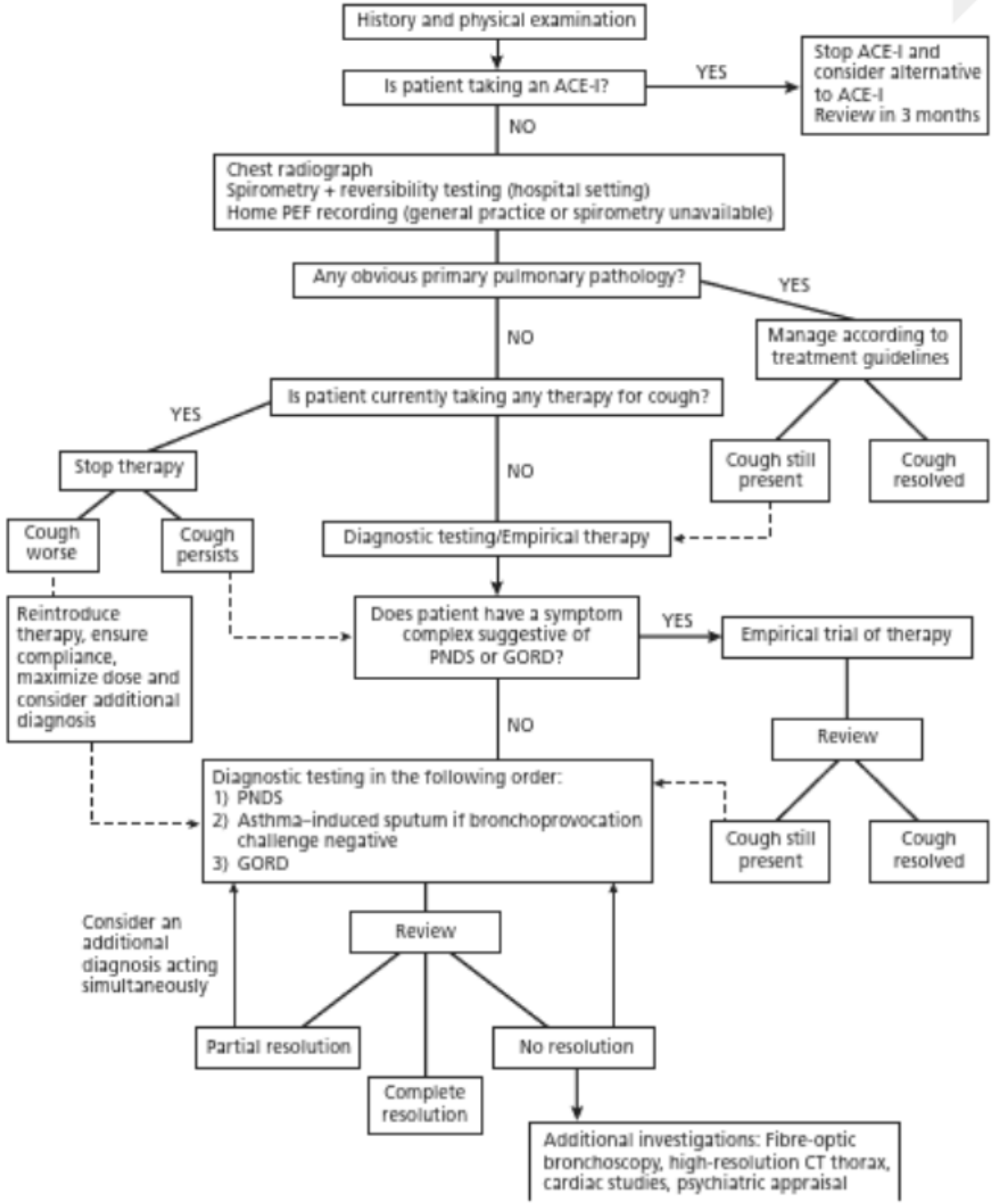


Fig. 4.2 Protocol for the evaluation of chronic cough in an adult. Adapted with permission from [8]. ACE-I, angiotensinconverting enzyme inhibitor; PEF, peak expiratory flow; PNDS, postnasal drip syndrome; GORD, gastro-oesophageal reflux disease; CT, computed tomography.