# Fueling A Healthier Future
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# Gastroparesis

- Definition
- Etiology
- Clinical manifestations
- Diagnosis
- Treatment
- Cumulative Management

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# References

American Gastroenterological Association ( AGA)
American College of Gastroenterology ( ACG)

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# Gastroparesis

Definition: *Syndrome*

*Objectively delayed gastric emptying of solids*

*Absence of Mechanical obstruction*

*Symptoms: N, V, early satiety, bloating, belching, pain*

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# Etiology

- Idiopathic; up to 50%
- DM; most recognized systemic disease associated with gastroparesis (up to 20% of prevalence, up to 2/3 of symptomatic diabetics have it).
    - Hyperglycemia ( >200 mg/dl) direct strong inhibitory effect of gastric emptying.
- Viral: Norwalk and rotavirus ( post viral may reverse within 1 yr).
- Post-surgical ( vagal injury after Afib ablation, Roux-en-Y, Bilroth)
- Medications: narcotics, anticholinergics, TCA, CCB, GLP-1 agonists.

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# Etiology ( 2)

- Neurologic diseases: MS, brainstem stroke, Parkinsonism, amyloid.
- Autoimmune: Lupus, Sjogrens, resolution with immunoglobulins Rx.
- Para-neoplastic: small cell lung cancer
- Mesenteric ischemia
- Degeneration of stomach muscle layer ( scleroderma).

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# Clinical Manifestations

- Nausea ( up to 93%)
- Vomiting ( up to 85%), undigested
- Early satiety ( up to 80%)
- Bloating
- Postprandial fullness
- Epigastric abdominal pain
- Weight loss
- Avoidance/ restriction of food

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# Physical examination

- Epigastric abdominal distention
- Succussion splash
- Look for hints of systemic clues: Raynaud, orthostatic hypotension, etc..

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# Evaluation

- Suspicion
  - Exclude mechanical obstruction:
    - EGD: Presence of residual solid food in stomach
    - CT enterography
    - Barium follow-through
  - Gastric motility: scintigraphic gastric emptying.
    - Meds affecting gastric emptying stopped 48 hours, 1 week for GLP-1.
    - BS <180
    - 4 hours length, 2 hours not sufficient.
    - While varies among institutions, gastric retention of >10% at 4 hours, or >60% at 2 hours.
  - 13C breath testing: expiratory 13CO2 concentration measured

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# Differential Diagnosis

- Psychiatric diseases
  - Anorexia nervosa, bulimia, depression, psychogenic vomiting, side effect of psychotropic meds.
- Rumination syndrome
  - Behavioral disorder: effortless regurgitation of undigested food soon after a meal.
  - No nausea or retching.
  - Normal gastric emptying
- Functional dyspepsia
  - Not much N/V and weight loss
  - More of post-prandial bloating.
  - Normal gastric emptying
- Cyclical vomiting syndrome
  - Intermittent episodes of symptoms free periods.

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# *Establishing etiology*

- Known etiology no further work-up
- Unknown etiology:
  - Labs: ANA, TSH, HbA1C, ANNA-1 or anti-Hu antibody in search for paraneoplastic gastroparesis in smokers.
  - Gastroduodenal manometry : differentiate myopathic from neuropathic process from pylorospasm.
  - Autonomic testing: central from peripheral neuropathy.
  - Electrogastrogram
  - Single photon emission computed tomography ( SPECT); further delineating gastric accommodation volume
  - Full thickness gastric and small intestinal biopsy

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# Treatment of Gastroparesis

- Dietary Modifications
- Hydration and Nutrition
- Glycemic Control Optimization
- Medications
- Surgical Interventions

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# Dietary Modification

- Avoidance of fatty, acidic, spicy, roughage (insoluble fiber), carbonated beverages, alcohol and smoking ( decrease contractility and delay emptying)
- Encourage low fat, soluble fiber, homogenization of food, hydration to avoid dehydration and electrolytes imbalance.
- Paramount importance to include Dietary Professionals in patients education and management

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# Glycemic Control Optimization

- Hyperglycemia slow gastric emptying
- Hyperglycemia attenuates efficacy of prokinetics
  - Avoid GLP-1 agonists
  - Dipeptidyl peptidase IV inhibitors ( eg: sitagliptin- Januvia) do not affect gastric emptying.

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# Prokinetics

- Metoclopramide:
  - D2 receptor antagonist
  - 5-HT4 receptor agonist
  - 5-HT3 receptor antagonist
  - Enhances antral contractions
  - Decreases postprandial fundus relaxation
  - Approved by FDA for 12 weeks
  - Extrapyramidal side effects, restlessness, anxiety, hyperprolactinemia, prolongation of QT interval
  - Tardive dyskinesia 1%- FDA black box warning: written discussion, informed consent, lowest starting dose ( 5 mg before meals and at HS).

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# Prokinetics

- Domperidone:
  - D2 agonist
  - Not cross BBB
  - Available in the US only through an FDA Investigational New Drug application. Widely available in Canada, Mexico, and Europe.
  - QT prolongation: therefore EKG before and during treatment. Must stop it if QTc>450 ms in men or >470 ms in women.

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# Erythromycin

- Motilin Agonist
- Induces high-amplitude gastric propulsive contractions
- Inhibits accommodation response of proximal stomach
- 4 weeks or less due to tachyphylaxis
- GI toxicity, ototoxicity, bacterial resistance, QT prolongation

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# Azithromycin

- Very similar profile to Erythromycin.
- Fewer GI side effects.
- Same side effect profile

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# Cisapride

- Propulsid
- 5-HT4 agonist
- Very effective in stimulating antral and duodenal motility
- Strong interactions with CyP3A4 isoenzyme ( macrolide, antifungals) causing arrhythmias.
- In US, Investigational Limited Access Program

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# Prucalopride

- Motegrity or Resolor
- 5-HT4 agonist
- No cardiac arrhythmias
- FDA approved for chronic constipation and not gastroparesis but has shown to increase gastric emptying in a small group but mixed resolution of symptoms

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# Neurokinin 1 antagonists

- Chemotherapy agents for N/V
- Aprepitant and tradipitant
- No significant improvements

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# Antiemetics

- Diphenhydramine and ondansetron. No gastroparesis studies

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# Cannabinoids agents

- THC, delays gastric emptying of solids and may lead to cannabis-induced hyperemesis.
- Cannabidiol, a low-THC extract may have some efficacy.
- One single study of 44 individuals; Epidiolex; reduced symptoms severity despite slowing gastric emptying of solids.
- FDA approved for seizure disorder not gastroparesis

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# Endoscopic/Surgical Interventions

- Decompression and feeding tubes:
  - PEG/PEJ
- Interventions directed at the pylorus:
  - G-POEM ( Gastric peroral endoscopic myotomy)
  - Transpyloric stent
  - Laparoscopic pyloroplasty
  - Intrapyloric botulinum toxin injections
- Gastric electrical stimulation: reserved for compassionate treatment N/V

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*Gastroparesis*

Questions ?

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