

# Modern Management of Gastroparesis

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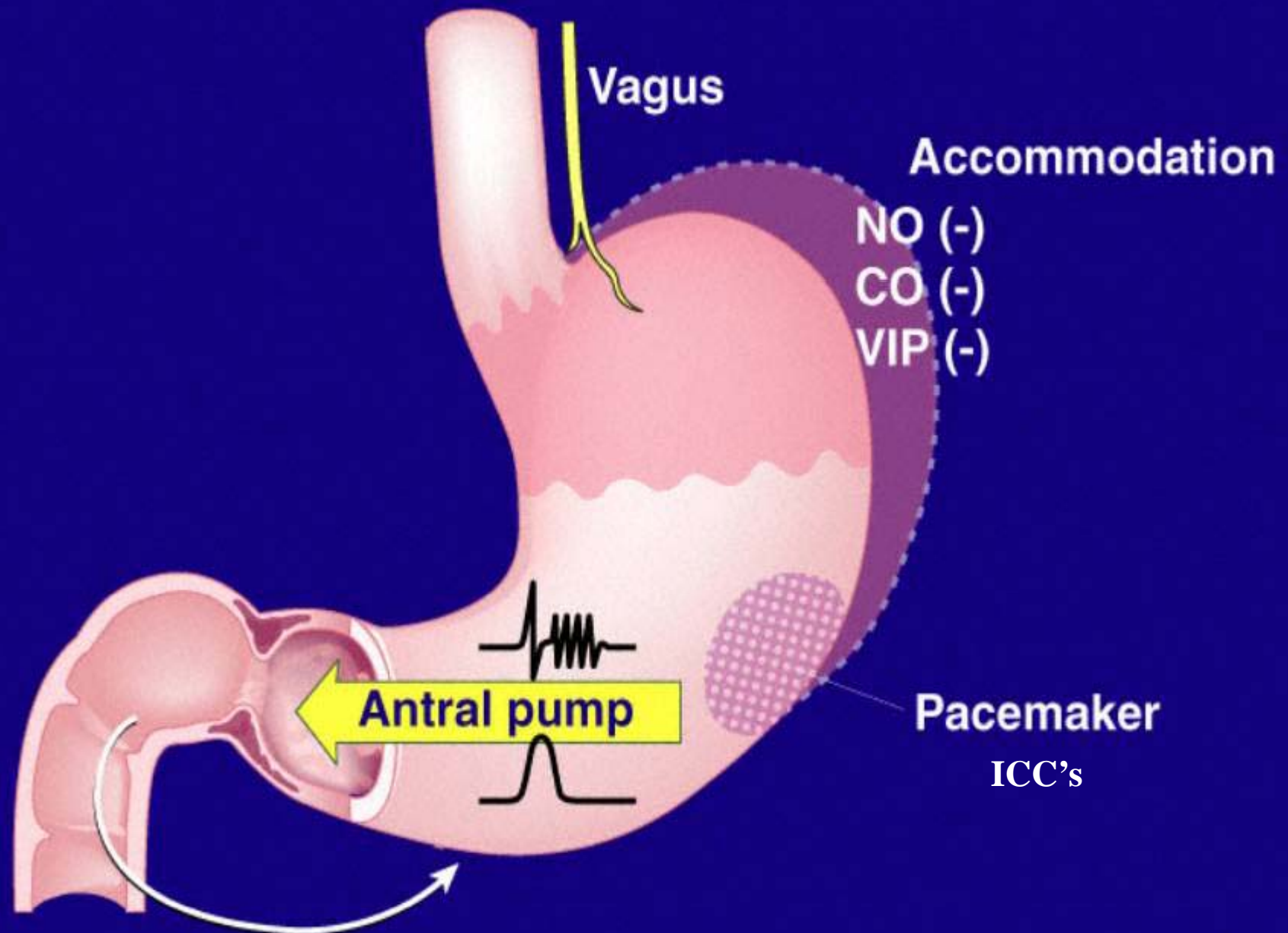
GI Motility program

Cedars-Sinai Medical center

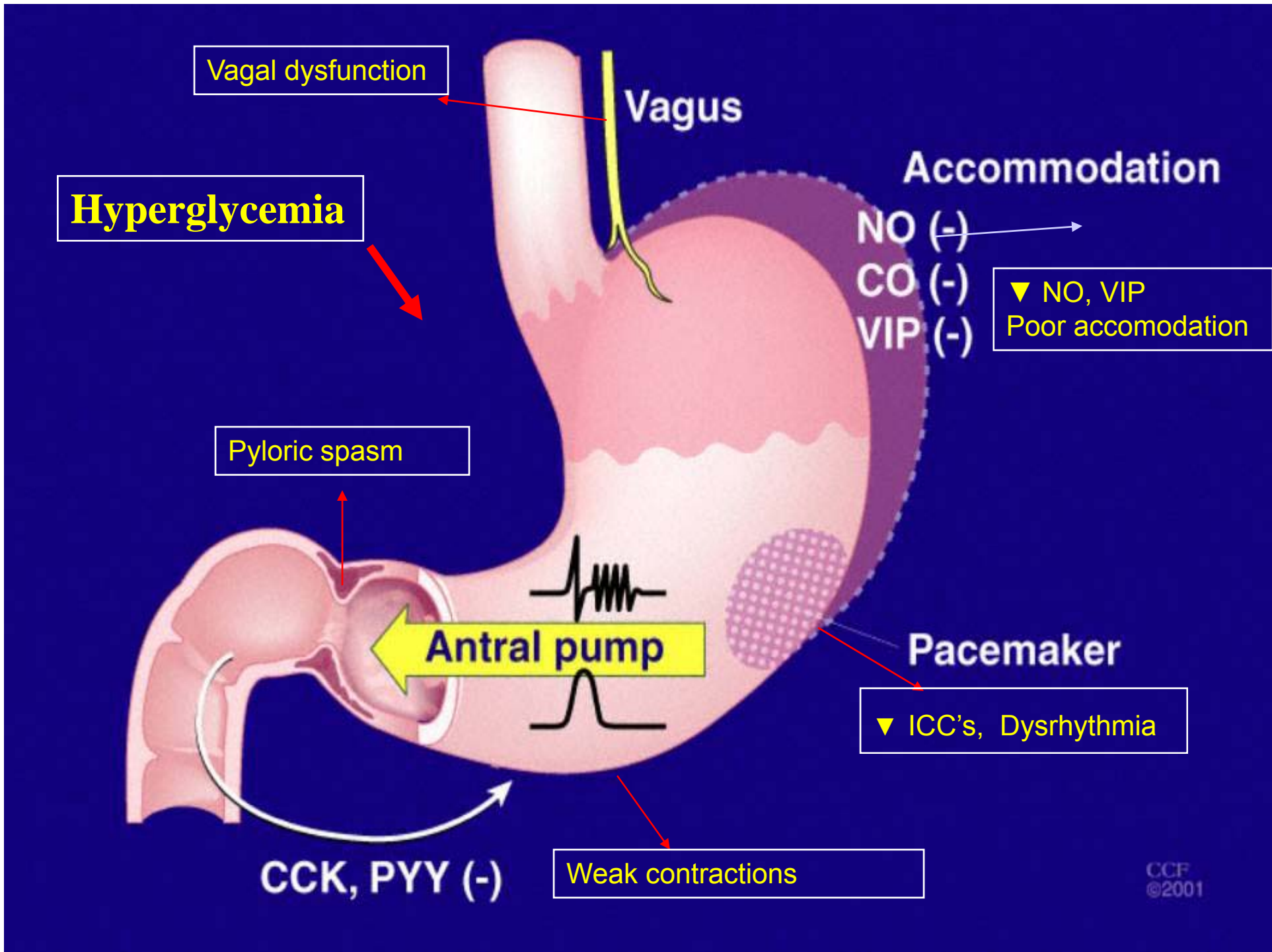


# Objectives

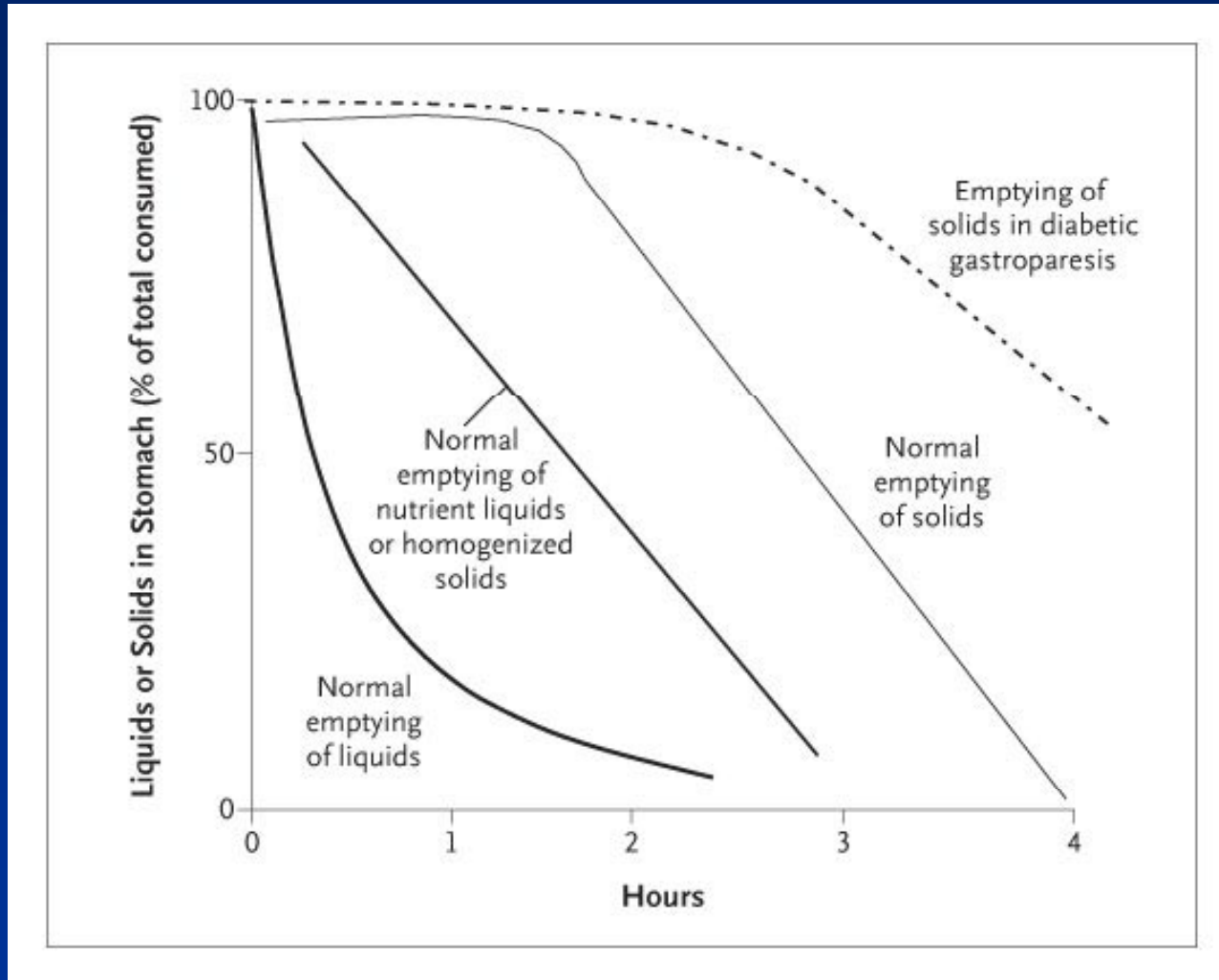
- Physiology of gastric motor function
- Epidemiology
- Evaluation
- **Treatment options**



**Vagus, CCK, PYY (-)**



# Patterns of Gastric Emptying in Healthy People and in Patients with Diabetic Gastroparesis

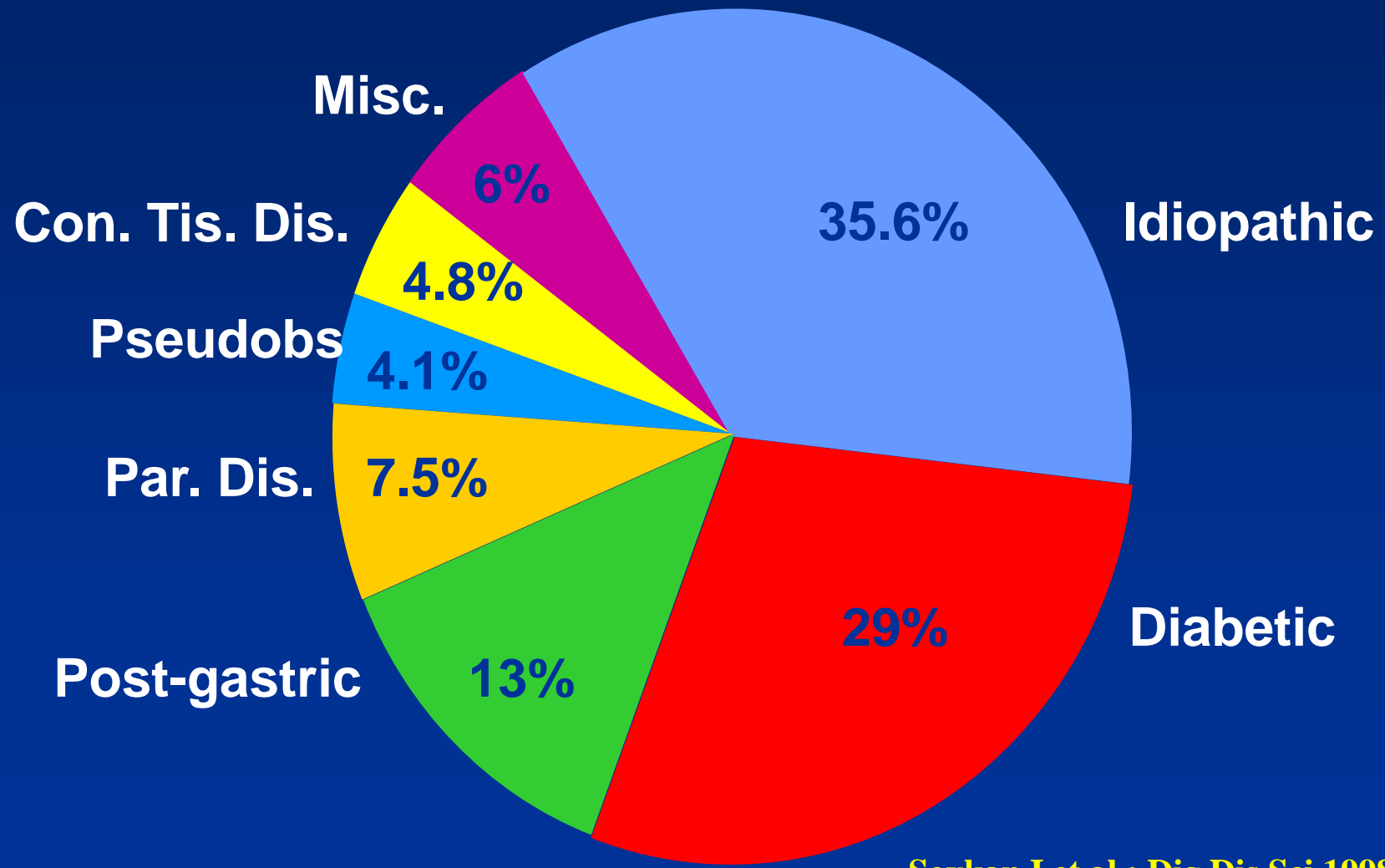


Camilleri M. N Engl J Med 2007;356:820-829



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# GASTROPARESIS (N=146)



Soykan I et al.; Dig Dis Sci 1998.

# Gastroparesis: Epidemiology

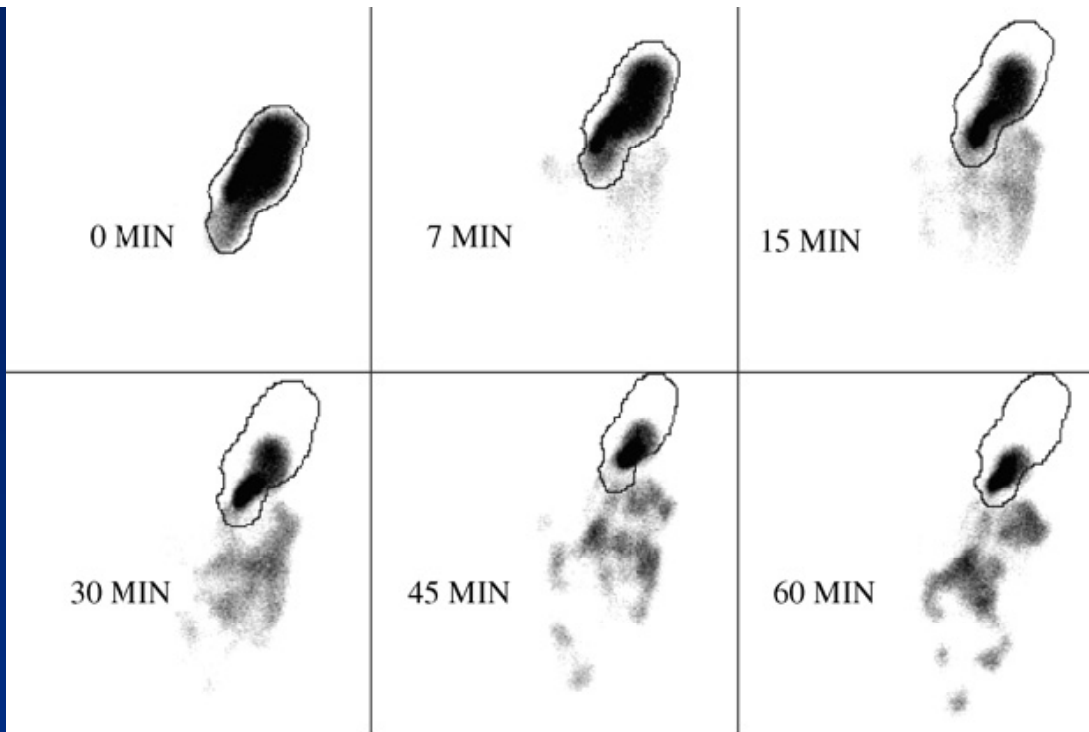
- Prevalence: 24.2 In Olmstead county  
Crohns-133, UC-229 (Jung, Gastroenterology (200))
- More prevalent in females
- Increasing with age (Gastroparesis Concoortium, DDW 2010)
- Heavy health cost burden (Wang, Am J Gastro 2008)
- Long-standing, poorly controlled type II and long standing type 1 DM, multi-organ involvement

## Gastroparesis: Symptoms

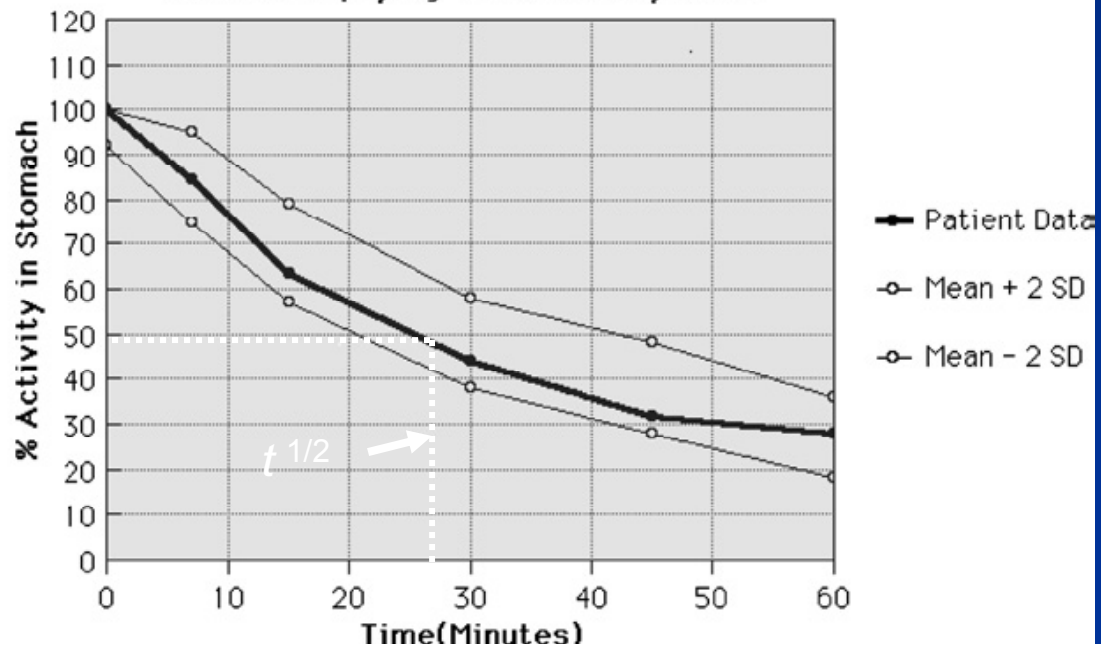
- Early satiety, postprandial nausea or vomiting, bloating, abdominal pain, weight loss
- The result of dysfunction of various gastric segments

# Gastroparesis: Evaluation

- History and physical
- **Exclude organic lesions:**
  - **Obstructive: KUB,EGD, SBFT, CT**
  - Drug related
  - CNS
  - **Pregnancy!**
- **Gastric emptying study**



Gastric Emptying Time Activity Curve



Lin HC, Dig Dis Sci 2005

## Normal values for low-fat, Gastric emptying Scintigraphy

Time	Lower limit gastric retention	Upper limit gastric retention
1 hr	30% *	90%
2 hr		60%
4 hr		10%
$t_{1/2}$ (in Minutes)		132

Consistent with rapid emptying

- 4 hr value increases the detection

• Cremonini F, Aliment Pharmacol Ther 2002

Tougas G, Am J Gastroenterol 2000

## Treatment Principles

- Reduce symptoms
- Rectify causes of gastroparesis (medications), control aggravating factors (glucose control)
- Nutritional status/support

## Management of Gastroparesis

- Dietary modification, Glucose control (long acting insulin in type 2 on oral agents, and in type 1 to minimize postprandial swings in blood glucose, insulin pump, post prandial short acting insulin)
- Medications: **antiemetics**, promotility
- Pain control
- Nutritional support: enteral, TPN
- Surgery: feeding tubes, gastric electrical stimulation (GES)

## Management of Gastroparesis: Diet

- Small frequent meals
- Low fat (liquid fat)
- Mechanically soft → pureed → liquid
- Low residue
- Supplementation: vitamins

## Management of Gastroparesis: Antiemetics

- Phenothiazines: prochlorperazine, promethazine.
- Dopamine antagonists: metoclopramide (10 mg QID), domperidone ( up to 20mg qid). Domperidone requires IND and IRB approval
- Serotonin 3 antagonists: ondansetron (4-8 mg TID)
- Cannabinoid: Dronabinol (5-10 mg BID)

## Management of Gastroparesis: Proton Motility

- Dopamine antagonists: metchloramide, domperidone
- Erythromycin (2-3 mg/Kg TID)

## Antiemetics/prokinetics : Adverse Effects

- Metochlopramide: fatigue , mood change, EPS, tardive dyskinesia. recent “black box” label (TD, 1:17,800 to 1:35,000 prescriptions. **Rao AS, APT 2010**)
- domperidone:▲ prolactin, gynecomastia, galactorrhea. Good safety profile due to poor penetration of blood brain barrier
- Erythromycin: Risk of sudden death due to drug interaction (**NEJM, 2004**)
- Phenothiazines: sedation, orthostatic hypotension, EPS

## Management of Gastroparesis: Medications

- Adequate dosing (strength, frequency)
- Adequate mode of delivery (ODT, liquid, suppository, J-tube)
- Combination therapy

## **Management of Gastroparesis: Alternative Nutrition**

Jejunostomy-tube feeding:

- Simple to operate (pump), cheap, minimal morbidity
- Improves nutritional status, glucose control, reduces hospitalizations

**TPN: expensive, risky, difficult to operate**



## GES for Gastroparesis

- Improvement in symptoms, QOL (open label studies)
- Improved nutritional status **Abell T, JPEN 2002**
- Reduced costs and healthcare utilization. **Abell T, Neurogastro 2005**
- Improved glucose control **Lin Z, Diabetes care 2004**
- Open label studies reported good clinical response **Soffer E, APT 2009**



## **Gastric Electrical Stimulation: Current Status/Indications**

- HDE status, requires IRB
- Diabetic and idiopathic gastroparesis
- Chronic, not responsive to available therapy, particularly when alternative nutrition required

## **Gastric Electrical Stimulation: Complications**

- **Device infection ~ 5-10%**
- **Device migration**
- **Stomach wall perforation**
- **Abdominal pain**
- **In most patients device can be reimplanted**

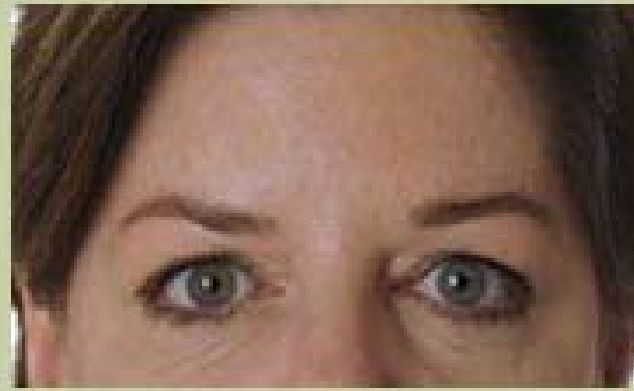
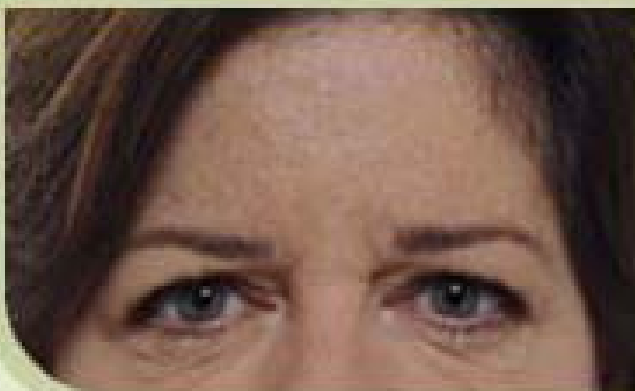
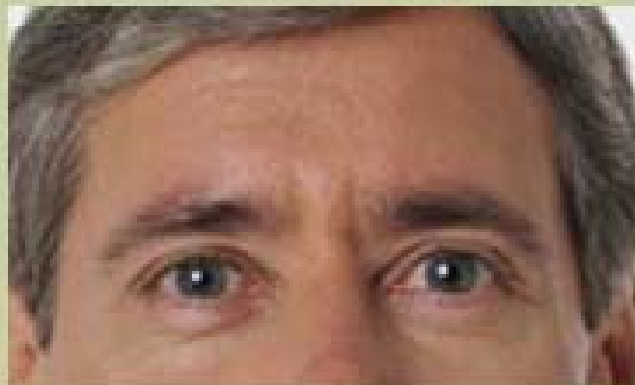
## Gastric Electrical Stimulation: My Take

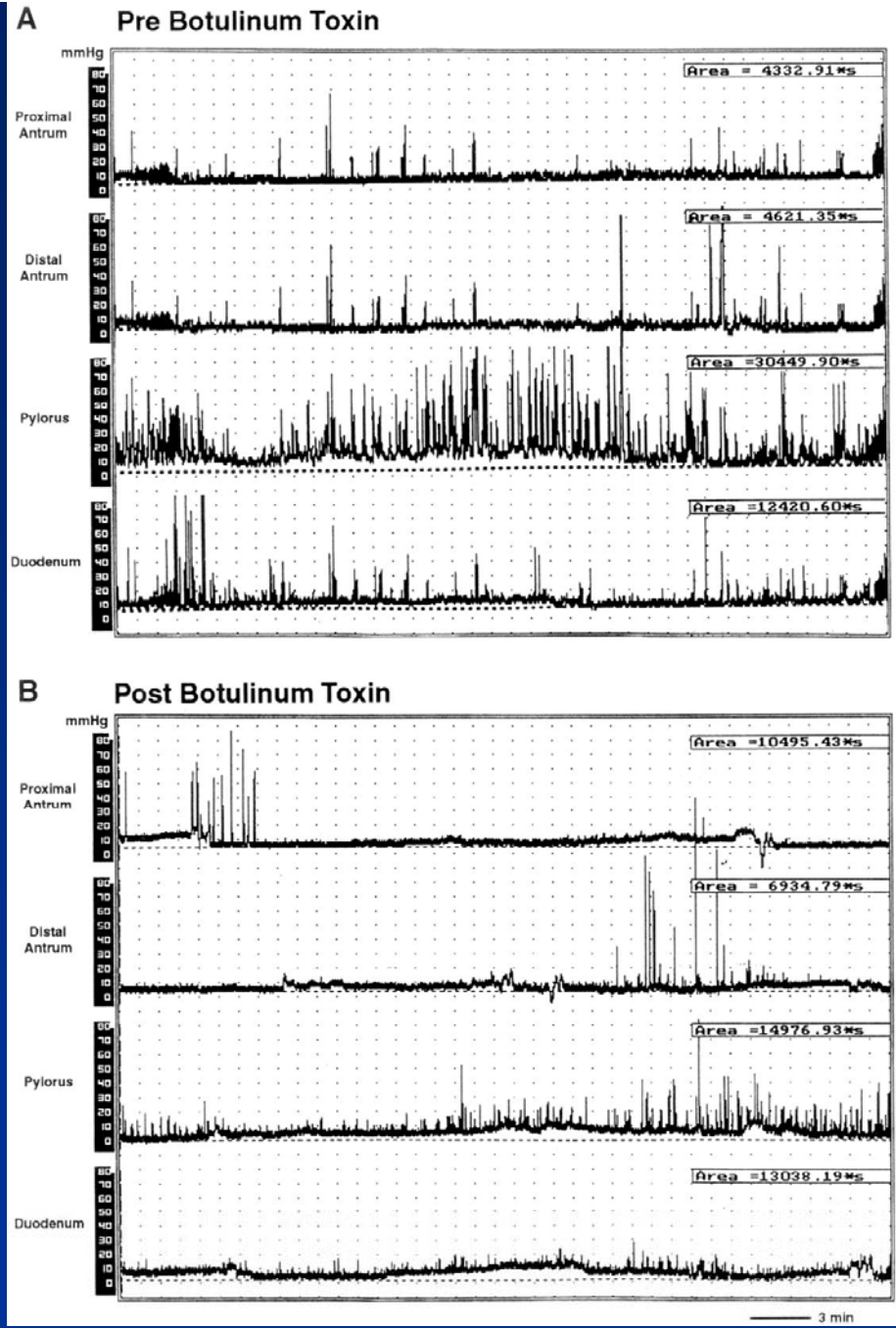
- **Patient selection!!**
  - what are the symptoms?
  - poor predictors: Idiopathic gastroparesis, pain/psychiatric ?
  - **Diabetic control**
- Maximize Rx prior to implantation / consider enteral feeding



Before BOTOX<sup>®</sup> Cosmetic

After





## **BOTOX in Gastroparesis**

- Data on symptoms and gastroparesis: inconclusive
- Remarkable effect in selective patients

# What is in the pipe line?

- Ghrelin analog-TZP-101
- Azithromycin
- Velustrag- 5HT4 agonit