Gastro esophageal reflux disease (GERD)
Montreal consensus defined GERD as a condition which develops when the reflux of stomach contents causes troublesome symptoms and/or complications. The term “troublesome” has been defined as negatively affecting an individual’s sense of well-being.
GERD is a common condition with prevalence rates as high as 40% in North America and Western Europe, and somewhat lower rates in South America and Asia. More than 50% of patients with symptomatic reflux symptoms have no esophageal injury.
Etiology and pathogenesis

A high pressure zone located between the intra-abdominal stomach and the intrathoracic esophagus is responsible for preventing the retrograde flow of stomach contents into the esophagus. This high pressure zone is created by contributions from the lower esophageal sphincter (LES) and the crural diaphragm. The LES is a 4-cm segment of circular muscle in the distal esophagus that is tonically closed because of the intrinsic myogenic properties of this specialized segment. The crural diaphragm augments the LES during times of increased demand, such as straining or coughing, which increase intra-abdominal pressure. A defective LES with reduced basal pressure is one mechanism for the development of GERD.
Etiology and pathogenesis

Prolonged transient lower esophageal sphincter relaxation (TLESR) represents the major mechanism by which GERD occurs. Gastroesophageal reflux also requires a positive pressure gradient between stomach and the high pressure zone. Straining and obesity are examples of conditions that increase abdominal pressure and contribute to a risk of GERD.
Displacement of the cardio esophageal junction above the crural diaphragm, which generally occurs as a result of the presence of a hiatus hernia, contributes to GERD by:

- Loss of the diaphragmatic contribution to the high-pressure zone.
- Increasing the pressure gradient between stomach and distal esophagus.
- Migration of an acid pocket above the diaphragm with increased acid exposure in the distal esophagus.
<table>
<thead>
<tr>
<th>Category</th>
<th>Factor</th>
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<tbody>
<tr>
<td>Lifestyle</td>
<td>Cigarette smoking</td>
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<tr>
<td></td>
<td>Obesity</td>
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<tr>
<td>Eating habits</td>
<td>Eating large meals</td>
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<td></td>
<td>Eating late at night</td>
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<td></td>
<td>Lying supine shortly after eating</td>
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<td>Foods and beverages</td>
<td>Alcohol</td>
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<td>Chocolate</td>
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<td></td>
<td>Citrus fruits and juices</td>
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<td>Coffee</td>
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<td>Fatty and fried foods</td>
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<td></td>
<td>Onions</td>
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<td>Peppermint</td>
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<tr>
<td>Medications</td>
<td>Anticholinergic agents</td>
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<td></td>
<td>Aspirin and NSAIDs</td>
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<td>Calcium channel blockers</td>
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<td>Nitrates</td>
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<td>Progesterone</td>
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<td>Opioids (due to delayed gastric emptying)</td>
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<td>Body position</td>
<td>Bending over, exercising (both result in increased intra-abdominal pressure)</td>
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<tr>
<td>Other</td>
<td>Pregnancy</td>
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<td>Tight-fitting clothing</td>
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<td>Hiatal hernia</td>
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Factors Associated With GERD

- Obesity
- Dietary factors
- Defective oesophageal clearance
- Abnormal lower oesophageal sphincter
  - Reduced tone
  - Inappropriate relaxation
- Hiatus hernia
- Delayed gastric emptying
- Increased intra-abdominal pressure
- Acid-pepsin (bile)
Clinical Picture-Signs & Symptoms

:Esophageal
- Heart burn
- Regurgitation
- Pain (epigastric, chest)

:Extraesophageal
  a. Established:
    - Chronic cough
    - Chronic laryngitis
    - Asthma
  - Dental erosions
Clinical Picture-Signs & Symptoms

:b. Proposed

• Pharyngitis
• Sinusitis
• Idiopathic pulmonary fibrosis
• Recurrent otitis media
Clinical Picture-Complications

- Erosive esophagitis
- Esophageal stricture
- Barrett’s esophagus
- Esophageal adenocarcinoma

Chronic occult bleeding as well as overt hemorrhage also may result from esophageal ulceration.
Diagnosis

Clinical picture: (Differential Dx: infectious esophagitis, pill-induced esophagitis, eosinophilic esophagitis, PUD, NUD)

Upper endoscopy should be considered in
- Patients with suspected GERD who have:
  - An alarm symptoms (dysphagia, significant weight-loss, anemia, or signs of GI bleeding)
  - Patients fail to respond to empirical proton pump inhibitor (PPI) therapy
Table 1. The Los Angeles Classification of Oesophagitis

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>One (or more) mucosal break no longer than 5 mm that does not extend between the tops of two mucosal folds</td>
</tr>
<tr>
<td>B</td>
<td>One (or more) mucosal break more than 5 mm long that does not extend between the tops of two mucosal folds</td>
</tr>
<tr>
<td>C</td>
<td>One (or more) mucosal break that is continuous between the tops of two or more mucosal folds but which involve less than 75% of the circumference</td>
</tr>
<tr>
<td>D</td>
<td>One (or more) mucosal break which involves at least 75% of the esophageal circumference</td>
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</tbody>
</table>
Diagnosis - Upper endoscopy

**LA Classification of reflux esophagitis**

- **LA Grade A**
  - $\geq 1$ isolated mucosal breaks $\leq 5$ mm long

- **LA Grade B**
  - $\geq 1$ isolated mucosal breaks $>5$ mm long

- **LA Grade C**
  - $\geq 1$ mucosal breaks bridging the tops of folds but involving $<75\%$ of the circumference

- **LA Grade D**
  - $\geq 1$ mucosal breaks bridging the tops of folds and involving $>75\%$ of the circumference

*Lundell et al. Gut 1999;45:172-180*
Differential diagnosis: Upper endoscopy

**EOSINOPHILIC ESOPHAGITIS**

**ESOPHAGEAL CANDIDIASIS**
Differential diagnosis - Upper endoscopy

HSV-ESOPHAGITIS

CMV-ESOPHAGITIS
COMPLICATIONS OF GERD-UPPER ENDOSCOPY

BARRETT

PEPTIC STRICTUR
Differential diagnosis-Extraesophageal Manifestations

GERD has been associated with asthma, chronic cough, and laryngitis. It is important to eliminate other non-GERD causes when these symptoms are present. **Laryngoscopy** often demonstrates edema and erythema as signs of reflux induced laryngitis; however, over 80% of healthy persons also have these findings. Laryngoscopy should not be used to diagnose GERD-related laryngitis. A PPI trial is recommended in patients who have typical GERD symptoms and extraesophageal symptoms.
Diagnosis

**Esophageal manometry** is useful for evaluating patients with either dysphagia or atypical chest pain who fail to respond to PPI therapy, and it is indicated before anti-reflux surgery.

**Ambulatory impedance-pH monitoring** using catheter, or wireless capsule may be helpful in the evaluation of patients who have not responded to twice daily dosing of a PPI.
Treatment

Life style modification
Medical Treatment
Surgical Treatment
Endoscopic Treatment
Treatment-Life style modification

- **Weight reduction** is suggested for patients with recent weight gain or for those who are overweight.

- Raising the head of the bed and **eliminating meals within 2 to 3 hours of bedtime** are helpful for nocturnal GERD.

- **Targeted elimination of foods associated with symptoms** (global elimination of proposed trigger foods (caffeine, chocolate, spicy foods, acidic foods such as oranges, and fatty foods) is not recommended).

- **Cessation of alcohol and tobacco use** is universally supported.
Step-Up & Step-Down Approach

- Antacids
- H2 blockers
- PPI therapy

PPI therapy once daily for 8 weeks is the therapy of choice for symptom relief. PPI therapy is superior to H2 blockers for treatment of GERD. It has been shown to offer faster healing rates for erosive esophagitis and decreased relapse compared with other agents. It also has been shown to offer faster and more complete relief of symptoms.
A PPI should be taken once daily 30 to 60 minutes before the first meal of the day.

Patients with a partial response to PPI therapy should have their dose increased to twice daily.

Patients who require long-term maintenance therapy should receive the lowest effective PPI dose, including on-demand or intermittent usage.

Despite earlier concerns that concurrent PPI therapy decreased the activation of clopidogrel, two randomized clinical studies have since failed to show an increased risk of adverse outcomes in patients treated with clopidogrel and PPIs.

PPIs are safe in pregnant patients.
Common adverse reactions to PPIs are **headache** and **diarrhea**. **Dyspepsia** may occur with sudden discontinuation of PPI therapy.

Switching to a different PPI may be helpful if the patient has an adverse reaction or if there is no clinical response; however, outcomes may remain the same with a different PPI.
Other possible adverse reactions include *vitamin (D) and mineral (calcium and magnesium)* malabsorption as well as increased risk of *community-acquired pneumonia*. *Clostridium difficile infection, hip fractures, osteoporosis,* and *cardiovascular events*.

Hip fracture risk may not be increased unless other risk factors are present. Short-term PP! use has been linked to community-acquired pneumonia, but long-term use has not been similarly associated.
The first step in treating refractory GERO is to: - Optimize PPI therapy by verifying correct administration (30-60 minutes before meals), Increasing to twice-daily dosing, or switching to another PP.

If symptoms remain unresponsive, alternative causes should be considered.

In patients with typical symptoms, upper endoscopy should be performed to rule out eosinophilic esophagitis or erosive esophagitis. If the endoscopy does not reveal eosinophilic esophagitis or reflux-related changes, pH-impedance testing should be performed.
Refractory Gastroesophageal Reflux Disease

A negative pH-impedance test likely indicates that PP! therapy should be discontinued and that the patient does not have GERD.

For those with prominent extra esophageal manifestations, referral to an otolaryngologist, pulmonologist, or allergist should be considered.
Treatment

GERD symptoms

Esophageal symptoms (heartburn, acid regurgitation)
- Alarm symptoms\(^a\) absent
  - Therapeutic trial of a PPI
    - If clinical response, continue with PPI regimen at lowest effective dose
    - No or incomplete response
      - Refer to a gastroenterologist for endoscopy and other evaluation

Esophageal symptoms (cough, laryngitis, asthma)
- Alarm symptoms\(^a\) present
  - Refer to a gastroenterologist for endoscopy and other evaluation

- Esophageal features present
  - Therapeutic trial of a PPI
    - No or incomplete response

- Esophageal symptoms/complications absent
  - Explore alternative causes

If clinical response, continue with PPI regimen at lowest effective dose
Surgical treatments for GERD consist of laparoscopic fundoplication or bariatric surgery (the latter for obese patients).

**Indications for surgery include**:
- Patient preference to stop taking medication-
- Medication side effects-
- Large hiatal hernia-

Refractory symptoms despite maximal medical therapy (although patients with medically refractory symptoms may be less likely to benefit from surgery)

Patients should undergo objective testing (such as pH-impedance monitoring to demonstrate true reflux with symptom correlation and manometry to rule out a motility disorder) prior to surgery.
Surgery is most effective in patients with typical symptoms or heartburn and regurgitation that are responsive to therapy. However, approximately one third of patients will require resumption of PPI therapy 5 to 10 years after surgery. Postoperative complications include dysphagia, diarrhea, and inability to belch because of a tight fundoplication. Carbonated beverages should be avoided. Transoral (incision less) fundoplication is a newer therapy that uses a full-thickness suture to create an endoscopic fundoplication; however, there are no long-term data that demonstrate efficacy.
Antireflux Surgery

Nissen fundoplication. The fundus of the stomach is wrapped around the lower esophagus and the edges are sutured together.
Endoscopic therapies for GERD have not been shown to be effective in the long term. Therapies have included thermal radiofrequency to augment the LES, silicone injection to the LES, and suturing of the LES. Early improvement of reflux symptoms has been seen, but long-term benefits have not been shown. Normalized esophageal pH levels have not been demonstrated after endoscopic therapies.
Endoscopic Therapy

Stretta Procedure

1. Balloon inflated with electrodes
2. Radiofrequency applied
3. Tightened junction preventing reflux

Enteryx injection

A
B
C
D
E
F
THANK YOU