



The Association of Reflux and Aspiration with NTM

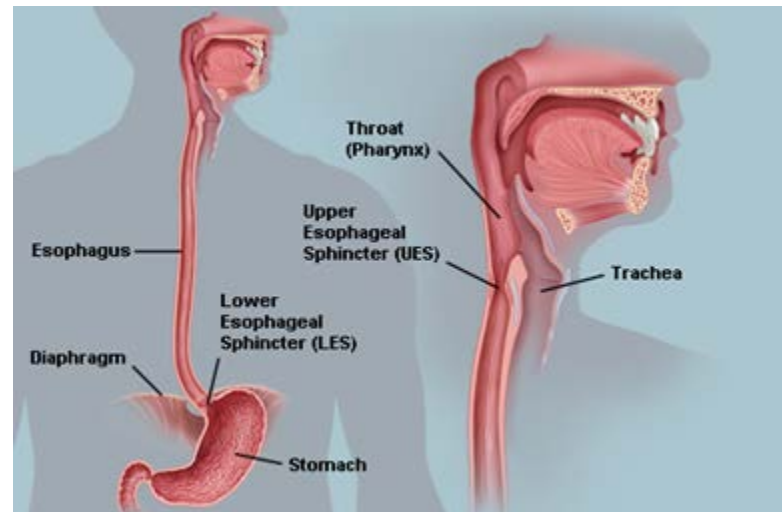
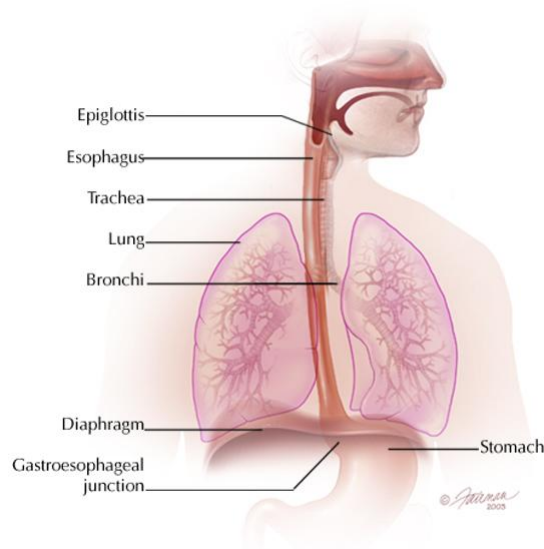
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Aspiration/Reflux and Mycobacteria

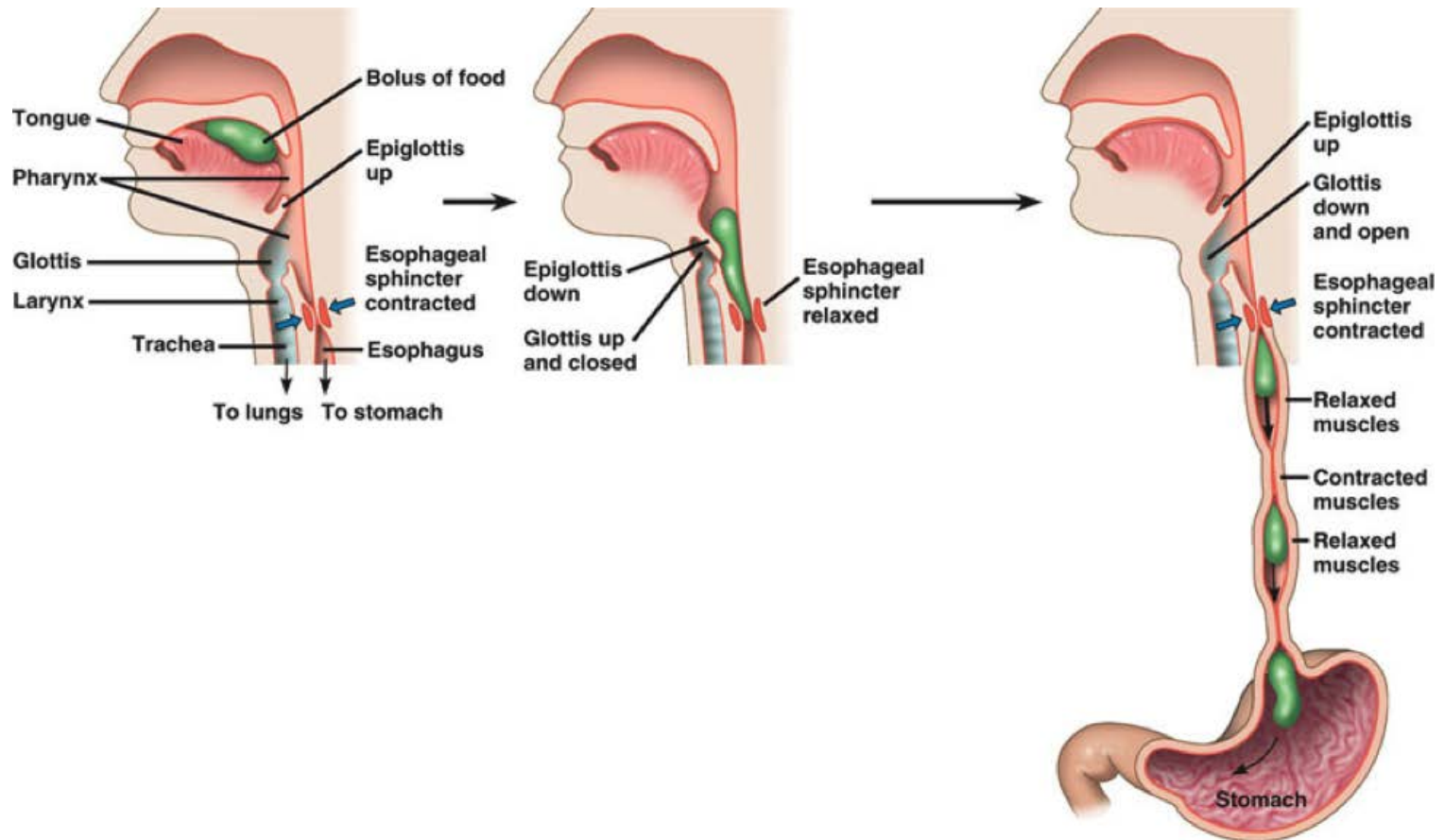
How could they be related???

The Basics

- The Esophagus
 - Tubular structure
 - Major purpose: transport swallowed food from throat to stomach
 - Length: 18 to 22 cm on average

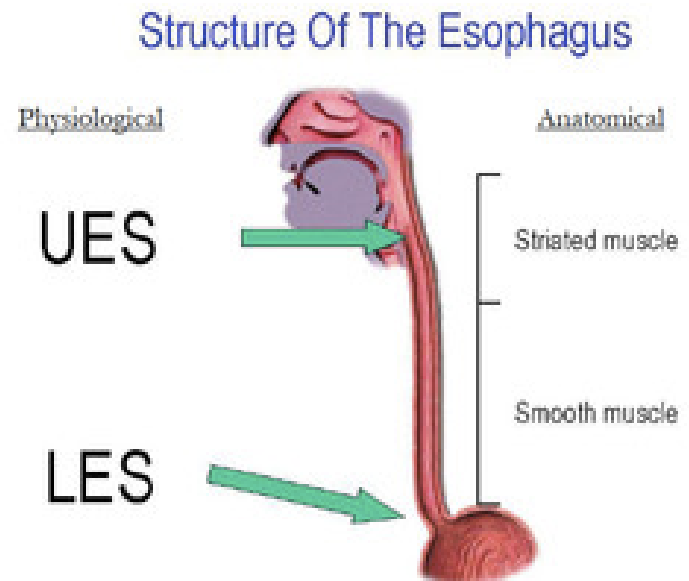


Swallowing



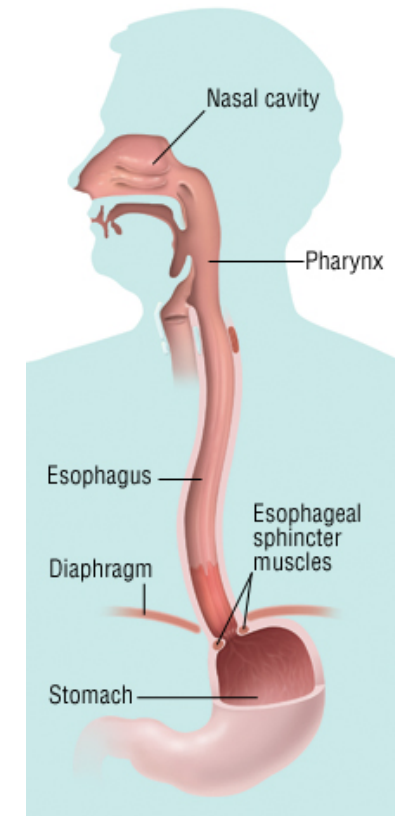
Aspiration – Who is Involved?

- Many specialists and practitioners may be involved along with pulmonologists and primary care
 - Including but not limited to:
 - Oral specialists/dentistry
 - Otolaryngologists (ENT)
 - Swallow center specialists
 - Gastroenterologists
 - Esophageal/motility specialists



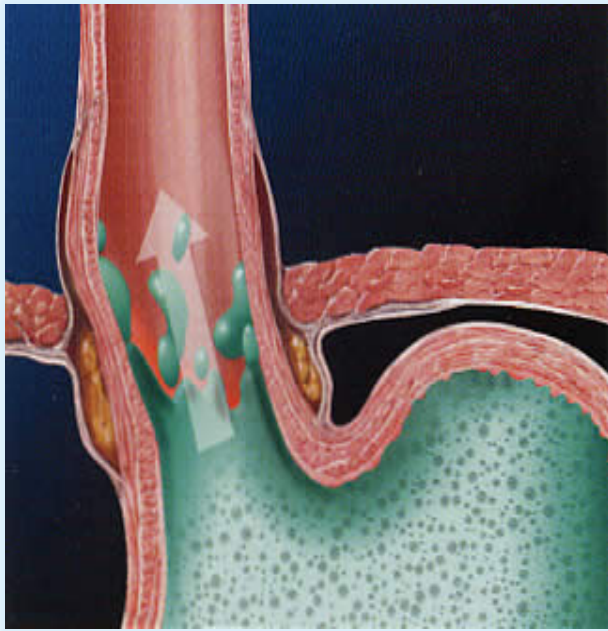
Swallowing Disorders

- An oropharyngeal disorder
 - Could be due to a problem in throat or larynx, may need ENT practitioner involved
 - Could be due to a neuromuscular problem in this area, may need swallow therapist involved and particular swallow xrays
- An esophageal motility (neuromuscular) disorder: problem with pushing food and/or liquid through esophagus into stomach
 - Examples
 - Esophageal spasm, achalasia
 - Can result in contents ascending up into airway
- *These problems may be mild and patient may not know there is a swallowing “problem”



Esophageal Disease

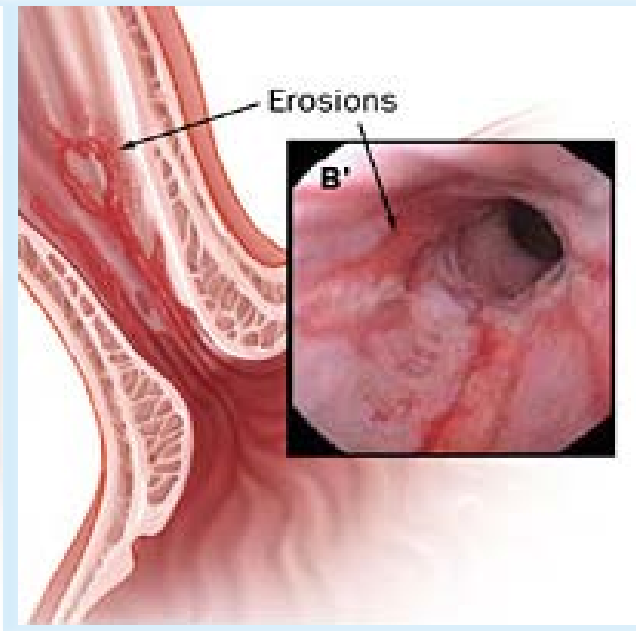
- **Gastroesophageal Reflux Disease (GERD)**
 - Definition: a condition that develops when the reflux of stomach contents causes troublesome symptoms and/or complications



Gastroesophageal reflux



Symptoms

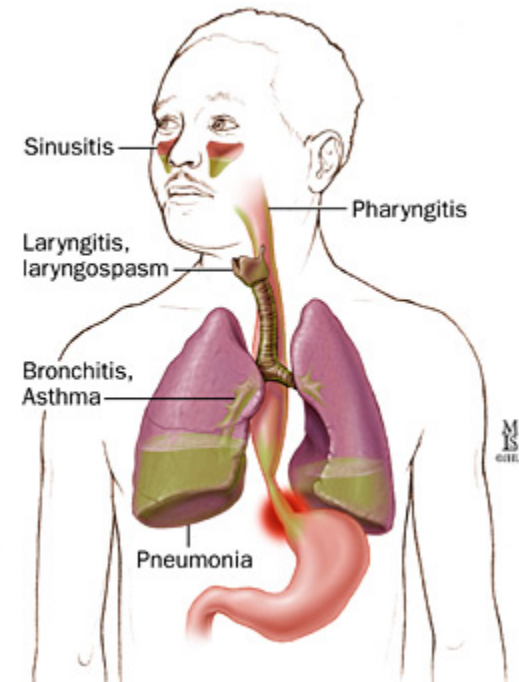
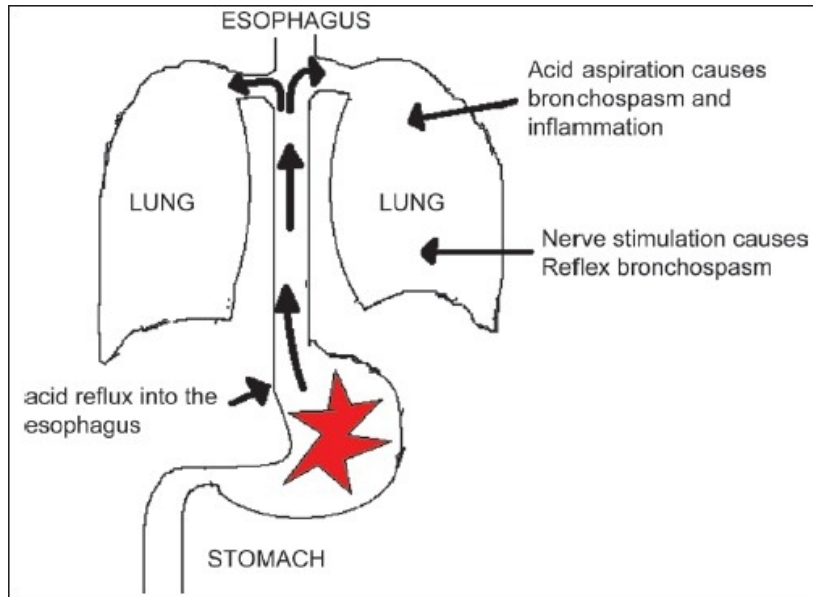


Damage

Symptoms

- Typical symptoms
 - Postprandial heartburn
 - Effortless regurgitation
- Atypical symptoms
 - *Potentially* due to GERD
 - Includes trouble swallowing, chest pain, cough, hoarseness, excessive throat clearing, wheezing, feeling of a lump in the throat

Potential Complications



Current Knowledge

- 2007 study of 58 patients with NTM¹
 - 26% had GERD by pH study and of these only 27% had typical symptoms of GERD
 - The GERD patients had worse bronchiectasis and lung inflammation on imaging
- 2011 review on bronchiectasis and GERD²
 - Included many patients with NTM
 - Large amount of patients (studies 26% to 75%) with bronchiectasis have symptomatic or 'silent' GERD
 - GERD may influence severity of bronchiectasis
 - *Cause and effect has not been established*

¹Koh et al. *Chest* 2007

²Lee et al. *Pulm Med* 2011

Treating GERD

- Often a PPI is chosen
- Potential side effects of PPIs
 - Low quality evidence or conflicting: dementia, cardiovascular events and stroke, kidney disease, calcium and bone problems, pneumonia
 - Certain vitamin deficiencies (magnesium and B12) appear rare or are treatable and reversible
- However
 - Understand if **need** to be on this type of drug long-term
 - *Weigh risks versus benefits*

Table. Evidence Supporting the Potential Adverse Effects of Proton Pump Inhibitor Drugs

Source	Adverse Effect	Adjusted OR (95% CI)
Lazarus et al, ³ 2015	Chronic kidney disease	1.50 (1.11-1.90)
Antoniou et al, ⁴ 2015	Acute kidney disease	2.52 (2.27-2.79)
Antoniou et al, ⁴ 2015	Acute interstitial nephritis	3.00 (1.47-6.14)
Cheungpasitporn et al, ⁵ 2015	Hypomagnesemia	1.43 (1.08-1.88)
Kwok et al, ⁶ 2012	<i>Clostridium difficile</i>	1.74 (1.47-2.85)
Eom et al, ⁷ 2011	Community-acquired pneumonia	1.34 (1.14-1.57)
Filion et al, ⁸ 2014	Community-acquired pneumonia	1.05 (0.89-1.25)
Zhou et al, ⁹ 2015	Bone fracture	1.33 (1.15-1.54)

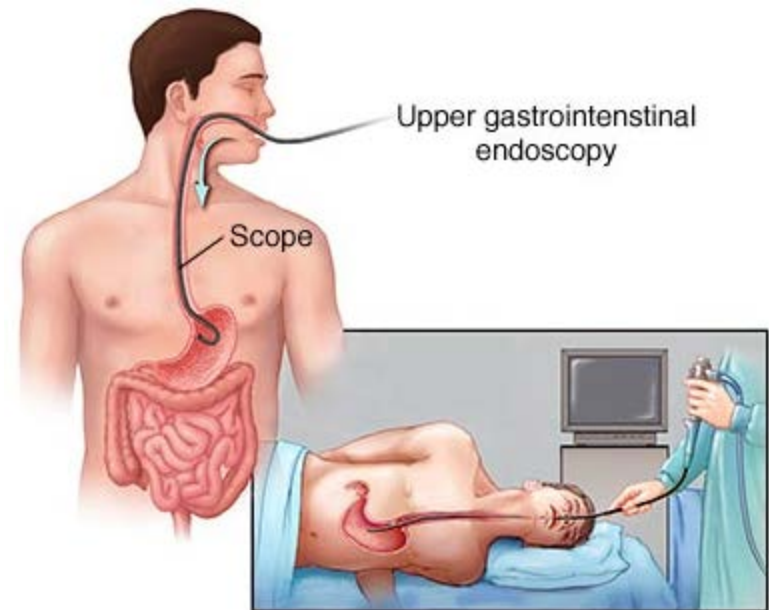
Abbreviation: OR, odds ratio.

Questions Needing Answers

- Does GERD predispose a patient to develop NTM?
- Can GERD make NTM worse?
- If GERD is involved, is the problem from acid, bile, or any type of reflux?
- How should we treat GERD in patients with NTM?
- Could an esophageal motility or swallowing problem complicate the picture?
- ***The answers to these questions remain very individualized***

Procedures to Help

- Upper endoscopy
 - Procedure through mouth with anesthesia
 - Good for looking at lining of esophagus and excluding complications in the esophagus from GERD
 - Cannot disprove GERD
 - Minimally useful for motility of the esophagus



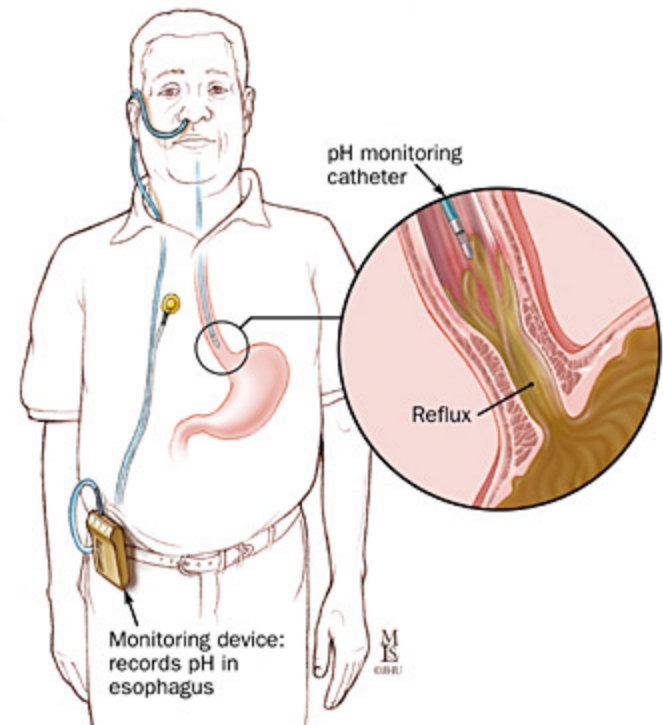
Procedures to Help

- pH study #1:
wireless pH capsule
 - Small capsule placed on endoscopy
 - Transmits acid data to recorder on outside of body for 48-96 hours
 - Capsule falls off on own and does not need another procedure to retrieve
 - Recorder returned by patient when recording has stopped



Procedures to Help

- pH study #2:
pH-impedance testing
 - Catheter through nose and into stomach, attached to a recorder worn by patient
 - Records acid, bile and all liquid reflux for 24 hours
 - Recorder returned the next day by patient and data is then downloaded



Procedures to Help

- Esophageal manometry
 - Deciphers if there is a motility problem in esophagus
 - Catheter placed through the nose and attached to computer on the outside of body
 - Study takes 5 to 10 minutes, about 10 swallows of liquid needed
 - Catheter is then removed and data is interpreted by physician



GOAL

Utilize specialty swallowing and esophageal testing to identify and appropriately treat esophageal disorders in our patients with NTM

Thank You

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