



# Swallowing (Deglutition)

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Dr. Mohammed Alzoghaibi

# Stages of Swallowing (Deglutition)

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- Oral stage (voluntary)
  - Pharyngeal stage
  - Esophageal stage
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# Swallowing (Deglutition)

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- Vagus & glossopharyngeal nerves for upper 1/3
  - Vagus nerve innervates the lower 2/3
  - Vagotomy → ENS takes place
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# Swallowing (Deglutition)

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Brain Stem (medulla & pons)  
(swallowing center)



CN V, IX, X & XII

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# Swallowing (Deglutition)

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Swallowing can be divided into:

- ***Voluntary stage of swallowing***

- Bolus → voluntarily squeezed or rolled posteriorly against the palate
- Swallowing cannot be stopped

- ***Pharyngeal stage of swallowing***

- Bolus reaches posterior mouth & pharynx → stimulates receptors → initiate series of automatic pharyngeal muscle contraction
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# Automatic pharyngeal muscle contraction:

- Soft palate is pulled upward and prevents the reflux of food to nasal cavity
- Palatopharyngeal folds are pulled medially to approximate each other – form a sagittal slit
- Vocal cords are approximated
- Larynx is pulled upward & anterior by neck muscles
- Epiglottis swing backward over the opening of larynx

N.B. removal of epiglottis does not cause serious debility in swallowing.

# Automatic pharyngeal muscle contraction:

- Upward movement of larynx moves up & enlarge opening of esophagus
- Upper 3-4cm of esophagus relaxes
- Muscular wall of pharynx contracts to push the food downward (propulsive contraction)

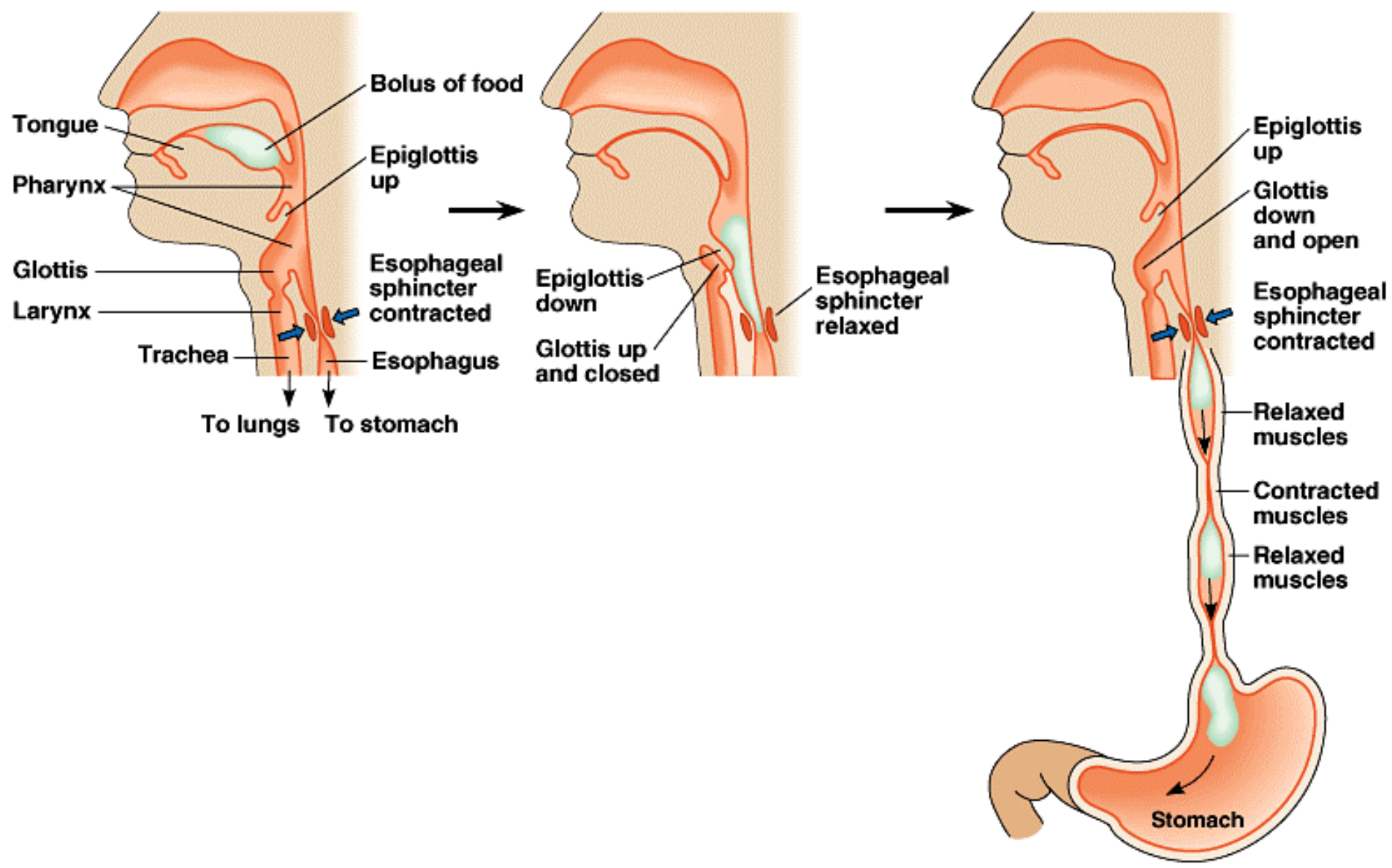
N.B. pharyngeal stage lasts for < 2 sec

# Swallowing (Deglutition)

## ■ *Esophageal stage of swallowing*

- Conducts food rapidly to the stomach
- Two types of peristaltic movements:
  - 1° peristalsis:
    - continuation of a peristaltic wave
    - begins in pharynx & spreads into esophagus
    - passes in 8-10 sec
  - 2° peristaltic waves:
    - results from the distention of esophagus
    - begins if the 1° wave failed to push the food down





# Receptive relaxation of stomach

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- As the waves of peristalsis pass thru esophagus to stomach, a wave of relaxation precedes the peristalsis, which transmitted thru myenteric inhibitory neurons
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# Function of lower esophageal sphincter (Gastroesophageal sphincter)

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- above the junction of esophagus with stomach by 3cm
  - remains tonically constricted
  - peristaltic swallowing wave passes down esophagus → receptive relaxation of gastroesophageal sphincter → allow food go easily to stomach
  - Sphincter does not relax satisfactorily → condition called **achalasia**
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# Esophageal reflux can be prevented by:

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- Gastro-esophageal sphincter
  - Valve-like mechanism: short portion of the esophagus that extends beneath the diaphragm before opening into stomach
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