

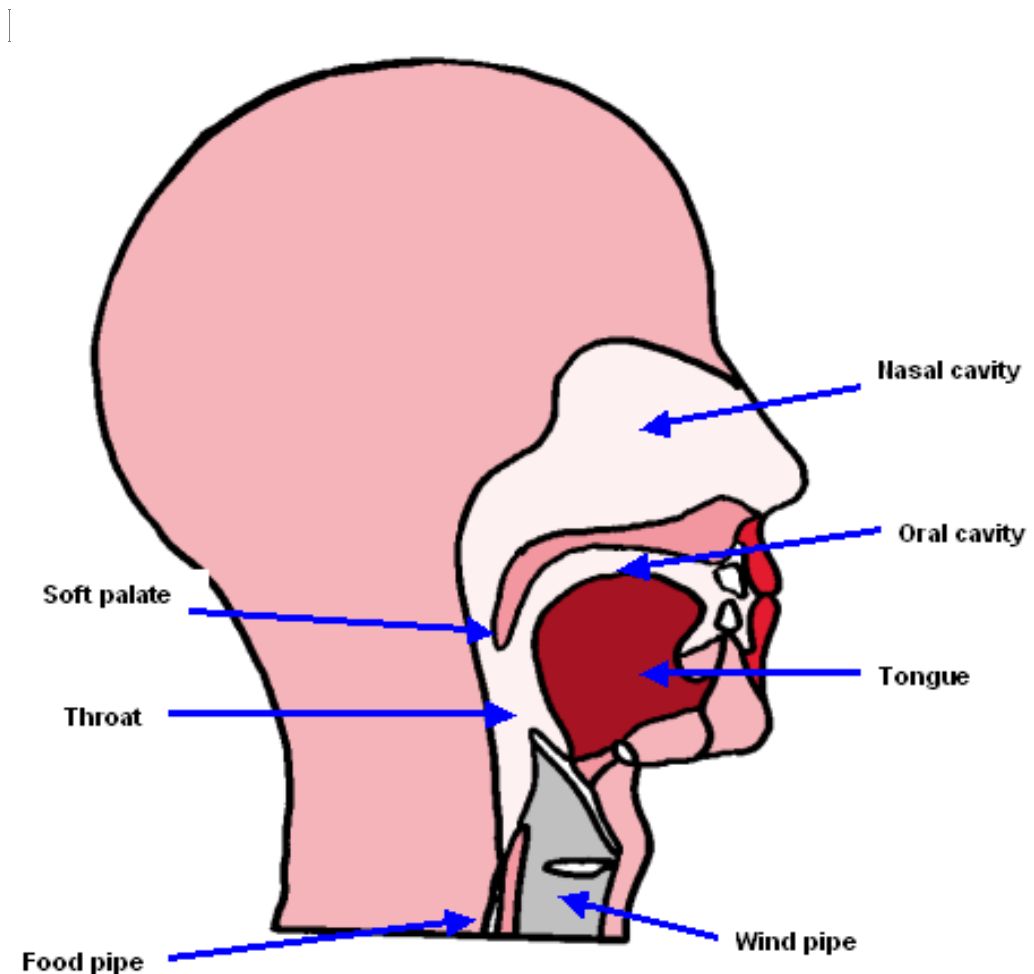
Normal Swallow

Swallowing is a very complex process. It involves good sensation, muscle control, the ability to manipulate/control food/drinks in the mouth, a prompt/effective swallow reflex and coordinated breathing/swallowing. The swallowing action occurs very rapidly. Food and drinks are moved from the back of the mouth to the stomach in only a few seconds.

The first part of swallowing requires smooth coordination of the lips, teeth, tongue and cheeks and other oral structures to form food and fluid into a manageable mass called a "bolus". This involves biting, chewing and moving food/fluid around the mouth using the tongue. The bolus is then pushed to the back of the mouth ready for swallowing. This part of the swallowing process is under our *voluntary control*.

When the bolus reaches the back of the mouth, the swallow reflex is triggered. The bolus is pushed into the throat, down the food pipe and to the stomach within seconds. This part of the swallowing process is *not under our voluntary control and is reflexive*.

Anatomy Involved in Swallowing:



Swallow stages

There are 4 stages of swallowing:

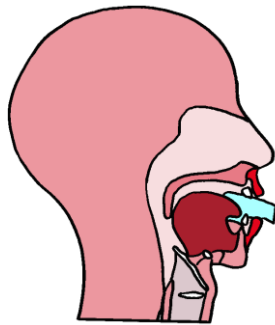
1. Oral Preparatory Stage
2. Oral Transport Stage
3. Pharyngeal (throat) Stage
4. Oesophageal (food pipe) Stage

Our body prepares to eat and drink (eg by the smells of food cooking or seeing the food being prepared). We usually have an upright and stable body position (we are usually quite still). We watch the food or fluid momentarily as we load the fork/spoon and/or as it approaches the mouth. We lean slightly forward towards the food or fluid (the food or fluid always comes from below the line of the mouth). We slightly tuck our chin.

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Stage 1: Oral Preparatory Stage

- Muscles of the lips, cheeks and tongue move, shape and manipulate the food or fluid so it can be chewed and shaped into a bolus for swallowing.
- Muscles of the lips, cheeks and tongue work together to move food or fluid into the mouth, to stop food or fluid from falling out of the mouth and also from falling back into the throat before it is ready to swallow.
- Food is chewed into tiny pieces and mixed with saliva and carefully formed into a bolus. This requires coordinated movement of the muscles of the tongue and cheeks and strong healthy teeth and gums.
- This stage can take some time depending on how hard or chewy the food is or how thick the fluid is (ever tried drinking a thick shake through a thin or long straw?)

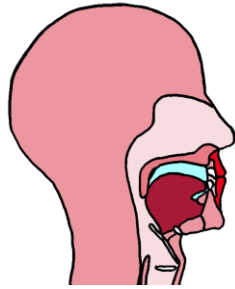


Fluid is drawn into the mouth.



Stage 2: Oral Transport Stage

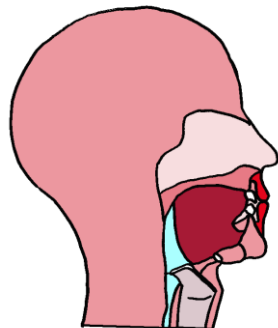
- The bolus is moved to the back of the mouth by the tongue. For a fluid bolus, it is cupped and channelled in the tongue.
- The bolus is held momentarily prior to the swallow (this is the point you could still spit it out).
- The tongue then uses a very strong and efficient wave like action to push the food or fluid bolus to the back of the mouth and towards the throat.
- The oral stage itself usually takes less than a second.
- The tongue forms a seal against the top of the mouth to prevent food or fluid from entering the throat before the swallow reflex is triggered.



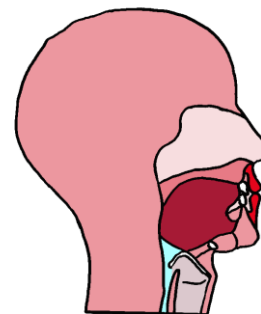
Bolus is held momentarily in the mouth prior to swallowing.

Stage 3: Pharyngeal (throat) Stage

- This stage occurs at the back of the mouth in the top of part of the throat called the pharynx
- The swallow reflex is triggered as the food/fluid reaches the back of the tongue and moves into the throat
- The soft palate at the roof of the mouth moves up towards the back of the throat to close off the nose, so food and fluid does not enter the nasal cavity
- The airway closes with the vocal folds closing tightly and the larynx (voice box) moves up to further protect the airway from food or fluid entering the lungs, breathing stops momentarily while we swallow
- The muscles of the throat also tighten in a wave like action to propel the food towards the stomach



The swallow reflex is triggered.

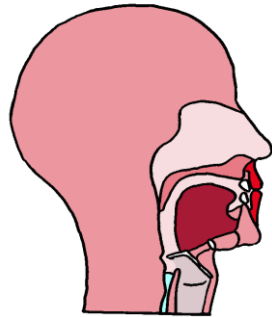


The bolus is propelled towards the stomach.



Stage 4: Oesophageal (food pipe) Stage

- This stage begins as the muscle at the top of the oesophagus is pulled open allowing the food to move from the throat into the food pipe or oesophagus
- The muscles of the oesophagus also work in a wave like action to push the food down the food pipe, through another muscle at the bottom of the food pipe and into the stomach
- When the bolus reaches the stomach, a small, muscular valve prevents any food or drink from refluxing (that is, going back up) into the oesophagus, or towards the lungs.



**The bolus moves down
the food pipe.**

