HICCUPS

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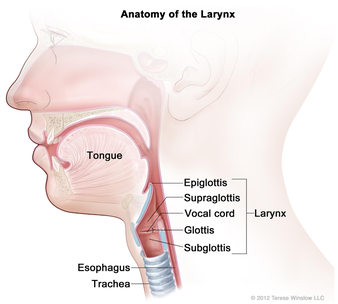
ABSTRACT

The hiccup is an incredibly common and well-known reflex in the human body, yet the intrinsic circuitry driving it, and especially its original purpose remains a topic of discussion in the medical community. This research dissucion will try to piece different recent theories behind the hiccup together and present an accurate, detailed description of the reflex. It goes over different explanations for the reflex, descriptions of the reflex itsef, along with different forms of the reflex. It will then move into a discussion and analysis of hypotheses of the origin of the hiccup.

DESCRIPTION OF THE REFLEX

The Hiccup as a reflex is marked by a rapid, involuntary intake of air, followed approximately .04 seconds later of the closure of the glottis, or the vocal cords. This closure effectively ceases the inspiration, cutting off the airflow to the lungs, and causing the 'hic' sound that gives the reflex its name.



This action may only occur once, although frequently it can occur between 4-60 times per second for a duration of several minutes or hours, in a 'hiccup attack.' The exact trigger for these attacks are still under speculation, but it is generally accepted that excessive, rapid stomach distension or intense emotion are the main causes.

CHRONIC HICCUPS

Most hiccup attacks occur for less than 48 Hours, with many of them being of a mush shorter duration than even that. These cases leave no perminant damage to the body and are simply annoying.

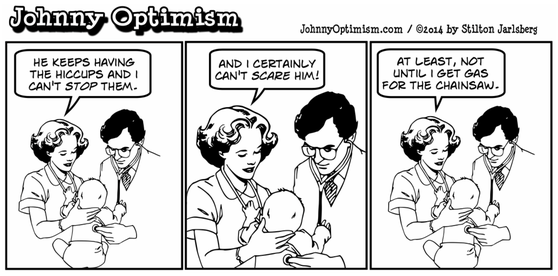
However, there are cases of hiccups of hiccups that last longer than this, and are medically broken down into two categories:

- **Persistant Hiccups** (> 2 days, < 1 month)
- **Chronic / Intractable Hiccups** (> 1 month)

These long-lasting attacks of hiccups can be triggered by an extensive range of causes, usually involving the phrenic nerve. Some relatively common examples include tumors or injuries, surgery, or even extreme stress / fright. Hiccuping is normally accompanied by weight loss, loss of sleep, depression, and other factors. These chronic cases of hiccups, which typically manifest in periods of day-long bouts, can last for decades if untreated.

HICCUP REMEDIES

Because of the mysterious and slighly amusng naure of the hiccup, many mysterious and slighty amusng cures have been created to cease them. Almost all of the home remedies that exist work in the same way, which is to interrupt the reflex arc, the 'latching logic' that keeps the hiccup reflex repeating. These are the maneuvers that are tried first when a patient is being treated. Records of hiccup remedies such as holding breath, drinking a glass of water, rebreathing into a paper bag, and being frightened have been documented and recommended in medical journals since the 19th century.



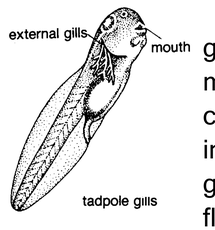
Cures for chronic and persistant hiccups are much more involved, but may be just as varied as cures for the ordinary hiccup. As many cases of chronic hiccups are caused by tumors or obstructions of some kind in the reflex arc, or chain of nerves that cause the hiccup reaction, many last-resort remedies involve some type of surgery to remove the obstruction. In the case of a psychogenic case of persistant hiccups, where the cause is a psychological one rather than being phisical, other types of remedies are applied. Persistant psychogenic hiccups have been cured using techniques such as hypnosis, acupuncture, and even counseling.

HICCUP PURPOSE THEORIES

There has been little research put into the definitive purpose of hiccups, as with chronic cases extrtemely few and far between, and hiccups being seen by most people as an amusing, harmless annoyance (as evidenced by the comics in the remedies section).

This presentation presents some more recent hypotheses and analyses them using biomechanical tools.

GILL HYPOTHESIS



This hypothesis arises from the similarity between gill ventilation in tadpoles and lungfish and the mammilian action of suckling. Both actions require closure of the glottis along with a rythmic suction in. In tadpoles, this action moves water across the gills while closing the trachea to keep water from flooding the lungs. This action is mirrored in animal sucking, except the fluid is being moved into the stomach instead of across gills. This suggests that the hiccup reflex may just be an artifact of evolution from our amphibian ancestors.

SUCKLING HYPOTHESIS

This theory states that the purpose of hiccups are to evacuate gas from the stomachs fo young animals during suckling. The reasoning seems to explain the fact that hiccups are most prevalent in younger animals and are only present in mammals. The hiccup does this by causing a drop in pressure in the chest, which can bring any gas trapped in the stomach from swallowing air into the esophagus, to be released the next time the mouth opens. In this way more room in the stomach can be reserved for milk, giving an evolutionary advantage.

AMNIOTIC REGULATION HYPOTHESIS

The amniotic regulation Hypothesis states that hiccups' function has to do with regulation of amniotic fluid in the womb. This and several other theories come from the fact that as much as 12% of all time in the womb is spent hiccuping, on average. The drop in pressure in the chest caused by hiccups can be used to draw amniotic fluid into the primitive gut to correct an imbalance. This would be a preventative measure to protect against too much amniotic fluid.