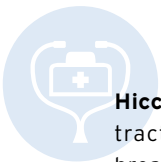


HICCUPS

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Hiccups involve an involuntary and spasmodic contraction of the diaphragm, the main muscle used in breathing which is positioned at the base of the lungs, separating the thoracic cage from the abdominal cavity. This muscle is controlled by the nerve centres which regulate breathing, and so under normal conditions its functioning is synchronised with all the other structures involved in breathing. However, if some factor exerts an anomalous influence on the muscle, or on the nerves or nerve centres which control it, an asynchronous, spasmodic contraction may occur: as a result of its spontaneous contraction the diaphragm will suddenly distend the thoracic cage causing an abnormal intake of breath, as the lungs drop rapidly and pull down the trachea and larynx. As a result of this action, and the force of the current caused by the sudden intake of air, the vocal cords of the larynx are drawn closer together, shutting the air off and causing the typical guttural sound which accompanies a hiccup. And as the movement of the diaphragm is asynchronous, the pace of breathing is affected and the action will generally be repeated several times, over a course of minutes or even longer periods, until it finally stops, unless some measure is taken to halt the cycle and return the whole process to normality.

Few conditions are as common as the hiccups, and it would be truly exceptional if an individual were not to

suffer from an attack at sometime during their life. While this is generally a commonplace disorder which will spontaneously subside and is of no seriousness, it can prove truly annoying, and at times problematic. Which may be why a thousand and one remedies have been dreamt up, some of which do help as they interrupt the sequence of factors involved in triggering and sustaining the episode.

The causes of hiccups can vary considerably, as the sudden contraction of the diaphragm could be triggered as a response to a stimulus from the muscle itself or otherwise the nerves or structures of the central nervous system which control its operation. The most common cause is an exaggerated distension of the muscle fibres of the diaphragm which, as a reflex response, causes them suddenly to contract, taking them out of sync with the person's breathing. This mechanism may be activated in a wide range of circumstances and disorders, the most common cause being compression of the diaphragm through dilation of the stomach after having eaten or drunk copiously, although any disorder leading to a dilation of the stomach or intestine could generate stimuli triggering hiccups, along with any increase in the size of the abdominal organs.

Another mechanism which could lead to hiccups is the abnormal triggering of nervous impulses in the

structures of the central nervous system which regulate the contraction of the diaphragm. This may occur, for example, in cases of alcoholic intoxication or disorders such as renal insufficiency. Emotional impacts may also generate nervous stimuli serving to contract the diaphragm and give rise to hiccups: when we are anxious we generally breathe more quickly, a process accompanied by an exaggerated elimination of carbon dioxide causing an imbalance in the acid and alkaline substances in the blood, one manifestation of which is hiccupping. Hiccups may also accompany any other condition directly or indirectly irritating the nerves controlling the diaphragm, as will occasionally occur following abdominal surgery.

For as long as the hiccups persist a number of measures can be taken to halt the process, and while these will often prove effective they do not always achieve their goal. The simplest, and perhaps most popular, method is momentarily to distract the attention of the sufferer, an approach with a scientific basis as the anxiety caused by the hiccupping itself causes it to persist. And so if the person affected is given a shock, the most widely employed "traditional method", or is suddenly distracted in some other way it is possible that, by diverting their attention, the nervous system will be able to re-establish the normal respiratory rhythm. Another simple procedure is to hold one's breath at the point of maximum intake in order to distend the diaphragm for a few seconds in an attempt to restart its normal functioning, hence the popular method of breathing deeply and, without letting the air out, gulping down a glass of water non-stop. Compression applied to the top of the abdomen may also work. This may be performed in a seated position by leaning forward, or by stretching out on the ground with the knees bent under the chest. Another useful approach, in particular when the condition is causing considerable anxiety, is for the person affected to breathe into a paper bag, thereby re-inhaling the carbon dioxide which is being eliminated to excess, as an increase of this substance in the blood may prevent the hiccups.

If the above methods fail, other more complex and more effective procedures may be applied to modify the activity of the nerves controlling the diaphragm. The

simplest, unpleasant as it may seem, is to induce vomiting, either by drinking warm salty water or by stimulating the throat. Provoking a sneeze may also help as this will also cause a spasm of the respiratory muscles serving to counter the hiccupping process. If the problem persists, other procedures may be performed under strict medical control, such as compression of the eyeballs or massaging of the carotid artery, or otherwise compression of the phrenic nerve, which can be performed directly with the fingers in the section behind the joint between the sternum and clavicle. On occasion stimulation of the back of the pharynx using a probe introduced via the nostrils has also proved effective.

If the hiccups go on for a particularly long time or become exhausting through their repetition, medical treatment may be required through the administration of sedative or narcotic medication. In extreme circumstances, if all the measures employed fail and the hiccupping continues almost indefinitely, becoming a more serious disorder which can even prevent the sufferer from sleeping, then recourse may be needed to more complex procedures, such as injections to anaesthetise the phrenic nerve and innervate the diaphragm, or even the severing of some of the fibres in a surgical operation. These are, though, truly exceptional cases.



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