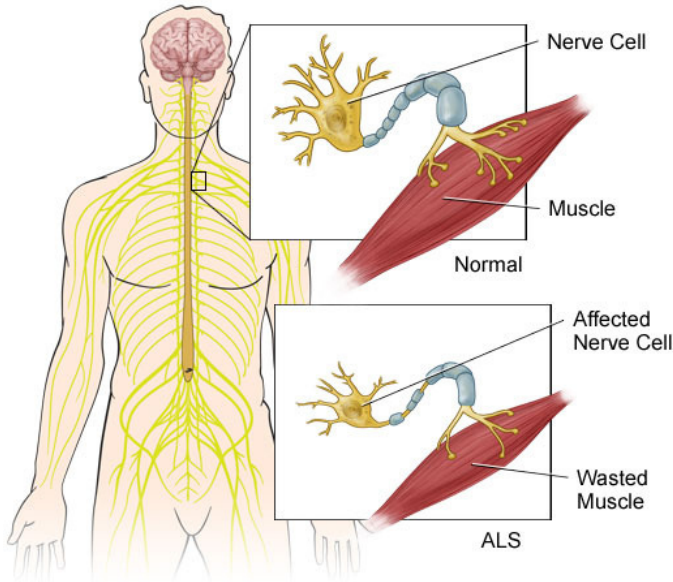


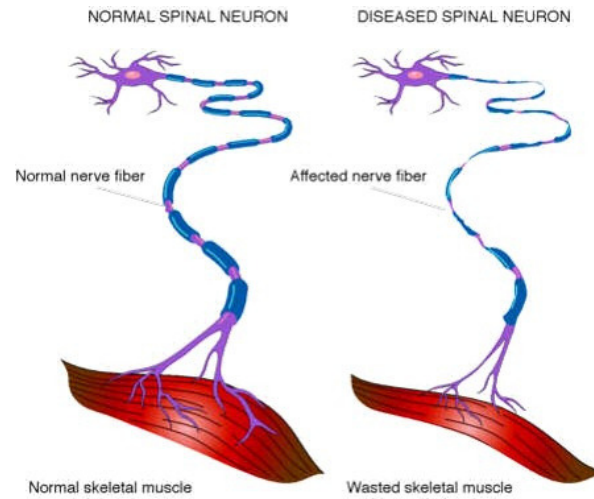
# Amyotrophic lateral sclerosis

Lou Gehrig's Disease

## Amyotrophic Lateral Sclerosis (ALS)



## HOW IT WORKS




ALS is a non-infectious disease that is incredibly debilitating to the victim. The disease injures or kills the upper and motor neurons (types of nerve cells) in the body of the subject. The upper neuron sends the signals from the brain to the spinal cord while the lower neurons send the signals from the spinal cord to the rest of the body. To understand ALS we can use its name, the word amyotrophic can be broken into 3 words: a meaning without, myo meaning muscle and trophic meaning nourishment. While lateral references the side or the side of the spinal cord and sclerosis which is the hardening or scarring in a region. So we can take away that the muscles having a lack of nourishment or signals from neurons leads to a hardening or scarring of affected tissue instead of being replaced by healthy nerves.

## SYMPTOMS



ALS often begins with non-critical symptoms and progresses to become a serious potentially fatal condition. Victims often will begin to feel a weakness or be paralyzed on a limb. The disease then will spread to other limbs creating a debilitating condition which cannot be ignored. Overtime this condition will become devastating, eating away at muscles causing difficulty in breathing, talking, eating, and moving in any way. However, it should be noted that the disease does not affect any brain function and victims, though they have trouble communicating, still are capable of thought. One example is the famed theoretical scientist Stephen Hawking, who has ALS and is a leading scientist in his fields of cosmology and theoretical physics. Once the respiratory muscles are affected, the person will require a breathing apparatus to be able to survive. The majority reason that victims perish is that the respiratory muscles deteriorate so much that the subject cannot breathe and dies.

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## TREATMENT



There is no cure for ALS however the effects of the illness can be slowed through treatment. One known treatment is of a drug known as "riluzole" this is the only drug approved by the FDA to treat ALS however the medication has only a mild improvement on the patient. Patients also require lots of therapy for this illness due to the symptoms effectively paralyzing most areas of the body. The victim will have to undergo speech therapy since your mouth muscles are affected. The patient will need a breathing apparatus so they can breathe due to the deterioration of respiratory muscles. They will need physical support so as to help them with a way to move whether it be a wheelchair or a walker while also making sure the patient is physically active. Overall these treatments are delaying the inevitable at best the average survival time is 3 years however there are cases in which people have survived for 20+ years including Stephen Hawking who diagnosed at age 21 is still alive at 73.

## CAUSES



Researches of ALS have found no definitive cause for the disease however there are theories. It affects all groups of people despite gender, race and ethnicity however the illness is most common in the later years of people's lives. Though some people gain it through heredity only about 5 to 10 percent do. One theory is that it is caused by genetic mutations which can lead to the development of this condition. Another theory is that the patients have a chemical imbalance, evidence has shown that subjects have a higher level of glutamate which in high concentrations can be toxic to nerve cells. A stranger theory though is that a patients immune system may actually be attacking its own nerve cells which has happened to many people for unknown reasons. Finally there is the theory with a scientific backing, military personnel are disproportionately more likely to develop ALS then any other group specifically veterans who landed in the gulf area creating some possible link to toxins or chemicals. Though none of these theories are definitive or proven and ALS is still officially without a known cause.

## STEM CELL RESEARCH



ALS is a very special disease and contains many interesting features. One of these features is that it can be treated with stem cells. Stem cells have been shown to have some effect on ALS and researchers are currently testing experimental treatments using stem cells. One man even was given the ability to walk a two and a half mile race after coming back from when he could only walk with a cane for short intervals. He was treated using stem cells, the researchers opened up his spinal cord and put stem cells where the affected tissue was in the hope that it would replace the dead motor neurons. His symptoms were reversed due to this process an unprecedented victory and the only known case of an ALS patient's symptoms being reversed. However this is not the end for the fight for ALS, that process was highly experimental and though it shows promise there still is a long way to go to cure ALS.