

# Amyotrophic Lateral Sclerosis: A Devastating Neurodegenerative Disorder.

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## Introduction

Amyotrophic Lateral Sclerosis (ALS), also known as Lou Gehrig's disease, is a progressive and debilitating neurodegenerative disorder that affects nerve cells in the brain and spinal cord. This condition primarily affects the motor neurons responsible for controlling voluntary muscles, leading to the gradual loss of muscle control and eventually impacting the ability to speak, eat, move, and breathe. ALS is named after the legendary baseball player Lou Gehrig, who was diagnosed with the disease in the 1930s, bringing it into the public spotlight. Since then, ALS has gained recognition and support from various organizations and individuals worldwide, dedicated to raising awareness and funding research efforts to find effective treatments and, ultimately, a cure [1].

ALS not only takes a toll on individuals diagnosed with the disease but also has a profound impact on their families and caregivers. As the disease progresses, individuals with ALS often require extensive support and care, both physically and emotionally. The loss of independence and the challenges associated with daily activities can lead to increased reliance on others, causing significant emotional strain on patients and their loved ones. Caregivers play a crucial role in the management of ALS, providing assistance with mobility, personal care, communication, and medical needs. The demands of caregiving can be physically and emotionally exhausting, highlighting the need for comprehensive support systems and resources for caregivers, including respite care and counseling services. The ALS community has been instrumental in fostering support networks, connecting individuals and families affected by the disease, and providing a platform for sharing experiences, knowledge, and emotional support. Organizations such as the ALS Association, ALS Society of Canada, and Motor Neurone Disease Association offer a range of services, resources, and advocacy efforts to improve the lives of those impacted by ALS [2].

## Causes and Risk Factors

The exact causes of ALS remain largely unknown. Only a small percentage of cases (approximately 5-10%) are considered familial, meaning they are inherited from family members who have the disease. The majority of ALS cases are sporadic, occurring without any apparent family history. Various factors are believed to contribute to the development of ALS, including genetic mutations, environmental factors,

and the interplay of both. Several genetic mutations have been identified as potential risk factors for ALS, with the most common being mutations in the C9orf72, SOD1, and TARDBP genes. However, these mutations only account for a fraction of cases, and researchers continue to investigate other genetic and environmental factors that may play a role [3]

## Symptoms and Progression

ALS initially manifests with subtle symptoms that may be easily overlooked or attributed to other causes. Common early signs include muscle weakness, twitching (fasciculations), cramps, and difficulty speaking or swallowing. As the disease progresses, the weakness spreads to other muscle groups, causing challenges with walking, writing, gripping objects, and performing daily activities. The progression of ALS varies from person to person. Some individuals may experience a slower decline, while others may have a more rapid deterioration. Ultimately, ALS affects the muscles responsible for breathing, leading to respiratory failure. It's important to note that ALS does not affect a person's intellect, and cognitive function usually remains intact [4].

## Diagnosis and Treatment

Diagnosing ALS can be challenging due to its similarity to other neurological conditions. It typically involves a comprehensive evaluation of symptoms, medical history, physical examination, and a series of tests. These tests may include electromyography (EMG) to assess muscle activity and nerve conduction studies, as well as imaging techniques like magnetic resonance imaging (MRI) to rule out other conditions. Currently, there is no cure for ALS, and treatment focuses on managing symptoms, improving quality of life, and prolonging survival. A multidisciplinary approach involving healthcare professionals from various fields, such as neurology, respiratory therapy, physical and occupational therapy, speech therapy, and nutrition, is crucial to provide comprehensive care and support. Medications, such as riluzole and edaravone, are FDA-approved for ALS and may help slow down the disease progression to some extent. Additionally, assistive devices, mobility aids, and breathing support may be recommended to enhance independence and maintain functionality for as long as possible [5].

ALS research has made significant strides in recent years, offering hope for improved understanding and potential

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treatments. Scientists are investigating various approaches, including gene therapy, stem cell therapy, and novel drug targets, to identify potential therapies that can slow, halt, or reverse the progression of the disease. Advancements in genetics and technology have allowed for a better understanding of ALS at the molecular level, identifying key cellular processes and pathways involved in the disease. These discoveries have opened up new avenues for targeted therapies and precision medicine, tailoring treatment approaches based on an individual's genetic profile. In addition to medical advancements, increased public awareness and support have significantly contributed to the fight against ALS. Fundraising initiatives, such as the ALS Ice Bucket Challenge, have not only raised substantial funds for research but have also brought the disease to the forefront of public consciousness.

## Conclusion

Amyotrophic Lateral Sclerosis is a devastating neurodegenerative disease that affects thousands of individuals worldwide. While there is currently no cure for ALS, ongoing research efforts, combined with advancements in technology and genetic understanding, offer hope for better treatment options and, ultimately, a cure. In the meantime, raising awareness, supporting individuals and families affected by the

disease, and contributing to research initiatives remain critical in the fight against ALS.

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