# Clinical Resource Guide:
# Amyotrophic Lateral Sclerosis (ALS)

## INTRODUCTION TO ALS

Amyotrophic Lateral Sclerosis is a progressive neurodegenerative disease, meaning nerve and brain cells deteriorate and cause a gradual loss of motor neurons. This leads to the inability of the brain to initiate and control muscle movements. Symptoms may start with difficulty swallowing or speaking, but will eventually progress to extreme muscle weakness, paralysis, and ultimately respiratory failure. The pathology of ALS involves the degeneration of motor neurons. There are many causes of neuronal damage including abnormal protein aggregation or mutations, oxidative stress, glutamate toxicity, and inflammation of neurons. Due to the irreversibility of the disease, and lack of a cure, palliative care should be initiated at the time of diagnosis.

## BACKGROUND

ALS often affects people between the ages of 40 and 70. In 2017, there was an estimated 31,000 cases in the United States, with approximately 5000 new cases every year. The exact cause of ALS is unknown. About 10% of cases are known to be hereditarily linked to genes that regulate how neurons function, while the other 90% of cases are thought to be sporadic or random. Some studies suggest that environmental factors, such as contact with lead and other chemicals compounds, may be linked to a higher likelihood of developing ALS. The median length of survival after diagnosis is between 3-5 years. Although, patients below the age of 40 are thought to have a predicted life expectancy closer to 5-7 years.

## Pharmacist Corner Objectives

1.) Identify early symptoms of ALS
2.) Recognize progressing symptoms and potential hospice eligibility criteria
3.) Recall medications used to delay disease progression
4.) Consider scenarios where deprescribing disease modifying medications is the best option

## INITIAL SYMPTOMS

1. Difficulty moving objects and climbing stairs
2. Loss of muscle control in hands and feet
3. Muscle twitching and cramping
4. Trouble with coordination and balance, as well as tripping and falling
5. Uncontrollable periods of laughing and crying
6. Significant fatigue
7. Slurred Speech

 

## ASSESSMENT OF HOSPICE ELIGIBILITY

The transition to hospice involves the decision to shift treatment away from slowing disease progression and maximizing functional status. The new goals of care revolve around managing symptoms and complications of disease progression, while focusing on patient comfort.

Patients will meet at least 1 of the following criteria:

1. Critically impaired breathing as demonstrated by all of the following:
    a. Forced vital capacity (FVC) < 30% of normal
    b. Dyspnea at rest
    c. Patient declines mechanical ventilation
2. Rapid progression of ALS and Critical nutritional impairment
    a. Bed bound status
    b. Needing major assistance by caretaker in all activities of daily living
    c. Oral intake of nutrients and fluid insufficient to sustain life
    d. Continuing weight loss
    e. Dehydration or hypovolemia
3. Patient should demonstrate at least 1 life threatening complication
    a. Recurrent aspiration pneumonia
    b. Decubitus ulcers
    c. Recurrent fever after antibiotics
    d. Inability to maintain sufficient fluid and caloric intake with 10% weight loss during the past 6 months
    e. Serum albumin < 2.5g/dL

| Disease Modifying Medications | | | |
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| **Medication** | **Dosing** | **Drug Characteristics** | **Use in Hospice** |
| **Riluzole (RILUTEK)** | **PO**<br>50 mg BID | • Can prolong survival 2-3 months<br>• Onset of effects can take 4-6 weeks<br>• TIGLUTIK is a liquid form that can be used when swallowing becomes difficult<br>• EXSERVAN is an ODT formulation<br>• Needs liver function monitoring<br>• Adverse drug effects (ADE): nausea, asthenia, dizziness, increased LFTs | • This medication does not relieve symptoms at the end of life, and puts patients at the risk of adverse drug events<br>• With a life expectancy of less than 6 months, there is no anticipated benefit of initiating or continuing this medication<br>• Consider deprescribing |

 

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| **Edaravone (RADICAVA)** | **PO**<br>105mg daily x14 days then 14-day drug free period<br><br>**IV**<br>60mg daily for 10 days then 14-day drug free period | • Has shown to slow the progression on physical decline<br>• Needs liver function monitoring<br>• ADE: bruising, abnormal gait, dermatitis, dyspnea | • This medication does not relieve symptoms at the end of life, and puts patients at the risk of adverse drug events<br>• With a life expectancy of less than 6 months, there is no anticipated benefit of initiating or continuing this medication<br>• Consider deprescribing |
| **Tofersen (QALSODY)** | **Intrathecal**<br>100mg every 14 days for 3 doses<br>then<br>100mg every 28 days | • Only available intrathecally<br>• Specifically for ALS with superoxide dismutase 1 (SOD1) gene mutations<br>• Potentially slows progression of disease, but inconclusive as to how much<br>• ADE: aseptic meningitis, myelitis, increased intracranial pressure, nerve root disorder, leukocytosis, fatigue | • This medication does not relieve symptoms at the end of life, and puts patients at the risk of adverse drug events, and dosage form complications<br>• With a life expectancy of less than 6 months, there is no anticipated benefit of initiating or continuing this medication<br>• Consider deprescribing |

## CLINICAL PEARLS

1. ALS is a terminal disease that proves to be challenging to both patients and their loved ones. It may be beneficial to offer counseling or support group opportunities to the patient and their family.
2. Diagnosis of ALS can be difficult given the lack of a specific diagnostic test, therefore patients with a diagnosis tend to be showing more progressive symptoms.
3. In a hospice setting, ALS management resolves around treating complications and providing comfort for the patient.
4. A “goals of care” discussion with the patient and their loved ones before late-stage disease is necessary.
5. Medications that previously provided benefit for a patient may not continue to provide benefit as disease progresses.
6. When transitioning a patient with ALS to hospice, deprescribing disease modifying medications must be considered.

 

## SUMMARY

ALS is a terminal neurodegenerative disease primarily impacting patients between 40-70 years of age. The disease presents with symptoms involving the loss of motor function. Initial management of ALS involves slowing disease progression with medications, while towards the end of life, managing complications and symptoms becomes the main priority. During the transition to hospice, a “goals of care” discussion, as well as medication deprescribing, become areas of focus for the care team. In hospice, it is essential to prioritize patient comfort and quality of life, which may be difficult for families to understand and accept. Given the life expectancy of patients with ALS and the devastating nature of disease progression, it is essential to discuss a patient’s goals of care and wishes with them and their families, for when their disease inevitably progresses. A comprehensive guide to the treatment of progressive disease complications can be found on this site.

## REFERENCES

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