

**UNSTABLE CONTROL OF BREATHING CAN LEAD TO INEFFECTIVE
NONINVASIVE VENTILATION IN ALS**

Online material

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BULBAR SIGNS AND SYMPTOMS

1.-UPPER MOTOR NEURON

- Increased jaw reflex
- Jaw spasticity
- Jaw stiffness with difficulty opening the mouth
- Spontaneous jaw clonus
- Increased facial reflexes
- Palmental sign
- Dysphagia
- Dysarthria (spastic with slow, strained speech)
- Choking
- Pseudobulbar affect
- Sialorrhea
- Difficulty management of pharyngeal secretions

2.-LOWER MOTOR NEURON

- Weak masseter
- Difficulty maintaining jaw closure
- Poor palatal elevation
- Muscle atrophy and fasciculations
- Incomplete eye closure
- Poor lip closure
- Dysphagia
- Dysarthria (Slurred, nasal and/or hoarse speech)
- Hoarseness