

AMYOTROPHIC LATERAL SCLEROSIS



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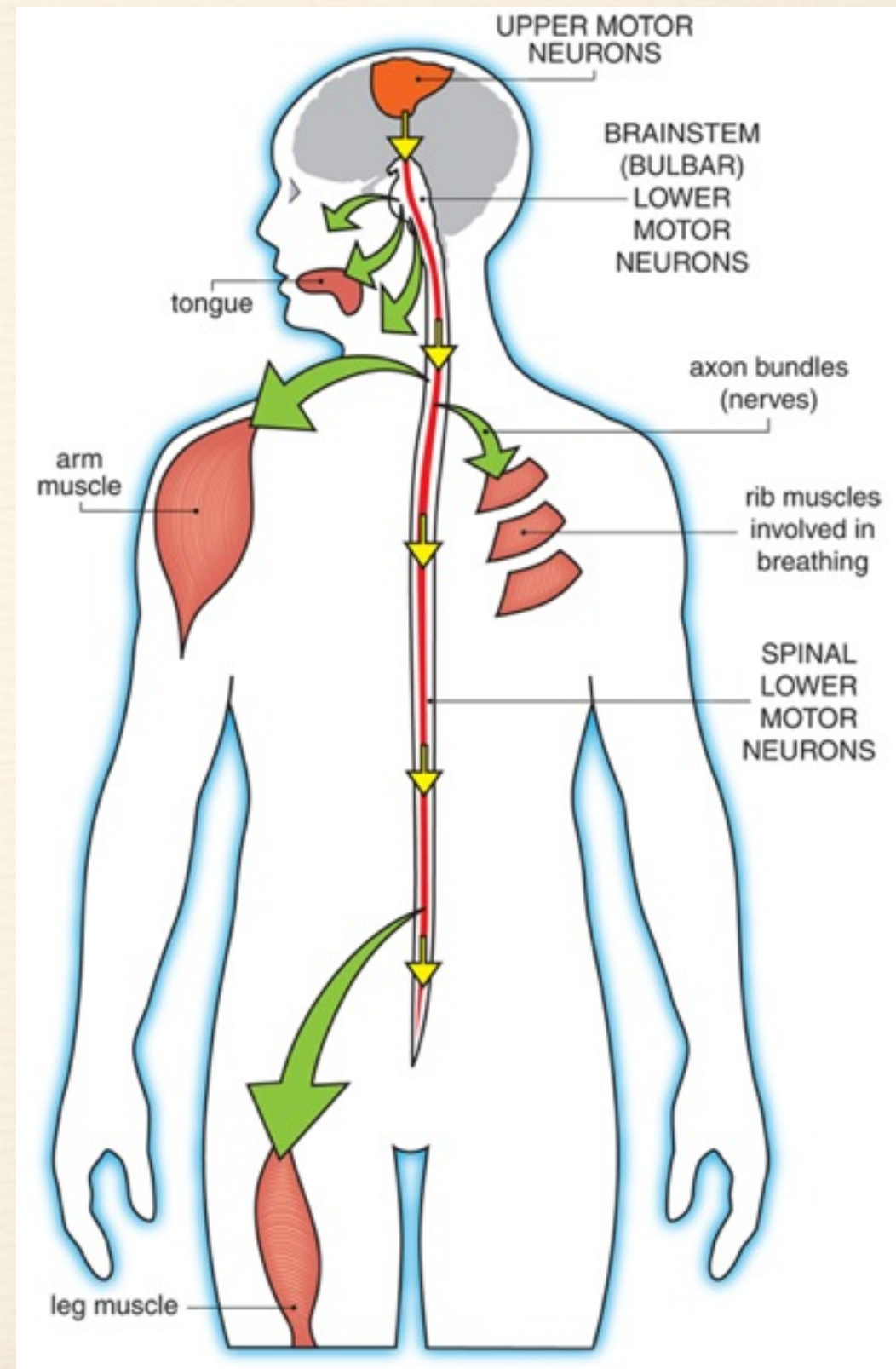
PTA 1410 (Concepts in Physical Therapy)

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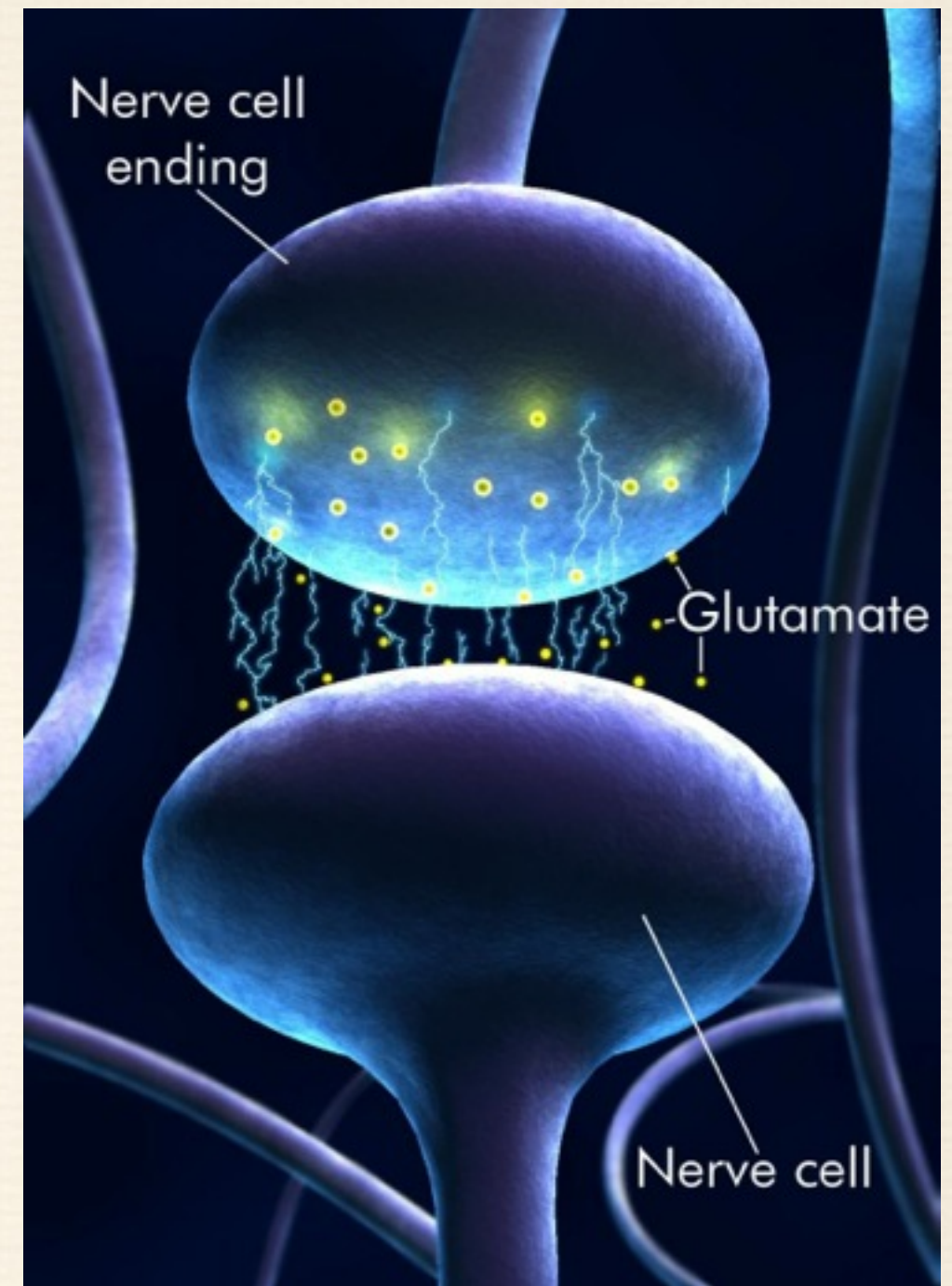
ALS

- ❖ Idiopathic, fatal neurodegenerative disease of the motor system
- ❖ Affects UMN and LMN while sensory system remains intact
- ❖ Ages 40-60; Males
- ❖ Autosomal inherited trait (FALS)
- ❖ Sporadic ALS (No family history of the disease)
- ❖ 70-80%: Limb-onset ALS
- ❖ 20-30%: Bulbar-onset ALS (Middle aged women)



What's in a Name?

- ❖ Amyotrophic -> Muscle atrophy, weakness, fasciculations
- ❖ Lateral Sclerosis -> Hardness to palpation of the spinal cord's lateral columns in autopsy specimens where gliosis follows corticospinal tract degeneration
- ❖ High glutamate concentrations



Lower Motor Neurons S/S

- ❖ Focal, asymmetrical weakness originating in the LE or UE
- ❖ Muscle weakness (UMN o LMN): Distal muscles first
- ❖ Cervical extensor weakness; Progression: Severely flexed neck
- ❖ Decreased ROM causes predisposition to joint subluxations
- ❖ Hyporeflexia, decreased or absent reflexes, muscle cramping
- ❖ Pain sources: Increased skin/bone/joint pressure due to immobility

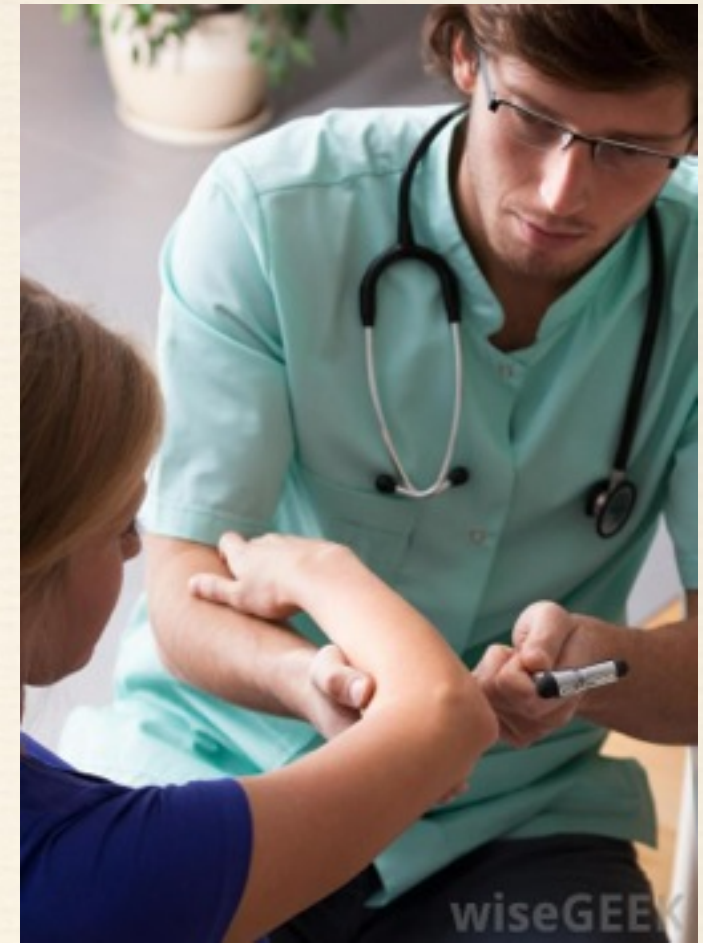


- ❖ My first symptoms from ALS were muscle twitching — called fasciculation — in my chest and back, along with muscle weakness in my right hand. Strangely, several doctors told me it was nothing to worry about.” - Steve Gleason



UMN Impairments

- ❖ Spasticity
- ❖ Hyperflexia
- ❖ Clonus
- ❖ Babinski's
- ❖ Hoffman's



The test is done by tapping or flicking the nail of the middle or ring finger to produce flexion of the index finger to the thumb.



Spastic Bulbar Impairments

- ❖ Dysarthria
- ❖ Inability to project the voice due to tongue, lip jaw, larynx, and pharynx muscle weakness
- ❖ Sialorrhea
- ❖ Pseudobulbar affect



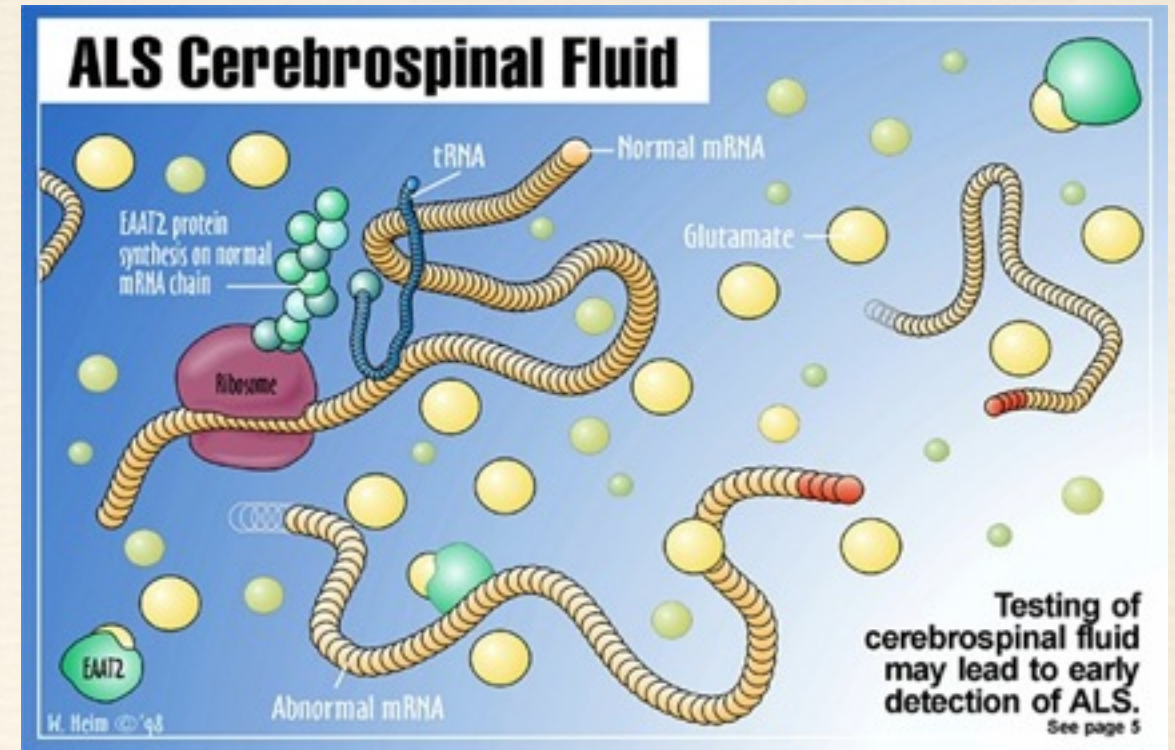
Cognitive Impairments

- ❖ Dementia
- ❖ Behavioral changes
- ❖ Alterations in personality
- ❖ Loss of ability to plan while memory remains intact



Diagnosis

- ❖ Electromyography: fibrillation and muscle fasciculations
- ❖ Muscle biopsy: verifies LMN involvement rather than muscle disease
- ❖ CT scans appear normal until late in the disease process
- ❖ Spinal taps: Reveals a higher protein content in those with ALS.



- ❖ "They took a muscle sample from my arm, stuck electrodes into me, and injected some radio-opaque fluid into my spine, and watched it going up and down with X-rays, as they tilted the bed." -Stephen Hawking

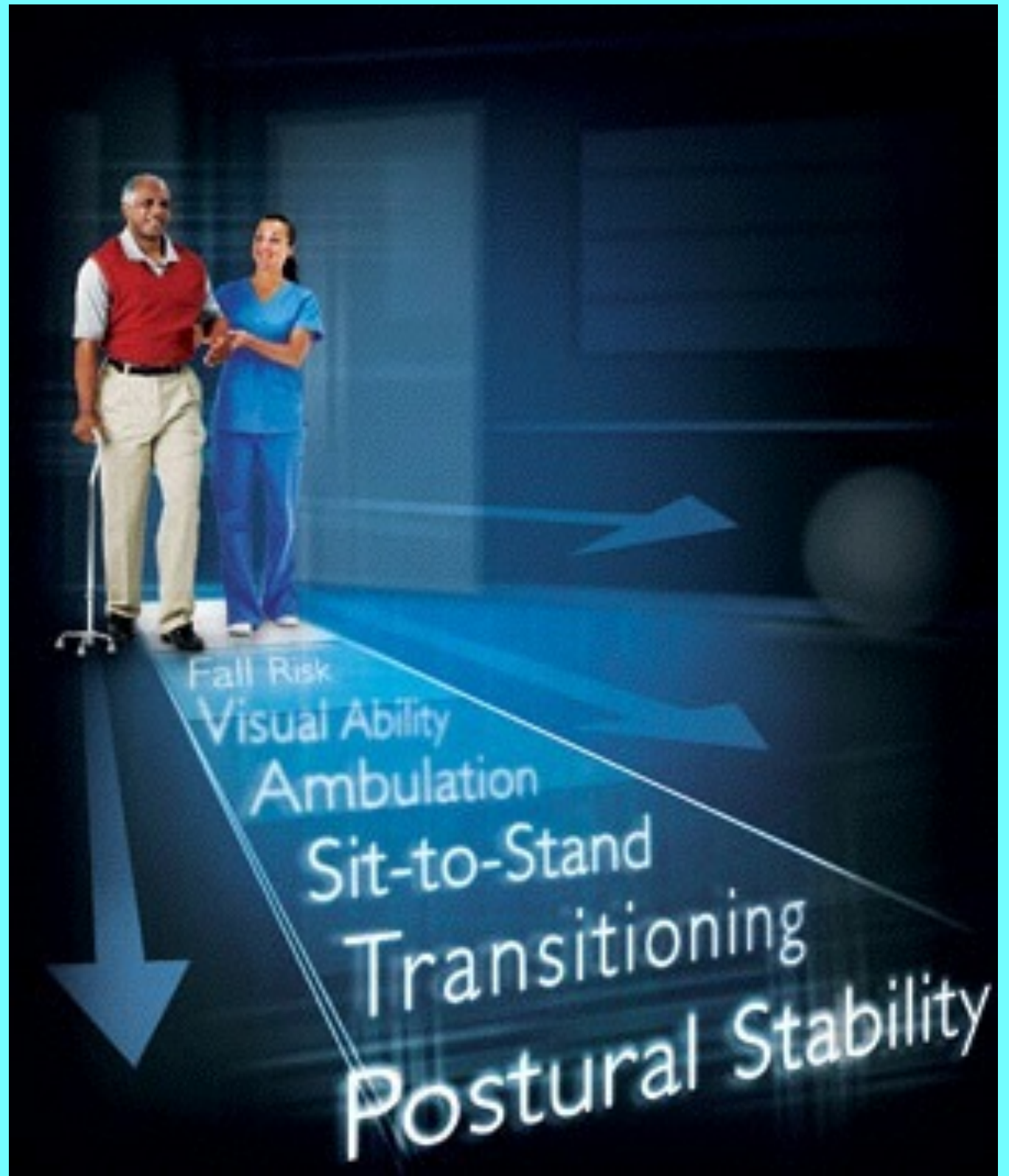
Additional Findings with ALS

- ❖ Vocal cord paralysis
- ❖ Dysphagia
- ❖ Decubiti
- ❖ Respiratory difficulties



Tests/Measures

- ❖ Aerobic capacity and endurance
- ❖ Arousal, attention, cognition
- ❖ Assistive and adaptive devices
- ❖ Environmental barriers
- ❖ Gait, locomotion, balance
- ❖ Motor function
- ❖ Muscle performance
- ❖ Neuromotor development and sensory integration
- ❖ Posture
- ❖ ROM
- ❖ Reflex integrity
- ❖ Ventilation



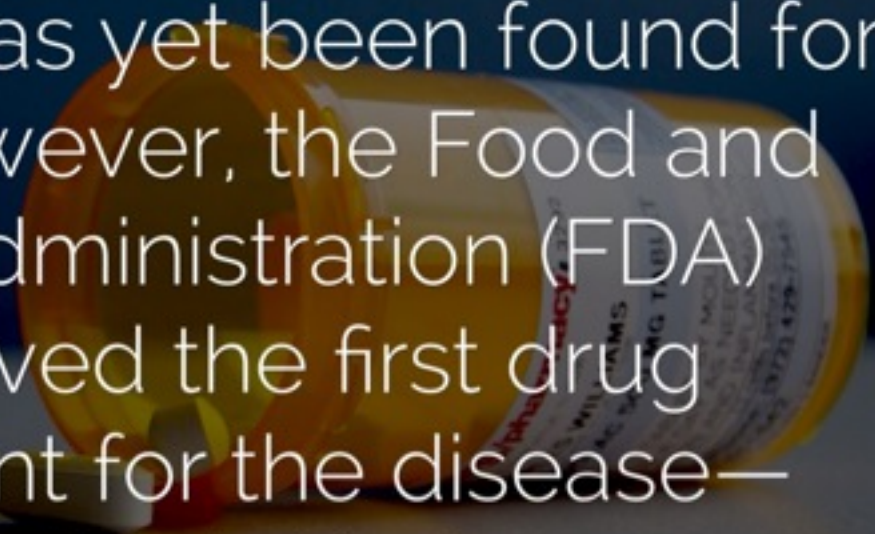
Physical Therapy Interventions

- ❖ Assistive device and gait training
- ❖ Maintenance of ROM, balance, stretching, and strengthening
- ❖ Orthotic support
- ❖ Pulmonary hygiene and breathing techniques
- ❖ Integumentary monitoring
- ❖ Wheelchair modifications
- ❖ Low-impact aerobics
- ❖ Energy conservation techniques



Is there a cure?

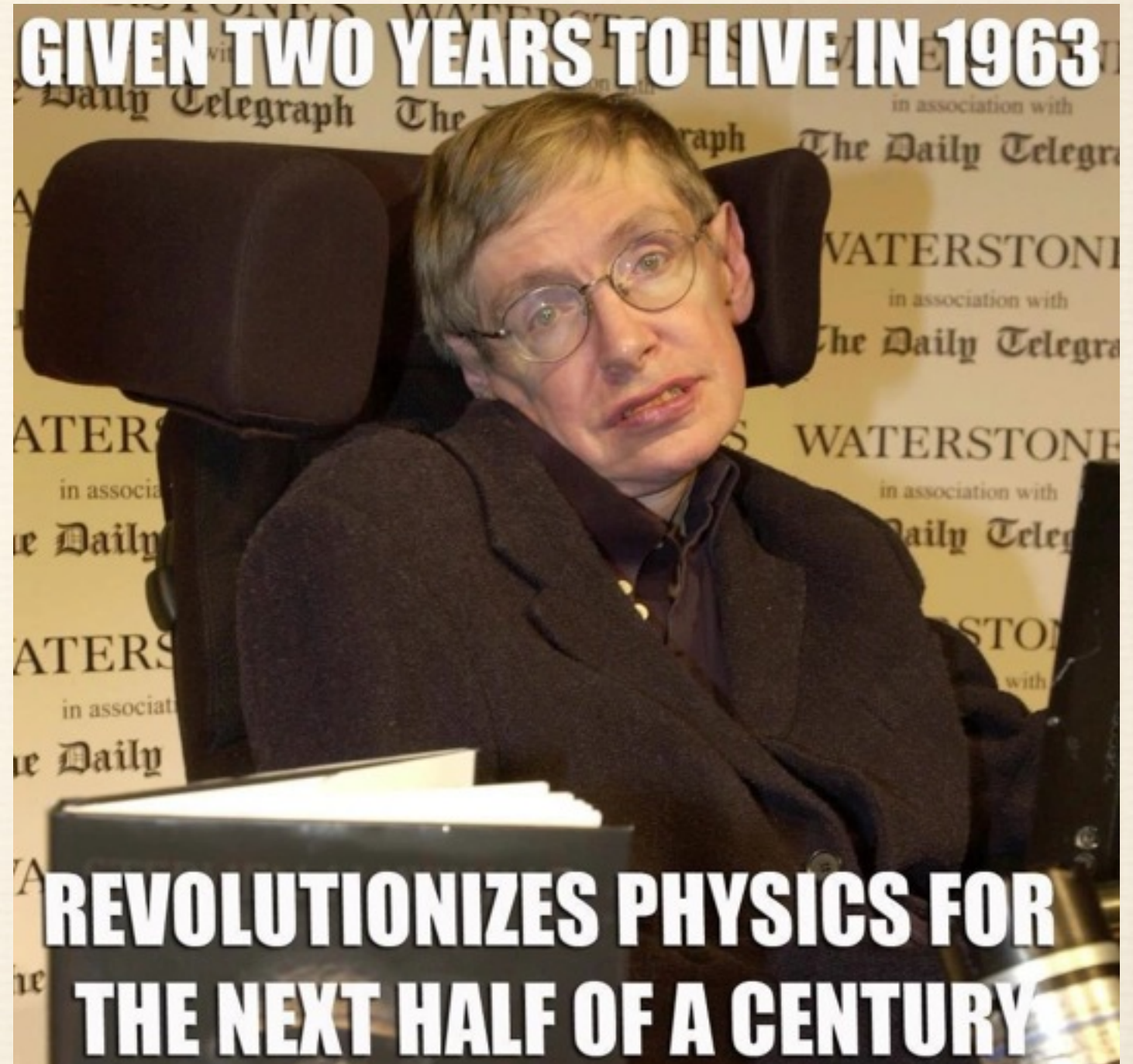
- ❖ Riluzole
- ❖ Glutamate inhibitor
- ❖ Side effects: Liver toxicity, asthenia, N/V, and dizziness
- ❖ Extends ALS survival for 2-3 months



No cure has yet been found for ALS. However, the Food and Drug Administration (FDA) approved the first drug treatment for the disease—riluzole (Rilutek)—in 1995.

Did You Know?

- ❖ ALS patients have an average course of 2-5 years with 20-30% of patients surviving longer than 5 years.
- ❖ Death usually occurs by respiratory failure



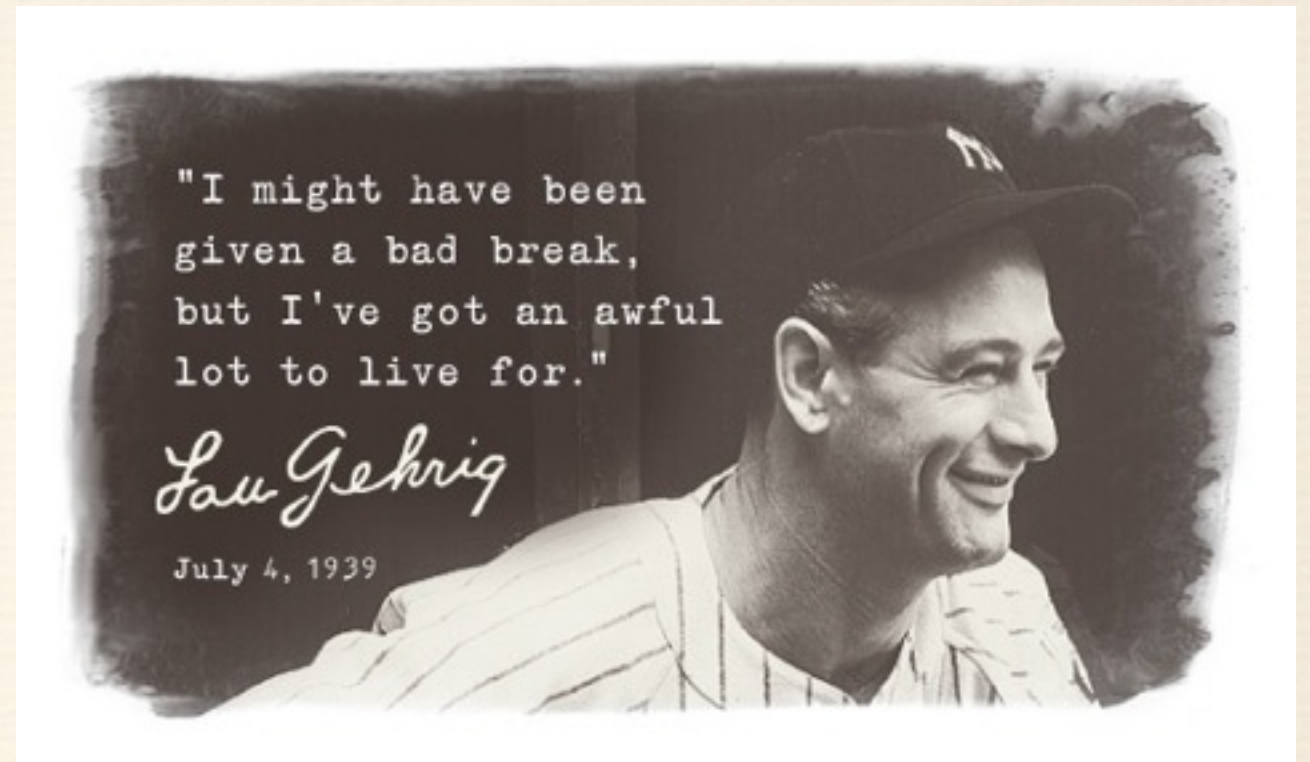
Football and ALS

- ❖ According to a new study from the National Institute for Occupational Safety and Health in Cincinnati, Ohio, professional football players are much more likely to die from Alzheimer's disease, ALS (Lou Gehrig's disease), and other conditions caused by brain cell damage. The research for this study included data from 3,439 ex-professional football players.

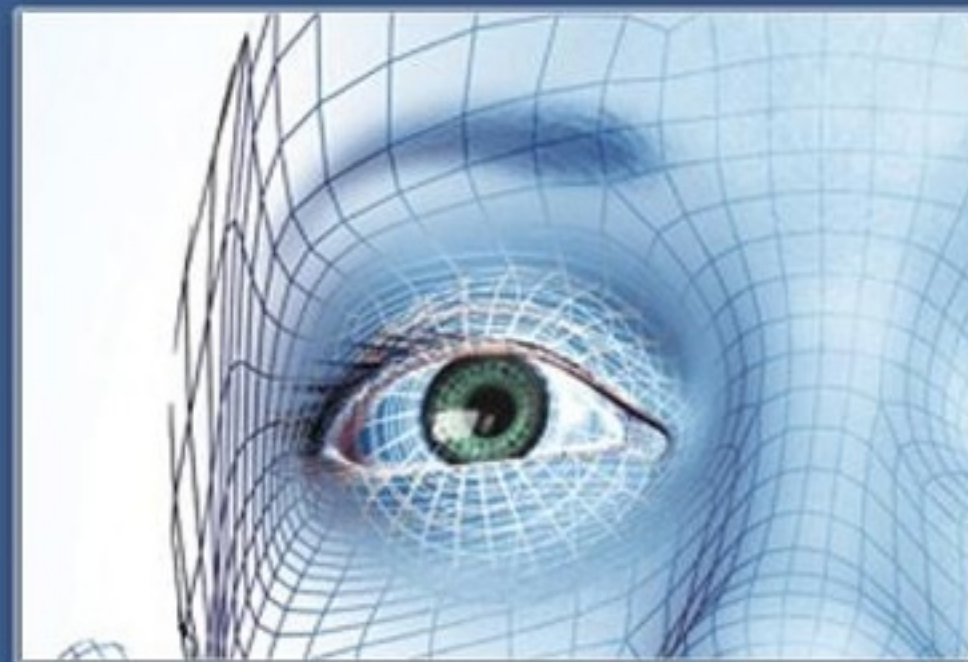


Football and ALS

- ❖ These results are consistent with recent studies that suggest an increased risk of neurodegenerative disease among football players. Although our study looked at causes of death from Alzheimer's disease and ALS as shown on death certificates, research now suggests that chronic traumatic encephalopathy (CTE) may have been the true primary or secondary factor in some of these deaths. A brain autopsy is necessary to diagnose CTE and distinguish it from Alzheimer's or ALS. While CTE is a separate diagnosis, the symptoms are often similar to those found in Alzheimer's, Parkinson's and ALS, and can occur as the result of multiple concussions. (Lehman)



Did You
Know?



<https://www.youtube.com/watch?v=lr6XbwSOBxM>

<https://www.youtube.com/watch?v=u6MyOXk98DI>

**“However difficult
life may seem,
there is *always*
something you can
do and Succeed
at.**

~ Stephen Hawking

