

# Speech and Swallowing Issues Faced by the ALS population & its Management

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# Objectives

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- Learn early signs of ALS
- Determine next steps once early signs are noted
- Learn how to manage dysphagia in the ALS population
- from pre-diagnosis to end of life
- Learn methodology for choosing most appropriate augmentative/alternative communication method for each ALS patient

## Progressive neurodegenerative disease affecting nerve cells in brain and spinal cord

1 out of 10 cases of ALS are due to a Genetic defect/Hereditiy

ALS affects approximately 5 out of every 100,000 people worldwide

Average age of diagnosis is 55 years with range of 40 to 70 years

Men 20% more likely to develop ALS than women.

Average time from onset to death: 3 to 5 years

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graph TD; A((abnormal pulmonary function)) --- B((abnormal speech)); B --- C((abnormal muscle biopsy)); C --- D((abnormal swallowing)); D --- E((abnormal isokinetic or isometric strength)); E --- F((abnormal larynx function)); F --- A; A --- B --- C --- D --- E --- F --- A; G((Clinical Features));
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# Clinical Features

abnormal  
pulmonary  
function

abnormal  
speech

abnormal  
muscle  
biopsy

abnormal  
swallowing

abnormal  
isokinetic or  
isometric  
strength

abnormal  
larynx  
function

# Symptoms

Clumsiness

Progressive  
Weakness

Speech  
change,  
dysarthria

Dysphagia

Cramps

Atrophy

Gait  
changes;

Progressive  
tongue  
Fasciculations:

Fatigue

# Swallowing

## Characteristics of ALS

### Oral Stage

Early tongue and lip involvement  
Increased meal duration  
Difficulty lateralizing food and controlling food

Fatigue associated with meals  
Anterior loss of bolus  
Increased difficulty as viscosity increases

### Pharyngeal Stage

Poor base of tongue excursion  
Poor pharyngeal contraction  
Delayed pharyngeal swallow initiation

Reduced laryngeal elevation and excursion  
Incomplete airway protection- penetration with subsequent aspiration

# Dysarthria Characteristics of ALS

Imprecise consonants

Hypernasality

Harsh voice

Low pitch

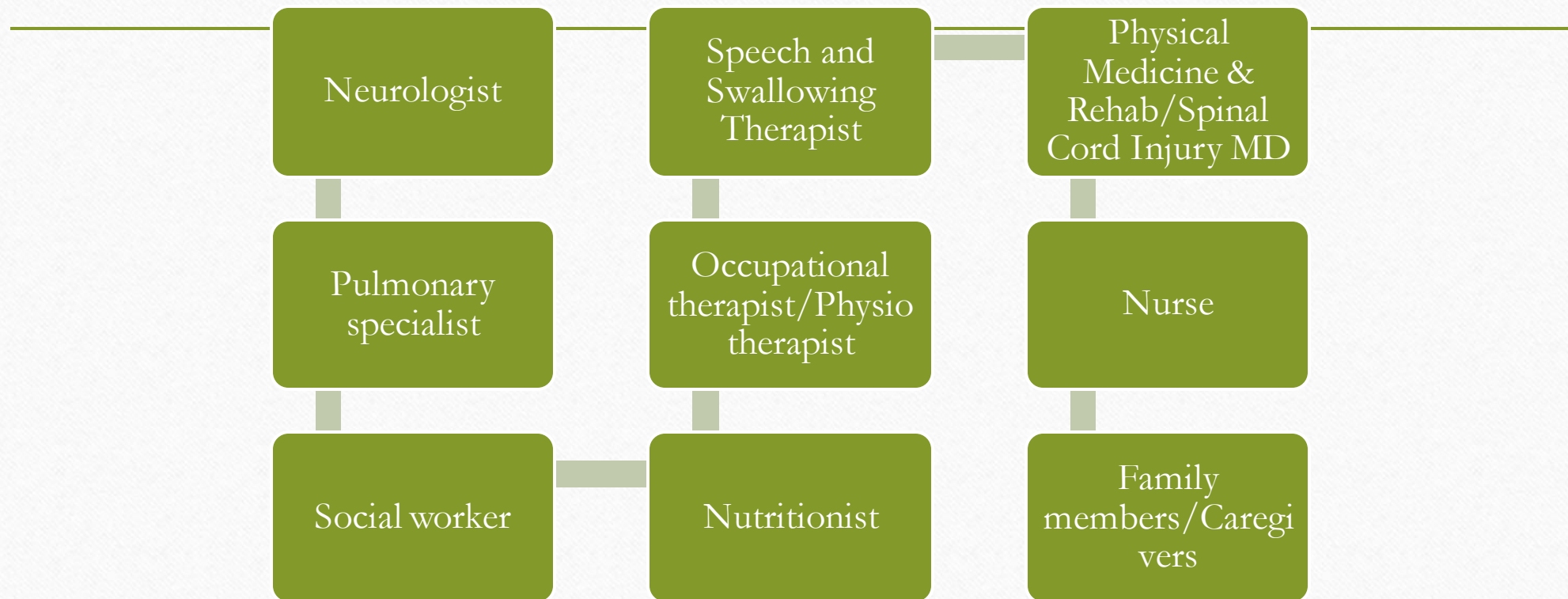
Reduced stress

Strained-strangled voice quality

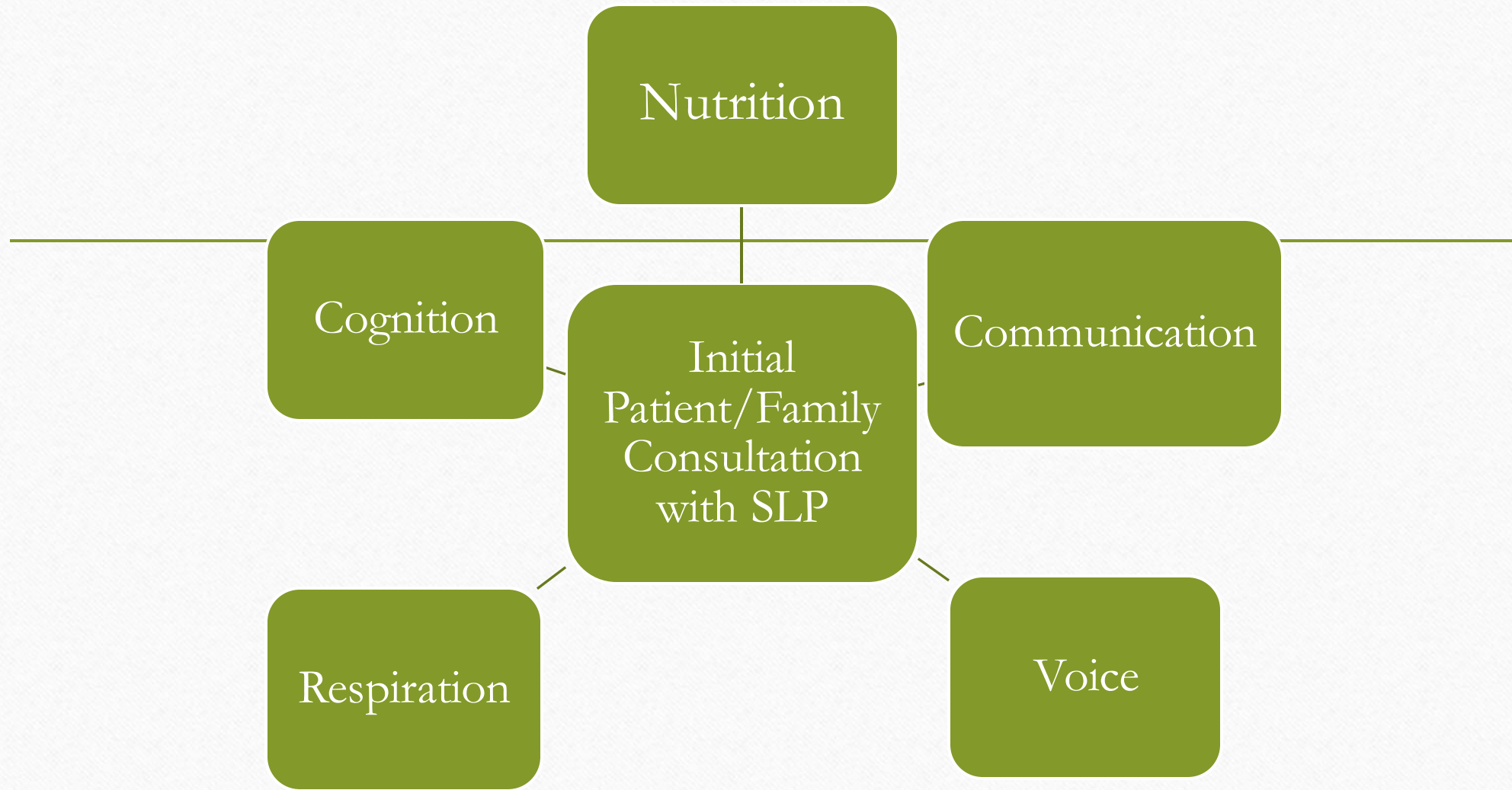
Audible inspiration

Nasal emission

# Multidisciplinary Care of the ALS Patient







# ALS FEATURES

<b>Course</b>	Progressive Decline	
<b>Communication</b>	Often requiring AAC	
<b>Swallowing</b>	Early onset, progresses to inefficiency and high aspiration risk and coincides with respiratory decline	
<b>Respiration</b>	Difficulty with cough, hypoventilation, often requires mechanical Ventilation Reduced respiratory support late in disease process.	
<b>Nutrition</b>	High risk to fail to meet needs early on typically occurs in coordination with decline in ADLs.	

# Management of swallowing in ALS

Energy  
Conservation

Diet modification

Respiration's effect on  
swallowing

Mealtime swallowing strategies

Smaller, more frequent meals

Smaller bolus volumes

Oral supplements

Modified Barium Swallow Test

# Five Stages of Speech Decline in ALS (Mathy, et. al.)

## Stage 1

No Detectable Speech Disorder

Listeners: note no difference in rate, precision, or loudness

## Stage 2

Extra effort needed for speech

Reduced speaking rate

Speech worsens with stress and fatigue

## Stage 3

Changes in speaking rate, articulation, and resonance evident

Reduction in Speech Intelligibility

Stage 4

Natural Speech  
supplemented  
with AAC.  
  
Portable writing  
system required

No functional  
Speech.  
  
Eye-gaze systems  
  
Integrated,  
multipurpose  
AAC systems

Stage 5

# Maintaining Use of Natural Speech (David Beukelman)

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- Behavioral Interventions
- Environmental Interventions
- Prosthodontic Interventions
- Supplemented Speech Interventions

# Behavioral Interventions

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- Speaking rate modification
- Maintain coordinated respiratory patterns
- Reduce fatigue
- Conserve energy for communication

# Prosthetic Interventions

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- Palatal lift (controversial and temporary)
- Palatal augmentation (drop-down)
- Voice amplification (i.e., Spokeman, Chattervox)



# Environmental Interventions

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- Optimize hearing of frequent listeners
- Optimize adverse speaking situations
- Reduce background noise
- Mute TV
- Amplify speaker in meetings, groups, & noise
- “Private conference room”

# Supplemental Speech Interventions

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- Topic boards
- Alphabet boards

# AAC Alternative and Augmentative communications

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- Handwriting- Boogie Board, dry erase board
- Partner-assisted auditory scanning
- Partner-assisted manual scanning
- Light-technology optical pointing with head mounted laser
- Facial expression
- Yes/no questions
- SpeakBook: <http://www.spectronicsinoz.com/blog/newtechnologies/>
- [speakbook-a-free-low-tech-eye-gazecommunication-system](#)

- **Determining Candidacy:**
- Familiarity with computers
- Attitudes towards high tech AAC
- Support system

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- Extremity function
- Cognitive function
- Vision (premorbid, not related to ALS)
- Language
- Ambulatory Status
- Size limitations of home
- Respiratory function
- Anticipated progression of disease

# High tech AAC system

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- Dedicated Systems with eye gaze capability
- Tobii ATI
- Dynavox
- LC Technologies
- iPad with speech applications

# Speech Applications- 100 to choose from!

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- Proloquo2Go
- TalkTablet
- Verbally
- SpeakIt
- Predictable
- Phrase Board

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Thank you

### Home Training Program for ALS

1. Internal oro-motor stimulation using oral B-vibrator brush massage on the tongue from tip towards the base alternately with honey & lemon juice.
2. External stimulation using a facial vibrator with a rough attachment to be massaged on the neck and mouth areas after application of any oil (Preferable kalonji oil, coconut oil).
3. Temperature alternations using crushed ice and warm water in 3 different textured cloths to be massaged all over face and neck in a motion like kneading dough.
4. Pronunciation of sounds (pa, ta, ka & ba, da, ga) alternately with fast rate of speech.
5. Use ice cream stick and push it against the tongue tip towards right, left, up and down. Apply resistance with ice cream stick on tongue tip.
6. Stack all the ice-cream sticks, place it in the mouth vertically and hold it in between the two jaws for as long as possible.
7. Use suck-swallow method using L- shaped small frooti straw. Suck liquids like water, juice, milk, tea, coffee, soup etc in small sips.
8. Semi-liquids like (rawa porridge, kheer, liquid khichdi) etc to be given with a long handled falooda spoon by suck-swallow method.
9. Blowing of whistle, candle and balloon.
10. Humming exercises for voice. Pronounce /mm/ with vibrations felt on the lips for as long as possible after a deep inhalation.
11. Pronounce vowel /a/ from low to high pitch and reverse.
12. Prolong the vowels /a/, /i/, /u/ for as long as possible after a deep inhalation.
13. Read newspaper headlines by stressing on each syllable of the word and use an open mouth approach for the same. Mirror practice is advisable.