# Demand on you CARE: Communication Challenges: Vision, Hearing and Speech

# Chapter 1: Speech and Language Disorders in Older Adults

## ELDER009

# Overview

- Define speech and language

- Define speech disorder and language disorder

- Discuss common speech and language issues in old age

- Improving communication – an overview

- Use of augmentative and alternative communication tools

- Practical tips

# Speech vs Language

# Speech:  how a word  is spoken



**Speech**

**Articulation**
How we produce speech sounds. Involves mouth, lips, tongue etc.

**Voice**
How we make sounds by vocal cords

**Fluency**
Describes rhythm

# Language: how words are made and used to express meaning

**Language**

**Identify word meaning E.g. "Tear" means the secretion flows from eyes in crying or making a paper apart**

**Put words together (to make a grammatically correct sentence)**

**Make new words Example:**

**COVID-19**

**Use right words in the right times Example: "Get out" versus "Would you mind leaving"**

# Speech and Language Disorders

- Speech disorder
  - Problem in creating / forming speech sounds to communicate with others
    (A.D.A.M. Medical Encyclopedia)


- Language disorder
  - Problem with processing of linguistic information
  - Can be related to morphology (how a word is formed), syntax (word arrangement of a sentence), or semantics (meaning)
  - Can affect comprehension (receptive), production (expressive) or both

# Common *Speech* and *Language* issues in old age

# Common speech issues with normal ageing

- Issue on articulation
  - Denture related: Loss of teeth / gingival recession etc.
  - Muscle change in tongue and oro-facial muscles
  - →Difficulty in pronouncing words

- Voice related (Presbyphonia)
  - Change of laryngeal structure (Gois, Pernambuco & Lima 2018)
  - →Change of voice: hoarseness, aphonia, reduction in voice projection power

**Speech / language problem
can lead to social withdrawal and poor Quality of Life**

# Common language issues with normal ageing

- Expression: Word finding difficulty (Burke & Shafto, 2004)
  - More "tip-of-the-tongue"
  - More "fillers" (eg. "er")

- Comprehension issue (Williams, Dunlop & Abdi, 2012)
  - Slower reaction time → needs more time to process meaning
  - Reduce ability to interpret inferences, metaphors, humours, etc

**Speech / language problem
can lead to social withdrawal and poor Quality of Life**

# Common diseases in elderly that may cause speech/language problems

- Neurological (Central Nervous System) conditions
  - Can affect both speech and language
  - Affect understanding of written words/speech, or motor system involved in expression
    - Example: Parkinson's disease, stroke involving speech/language related areas, neurocognitive disorders
    - → **Aphasia, dysarthria, verbal apraxia, cognitive communication disorder** *(see later slides)*

- Non – neurological conditions
  - Mainly affect speech
  - Those "local" structures involved in normal speech production
    - Example: post radiotherapy for nasopharyngeal carcinoma, cancer of tongue
    - Example: post surgery for larynx cancer

# Common neurologically related Speech / Language problems

- Dysphasia / Aphasia
- Dysarthria
- Verbal apraxia
- Cognitive communication disorder

# Dysphasia / Aphasia

- Aphasia is a language impairment due to brain injury
  - Affect production and/or comprehension of speech
  - Affect also the ability to read and/or write.

*(National Aphasia Association)*

- 8 clinically recognizable aphasia syndromes *(Boston Aphasia Classification System)*
  - Broca's aphasia
  - Wernicke's aphasia
  - Conduction aphasia
  - Global aphasia
  - Transcortical motor aphasia
  - Transcortical sensory aphasia
  - Isolation aphasia
  - Anomic aphasia

# Classification of dysphasia / aphasia
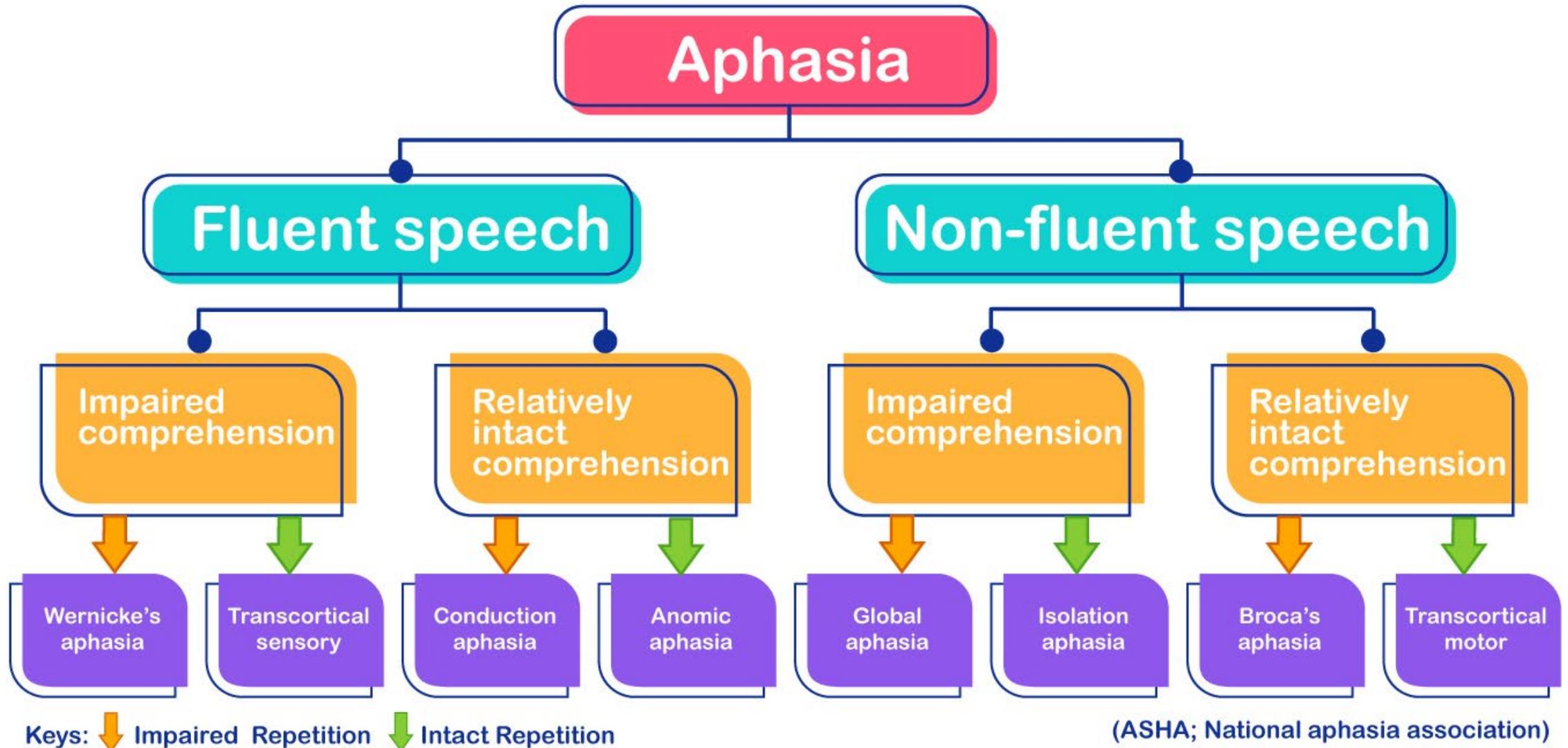
# Common manifestations of dysphasia / aphasia

- Intact non-linguistic cognitive skills but have **expressive and/or receptive deficit**

- **Expressive** aspect (not exhaustive):
  - Word-finding difficulty. E.g. difficult to name objects
  - Slow and halting speech
  - Difficult to construct a sentence and mainly express in short & fragmented phrases
  - Semantic paraphasia. (e.g. mis-naming knife as spoon)
  - Making grammatical errors and putting words in wrong order
  - Speak jargons (e.g. making up nonsense words)
  - Circumlocution may happen (i.e. replacement of specific words with generalizations)

# Common manifestations of dysphasia / aphasia

- **Receptive** aspect (not exhaustive)
  - Difficult to understand spoken/written words.
  - Provide unreliable answers.
  - Difficult to follow fast speech.
  - Fail to comprehend complex grammars e.g. passive sentences, embedded sentences.
  - Misinterpret meanings of words/pictures/gestures.
  - Not aware of own speech errors.

# Dysarthria

- Speech disorder characterized by
  - abnormalities in the strength, speed, range, steadiness, tone, or accuracy of movements required for breathing, phonatory, resonatory, articulatory, or prosodic aspects of speech production that have a neurogenic origin (Duffy, 2013)

- Common Types
  - Flaccid dysarthria
  - Spastic dysarthria
  - Hypokinetic dysarthria
  - Hyperkinetic dysarthria
  - Ataxic dysarthria
  - Mixed dysarthria

# Common manifestations of dysarthria
*(not exhaustive)*

- Imprecise articulation
- Change of voice quality, e.g. hoarseness, decreased loudness
- Change of pitch level (too high vs too low or monopitch)
- Tremor voice
- Change of speech rate (too fast/slow, accelerating)
- Short rushes of speech
- Hypernasality/hyponasality

(ASHA; Duffy, 2013)

# Verbal Apraxia

- Speech disorder that reflects an impaired capacity to plan or program sensorimotor commands necessary for directing movements that result in phonetically and prosodically normal speech (Duffy, 2013, p.4)
  - Articulators (tongue, lips, palate etc.) are intact and without weakness.
  - Language ability (comprehension & expression) is intact.

# Common manifestation of verbal apraxia

- Features of verbal apraxia (not exhaustive)
  - Phoneme distortions (speech sounds will be distorted)
  - Reduced speech rate
  - Adjacent syllables are with equal stress
  - Inconsistent articulation errors.
  - Groping for correct speech sounds.
  - Difficulty initiating speech sequence.

  (Allison et al., 2020; Ballard et al., 2014)

# Cognitive communication disorder (CCD)

- Any aspect of communication difficulty that is affected by disruption of cognition. e.g. attention, problem solving/reasoning.

# Common manifestations of CCD

(not exhaustive)

- Having difficulty concentrating on conversations.
- Fleeting attention which may miss important information told by the communication partners.
- Having difficulty recalling information, e.g. failed to remember names in social gatherings which may cause embarrassment.
- Having difficulty in understanding jokes and just take the literal meaning of speech.
- Slow information processing: cannot keep up with a flowing conversation.
- Impaired social communication skills.  E.g. failure to 'read' non-verbal cues, like facial expressions and body language.

(Prosser & Morris, 2017; ASHA)

# Improving communication – an overview

- ## Therapeutic principles *(ASHA; Heidrun & Wolfram, 2005)*

  - Restorative/restitution: restoring impaired function

  - Compensatory: improving functions by substitution strategies to compensate for non-amendable deficits.

  - Adaption: changing communication environment/behaviour to adjust for the disorder

# Improving communication – an overview

- Aim
  - To help the patient to use remaining language abilities, restore language ability as much as possible and learn other ways of communication
    *(National Institute of Health)*

- Two approaches
  - Impairment-based approach
  - Functionally oriented/communication approach

# Improving communication – an overview

- Impairment based
  - Focus on improving language functions
  - Consist of procedures that directly stimulates specific listening, speaking, reading and writing skills
    *(National Aphasia Association)*

  - More often for initial active rehabilitative stage

- Functionally oriented
  - Focus on enhancing communication by any means and encourage support from carers
  - Often include more natural interactions involving real life communication challenges

  - More often for long term chronic condition

# Improving communication in Dysphasia / Aphasia: Examples of impairment-based therapy
## *(not exhaustive)*

- Treatment of word-finding difficulty
  - To provide cueing strategies to help the patients to retrieve, for example, object names.

- Constrained-induced language treatment (CILT)
  - 'Forcing' the patient to use spoken language and discouraging the use of compensatory communication strategies, e.g. writing, gesturing (Pulvermuller, et al. 2001)

- Melodic Intonation Therapy (MIT): the use of musical elements of speech (e.g. stress, melody) to improve speech expression (Norton et al, 2009)

- (Under research)
  - Non-invasive brain stimulation: transcortical magnetic stimulation (TMS) or transcortical direct current stimulation (tDCS) to stimulate specific areas of the brain in order to enhance aphasia treatment. (Wortmann-Jutt & Edwards, 2017)

# Improving communication in Dysphasia / Aphasia: Examples of functionally oriented approach
## *(not exhaustive)*

- Supported conversation (Simmons-Mackie,1998)
  - Patient and care-giver are engaged in conversation
  - Patient takes the lead in the conversation and the care-giver follows the patient's lead.
  - Care-giver provides language facilitation in the conversation context in order to enhance the patient's confidence and skills during conversation with others.

- Life participation Approach to Aphasia (LPAA) [Chapey et al., 2000]
  - A treatment approach which focuses on enhancing the ability to perform communication activities of daily living.
  - The primary purpose of therapy is advocation of joint actions aiming at community re-integration
  - For example, in the initial stage of CVA, the goal can be to establish effective communication with nursing staff and clinicians in the rehabilitation centre.

  (https://leader.pubs.asha.org/doi/10.1044/leader.FTR.05032000.4)

# Improving communication in dysarthria

- Examples of restorative/restitution based treatment
  - Treatment focusing on speech motor systems:
    - Inspiratory/expiratory muscles strength training to enable better breath support in speech production
    - Tongue and lips muscle strength training to enable clearer articulation.

- Examples of compensatory and adaption- based treatment
  - Altering the communication environment.  E.g. reducing background noise
  - Encouraging the use of more gestures to clarify unclear/slurring speech.
  - Use of augmentative and alternative communication (AAC) tools. E.g. communication book
  - Adjust speech rate. E.g. speak more slowly

# Improving communication in verbal apraxia
## (not exhaustive)

- Articulatory kinematic approach
  - Improving the spatial and timing of speech sounds
  - Focus on how to move tongue and lips to produce the word correctly
  - Patient was asked to imitate different speech sounds
  - Care-giver gives cues to help the patient the produce the target sounds correctly.

(Ruckman, and Travers, 2017)

- Rate/rhythm approach
  - Manipulation of rate/rhythm to improve speech production or reduce symptoms
  - For example, the patient will be instructed to speak with speech rate at one syllable per beat of a metronome in order to obtain clearer speech production.

(Shannon, Mauszycki & Wambaugh, 2011)

# Improving communication in CCD

- Treatment principle is to identify underlying nature / deficit leading to CCD and treat accordingly (Tompkins, 2012)
  - CCD can be related to deficit of various underlying cognitive functions, for example, memory, reasoning, attention organization and awareness. Treatment should be targeted at the underlying deficit.

  - Patients have the same presentation could be due to different underlying deficits.

  - For example, a patient could not follow a complex command (take a bun from the bag, cut it into 2 and put them in the fridge) could be due to deficits in sustained attention, or it could be due to impaired memory

  - Intervention will be focused on overcoming the deficit area by adopting impairment-based and /or functionally oriented approach

# Improving communication – an overview

- ## Therapeutic principles *(ASHA; Heidrun & Wolfram, 2005)*

  - Restorative/restitution: restoring impaired function

  - **Compensatory: improving functions by substitution strategies to compensate for non-amendable deficits.**
    → Augmentative and Alternative Communication (AAC) tools can be used

  - Adaption: changing communication environment/behaviour to adjust for the disorder

# Use of Augmentative and Alternative Communication (AAC) tools

- Augmentative and Alternative Communication (AAC) refers to all forms of communication that can supplement or compensate for the impairment and disability of people with communication disorders (ASHA)

- 2 modes of AAC communication:
  - Aided
  - Unaided

# Use of AAC tools

## Aided:

- Need some tools/devices to transmit/receive massages

- The devices can be low-tech or high-tech ones.

- Low-tech: do not require battery/electricity.
  - E.g. Communication boards that the patient can select letters/words/pictures/symbols to express messages (Millar & Scott, 1998).



https://images.app.goo.gl/4z5ZTPahGeyWypYD8

# Use of AAC tools

**Aided:**

- High-tech: speech generating devices.
  - Device can produce speech according to the symbols/words that the patient selects.



https://images.app.goo.gl/EiAE3S9H73BEx2NG7

# Use of AAC tools

**Aided:**

- High-tech: Apps
  - There are apps that can be downloaded to mobile phones or iPad or android Pad that can make the mobile phones/iPad/android Pads act like a speech generating device.
  - e.g.: Text to Speech! app

# Use of AAC tools

**Unaided:**

- No external tools is needed:
  - Patient expressed by facial expressions, gestures (e.g. pointing) etc.

# Use of AAC tools

**How to select choices (e.g. pictures/symbols/alphabets) in the communication board/device? (ASHA)**

2 types:
- Direct selection
- Indirect selection/Scanning

# Use of AAC tools

**How to select choices in the communication board/device? (ASHA; Communication Matters)**

Direct selection:

- The person using AAC selects directly on the symbols or words or pictures that are shown in the communication books/devices.
- For example, he may select specific symbols/alphabets in a communication book by finger-pointing, or use light-pointers or infrared pointing devices to select symbols/alphabets in a computer device.
- Typing on a smartphone or tablet is also an AAC using direct selection method.

# Use of AAC tools

**How to select choices in the communication board/device? (ASHA; Communication Matters)**

Indirect selection/Scanning:

- The person using AAC selects a target from a set of choices that appears one by one. (for example, alphabets A to Z appears one by one on the computer screen.  If the AAC user would like to select letter 'B', then he has to push a switch when the letter 'B' appears in order to select it)

# Use of AAC tools

**How to choose AAC tools (Mineo, 1990)**

- Depends on patient's motor abilities: For example, a patient with less precise hand control may need to have a device with larger buttons

- Patients who have more severe physical limitations may need to use indirect rather than direct selection method.

- Communication skills: For example, if patient had difficulty recognizing printed words, we may use pictures/symbols in his communication books.

- Communication needs.  The communication board should contain contents that the patient usually uses.  For example, if he likes eating, we may add more food items in his AAC device for him to select.

Goal to be achieved:

- Patient can use the AAC tool efficiently in different context with different communication partners for different purposes.

# Use of Augmentative and Alternative Communication (AAC) tools

You may get some insight on how to use AAC the from the websites below or other similar websites from internet:

http://www.talkingmats.com/

https://www.aacscotland.org.uk/videos/

# Practical tips

# Practical tips for screening communication problems and management

- Is there communication problem?
  - Can he follow simple or complex instruction?
  - Can he express himself well?
- Is it new onset (seek medical advice if new onset) or known issue related to background medical condition?
- Is it a problem of input (comprehension) or problem of expression?
- If it is an expressive issue
  - Is it a speech issue (Dysarthria/verbal apraxia) or language issue (Aphasia/CCD) ?

# Practical tips for screening communication problems and management

- Consider the approach to adopt in improving communication
  - Impairment based vs functionally oriented intervention

  (try impairment based intervention to restore maximum possible function if that is feasible)

-  Consider the use of Augmentative and Alternative Communication (AAC) tools with person-centered approach

# If you are uncertain what to do …

- A speech therapist can always help you out

- Upon receiving a referral, Speech Therapist will:
  - perform an assessment for the patient.
  - make a diagnosis.
  - provide tailor-made recommendations and treatment for each patient according to his/her problems.

- End of Chapter 1-

# Extended Reading

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