

# Handout on Stroke and Aphasia

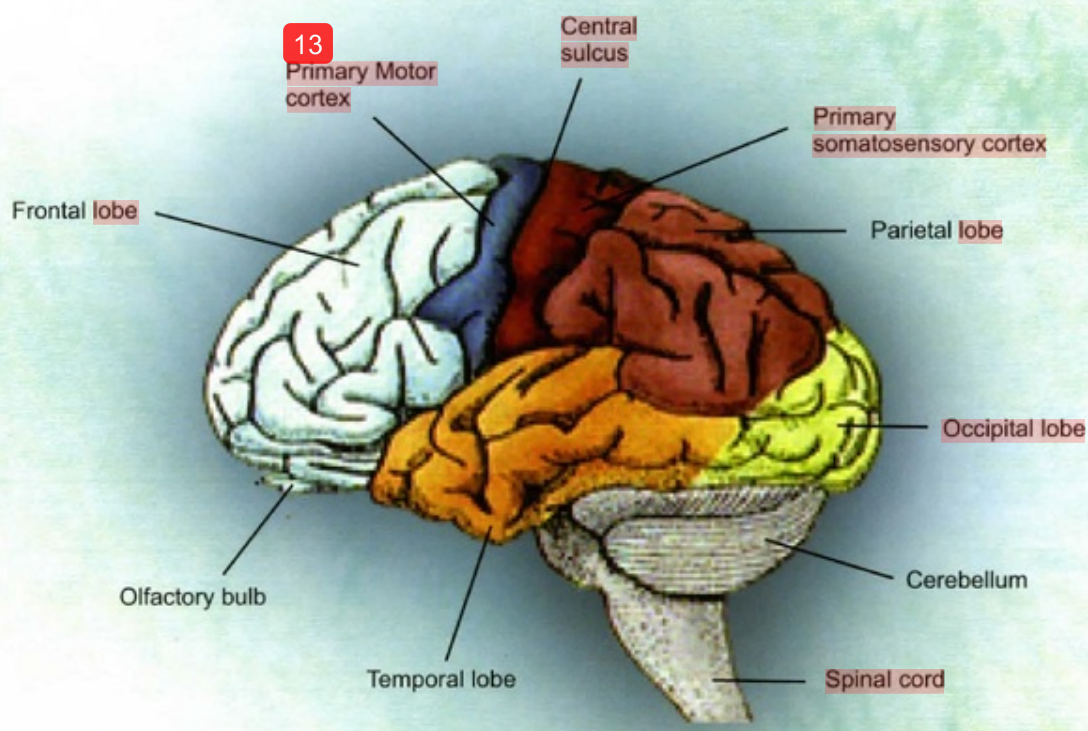
*by* Pushpavathim, Suchitra Shymalake

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| FILE           | HANDOUT_ON_STROKE_AND_APHASIA.PDF (7.41M) |                 |       |
| TIME SUBMITTED | 28-OCT-2014 02:50PM                       | WORD COUNT      | 5133  |
| SUBMISSION ID  | 470225492                                 | CHARACTER COUNT | 26648 |

PBM-567

# Hand out on Stroke and Aphasia



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**Title:** A Handout on Stroke and Aphasia

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**Published by:** Dr. Savithri S. R., Director, All India Institute of Speech and Hearing, Mysore

**Year:** 2012

**Pages:** 20

**Price:** ₹ 50-00



## Stroke and Aphasia

### Introduction

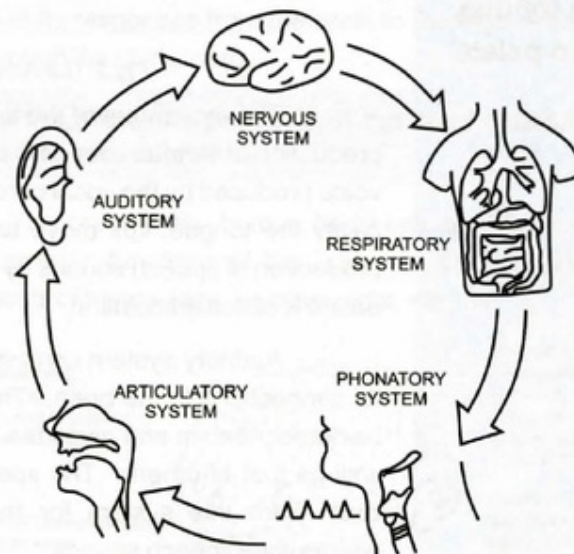
Human beings communicate with one another right from birth. Communication is exchange of feelings, thoughts, messages through interaction between individuals. Communication through speech and language helps us to form relationships and encourages understanding among people, hence it is communication that makes us human. Let us learn about speech and language.

### What is Speech?

Speech is the activity of uttering sounds or words by the modifying the air passing from the larynx through pharynx (over the vocal cords) by the structures in the oral cavity namely tongue and lips. Thus, thoughts and feelings are expressed through words.

Various systems in human body are involved in the speech production. The nervous system is the main control where the speech and language are programmed i.e. using of appropriate words, grammatical formation of sentences and the content (relevance, information as well as fluency or flow of speech)

**Speech is a  
unique gift to  
human beings**



*Fig. 1: Systems involved in the production of Speech  
(Source : Introduction to communication disorders - Dr. M. N. Hegde)*

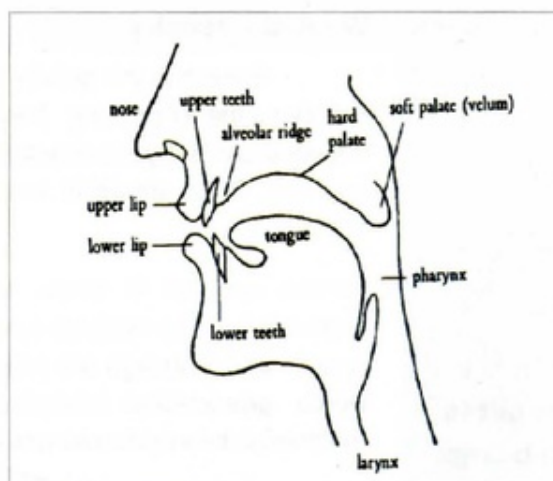
Respiratory system provides the air which is essential for the production of voice which is required for verbal mode of speech. Speech is mainly carried out using the air stored in the

**Speech sounds are modified by the movement of the tongue, lip and palate**

lungs which is forced out through the larynx (voice box) to provide voice.

Phonatory system consists of the Larynx (voice box) which houses the vocal cords. The expiratory air forces the cords to vibrate and hence voice is produced.

The articulatory system consists of the organs/structure in the oral cavity i.e. the tongue, lips, palate and mandible.



*Fig.2: The Articulatory system*

The movement of the tongue, lips and palate helps in the production of various sounds in speech. When the vibrating air i.e. voice produced by the vocal cords in the larynx moves into the oral cavity the tongue, lips move and produce various sounds. The production of speech sounds by the movement of tongue, lips and palate is called articulation.

Auditory system consists of ear, hearing mechanism and its connections to the brain. The auditory system acts as a feed back mechanism and gives the ability to hear our own speech as well as that of others. The speech sounds have to travel to the brain from this system for the individual to understand and differentiate speech sounds.

Many individuals do not realize that speech is a special ability gifted to human being only, and how communication is very effective through speech.



**Specific areas  
in the brain  
control  
different  
functions in  
the body**

The speech and language take place with the simultaneous co-ordinated action of respiration, phonatory, articulatory and central nervous system

**What is Language?**

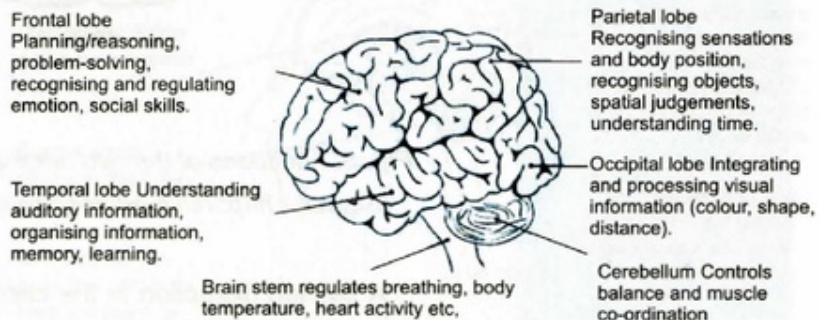
Language is the expression of ideas, feeling or thoughts. Speaking, reading, writing, gestures, signs and understanding are all forms of language. A person may use one or more of the above forms of language for communication in day to day life.

**How is speech-language, communication possible in the human body?**

The nervous system in <sup>17</sup> human body is a specialized communication network. The **nervous system consists of the brain, spinal cord and** set of nerves. Together they control all the activities of daily living. Nerves from the brain reach the different sensory organs (ears, eyes, nose etc) and spinal cord, from the spinal cord, to the different parts of the body. A set of nerves receive information from the environment through sense organs and transmit the messages to the brain via spinal cord. Another set transmits responses from the brain to the various parts of the body through the spinal cord.

**How are the functions/activities of the body controlled executed or controlled?**

The brain in the human body has specific areas which control specific functions of the body viz; speech & language, movements of hands, legs, hearing, sight, etc



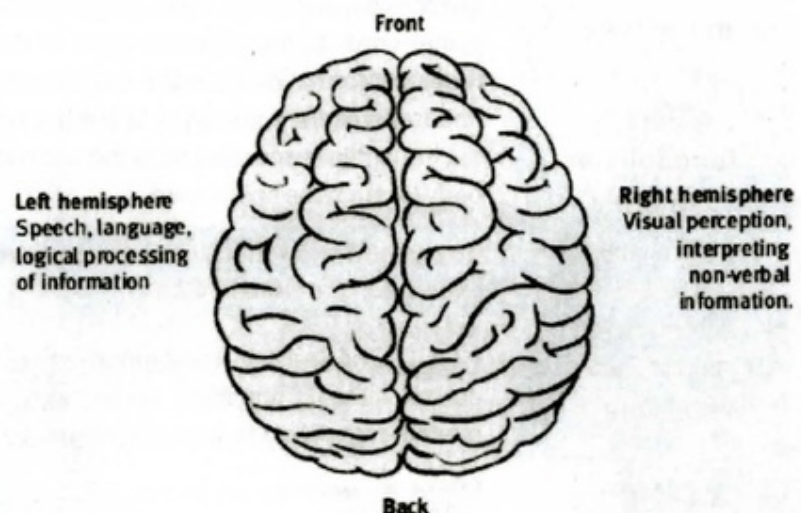
*Fig.3,4. Areas in the brain controlling different functions of the body  
Source : [Http://ship.edu/egboer/speechbrain.html](http://ship.edu/egboer/speechbrain.html)*

## How does **the brain** function/work?

In order for the brain to function, the cells in the brain (neurons) must have a continuous supply of oxygen, and other nutrients carried in the blood during circulation. Hence, continuous circulation of blood is important for proper functioning of the brain.

The brain is mainly divided anatomically into two halves., i.e the Left hemisphere and the right hemisphere. The two halves have been found to perform different functions. I.e. left brain performs functions like using logic, sequence, words and language (grammar, vocabulary) looking at parts rather than whole. Whereas right hemisphere performs different functions like : feeling, working holistically, use of symbols, images, initiative thinking and spatial perceptions and creativity.

**5**  
**Left brain controls the right side of the body and right brain controls the left side of the body.**



**Fig. 5.** Functions of the two hemispheres of the brain

(Source : <http://ship.edu/egboer/speechbrain.html>)

A sudden disruption in the circulation may occur in the cases of brain insult, stroke - blocking the flow of blood.



This disruption or blocking may be of different types. I.e.



Fig.6.a  
(a) Rupture of the blood vessel in the brain



Fig. 6.b  
(b) Blockage in the blood vessel due to a clot or emboli in the blood stream.

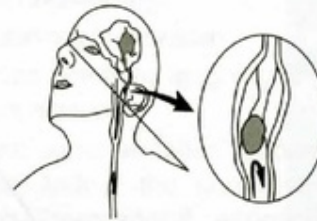


Fig. 6.c  
(b) 1 hemorrhage i.e. bleeding inside the brain  
(a damaged or Weakened artery may burst or bleed).  
(Source : <http://www.medlineplus/patient instructions>)

**Stroke is caused by a sudden disruption in the flow of blood in the brain**

### What is stroke?

A sudden disruption /disturbance in the flow of blood in the brain deprives the cells of the brain from receiving oxygen and

Damage to the motor area of the right cerebral hemisphere can cause weakness of the left arm, leg and face

Damage in the left parietal lobe can cause loss of co-ordination in the right arm and leg

Damage in Broca can cause speech problems

Damage in Wernicke's area can cause difficulty in understanding speech, reading, naming objects

Even a small stroke in the brain stem can cause severe problems as many nerves pass through here from the brain to spinal cord

Damage to the cerebellum can cause unsteadiness and poor co-ordination

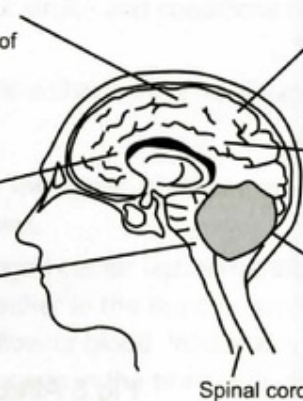


Fig. 6 d. Type of problems - due to brain damage  
(Source : <http://www.medlineplus/patient instructions>)



hence the cells in the affected area (area where the disruption has occurred) are damaged. Thus when **stroke** occurs, the flow of blood in the affected area gets disrupted. This affects that particular region in the brain. As a result the body functions that are controlled by that area of the brain gets affected.

### What is the most prominent sign of stroke?

The most visible sign of stroke is paralysis on one side of the body i.e., if there is paralysis on the right side of the body then there is damage or injury to the left side of the brain and vice versa.

**Stroke can affect individuals of all age groups. It attacks not just the old but the younger generation is at risk too, now a days**

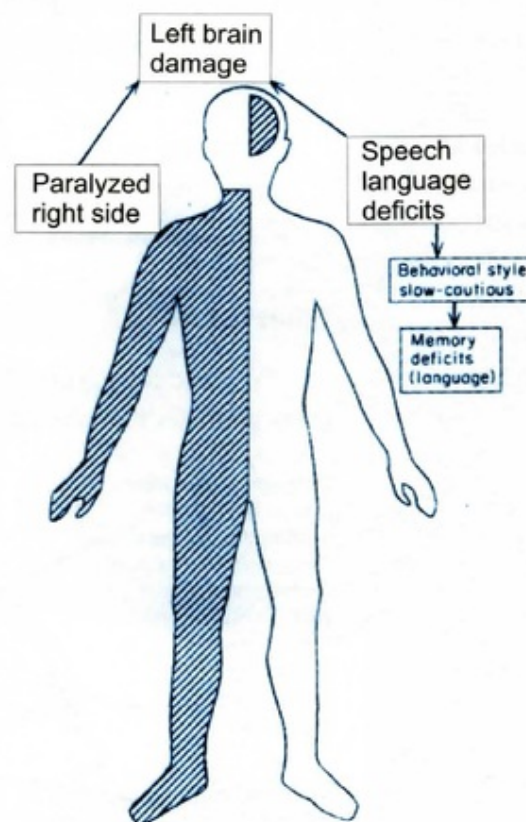


Fig.8 Affected side in the brain and body  
(Source: stroke, why do they behave that way? American Heart Association National centre.)

**Risk factors for Stroke are high BP, heart disease, diabetes or smoking**

## Warning signs of stroke:

- Sudden numbness or weakness in the face/arm/leg
- Sudden difficulty in expressing or understanding speech
- Sudden difficulty in vision/sight in one or both eyes
- Sudden difficulty in walking/ dizziness /Loss of balance
- Sudden severe headache with no known cause

## The other possible symptoms caused by stroke:

- Loss of consciousness.
- Problems with balance and co-ordination.
- Problems in swallowing.
- Double vision or partial vision.
- Inappropriate emotions laughing, crying now and then for no apparent reasons.
- Speech and communication problems may range from a difficulty in finding the correct word to a total loss of speech (meaningful expression) understanding, reading and writing may also be affected.

## What are the tests for diagnosing stroke?

A doctor usually diagnoses a stroke by the typical signs and symptoms (some of which are mentioned above) which may develop suddenly. Some of the medical tests which are most frequently used for diagnosis are:

- A brain scan (CT scan or MRI scan) which can determine the type of stroke and conditions which may have caused it.
- Blood tests to check the level of sugar, cholesterol etc.

## Types of stroke:

The main two types of stroke are: Ischaemic stroke and haemorrhagic stroke.

As mentioned earlier Ischaemic stroke is caused by blood clot in an artery (either in the brain or any other part of the body) which blocks the flow of blood. Whereas in Haemorrhagic stroke, a blood vessel bursts in the brain or in the subarachnoid space (narrow space between the brain and the skull) leading to bleeding and tissue damage.



4  
Stroke is a medical emergency in which every minute counts. The longer the blood flow is cut off to the brain, the greater the damage.

## What is the treatment and care needed for persons with stroke?

A person with stroke needs immediate medical care. There is a very short period of time called the "Golden Hour" within which if a person receives medical treatment, there are more chances to reverse the stroke.

If you suspect that a person has stroke the quick checking guide 'FAST'. Look for the following symptoms remembering the word **FAST** as soon as Possible.

3  
F - Facial weakness, the person is unable to smile and their eye or mouth is droopy.

A - Arm weakness- the person is only able to raise one arm.

S - Speech problems the person is unable to speak clearly or can't understand the spoken word.

T - Call medical emergency help if you suspect the person has had a stroke.

9  
(Source: <http://www.redcross.org.uk/what-we-do/First-aid/First-aid-tips-and-videos/stroke.>)

### Treatment for stroke:

1  
Medication may be advised to reduce any risk factors for having a further stroke .i.e. medication to lower the blood pressure, sugar level or cholesterol level. In the cases of narrowing of the arteries or haemorrhage in the brain, then surgery may be needed.

1  
Treatment should be started as soon as possible. Treatment should be tailored to the particular needs of the individuals. The treatment plan depends on the factors such as severity of the stroke, the effects it has , the cause of the stroke, and other diseases that may be present.

### Can stroke be prevented?

The risk factors which increase the chances of having stroke are as follows:

Smoking. The chemicals in tobacco increase the risk of damaging the arteries by being carried away by the blood stream. Stopping smoking can greatly reduce the risk of having stroke.

When the centres in the brain that control speech and language are affected, then the result is a disorder known as Aphasia.

High blood pressure. The blood pressure should be checked now and then. Treatment for high Blood pressure can definitely reduce the risk of stroke.

**1** Overweight: losing some weight is advised.

High cholesterol: This can be treated if it is high.

Inactivity: Moderate activity is a must for atleast 30 mins for healthy living.

Diet: Aim to eat a healthy diet.

### **1** What are the long- term effects of stroke?

The type and extent of disability caused by a stroke can vary greatly. It depends on the extent of the damage to the brain. One of the long term effect of stroke is aphasia.

### What is Aphasia?

Aphasia is a disorder that results from damage of portions of the brain that are responsible for language (communication in day to day life). Aphasia occurs suddenly as a result of stroke or head injury, but it may develop slowly in the cases of brain tumor and degenerative diseases (eg. Dementia)

### **12** What causes Aphasia?

Aphasia is caused by damage to one or more areas of the brain which is responsible for controlling the production of speech or understanding speech. Most often the cause is stroke (which results due to an interruption in the blood flow to the brain). Other causes can be injury to the brain (eg. Motor vehicle accident) or severe blows to the head, brain tumors, infection etc.,

Depending on the area and extent of damage, individual with Aphasia may show some of the following symptoms:

#### **Speaking and Expressing**

- Some may not be able to speak or may speak short phrases with great effort. In choosing meaning, correct word, correct

#### **Understanding Speech**

- Some may have more difficulty in understanding speech.
- May find it difficult to attach meaning.



**Rehabilitation is relearning things or finding new ways of doing things you did before**

Grammar, or difficulty in naming may occur.

- May be able to speak at length but may make no sense / meaning because they are not able to understand speech, they are not able to speak in meaningful sentences. eg: I... water, food, bus.

#### **Difficulty in**

Orientation in directions and time

- Understanding the time, which part of the day it is (afternoon-morning) and confusion in perceiving left or right side.

#### **Understanding spatial concepts**

- Difficulty in identifying parts of the body
- Difficulty in perceiving various concepts like above, below, back,

#### **Reading writing**

- Exhibit difficulty in reading, writing & calculating
- Able to read some letters.
- Able to read simple words but, may not understand.

#### **Treatment for Aphasia:**

Rehabilitation or re-training is essential for every individual with aphasia.

#### **What is rehabilitation/retraining?**

Rehabilitation or retraining means, training the individual to regain/get back the skills (communication as well as movements of limbs) which he or she has lost as a result of stroke.

#### **Who will do the retraining?**

A team of specialists will do the rehabilitation/ retraining

Rehabilitation focuses on Speech language therapy besides Physiotherapy and Occupation therapy

## Specialists/Professionals involved in rehabilitation or retraining

### Speech Language Pathologist:

The role of speech language pathologist is to retrain the patient to use his communication skills through verbal (speech) or non verbal (non speech) modes. Speech language pathologist also teaches the family members how to work upon / support the communication skills of the patient at home.

### Physiotherapist:

Trains mainly to use the paralysed limbs through specific exercises and tries to recover normal movements. Eg: Walking, sitting, getting up etc.

### Occupational Therapist:

Trains the individual to achieve the finer skills needed for day to day living, eg: buttoning, wearing clothes, eating.

### Physician:

Takes care of the overall health (heart, BP checkup) which also includes prevention of subsequent attacks.

### Neurologist:

Diagnosis and evaluation (through scanning, MRI etc.) and medication for the problems identified.

### Family members: What is the role of family members?

Providing support, care and love to the individual after stroke is extremely important for recovery to take place.



Fig.8. Interaction of family members with the individual with aphasia



**Aphasia is a disorder that occurs due to damage in the areas of the brain related to speech and language**

**The family members should do the following:**

1. Provide immediate help to stroke victim (i.e. individual who has suffered a stroke) by taking the individual to the physician/ neurologist at the earliest.
2. Seeking the consultation and advice of speech-language pathologist, soon after discharge from the hospital to enhance early recovery.
3. Make communication a pleasant experience. Praise and encourage the patient whenever he tries to speak, even though not perfect.
4. Give the patient chances to hear/listen to speech at home ex: your speech as well as TV and radio program.
5. Provide short and simple explanations. If the patient fails to understand then, be patient and repeat the instruction or speech.
6. Keep the home training sessions/periods short. A few short sessions daily is much better than a long session once a week.
7. Make your outlook constructive and positive. Emphasize the things he/she can do and built up his/her self-confidence.
8. Allow the patient to be as independent as possible.
9. Help the individual to accept himself/herself in the light of the present situation
10. Always phrase your questions so that the individual may answer 'Yes' or 'No'
11. Change the activity whenever the individual shows fatigue.
12. Try to meet all mis-happenings or accidents on the part of the individual in a relaxed manner. Eg: make no issue of a glass of water spilling or food spilling over the individuals dress etc.
13. Follow the physician's and speech-language pathologist's advices.
14. Take the individual for regular re-checkups, speech-language therapy and physiotherapy as advised.

**Don't do the following:**

1. Don't force the patient to speak or see people when he/she does not want to do so.

**Rehabilitation Professionals, individual and family are vitally important partners in rehabilitation. They all must work together for the rehabilitation to succeed.**

2. Don't talk for the patient. Give the patient enough opportunity to speak.
3. Don't interrupt the patient when he tries to say something.
4. Don't insist the patient to pronounce each word perfectly.
5. Don't become irritated when the patient is unable to communicate. Such a reaction will make it even more difficult for him to communicate.
6. Don't constantly remind the patient that he has once communicated well. If comparisons are made, it should be made on the basis of patients improvement, since the onset of aphasia.
7. Don't isolate the patient. Keeping him confined to a room makes the individual feel more disabled.
8. Avoid creating any situation which might cause anxiety or stress or frustration due to the individuals present condition or disabilities
9. Avoid making any issue about the individual's lack of speech.
10. Avoid as far as possible all discussions about before or after his accident, injury or stroke and never make a mention of his inabilities.

#### **Therapeutic activities for carrying out at home:**

The activities would differ from individual to individual based on the Speech Language Pathologist's assessment. But, here are some activities to be practised at home;

- (1) **Use of picture cards:** Stick simple and clear pictures of objects and activities done daily on separate cards. This can improve the learning process. The vocabulary of the patient can be retrieved by constant stimulation using these cards.



Fig: 9 Use of picture cards for retrieving vocabulary



**Speech & Language therapy is the only way to help Aphasics relearn the lost abilities for communication**

**(2) Use of picture board / communication boards:**

Make a picture board with simple and clear pictures of the daily activities of the individual for his immediate needs. The individual can be trained to point out to the pictures to indicate his wants or needs in the initial stages subsequent to loss of speech.

**Exercises to improve expression i.e. Speech out put:**

- Have the individual name objects / persons in house / etc. using picture cards or photos (use the picture cards as mentioned previously) and try to help the individual.
- Come out with words or part words: Encourage the individual to speak out by telling the initial part of the word. Eg: ba.... For ball, bu.....book etc. Let the individual try to complete the word.
- Simplify your speech. Use simple and short sentences
- Use gestures and body language (i.e. use your hands, head etc. and facial expression too).
- Make use of available resources at home i.e. real objects, picture cut outs from magazines, news papers, simple line drawing etc.
- There are numerous situations at home in our daily life where communication can be encouraged to the maximum extent or use. eg: during meal time at home a number of verbal or non-verbal expressions can be encouraged and elicited i.e. answering yes/ no to questions, indicating desired food choices either through verbal or non-verbal mode, with more emphasis on functional vocabulary eg: enough, want more, chewing, swallowing, a little more etc.  
Encourage the use of expressions of verbs with pictures of different objects used in day to day life.  
eg: soap i.e. give/keep a picture of soap or actual soap itself and ask what has to be done with it. The individual has to describe verbally or non verbally its use or function. Encourage or accept even if it is partial response or incomplete expression. Similarly proceed with other objects/materials at home.
- Use writing drawing, pointing all these are different forms of communication which in turn help the individual to come out with verbal expression or speak.

**7**  
**Encourage the person with aphasia to use other ways to communicate ie. Pointing and hand gestures**

- Have patience and give enough time for the individual to communicate.
- Use computer if you have one at home. It may help in providing sensory stimulation especial audio-visual (i.e. though hearing and vision simultaneously)

**Exercises to improve naming aspects:**

- Have a chart that shows body parts and encourage the aphasic individual to name them one by one.
- Have a chart of common objects used daily and point out to the items, let the individual try to name them.  
Please note , in the above task if the individual is unable to get the name, then say the name and let the individual repeat or continue this for a few sessions or say the starting sounds of the name of the object eg: ba.....for ball and prompt the individual to come out with the word.
- Ask the individual to name the objects upon description



Fig 10: Encouraging to name the picture

- Ask the individual to name the objects/materials belonging to a certain category i.e. Fruits: name as many fruits as possible.
- Give an expression or name and let the patient tell the opposite of it. Eg: hot - cold
- Name three animals/fruits etc and ask the individual to name the category.
- Write the names of the objects/pictures on cards and make the individual match objects or pictures of objects or items with their corresponding names.



**Seek the  
advice of the  
professionals  
frequently for  
effective  
rehabilitation**

### **Exercises to improve understanding of Speech:**

- Use picture cards as described earlier. Name the picture and let the aphasic individual point to the picture.
- Use pictures of different emotions (i.e. happy, sad) Help the patient/individual to understand emotions.
- Use real objects at home: describe them and let the individual name them.
- Make a list of questions which have to be answered either as 'Yes' or 'no'. The questions should be pertaining to day to day life eg: Did you have coffee now? The patient has to answer depending on the situation. Use such verbal drills for improving understanding on a day to day basis.

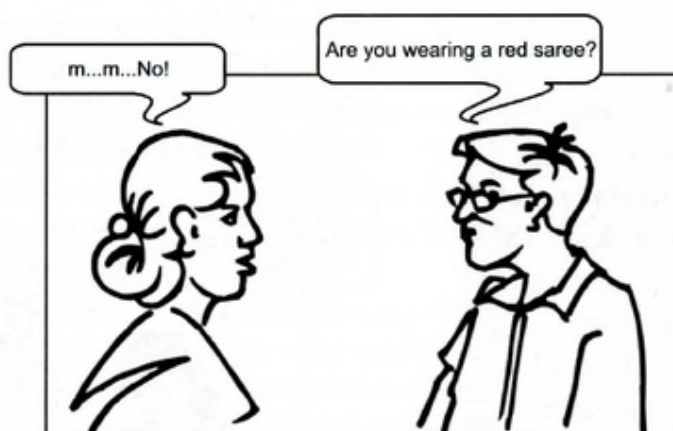


Fig 11: Communication task to improve understanding

- Describe a picture and ask the patient to point out. Pictures should be simple line drawings, gradually increase the complexity of the task, which involves finer/ careful listening and understanding.
- The individual should perform specific actions to verbal commands, eg: present/ keep a comb in front of the individual on the table and say comb your hair, similarly 'eat with a spoon' etc. Gradually increase the complexity of the task from single task to multiple tasks, in a step by step fashion.
- Pointing to the picture when a brief description of the picture is uttered/expressed verbally.
- Arranging pictures in sequence of a story.

**Always follow the advice of the speech-language pathologist regarding the home activities for speech and language and physiotherapist and occupational therapist for exercises for the limbs, and for training in skills carrying out day to day activities at home.**

#### **Use of computers:**

Computers can also be helpful in aiding individuals with Aphasia at home. DVDs or software which aid in communication can be downloaded (some of which are free downloads) from internet. So if there is a computer at home, try these alternatives in addition to the other activities mentioned previously.

The role of the family members is of utmost importance in rehabilitation. The active participation of the family members in the rehabilitation program and their co-operation with professionals involved, makes rehabilitation successful and brings quality in the day to day life of the person with Aphasia.

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## Frequently Asked Questions (FAQ)

Hope you have got answers to the following questions after reading this handout

- 1) What is stroke?
- 2) What is Aphasia?
- 3) What are the causes for Aphasia?
- 4) What are the contributing factors for a Stroke risk?
- 5) Where to seek help for Stroke and Aphasia?
- 6) Who are the members involved in the rehabilitation team?
- 7) What is physiotherapy?
- 8) What is occupation therapy?
- 9) What is Speech- Language therapy?
- 10) What is the role of family members and caregivers?
- 11) What should the family members do?
- 12) What should not be done by the family members?
- 13) How is the training to be carried out at home?

If you are unable to answer any of these questions or have not understood specific information, please refer back to the relevant sections in the booklet or consult/discuss with a Speech-Language Pathologist.





## Summary

To summarize, this handout gives a brief description about Stroke and Aphasia. It answers some frequently asked questions such as how is Stroke caused and how paralysis affects the body. It also has a brief description about how the brain functions and about Speech and Language. It includes a clear picture of the causes for Stroke and risk factors involved.

The handout also speaks about Aphasia in simple words. It describes the type of aphasia in simple fashion which is comprehensible/ understandable for a caregiver and even for a layman. A detailed picture is also provided about the rehabilitation and team work/ members involved in the process.

An outline about the management program to be carried is also provided in detail in the simple step by step fashion. Hence the caregiver or family member can have a clear idea about the disorder that has occurred (i.e. Aphasia) and how to go about in the rehabilitation procedure.

### For further details contact:

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## **AIISH GENESIS AND GROWTH**

All India Institute of Speech and Hearing is a premier institute in the country imparting training in the field of Speech and Hearing. Established on 9<sup>th</sup> August, 1965 as an autonomous organization, AIISH caters to manpower generation in the field, promoting research and providing rehabilitation services in the area. The institute is located on a sprawling area of 30 acres (two campuses) in Mysore.

The institute is registered as a Society under the Societies Registration Act XXI of 1860 (Punjab Amendment) Act, 1957 and is functioning as an autonomous body under the aegis of the Union Ministry of Health and Family Welfare.

Established primarily as a training institute, it started training programs at postgraduate level in 1967 followed by B.Sc. (Speech and Hearing) in 1968. The institute now offers three Diploma programs: Diploma in Hearing Aid and Ear mould Technology (DHA & ET), Diploma in Training the Young Deaf and hard of Hearing (DTYDHH), Diploma in Language, Hearing and Speech through Quasi distance mode (DHLS); two Graduate programs: Bachelors in Audiology and Speech Language Pathology (BASLP) and B.S.Ed. (Hearing Impairment); three Masters programs (M.Sc. in Audiology, M.Sc. in Speech-Language Pathology and M.S.Ed. in Hearing Impairment); three PG Diploma courses (PG Diploma in Forensic Speech Sciences and Technology, Clinical Linguistics and Neuro-Audiology,); two doctoral programs (Ph.D. in Audiology and Speech-Language Pathology); and Post Doctoral Fellowships. The institute also conducts short term training and orientation programs for professionals in allied specialties.

AIISH is recognized as a reputed organization for training manpower in the field of speech and hearing and related areas throughout the country. The institute has been recognized as a Centre of Excellence in the Area of Deafness (WHO), as a Centre for Advanced Research (UGC) and as a Science and Technology Institute (DST). The institute is affiliated to the University of Mysore for the award of degrees. The academic programs of the institute have the recognition of the Rehabilitation Council of India, a statutory body in the area of rehabilitation sciences.

The institute is wholly financed by the Government of India. The functioning of the institute is under the direction of the Executive Council with the Hon'ble Union Minister for Health and Family Welfare as the Chairman and the Hon'ble Ministry of Health and Family Welfare, Government of Karnataka, as the Vice-Chairman. The other statutory bodies of the institute are the Finance Committee and the Academic Committee.

## **ALL INDIA INSTITUTE OF SPEECH & HEARING**

**Manasagangothri, Mysore 570 006**

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