Aphasia (pronounced /əˈfeɪʒə/ or pronounced /əˈfeɪziə/), from the Greek root word "aphatos", meaning speechless, is an acquired language disorder in which there is an impairment of any language modality. This may include difficulty in producing or comprehending spoken or written language.

Traditionally, aphasia suggests the total impairment of language ability, and dysphasia a degree of impairment less than total. However, the term dysphasia is commonly confused with dysphagia, a swallowing disorder, and thus aphasia has come to mean both partial and total language impairment in common use.

Depending on the area and extent of brain damage, someone suffering from aphasia may be able to speak but not write, or vice versa, or display any of a wide variety of other deficiencies in language comprehension and production, such as being able to sing but not speak. Aphasia may co-occur with speech disorders such as dysarthria or apraxia of speech, which also result from brain damage.

Aphasia can be assessed in a variety of ways, from quick clinical screening at the bedside to several-hour-long batteries of tasks that examine the key components of language and communication. The prognosis of those with aphasia varies widely, and is dependent upon age of the patient, site and size of lesion, and type of aphasia.

1) Classification

Classifying the different subtypes of aphasia is difficult and has led to disagreements among experts. The localizationist model is the original model, but modern anatomical techniques and analyses have shown that precise connections between brain regions and symptom classification don’t exist. The neural organization of language is complicated; language is a comprehensive and complex behavior and it makes sense that it isn’t the product of some small, circumscribed region of the brain.

No classification of patients in subtypes and groups of subtypes is adequate. Only about 60% of patients will fit in a classification scheme such as fluent/nonfluent/pure aphasias. There is a huge variation among patients with the same diagnosis, and aphasias can be highly selective. For instance, patients with naming deficits (anomic aphasia) might show an inability only for naming buildings, or people, or colors.
Localizationist model

The localizationist model attempts to classify the aphasia by major characteristics and then link these to areas of the brain in which the damage has been caused. The initial two categories here were devised by early neurologists working in the field, namely Paul Broca and Carl Wernicke. Other researchers have added to the model, resulting in it often being referred to as the "Boston-Neoclassical Model". The most prominent writers on this topic have been Harold Goodglass and Edith Kaplan.

- Individuals with Broca's aphasia (also termed expressive aphasia) were once thought to have ventral temporal damage, though more recent work by Nina Dronkers using imaging and 'lesion analysis' has revealed that patients with Broca's aphasia have lesions to the medial insular cortex. Broca missed these lesions because his studies did not dissect the brains of diseased patients, so only the more temporal damage was visible. Individuals with Broca's aphasia often have right-sided weakness or paralysis of the arm and leg, because the frontal lobe is also important for body movement.

- In contrast to Broca's aphasia, damage to the temporal lobe may result in a fluent aphasia that is called Wernicke's aphasia (also termed sensory aphasia). These individuals usually have no body weakness, because their brain injury is not near the parts of the brain that control movement.

- Working from Wernicke's model of aphasia, Ludwig Lichtheim proposed five other types of aphasia, but these were not tested against real patients until modern imaging made more indepth studies available. The other five types of aphasia in the localizationist model are:
  1. Pure word deafness
  2. Conduction aphasia
  3. Apraxia of speech, which is now considered a separate disorder in itself.
  4. Transcortical motor aphasia
  5. Transcortical sensory aphasia

- Anomia is another type of aphasia proposed under what is commonly known as the Boston-Neoclassical model, which is essentially a difficulty with naming. A final type of aphasia, global aphasia, results from damage to extensive portions of the perisylvian region of the brain.

Other ways to Classify Aphasia - Fluent, non-fluent and "pure" aphasias

The different types of aphasia can be divided into three categories: fluent, non-fluent and "pure" aphasias

- **Fluent aphasias**, also called receptive aphasias, are impairments related mostly to the input or reception of language, with difficulties either in auditory verbal comprehension or in the repetition of words, phrases, or sentences spoken by others. Speech is easy and fluent, but there are difficulties related to the output of language as well, such as paraphasia. Examples of fluent aphasias are: Wernicke's aphasia, Transcortical sensory aphasia, Conduction aphasia, Anomic aphasia

- **Nonfluent aphasias**, also called expressive aphasias are difficulties in articulating, but in most cases there is relatively good auditory verbal comprehension. Examples of nonfluent aphasias are: Broca's aphasia, Transcortical motor aphasia, Global aphasia
"Pure" aphasias are selective impairments in reading, writing, or the recognition of words. These disorders may be quite selective. For example, a person is able to read but not write, or is able to write but not read. Examples of pure aphasias are: Pure alexia, Agraphia, Pure word deafness

### Primary and secondary aphasia

Aphasia can be divided into primary and secondary aphasia.

- **Primary aphasia** is due to problems with language-processing mechanisms.
- **Secondary aphasia** is the result of other problems, like memory impairments, attention disorders, or perceptual problems.

### Cognitive neuropsychological model

The cognitive neuropsychological model builds on cognitive neuropsychology. It assumes that language processing can be broken down into a number of modules, each of which has a specific function. Hence there is a module which recognises phonemes as they are spoken and a module which stores formulated phonemes before they are spoken. Use of this model clinically involves conducting a battery of assessments (usually from the PALPA), each of which tests one or a number of these modules. Once a diagnosis is reached as to where the impairment lies, therapy can proceed to treat the individual module.

### Acquired childhood aphasia

**Acquired childhood aphasia** (ACA) is a language impairment resulting from some kind of brain damage. This brain damage can have different causes, such as head trauma, tumors, cerebrovascular accidents, or seizure disorders. Most, but not all authors state that ACA is preceded by a period of normal language development. Age of onset is usually defined as from infancy until but not including adolescence.

ACA should be distinguished from developmental aphasia or developmental dysphasia, which is a primary delay or failure in language acquisition. An important difference between ACA and developmental childhood aphasia is that in the latter there is no apparent neurological basis for the language deficit.

ACA is one of the more rare language problems in children and is notable because of its contribution to theories on language and the brain. Because there are so few children with ACA, not much is known about what types of linguistic problems these children have. However, many authors report a marked decrease in the use of all expressive language. Children can just stop talking for a period of weeks or even years, and when they start to talk again, they need a lot of encouragement. Problems with language comprehension are less common in ACA, and don't last as long.

### 2) Signs and symptoms

People with aphasia may experience any of the following behaviors due to an acquired brain injury, although some of these symptoms may be due to related or concomitant problems such as dysarthria or apraxia and not primarily due to aphasia.

- inability to comprehend language
- inability to pronounce, not due to muscle paralysis or weakness
- inability to speak spontaneously
- inability to form words
- inability to name objects
- poor enunciation
- excessive creation and use of personal neologisms
- inability to repeat a phrase
- persistent repetition of phrases
- paraphasia (substituting letters, syllables or words)
- agrammatism (inability to speak in a grammatically correct fashion)
- dysprosody (alterations in inflexion, stress, and rhythm)
- incompleted sentences
- inability to read
- inability to write
- limited verbal output
- difficulty in naming

The following table summarizes some major characteristics of different types of aphasia:

<table>
<thead>
<tr>
<th>Type of aphasia</th>
<th>Repetition</th>
<th>Naming</th>
<th>Auditory comprehension</th>
<th>Fluency</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wernicke's aphasia</td>
<td>mild–mod</td>
<td>mild–severe</td>
<td>defective</td>
<td>fluent  paraphasic</td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td>Individuals with Wernicke's aphasia may speak in long sentences that have no meaning, add unnecessary words, and even create new &quot;words&quot; (neologisms). For example, someone with Wernicke's aphasia may say, &quot;You know that smoodle pinkered and that I want to get him round and take care of him like you want before&quot;, meaning &quot;The dog needs to go out so I will take him for a walk&quot;. They have poor auditory and reading comprehension, and fluent, but nonsensical, oral and written expression. Individuals with Wernicke's aphasia usually have great difficulty understanding the speech of both themselves and others and are therefore often unaware of their mistakes.</td>
</tr>
<tr>
<td>Transcortical sensory aphasia</td>
<td>good</td>
<td>mod–severe</td>
<td>poor</td>
<td>fluent</td>
<td>Similar deficits as in Wernicke's aphasia, but repetition ability remains intact.</td>
</tr>
<tr>
<td>Conduction aphasia</td>
<td>poor</td>
<td>poor</td>
<td>relatively good</td>
<td>fluent</td>
<td>Conduction aphasia is caused by deficits in the connections between the speech-comprehension and</td>
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</table>

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speech-production areas. This might be damage to the arcuate fasciculus, the structure that transmits information between Wernicke's area and Broca's area. Similar symptoms, however, can be present after damage to the insula or to the auditory cortex. Auditory comprehension is near normal, and oral expression is fluent with occasional paraphasic errors. Repetition ability is poor.

<table>
<thead>
<tr>
<th>Nominal or Anomic aphasia</th>
<th>mild</th>
<th>mod–severe</th>
<th>mild</th>
<th>fluent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anomic aphasia, is essentially a difficulty with naming. The patient may have difficulties naming certain words, linked by their grammatical type (e.g. difficulty naming verbs and not nouns) or by their semantic category (e.g. difficulty naming words relating to photography but nothing else) or a more general naming difficulty. Patients tend to produce grammatic, yet empty, speech. Auditory comprehension tends to be preserved.</td>
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<table>
<thead>
<tr>
<th>Broca's aphasia</th>
<th>mod–severe</th>
<th>mod–severe</th>
<th>mild difficulty</th>
<th>non-fluent, effortful, slow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals with Broca's aphasia frequently speak short, meaningful phrases that are produced with great effort. Broca's aphasia is thus characterized as a nonfluent aphasia. Affected people often omit small words such as &quot;is&quot;, &quot;and&quot;, and &quot;the&quot;. For example, a person with Broca's aphasia may say, &quot;Walk dog&quot; which could mean &quot;I will take the dog for a walk&quot;, &quot;You take the dog for a walk&quot; or even &quot;The dog walked out of the yard&quot;. Individuals with Broca's aphasia are able to understand the speech of others to varying degrees. Because of this, they are often aware of their difficulties and can become easily frustrated by their speaking problems. It is</td>
<td></td>
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<tr>
<td>Aphasia Type</td>
<td>Speech</td>
<td>Language</td>
<td>Reading</td>
<td>Writing</td>
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<tr>
<td>------------------------</td>
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</tr>
<tr>
<td>Transcortical motor aphasia</td>
<td>good</td>
<td>mild−severe</td>
<td>mild</td>
<td>non-fluent</td>
</tr>
<tr>
<td>Transcortical mixed aphasia</td>
<td>moderate</td>
<td>poor</td>
<td>poor</td>
<td>non-fluent</td>
</tr>
<tr>
<td>Global aphasia</td>
<td>poor</td>
<td>poor</td>
<td>poor</td>
<td>non-fluent</td>
</tr>
<tr>
<td>Subcortical aphasias</td>
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</table>

Jargon aphasia is a fluent or receptive aphasia in which the patient’s speech is incomprehensible, but appears to make sense to them. Speech is fluent and effortless with intact syntax and grammar, but the patient has problems with the selection of nouns. They will either replace the desired word with another that sounds like the original one, or has some other connection, or they will replace it with sounds. Accordingly, patients with jargon aphasia often use neologisms, and may perseverate if they try to replace the words they can’t find with sounds.

Commonly, substitutions involve picking another (actual) word starting with the same sound (e.g. clocktower - colander), picking another semantically related to the first (e.g. letter - scroll), or picking one phonetically similar to the intended one (e.g. lane - late).
3) Causes

Aphasia usually results from lesions to the language-relevant areas of the frontal, temporal and parietal lobes of the brain, such as Broca's area, Wernicke's area, and the neural pathways between them. These areas are almost always located in the left hemisphere, and in most people this is where the ability to produce and comprehend language is found. However, in a very small number of people, language ability is found in the right hemisphere. In either case, damage to these language areas can be caused by a stroke, traumatic brain injury, or other brain injury. Aphasia may also develop slowly, as in the case of a brain tumor or progressive neurological disease, e.g., Alzheimer's or Parkinson's disease. It may also be caused by a sudden hemorrhagic event within the brain. Certain chronic neurological disorders, such as epilepsy or migraine, can also include transient aphasia as a prodromal or episodic symptom. Aphasia is also listed as a rare side effect of the fentanyl patch, an opioid used to control chronic pain.

Dysnomia

Dysnomia is a difficulty or inability to retrieve the correct word from memory when it is needed. Dysnomia can affect speech skills, writing abilities, or both.

Normal individuals will occasionally suffer problems recalling words. This only becomes a medical condition when the recall problems interfere with daily life. Doctors use neuropsychological tests to diagnose the condition.1

Dysnomia can develop because of brain trauma or can be a learning disability. Dysnomia from strokes or head injuries will frequently reduce or disappear with time.

The learning disability, however, cannot be cured. Patients can improve their life skills by using coping strategies.

- Overview

Word-recall problems become a medical condition when severe enough to interfere with a patient’s daily life. Neuropsychological tests of dysnomic individuals show a significant difficulty recalling words or names.

As a long-term condition, dysnomia can be:

- An inherited learning disability
- A symptom of dementia, including Alzheimer's
- A result of brain trauma, including accidents or stroke
- A side-effect of certain drugs
- A result of aging

Dysnomia can also describe a short-term problem in recalling words or names. In this case it is used as a symptom, not as a condition. Dysnomia can be a symptom of alcohol intoxication, low blood sugar, concussion, fluid/electrolyte imbalance, nutritional deficiencies, hyperthermia, hypothermia, hypoxemia, and other conditions and illnesses.
Symptoms

Dysnomia impairs an individual's ability to succeed in speech and writing tasks.

- People who have dysnomia may replace a word with a synonym in an attempt to express their thoughts without using the word they are having difficulty retrieving. Word substitutions may be a word similar in meaning or in sound, or in severe cases, jargon (a nonsense word).
- Dysnomics will take longer to complete tests or leave timed tests incomplete.
- Dysnomics may pause or appear to struggle when trying to recall words or names.

Dysnomia vs. anomia

The difference between dysnomia and anomia is the level of function. This is indicated by the nature of the names, dys-nomia vs. a-nomia. Anomia, "renders a person completely unable to name familiar objects, almost as if he or she were suddenly required to converse in a foreign language". Dysnomia, on the other hand, is a lesser level of dysfunction, a severe form of the "tip-of-the-tongue" feeling where the brain cannot recall the desired word or name.

Despite the difference, some sources interchange the terms. A review of available literature shows:

- The two diagnoses have similar, but separate references in diagnostic codes
- Anomia is cited more frequently/studied more frequently, possibly because anomic patients are more likely to be hospitalized or institutionalized
- Dysnomia appears more common in reference to a learning disability
- In cases where the two terms are used in the same materials, dysnomia is sometimes mentioned as the primary, other references place anomia first, and other references list both and treat them as synonyms.

Despite the separate diagnostic codes, a search of online materials failed to reveal clear clinical criteria for when dysnomia shifts to anomia.

Dysnomia and expressive aphasia

Dysnomia is a type of expressive aphasia

Testing methods

Doctors use neuropsychological tests to diagnose dysnomia and anomia. The tests can measure the condition's severity and identify/eliminate other neuropsychological conditions with similar symptoms.

Rapid Automatized Naming is a good example of these tests. Rapid Automatized Naming times how quickly the patient can name common objects or colors. A typical test would have the patient rapidly name five pictures of common objects or colors appearing repeatedly on a computer screen. The doctor compares the completion time against average times for the patient's age group.

Treatment

Doctors recommend different treatments based on the cause of the dysnomia.
Dysnomia caused by a brain trauma, including injury or stroke, is frequently treated by a speech pathologist using exercises to improve recall. For brain trauma cases, doctors recommend that, "language therapy should begin as soon as possible and be tailored to the individual needs of the patient."

Treatment is more difficult when dysnomia is caused by developmental issues. Since the area of the brain dealing with word recall has not fully developed, there is currently no way to cause the development or speed its process. In children with dysnomia, the condition may lessen or disappear as the child grows.

If a medication is causing dysnomia as a side effect, the prescribing doctor can offer alternatives.

A published case study reported that antidepressants helped a dysnomic patient.