

Speech Assessment:

Consider both spoken and written language

1. Spontaneous speech- ask the patient a few questions such as where they live, how many children, what their job is etc to get a sense of the fluency of their speech. If they are struggling with this then asking them to say the days of the week or months of the year can be useful to get an idea of what their speech quality is like. This is a good opportunity to decide if the speech deficit is dysarthria or aphasia. If the speech is difficult to understand but the grammar is correct and the content appropriate then it is more likely due to dysarthria. If there are grammatical errors or the speech sounds broken then it is more likely to be dysphasia.
2. Naming- When testing naming use words that are available to you such as “eye-brow”, “knuckles”, “pen”, “paper”, “watch”. Then test lower frequency words such as ask them to name the face of a watch, winder, hands, strap etc and same with a pen. Having line drawings of objects is also useful here.
3. Comprehension- start testing of comprehension with a simple one stage command such as “close your eyes” and then increase to two, three and four stage commands such as “touch your nose and then your ear” and “stand up, turn around, clap two times and sit down”. If these are easily performed increase the complexity of the task such as “with the comb, touch the coin”. And then you can ask more complex comprehension questions such as “does a cork sink in water?” or “Do you put on your shoes before your socks?” and even more complex such as “If a lion was killed by a tiger which one is still alive?” Word recognition can be tested by asking the patient to point at items that are plainly visible.
4. Repetition- This is tested by asking the patient to repeat phrases of increasing complexity. Speech consisting of over-learned sequences such as “one, two, three” are preserved in all but the most severe of cases. Then short sentences using high-frequency words such as “she did it” and “this is it” and then longer sentences with less frequent words such as “it’s a lovely day today in Dublin” or “they heard him speak on the radio last night”. And then finally complex, low-frequency phrases such

as “baby hippopotamus” and “British constitution” or “no ifs, ands or buts”

5. Reading- Ask the patient to read aloud from a newspaper or from a list of single words. The patient may be able to read only regular words as opposed to irregular words. Reading comprehension can be tested with written commands such as “fold this paper in half and put it on the table” or with a written word-picture matching test.
6. Writing- Ask the patient to write a sentence spontaneously. You may also dictate a sentence to a patient in order to check for regularly spelled words and irregular words. You can also ask patients to write names of objects or actions in response to pictures.

Patterns of Speech Abnormalities:

1. Wernickes aphasia

a. What is the deficit?

Comprehension is markedly impaired in Wernickes aphasia.

Patients with this type of aphasia are usually talkative but what they say is completely incomprehensible as they themselves do not understand it. This is referred to as jargon aphasia. Repetition of spoken words is also impaired in Wernickes aphasia.

Comprehension of written language will also be impaired.

b. Where is the lesion?

In Wernickes aphasia the lesion is located in the posterior superior temporal gyrus. In terms of stroke this would be in the left middle cerebral artery inferior division.

2. Brocas aphasia

a. What is the deficit?

There will be a hesitation to speak. The speech will be broken and the patient will be unable to name common objects. They will be aware of the fact that speech is abnormal. Comprehension will not be completely normal in Brocas aphasia. Sometimes patients will

maintain automatic speech such as counting to 10 or naming the days of the week- this type of automatic speech is thought to be located somewhere distinct from Brocas area and also some studies show there is bilateral representation for this function. Repetition and writing function are also impaired in Brocas aphasia.

b. Where is the lesion?

Brocas (or motor) aphasia is caused by lesions in Brocas area or adjacent structures in the inferior frontal gyrus. In terms of stroke this would be in the left middle cerebral artery superior division.

3. Global aphasia- this is a combination of both Wernickes and Brocas aphasia with a stroke involving all of the middle cerebral artery.

4. Conduction aphasia

a. What is the deficit?

Here the main deficit is in repetition. There will be frequent paraphasic errors with preserved comprehension. Naming will also be impaired. Patients will often try to correct their errors. Writing language may be similarly affected.

b. Where is the lesion?

Damage to the arcuate fasciculus can cause this type of deficit as this connects Wernickes to Brocas area. A lesion in the peri-sylvian area may also interrupt the arcuate fasciculus causing this type of deficit.

5. Transcortical sensory aphasia

a. What is the deficit?

This type of aphasia sounds similar to Wernickes but one difference is that repetition is intact. So again the speech is completely incomprehensible. Patients may be able to read but they will not be able to understand what they have read.

b. Where is the lesion?

This syndrome is produced by lesions close to Wernickes area in the temporo-occipital or parietal-occipital regions. In terms of a

stroke it could result from a watershed infarct between middle and posterior cerebral arteries.

6. Transcortical motor aphasia

a. What is the deficit?

Here the patient will have good comprehension and repetition but otherwise non-fluent speech output and difficulty with expression and naming.

b. Where is the lesion?

Damage to the supplementary motor area and connections to the frontal perisylvian speech area will produce this type of speech deficit. The supplementary motor area receives blood supply from the anterior cerebral artery and so infarcts involving this artery may produce this speech deficit.

Aphasia related syndromes:

7. Alexia without agraphia

a. What is the deficit?

Patients with this syndrome can write but cannot read. Their ability to produce and understand oral speech is intact.

b. Where is the lesion?

This deficit is caused by lesions in the occipital lobe and extending in to the splenium of the corpus callosum. In terms of stroke this could be caused by a left posterior cerebral artery occlusion.

8. Alexia with agraphia

a. What is the deficit?

Here the patient cannot read or write.

b. Where is the lesion?

Here the lesion usually involves the dominant inferior parietal lobule in the region of the angular gyrus.

Conditions that could be mistaken for aphasia:

Patients who have a delirium or a metabolic encephalopathy may have trouble naming and following commands and so may appear aphasic. Patients who

have severe depression may be unwilling or unable to communicate and again may appear as if they have an aphasia.

Dysarthria is usually easy to distinguish from dysphasia. The speech may be slurred but the content is correct and makes sense. Also, if the dysarthria is not accompanied by a hemiparesis writing function will be normal.

References:

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Neuroanatomy through clinical cases, Hal Blumenfeld

The Neurologic Examination. Scientific basis for clinical diagnosis. SHibasaki H and Hallett M.