



Stroke Part 2

Neurocognitive assessment and Rehabilitation

Well-established neurobiological basis of rehabilitation - apart from the settling of stroke-related oedema, neurological recovery may occur because of:

- i) recruitment of alternative neural pathways - 1.3 trillion non-active synapses in the adult brain
- ii) Dendritic sprouting: in animal experiments, rehabilitation-like manoeuvres increase brain nerve growth factors and encourage dendritic sprouting
- iii) reduction of threshold sensitivity for nerve depolarization

Key aim is therefore not compensatory, but is to aim for normal tone and body movement

Neurocognitive assessment: - three stages

- Alertness, language, cognition
- "Classical" neuro examination
- Other cortical function

The first stage is to assess whether the stroke has caused **communication barriers**, and also the **cognitive ability** of the patient (both of these will critically affect the rest of the examination)

- a Level of consciousness
- b Language
- c Cognitive function
- d Awareness of deficit

The second stage is the "classical" neurological examination

- a Cranial nerves
- b Tone
- c Power
- d Sensation
- e Co-ordination
- f Reflexes

The third stage is to assess a range of cortical perceptual functions, previously loosely referred to as "parietal signs" as the parietal lobe largely deals with the reception and analysis of sensory information

- a Attention/Neglect
- b Agnosia
- c Apraxia

First and third stage assessments are the most critical for determining prognosis and the most appropriate rehabilitation strategy. Second stage are the most helpful in terms of localization of the stroke lesion.

"End-of-the-bed-ogram"

Position

- Overall ? neglect / inattention
- Limbs ? risk of pressure
- ? promoting contracture

Alertness / facial expression ? pain

Breathing: ? laboured / 'wet'

Alertness, language, cognition

The presence of coma or drowsiness

- 1) requires an awareness of the possibility of other diagnoses
- 2) has a worse prognosis in cases due to stroke

Language/communication

▪Speech and language are not synonymous: some patients have slurred speech with normal language function eg dysarthria, while others may have normal articulation with abnormal language function eg reading/writing

▪Language disorders are common after stroke, vary enormously between patients. There are three major types of disorder:

- Dysarthria
- Dysphasia
- Dyspraxia

A patient may have any combination or none of these!

▪A communication problem may be evident. If not, ensure that the patient can hear you, and ask him to name some objects. Inability to do so should alert you the possibility of a dysphasia (or a visual agnosia (see below). If they cannot do this, do a one-stage command ("close your eyes tightly"), two-stage command ("close your eyes tightly and raise your arm") and three-stage command ("close your eyes tightly, raise your arm and close your fist"). Document which, if any, the patient can comply with.

▪Dysarthria is a problem of articulation, but language is preserved and the patient will usually have a degree of pseudo-bulbar palsy, ie an upper motor neuron lesion of cranial nerves IX-XII.

▪Dysphasia is a problem with language. It is more common after dominant hemisphere lesions. The dysphasias do **not** fit easily into categories such as "motor", "sensory", "Broca's", etc..

The emphasis is to describe what you find, and the most useful categories are *fluent* and *non-fluent dysphasias*.

▪Fluent dysphasia: (receptive, conductive or nominal usually)

The patient speaks effortlessly but does not get to the point. May be Wernicke's (temporo-parietal)

▪Non-fluent dysphasia: (expressive usually) speak with difficulty, an effort to produce words. often frustrated++ as aware of deficit
May be Broca's (adjoining motor cortex)



Dyspraxia (see below)

Cognition

If language is preserved, either the MMSE should be routinely performed. If language is significantly impaired, get a collateral history and request a joint OT/SLT assessment.

Classical neuro examination

Cranials- NB:

- Conjugate gaze paralysis
- Hemianopia
- Pupillary disturbances
- Facial n palsy
- Pseudobulbar palsy

Tone

- Usually up, but may be reduced
- In comatose patient, lifting limb and let fall may indicate affected side

Sensation

- 25% have somatosensory symptoms

Reflexes

- Remember Hoffman's

Perceptual disorders

In the presence of normal sensory and motor pathways (cf importance of doing stages one and two first), disorders of perception may occur. If these are not picked up, i) the patient may not get appropriate therapy, ii) commonly may be branded as "lazy" (a forbidden term in ARHC!) or "poorly motivated".

Agnosia; difficulty interpreting sensory data from the environment or from one's own body

Visual agnosia is a disorder distinguished by the inability to recognize familiar object. There are a number of subtypes of visual agnosias

- **Mirror agnosia:** Patients cannot recognize objects or activity on either their left or right field of view.
- **Form agnosia:** Patients perceive only parts of details not the whole object
- **Prosopagnosia** - Inability to identify faces even though the person is known to patient.
- **Object Agnosia** - Inability to name objects

Auditory agnosia pt can hear but cant interpret sounds incuding speech

Anosagnosia – reduced awareness of neurological deficit

Somatosensory Agnosia (Astereognosis - Tactile Agnosia) - Patients with this disorder have difficulty perceiving objects through tactile stimulation although basic tactile sensation is intact

Apraxia: difficulty in formulating movements or in initiating and sequencing motor activity in response to a sensory input.

The patient cannot do an activity voluntarily, but may be able to so automatically

- Dressing apraxia
- Speech apraxia
- Gait apraxia

Stroke Classifications (AgePage 5)

May help in defining

- Aetiology
- Infarct size
- Patient disability
- Prognosis

CAUTION when giving prognosis:!!

- At 12 months
 - 1/3 pts will have died
 - 20-30% dependent on another person for ADL's
 - 40-50% dependent
- Indicators of poor functional recovery
 - urinary incontinence
 - poor postural control
 - cognitive dysfunction
 - visual-spatial perceptual dysfunction

Internet resources:

- *www.irishheart.ie - Irish Heart foundation
- *www.rcplondon.ac.uk/pubs/books/stroke/index.htm - RCP guidelines
- *www.stroke.org.uk - Stroke Association
- *www.basp.ac.uk - British association of stroke physicians
- *www.strokeassociation.org/presenter.jhtml - American Stroke Association
- *www.ninds.nih.gov/ - National Institute of Neurological Disorders and Stroke