

Apraxia

PRAXIS

- **SENSORY PERCEPTUAL SYSTEM:**

Distinguish between visual, auditory and object information

- **CONCEPTUAL SYSTEM:**

Knowledge of: - Object function -Action - Sequencing actions

- **PRODUCTION SYSTEM:**

Involves: - Organize and control response selection - Execution (correct force, direction and timing)

APRAXIA

- `A cognitive motor planning disorder leading to an inability to perform actions in the absence of weakness or sensory loss`
- Prevalence – 1/3 of those in rehabilitation centers and nursing homes following left hemisphere stroke
- Ideomotor Apraxia
- Ideational Apraxia

Ideomotor Apraxia

- A disorder in the initiation and execution of planned sequences of movement.
- The concept of the task is understood but the movements lack the correct force, direction and timing in order to achieve a motor goal.

- A person with ideomotor apraxia **knows what to do, but not “how to do it”**, so still has problems with carrying out the task.
- Typically, actions become hesitant and imprecise, or movements lack flow and timing.

Ideational Apraxia

- A disorder in the performance of skilled activity because the concept of the action related to the object is impaired.
- A disturbance in the conceptual organization of actions.

- Ideational apraxia is usually related to the conceptual organization of actions, and refers to problems related to **“knowing what to do”**, leading to **difficulties of task sequencing and object use**.
- A patient may for example start eating a slice of bread before putting spread on, or brush his hair with his toothbrush.
- The two types of apraxic problems are however often present to varying degrees, influencing each other

APRAXIA TEST

- Caroline van Heugten and Chantal Geusgens
- Apraxia Screen of TULIA (AST)
- Measurement of disability in people with apraxia

- In apraxia evaluation and treatment, it is often useful to consider the following terms:
- **Imitation** can be concurrent or delayed
- **Pantomime**: the person is asked to demonstrate a particular gesture, with a verbal command or showing him/her an object or a picture.
- **Gestures** can be **transitive** (involving an object or a tool) or **intransitive** (without object, can be with or without meaning)

Behavioral observations

- Tasks which can be used in a functional setting e.g.
 - Making a cold drink
 - Putting paper in an envelope
 - Hole punching paper and putting it in an A4 file.

Ideomotor Apraxia Performance errors

- ✓ Spatial orientation errors
- ✓ Temporal imprecision errors (timing errors)
- ✓ Errors of the force of movement
- ✓ Poor distal differentiation
- ✓ Body part as object
- ✓ Gestural enhancement
- ✓ Vocalisation

Ideational Apraxia Performance errors

- ✓ Inappropriate object use
- ✓ Sequencing errors - omission / incomplete
- ✓ Blending sequences together
- ✓ Action overshoots what's required
- ✓ Action remains incomplete
- ✓ Perseveration

ERROR ANALYSIS

- Which kind of errors ?
- Where ?
- When ?
- Which body part ?
- Who and how asked the task ?
- Is the person conscious of the error ?
- Is the person able to correct the error ?
- Are there safety issues to be considered ?

Error type example

Omission: Does not put paste on the toothbrush

Repetition: Washing the same body part several times

Perseveration: Same movement in two consecutive actions:
stir the coffee then stir the sugar

Disturbances to order of movement in sequence: Attempts to
pour the milk without removing the lid

Difficulty terminating movements: Continues to stir the
coffee without drinking it

Difficulties coordinating limbs in time and space: May have difficulties with tasks that require the use of both upper limbs

Performance in wrong plane: Wave goodbye with a flat hand

Using body part as object: Using hand to comb hair

Verbalize performance without completing: Talk through the steps required but not able to complete the actions

Mismatch objects to actions: Attempts to comb hair with a tube of sweets

Suggestions for Assessment and Intervention

Assessment

- Use activities that require both transitive (tool-based) and intransitive (sociocultural) gestures.
- Ascertain if a person is able to pantomime and imitate (both concurrent and delayed). Ask them to perform an activity to verbal command with and without the object present, and then use a photograph as a cue (also helpful if communication skills are impaired). Relate this information to the conceptual-production model of praxis to determine the level(s) of breakdown in performance and the pattern of gestural deficit.
- Observe function within a naturalistic environment whenever possible.
- Document the types of errors observed and note if the person is able to overcome them (reparable) or if the errors are fatal (i.e. the therapist needs to intervene to aid continuation of the task).
- Consider the different stages of goal-directed movement and observe at which stage the breakdown may be occurring: sensory/perceptual, conceptual or production stages.

Intervention

- Provide and/or teach compensatory strategies (Intercollegiate Stroke Working Party 2016).
- Explain the impairment and the impact on function to the person, their family and their treating team (Intercollegiate Stroke Working Party 2016).
- Be careful if thinking about issuing equipment (new tools, for example a bathboard), as a new transitive gesture for someone with difficulties performing existing transitive gestures could prove too difficult. You may need to introduce essential equipment through a process of chaining.
- *Strategy training* – teach the person and their family the concept of activity analysis and chaining; they may wish to transfer this technique to other priority activities and take control of their own rehabilitation.
- Carry out intervention sessions within the naturalistic environment wherever possible and use items within the environment for non-verbal cues.

Cognitive Rehabilitation Approaches

- Restitution – aimed at reducing specific cognitive deficits
- Specific skills training – aimed at improving functional task ability
- Substitution or cognitive strategy training – teach people new ways to deal with daily life problems

- **Activities in context:** Clark et al 1994
- **Appropriate environment:** Park S et al 1994
- **Errorless learning:** Goldenberg and Hagmaan 1998
- **Task specific training:** Goldenberg & Hagmaan 1998; Wilson 1998
- **Goal directed activity:** Goldenberg & Hagmaan 1998
- **Structured tasks:** Wilson 1998
- **Practice and repetition of meaningful tasks:** Goldenberg & Hagmaan 1998; Wilson 1998

Strategy training - Apraxia

Stage of activity	Intervention
Initiation	Instruction
Execution	Assistance
Control	Feedback

Transfer effects

For patients to function as independently as possible at home and in society, two types of transfer of treatment effects are needed

- Tasks taught in the rehab setting should be transferred to the home setting
- Transfer of intervention effects from trained to non trained (related) tasks is important in terms of the clinical success of a therapy programmed as not all difficulties can be dealt with in therapy programmed