Apraxia
An Intervention Guide for Occupational Therapists

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Objectives

- Identify the difference between Ideomotor and Ideational Apraxia in the clinical setting
- Understand how everyday living is affected if apraxia is present
- Implement at least 2 intervention strategies focus on
Apraxia

- Cognitive disorder of **purposeful** and **skilled** movement
- Associated with LEFT hemisphere damage
- 1/3 of people with LEFT hemisphere CVA and often co-occurs with RIGHT hemiplegia and aphasia
- May also occur in other neurological conditions: Alzheimer’s, seizures, TBI
- **Brushing Teeth??**
Results from..

- Apraxia results from dysfunction of the cerebral hemispheres of the brain, especially the parietal lobe, and can arise from many diseases or damage to the brain.
Ideational Apraxia

Loss of ability to conceptualize, plan, and execute motor actions involved in use of tools or objects.
They have lost the perception of the objects purpose
- Difficulty with first step of motor planning, including:
  1. Knowing what object to use and how
  2. Sequencing
  3. Knowing what to do within the task
Ideational Apraxia

- Persons movements appear confused because he cannot form a plan on how to sequence these movements when using a tool.

- The IDEA processing and planning areas are damaged.

- They have lost the knowledge or thought of what an object represents.
Ideational Clinical Examples

- The patient does not know what to do with toothbrush, toothpaste or shaving cream
- Uses tools inappropriately (i.e. smears toothpaste on face, uses washcloth to wash sink instead of face, eats soap, toothbrush as hairbrush)
- Sequences activities steps incorrectly so that there are errors in the end result of task (i.e. put socks on top of shoes, washing body without soap, attempting to drink milk without opening container)
Eating with Apraxia
Less Choices- Take away other utensils
Ideomotor Apraxia

- Impinges on one’s ability to carry out common, familiar actions on command.

- Disturbance of voluntary movement in which a person cannot translate and IDEA into MOVEMENT

- A breakdown with the planning of the task despite understanding the concept of the task
May experience:
1. Sequencing of movements
2. Choppy, clumsy, or irregular movements
3. Inability to adjust grasp during tool
4. Unable to perform task on command

CAN describe how to perform the task; they know what an object is, patient knows how to perform task
Ideomotor

- Can still perform automatic movements, such as cutting with scissors.

- However disturbance when ASKED to do something upon request – poor ability to copy or gesture, such as wave good – bye!
Ideomotor Clinical Examples

- Awkward or clumsy movements
- Difficulties when planning movements to cross midline (i.e. adjusting the grasp on a hairbrush when moving it from one side of the head to other to turn the bristles toward the hair)
- Difficulty orienting the UE or hand to conform to objects such as picking up a juice bottle with the radial side of the hand down or via picking up bottle with a pinch grip on the lip of the bottle instead of a typical cylindrical grip on the base
- Ask a patient to give you a thumbs up
- Ask a patient to copy your movements
Ms J

Ms. J has full movement and strength in her “good” right leg. She’s able to weight-bear through it and can kick her left shoe off. HOWEVER, she cannot use her right leg to foot propel her wheelchair. She can tell you what she needs to do, but she is not able to tie together the concept of moving her WC with the actual performance of using her “good” foot.
What are you observing? How would you teach her WC propulsion to give her some independence with functional mobility?

Answer: Facilitate Normal Motor Patterns
Offer proprioceptive /kinesthetic input to the limb, like moving the limb through the desired motion. Guided performance of whole activity.
Apraxia Assessment

- Functional assessment of how apraxia affects daily living rather than simply the presence of apraxia should be the preferred method for Rehabilitation Professionals
Combing through deficits is difficult

Is it apraxia, something else, or a combination?”

○ Body schema/visual-spatial impairments such as unilateral neglect
○ Visual and sensory deficits
○ Aphasia
○ Attn, memory, or other cognitive deficits
○ Hemiplegia
○ Fear

*OBSERVATION of the patient with OT/PT/Speech/Rec and nursing is vital to understanding their deficits
**Clinical Observations**

<table>
<thead>
<tr>
<th>FEEDING</th>
<th>Uses a spoon as straw (IA)</th>
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<tbody>
<tr>
<td></td>
<td>Puts butter in coffee (IA)</td>
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<tr>
<td></td>
<td>Awkward grasp on knife interferes with cutting (MA)</td>
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<tr>
<td></td>
<td>Unable to adjust movements to guide spoon to mouth smoothly without spilling (MA)</td>
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</tbody>
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<table>
<thead>
<tr>
<th>GROOMING</th>
<th>Smears toothpaste on sink (IA)</th>
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<tbody>
<tr>
<td></td>
<td>Doesn’t know how to turn on water faucet (IA)</td>
</tr>
<tr>
<td></td>
<td>Grasp comp awkwardly, resulting in inaccuracy when combing hair (MA)</td>
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<tr>
<td></td>
<td>Inability to pantomime toothbrush use (MA)</td>
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</tbody>
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<table>
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<tr>
<th>DRESSING</th>
<th>Attempts to put socks on hands (IA)</th>
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<tr>
<td></td>
<td>Puts shirt over gown when dressing UB (IA)</td>
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<tr>
<td></td>
<td>Not able to plan movement sequence for donning shirt upon command (MA)</td>
</tr>
<tr>
<td></td>
<td>Not able to re-adjust sock within the hand after picking it up (MA)</td>
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IA = IDEATIONAL    MA = Ideomotor
### Clinical Observations

| Mobility                  | Attempts to propel WC by pushing on the brakes repeatedly (IA)  
|                          | Attempts to lock WC brakes by pulling on armrest (IA)  
|                          | Cannot plan movements to roll and sit up over the EOB (MA) |
Recovery

- Improvement from ideomotor apraxia may be related to the site of the lesion, anterior lesions may fare better
- An exam of recovery of 26 clients with apraxia revealed that 13 remained apraxic 5 months later
- Age, gender, aphasia, education level, and lesion size do not seem to influence recovery from apraxia.
Limb apraxia recovery showed no significant correlation with recovery language deficits.

Aphasia and Apraxia seem to have related but distinguishable recovery process

After first few months of recovery, clients will plateau
Effect of Apraxia on ADLs and rehab outcomes

- It is well recognized that apraxia does have a substantial negative effect on an individual ability to engage in meaningful activities.
- Apraxia Affects behavior during Meals Eating: used fewer utensils, were less organized, were less efficient, ate haphazardly, placed too much or too little food, and action deficits.
- Ideomotor apraxia increases dependency in grooming, bathing, and toileting.
Effect of Apraxia on ADLs and rehab outcomes

- 6 months after DC from hospital, apraxia and the need for assistance with ADLs are highly correlated.
- Those with apraxia require more assistance than those with other neurologic impairments.
- The relationship of severity of apraxia to long term dependency after rehab is strong.
Effect of Apraxia on ADLs and rehab outcomes

CLEARLY the presence of apraxia warrants special attention from a rehabilitation perspective.
Research

- Up to now, only a few studies have been published that investigated the efficacy of treatments for upper limb apraxia. This might be due to assumption that apraxia does not cause a significant impairment in daily life.

- Contrary to this assumption, it has been demonstrated that apraxia significantly affects patients in their everyday lives and has a negative impact on their rehabilitation.
Evidence-Based Intervention

- 2 Categories
  1. Interventions focused on attempting to decrease the apraxia impairments itself
  2. focused on improving activity performance despite apraxia
Decreasing apraxia impairment

- Van Heugten states
  - “The recovery from apraxia is not a realistic goal for therapy. Instead, aim to help client develop new patterns of cognitive activity through compensatory mechanisms, or adaptation of tasks and environment.”
Evidenced-Based Treatment Approaches

Focus on decreasing activity limitation and participation restrictions of those living with apraxia

- Errorless Learning/Training of Details
- Combined Mental and Physical Practice
- Gesture Training
- Strategy Training
Errorless Learning/Training of Details

- A technique in which the person learns the activity by doing it
- The OT intervenes to prevent errors from occurring
Errorless Learning/Training of Details

- Therapist provides support during critical stages of task to prevent errors
  - Hand over hand guidance
  - Cuing
  - Parallel demonstration
Example without intervention
Intervention Example

Hand over Hand guidance
Washing hands
Washing hands intervention

First I demonstrate the task. This automatically helps him initiate the task.

To prevent an error, I provide HOH A to reach for soap.
Example

- Pt searches for armhole before completing whole task of UB dressing
- OT provides essential vc’s and HOH assist to prevent errors
- Pt then practices threading sleeves, shirt around back (isolated)
- OT points out sensory aspects: fabric/buttons
Combined Mental & Physical Practice

Example:
30 minute instructional audiotape
5 minute progressive relaxation
20 minute mental practice emphasizing visual and kinesthetic details

“Close your eyes, imagine the shirt in your lap, It is red and black, soft flannel, feel the texture, the buttons, draw attention to the right sleeve, hold shirt with your left hand while you search for the right sleeve, feel the opening, thread your arm through …..”
Gesture Training
Transitive

- STEP 1- Demonstrate/Show use of an object (e.g. comb)
- STEP 2- Show a picture of a person appropriately using object and patient then pantomimes object use
- STEP 3-Show a picture of only the tool . Ask patient to pantomime appropriate use
Example

- **Stage 1**: Here is a toothbrush “Show me how you use it?”
- **Stage 2**: Picture of man brushing teeth, “Can you brush your teeth like in the picture?”
- **Stage 3**: Picture of toothbrush. “How do you use it?”
Gesture Training
Intransitive

- Challenge to perform tasks across contexts

Example:
1. Show 2 pictures ie: donning hat and just the hat
2. Show only picture donning hat
3. Show new picture in different context ie: baseball cap
Gesture Training
Gesture Training Brush
Supported in Research

- Smania and colleagues report positive effect of the intervention persisted at least for 2 months after the gesture training had been completed
Strategy Training

- Assuming that apraxia is a persistent and difficult-to-treat syndrome, this therapeutic approach is aimed at teaching patients strategies that might help to compensate for apraxic deficits in daily life
Strategy Training

- Teaching client strategies to COMPENSATE for the presence of apraxia
- Focus on training activities that are relevant to the client

“This strategy training approach for apraxia has been tested with promising results.

Authors concluded “therapy programs succeeded in teaching client compensatory strategies, which enable them to function more independently.”
Strategy Training- Using internal and external Cues

- Compensatory approach
- Training in self verbalization (internal)
- Provide cues to improve task (external)
- Physical assistance (external)
- Written list of steps to help with sequencing (external)
- Sequence of pictures as visual cues (external)
Specifics of Strategy Training

- During strategy training, the patient practiced several ADLs with support by an occupational therapist.
- Dependent on the patient’s degree of impairment, the occupational therapist supported the patient at three different stages according to a detailed protocol.
Strategy Training

- Interventions are focused on errors related to:
  - Initiation-developing a plan of action
  - Execution-performance of the plan
  - Control-controlling and correcting activity to ensure an adequate end result
Impaired in **initiating** an action—assist the patient by providing additional **verbal instructions**.

If the patient still does not initiate the action, the OT might hand over the required objects to the patient.

If on the other hand a patient has difficulties with the actual **execution** of an action, the occupational therapist can **verbally describe** the single steps needed for execution of the action or can provide **direct physical support** by, for example, correctly positioning the patients’ limbs. Finally, the OT can provide **feedback** to the patient regarding the outcome of his/her action and/or could ask the patient to monitor the result of the action.
Brushing Teeth Example

• Instructions:
  – “Take this and brush your teeth”
  – “Pantomime use of toothbrush”
  – Show picture of activity

Again this is used for **initiation** of task if they do not do it on their own.
Brushing teeth

• Assistance
  ▪ Verbal Assistance
    • Name steps of activity – Place toothbrush in mouth, now go in circular motion
    • Direct the attention to the task at hand
    • Stimulate verbalization of steps – Have patient do
  ▪ Gestures or Mimic
  ▪ Show pictures of proper steps
  ▪ Physical Assistance
    ▪ Guiding the limb
    ▪ Take over until the patient starts performing
    ▪ To provoke movements
Brushing Teeth

• Feedback
  – Verbal or physical feedback in terms of the result or performance
  – Video recording of the patient’s performance and show the video
  – Place patient in front of mirror

*Feedback used in term of CONTOL-correcting the activity to ensure adequate end result
Guiding – A part of Assistance

- **Guiding Techniques by Jane Davis**
- **One more Guiding Video**
Stapling

Awkward holding of paper/stapler
intervention

I provided a RED line to give visual feedback as to where staple should go
Facilitating Carry-Over to Daily Tasks

- Requires lots of repetition
- Find what works with individual patients and stick with it
- CONSISTENCY!! Between all disciplines. Be sure PT/OT are teaching same transfer technique and making sure it works in the gym as well as in the bathroom!
- How are your techniques carrying over with nursing?
- Allow LOTS of extra time to process a request
Take Home Message

- Repetition
- Consistency
- Extra Time
- Overall Patience
- FIND OUT WHAT WORKS BEST FOR YOU PATIENT!!

- And sometimes less is MORE
Interventions for Caregivers

- Be mindful that cognitive and perceptual deficits in general are not commonly understood in the community - EDUCATE
- Make sure they understand behaviors observed are not caused by LACK OF MOTIVATION
- Emphasize habits and routines and keeping a consistent sequence of ADLs
Interventions for Caregivers

- Emphasize that client needs MORE TIME to complete ADLs- avoid rushing
- Teach caregiver what you have founds helps enhance function (gestures, tactile, visual)
- Emphasize the need to allow for Independence –edu on importance of NOT over assisting.
Case Study Meredith

- 48 year old housewife
- CVA affecting Left parietal Lobe
- She needs Max A for all mobility
- She has an 8th grade education and does not read
- She enjoys cooking, cleaning, and watching TV
- You observe the following during ADL’s
  - #1 She does not initiate getting dressed
  - #2 She requires max A for grooming, often uses the wrong tools
  - #3 She is observed pouring her milk on her food, and eating with her knife
Meredith

- Identify with each deficit, the type of apraxia observed.
- Go through items #1-3 and plan out an intervention and why

- Show intervention with Error less learning
- Show intervention with Strategy Training
- Show intervention with Gesture Training
“Pusher Syndrome”

- “Pusher Syndrome” is a clinical disorder following left or right brain damage.
- A Neurological deficit present in a group of stroke patients characterized by distorted postural orientation.
- Patient ACTIVELY pushes away from nonparetic (strong) side.
Understanding Pusher Syndrome

- The posterior thalamus appears to be a fundamental brain structure that controls body upright posture.

  - Lesion thought to cause Pusher Syndrome.
Patient Presentation

- Pushes with strong arm
- 20 degree tilt
- Sally, I feel upright

FALL!!
Diagnosis of Pushing Behavior

- 3 variables important in examination of patients with pushing
  1. Spontaneous body posture/tilting toward the more affected side
  2. Increase of pushing force by spreading of the nonparetic extremities from the body (abduction and extension of the less-affected extremities)
  3. RESISTANCE to passive correction of posture
- Determined with patient both sitting (feet with ground contact) and standing
Prognosis of the disorder

- At admission to hospital post stroke, more severely impaired level of consciousness and impaired ability to walk, paresis of upper and lower extremities, and initial function in ADL.
- 6 months post stroke, rarely still evident
- Good prognosis
- “Pushers” take 3.6 weeks longer than “non-pushers” to reach same functional outcome
Goal of Therapy

- Visual information corresponds to reality
- Use visual aids to give feedback about body orientation
- Experience of not falling after attaining correct position
Treatment Strategies

- Should NOT be treated in horizontal position
- Treat in Earth Vertical Position

SITTING-----STANDING-----WALKING
Treatment Strategies

- First Goal: Showing the patient that they are tilted NOT erect

  Ask your patient, while sitting or standing, if they are oriented upright

- Now provide feedback to your patient
VISUAL FEEDBACK
Treatment Strategies – make them feel like they will not fall

- Address perceptual problem - communicate with patient
  - Ask patient which way he feels he is falling
  - Explain true direction patient is falling
  - Encourage patient to trust you
Treatment Strategies
Treatment Strategies

- AVOID Elbow Extension in non-affected UE
Specific Treatment Techniques

- Sitting on side of mat
- Short range reaching with weight shift to non-hemiplegic side
- Bear hug from non-hemiplegic side
- Sitting WB on non-hemiplegic elbow
- Sit forward with NDT facilitation

- Side-sit or side lying propped on elbow on non-hemiplegic side
- Bed mobility considerations
- Transfers toward hemiplegic side initially
- Standing at hemi-bar performing weight shifting; reaching

Have them stand next to wall-place wall next to arm that pushes
References


References

1. Glen Gillen Cognitive and Perceptual Rehabilitation – Optimizing Function 2009 Mosby
Thank You!
Any Questions?