

The Effects of a Traumatic Brain Injury on Pragmatics

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Introduction of Pragmatics and Traumatic Brain Injury

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What is Pragmatics?

- ❑ Pragmatics is one's general knowledge of the world and how they use language for communicative purposes (Arcara, 2020)
- ❑ Pragmatics is interconnected with memory, executive functions, and theory of mind (Arcara, 2020)
- ❑ Difficulties in a person's pragmatics is one of the most common results of a TBI (Arcara, 2020)



What is effected after a Traumatic Brain Injury?

- ❑ Theory of mind
- ❑ Memory function
- ❑ Executive function
- ❑ Language and communication disorders

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Table 1

Common cognitive impairments following TBI

Cognitive Impairments following traumatic brain injury

Impaired attention

Decreased concentration

Easy distractibility

Impaired visual spatial conceptualization

Slow verbal/visual information processing

Impaired memory

Communication disorder

Poor judgment

Poor executive function

TBI – Traumatic brain injury

Theory of Mind (ToM)

- ❑ “...the ability to infer other people’s and one’s own mental states accordingly seems to be necessary to communicate effectively.” (Bosco, pg. 876)
- ❑ TBI patients performance on ToM tasks are relatively low and this could explain the cognitive deficits (Bosco, 2018)

Memory Function

- ❑ This is usually the first function to be impaired and one of the last functions to be fully recovered
- ❑ Cognitive rehabilitation therapy interventions are used to help memory
 - ❑ Tasks include word lists, paragraph listening, and visual imagery

Executive Function

- ❑ When executive functioning is impaired this results in verbal working memory, initiation, inhibition, planning and switching components to be difficult for TBI patients
- ❑ 1/3 of the pragmatic difficulties in TBI patients stem from executive functioning problems

Language and Communication Disorders

- ❑ Language and communication disorders are also very prevalent in TBI patients
- ❑ 4 main groups:
 - ❑ Apraxia, aphasia, dysarthria, cognitive communication disorder
- ❑ Apraxia is the inability to carry out a motor act
- ❑ Aphasia is the loss of ability to understand or express speech
- ❑ Dysarthria is a motor speech disorder, the muscles in the face are weakened

Speech Pathologists and TBI

The goal of a SLP is to get the TBI patient back into their life and social relationships



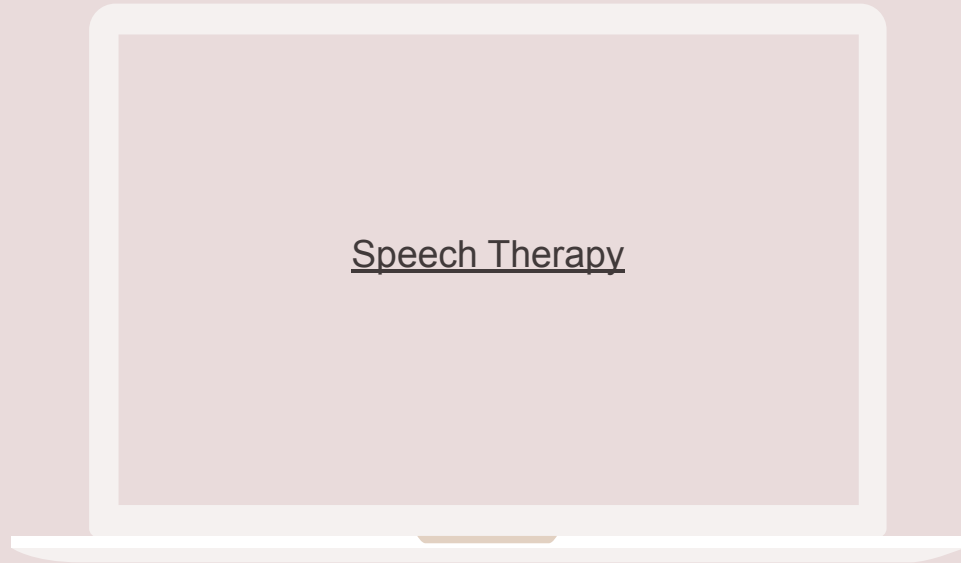
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Strategies used:

- ❑ Training with appropriate aids
- ❑ Therapies to improve speech and communication
- ❑ Understanding grammar and vocabulary
- ❑ Social communication skills
- ❑ Planning and organizing
- ❑ Therapies to improve oral-motor control and swallowing
- ❑ Interventions to enhance daily functioning

(MU health, 2020)

How a Speech
Pathologist works
with a TBI patient
video link



Etiology and Prevalence of Traumatic Brain Injury

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Traumatic Brain Injury (TBI) is among the significant causes of morbidity and mortality in the present world (Barman, pg. 1)

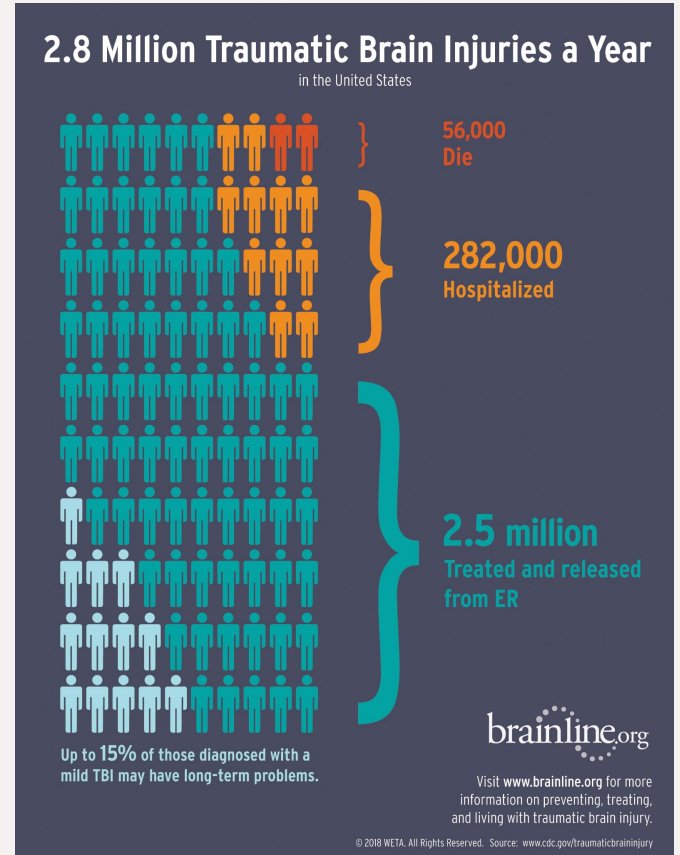
Etiology

- ❑ Pragmatic deficits are the most frequently shown after a brain injury (Zimmerman, 2011)
- ❑ Main cause of brain injury was road traffic accidents (Bosco, 2018)
 - ❑ Road safety is being recognized by the WHO because of the amount of cases (Barman, 2016)
- ❑ TBI is classified as mild, moderate, and severe (Barman, 2016)
 - ❑ This will depend on the level of consciousness
 - ❑ Severe TBI cognitive recovery may take 2 plus years
 - ❑ Mild TBI cognitive recovery can be rapid within 3 months
- ❑ TBI cases show a high prevalence for executive deficits (Zimmermann, 2011)

Prevalence

- “Around 1.6 million persons sustain TBI, whereas 200,000 die annually in India...”

(Barman, 2016)



<https://www.brainline.org/sites/default/files/Brain%20Injury%20Numbers%20Infographic%202018.jpg>



10,000,000

People suffer from a Traumatic Brain Injury worldwide

Tests



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Tools for assessment

The Assessment of Pragmatic Abilities and Cognitive Substrates (APACS)

- ❑ Used to evaluate production and comprehension
- ❑ Parted into different categories
 - ❑ Interviews, descriptions
 - ❑ Narratives
 - ❑ Figurative language
- ❑ Calculates the percentage of individuals with a performance below the cut off in the APACS total score

(Acara, 2020)

Montreal Communication Evaluation Battery

- ❑ Used to evaluate communicative abilities
- ❑ Uses:
 - ❑ Conversational discourse
 - ❑ Looks for word change, inappropriate comments, change of subject
 - ❑ Metaphor interpretation
 - ❑ Narrative discourse
 - ❑ Indirect speech acts

(Zimmermann, 2011)

Outcome measurement tools

Functional Independence Measure (FIM)

- ❑ This is used to assess if the patient can live independently and return to work
- ❑ This should be considered when planning a rehabilitation plan for TBI survivors

(Barman, 2016)

Communication Activities of Daily Living Test (CADL)

- ❑ This is used before and after a patient uses a training program
- ❑ It assesses the changes in communicative performance following a cognitive rehabilitation plan

(Bosco, 2018)

Interventions

Interventions can promote the most successful return to communication (Acara, 2020)

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Effects of age on strategies

- ❑ All areas will be the same depending on age
- ❑ Children will have trouble learning new information because they had fewer years to gather knowledge
- ❑ Children usually have longer interventions

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As for the significant effect of age, this is not surprising, and corroborated previous evidence of age-related changes associated with pragmatic skills and specifically with the comprehension of idioms and metaphors (Acara, pg. 1087)

Recommendations

- ❑ Focus on discourse and conversation, but also focus on figurative language (Acara, 2020)
- ❑ Intervention targeting specifics pertaining to the patient (Acara, 2020)
- ❑ Computer assisted strategies have seen to help attention, memory, and executive skills (Barman, 2016)
- ❑ Very beneficial for individuals with TBI to go into interventions that focus on communicative skills (Bosco, 2018)

Different types of strategies

- ❑ Cognitive rehabilitation
- ❑ Attention process training
- ❑ Multidisciplinary approach
- ❑ Group based interventions
- ❑ Pharmacotherapy
- ❑ Lee Silverman voice treatment
- ❑ Vision restoration therapy
- ❑ EL technique

Cognitive Rehabilitation

Goal is to improve the person's ability to process and interpret information and help them perform mental functions

Compensatory approach teaches ways of bypassing for the impaired function

Restorative approach strengthens or restores the impaired skills

Examples: assistive technology, calendars, electronic memory devices, alarms

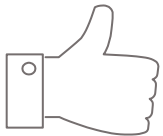
Multidisciplinary Approach

This approach had many benefits when combined with cognitive rehabilitation

Physician, neurophysiologists, speech language pathologists, occupational therapists, physical therapists, social workers

All of these professionals work together for the best outcome of the patient

Cognitive Pragmatic Treatment Program



- ❑ This treatment includes all the main aspects of communicative ability within a single program
- ❑ Uses gestures, facial expressions, posture, and prosodic cues
- ❑ Targeted activities are used that aim to improve the patients social communicative skills depending on the setting
- ❑ Improvements of communicative-pragmatic performance were shown in patients that used this program

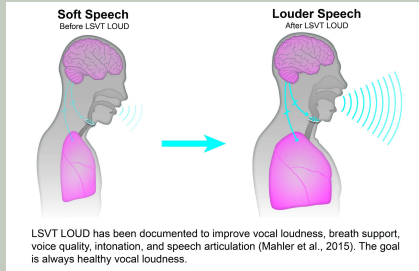
Vision restoration therapy (VRT)

This therapy uses visuospatial cues to direct attention to the areas of residual vision

Improvement in vision can be seen in persons with visual field defect

Attention processing training (APT)

This therapy is a direct attention training program, intended to be restorative, and improve visual and auditory attention



TBI can affect other parts besides pragmatics, these are examples of auditory and visual interventions

Focuses on respiratory, laryngeal muscles, and articulatory functions

Improves loudness, phonation and connected speech, word and sentence eligibility in persons with dysarthria. Which can be a result from a stroke.

An example is taking medications at meal time or keeping keys in a consistent location

Uses compensatory strategies, targeting specific memory problems in patients.

Observation

I spoke to a Speech Pathologist about a case with her patient who suffered from a severe TBI

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Introduction to the patient's case

Herricks Physical Therapy

Speech Pathologist:
Samantha Herrick

- ❑ Patient suffered a severe TBI
- ❑ Induced coma
- ❑ Hospitalized for a year
- ❑ Right medial cerebral artery affected
- ❑ Facial paralysis
- ❑ Suffers from seizures to this day (on medication)
- ❑ Severe neurofatigue
- ❑ Craniectomy





How pragmatics is affected?

- ❑ Very egocentric in conversation
- ❑ Cannot process surprises
 - ❑ Shut down, avoidance
 - ❑ No abstract thinking
- ❑ No filter in discourse
- ❑ Boundaries
 - ❑ Example: He loves his teacher and wants to take her to his 8th grade dance
 - ❑ He doesn't understand the appropriate emotion of love
- ❑ Not aware of other people during a conversation

Other factors

ADHD and Depression

This came as he became older and more aware of his disabilities

Visual

Visual field cut problems with peripheral visual information

A visual schedule is used during therapy sessions

Feeding

Functional feeding is intact, but muscles on his face show weakness.

Electrical stimulation can be used for this

Multidisciplinary Team

Different professionals work with him.

This includes:

Speech Pathologist, Occupational Therapist, Physical Therapist, Counselor, Nurse, Neurologist, Doctor, and his family



Strategies used in Therapy

Therapy after a TBI comes with slow progress

Cognitive Rehabilitation

- ❑ Task specificity
 - ❑ very clear set of directions and expectations
- ❑ Tactile cues
- ❑ Visual cues
- ❑ Verbal cues

STEM cell intervention

- ❑ This will help regrow a lot of brain damage

Behavioural therapy

- ❑ Reinforcement
- ❑ Modeling
- ❑ Showed a lot of growth using this therapy

Future Research



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Suggestions



- ❑ More indepth research on patterns of recovery and pragmatic recovery
- ❑ Which brain patterns affect pragmatics
- ❑ Using more specific tests for executive functions

(Acara, 2020)

- ❑ Investigate with larger samples to identify pragmatic and executive dissociation and associations more closely

(Zimmermann, 2011)

- ❑ A closer look into noninvasive brain stimulation
- ❑ It could show improvements in mood, visuospatial functions, language and working memory, and executive functions

(Barman, 2016)

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- ❑ Samantha Herrick (Observation)
- ❑ Video Link: <https://braininjuryeducation.org/treatment/speech-therapy.html>

Thanks!

Any questions?

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