Neuropsychological Assessment of Cognitive & Psychological Functioning after Concussion

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OBJECTIVES

- Describe the cognitive and psychological difficulties after concussion.
- Describe the process of neuropsychological assessment and consultation after concussion.
- Discuss the factors that can impact cognitive and psychological recovery after concussion.
- Discuss recommendations, strategies, and accommodations for improving cognitive and psychological recovery and returning to activity.
COGNITIVE & PSYCHOLOGICAL DIFFICULTIES AFTER CONCUSSION
COMMON SIGNS AND SYMPTOMS OF CONCUSSION

Physical
- Headache
- Visual problems
- Dizziness / Balance Issues
- Noise and/or light sensitivity
- Nausea / vomiting

Cognitive / Learning
- Attention problems
- Memory dysfunction
- Fogginess
- Fatigue
- Slowed processing / reactions

Neuropsychiatric / Psychological / Behavioral
- More emotional
- Sadness, Depression
- Nervousness, Anxiety
- Irritability
- Reduced frustration tolerance
- Impulsivity

Sleep Disturbances
- Difficulty falling asleep
- Sleeping more or less than usual

Many symptoms are non-specific to concussion & could have other causes…. Must explore with patient
Cognitive Problems After Concussion

- Mental fatigue, mental “fog”
- Decreased concentration, attention, and working memory
  - Distracted easily; Loses train of thought during tasks or conversations
  - Misses details, careless errors, difficulty with multi-step directions
  - Difficulty with tasks that require more mental effort
- Difficulty with new learning and recall; Forgetful; Needs more repetition
- Reduced processing speed; Needs extra time & more breaks
- Difficulty with mental flexibility and multi-tasking
- Increased tendency to respond without thinking or filter; impulsivity
PSYCHOLOGICAL PROBLEMS AFTER CONCUSSION

▪ Irritability, low frustration tolerance, low stress tolerance
▪ Reduced coping & stress management skills; Previous strategies may not work or be possible (i.e., may have used exercise when stressed before)
▪ Reduced self-confidence & self-esteem
▪ Depression, anxiety, more emotional or moody
▪ Withdrawn, avoids social interactions, self-conscious of difficulties
▪ May feel lonely and left-out of activities (i.e., restricted from sports, videogames); Loss of identity with peers
▪ Loss of enjoyment increases depression risk; Fun activities may trigger symptoms early on (i.e., concerts, computer, amusement parks, etc.)
Most clinicians consider persistent symptoms to be those lasting longer than 2-4 weeks (or longer, literature varies).

For some patients, this may be expected due to their history (i.e., history of previous concussions, LD, etc.).

For others, this raises the question of other factors contributing to persistent symptoms.

Usually at this point, referrals are made to other specialists (i.e., psychologists, physical therapist, vision therapist) or for further medical evaluation (i.e., neuroimaging).

This is often when someone is referred for a consultation or assessment with a neuropsychologist (if cognitive / psych symptoms).
NEUROPSYCHOLOGICAL CONSULTATION & ASSESSMENT AFTER CONCUSSION
Purpose of Concussion Consultation with a Neuropsychologist:

• To determine an individual’s current cognitive and emotional functioning.

• To identify factors that may be contributing to their persistent symptoms and prolonged recovery.

• To make recommendations that may help concussion recovery.

• To make recommendations for supports and services during the recovery process.
Concussion Consultation with a Neuropsychologist includes:

• Comprehensive review of history (medical/developmental, TBI history, educational, social, psychological, behavioral).

• Review of current stressors and challenges.

• Review of changes and difficulties since concussion; What helps? What worsens symptoms?

• Review of services and supports since concussion.

• Assessment:
  • A screening of mood symptoms.
  • A brief screening of cognition or a full neuropsychological assessment as appropriate and able to tolerate.
WHAT IS A NEUROPSYCHOLOGICAL ASSESSMENT?

A neuropsychological assessment involves testing that is sensitive to problems in brain functioning. The purpose is to tell how well the brain is working when it performs certain tasks (i.e., remembering). These tests involve paper-and-pencil tasks, hands-on activities, looking at pictures, listening to information, completion of some questionnaires, and talking with the examiner about history and areas of concern.

Neuropsychological assessments are completed by psychologists who have specialized training in the area of brain-behavior relationships.
WHAT IS A NEUROPSYCHOLOGICAL ASSESSMENT?

A comprehensive neuropsychological assessment typically looks at:

• Attention and working memory
• New learning and recall
• Processing speed
• Language functions
• Visual-spatial and perceptual functions
• Motor skills and speed
• Reasoning, problem solving, executive functioning
• Academic functioning (if relevant)
• Emotional / Psychological functioning
WHAT IS A NEUROPSYCHOLOGICAL ASSESSMENT?

Results are interpreted based on:

• Typical functioning for age and education level
• The specific history of the person being assessed
  • History of learning problems, ADHD, psychological issues, medical history
  • History of special education services
  • Previous testing, state test results, academic performance, etc.
• Pattern expected for condition being seen for (i.e., mTBI)
• Other conditions that could be contributing (i.e., anxiety, insomnia, medications, substances, poor effort or participation, etc.)
FACTORS THAT CAN IMPACT COGNITIVE & PSYCHOLOGICAL RECOVERY AFTER CONCUSSION
PRE-INJURY CHARACTERISTICS CONTRIBUTING TO PROLONGED RECOVERY

• Previous concussions & duration between concussions
• Psychiatric history: anxiety, depression, trauma, stressors
• Learning disabilities, ADD/ADHD
• History of migraines
• Gender (females take longer to recover)
• Age (children and seniors take longer to recover)

*History of previous concussions, psychiatric history, LD/ADHD, or migraines can contribute to increased symptom severity and longer recovery process.
CONCUSSION SYMPTOM CHARACTERISTICS CONTRIBUTING TO PROLONGED RECOVERY

• Acute dizziness after injury – 6.3x more likely
• Headache lasting more than 60 hours
• Greater # of post-concussive symptoms early on
• Severity of neurocognitive weaknesses within first 3 days (on cognitive screening measures, such as ImPACT test)
• “Complicated Concussion” (positive neuroimaging or neuro exam)
• Ongoing visual &/or vestibular disturbance can contribute
POST-INJURY FACTORS CONTRIBUTING TO PROLONGED RECOVERY

- Depression, anxiety, PTSD, stressors
- Insufficient cognitive or physical rest / too much exertion
- Prolonged extreme rest / too much avoidance of activity & stimulation
- Insufficient sleep; Inadequate nutrition / hydration; Substance use
- Over-stimulation (especially visual / vestibular)
- Pain; Other injuries; Other medical conditions; Sedating medications
- Poor or no access to needed resources, supports, and services
- Psychosocial factors & stressors (relationships, work, school, role changes, etc.)
- Social isolation / loss of activity ➞ may lead to depression, loneliness, etc.
- Secondary gain / symptom exaggeration needs to be considered
• Review NP testing results (cognition, mood/psych)
• Provide psychoeducation regarding concussion and recovery
• **Provide recommendations for their recovery plan (what to do, etc.)**
• **Review wellness & coping strategies, cognitive strategies, resources**
• Provide written recommendations for school or work changes as needed (modifications, accommodations, schedule, 504 Plan, etc.).
• Provide referrals as appropriate (counselor, vision, vestib., conc MD).
• Discuss follow-up plan (i.e., repeat assessment, revised recs, etc.).
RECOMMENDATIONS TO IMPROVE COGNITIVE & PSYCHOLOGICAL RECOVERY
WHAT TO DO & WHAT TO AVOID OR LIMIT

- The key element of a concussion recovery plan is to find the right balance between rest and cognitive activity / physical activity.
- Avoid too much rest for too long as this can be maladaptive (1-3 days is typically recommended); Avoid over-doing it too soon.
- Progressive Return-to-Activity: Encourage a gradual increase in cognitive / physical activity as symptoms improve; Only increase activity if symptoms are not significantly worsened.
- Prevent over-stimulation (light, noise, vestibular, visual, etc.); Gradually increase exposure to this for increased duration.
- Prevent activity that is high risk for re-injury during recovery period.
- Do exercises that are rec by provider (physical, cognitive, visual, etc.)
PROGRESSIVE RETURN-TO-ACTIVITY PLANS

• There are many different guidelines that have been developed for return to activity (RTL, RTP, etc.). These can be applied to return to work (duty) as well.

• Common elements: Gradual increase in exertion and tasks over time as symptoms improve and tolerance increases.

• Examples:
  • Color zones: Red, Orange, Yellow, Green, Blue (Dr. Streeter reviewed already)
  • CDC Pediatric mTBI Guideline (2018) (Dr. Streeter reviewed already)
  • Graduated return-to-school strategy (Concussion Statement Berlin 2016)
  • Return-to-school Concussion Protocol (Dematteo & colleagues, 2015)
  • Military progressive return to activity guides (DCOE), 6 stages
  • Return-to-Play (Dr. Mortazavi to discuss)

• Customize plan for individual’s need. Provide recs in writing for school / work.
WELLNESS PROMOTION FOR BRAIN HEALTH

- Manage stress, depression, anxiety, frustration; Use effective coping skills. Work with a counselor if needed.
- Make time for enjoyable activities that will not trigger symptoms.
- Regular social contact with supportive people.
- Adequate sleep. Plan for about 1 hour more than the person typically needs (not what they typically get). Work with MD & counselor on sleep if needed.
- Good nutrition: Regular healthy meals & snacks with protein; Adequate hydration; Avoid caffeine, nicotine, alcohol & drugs (consult MD & get treatment as needed).
- Regular physical movement under guidance of MD or PT.
- Compliance with any medical / treatment recommendations.
Working with a counselor for support after a concussion may be helpful for those with prolonged symptoms:

- Learn how to implement lifestyle changes for optimal self-care and wellness.
- Learn sleep strategies, relaxation strategies, stress management, coping thought processes, and other approaches to improve psychological well-being and facilitate adjustment; Recognize and build on strengths.
- Address other pre-existing or co-occurring psychological issues or stressors.
- Develop a plan for alternative activities (social involvement, purpose, confidence).
- Increasing adherence to treatment & reduce risky behaviors.
- Build supports; Link with needed resources and services.
- Family support & education; Address any family issues and stressors.
- Learn & use cognitive and compensatory strategies to increase functioning despite symptoms or weaknesses.
SIMPLE COGNITIVE STRATEGIES TO USE DURING RECOVERY

• Designate certain quiet places to do work.
• Work in areas that do not have distracting noises or things (i.e., TV off, clear desk, away from conversations, put phone away, etc.).
• Work for short periods of time and increase gradually as you can handle it.
• Take regular short breaks. Get up and move a little during the breaks.
• Break tasks into smaller, more manageable steps.
• Focus on 1 thing at a time. Do not multi-task.
• Double check instructions or results – read it out loud or point to each word so you don’t skip over something important. Repeat instruction to yourself.

Continued…
SIMPLE COGNITIVE STRATEGIES TO USE DURING RECOVERY

• Instead of trying to remember, use compensatory memory strategies: note-taking, post-its, calendar, reminders on electronic device, checklists, etc. Make “cheat sheets” for reminders.

• Prepare a notebook or binder with all important information in one place (dr’s name/tel, list of meds, calendar, To-Do lists, reminders, strategies, etc.).

• Allow extra time to do tasks so you can focus and use strategies without being rushed.

• Proper time management is key to having enough time. Plan to have double time to do things initially.

• If you feel stuck or frustrated, take a break from the task and then return to it later with a fresh mind.
14 yo, athlete, advanced classes, ref by MD 2 months post injury

• Trouble concentrating in class, slower processing, slower word-finding, must re-read information, thinking takes more effort, worries that grades will slip

• Reluctant to take time off post-injury due to exams, stayed up late studying since took much longer to encode info, teachers not aware of injury

• Assessment: Probs w/attention, working memory, recall, impulsivity, anxiety/stress

Contributing Factors:

• Pre-existing anxiety, high pressure on self to excel

• Insufficient cognitive rest / too much exertion; Insufficient sleep

• Psychosocial stressors: Self-imposed pressure, school unaware so could not support, reluctant to return to sport due to repeated injuries (worried to tell parents)

Interventions: Notified teachers, modified plan, coping skills, discussion w/parents
CONCUSSION RESOURCES

- CDC Heads Up Concussion Guidelines, Resources, Handouts, and Online Training
  - Heads Up to Schools: Know Your Concussion ABCs; Returning to School After a Concussion: A Fact Sheet for School Professionals (PDF available for download)
- Brain Injury Association of America (biausa.org)
- Brain Injury Alliance of Arizona (biaaz.org)
- Center for Brain Injury Training and Research (cbirt.org)
- Children’s National Safe Concussion Outcome (childrensnational.org)
Questions???

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