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Concussions/Mild TBIs: Early Intervention to Achieve the Best Outcomes Webinar FAQs

December 10, 2020

1) **Is a CT scan required on initial visit for all motor vehicle accidents?**

   No, it is not necessary to do a CT scan for every case. Generally, CT scans are indicated for those above age 16 with non-penetrating mTBI; with a GCS score of less than 14; with a loss of consciousness or period of post-traumatic amnesia; or with a GCS less than 15 with one of the following: age >60, headache, vomiting, drug/alcohol intoxication, trauma above clavicle, seizure, focal neurological deficit, coagulopathy or "dangerous mechanism of injury."

2) **Regarding the case study, did state jurisdictional laws/issues contribute in any way to the care situation (e.g., being able to move/direct care)?**

   We were not able to direct care in this jurisdiction. The key to being able to move the injured worker to appropriate providers was establishing a sense of trust between our case manager and the patient/spouse, such that they were agreeable to/in support of changing providers.

3) **I have an injured worker who is three years post-accident, with no previous diagnosis or treatment of a TBI. The providers now want to do a brain DTI for white matter evaluation to determine if a TBI occurred. Can this be determined three years later, and what kind of treatment exists at this point?**

   Diffusion tensor imaging lacks specificity for TBI, and the quality and interpretation of the results can vary. At three years post-injury, it would also be difficult to link findings to a specific injury. In addition, white matter changes such as those demonstrated with DTI can also be due to aging or other pathology.

4) **Can a patient manipulate the neuropsychological test?**

   Yes, patients can manipulate neuropsychological tests by not putting forth full effort, deliberately providing false responses, etc. Certain tests (e.g., symptom validity tests) are designed to pick-up on this type of responding, and trained neuropsychologists can examine patterns of performance to pick-up on these "manipulations."

5) **How does vestibular therapy work and when should it be considered? How many visits are recommended?**

   Please refer to the **VA/DoD Clinical Practice Guideline** for the management of concussion-mild traumatic brain injury and the **Ontario Neurotrauma Foundation guideline.**

6) **Would you please define once again, concussion vs. mild TBI?**

   They are equivalent terms, and they both refer to a brain injury of mild severity (see criteria on CDC/ACRM slide).

7) **What are your thoughts on a whiplash type injury? Can this cause a TBI? Does treatment differ in any way? If there is no direct impact to the brain, does it still hit back and forth from whiplash?**

   A concussion/mTBI occurs because of a blow or any force that is sufficient to cause neurologic changes to the brain at the time of the injury. A whiplash injury refers to an injury due to an acceleration/deceleration force that causes trauma to the neck. If the force is strong enough, there can also be injury to the brain. The force needs to be about 100 g to cause a concussion. Unfortunately, we do not know the actual force applied in most cases of concussion, except occasionally those measured with accelerometers in sports research.

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8) **Do you believe hyperbaric oxygen therapy is credible and recommended by Paradigm?**

It is our opinion that there is insufficient evidence at this time to recommend hyperbaric oxygen therapy for TBI.

9) **What is your opinion on right eye TBI exams?**

Right eye technology is a promising area of research. More research is needed with sufficient numbers of subjects to determine its clinical usefulness in concussion/mTBI.

10) **I see prescribing medication is not preferred. What is given to patients for pain complaints?**

It is not the case that medication use in general is not preferred. Medication choices can vary depending on symptoms. They are not typically the first line of intervention for most symptoms. Opioids, in particular, should be avoided.

11) **I recently heard a presentation by a neuropsychologist who said he was concerned about the diagnosis "convergence" for his post-mild concussion patients. He felt it may be used too frequently and perhaps didn't carry as much weight as the diagnosing medical provider suggested. What are your thoughts on this?**

It is unclear if this refers to “convergence insufficiency,” which is a visual disorder in which the eyes do not move in coordination with each other when refocusing/adjusting from far to near. This can occur after a concussion/mTBI. This condition occurs in the general population at a fairly high frequency, and it can worsen after a concussion/mTBI. If it is due to the TBI, it should improve over time. An optometrist can recommend exercises for a home program. If the question refers to “conversion disorder,” this is a psychiatric diagnosis that refers to the presence of symptoms that cannot be explained by a medical/physiological condition. This is one of several conditions or “labels” (including malingering and somatization disorder) that are sometimes given to mTBI patients whose symptoms are inconsistent with/in excess of what could be explained by the diagnosis of mTBI. Differential diagnosis is very important, as there can be multiple factors explaining inconsistent symptom presentation (we also touch on this in the webinar).

12) **Are ongoing headaches treated as migraines?**

There are many different types of post-traumatic headaches. These are called phenotypes because each type has different characteristics. It is very important that a physician determine which type is most likely before prescribing treatment. Many headaches that occur after a concussion/mTBI are cervicogenic (related to the neck), not migraine-type (vascular) headaches.

13) **How would you respond to the belief that ALL post-concussive patients recover in three months or less?**

Please refer to the data and studies listed on slide 15 of our webinar presentation, which suggest that most, but not all, patients with concussions/mTBIs, recover.

14) **I have an injured worker with a mTBI and her symptoms have continued longer than 1.5 years. This injured worker had an IME by a neuropsychologist and is at MMI. Is she exaggerating the claim?**

We cannot responsibly answer this question without knowing more about the patient, reviewing the inured worker’s history, the IME report, etc. Perhaps, but we would not necessarily conclude this. Please refer to slide 25 of our webinar presentation for more on this topic.

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15) **Is there a particular order of specialists that you recommend when working up an injured worker for a head injury? I have a claim where the injured worker is treating with the orthopedic for physical injury to a different body part, and also with a neurologist. Most recently, there has been a referral to a neuropsychologist. There has been no mention of a PM&R.**

In Paradigm's model, a PM&R physician and neuropsychologist lead the team and would conduct the initial evaluations after the acute diagnosis is made (in the ED or by a primary care physician), if there are symptoms that do not resolve within the first 2-4 weeks. Referrals are then made to other providers and the results of evaluations are integrated into treatment plans.

16) **Is it fair to say that if the claimant never lost consciousness they most likely did not sustain a mild TBI?**

Actually, the majority of patients with concussion/mTBI do not lose consciousness. They have impairment in consciousness (such as confusion) or post-traumatic amnesia (difficulty with ongoing memory storage and retrieval).

17) **What are common medications used for treating the symptoms of mTBI?**

This is very symptom/patient-specific. Some examples would be use of Meclizine for dizziness, Amitriptyline for cervicogenic headaches, and Melatonin for insomnia.

18) **I have never had a physiatrist for mTBI. Usually patients are sent to a neurologist and physiatrist is only included if the injured worker has physical deficits. Can you comment on what a physiatrist can offer that neuro cannot?**

We would recommend a physiatrist who specializes in or is board-certified in brain-injury medicine to be the primary treating physician. He or she will conduct both a cognitive and a physical examination and screen for mental health disorders including post-traumatic stress disorder and depression. The typical components of the examination are discussed in slide 20 of our webinar presentation.

19) **What do you do when all of these things were completed, two years have passed, and the injured worker wants to "start over" with each referral to another person on the team? Malingering is present and acknowledged in the neuropsychology report. How do you help the injured worker that wants to be released and returned to their normal life?**

Rather than start over with new referrals to a list of specialists, you may want to consider identifying a PM&R physician with specific experience in mTBI management, to reinforce strategies/recommendations that have already been made by prior specialists (assuming these are evidence-based; otherwise, secure referrals to qualified providers). You may also consider identifying a neuropsychologist with specific experience in mTBI treatment to work with patient on identifying and addressing other factors (e.g., psychological, pain, secondary gain) that may be impacting the patient's lingering symptoms. They should use an evidence-based approach to helping patients move beyond these barriers and look forward to create and adjust to what may be their "new normal" (vs. looking to "get back to" their old life).

20) **What do you think of the mind-eye connection? Vision therapy was ordered for weeks for my client, but it did not work.**

Similar to Question 11 the visual and vestibular systems are anatomically linked, and a disruption of these systems from a concussion can lead to problems with visual scanning and symptoms such as dizziness, blurred vision, and headache. These symptoms tend to improve. A neuro-optometrist can provide guidance for a home program. This does not need to be a prolonged, expensive program in a clinic setting.

21) Is there a test (or tests) to discover if a Somatization disorder exists?

There is no specific test for diagnosing somatization disorder. However, this is a diagnosis that may be made based on patterns of responses on several tests, as well as observation, careful review of history, and interviews with the patient/significant others.

22) What if the patient has no health insurance to pick up where workers' compensation leaves off? Is he just stuck out there? All that work for nothing?

A social worker can be helpful to find coverage through a public benefit or the Affordable Care Act.

23) I have a claim where a young woman stood up from retrieving something and hit the top of her head and had no loss of consciousness. At one month post-concussion, she presented to the emergency room and was diagnosed with Torticollis. They said this was due to the concussion. Can this be true?

A force directed downwards on the head of sufficient magnitude can cause injury to the brain, but also to the cervical spine (e.g., a cervical disc herniation) and the muscles and other soft-tissue structures of the neck.

24) Is there thought as to why women fair so poorly?

Some studies have shown that symptoms tend to be more severe or last longer in girls/women than boys/men after a concussion. Scientists theorize that there may be biologically or socially determined reasons for this. For example, biological factors are suggested by the fact that more women than men have migraine headaches—and those migraines are influenced by female hormones. There may also be differences because of anatomic factors. For example, girls and women generally have weaker neck muscles. And, for example, in soccer the size of the head in relation to the ball varies for women and men. Researchers have also found differences in symptom reporting between female and male athletes, and this is considered a socially determined factor.

25) When is it ideal to get the neuro-psych evaluation/testing done? I have seen recommendations at around six months and not sooner.

We would recommend consideration for neuropsychological evaluation in mTBI/concussion in a patient whose symptoms are not resolving (or are worsening) within the first 30 days post-injury. Repeat neuropsychological evaluations are generally not recommended at a frequency greater than every 6-12 months.

26) What is the correlation between motivations to return to work related to financial impact, such as professional athletes?

Motivation is a factor to consider in all people with concussion/mTBIs when setting goals with them. Athletes in general have a strong desire to get back to the sport. Workers may have varying degrees of investment in their work.

27) Regarding the chart with criteria for mTBI, can you comment on amnesia?

Post-traumatic amnesia is a period immediately after the injury or after the person emerges from unconsciousness when they are confused and having difficulty remembering information.

28) **I sustained a mild TBI injury from a motor vehicle accident and experienced daily headaches for a year, until a concussion specialist recommended seeing a neuro-optometrist who discovered I had a convergence disorder. After receiving prism lenses, the headaches disappeared completely. My question is, can mild TBI's affect vision and how often is this addressed when treatments such as vestibular therapies fail?**

Yes, prism glasses can sometimes be helpful after a concussion for certain visual problems. Ideally, a vestibular therapist works in conjunction with a neuro-optometrist to determine the best treatment strategies if there are vestibulo-ocular problems after a concussion/mTBI.

29) **Do neurologists have an effective role in post-concussive syndrome treatment? We see many referrals to neurologists instead of PM&R.**

In the model we support, referral to a neurologist can be very helpful if the injured worker has severe headaches or seizures, for example. In these cases, the physiatrist may choose to consult a neurologist.

30) **I have a claim with a 32-year-old male who was struck by a car with loss of consciousness. A CT scan was completed same day, but there were no findings. He was on temporary total disability for 4 ½ months. He has a prior history of a closed head injury, cancer treatment, and psychiatric care. He was evaluated by a neuropsychologist who indicated he could seek psychiatric treatment with medication. The claimant returned to work and a year later and was promoted to a supervisor position. His wife left him, and all of a sudden, he is on temporary total disability and on a psychiatric basis for TBI. He threatened suicide and was hospitalized. This brought his wife to his side to provide support. We are over a year post injury. What would be the best handling of this type of situation?**

We would suggest another comprehensive neuropsychological evaluation by a provider with specific expertise in evaluating patients with mild TBI. Ensure the evaluator has been provided with the initial evaluation, full medical records (from time of injury, through recent psychiatric hospitalization), so that a thorough evaluation and interpretation of results (that includes rendering opinion re relatedness of current psych issues to claim) can be completed.

31) **I wonder if New Zealand, Canada, and the U.S. are using the same criteria set?**

The researchers in all cases collected data about continuing symptoms after concussion/mTBI, but they did use different instruments or methods to collect the data.

32) **Are diagnostic tests such as an EEG/qEEG, SPECT, and a BAER appropriate at one-week post mTBI, with minimal and improving symptoms?**

These are not part of the evidence-based guidelines for a diagnostic workup (see the Ontario and VA/DoD guidelines).

33) **Are there endocrine issues associated with TBI? Any nutritional considerations that may be beneficial for healing/recovery?**

There can be endocrinologic abnormalities after a concussion/mTBI, but these are uncommon. Good nutrition, exercise, and promoting beneficial sleep are important components of a post-concussion treatment program.

34) What is the likelihood of return to work for an injured worker with a previous mTBI? Is cognitive therapy recommended for patients that were not originally treated when the mTBI occurred?

If this question is about whether return to work and therapy are possible and indicated for a patient whose injury was some time ago (vs. recent), then yes, psychoeducation and cognitive therapy can be of benefit even if provided months (or years) post-injury—with the focus likely to be on providing education and teaching compensatory strategies. And yes, return to work could certainly be possible later post-injury, if appropriate interventions are provided to address persistent/residual symptoms.

35) Could an individual suffer a subdural hematoma without experiencing a mTBI?

Depending on other criteria (see slide 9 from webinar presentation), if the patient sustained a subdural hematoma, they may have experienced either a mild/moderate/severe TBI.

36) What are your thoughts on Botox injections for post-concussion syndrome?

Migraine headaches may respond to botulism toxin injections. It is very important to determine the headache phenotype and treat based on this since many post-concussion headaches are cervicogenic.

37) As the case study participant lived in a rural area, what was the vehicle of treatment?

The patient/spouse drove to the PM&R/neuropsych providers and stayed overnight in a hotel when attending outpatient visits.

38) What steps were used to get the employer to agree to work accommodations for psychological and physical conditions?

Recommendations for accommodations were requested and received from the PM&R and neuropsychologist treating providers, and the employer was asked if they could accommodate, which they did, following the initial failed return to work attempt.

39) What was needed to shift the work related psychological treatment to the injured worker's regular health care coverage?

Documentation from the treating provider that the focus of treatment had shifted from adjustment to injury (mTBI) issues, to addressing more chronic issues related to pre-injury diagnoses of depression and anxiety. The provider was then in agreement to shift payer source.

40) What does the "services" category include? In New York state workers' compensation, nurse case managers cannot direct the claimant to particular providers, we can only suggest.

Typical services for a patient with concussion would include speech therapy for cognitive deficits, physical therapy for mobility problems including balance deficits, vestibular dysfunction, or painful conditions such as neck strain/sprain. A neuro-optometrist can be helpful in diagnosing vestibular-ocular disruption and providing exercises for a home program.

Since carriers cannot direct care in most jurisdictions, it becomes imperative to develop rapport/trust between nurse case manager and the injured worker/family such that they become partners in the decision and see the value in shifting care to more experienced providers.

41) How would you differentiate between attention deficit disorder (ADD) and concussion with findings on a neuropsych?

This is a complex question that can't be answered in a few sentences, but there are specific tests. Careful review of history (pre and post-injury) and analysis of patients' performance across a variety of tests, that can help the trained neuropsychologist to distinguish between impairments due to ADD/developmental disability and those resulting from concussion/mTBI.

42) Please give additional comment. I have difficulty with a label of "mild" head trauma with such quick resolution time lines given. I am confident we will find the mild head traumas in the future will show by advanced testing because very significant trauma to the micro connects of the brain. I just have too many injured workers with symptoms consistent with multiple injured workers and last for very long periods. These are not malingering men, they want to get back to work. I have never seen individuals in my career improve in a couple weeks.

The clinical literature/research shows us that in fact most patients with mTBI do have symptoms that resolve within a couple of weeks. For those with lingering symptoms, we agree that the dismissive label of "malingering" is often incorrect, misleading and damaging; and that these patients require a more extended, holistic yet focused symptom-based treatment approach in order to achieve optimal outcomes.

43) Do you recommend neuropsych testing at about the 30-day mark if an injured worker is still having symptoms, and then perhaps in the next 6-12 months to compare? Do you need repeat testing? Does it matter if you don't really have any type of baseline before doing initial neuropsych testing?

Yes, in response to timeline questions. Repeat testing is not necessary, unless there is a specific indication (e.g., ongoing symptoms, need to document return to baseline). If patient reports resolution of symptoms, then there may be no need to do repeat testing. While baseline (pre-injury) assessment/information is always very valuable, it is often unavailable and would not preclude completing neuropsychological evaluation or rendering opinion regarding causality.

44) How can a CT or MRI identify the TBI, is it because of blood on the brain?

The typical findings in a complicated mTBI (i.e., those with imaging abnormalities if other criteria are met) can be a small subdural hematoma, evidence of diffuse axonal injury (small hemorrhages called petechial hemorrhages), or contusions (bruising) of the brain.

45) Is it common to see a patient become symptomatic after being asymptomatic for five months without another incident? I have a claimant who worked full duty for the entire five months until he was laid off and is now unable to get out of bed.

If a concussion/mTBI has occurred, the physical symptoms will emerge in the first 24-48 hours; cognitive symptoms may take longer (up to one week) if cognitive demands are low initially or if the physical symptoms such as pain and dizziness predominate.

46) Have any studies ever been completed on the zodiac signs of people who recover faster than others do or what role that might play on recovery, or is that not considered, only gender?

We are not aware of any studies on relationship between zodiac sign and recovery trajectories.

47) For a mild concussion, how often is it appropriate to have "no driving" restrictions? I have an injured worker on no driving restrictions, seven months postdate of injury.

A driving evaluation can be done if there are questions. There should be a physiatrist referral after evaluation for cognitive or visual deficits that might impair driving.

48) What is the name of Dr. Sandel's book?

Shaken Brain: The Science, Care and Treatment of Concussion (Harvard University Press, 2020)

49) Is psychological treatment considered as part of a comprehensive rehab program for mild TBI?

It certainly should be, in our opinion. As discussed, we view PM&RR/physiatry and neuropsychology/psychology as the "core" providers for these patients. There may or may not be a need for additional specialists or comprehensive rehabilitation programs.

50) What approach can you take with a medical provider who diagnoses someone with a concussion with no initial altered mental status?

If there is no evidence of an altered mental status, or other neurologic signs, or symptoms, the diagnosis of concussion is in question. This is a case where a neuropsychological evaluation can be very valuable to determine whether a concussion occurred and if the symptoms and signs are due to the injury.

51) What are some resources to use to find brain injury board certified specialists in our areas, such as PM&R and neuropsych?

The American Academy of PM&R website: Find a Physician

For neuropsychologists, there is a directory that can be searched by zip code within the American Board of Professional Psychology provider locator site.

52) Will you please compare a CT scan showing petechial hemorrhage versus an intracranial bleed? What is the severity of petechial hemorrhages and the long-term effects?

Petechial hemorrhages occur in diffuse axonal injury.

53) As the diagnosis is symptom based, should we validate it through diagnostic testing? What evidence-based testing can help confirm if there is a true TBI?

As discussed in the presentation, the diagnosis is clinical—there is currently no single diagnostic test that can confirm diagnosis of mTBI. The diagnosis is made via comprehensive evaluation including history, observation, review of symptoms, performance on a variety of tests (physical, cognitive, personality/emotional) and interpretation of patterns/findings from all of these sources.

54) If a provider does "symptom validity" testing, how can one determine if the analysis was performed?

If a provider is including symptom validity testing in their battery of tests, then they will, by extension, be interpreting the results of those tests as evidence that the patient is either performing effortfully or suboptimally. This would be expected to be specifically addressed/documented in the evaluation report.

55) Why is imaging not part of initial diagnosing and when will the medical community begin using imaging on a regular basis?

Hopefully, we will find more widespread use of neuroimaging and laboratory biomarkers to diagnose the subtle or milder brain injuries in the next five years.

56) Do findings on the CT scans correlate with the severity of symptoms and length of time that symptoms may persist?

CT scans do not show microscopic injuries, which are responsible for the symptoms of concussion/mTBI.

57) Which diagnostic test is more informative CT or MRI?

MRI shows more abnormalities in the brain itself than a CT scan. However, neither shows microscopic injuries.

58) Why is it that numerous psychiatrists allow claimants with limited medical objective findings (concussions) to go on and on about symptoms (subj. findings) forever, keeping them at an off-work status without referring them for a neuro psych evaluation?

This speaks to the importance of finding qualified, experienced providers that have expertise in management of patients with concussion/mTBI. A PM&R with brain injury medicine certification and board certified neuropsychologist would be indicated to perform comprehensive evaluations and make recommendations to promote recovery and positive outcomes. If the patient were unwilling to seek these specialists as treating providers, then perhaps IMEs to obtain the relevant opinions would be an option.

59) I would love to get Dr. Benson's suggestions for continuing reading on topic of closed head injuries.

There are too many articles to list, but several books are listed below:

- *Textbook of Traumatic Brain Injury, 3rd edition*. 2019 Silver, McAllister & Arciniegas, Eds.
- *Concussion: Assessment, Management and Rehabilitation*. 1st Ed, 201, Eapen & Cifu.
- *Neuropsychological Management of Mild Traumatic Brain Injury*. 2000 Raskin & Mateer, Eds.

60) Does amnesia need to be reported in order to consider the diagnosis of mTBI?

It is very helpful if we have documentation of post-traumatic amnesia, measured using an instrument like the Galveston Orientation or Amnesia test. However, this is rarely done in emergency rooms or primary care clinics. A history of impairment of consciousness, confusion, or other neurologic abnormalities confirms that a concussion/mTBI has occurred. Unfortunately, we often have to do this retrospectively.