

“The 15 Critical Questions Regarding Concussions, Baseline Testing, and Return to Play Medical Decisions”

1. What is a concussion? How do they occur?

A concussion is a mild traumatic brain injury that is caused by a blow to the head and/or body. When your head/body suffers a blow, your brain will bounce off of your skull and temporarily stop the brain from functioning. Concussions can occur from playground injuries, falling off a bicycle, fights, falling, car accidents and of course ALL athletic sports.

2. What are the signs and symptoms of a concussion?

As it may be an indication of concussion, do not hesitate to seek medical attention if an athlete displays or describes experiencing any of the following symptoms:

Signs observed	Signs reported by athlete
<ul style="list-style-type: none"> • Appears to be dazed or stunned • Is confused about assignment • Forgets plays • Is unsure of game, score, or opponent • Moves clumsily • Answers questions slowly • Loses consciousness (even temporarily) • Shows behavior or personality change • Forgets events prior to hit (retrograde amnesia) • Forgets events after hit (anterograde amnesia) 	<ul style="list-style-type: none"> • Headache • Nausea • Balance problems or dizziness • Double or fuzzy vision • Sensitivity to light or noise • Feeling sluggish • Feeling "foggy" • Change in sleep pattern • Concentration or memory problems

3. What tests should you get for your child/athlete to make sure they are safe?

Every child/athlete should have a baseline ImPACT neurocognitive test. Optimally, this test should be taken for athletes before the start of the season, but even midseason or post season your child/athlete should always have a baseline on file. This test will give physicians a true neurocognitive normal prior to a child/athlete getting concussed. An additional test is a balance assessment to look at a child/athletes postural stability. Universities and specialized clinics are incorporating an additional assessment for balance testing like BESS, SAC or CDP (Computerized Dynamic Posturography). Together, ImPACT and a balance assessment make up a full comprehensive baseline evaluation to keep your child/athlete safer.

4. Should only children and youth athletes get baseline testing?

NO! Children and youth athletes are more susceptible to get concussed because of their playful lifestyle, i.e. playing on play grounds, riding bikes, climbing trees and playing contact sports. In all reality, EVERYONE is susceptible at getting a concussion. Any adults who play sports, ride motorcycles or anyone who is just looking to keep themselves safer should have a baseline test done.

5. What does ImPACT specifically look for?

Baseline neurophysiological testing (ImPACT) provides an individualized objective evaluation of the concussed athlete's post-injury condition and assists in tracking recovery for safe return to play. The testing program measures multiple aspects of cognitive function, including: attention span, working memory, reaction time, and problem solving. Comparing baseline testing with post-injury scores will indicate if an athlete has returned to his/her pre-concussion baseline, and if he/she is appropriate for return to play.

6. What does CDP specifically look for?

A Computerized Dynamic Posturography (CDP) is to assess the manner in which a child/athlete is integrating sensory information to maintain balance. After a concussion, children/athletes often report symptoms of dizziness and imbalance, which may be due to a vestibular (inner ear) injury or the result of injured brain centers. Testing with ImPACT and CDP provides a more comprehensive baseline, so that more accurate decisions can be made in regard to return to school/play recommendations.

7. What specific tests are done once my child/athlete suffers a concussion?

Once the child/athlete has been concussed, they will make an appointment to come back to the facility for a post-injury evaluation by a physician, physical therapists and if the physician recommends it, diagnostic testing in a balance lab. Once the results are received, additional tests may be recommended like an MRI and possibly an appointment with a Neuropsychologist. From there, a team of specifically trained doctors and physical therapists will decide which program will better suit the child/athletes needs.

8. Once someone has suffered a concussion can you get one again?

Injuries to the brain from a concussion are cumulative. This means that if a person has had one concussion they are more likely to get another concussion. Repeated concussions can cause permanent injury to the brain. The more concussions an individual has, the more likely a person is to develop long-term problems. Typically, symptoms become more severe and are more numerous, and recovery is much slower, with each successive concussion. Once someone has suffered a concussion, you are at a higher risk of getting another one. IF a child/athlete should suffer another concussion without the first one resolving (usually within 3

weeks or less of the first one), a child/athlete could suffer what's called, Second Impact Syndrome (SIS).

9. If my child/athlete should suffer from Second Impact Syndroms (SIS), what could happen to him/her? Should I seek medical attention immediately?

Second Impact Syndrome is described when a child/athlete suffers another blow to the head before their first concussion resolved and the mildest blow could result in SIS. Sometimes parents/coaches will not even realize a concussion has occurred. That's why baseline testing is so important so results can be compared when a child/athlete has a possible concussion and diagnosing is more accurate. Generally, most concussion will resolve within 3 weeks, however, if the athlete/child were to suffer SIS, you potentially run the risk of getting swelling of the brain, suffer brain damage and/or death. If your child/athlete has suffered a concussion recently and receives another blow, they need to seek IMMEDIATE medical attention.

10. Can post injury ImPACT and CDP tell if my child/athlete has had or HAS a concussion?

If a child/athlete has had a baseline ImPACT test, it is much easier to compare results from the post injury to their baseline. It will show us if there are neurocognitive deficits the athlete may have suffered. Commonly after a concussion athletes will report dizziness and imbalance. This may be due to a vestibular injury or may also be a result of injured brain centers, which are impairments in central integration of vestibular, visual, and somatosensory information used in balance. By comparing a child/athlete's balance after an injury with their baseline CDP a more thorough decision can be made on return to school/play recommendations.

11. Can the ImPACT post injury test and/or CDP tell how bad my child/athlete's concussion is?

The results from an ImPACT post injury test (compared to baseline) and CDP will let us know that the child/athlete is suffering from a concussion. We use the post injury tests throughout the child/athletes rehabilitation program to see the progress the child/athlete is making and whether or not they are still suffering from neurocognitive and balance deficits.

12. Are there treatment options for a child/athlete who has suffered a concussion?

Yes! Treatment will vary from individual to individual and may include activity restrictions, vestibular therapy for dizziness and imbalance, and medications to help with headaches, anxiety and/or depression. A medical doctor will make recommendations on which course of treatment will best suit the child/athlete.

13. Why is vestibular clinics/testing becoming popular with concussions? Why is vestibular therapy more specific to concussions rather than physical and/or occupational therapy?

Vestibular therapists are specially trained to assess deficits caused by injury to the vestibular system. The vestibular system, which includes the inner ear and its connections with the brain, is responsible for sensing head movement and helps to maintain balance. In addition, it is responsible for keeping your eyes focused while the head is moving. The inner ear is a very small and fragile structure located in the skull just behind the ear. Trauma to the head can cause inner ear damage. With specific exercise and management skills, dizziness can be reduced significantly or eliminated, and balance can be improved. The type of exercise utilized depends upon the unique problems that the individual demonstrates during the evaluation. Some exercises are geared toward helping with balance, some with helping the brain resolve differences in the inner ear signals, and some with improving the ability to visually focus.

14. How often should my child/athlete be tested?

Any child/athlete under the age of 20 should have a baseline test done every two years (unless they got concussed in the season prior than they should have a subsequent one done again the next year) only because youth have normal changes neurocognitively, which would change the baseline results. Adults and professional athletes should be tested only once.

15. What should you as a parent/coach/self look for in a facility for baseline and post injury testing?

- A facility that can handle the severity of concussions and are well trained in that field.
- A facility that can get you in to see a specialist within 24-48 hours after a concussion has happened. (Monday-Friday hours at the very least)
- A facility that offers ImPACT and CDP baseline testing.

At NDBC we take a multidisciplinary approach towards concussion treatment and management. We have a TEAM of Medical Doctors, Neuro Psychologists, Neuro Radiologists, Audiologists, and Physical Therapists all specifically trained in the field of treating brain injuries and concussions. Your evaluation will begin with one of our physicians where they will perform a thorough post-concussion evaluation using the common Acute Concussion Evaluation protocol (ACE). Our physician will then decide whether your condition is appropriate for NDBC, and then may order additional evaluations with other NDBC providers. What makes our clinic unique for concussions is that we have the ability to provide IMPACT neuropsychological baseline and post-concussion testing, Computerized Dynamic Posturography (CDP) for postural stability and functional deficits, and a complete neurotologic balance assessment in our Balance Testing Lab. No other facilities in the Midwest area provide all these components in one facility, enabling us to provide the very best assessment possible, exceptional continuity of patient care, and convenience for the patient.