

# What is Post-Concussion Syndrome and when do we treat?

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We have been seeing so many young athletes with post-concussion syndrome lately...but what is post-concussion syndrome (PCS) and how does it differ from the normal headaches, confusion and other symptoms that one suffers after a concussion. Post-concussion syndrome (PCS) has been defined as persistent symptomatology lasting more than 10 days- 6 months after a concussion. Recent studies have described PCS as the constellation of symptoms lasting more than 6 weeks after a concussion. Most patients with mild TBI or concussion have symptoms that resolve or improve after 7 to 10 days. PCS symptomatology can usually be defined or described as falling into one or more of four categories: somatic complaints (of pain, usually in the head/ neck), sleep disturbances (insomnia or fatigue/ lethargy), emotional lability (crying or anger), and cognitive or school issues. A complex relationship exists between these four areas of complaints, so that sleep disturbances may be causing headaches and so on.

Most patients get better after a concussion. However, there are some patients who are still suffering from headaches, and other symptoms, weeks and even months after a concussion. As a neurosurgeon, when I see these children and young adults clinically, I first want to be certain that they do not have ANY “surgical issues”. In my opinion, if a child has persistent headaches after a concussion, a MRI of the brain and cervical spine may be indicated to rule out such occult diagnoses such as: Chiari malformation, arachnoid cyst, hydrocephalus, and sometimes, chronic subdural hematomas. I have seen thousands of children who have suffered headache after a concussion, and in my clinical experience, about 90 – 95% get better. With the 5-10% of children who are not better after a few weeks, a MRI is indicated to rule out a serious problem that could be “corrected” or fixed surgically. Believe me... I have operated on at least two or 3 dozen children who had a “lesion” on their imaging studies.

Once a MRI has been done and is negative, the concussion patient leaves my care, and is transitioned to three of my “friends and colleagues” . Neurology, neuropsychology and physical therapy are the THREE most important aspects of rehabilitation of the PCS patient. We send patients with PCS to our colleagues in pediatric neurology for headaches, or to our pediatric neuropsychology colleagues, for cognitive or psychological issues. Neuropsychologists initiate comprehensive testing that helps to determine if a patient has deficits in their functional brain abilities. If there are deficits or problems, then the neuropsychologists help to determine what function was impaired by the concussion. The pediatric neuropsychologists are experts in identifying and explaining the cognitive problems that a child may be experiencing. Once their examinations are done, typically a neuropsychologist will generate a report that should be shared with the child’s school nurse and study team or teachers. While most neuropsychologists don’t do “cognitive remediation” themselves, they usually know experts in the local area who can help your child “get back on track” cognitively and functionally.

Neurologists are doctors who will see PCS patients and at times, initiate medications for the treatment of post-concussion headache. The first issue to address is the severity of the headaches and whether or not the headaches are negatively affecting the patient’s life. Headaches that are so bad, that a child refuses to go to school, should be investigated. If the MRI is negative, the results should be shared in a positive and supportive way with the child. The child should know that they are in no “danger” and that these PCS headaches will get better. I personally recommend starting non-pharmaceutical methods as one considers starting medications. By this, I am referring to PT, massage, bio-feedback, yoga, and other relaxation methods. I also would want to see what medications are being used at home to treat headaches. You need

to know, before coming up with a treatment plan, if there are migraine-sufferers in the family. If a child has a concussion, and “migraines” are unmasked, the medical treatment and approach may be very different. Tailoring the management approach to each individual child is very important. Nutraceuticals are often considered as first line treatment, employing natural vitamins and extracts to reduce many of the symptoms that PCS may cause. Vitamins E, C and D, as well as green tea, ginseng, and fish oil, have all been used successfully to treat PCS symptomatology. In general, all other medications that treat headache may also be considered but we would typically avoid any medication that increases the risk of seizure, or causes mental slowing or confusion. We usually start at the lowest doses, and titrate to a higher dose as needed. Sometimes, results may take weeks to occur. It is important always to go back to the beginning, and to determine if headaches are the ONLY problem, or if they are occurring with sleep disturbance or with emotional volatility, or even with cognitive problems. A child who is failing in school, despite hours of studying, will have headaches and most likely, depression. The medications used to treat headaches for PCS patients are usually: analgesics, non-steroidal anti-inflammatory drugs (NSAIDs), anti-depressants, anti-convulsants, beta-adrenergic antagonists, ergot derivatives or triptans, and NOT narcotics. There are headaches associated with dizziness that may respond to vestibular suppressants or benzodiazepines. Chronic fatigue syndrome with headache may respond well to neuro-stimulants. Children who cannot sleep at all and who have PCS headaches may respond Nausea with headache may get better with anti-emetics. It is IMPORTANT to see a neurologist for PCS after being CLEARED by a neurosurgeon or by a negative MRI brain and cervical spine.

Physical therapists are vital and instrumental in preparing a child to re-enter athletics and sports/ physical education. Pediatric PT's work one-on-one with each child, to get the child physically fit, or they will help maintain a competitive athlete at a functional level, after a concussion. Pediatric PT's will also provide vestibular testing and training, for children with dizziness and vertigo after a concussion. PT's will do strengthening and other specific training, individually tailored for the injured child. I have seen stellar athletes who become very depressed, lethargic and angry after a concussion. Many of them have responded well to physical therapy and sports conditioning. As long as the MRI's are negative, working out without return of symptomatology is allowed. So, if the child is having mild to moderate headaches with a negative MRI, I will allow and recommend PT to start doing some activity with the child, to slowly build-up their tolerance and stamina. Once a child has been seen and evaluated by a physical therapist who specializes in concussion/ PCS, the PT will develop a treatment plan with the coordinating physician/ surgeon.

At NJ Concussion Center, we specialize in treating children and young adults with concussion and PCS. As a neurosurgeon, I am happy to see the child with PCS and headaches first. I do not believe that there is any need for me to see a child with PCS without headaches, but with solely cognitive issues. However, I have seen patients for our neuropsychologists, when they identify and diagnose a concerning neurological problem. Those children may be referred back to neurology or neurosurgery, depending on the symptoms and their severity. The most important aspect of our concussion center is the teamwork provided by COMPASSIONATE, CARING and EXPERT professionals, and the INDIVIDUALIZED treatment plan that is developed for each patient. We cannot “see” a patient immediately and “clear them”. That is not what we do. We cannot guarantee that your child will still be a straight A student, or that your child will perform at a Division I varsity college level. We can help your child get better though, and in our opinion, we will provide you with the best concussion care in New Jersey!