

# Bettendorf Community School District (BCSD) Concussion Guideline

For the purposes of this guideline, the term **athlete** is defined as a Bettendorf Community School District (BCSD) student participating in extracurricular activities in which an annual pre participation physical is required. This guideline is in place to protect the safety of athletes who have sustained a sport related concussion or mild traumatic brain injury (MTBI) in a BCSD sponsored extracurricular activity. No guideline can guarantee against future incidents. However, this guideline is designed to return concussed athletes to competitive sports in a manner that will reduce the likelihood of secondary injuries such as Post-Concussion Syndrome and/or Second Impact Syndrome. The guideline outlined below ensures that there is adequate time and activity modification necessary to allow the brain to heal before a secondary injury can occur.

## Definition of Concussion:

- **Sport Related Concussion (SRC) is defined as a traumatic brain injury caused by biomechanical forces. Common features used in clinically defining a concussive injury include:**
  1. Concussion may be caused either by a direct blow to the head, face, neck or elsewhere on the body with an "impulsive" force transmitted to the head.
  2. Concussion typically results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously. However, in some cases, symptoms and signs may evolve over a number of minutes to hours.
  3. Concussion may result in neuropathological changes, but the acute clinical symptoms largely reflect a functional disturbance rather than a structural injury and, as such, no abnormality is seen on standard structural neuroimaging studies.
  4. Concussion results in a graded set of clinical symptoms that may or may not involve loss of consciousness. Resolution of the clinical and cognitive symptoms typically follows a sequential course. However, it is important to note that in some cases symptoms may be prolonged.
  5. Clinical signs and symptoms of sport related concussion cannot be explained by pre-existing injuries such as, cervical pathology or vestibular impairment etc, drug, alcohol, or medication use, or comorbidities (such as psychological conditions or existing medical conditions)

The preceding definition is from the Consensus Statement on Concussion in Sport 5th International Conference on Concussion in Sport Held in Berlin, October 2016.

## Additional Concussion Information:

**Second Impact Syndrome (SIS)** is also a very real concern and can be potentially catastrophic. According to the Center for Disease Control and Prevention (CDC) a repeat concussion that occurs before the brain recovers from the first, usually with a short period of time (hours, days, or weeks), can slow recovery or increase the likelihood of having long term problems. In rare case, repeat concussions can result in brain swelling, permanent brain damage, and even death. The CDC refers to this more serious condition as **Second Impact Syndrome**. SIS in short is suffering a second MTBI or concussion while the brain is recovering from an initial MTBI or concussion and thus potentially leading to a higher level of brain damage and catastrophic consequences. SIS is believed to have been the cause of approximately 30-40 deaths over the last decade. The risk of SIS is real, and following a gradual return to play protocol or guideline after sustaining a MTBI or concussion can greatly reduce the chances of this potentially life threatening condition.

In addition, with every MTBI or concussion there is a risk of developing **Post-Concussion Syndrome (PCS)**. According to the Mayo Clinic, PCS is a complex disorder in which a combination of post-concussion symptoms may last for weeks and sometimes months after the injury that caused the initial concussion. Symptoms of PCS may include but are not limited to chronic headaches, fatigue, sleep difficulties, personality change, increased irritability, increased emotional feelings, sensitivity to light and noise, dizziness, and deficits in short-term memory and general academic functioning. PCS can be very disabling for an athlete, and may be permanent in some cases. The majority of athletes who experience MTBI or concussion are likely to recover fully without experiencing long term detrimental effects of MTBI or concussion.

**Chronic Traumatic Encephalopathy (CTE)** is a progressive degenerative disease of the brain found in individuals with a history of repetitive brain trauma, including symptomatic concussions as well as asymptomatic sub-concussive hits to the head. Several retired professional athletes have been diagnosed postmortem with CTE. Recent reports have been published of neuropathologically confirmed CTE in retired professional football players and other athletes who have a history of repetitive brain trauma. This trauma triggers progressive degeneration of the brain tissue, including the build-up of an abnormal protein called tau. These changes in the brain can begin months, years, or even decades after the last brain trauma or end of active athletic involvement. The brain degeneration is associated with memory loss, confusion, impaired judgment, impulse control problems, aggression, depression, and, eventually, progressive dementia. As serious as CTE is, it has also been reported that many former athletes show no symptoms of CTE or any other neurological disorder and have sustained the same number of sub-concussive hits to the head. The bottom line is CTE is real and can happen, but one never knows until much later in life due to the nature of CTE's lengthy progression in the brain.

## Concussion signs and symptoms:

Signs	Symptoms
Dazed and confused appearance ("In a fog")	Headache
Slow, labored, or clumsy movement	Nausea/ Vomiting
Slow to respond, process thoughts, formulate words	Dizziness or balance issues
Behavior/personality changes (irritable, nervous, sad)	Blurry vision
Difficulty concentrating	Sensitivity to light or sound
Memory problems	Feeling sluggish or tired (foggy)
Glassy eyes	Sleeping pattern changes (more/less or difficulty sleeping)

## BCSD Concussion Guideline

- An athlete with signs and symptoms of a concussion, or an athlete believed to have sustained a MTBI, will be removed from play as soon as possible until evaluated and cleared by a qualified health care professional specifically trained in concussion evaluation and management. The BCSD employs Certified Athletic Trainers (ATCs), qualified in concussion recognition, management, and treatment. The ATCs work under the BCSD Team Physician(s). If parents/guardians choose to take their student athlete for evaluation to other health care professionals outside of the school setting, it is encouraged that those health care professionals evaluating and treating concussions be qualified and trained in the area of concussion and MTBI management. The ATCs and BCSD physicians maintain the right to determine return to play progression for each athlete.
- All athletes with suspected concussions will be removed from competition/practice. They then will be evaluated by the ATCs or BCSD Team Physician and if determined to have concussion the parents will be notified. If those health care professionals are not available, the supervising coach or administrator will call the parents/guardians. It is suggested that the parents then take their son/daughter to a family physician for evaluation or to the emergency room if symptoms are present. If another medical professional such as a MD/DO perform an evaluation and provide treatment, the athlete should bring documentation of the diagnosis and recommendations to the ATCs. The qualified health care providers' orders will be reviewed and followed unless the BCSD Team Physician or the ATCs feel the athlete needs further evaluation and screening or a more conservative approach to the injury. The BCSD Medical Staff will act in the best interest of the athlete and the school district.
- The District BCSD uses the Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT) software. ImPACT is a concussion evaluation tool that has been used by NCAA Division I schools and other professional sports. Athletes will take a baseline test on ImPACT. The results of the baseline test are stored within the software. In the event of a suspected or diagnosed concussion, the athlete will be given a post-injury test. Scores will be evaluated by the BCSD Medical Team and compared to baseline results. This test acts as a tool for the BCSD Team Physician and ATCs to use as a guide to safe return to play (RTP). **ImPACT Tests will not be the sole determining factor for RTP decisions.** All Bettendorf High School athletes participating in Football, Volleyball, Basketball, Soccer Players, Wrestlers, and Cheerleading/Dance will be given the opportunity to take the ImPACT Test.
- The BCSD also utilizes the King-Devick Test. The King-Devick is recognized by many top NCAA schools and the Mayo Clinic as a reliable and quick tool to objectively determine whether players should be removed from play for further concussion evaluation. This test will primarily be used in football, but may also be used in other contact sports listed above. This test requires baseline testing of the athletes prior to use on the field. The King-Devick test will not be the sole determining factor for the need for concussion evaluation or removal from play.
- If the athlete is deemed to have suffered a concussion, the athlete will not be allowed to return to participation until cleared by the ATCs, BCSD Team Physician, or other qualified health care professional. **The athlete must follow the return to play (RTP) steps and procedure as appears in this guideline. No student-athlete will be allowed to return to play without following the RTP steps and procedure.**
- Following a concussion, the athlete will be monitored daily for symptom checks by the athletic trainer or school nurse. When the athlete demonstrates symptom resolution, and a full return to academic school and class work, a post injury ImPACT test will be administered. The results will be compared to the athlete's original baseline scores. These scores will be evaluated by the athletic trainers. If there is no baseline test available for comparison, the scores will be compared using a national data base standard and the students GPA. If a parent would like the scores made available to them to take to their family physician they can make a verbal or written request to the athletic trainer or athletic department.
- **The BCSD Team Physician and the ATCs (working directly under BCSD Team Physician) will have ultimate return to play authority.** The BCSD Team Physician and the ATCs will take into consideration all other health care providers qualifications and directions and will make a determination as to the athletes return to play status. The BCSD Team Physician and the ATCs may agree to follow other health care providers scripts or choose to overrule those providers if believed to be in the best interest of the school district and athlete. The BCSD Medical Staff will not overrule a restrictive note unless the parents/guardians request a second opinion from the BCSD Team Physician and will then follow the BCSD Team Physician's findings and direction. **The ATCs will not overrule a conservative or more cautious note in any circumstance.**

## Detailed Return to Play (RTP) Guideline

- Bettendorf High School and BCSD utilizes a return to play guideline for safely reintegrating athletes to sport and physical activity after concussion. The return to play steps consists of 6 days of progressive and monitored physical activity. The athlete will start the process once they are symptom free. The athlete will move from step to step until completion of the guideline before full return to play (RTP). If each step is passed without symptom recurrence, an athlete could potentially return to full game participation in 6 Days (See Table-1). However, this is the best case scenario and is often not the case when dealing with concussion and MTBI. If symptoms resurface within any step/day during the RTP guideline, the athlete will repeat the previous day's physical activity requirements once they are symptom free. BCSD personnel, Team Physician, or the ATCs will try to communicate as much as possible with parents and other physicians who may have seen the athlete throughout the RTP process. It is important to note that a Step does not denote a day/24 hour period as Steps could take weeks and some instances allow for multiple Steps in the same day.
- **Progression past Step 1 only occurs when an athlete is asymptomatic (reports and shows no signs or symptoms of concussion or Post-Concussion Syndrome). An athlete will not advance or proceed in the process with signs and symptoms of concussion. The athlete must also be fully engaged in all normal academic course work as prior to the injury.**
- If symptoms occur or persist anytime in the guideline the athlete may be referred back to BCSD Team Physician or family physician. If this occurs the athlete will not progress any further in the RTP process.
- **Step One**
  - An athlete could remain in Step One as long as symptoms remain. If an athlete has an increasing number of concussion signs or worsening symptoms the athlete may be referred back to a physician or to a specialist. If an athlete's symptoms remain unchanged for more than 7 days, the athlete may also be referred back to a physician or specialist at that time.
  - Athlete is initially evaluated by ATCs or BCSD Team Physician or qualified health care professionals and determined to have a concussion or MTBI. If evaluated by a qualified health care professional not employed by the BCSD, documentation and any notation from that provider should be shared with the BCSD medical staff. It is important to understand that no matter what health care provider evaluates the athlete they must still follow the BCSD RTP Guideline written within this document unless agreed upon by the BCSD Team Physician.
  - Once a concussion has been determined by the ATCs or the BCSD Team Physician, the athlete will be removed from all physical activity and mental exertion. The ATCs or the BCSD Team Physician may recommend time off from school to allow the brain to heal; this could mean the absence of school and classroom activities. The athlete will, at this point, enter the BCSD Return to Learn Guideline. The ATCs will communicate with parents/guardians, school administration, school nurse, and teachers to report the athlete's condition and cognitive abilities if necessary. **Once the athlete is asymptomatic for 24 hours they will progress to Step Two and back in school full time without restriction.** The BCSD Team Physician and ATCs will err on the side of caution if the 24 hour period is in question. The ATCs and BCSD Team Physician maintain the right to delay progression to Step 2 of this guideline.

The 24 hour period begins when the athlete notes they are asymptomatic. If an athlete goes to bed with symptoms and wakes the next morning without symptoms, the 24 hour period starts at the time when the athlete wakes without symptoms.
  - Athletes will be asked to report symptom severity to the ATC, or School Nurse, by completing an online or paper Concussion Symptom Checklist three times a day.

- **Step Two**

- Athlete may take a post-injury ImPACT Test once they have been **asymptomatic for a minimal of 24 hours**. The athlete must be asymptomatic prior to starting the post-injury test. The King Devick test may also be used to determine the readiness to return to physical activity as an additional post-injury testing tool.
- If the Post Injury ImPACT Test results are comparatively equal to baseline scores and the athlete remains asymptomatic the ATCs or BCSD Team Physician will determine whether to progress the athlete to gradual physical activity and the RTP guideline. If the athlete's scores are not comparatively equal or symptoms increase during testing, the ATCs or the BCSD Team Physician will make a determination as how to progress the athlete. This may include another day of rest, or 24 hour asymptomatic period, before proceeding to Step 3. The BCSD Medical Team maintains the right to determine whether or not to progress an athlete from one step to another. The BCSD Medical Team will act in the best interest of the athlete and the district to progress the athlete even if the athlete claims to be asymptomatic and/or their score are comparatively equal. This may occur more frequently in those individuals with a concussion history or other mental or cognitive conditions that may delay healing. Previous concussion history, ImPACT scores, medical evaluation results, current medications the athlete may be using, and other cognitive or physical complications will be considered in making the decision to progress the athlete in the RTP process. **ImPACT scores are not the sole determining factor in RTP progression.**
- **At any time the athlete exhibits the same symptom level or lingering symptoms that prevent comparatively equal scores on ImPACT or King Devick Test, that athlete may be referred back to the BCSD Team Physician or MD/DO of the parents/guardian choosing. At this time the BCSD Team Physician and/or BCSD Certified Athletic Trainers will make a determination how to progress the athlete.**
- The athlete may progress from Step Two to **day one** of Step Three in the same day if they are asymptomatic and have comparatively equal ImPACT scores. **THIS IS THE ONLY SENARIO IN WHICH MULTIPLE STEPS CAN BE COMPLETED IN A PERIOD OF LESS THAN 24 HOURS.**

- **Step Three**

- Athlete is ready for monitored gradual return to physical activity. An athlete will not be permitted to pass multiple physical activity steps/days within a single 24 hour period.
- If symptoms resurface at any time during the progression, the athlete will automatically step down to the previously passed day of physical activity. They must asymptomatic for approximately 24 hours prior to attempting the previous day's physical activity requirements or mental tests. Physician consultation may also occur if symptoms present after any physical activity within the return to play guideline.
- Physical Activity Progression (By Days)
  - Day 1 – Light cardiovascular exercise on stationary equipment - Heart rate to stay below 70% of max heart rate.
    - (If no symptoms occur within approximately 24 hours, the athlete may progress to Day 2)
  - Day 2 - High intensity cardiovascular using a non-stationary means, such as running or swimming. These activities may or may not be specific to their sport
    - (If no symptoms occur within approximately 24 hours r, the athlete may progress to Day 3)
  - Day 3 – Strenuous cardiovascular workout which may be specific to position in sport. If contact Sports, no contact drills will be allowed but may participate in non-contact drills and resistance training.
    - (If no symptoms occur within approximately 24 hours, the athlete may progress to Day 4)
  - Day 4 – Return to normal practice. Full contact allowed with no restrictions. Athlete is not released for game or competition play. **The head coach and ATC will determine what conditions must be present for a practice to be considered a full contact unlimited practice.**

- **Step Four**

- In this step the athlete will undergo a final evaluation and screening and be returned to full participation without restrictions. This may include a final ImPACT test. ***The athlete must complete a full contact unlimited practice prior to being released to participate in any game or competition.***
  - Day 5 – Full and Unlimited participation in Games and Matches.

**Example - 1:**

Athlete completes a STEP 3 - Day 2 workout and following experiences increase symptoms, the athlete will first wait until they are asymptomatic and then have to perform the Day 1 test again to progress to Day 2. On the day of the repeated Day 1 test the athlete must be asymptomatic from early morning wake-up to time of test the same day. This means the athlete could not wake up the next day with a headache (symptoms) and then proceed to try the repeated Day 1 cardiovascular exercise in the afternoon when the headache subsides. Physicians may be consulted if this occurs.

## REFERENCES

1. McCrory, P., Meeuwisse, W., Dvorak, J., Aubry, M., Bailes, J., Broglio, S., ... & Davis, G. A. (2017). Consensus statement on concussion in sport—the 5th international conference on concussion in sport held in Berlin, October 2016. *Br J Sports Med*, bjsports-2017. Broglio, S. P., Cantu, R. C., Gioia, G. A., Guskiewicz, K. M., Kutcher, J., Palm, M., & McLeod, T. C. V. (2014). National Athletic Trainers' Association Position Statement: Management of Sport Concussion. *Journal of Athletic Training*, 49(2), 245–265. <http://doi.org/10.4085/1062-6050-49.1.07>
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# Summation of Return to Play Guideline

The following information and chart **represents the best case scenario after a MTBI or concussion injury for return to play status**. Athletes must be asymptomatic to progress past Day 1 (Step 1), and must continue to be asymptomatic throughout the progression to Full Release. If an Athlete experiences symptoms of concussion at any time they will not be allowed to progress to the next step. If an athlete experiences symptoms during Day 2 – 5, they will move back 1 day and must remain asymptomatic for approximately 24 hours following completion of the physical activity prior to moving forward again. At any time symptoms may dictate an athlete to be moved back more than one day in the progression to ensure athlete safety. A referral back to a physician or specialist may also be necessary. In addition, the BCSD Team Physician or BCSD ATCs maintains the right to halt progression if it is determined to be in the best interest of the student athlete or BCSD.

**Table - 1**

## Post-Concussion Summation of RTP Guideline *BEST CASE SCENARIO*

Day 0 Concussion Occurred	Day 1 Possible ImPACT Test Rest - No Physical or Mental Activity	Day 2 ATHLETE IS ASYMPTOMATIC ImPACT Test Light Stationary Cardiovascular Exercise <70%	Day 3 Movement Based Cardiovascular Exercise	Day 4 High Intensity Sport Specific Drills (NO CONTACT)	Day 5 Full Practice and Contact Activities (NO GAMES)	Day 6 Full Release All Activities GAME PLAY
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	<b>Sunday</b>
Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	<b>Monday</b>
Wednesday	Thursday	Friday	Saturday	Sunday	Monday	<b>Tuesday</b>
Thursday	Friday	Saturday	Sunday	Monday	Tuesday	<b>Wednesday</b>
Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	<b>Thursday</b>
Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	<b>Friday</b>
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	<b>Saturday</b>

**STEP 1**

- Day 0 -Preseason ImPACT Testing
- Day 0 -Athlete Sustains, or is Diagnosed with Concussion (Evaluation by ATC or MD if Possible)
- Day 0 -Athlete Removed From Participation
- Day 1 -Athlete Evaluated (Re-Evaluated)
- Day 1 -Possible Post Injury ImPACT Test
- Day 1 -Rest from Mental/Physical activity

**STEP 2**

- Day 2 -Only if Athlete Asymptomatic (Remain at Day 1 Until Asymptomatic)
- Day 2 -If Asymptomatic → Post Injury ImPACT Test →

**STEP 3**

- Day 2 Continued
- Day 2 -If Passed Post Injury ImPACT Test → Light Stationary Cardiovascular Exercise <70% Max
- Day 2 -If No Pass → Re-Evaluate Factors. Possible No Exercise or Stay at Step 1
- Day 3 -If Asymptomatic → Higher Intensity Cardiovascular Exercise with Movement
- Day 3 -If symptomatic → Re-Evaluate and Return to Day 2
- Day 4 -If Asymptomatic → Progress to Increase Intensity Sport Specific Training (NO CONTACT)
- Day 4 -If symptomatic → Re-Evaluate and Return to Day 3
- Day 5 -If Asymptomatic → Full Contact Practice (NO GAMES)
- Day 5 -If symptomatic → Re-Evaluate and Return to Day 4

**STEP 4**

- Day 6 -If Asymptomatic → FULL RELEASE – NO RESTRICTIONS
- Day 6 -If symptomatic → Re-Evaluate and Return to Day 5