Concussions - Causes & Symptoms

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Introduction

Concussions most commonly occur in organized contact sports such as football, wrestling, and soccer, but they can also occur in synchronized swimming. Because, concussions can lead to serious health consequences, it is essential that synchronized swimmers, coaches, parents, and healthcare providers learn the signs and symptoms of concussion and what to do if a concussion occurs.

What is a Concussion?

A concussion is a type of mild traumatic brain injury (or mTBI) caused by a bump, blow, or jolt to the head or body that shakes the head and can alter the way the brain normally functions. Less than 10% of concussions involve a loss of consciousness. In synchronized swimming, common causes of concussion are from a collision with another synchronized swimmer, hitting the wall, falling from a lift, being kicked in the head by an arm or a leg, etc. What ensues are a number of possible symptoms that may adversely affect the synchronized swimmer's ability to perform daily mental and physical tasks, alter mood and personality, and reduce the ability to safely participate in synchronized swimming. Each concussion is unique and can affect the injured synchronized swimmer in a different way. Recognition and proper response to concussions when they first occur is imperative to help prevent further injury or even death.

How to Recognize Signs and Symptoms of Concussion:

Keys to identifying concussion include an observed or reported forceful bump, blow or jolt to the head or body that results in rapid movement of the head AND any changes in the synchronized swimmer's behavior, thinking, or physical function.

It is important to remember that you can't "see" a concussion and that not all synchronized swimmers will experience or report the symptoms right away. Some synchronized swimmers may wait for hours or even days after the injury to report a problem. The following is a list of common symptoms of concussion. Keep in mind that it is not uncommon to have some of the symptoms at baseline. A concussion would be an increase in the severity or number of symptoms.

Signs Observed by Others	Symptoms Reported by Synchronized Swimming
Confusion	Headache or "pressure" in head
Foggy	Nausea, vomiting, numbness or tingling
Forgetful	Balance problems or dizziness
Disoriented	Double or blurry vision, ringing in the ears
Lack of coordination	Sensitivity to light and noise
Slow to respond	Increased emotional behavior/irritability
Brief unconsciousness	Concentration or memory problems
Mood, behavior, or personality changes	Feeling sluggish, low energy, foggy, or groggy
Inability to recall events prior to hit or fall	Confusion
Inability to recall events after hit or fall	Does not "feel right" or "feeling down"
Seizures immediately after the hit/fall	Problems with insomnia or excessive sleep

What to do if you suspect a concussion:

If the **synchronized swimmer loses consciousness** following an impact to the head or body, a qualified healthcare provider or first aid responder should immediately perform a primary survey to ensure the synchronized swimmer's airway, breathing and circulation are not compromised, and to check for signs of additional injury. If consciousness is not regained by the completion of the primary survey, the Emergency Medical System (EMS, 911) should be activated for transportation and evaluation at the nearest medical facility.

If there is no loss of consciousness, and a concussion is suspected, immediately remove the athlete from the pool. Remove cap and goggles. Go through the symptom list noted above and ask the swimmer to complete the symptom survey.

Any synchronized swimmer who experiences a concussion (with or without loss of consciousness) should immediately be withheld from synchronized swimming and any other physical activity.

The synchronized swimmer must be evaluated by a licensed health professional trained in concussion diagnosis and management. A repeat concussion that occurs before the brain has recovered from the first trauma —usually within a short time period (hours, days, weeks)—can slow the recovery process and/or increase the chances for long-term problems including death. Therefore, a concussed synchronized swimming must follow the advice of the healthcare provider in returning to activity.

If the athlete does not have symptoms, please ask the athlete to remain poolside and continue to monitor the athlete every 10 – 15 minutes as symptoms can occur over time. If the athlete has no symptoms at the end of the training session, inform the parent/guardian that impact has occurred and advise them to continue monitoring the athlete for symptoms at home for the next 24 hours. If symptoms develop, the athlete should be evaluated by a licensed health professional trained in concussion management.

Management:

Most individuals with a concussion will fully recover in a timely manner (7 – 10 days) given early and proper care. But for some individuals, signs and symptoms of concussion can last for days, weeks, or longer and may be present during daily functioning in addition to exercise or synchronized swimming activity. Research informs us that some aspects of cognition and the bodies balance system can be affected for months following concussion.
Concussion management includes both physical and cognitive (mental) rest until symptoms resolve to baseline for all activities of daily living prior to returning to synchronized swimming. If there is any question whether or not a synchronized swimming should participate, current guidelines state **"When in doubt, sit them out."** Provide this fact sheet to the synchronized swimmers parent, guardian or roommate.

- **Monitoring for mental or physical deterioration** over the initial few hours after injury is essential.
- **Restful sleep and relaxation.** Like any injury, the injured body part (in this case the brain) needs rest from activity to promote the healing. This can mean rest from television, computers, reading, texting and even music.
- **Acetaminophen** (Tylenol) can be taken safely
- **DO NOT** drink alcohol, take sleeping medication, aspirin or anti-inflammatory medication (i.e. Advil)
- **DO NOT** return to synchronized swimming the same day as the injury, even if symptoms resolve.
- **DO** return to synchronized swimming only after being cleared by a licensed healthcare provider experienced in concussion management, which may include a variety of tests designed to assess brain function (neurocognitive tests).

Returning to Synchronized Swimming:

The following is a guideline. The return to synchronized swimming and progression must be led by a health care provider who is trained and experienced in concussion management. It is highly recommended that the physician be able to directly communicate with the coach in directing return to sport and providing step-by-step guidance. To facilitate this communication, it is recommended that athletes and parents sign a waiver prior to each season allowing for this direct communication. Once the synchronized swimmer's symptoms have resolved to baseline with daily activity, the synchronized swimmer should follow a step-wise return to synchronized swimming protocol. **Medical clearance is required to progress from Stage 1 to Stage 2.** Within each stage, activity is introduced and increased gradually. The athlete should be symptom free for 24 hours before progressing to the next stage. **If at any stage the synchronized swimmer experiences a recurrence of symptoms of concussion, he/she needs to return to the previous level of activity until the symptoms resolve and should not try to progress for at least 24 hours**. Each step may take a minimum of one day, depending on the duration or recurrence of symptoms. Synchronized swimmers will progress through the following at differing rates:

Stage	Home Activity	School Activity	Physical Activity
# 1 No Activity	• Rest quietly, nap and sleep as much as needed. • Avoid bright light if bothersome. • Drink plenty of fluids and eat healthy foods every 3-4 hours. • Avoid "screen time" (text, computer, cell phone, TV, video games).	• No school. • No homework or take-home tests. • Avoid reading and studying.	• Walking short distances to get around is okay. • Passive flexibility and breathing exercises ok but do not hold breath for more than 10 seconds. • No exercise that increases heart rate of any kind. • No driving.
# 2 Light Aerobic Exercise	• Allow 8-10 hours of sleep per night. • Avoid napping. • Drink lots of fluids and eat healthy foods every 3-4 hours. • "Screen time" less than 1 hour a day. • Spend limited social time with friends outside of school. • Avoid bright light and loud noise	• No school. • May begin easy tasks at home (drawing, baking, cooking). • Soft music and 'books on tape' ok. • Once your child can complete 60-90 minutes of light mental activity without a worsening of symptoms he/she may go to the next step.	• Light physical activity, like walking, biking, kick with kickboard but stop if neck hurts • Limit water time • No inversions or breath holds more than 10s. • Aerobic Activity up to 70% Max HR • No resistance training • Continue passive flexibility • Add active flexibility and extension exercises • Light core strengthening (i.e. plank) • Wear sunglasses and ear plugs to practice • No memorization of routines • Avoid sharp, rapid head movement

Stage	Home Activity	School Activity	Physical Activity
# 3 Sport Specific Exercise	• Allow 8-10 hours of sleep per night.Avoid napping. • Drink lots of fluids and eat healthy foods every 3-4 hours. • "Screen time" less than 1 hour a day. • Spend limited social time with friends outside of school.	• Gradually return to school. • Start with a few hours/half-day. • Take breaks in the nurse's office or a quiet room every 2 hours or as needed. • Avoid loud areas (music, band, choir, shop class, locker room, cafeteria, loud hallway and gym). • Use sunglasses/ earplugs as needed. Sit in front of class. • Use preprinted large font (18) class notes. Complete necessary assignments only. No tests or quizzes. • Limit homework time. • Multiple choice or verbal assignments better than lots of long writing. • Tutoring or help as needed. • Stop work if symptoms increase.	• Gradual increase aerobic activity, allow some head movement • Jogging • Swimming all strokes (no flip-turn) • Re-introduce synchro specific drills (no inversions) • Horizontal Sculling • Ballet Legs • Eggbeater and body boosts • Land-drill • No pattern • No resistance training or high-impact cardio • Continue flexibility and extension exercises
# 4 Non-Contact Drills	• Allow 8-10 hours of sleep per night. • Avoid napping. • Drink lots of fluids and eat healthy foods every 3-4 hours. • "Screen time" less than 1 hour a day. • Spend limited social time with friends outside of school.	• Progress to attending core classes for full days of school. • Add in electives when tolerated. No more than 1 test or quiz per day. • Give extra time or untimed homework/tests. • Tutoring or help as needed. Stop work if symptoms increase.	• Increase physical and cognitive load • Resume full dry land training including resistance training • Re-introduce inverted skills and whole-body movements • Technical drills, gradually increasing intensity - Figure parts - Routine sections - Flip turns • Remain out of the pattern • Re-introduce full light and sound stimulation at the pool

Who Might a Synchronized Swimmer Work with Following a Concussion:

A synchronized swimmer may work with a number of licensed healthcare providers who will assist in his/her recovery including: sports medicine physicians, certified athletic trainers, physiotherapists, neuro-psychologists, psychiatrists, and/or osteopaths.

References:

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Concussion Tip Sheet from Taskforce on Dancer's Health Dance USA

Pocket Concussion Recognition Tool, copyright parachute Canada 2013
2015 California Interscholastic RTL Protocol

Adapted from:

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