Concussion Management

Preventing Further Brain Injury After a Concussion

Concussions are often an "invisible" injury. Many concussions go undiagnosed and untreated, and most occur without loss of consciousness. People should know how to recognize when someone has experienced this trauma. If a concussion is not managed properly, it can lead to severe consequences, such as brain damage and even death. Follow the California Interscholastic Federation (CIF) guidelines for the Return to Learn (RTL) and Return to Play (RTP) Protocols to help safely reintroduce the concussed person back into academics, work, and sports. These guidelines can also be accessed on the CIF website at **www.cifstate.org**. To learn more about MarinHealth℠ Medical Center's Athletic Training Program designed for student athletes visit us online at **www.mymarinhealth.com/athletics**.

RETURN TO LEARN (RTL) PROTOCOL

Concussions are brain injuries that affect various forms of cognitive function and may manifest with immediate or delayed-onset symptoms. Each individual concussion will be different in their range, duration, and severity. Returning to academics, work, and highly cognitive functions needs to be closely monitored in order to help with recovery. The RTL Protocol outlined in this handout is designed to assist a concussed person return to their learning or working environment in stages aimed to keep brain activity below levels that cause symptoms to worsen.

REMEMBER

1. If symptoms (e.g., headache, tiredness, irritability) worsen at any stage, stop activity and rest.
2. Seek further medical attention if the symptoms continue beyond 7 days.
3. A better outcome may be achieved if appropriate time is allowed for complete brain recovery before returning to mental activity, as compared to rushing through these guidelines.

RETURN TO PLAY (RTP) PROTOCOL

Individuals with a suspected concussion should be removed from play immediately, and SHOULD NOT return to play the same day. Even though a traditional brain scan (e.g., MRI or CT) may be "normal," the brain has still been injured. Research shows that a second blow before the brain has fully recovered can result in prolonged recovery—weeks to months—and serious damage to the brain, such as severe brain swelling (Second Impact Syndrome). In addition, there is an increasing concern that sub-concussive head impacts and recurrent concussions may contribute to long-term neurological problems.

A recent pressing concern is Chronic Traumatic Encephalopathy (CTE), a newly discovered disease that has been linked to sub-concussive hits to the head. Youth and adolescents may take more time to recover from a concussion; conservative treatment is necessary to avoid long-term serious problems. A primary goal of the RTP Protocol is to prevent pre-mature return to play to minimize risk of serious brain damage.

RETURN TO LEARN (RTL) PROTOCOL

Give this form to teachers/school administrators and employers to help them understand the concussed person's recovery.

STAGE	ACTIVITY	OBJECTIVE	PHYSICAL ACTIVITY
Brain Rest	Compete cognitive rest—no school, homework, reading, video games, or computer work	Recovery	Walking short distances. No exercise of any kind. No driving.
This stage usually ends 3 – 5 days after injury. Progress to the next stage when symptoms start to improve but may still be present.			
Restful Home Activity	Relax previous restrictions on activities and add short periods of cognitive activity (5 – 15 minutes at a time)	Gradual, controlled increase in cognitive activities	Light physical activity like walking. No driving.
Progress to the next stage when symptoms start to improve but become fewer.			
Home-based Academics or Work	Home-based cognitive activity in longer increments (20 – 30 minutes at a time)	Increase cognitive stamina by repeating short periods of self-paced cognitive activity	Light physical activity like walking. No driving.
Progress to the next stage when the above activities can be completed without symptoms.			
Return to School or Work (Partial Day)	Partial day of school/work after tolerating 1 – 2 cumulative hours of home-based academics or work	Re-entry into school/work with accommodations to permit controlled increase in cognitive load	Light physical activity, like walking. No driving.
Progress to the next stage when the above activities can be completed without symptoms.			
Return to School or Work (Full Day)	Increase to full day of school/ work	Accommodations decrease as cognitive stamina improves	Light physical activity like walking. No driving.
Progress to the next stage when the concussed person has returned to school/work full time and is able to complete all tests/assignments without symptoms.			
Full Cognitive Recovery	Introduce testing, catch up with essential work	Full return to school/work; may commence Return to Play (RTP) Protocol	Commence RTP Protocol

RETURN TO PLAY (RTP) PROTOCOL

California Law states that this RTP Protocol must be completed a minimum of 8 days after a concussion diagnosis by a physician for all students. All stages must be completed BEFORE returning to FULL COMPETITION. A certified athletic trainer (ATC), physician, and/or identified concussion monitor (e.g., coach, athletic director) must monitor each stage after completion. Seek further medical attention if one cannot pass a stage after 3 attempts, or if he or she feels uncomfortable during the progression.

STAGE	ACTIVITY	EXERCISE EXAMPLE	OBJECTIVE OF STAGE
I	No physical activity for at least 2 full symptom-free days AFTER seeing a physician	• No activities requiring exertion (weight lifting, jogging, PE classes)	• Recovery and elimination of symptoms
After Stage 1, do not progress more than 1 stage per day. It takes a minimum of 6 days to pass Stages I and II. Before beginning Stage II, must be back to normal academic/work activities unless otherwise instructed by a physician.			
II-A	Light aerobic activity	• 10 – 15 minutes (minimum) of walking or stationary biking • Must be performed under direct supervision of a designated individual	• Increase heart rate to no more than 50% of perceived maximum exertion (e.g., <100 bpm) • Monitor for symptom return
II-B	Moderate aerobic activity (light resistance training)	• 20 – 30 minutes of jogging or stationary biking • Body weight exercises (squats, planks, push-ups), maximum 1 set of 10, no more than 10 minutes total	• Increase heart rate to 50 – 75% maximum exertion (e.g., 100 – 150 bpm) • Monitor for symptom return
II-C	Strenuous aerobic activity (moderate resistance training)	• 30 – 45 minutes running or stationary biking • Weight lifting ≤50% of maximum weight	• Increase heart rate to >75% maximum exertion • Monitor for symptom return
II-D	Non-contact training with sport-specific drills (no restrictions for weight lifting)	• Non-contact drills, sport-specific activities (cutting, jumping, sprinting) • No contact with people, padding, or the floor/mat	• Add total body movement • Monitor for symptom return
Prior to beginning Stage III, one should successfully complete Stages I and II. Student athletes must present a written physician (MD/DO) clearance for RTP to their school's concussion monitor.			
III	Limited contact practice	• Controlled contact drills allowed (no scrimmaging)	• Increase acceleration, decelerations, and rotational forces
	Full contact practice	• Return to normal unrestricted training, with contact	• Restore confidence, assess readiness for return to play • Monitor for symptom return
MANDATORY: Student athlete must complete at least 1 contact practice (2 are highly recommended) before returning to competition; for non-contact sports, 1 unrestricted practice is required.			
IV	Return to play (competition)	Normal game play (competitive event)	Return to full sports activity without restrictions

Basic Guidelines of Home Care Following a Concussion

The immediate management of a concussion is important to overall recovery. Some basic guidelines of home care include:

- AVOID ibuprofen (Motrin, Advil) or aspirin for the next 48 hours due to the risk of increased bleeding in the brain.
- Acetaminophen (Tylenol) often won't take away a concussion headache. DO NOT give narcotic pain medications, such as codeine.
- Anyone with concussion symptoms needs to be monitored by a responsible adult and should not be left alone the first 12 – 24 hours after the injury.
- Check for normal breathing every few hours while sleeping, but DO NOT wake them unless you are concerned. If he/she can't be roused, call 911 immediately.
- Make an appointment to see a physician within 72 hours. Inform the person's school or work about the injury. Reduce cognitive stimuli, such as reading, studying, and screen-time if symptoms are severe or worsen.
- Track their symptoms using the Centers for Disease Control and Prevention's Concussion Symptom Checklist available at **www.cdc.gov**, and bring this to their physician appointments.
- DO NOT participate in afterschool sports, PE, or physical activities until one is evaluated and cleared by a physician trained in the diagnosis and management of concussions.