

6b. Return-to-Diving Strategy

The following is an outline of the *Return-to-Diving Strategy* that should be used to help athletes, coaches, trainers and medical professionals to partner in allowing the athlete to make a gradual return to sport activities. An initial period of 24-48 hours of rest is recommended before starting any concussion protocol. It is important that youth and adult student-athletes return to full-time school activities before progressing to *Return-to-Diving Strategy*. It is also important that all athletes provide their coach with a *Medical Clearance Letter* prior to returning to resuming training.

The [Table of Steps to Return to Post Concussion Training](#) (on the next page) needs to be applied in conjunction with the [Rules for Implementing the Table to Return to Post Concussion](#) and with the [Concussion Management Protocol for Trainers](#).



Table of Steps to Return to Post Concussion Training

Designed by Marie-Claude Saint-Amour, Pht, dip. Physio of sport, FCAMPT (Version 3-1)

| Day | Physical preparation | Dry land | Dry board and Trampo | Pool deck and in the water | 1 meter | 3 meters | Tower |
|-----|--|---|---|--|---|---|--|
| 1 | Rest | Rest | Rest | Rest | Rest | Rest | Rest |
| 2 | Stationary bike (low intensity) | Stretching Core/stabilization training Proprioceptive exercises (low intensity) | | | | | |
| 3 | Stationary bike (moderate intensity) Swimming (low intensity 20 minutes) Muscle training (low intensity) | Stretching/core exercises Proprioceptive exes on balance boards/ground Simulations (no jump) | | | | | |
| 4 | Warm up (out of water) Progress muscle training | Armstand against the wall Jumps (Intensity: 50-75%) Simulations (no jump) Vestibular stimulation (twist on the floor, rolls) Coordination exercises (agility ladder, etc) | | Head down position in water Torpedo in the water | | | |
| 5 | Warm up (out of water) Normal muscle training | Armstand Jumps (Intensity: 100%) Hurdle Simulations with jump Vestibular (twist floor/standing, cartwheel, rolls) Coordination exercises (agility ladder, etc) | Dry board: 100/200 (no hurdle or approach) 100/200 with hurdle/approach Trampo: 100 (non continuous) 100 with approach | No hurdle jump Front/back fall Head down in deep water | No hurdle jump Front/back fall | No hurdle jump | 100/200 3m/5m |
| 6 | | Armstand (done repeatedly) Continuous jumps (Intensity: 100%) without rest More complex vestibular/coordination exercises | Trampo: continuous jumps Dry board: 100 with multiple bounce | 101/201/301/401 | 101/201/301/401 (without hurdle and with hurdle) | 100/200 with hurdle/approach Front/back fall | Front/back fall 3m/5m 100/200 7m/10m |
| 7 | | 102-202-302-402 | 102-202-302-402 without and with hurdle/approach | 102-202-302-402 610-621 small tower | 102-202-302-402 | 101/201/301/401 no hurdle | 101/201/301/401 3m/5m Front/back fall 7m |
| 8 | | Dryland repetitive twists | X01 and X03 (landing on the back) 5122-5221 | 5201-5101 | 103-203-403-303 | 101/201/301/401 (without hurdle and with hurdle) | 101/201/301/401 7m Front/back fall 10m |
| 9 | | | 104-204-304-404 | 520X-510X | 104-204-304-404 | 103-203-403-303 | 103-203-403-303 5m/7m 611-621 3m/5m 101/201/301/401 7m/10m |
| 10 | | | | | 10X-20X-30X-40X 5122-5221-5321 | 105-205-305-405 | 105-205-305-405 5m/7m 612-622 3m/5m 103-203-403-303 7m/10m |
| 11 | | | | | 51XX-52XX-53XX | 5132-5231-5331 10X-20X-30X-40X | 105-205-305-405 7m/10m 6XX 3m/5m 612-622 7m/10m 5122-5221-5321 3m 5132-5231-5331 3m/5m |
| 12 | | | | | | 51XX-52XX-53XX | 10X-20X-30X-40X 7m/10m 5132-5231-5331 7m-10m 51XX-52XX-53XX 3m/5m |
| 13 | | | | | | | 6XX 7m/10m 61XX-62XX 3m/5m 51XX-52XX-53XX 7m/10m |
| 14 | | | | | | | 61XX-62XX 7m/10m |



Rules for Implementing the Table of Steps to Return to Post Concussion Training

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- I. A complete rest period of 24-48h after the injury occurred is recommended. If symptoms are getting better after the initial rest period, the athlete can then start the Return-to-School Strategy while closely monitoring and keeping symptoms under control (activities should not bring on or worsen their symptoms). Once symptoms are under control, the athlete can start the Return-to-Diving Strategy.
- II. **Get the approval from the team physician (or other physician) before resuming training.**
- III. **Never start step #2 when there are still some symptoms, whatever they are.**
- IV. Monitor the athlete to make sure there is no recurrence of symptoms during movements/exercises and during the first 24hr following training.
- V. If during a step the athlete has symptoms that reoccur, he/she must stop training right away and rest for 24hr starting when symptoms will have disappeared. Then, he/she will be allowed to resume the protocol at the step prior to where symptoms occurred and go on when there are no symptoms.
- VI. In each step of the protocol, when starting new movements, only try to do 3 or 4 repetitions. We want a gradual exposure to increased stress on the brain. The items which were permitted in the prior step can be done without any restriction.
- VII. With children and youth/teenagers (<18 year old), the Return-to-School Strategy should be very gradual and may be longer (see **point 6a** of this document for recommendations) which means the period of time before going back to sport specific activities may be longer than with adults. Once the child is cleared to go back to physical activities, each step of the Return-to-Diving Strategy can last between 2 and 4 days, instead of 24h recommended for adults (at the physician's discretion). Children and teenagers should definitely not return to sport until they have successfully returned to school. Early introduction of symptom-limited physical activity is recommended.
- VIII. If an athlete suffers from a second or third concussion, return to diving using the protocol should be even more gradual than for a first concussion. Each step of the protocol should then last between 2 and 4 days, rather than 24 hrs.



The protocol to return to diving is not based on the difficulty of the dive itself. It is mostly based on the amount of stress put on the brain during the execution of the dive. Therefore, it is possible that during the protocol, some technically easier dives will be permitted later in the process even if they are more simple to execute. It is simply that the amount of stress put on the brain is greater or that the motor command in those dives (ex: arm stands) is more complex.

Glossary

| | |
|------------------------------------|---|
| <i>Warm-up</i> | The main goal is to increase the body temperature by doing exercise |
| <i>Fall</i> | No hurdle or no jump while entering water head first |
| <i>Head down position in water</i> | Full body immersion in the water with head facing down (the athlete must not dive to take that position, he/she must assume this position directly in the water) |
| <i>Hurdle/Approach</i> | Walk on the springboard/platform |
| <i>Simulations</i> | Sequence of diving motion on the floor (arm movement, opening...) with mental visualization |
| <i>Torpedo</i> | Full body immersion in the water. The athlete is then asked to push off the wall of the pool to propel himself/herself (on the stomach and back) |
| <i>Muscle training</i> | Muscle training will progress will taking exercise intensity, volume and complexity into consideration. For example, in step 3 of the protocol, the athlete can begin light muscle training. In that case, the weights must be adapted to limit intensity, volume and complexity of the effort. If one of these elements needs to be increased, we need to lessen the two others. So, if the complexity of the exercise increases, intensity and volume shall be decreased to compensate. |

