# Rest & Recovery

MOST OF US ASSOCIATE INCREASES IN TRAINING LOAD WITH INCREASES IN FITNESS LEVEL. WHAT WE OFTEN OVERLOOK IS THE FACT THAT THE *REAL* GAINS IN EXERCISE CAPACITY OCCUR WHEN THE BODY AND MUSCLES ARE AT REST. WHILE PRACTICE IS WHERE WE SEE *TIMES* IMPROVING, THE *UNDERLYING* ADAPTATIONS TO THIS TRAINING ACTUALLY OCCUR WHILE THE BODY RECOVERS FROM THIS WORKLOAD. SO, WHILE WORKOUT IS THE ALL-IMPORTANT *STIMULUS* THAT *INITIATES* THE ADAPTATION PROCESS, THE MAJORITY OF THE BODY'S "METABOLIC REBUILDING" OCCURS WHILE THE BODY IS AT REST (I.E. DURING RECOVERY). THIS TYPE OF ACTIVITY INCREASES THE BLOOD CIRCULATION AND REMOVES/UTILIZES METABOLITES FASTER THAN PASSIVE RECOVERY ALONE.

**This is why it is important for the athlete to understand it is just as important what you do outside of the pool as what you do in the pool!**

### Cool Down – Eat – Stretch – Massage – Sleep

These are the five key components to an optimal recovery that all water polo players should understand, believe in, and most importantly, *practice on a regular basis*.

## Cool Down and Recovery

Swimming at high intensities, such as during games and practice, can cause metabolites like inorganic phosphate, ADP, hydrogen ions, and of course, *lactate*, to accumulate in the muscles. A build-up of these metabolites is associated with conditions that can compromise your next athletic performance.

Cool down (active recovery) facilitates the removal/utilization of lactate after a match or work out. The *intensity* of the cool down influences how quickly this removal/utilization of lactate occurs. Too high an intensity may produce additional lactate, while too low an intensity may not create enough circulation to remove/utilize the lactate any faster than standing around would (passive recovery).

At games where a warm down pool is not available, water polo players should complete their active recovery on land. This should include active stretching, light jogging, arm rotations and/or other land-based exercises that engage the same muscle groups used during the activity. Even on land, this type of activity increases the blood circulation and removes/utilizes metabolites faster than passive recovery alone.

Finally, the recommended intensity and duration of a player's cool down depends on how much an individual swam, at what level of intensity, and when their next game/practice is. Players should ask their coach each day what the appropriate cool down for them is.

## Nutrition and Recovery

The primary fuel source for most swimmers during training is carbohydrate. During high intensity swimming, this carbohydrate comes from circulating blood sugar and glycogen, the storage form of carbohydrate. Over time, as glycogen is used, it must be replaced to avoid depletion. Should glycogen stores become low or depleted, circulating blood sugar shares the burden of supporting the demands of tough workouts and games with the body's last resort high-intensity fuel source, protein. Since this protein usually comes in the form of muscle protein, it is easy to see how long-term failure to replenish glycogen can lead to tissue breakdown. Combined with the tissue breakdown that is a normal result of hard exercise, it is also easy to see why poor nutritional recovery usually rears its ugly face in the form of feelings of "lead legs" during swim sets & fatigue during matches.

One of the key factors to keep in mind is that the "***window of opportunity***" for maximizing glycogen repletion starts to close as soon as exercise stops and lasts for about **two hours**. Therefore, the most effective ways to make the most of your recovery time and maximize the training adaptation are:

- Eat a substantial carbohydrate snack with some protein *immediately* after practice or within 20-30 min of finishing a workout. This can be as simple as a protein bar.
- Eat a main meal within 2 hours of finishing workout. Carbs / Protein important.
- During tournaments, eat a high-carb / moderate-protein snack *immediately* after your 1st game and *again* after your last.



# Rest & Recovery

Carbohydrates snacks include colorful fruits and juices, milks, yogurts, breads, cereals, etc…

Protein foods can be meat, peanut butter, milks, yogurt, cereals, veggies, etc…

### Nutrition and Recovery cont…

During its time off, the body will adapt, but only if provided with the *right fuels at the right times*. For many swimmers, ensuring good nutrition is like a *full-time eating job*! Not only is the goal to replenish glycogen, but also to ensure a high level of circulating protein, vitamins and minerals to combat tissue breakdown during subsequent workouts and recovery periods and maintain hydration to optimize metabolic efficiency (a fancy way of saying that water allows the body to access the nutrients it needs when it needs them).

### Stretching and Recovery

Stretching is a key component of the daily training plan for athletes. It plays an important role in the recovery process and in preparing for the next training session. Stretching increases blood flow to muscles, stimulates the passage of amino acids (building blocks of protein) into muscles, accelerates protein synthesis in cells, and inhibits protein breakdown. These processes help the muscle repair itself and improve the body's ability to recover in time for subsequent practices or competitions. Stretching as part of recovery can also reduce the chance of injury during subsequent workouts. Its effects on increasing flexibility and range of motion allow the arms and legs to move freely and unencumbered.

A few important reminders for stretching:

*Do* not bounce.
*Do* not stretch to the point of feeling pain. If you do, you may risk tearing a muscle.
*Do* not hold your breathe. Breathe freely and stay relaxed.

### Massage and Recovery

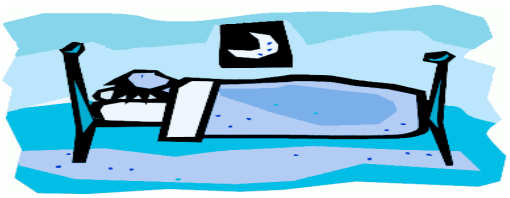
Many players face chronic muscle soreness, fatigue and tightness around peak training times and during multiple-day tournaments. Sports massage, which involves the rhythmic compression of muscle tissue, stimulates blood circulation during recovery. Similar to active recovery, the blood circulation can help cleanse the tissue of metabolic. Massage during recovery can also alleviate muscle tightness and induce mental relaxation.

The appropriate use of massage, both post-match and post practice can facilitate the overall recovery process and contribute to the prevention and management of overuse injuries.

### Sleep and Recovery

As mentioned previously, the majority of the body's muscle rebuilding occurs while the body is at rest. Therefore, in order to benefit the most from the work done during practice and to perform optimally, it is important for athletes to get sufficient sleep during their time away from the pool. Getting too little sleep can hinder recovery from exercise by impairing glucose metabolism, increasing cortisol levels (causing decreased tissue repair and growth), and compromising immune function. Not only is protein breakdown reduced during sleep, growth hormone is released during this time. Sleep also helps maintain optimal emotional and social function during the day.

An important point to keep in mind when it comes to sleep is that every athlete has a different optimal amount of sleep. **7 hours of sleep is the minimum** optimal for most teenagers, while 9 hours is optimal for others.



Workouts are hard. They're supposed to be. They're designed to tell the body, "This is hard work for me…you better do something to enable me to do it again later." And the body actually responds by becoming more efficient – aerobically and an-aerobically. During its time off, the body WILL adapt. But only if you give it the **proper rest and recovery fuels.**

