



Posttraining cool down (24 hours)

Overview

Post-training recovery strategies are required to reduce the risk of maladaptation to training (injury or overreaching) and to maximise optimal performance.

Fatigue following competition or training has many factors that recovery strategies require targeting such as dehydration, glycogen depletion, muscle damage and, let's not forget, mental fatigue.

So these can include nutritional intake, cold water immersion (CWI), sleeping, active recovery, stretching, compression garments, massage and even electrical stimulation (EMS). The most effective of these will always focus on hydration, diet and sleep.

Ultimately, time spent cooling down will aid footballers' performance by accelerating the recovery process.

Key thinking

Muscle damage is likely a major factor to consider when explaining post-training fatigue. During training players' drills usually mimic specific moments found during game play. If these drills are position-specific, although the session may be a small fraction of distance or time covered in the game, the player may have replicated (practised) specific key metrics as much or in some cases more than during actual game play.

The repetition of changes of direction, acceleration and deceleration throughout a training session may induce muscle damage.

As a result, this damage is characterised by muscle soreness, increased passive muscle stiffness, muscle swelling and a reduction in muscle force production.

When training and competing, there may be insufficient time for players to recover psychologically, possibly leading to lack of motivation and mental burnout. Travelling may lead to the disruption of circadian rhythms (jetlag, for instance, or arriving somewhere during the night) thereby increasing the level of stress induced by restricted motion, unfamiliar sleeping patterns and poorer quality of sleep.

Equipment required

The load and intensity of the training session determines the type of recovery protocol (passive, active or regenerative). For example high load intensity training will cause more muscle damage and deplete glycogen stores more than low intensity training. As a result a more active or regenerative recovery session may be required.

High, moderate and low intensity recovery options

It is important that the post-training recovery covers key elements and that the priority strategies are covered dependent on type/ intensity of training session.

This table (below right) outlines typical strategies during the recovery process (CWI – cold water immersion; EMS – electrical muscle stimulation):

Session type	High intensity/ Load	Moderate intensity/Load	Low intensity/ Load
Active recovery	✓	✓	✓
Diet	✓	✓	✓
Hydration	✓	✓	✓
CWI	✓		
Sleep	✓	✓	✓
Massage	✓	✓	
Compression wear	✓	✓	✓
EMS	✓		



KEY COOL DOWN PHASES

PHASE ONE (IMMEDIATE)

Active/passive recovery

Low intensity exercise allows the heart rate to slow down and the body to start cooling. This can be achieved by doing low intensity ball drills, or by jogging for 5-15mins (dependent on training intensity).

Even after a light training session, a cooling down process is essential.

PHASE TWO (IMMEDIATE)

Hydration

Players' body mass is taken prior to training and immediately afterwards. The difference in mass is then used to measure the appropriate amount of fluid the players should replace.

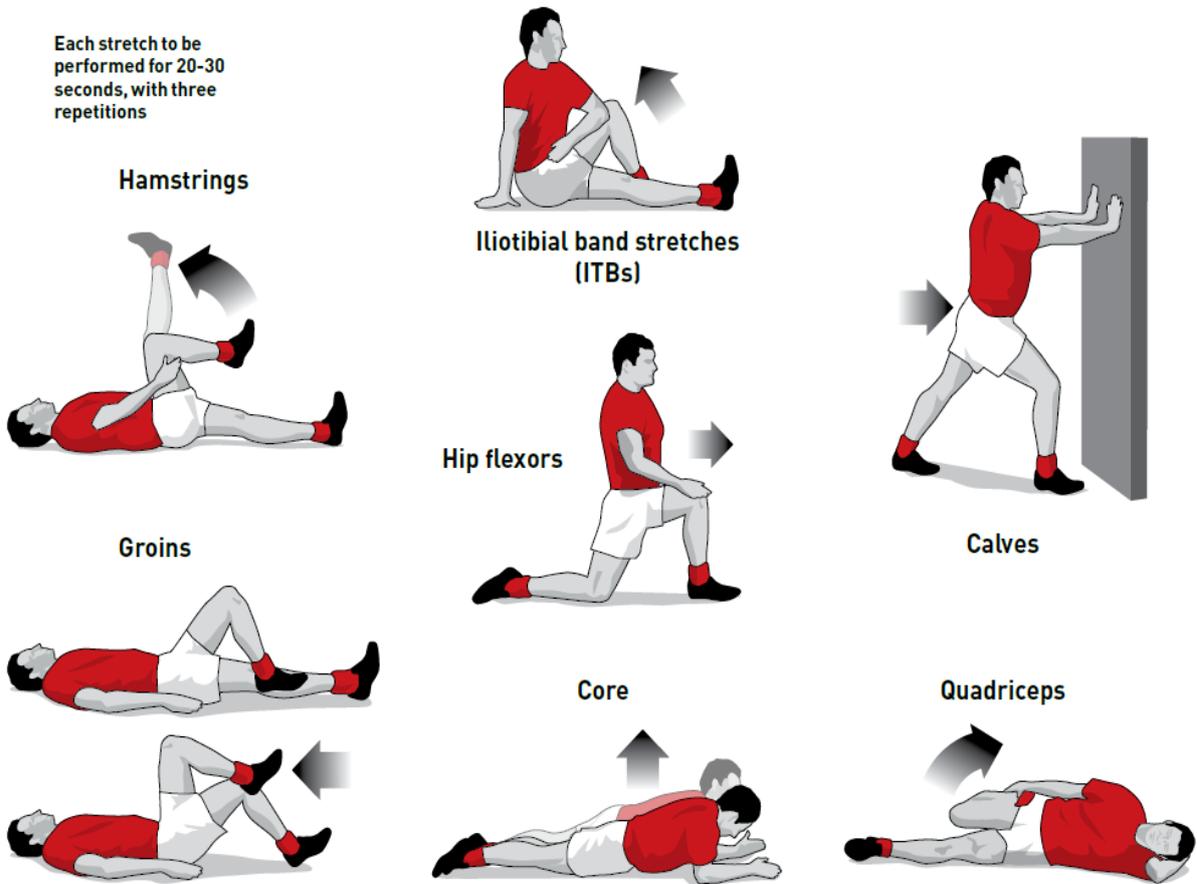
PHASE THREE (IMMEDIATE)

Static stretches

Each of the stretches shown are to be done with three repetitions, holding for between 20-30 seconds each.

Shaking limbs between each stretch promotes the return of blood to the heart if required, followed by passive recovery (foam rolling). During this time players are also encouraged to continue rehydrating.

Each stretch to be performed for 20-30 seconds, with three repetitions



PHASE FOUR
(UP TO TWO HOURS POST-EXERCISE)

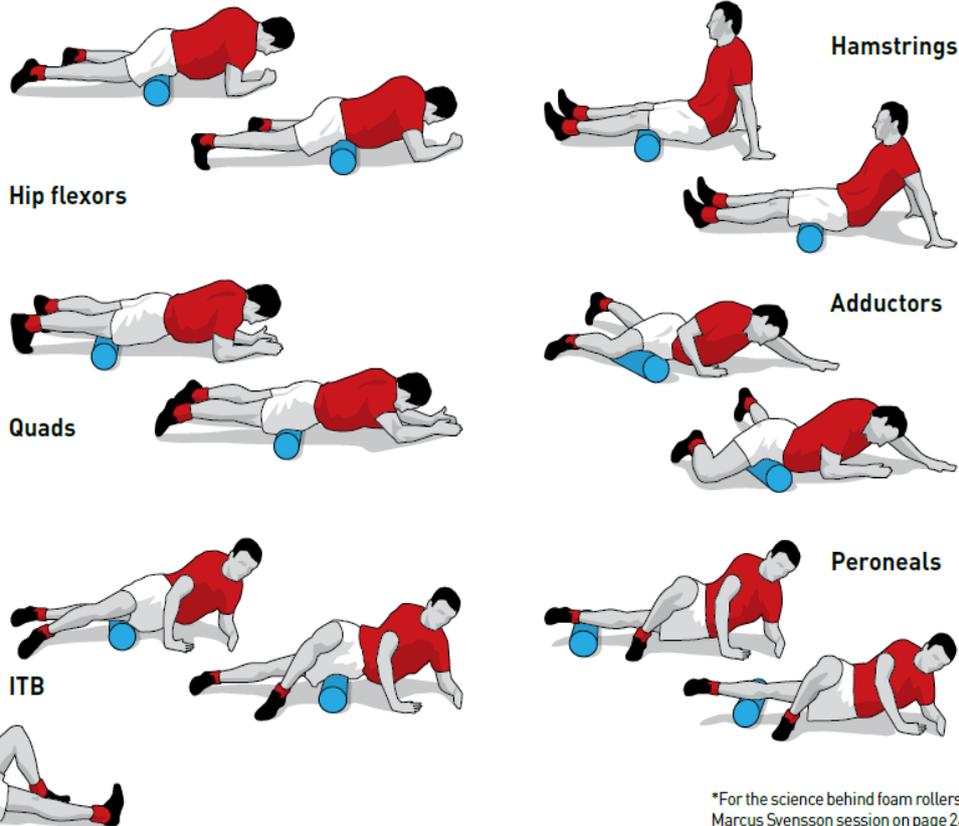
Restore and repair

It is important to promote muscle regeneration post-training and a recovery shake that contains at least 30g carbohydrate (CHO) and 15g protein (2:1) plus essential amino acids should be consumed within 30 minutes posttraining.

In addition, eating meals containing essential amino acids with a high leucine and unrefined CHO content within two hours of training appears effective. Adding green vegetables will also help bolster the immune system, while cold water immersion (CWI – which appears to minimise fatigue and accelerate postexercise recovery) and massage can help reduce muscle soreness.

It should be noted though, CWI has an analgesic effect and is recommended only after a high intensity or high load training (10-15 degrees for 5-10mins). Alcohol should be avoided as it delays the recovery process. Firstly, it acts as a diuretic, causing dehydration; and secondly it delays the ability of the muscles to recover.

Further recovery moves using a foam roller to be performed for 30-60 seconds, with three repetitions



*For the science behind foam rollers see Marcus Svensson session on page 24

PHASE FIVE (UP TO 24 HOURS POST-EXERCISE)

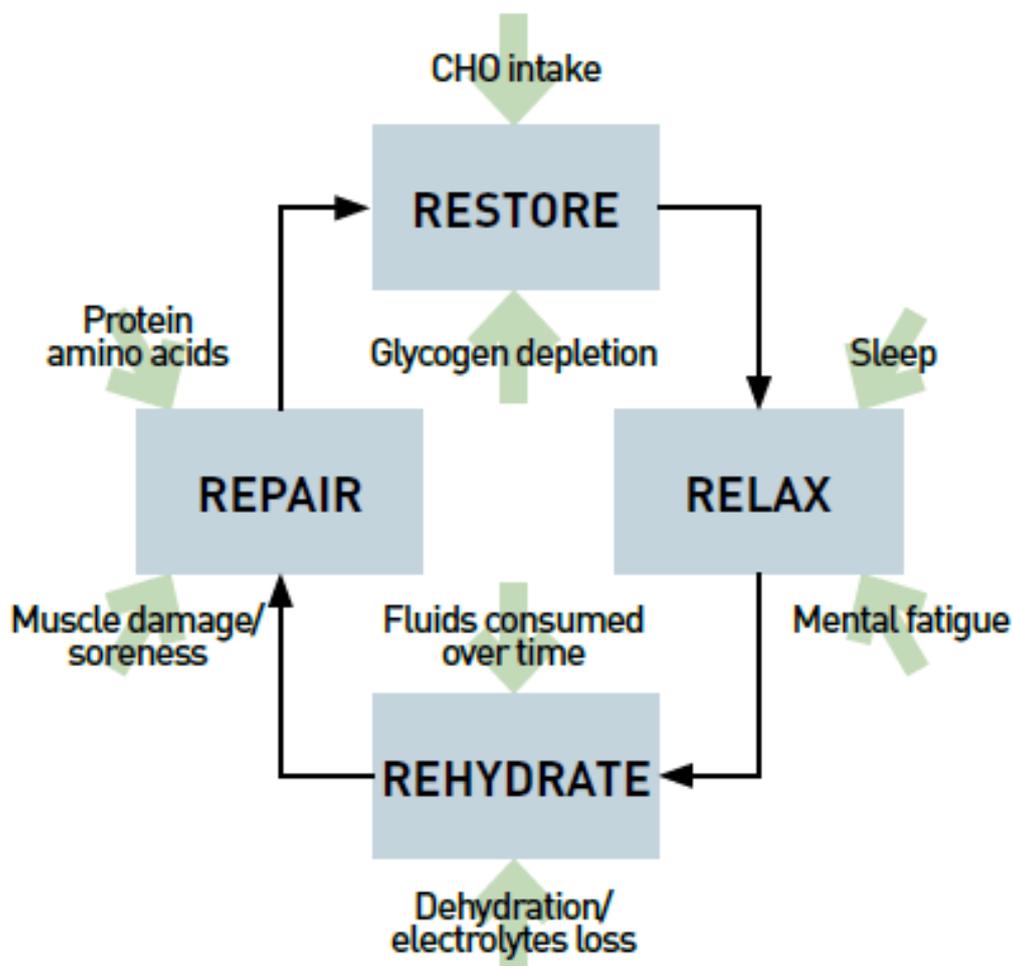
Relaxation

To accelerate the recovery process, sleep is essential. Lack of sleep has been associated with lower levels of endurance and maximal strength. I will always encourage players to try to create a relaxing bedtime environment (no caffeine, no computing or gaming before going to bed), with at least eight hours' sleep recommended.

Desired recovery

Daily training intensity and load will vary depending on fixtures, and this may affect recovery protocols and strategies. Education is key to optimal recovery and should be taken seriously, though in principle, the recovery strategy should:

- **REPAIR:** Promote muscle protein synthesis, and reduce muscle soreness
- **RESTORE:** Promote glycogen resynthesis
- **REHYDRATE:** Promote hydration
- **RELAX:** Facilitate mental recovery





Match day cool downs

A foundation plan for the week that follows

Overview

Utilising recovery strategies effectively can enhance a player's ability to participate in further training and increase physical readiness for fixtures.

Key thinking

It is vital that players are educated in the benefits of recovery, creating a culture where these strategies become a weekly process and routine. To follow the intensity of a match we must have a complete plan for the week ahead, and that recovery period begins as soon as the players leave the field. And that's not just to the benefit of the body, because psychological (as well as physiological) adaptations occur as a result of fatigue, and these must be managed on an individual basis.

Equipment required

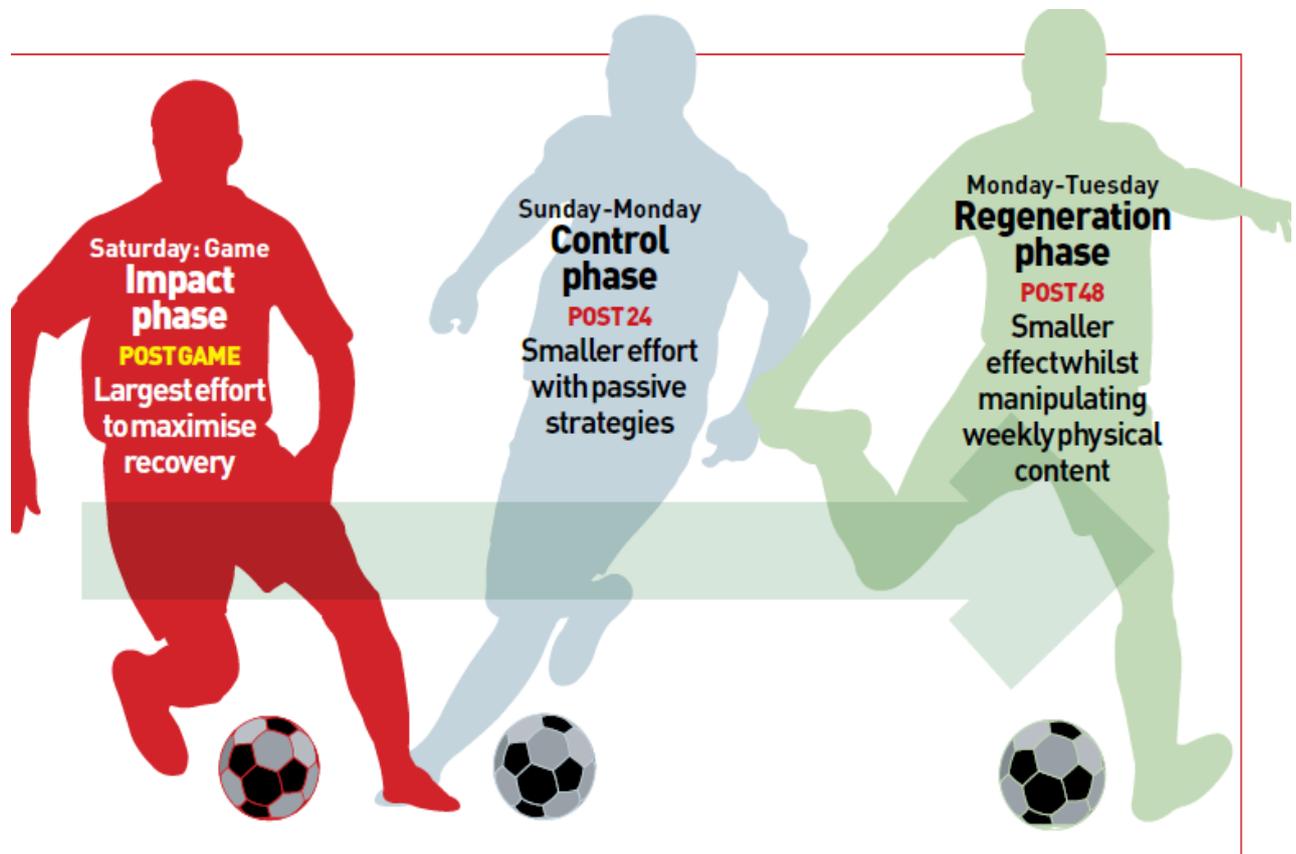
Two categories are used - active and passive recovery:

- Active recovery strategies are used when the players are performing an activity - including jogging, cycling, aquatherapy, mobility and foam rolling exercises.
- Passive recovery strategies are demonstrated when the players do not need to physically perform the activity. So this might include cold water immersion or ice baths, massage, compression garments and nutrition intake.

Recovery in three phases

The use of nutritional/recovery shakes is a great way to refuel when the team receives a post match de-brief, before moving onto the key forms of active recovery that develop over the next 48 hours and set the tone for the week leading up to the next game (if we have that long!).

To develop an operative recovery strategy, three progressive phases can be employed:



IMPACT PHASE

(0-24hrs)

This initial phase post-game is when the body is in shock. During this phase it is important to protect the body and utilise primary strategies to impact recovery. This phase is where the largest quantity of recovery and cool down methods are provided. Contained within this phase are four pillars that represent fundamental foundations for a cool down procedure.



PILLAR 1 REFUEL

Allow players to refuel using recovery shakes that contain high contents of carbohydrates and protein to replenish any lost nutrients and rebuild damaged muscles. Having basic nutritious foods available – such as fresh fruit to ensure a high intake of vitamins and minerals – is also imperative.

Time: Immediately post-match

PILLAR 2 MOBILITY AND RELEASE

Utilising masseurs to aid in reviving and 'flushing out' waste products from the muscles will aid in recovery. The use of foam rollers - where players actively look to apply pressure to the muscles to squeeze and mobilise the tissue - assists in the removal of lactic acid.*

Time: 5-10mins

PILLAR 3 STRETCHING

Players can be led through a routine of stretching - this can be conducted in the dressing room if space provides, or out on the field. This needs to encompass large movements that mobilise key joints and stretch key muscle groups. Providing a routine that players can relate to, understand and even learn, ensures consistency in the delivery of recovery.

Time: 4-8mins

PILLAR 4 CONTRAST BATHING

Players alternate between a hot shower for two minutes before spending one minute in waist deep icy water. This cycle can be repeated for as many as five hot and four cold exposures.

Maximum time: 14mins



CONTROL PHASE

(24-48hrs)

This phase utilises passive strategies where athletes control their own recovery. Within this phase we will recommend aqua jogging, swimming and the use of compression garments. Although a secondary stage, there are still a great number of important factors to consider, and a certain amount of empowerment is needed to ensure players use this time effectively.

REGENERATION PHASE

(48hrs onwards)

The smallest quantity of active or passive recovery methods are used in this phase, but it remains a key part of the process. Using a multidisciplinary approach, it is vital that certain physical content is manipulated, for example pitch dimensions, playing numbers, and intensities; with large-sided games for physical load and small-sided games for intensity.

Promoting individuality in cool down strategy

We know the key requirements of a cool down are to reduce muscle soreness and prepare players for forthcoming events.

However, a blanket approach is difficult to implement as individual players may require different means that specifically work for them.

When a player is substituted during a game his recovery needs to start from the moment he leaves the field, and that will begin with a recovery shake and some water. Having foam rollers available on the bench for players to release and stretch is effective, while some clubs use spin bikes on the touchline.

While there are only minor differences when it comes to substitutes – at the end of the game when the squad is re-fuelling, the substitutes may have moved on to contrast bathing – compared to those playing a full 90 minutes.

The cool down is the first step in preparing players for the next session, so having the ability to assess all factors and still provide an effective recovery strategy is an important players tool that can't be underestimated.

Advanced cool down techniques

Overview

As the modern game gets faster and more physically demanding, the importance of a proper recovery between training sessions and matches cannot be overstated. There is no better incentive to a player than being fresh and ready to perform the following day and not feeling the fatigue or 'heavy legs'.

In its simplest form the cool down can be performed at the end of a match on the pitch as stretch and mobility work, combined of course with appropriate nutritional intake (protein, carbohydrate, hydration).

Cold water immersion (ice bath)

Players would be immersed up to waist level in cold water (below 10 degrees Celsius) for up to 10 minutes.

Why an ice bath works:



When completing exercise, muscles, tendons, bones and nerves are all in a recovery state, but surrounded by lactic acid, one of the waste products of exercise. The effects of too much lactic acid are tiredness, achiness and fatigue. Taking an ice bath means blood vessels tighten and the blood supply moves away from the legs. When jumping out of the ice bath, new blood arrives, flushing away the lactic acid and invigorating the muscles with oxygen.

Roller form (foam roller)

This is effective in the fact that it promotes self-myofascial release, relieving muscle pains. Players can work the full body with the roller form and focus on especially tender areas, for example the IT-band and calves. If we're tight on space I might split the team into two groups, with one performing mobility and stretches, and the other using rollers.

Why a foam roller works:

When we exercise, micro-tears and swelling muscle fibres create knots, adhesions and scar tissue, which impinge on nerves and vessels.

The foam roller 'irons out' these irregularities, keeping muscle mass smooth by breaking it down and releasing trigger points. It also increases blood flow within the muscle.

A foam roller can be used before, during or after a session, and in a player's own time. It's a cost-effective and longlasting piece of training kit.

Process:



The tender muscle area must be pushing down, therefore use arms and body position as leverage points in order to let gravity push a sore area onto the roller.

When locating a tender spot, roll over and back to 'work' out the knots, rocking back and forth and tackling an area no more than an inch in length at a time. Concentrate on the tight areas for 30 seconds at a time in an overall workout of not more than 15 minutes, but repeat up to three times a day.