WARM UP AND COOL DOWN

**WARM-UP**

The objective of warming up is to prepare your body for the upcoming activity. During this time your heart rate increases to encourage blood flow to the muscles needed for exercise. These muscles are now able to loosen up and be used effectively. There are two types of warm ups, a general warm up and a sport specific warm up. What you do to warm up is dependent upon the physical demands of your activity and your sport.

***Did you know that before your activity you should…***

* Warm up muscles slowly by walking, jogging, and/or swimming for 10-15 minutes, try to choose exercises that keep the body upright to encourage full range of motion for the hips.
* Engage in dynamic type stretching (ballistic stretches for a short period of time) once the muscles are warm, make sure to stay controlled with these movements.
* Include the following upper and lower body movements:
o jumping jacks
o arm circles
o high knees
o scissor kicks
o carioca (slow then progress to faster)
* Practice sport specific movements such as your swing, stroke or shot to facilitate muscle preparation, this helps you feel what your body is preparing to do.
* Your warm up should NOT include static type stretching (holding the stretch for a long period of time), this type of stretching does not prepare the muscle for activity because it stretches it too much to be used effectively.
* NOTE:  Ballistic stretching shortens muscles, therefore appropriate maintenance or improvement of flexibility must be scheduled as a separate training session depending on the needs of the athlete.

**COOL-DOWN**

The objective of cooling down is to facilitate your body's recovery from the activity. During this time your heart rate decreases towards normal and blood flow to the muscle slows down. The muscles are now repairing to facilitate growth so you only require a certain amount of blood. A cool down is usually general with some emphasis on key muscle groups used during the athletic activity.

***Did you know that after your activity you should…***

* Keep your muscles active for 10-15 minutes using active rest such as slow walking, cycling etc. (many athletes ride the stationary bike post game/competition or practice).
* Engage in static type stretching (holding stretches for a long period of time) while the muscles are still warm, maintain good form throughout the stretch.
* Include the following upper and lower body stretches:
o chest stretch in doorway
o triceps stretch overheard
o quadriceps (front thigh) stretch standing up
o hamstring (back thigh) stretch lying down
o back stretch (twist) lying on side
* Partner assisted stretching (also known as PNF - Proprioceptive Neuromuscular Facilitation) is best done later to give the muscles and nervous system time to recover from activity.
* Schedule and engage in separate stretching sessions (that include both static and PNF stretching) for later in the day, it is best to take the time for this after a hot shower because the muscles are loose, relaxed, and warmed up ready to improve flexibility!

NOTE:  During high intensity training (high speed and/or power), maximum strength training, or plyometrics, muscle fibers will be damaged and need to repair during recovery. All these activities also tax your Central Nervous System (CNS). Depending on the intensity and the volume of these activities recovery might take several hours for your muscles, and 48-72 hours for your CNS.

Always include an adequate warm up and cool down to your exercise routine. Both give your body the chance to adapt to the next activity or rest period. Keep in mind the sport you are competing in to address specific areas during the warm up and cool down to encourage repair and growth. Remember the principle of starting general and working towards specific. Your body will appreciate you easing into it.

**Warm-up** is one of the most important elements of an exercise program. It is particularly important to help prevent injury. Warm-up is low-level activity, which should be completed prior to stretching and more strenuous exercise. The objective of the warm-up is to raise total body temperature and muscle temperature to prepare the entire body for vigorous activity. The warm-up period prepares the cardiovascular system, respiratory system, nervous system and the musculoskeletal system by gradually increasing the demand on those systems so that they are able to accommodate the demands of more strenuous activity.

A proper Warm-up serves to raise the body to a necessary work capacity.

**There are two types of Warm-Up:**
1. General
2. Sport Specific.

The purpose of the General Warm-up is to increase the functional potential of the body as a whole, whereas the purpose of the specific warm-up is to establish the optimal relationship between the forthcoming movements of the activity. The Sport Specific General Warm-up utilizes low intensity movements and exercises that actually involve the body parts that will be used in the subsequent activity. The General Warm-up is effective for raising core temperature and increasing blood circulation in order to raise both the general body and the deep muscle temperatures, which in turn help to heat up the muscles, ligaments and tendons in preparation for more vigorous activity. The way that we know we have done this is by breaking a sweat. Sweat is the mechanism our body uses to cool itself down. So if there is sweat we can assume that the core temperature has elevated.

The likelihood of injury is reduced. Athletic performance can be improved. The warm-up increases muscle efficiency, reduces potential for muscle pulls, improves reaction time and improves the speed of movement of muscled and ligaments. A proper general warm-up can also help reduce the severity of post-exercise muscle soreness. The higher temperatures and increased blood flow resulting from warm-up are important for delivery of oxygen to the muscles and for prevention of build-up of unwanted waste products which can lead to muscle soreness.

**Duration & Intensity of Warm-up**

It is difficult to recommend specific intensity and duration of warm-up for every person, but most research in this area suggests an increase in body and muscle temperature of approximately one to two degrees Fahrenheit to be adequate. A brisk 5-10 minute General Warm-up will generally produce sufficient results to prepare the body for more strenuous exercise. The duration and intensity of warm-up should be adjusted according to the environmental temperature and the amount of clothing worn. The higher the environmental temperature and the greater the amount of clothing, the sooner the desired body temperature is attained. It is also important to begin a major activity while still warmed-up. Ideally, the rest period should be more than a few minutes. In any case, no more than fifteen minutes should elapse. When the beneficial effect of warm-up has dissipated, the muscle temperature will have returned to pre-warm-up levels.

**Difference Between Warm-up & Stretch**

There is an important difference between warm-up and stretching. If one stretches the muscles without prior warm-up, the muscles are cold and are more prone to injury, such as muscle tear or strain. When you do use static stretches prior to any activity you do inadvertently warm the muscles up, but performing static stretches prior to explosive and strength activities can have the opposite effect on performance. Static stretching is telling your muscles it’s time to cool down, when we are actually trying to prepare muscle for strenuous activity. You want to get the heart pumping and increase blood flow to the muscles before stretching.

## THE WARM-UP

## Why warm up?

When commencing a bout of exercise your body needs to make a number of adjustments. These include:

* increasing your breathing and heart rate;
* increasing the energy-releasing reactions in the muscles; and
* increasing blood flow to the muscles to supply them with more oxygen and to remove waste products.

These adjustments do not occur straight away, but require a number of minutes to reach the necessary levels. So the purpose of a warm-up is to encourage these adjustments to occur gradually, by commencing your exercise session at an easy level and increasing the intensity gradually. If you were to start exercising at a strenuous level without a warm-up, your body would be ill-prepared for the higher demands being made of it, which may cause injury and unnecessary fatigue.

## What is a warm-up?

A warm-up usually takes the form of some gentle exercise that gradually increases in intensity.

## What does a warm-up do?

A pre-exercise warm-up does more than just make you warm, it:

* increases blood flow to the muscles, which enhances the delivery of oxygen and nutrients;
* warms your muscles, which promotes the energy-releasing reactions used during exercise and makes the muscles more supple;
* prepares your muscles for stretching;
* prepares your heart for an increase in activity;
* prepares you mentally for the upcoming exercise;
* primes your nerve-to-muscle pathways to be ready for exercise; and
* prevents unnecessary stress and fatigue being placed on your muscles and heart, which can occur if you exercise strenuously without a warm-up.

The warm-up is widely viewed as a simple measure to prepare your body for exercise of a moderate to high intensity, and is believed to help prevent injury during exercise. Although there is a lack of clear scientific evidence that warming up prevents injuries – due to ethical constraints of doing studies in which the design involves a potential increased risk of injury to some participants – anecdotal evidence and logic would suggest that a warm-up should reduce the risk and, at worst, not increase it.

## Ensuring an effective warm-up

To make your warm-up effective, you need to do movements that increase your heart rate and breathing, and slightly increase the temperature of your muscles. A good indication is warming up to the point where you have raised a light sweat.

If you’re exercising for general fitness, allow 5 to 10 minutes for your pre-exercise warm-up (or slightly longer in cold weather).

If you are exercising at a higher level than for general fitness, or have a particular sporting goal in mind, you may need a longer warm-up, and one that is designed specifically for your sport.

## Warm-up options

Follow these options in the order listed.

### 1. General warm-up

To begin your warm-up do 5 minutes of light (low intensity) physical activity such as walking, jogging on the spot or on a trampoline, or cycling. Pump your arms or make large but controlled circular movements with your arms to help warm the muscles of your upper body.

### 2. Sport-specific warm-up

One of the best ways to warm up is to perform the upcoming exercise at a slow pace. This will allow you to simulate at low intensity the movements you are about to perform at higher intensity during your chosen activity. Typical examples include steady jogging, cycling or swimming before progressing to a faster speed. This may then be followed by some sport-specific movements and activities, such as a few minutes of easy catching practice for cricketers or baseball players, going through the motion of bowling a ball for lawn bowlers, shoulder rolls, or side-stepping and slow-paced practice hits for tennis players. Sport-specific warm-ups are often designed by a qualified trainer in that sport.

### 3. Stretching

Any stretching is best performed after your muscles are warm, so only stretch after your general warm-up. Stretching muscles when they are cold and less pliable may lead to a tear. Stretching during a warm-up can include some slow, controlled circling movements at key joints, such as shoulder rolls, but the stretches should not be forced or done at a speed that may stretch the joint, muscles and tendons beyond their normal length.

Another component of stretching during a warm-up is ‘static stretching’ — where a muscle is gently stretched and held in the stretched position for 10-30 seconds. This is generally considered the safest method of stretching.

Perform a light static stretching routine at the end of your warm-up by stretching each of the muscle groups you will be using in your chosen activity. A static stretch should be held at the point where you can feel the stretch but do not experience any discomfort. If you feel discomfort, ease back on the stretch. Remember not to bounce when holding the stretch.

Studies comparing a warm-up that includes static stretching with a warm-up that does not include static stretching have shown that pre-exercise static stretching improves flexibility, but its effect on injury prevention remains unclear. Hence you may find it better to keep most of your static stretching for after your exercise session, that is, as part of your cool-down.

Apart from static stretching, other methods of stretching include ballistic, dynamic and PNF (proprioceptive neuromuscular facilitation) stretching, each of which is best done under instruction from a qualified fitness instructor or sports coach.

## THE COOL-DOWN

## Why cool down?

The practice of cooling down after exercise means slowing down your level of activity gradually. Cooling down:

* helps your heart rate and breathing to return towards resting levels gradually;
* helps avoid fainting or dizziness, which can result from blood pooling in the large muscles of the legs when vigorous activity is stopped suddenly;
* helps to remove metabolites (intermediate substances formed during metabolism) from your muscles, such as lactic acid, which can build up during vigorous activity (lactic acid is most effectively removed by gentle exercise rather than stopping suddenly); and
* helps prepare your muscles for the next exercise session, whether it’s the next day or in a few days’ time.

You may see conflicting advice as to whether cooling down prevents post-exercise muscle soreness, also known as delayed-onset muscle soreness (DOMS), which tends to occur after doing unfamiliar exercise or working at a harder level than usual. However, even if cooling down doesn’t prevent DOMS, the other benefits of cooling down mean that you should always make it a part of your exercise session.

DOMS is more common after unfamiliar exercise involving ‘eccentric’ muscle contractions, such as jogging downhill, or lowering weights, as the muscles are put under more stress than normal in these activities. However, such soreness usually only occurs in the first few sessions, since the muscles adapt, and with continued training should not occur.

## Ensuring an effective cool-down

For an effective cool-down:

* perform low intensity exercise for a minimum of 5 to 10 minutes; and
* follow this with a stretching routine.

## Cool-down options

### 1. Continuing your chosen exercise while gradually lowering its intensity

Gradually slowing down the pace and exertion of your activity over several minutes can seem a natural progression, as well as fulfilling the need to include a cool-down period at the end of your exercise.

### 2. Slow jogging, brisk walking or gentle cycling

Another option is to jog, walk briskly or cycle for a few minutes after your exercise, making sure that this activity is lower in intensity than the exercise you have just performed.

## Stretching as part of your cool-down

The best time to stretch is during your cool-down, as at this time your muscles are still warm and most likely to respond favourably, and there is a low risk of injury. Stretching helps to relax your muscles and restore them to their resting length, and improve flexibility (the range of movement about your joints).

As a guide, allow 10 minutes of post-exercise stretching for every one hour of exercise. Make these post-exercise stretches more thorough than your pre-exercise stretches. Ensure that you stretch all the major muscle groups that you have used during your exercise. Stretch each muscle group for 20 to 30 seconds, 2 to 3 times.