WARMING UP AND COOLING DOWN FOR EXERCISE

Online Training

THE WARM-UP

A warmup generally consists of a gradual increase in intensity in physical activity (a "pulse raiser"), joint mobility exercise, and stretching, followed by the activity. For example, before running or playing an intensive sport, athletes might slowly jog to warm their muscles and increase their heart rate. It is important that warmups be specific to the activity, so that the muscles to be used are activated.

The risks and benefits of combining stretching with warming up are disputable, although it is generally believed that warming up prepares the athlete both mentally and physically. In a meta-study of 32 high quality studies, about four-fifths of the studies showed improvements in performance.

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 several 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 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

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).

An effective warm-up has a few key elements or steps. These elements should all be working together to minimize the likelihood of sports injury from physical activity. The main purpose of warming up is to prepare the body and mind for more strenuous activity. One of the ways an effective warm-up achieves this is by helping to increase the body's core temperature, while also increasing the body's muscle temperature, helping to make the muscles loose, supple and pliable.

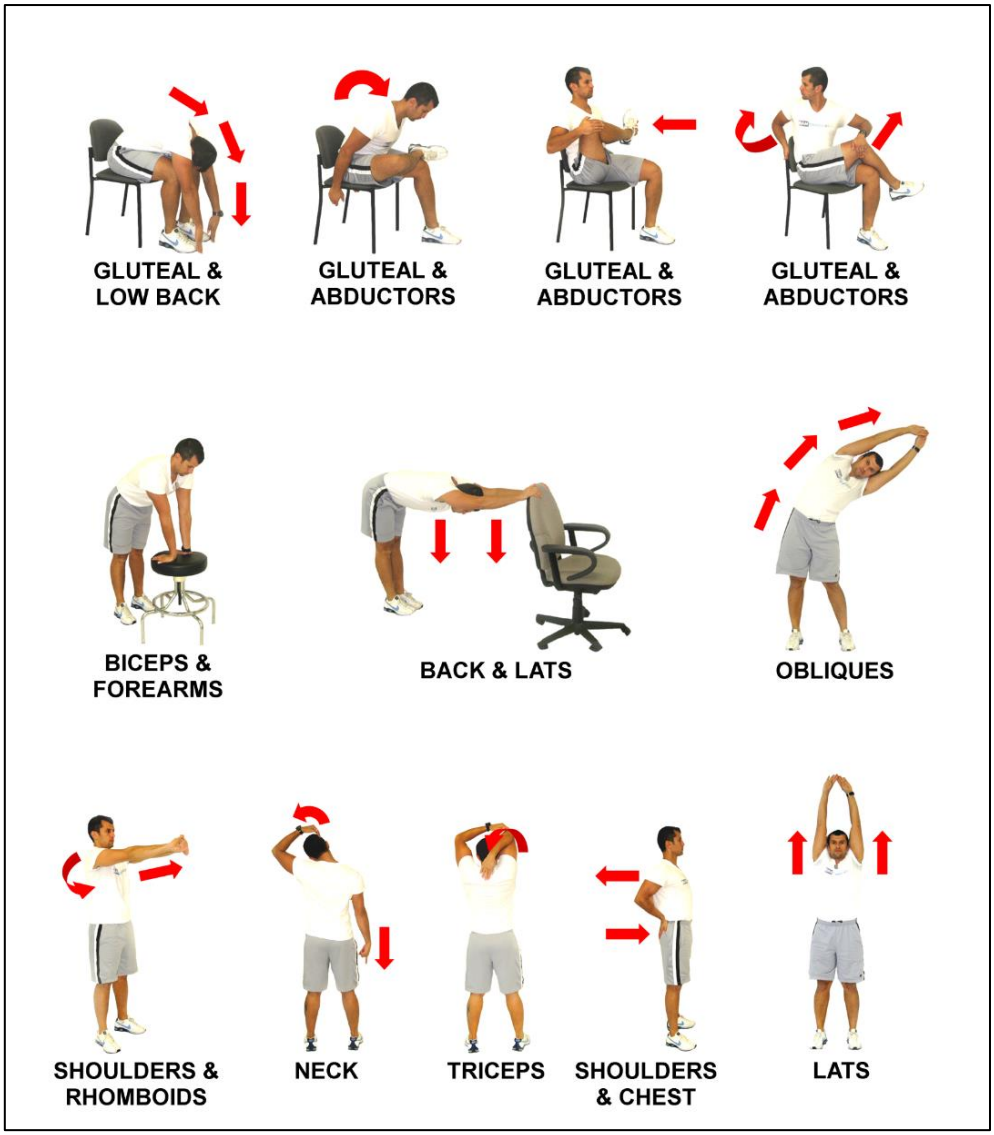
If you are exercising at a higher level than for general fitness, or have a particular sporting goal in mind, you may need a longer warm-up, and one that is designed specifically for your sport.

WARM-UP OPTIONS

Follow these options in the order listed.

1. General warm-up

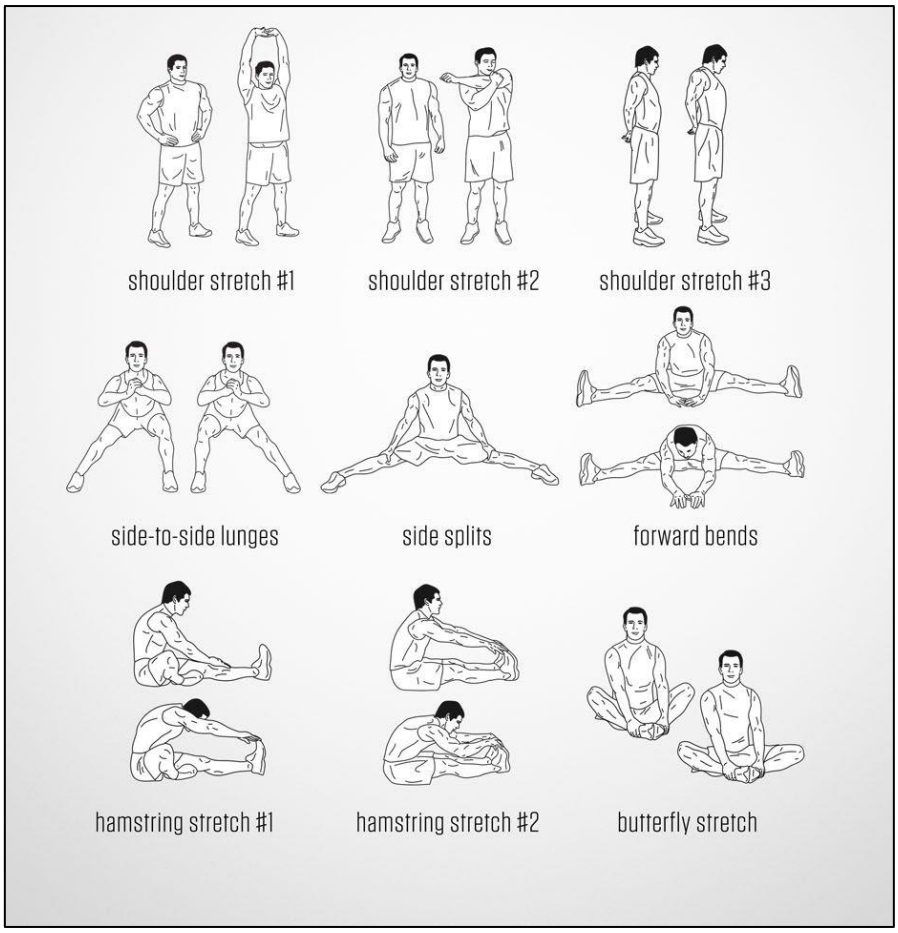
To begin your warm-up, do 5 minutes of light (low intensity) physical activity such as walking, jogging on the spot or on a trampoline, or cycling. Pump your arms or make large but controlled circular movements with your arms to help warm the muscles of your upper body.



Recommended Office Warm up

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.



Sport warm up

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

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.

PREVENTING INJURY

The most important reason for doing a warmup is to prevent injury during exercise; keeping the muscles warm will prevent acute injuries such as hamstring strains and will stave off overuse injuries by allowing the body to prepare steadily and safely. In more static sports, such as cricket, it is a good idea to stretch throughout the game as this will keep the muscles warm and allow them to function effectively; substitutes should also continue to run and stretch while they are waiting to join a game; this is commonly seen in football matches where the substitutes jog, jump and stretch along the side lines.

Likewise, The cool down is as instrumental to the prevention of injury as the warm up; stopping an activity without cooling down will contribute to a build-up of toxic substances and lactic acid which will cause muscular pain and stiffness the day after; this can restrict movement and be very painful. Blood which has been delivered to the muscles to facilitate quick contraction will also build up if a cool down is not completed; this is commonly known as blood pooling. It is also important to take on fluids and top up energy reserves with a carbohydrate-rich meal after exercise.