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CARDIOVASCULAR TRAINING

Introduction

Cardiovascular fitness can be defined simply as your body's ability to get oxygen and blood to the muscles. When you do physical activity and your pulse quickens and your breathing gets deeper, you are using your cardiovascular system.

There are a few simple guidelines you can follow when determining how much cardio work you should do.

Basically, it all comes down to your goals.

Trying to lose fat? you need to do more cardio than if you are trying to gain weight. For fat loss, three to five times per week at 20 to 40 minutes per session is plenty. Start conservatively if you are just starting training, e.g. three times per week, 20 minutes per session.

Trying to gain weight? you will find that goal easier to achieve if you don't do any cardio at all, though you will still maintain health benefits without much effect on your weight gain if you do light cardio work twice a week for 20 minutes.

Improving cardiovascular fitness in general? training three or four times per week for 20 to 40 minutes per session (depending on your current level of fitness) will yield good results.

Cardiovascular training, no matter what the exercise, is categorised based on duration and intensity. When you are choosing which type of cardio to do, keep your goals in mind.

- If your goal is to improve your general cardiovascular fitness, do moderate intensity work where you are starting to breathe deeply and you can feel that you are working..
- If your goal is fat loss but you're in poor shape, do low intensity, long duration work such as walking.
- If you want fat loss and you're in reasonably good cardiovascular shape, do the type that burns the most calories, i.e. High Intensity Training (explained in detail overleaf).

1. Low Intensity, Long Duration

- This type of training involves intensities of around 40 to 60% of Maximum Heart Rate (HR Max).
- It is basically something slow, easy, continuous and long (over 40 minutes). This can be walking, cycling, jogging, etc.
- You should be able to converse comfortably while doing it (called the talk test).
- This type of training is good for people just getting started with cardio work.
- It is reasonably good for fat loss, especially in very obese people.
- It is also the least demanding form of aerobic training.

2. Medium Intensity, Medium Duration

- This involves aerobic work done at around 70% of HR Max.
- It is harder, therefore it cannot be done for as long, usually between 20 to 40 minutes and is the next step up from the low intensity work.
- This type of training can be used for fat loss and for increasing aerobic capacity and is characterised by the beginning of heavy breathing but not so much that you are soon out of breath and must stop

3. High Intensity, Short Duration

- This version of aerobic work is done at around 80 to 85% of HR Max . That point, at 85% of your HR Max, is generally considered to be the upper level for effective fat loss, though this can vary depending on genetics and fitness level.
- This is a very demanding form of training and is done for between 5 to 20 minutes generally, depending on fitness level and intensity.

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FLEXIBILTY

Introduction

Life conspires to shorten our muscles. Every hour we spend sitting or driving, every mile we run, every weight we lift helps make certain muscles shorter. Unless we stretch these muscles to help them return to their original lengths, they stay shorter and tighter affecting posture, and can make it more difficult to perform simple, everyday tasks. Stretching effectively will increase your muscles' range of motion to improve performance in sport and exercise, help prevent injury and generally make life more comfortable for you.

As one muscle stretches, another contracts. If any muscle stretches too far, the body's stretch reflex kicks in and the muscle suddenly goes from a stretch to a contraction to avoid injury.

Say you fall asleep on a train, as your head nods forward, your neck muscles stretch suddenly, and then just as suddenly contract to pull your head back up.

In sport, you sometimes have too much momentum and the stretch reflex can't keep the muscle or its connective tissues from stretching too far. A strain, sprain or tear is the end result.

Accustom your muscles and connective tissues to stretching exercises, and increase range of motion in crucial joints, such as those in your hips, lower back and shoulders.

For more advanced trainers effective stretching can dramatically increase range of motion for sport and exercise.

When to Stretch?

The biggest myth about stretching is that it's a warm-up.

You shouldn't stretch until you're already warmed up, 5 minutes on a cross trainer will assist with the warm up prior to stretching.

A cold muscle is easily injured, so you don't want to stretch until you've already raised the temperature in your muscles by several degrees. Stretching after a workout, as part of your cool-down, is ideal. On the other hand, you don't need a warm-up if you just get up from your desk a few times a day and gently stretch out tight muscles.

How Often? At least three times a week.

How Long? 15 to 20 seconds per stretch.

Technique? To perform most stretching exercises, simply get into the position shown in the illustration, feel a gentle pull in the targeted muscles, and hold that position. Don't try to push or pull yourself into dramatically deeper stretches; that will simply activate the stretch reflex, and your muscles will contract while you're trying to stretch them. This produces muscle fatigue, if not injury. Your flexibility will improve over time without adding that extra, unproductive effort. Try to perform each stretch three times. You can do all of the stretches indicated in circuit fashion, one right after the other, and do three circuits. Or you can do each stretch three times before moving on to the next.

Progress? Increase each stretch to 25 to 30 seconds' duration.

You should use a stretching programme your entire life, and add other stretches you learn. But if you want to increase your strength and flexibility for sports performance, consult with a fitness instructor for information on dynamic stretching techniques.

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ENDURANCE TRAINING

Introduction

Continuous and interval training are great ways to improve your aerobic endurance. The following information will explain how often you should perform endurance training and at what intensity. Use the general guidelines to develop your own sport-specific continuous and interval training sessions.

Continuous Endurance Training

As its name suggests this type of endurance training involves exercising continuously. The intensity must be light enough to allow for a 30-45 minute duration without being so light that it fails to overload the cardio system.

As with any component of fitness you must first lay down the foundations on which to build more specific, more intense forms of endurance training.

Starting off with light, continuous type exercise is something most professional athletes do at the start of each season, before they begin interval training.

Continuous endurance training can take many forms, swimming, cycling, running etc or can be done by using the range of cardio equipment available in all of the fitness studios.

The intensity should be 75-80% maximum heart rate (See below for determining heart rate intensity)

If you don't have a heart rate monitor, stop a couple of times during the session, take your pulse for 10 seconds and multiply by 6. Better still use the "talk test" -- if you can just about hold a conversation while you exercise, then the intensity is about right.

Interval Endurance Training

Interval training is simply bouts of intense activity separated with short rest periods. Using this approach you can exercise at a higher intensity without fatiguing.

If you can run 2 miles continuously in 14 minutes by pushing yourself! Using interval training you can break the distance up into half-mile sections -- 4 in total. Generally you will be able to maintain a faster pace if you are only running half a mile so your target time could be 3 minutes for each half-mile section. Your interval training session will incorporate a walking or slow jogging phase after each half mile and when you complete the session you will have run 2 miles in 12 minutes, something you probably wouldn't have been able to achieve running continuously for 2 miles.

The intensity of interval training is higher -- around 85% maximum heart rate but resting between each repetition to allow your body to recover should take the form of active recovery, rather than standing still, walk or jog very slowly for up to a minute.

Determining Exercise Intensity For Endurance Training

Most coaches and athletes use heart rate because it is by far the most practical and easy to measure. In order for you to get the most out of your endurance training a heart rate monitor will be very useful.

If you are serious about training a heart rate monitor is one of the best investments you can make!

The first step you must take is to establish your maximum heart rate. *(see Fat Burning card)*

With both continuous and interval training your body will begin to adapt after several weeks. In order to continue exercising at 70% of your maximum heart rate, you must increase the exercise intensity (the speed you are running or cycling etc).

Another method to calculate your training threshold is the Karvonen equation. It's a bit more complicated but offers a more specific training zone. The equation takes into account your working heart rate (calculated as the difference between maximum heart rate and resting heart rate).

To calculate a training zone at 70% for a 40 year old with a resting heart rate of 70 bpm.

Target HR zone = (Maximum HR - Resting HR) x 70% + Resting HR

220 - Age = (180 - 70) x 0.7 + 70

(example 40 years) = 77 + 70

= 147bpm

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FAT BURNING

Introduction

It is likely that what you want to achieve is to lose body fat and improve your overall body composition. If we could identify the exercise intensity which evokes the highest rate of fat burning, then we could selectively carry out workouts at this intensity and make dramatic improvements to our bodies. The reality is very different. The following provides information to assist you with the types of cardio training which will assist you to work towards your goals. It is based on achieving an increase in your heart and breathing rate during workouts.

Maximum Heart Rate

- Your maximum heart rate (Max HR) is the theoretical number of beats per minute that your heart is capable of producing. This is simply an estimation, not an absolute limit.
- This is found by subtracting your age from 220, e.g. if you're 40 years old, 220 - 40 = 180 Max HR.
- To measure aerobic exercise intensity, percentage of Max HR (%Max HR) is often used. If you want to exercise at 60% of your Max HR, your heart rate should be, using the example above, around 108 beats per minute.
- Your heart rate is your guide for cardiovascular exercise intensity.

Target Heart Rate

Your Target Heart Rate is the range of heart beats per minute at which you should work at in order to best achieve aerobic fitness. This range is typically between 60% to 80% of your Max HR. The bottom end of the scale is best for low intensity training while the top end is for high intensity training.

Finding Your Heart Rate

- The first position to locate your heart rate is on the inside of the wrist below your thumb. Use your forefinger and middle finger to feel the pulse The second site is on the carotid artery on the neck (either side). Place your fingers on the side of your windpipe, just below the jaw. Count the beats for 10 seconds then multiply by six to get beats per minute.
- An electronic heart rate monitor that is strapped to your chest or on a watch can also be used to keep track of your heart rate (the chest strap style is usually more accurate, being much closer to your heart).

Low Intensity Sessions to Burn Fat

Research has suggested that when you cycle, swim, row or run at a modest intensity of only about 69% MHR, fat provides about 50% of the calories you need to keep going for the first hour or so. If you keep going after that, fat becomes even more generous, providing around 70% of the total energy after two hours and 80% or more if your work duration exceeds three hours.If you increase the intensity then the Fat contribution decreases - at 80% Max HR fat provides 33% of the energy.

Higher Intensity Sessions

The implication from this research is that if you wish to burn maximum amounts of fat then you should train in the 69 % Max HR window. The reality is that if you train at higher intensities you can burn just as much fat. If you cycle along at 80 % Max HR, fat would provide 33% of the required calories. Thus, the slower workout sounds better from the fat breakdown perspective - or does it?

A moderately fit person exercising at 69% Max HR generally consumes about 220 calories during a 30 minute workout. If the same athlete works out at 80%, 330 calories are burned during the same period. Of course, 50% of 220 calories and 33% of 330 calories yield an identical number of calories coming from fat - 110. High intensity training will also boost your metabolism long after the workout is done. This does not happen with low intensity training. High Intensity training is a powerful fat loss tool, but should only be used by trainers who already have a good level of fitness.

Effective way to lose fat

It is likely that you will be time constrained to some degree and won't have hours to spend on low intensity sessions. When time is limited, there is little reason to train in the lower HR zone. If your overall goal is to get leaner, the bottom line is that calorie burning is the best way to achieve it. The most effective way to lose body fat is to burn slightly more calories than you take in, and to continue this over an extended period of time.

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STRENGTH TRAINING

Introduction

Strength training can be very demanding if you have any concerns regarding your physical ability to undertake a programme of strength training please consult with your GP prior to commencing.

How Do You Get Started?

1. Remember to warm up. Warming up will give your body a chance to actually warm the muscles and lubricate the joints of those areas about to be exercised.
2. Remember to stretch this will increase and maintain muscle flexibility.
3. When you are starting an exercise program keep it light. Work on technique and slowly work up to heavier weights.
4. Maintain good technique through the complete range of motion, move slowly and with control, breathe, and maintain a neutral spine. Never sacrifice technique just to add more weight or repetitions.
5. The intensity of your workout will depend on the number of sets and repetitions, the overall weight lifted, and the rest between sets. You can vary the intensity of your workout to fit your activity level and goals.
6. Listen to your body. Heart rate is not a good way to determine your intensity when lifting weights, it is important to listen to your body based on an overall sense of feeling of exertion.
7. The minimum amount of strength training recommended is eight to twelve repetitions of eight to ten exercises, at a moderate intensity, two days a week. You will get more overall gains with more days per week, sets and resistance, but the progression is one in which you must listen to your body.
8. Strength training session are recommended to last up to one hour.
9. As a general rule, each muscle that you train should be rested one to two days before being exercised further in order for the fatigued muscles to rebuild.
10. "No pain, no gain." This statement is not only false, but can be dangerous. Your body will adapt to strength training, and will reduce in body soreness each time you workout.

Strength Training Principles:

1. **Overload:** To see gains in strength you must always stimulate the muscle more than it is accustomed to.
2. **Progression:** The active muscle must continue to work against a gradually increasing resistance in order to meet overload.
3. **Specificity:** Gains you receive are dependent on the muscle group used, and movement pattern performed.
   - Strength (maximal force): If you are interested in strength gains you want to train with higher weights and closer to your 1 RM i.e. the weight you can lift only once before the muscle is fatigued.
   - Endurance (a force that is repeated): If you are interested in gains in endurance, you should concentrate on lifting lower weights and higher repetitions.
4. **Arrangement:**
   - *Warm-up* - the warm-up should be "sport specific". In other words, if you are performing the bench press, begin your warm-up with a light intensity and perform 8-10 reps.
   - *Stretch* - it is important to stretch to promote increased blood flow to the muscles, and to increase flexibility, range of motion and decrease the risk of injury.
   - *Workout* - work larger muscle groups first, then smaller muscle groups.
   - *Cool-down* - keeps the body active and prevents pooling of blood in the extremities. The cool-down is done at a lower intensity.
5. **Breathing**: When lifting weight or working muscles against resistance, exhale through the mouth as you are performing the work. Caution: Failure to breathe correctly during heavy weight lifting may cause drastic increases in blood pressure that may be harmful.

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SHOULDERS AND ARMS

SHOULDER PRESS
Military press (using the front handles) will work the front and outer deltoids (shoulder) and the triceps (rear of upper arm).

TIP
To prevent strain on lower back, keep back against back rest at all times by using foot rest.

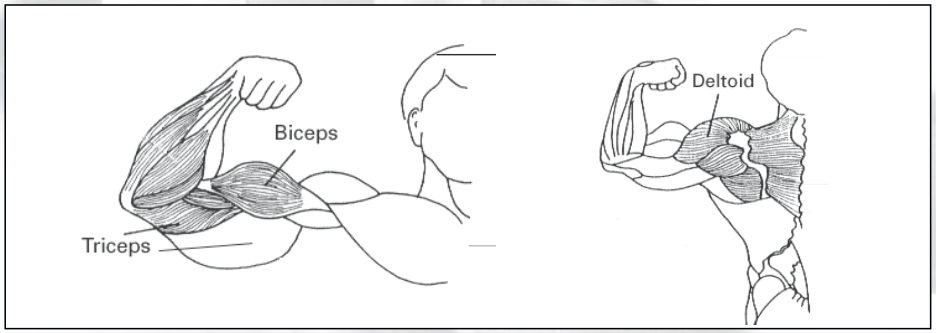
SHOULDER PRESS
Behind the neck press (using rear handles) will work front and rear deltoids (shoulder), trapezius (upper back and neck) supraspinatus (upper back), pectoralis (chest), serratus anterior (outer and upper rib cage and triceps (back of upper arm).

TIP
This is a tough exercise to control so use a light weight when first learning the movement. Make sure the neck and shoulders are warmed up fully before beginning this exercise.

SHOULDER SHRUGS
Shoulder shrugs will work the trapizius (neck and upper back), levitor scapulae (beneath the trapizius) and the rhomboids (upper back).

TIP
This exercise can be performed with dumbbells or using the chest press machine (flat). Concentrate on lifting and lowering the weight at the same rate.

LEVEL	PER WEEK	SETS	REPS	REST
Beginner	3	1 - 3	10 - 15	30 - 60 secs
Intermediate	2	2 - 4	8 - 12	60 - 120 secs
Advanced	2	3 - 5	6 - 8	90 - 240 secs



TRICEPS PUSH-DOWNS
All round exercise for all three heads of the triceps (back of the upper arm). Use the lat pull-down machine with the rope attachment.

TIP
Push down with only your arms-don't bring your upper body into play. To prevent elbow injury, dont forcefully extend your elbow at the bottom of the extension.

STANDING TRICEPS CURL
Two handed grip on the end of a dumbbell gives more control and is safer.
This exercise will work the triceps (rear of upper arm)

TIP
Doing this exercise sitting down will keep you more stable and helps reduce the risk of strains. Don't swing dumbbell above head, keep very strict movement.

PREACHER CURL
This exercise will work the biceps (front of upper arm), because it keeps the upper arm stabilized it provides maximum stress, making each rep more efficient.

TIP
Keep elbows and upper arms in contact with platform. Keep wrists straight to prevent unnecessary stress on the joint. Don't overextend the arms at the bottom of the curl, this could cause injury to the elbow joint.

INCLINED DUMBBELL CURL
The reclined position places a lot of stress on the biceps (front of upper arm) and the supinator (near elbow) muscles. The bench provides good support and you are less likely to strain a back muscle than when standing.

TIP
To increase difficulty, rotate your wrist at the top of the lift so your palms turn outward. Keep the weight under control and don't allow to swing.

LEVEL	PER WEEK	SETS	REPS	REST
Beginner	3	1 - 3	10 - 15	30 - 60 secs
Intermediate	2	2 - 4	8 - 12	60 - 120 secs
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ABDOMINALS

CRUNCHES

Safer than the sit-up, the crunch involves curling your torso into your body, the exercise will work Rectus Abdominis (upper and lower abdominals) and Obliques (side).

TIP

Bending the knees will pull your lower back to the floor. Avoid pulling on your head, put hands to the side of head.

RAISED LEG CRUNCH

Lie on you back with your feet up on a bench or chair. This exercise will work on the upper abdominals (top four of the six-pack) upper abdominals are usually the first to develop fully.

TIP

Keep legs at a 90 degree angle, reducing the angle will reduce the effectiveness of the exercise.

OBLIQUE CRUNCHES

Side crunches work the external and internal obliques (side). Strong obliques thin the waist making you look good but can add power to your golf swing for example.

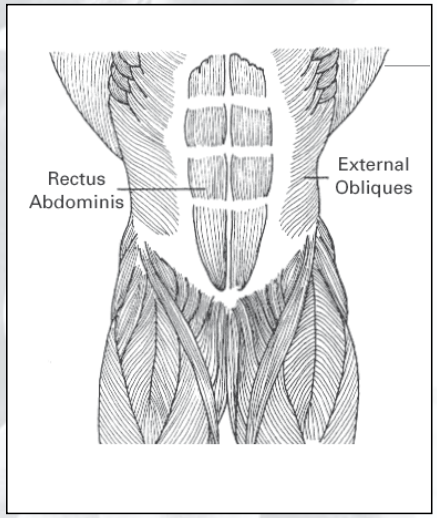
TIP

To increase difficulty, hold each crunch at the top for a count of two. Avoid pulling your head with your hands.

CYCLE

Sit on the floor with your knees bent 90 degrees and feet just off the floor. Place your hands behind your head. Bring your left elbow toward your bent right knee, keeping your left leg extended as if you were cycling lying down, repeat other side. This exercise will work upper, lower and side abdominals.

LEVEL	PER WEEK	SETS	REPS	REST
Beginner	3	1 - 3	10 - 15	30 - 60 secs
Intermediate	3	2 - 4	10 - 15	60 - 120 secs
Advanced	3	3 - 5	15 - 20	90 - 240 secs



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LEGS

LEG PRESS

Leg press is a good alternative for squats, the exercise will work the hamstrings (back thigh), quadriceps (front thigh) and hip flexor (front hip) muscles.

TIP

Toes at top of plate will place more stress on the hamstrings and hip flexors. Heals at bottom of plate will place more stress on the quadriceps.

LEG EXTENSIONS

Leg extensions strengthen and condition the quadriceps (front of thigh)muscles and the ligaments and tendons of the knee, good for rehabilitation and recommended for sports in which knee injuries are common.

TIP

Maintain a constant speed during the exercise. Turning your toes out will work more of the inner quadriceps. Turning your toes in will work more on the outer quadriceps.

LEG CURL

Leg curls will work the hamstrings (back of thigh), hamstrings are difficult to work, which explains why they are prone to pulls and strains.

TIP

Turning your toes out will work more of the outer thighs area of the hamstring. Turning your toes in will work more of the inner thighs area of the hamstring.

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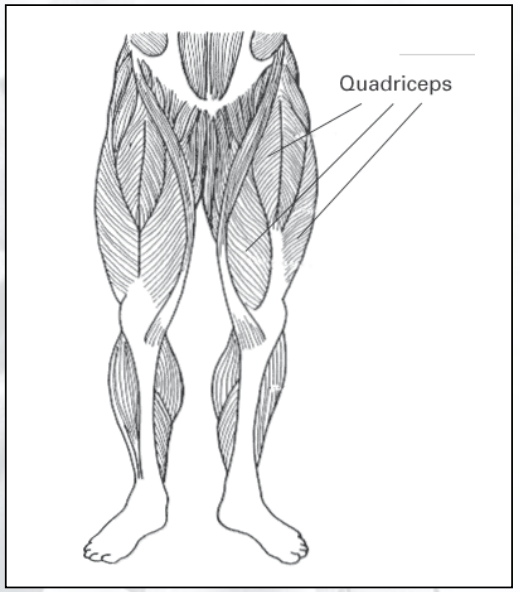

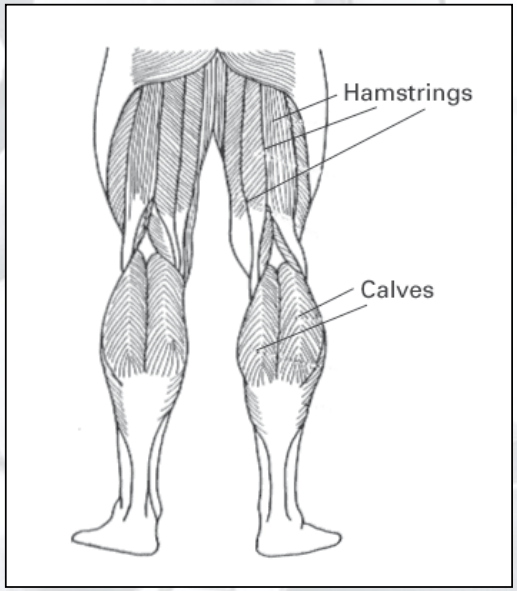

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CHEST AND BACK

FLAT BENCH PRESS

Of all the chest exercises ,the bench press is probably the most widely used. It works the pectoralis (chest), deltoids (shoulder) and triceps (back of upper arm) muscles.

TIPS

Wide grip will work more of the outer and upper chest.

INCLINE BENCH PRESS

This exercise helps build the upper and outer pectoralis (chest) and shoulders. It also works the serratus anterior (outer and upper rib cage).

TIPS

Very good exercise for the Female trainer.
Keep back flat against the bench at all times.
Keep elbows pointing out.

SEATED BENCH PRESS

Similar exercise to the Flat/Incline but a more comfortable position. It works the pectoralis (chest), deltoids (shoulder) and triceps (back of upper arm).

TIPS

Wide grip will work more of the chest.
Neutral grip will work more of shoulders and triceps.

PEC DECK

Best exercise for developing the middle of the pectoralis major muscles, (inner chest) also works deltoids (shoulders) and serratus anterior (outer and upper rib cage).

TIPS

Focus on the elbows meeting in the middle.

LEVEL	PER WEEK	SETS	REPS	REST
Beginner	3	1 - 3	10 - 15	30 - 60 secs
Intermediate	2	2 - 4	8 - 12	60 - 120 secs
Advanced	2	3 - 5	6 - 8	90 - 240 secs

LAT PULL-DOWNS

This exercise will work the hole back. It primarily works the latissimus dorsi (mid and lower back), terres major (below shoulder blade), rumboids (upper back) and the biceps (front of upper arm).

TIPS

Don't let your upper body move forward as you lower the bar. Can be pulled down behind the head onto the top of the shoulders or to the front if more comfortable and easier to control.

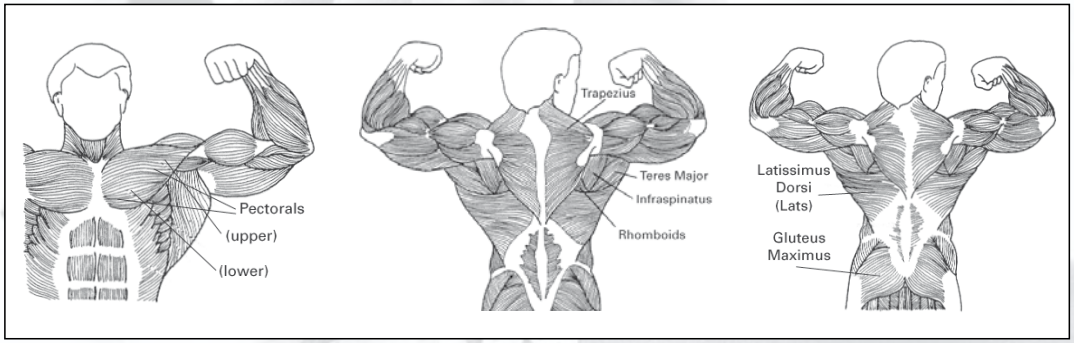
ASSISTED CHINS

This exercise looks easy, but it requires you to raise your entire body weight. It works all the major upper body and mid body muscles, including those in the back, chest and arms.

TIPS

The more weight used, the easier the exercise, find the correct weight so you can raise and lower under control. Increase difficulty by using a wider grip.

LEVEL	PER WEEK	SETS	REPS	REST
Beginner	3	1 - 3	10 - 15	30 - 60 secs
Intermediate	2	2 - 4	8 - 12	60 - 120 secs
Advanced	2	3 - 5	6 - 8	90 - 240 secs



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WARM UP AND COOL DOWN

Introduction

Time spent on warming up and cooling down will improve your level of performance and accelerate your recovery process before you train or compete again. As a result the warm up and cool down is an essential part of both the training session and any competitive sports you undertake.

Warm Up

Muscle stiffness is thought to be directly related to muscle injury and therefore your warm up should be aimed at reducing muscle stiffness. Warming up should at least consist of the following:

- 5 to 10 minutes jogging/cross trainer - to increase body temperature
- 10 to 15 minutes of stretching exercises- reduce muscle stiffness
- What are the benefits of a warm up? Your performance may be improved as an appropriate and effective warm up will result in an increased speed of contraction and relaxation of warmed muscles and ultimately a reduction in muscle stiffness following any period of activity including a training session or participation in sports.

Cool Down

Your cooling down routine should consist of low intensity exercises and could incorporate the following types of activity:

- 5 to 10 minutes jogging/walking to decrease body temperature and remove waste products from the working muscles
- 5 to 10 minutes stretching exercises to decrease body temperature, remove waste products from the working muscles and to increase range of movement.

What are the benefits of a cool down? An appropriate cool down will aid in the dissipation of waste products and reduce the chances of dizziness or fainting following a period of high intensity physical activity.

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