

68 Vigorous bouncing whilst stretching is not a good idea. This creates small tears in the muscle and tendon every hour. It's a position they don't get into very often. We sit in a car, at a desk or in front of the TV most of the time, so get into a habit of doing a simple stretch a few times a day, EVERY day.

69 Stretch your arms above your head and interlock your fingers with your palms towards the ceiling. Do this problems stated above. This is called passive stretching. Never go beyond the limit

66 Stretching using a partner to push the limit beyond its normal limits can lead to the

65 Stretching is really an activity to prepare the muscles for the range of movement they are about to be put through. Joints can become over flexible and liable to injury if consistently stretched too far. Intensive stretching in young gymnasts has led to injuries and joint problems in later life.

64 Warm up should be just that, enough exercise to get your muscles, tendons, ligaments and joints warm. It should prepare your body for the main activity. Your tissue is more elastic when warm and this means safer and more effective stretching. Always jog or bike ride for 5-10 minutes before stretching.

Stretching

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62 Sit ups with straight legs and leg raises put a lot of strain on the lower back and can aggravate back back injuries or weak backs. The majority of the movement comes from the ilio Psoas muscle, which attaches the front of your lumbar spine to the inside of your upper thighbone (Femur). When doing leg raises you can feel your lower back being forced to arch as it carries the weight of your legs.

61 Press ups are a great all round exercise and not just for the arms. The abdominals also get a good workout and just about every muscle in the body is involved.

60 Warm down thoroughly to offset Delayed Onset Muscle Soreness (DOMS). It happens 24-48 hrs after heavy exercise. Untrained people are more susceptible. It is caused by structural damage in the muscle, or is chemia at a microscopic level. Ten to fifteen minutes jogging and a good massage are recommended.

59 Reduce your load of training in the run up to a big event, but keep the QUALITY of training high. This is called "Tapering down" and it helps you to peak for a competition. In the last few days prior to competition do very little, if anything at all. This allows the body to recover and be at it's strongest. When you train every day or twice a day, the body is in constant state of breakdown and repair.

58 Peaking is when the athlete plans their training to give them their best performance at a particular time of the year. It is different for a team sport because they need to function at their best for the whole season and there are many different factors involved.

57 Keep your stamina and endurance levels high. It lasts longer than strength, but is less easy to build up the older you get. The motto is, keep it up throughout your life!

56 Do you keep your eye on the ball at point of impact? Highspeed photography has shown that cricket players have their eyes closed when they hit the ball. Baseball players actually start their swing to hit the ball before it leaves the hand of the pitcher, because it travels at such a speed that they'd miss if they started their movement any later. At that point the movement has already been initiated and is impossible to correct.

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81 Ideally drink 8 glasses of water a day? This really depends on how hot or cold the climate is and your body temperature by sweating and radiation.

80 Look after your skin, it is the largest organ in your body! It protects you from dirt, it's waterproof, and controls object of sweating. Heat exhaustion and dehydration can be a real possibility in this scenario.

79 Don't wear garments that are designed to keep you warm and dry for running in warm/hot weather. They are designed to keep you dry by wicking away the moisture from your body, which defeats the purpose of sweating. Heat exhaustion and dehydration can be a real possibility in this scenario.

78 Lack of proper hydration causes the greatest drop-off in performance. Once you are thirsty you are already dehydrated to some extent.

77 Sweating is one way your body loses water. Your body sweats to cool you down by making your skin wet, and it is the subsequent evaporation of the sweat that has the cooling effect.

Hydration & Temperature

76 Interpreting information that your body receives is the most critical factor in your level of stress i.e. how you think! A busy day may worry you to death because you don't know how to fit it all in, or it could make you happy because there is nothing you like better than to be occupied. It all depends on how you talk to yourself. The great thing is, you can change the way you think!

75 Stress according to the psychologist Selye is the "nonspecific physical response of the body to any demands made upon it". These demands can be physical or mental, initiated by yourself or the environment. Physical manifestations of stress can be anything from weight loss to shrinkage of the lymphatic system and gastrointestinal ulcers.

74 Exercise is a great stress reliever, and it can cause stress as well! Being obsessed with exercise to the point where you HAVE to do your session, no matter how little time your already busy schedule leaves you is a recipe for disaster. You will not die any younger, or become monstrously obese, just because you miss a session. Be flexible with yourself, otherwise you just have another source of stress!

73 Mental rehearsal is a vital part of sports performance

72 Focus on the end result and what you want to achieve. You must have clearly defined goals otherwise you may give up. Your attitude largely depends on your results.

Mental Training

71 Tense the already stretched muscle. Do this at about 20% intensity for 68 seconds, then relax and feel the muscle's resistance fade, allowing you to stretch further.

70 Slow steady stretches defeat the Inverse Stretch Reflex and allow the muscle to relax so you can safely expand the stretch. You need to hold it for 30-60 seconds. You should never be in pain doing a stretch, just at a point of tension!

69 Training the Inverse Stretch Reflex can enhance explosive power. It is the reason why you can jump higher after jumping off a bench onto the ground, than you can from a standing position. It is called Plyometrics.

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67 Kicks out!

66 tissue leaving you more prone to injury. When a muscle is stretched suddenly, it has a reflex action that makes it contract, called the Inverse Stretch Reflex. When a doctor bangs your knee with a hammer, it momentarily stretches the tendon below the Patella (kneecap) and the muscles react by contracting and that is why your leg kicks out!

how active you are. Drink the amount that feels comfortable. A better indicator is that your urine should be clear. In very hot, dry climates you may need to drink as much as 10 litres a day, or more.

82 Drinking water means just that, not tea, coffee, concentrated fruit juices, squashes or worst of all soft drinks. All these make your system work harder and do not cleanse you. Investing in a water purifier is one of the best things you can do.

83 Drink a glass of water when you feel hungry in between meals, instead of eating chocolate. We often confuse thirst with hunger.

84 Isotonic drinks have actually been shown by studies to be absorbed faster than water and have a more beneficial effect because of the carbohydrate it delivers to the body, it therefore helps to speed your recovery. To be really effective the carbohydrate content should be no more than 8%. To make an isotonic drink just add a little salt to a normal dilute orange squash.

Injury Prevention & Treatment

85 Get old or niggling injuries seen to and sorted out. They will either get worse or cause a secondary injury.

86 Increase your training gradually, by not more than ten per cent a week.

87 Get coaching for your sport. Poor technique is the source of many injuries.

88 Pain means STOP! Pain is a warning mechanism in our bodies, like a light coming on the dashboard of the car, indicating low oil, if you carry on the car will grind to a halt, and so will you!

89 Always warm up before an activity. The older and less active you get the more important this becomes.

90 Ice it! This is your first course of action for any soft tissue injury that isn't an open wound. Never put the ice medium directly onto skin, wrap it in a towel or something similar. For pulls, strains and sprains apply ice as soon as possible and keep it on for 10-15 mins or as long as is comfortable. Repeat every hour for the first 24 hours. Ice reduces swelling and bruising by contracting the blood vessels in the area. Get your injury diagnosed by a Doctor who has some sporting knowledge.

91 Use ice and compression bandaging to restrict the amount of swelling, caused by oedema, the fluid that collects under the skin to cool an area of trauma. If this is not restricted, it can settle in the tissues and become a bit like glue, making it difficult to regain full movement, especially if it is a joint.

92 Start to put some heat on the injured area after 24 hours of cold treatment. Heat dilates the blood vessels and encourages blood and all the nutrients that it carries to circulate the damaged area, accelerating the healing process. You can combine hot and cold for a while to discourage swelling recurring.

93 Elevation of an injured limb helps stop pooling of blood and fluids.

94 Rest when you are injured! It is the only way your body can recover properly. On the day that you feel ready to exercise again, leave it one more day before starting again.

95 When you start to exercise again, do so slowly and gradually build up day by day. Unless you have had specialist treatment, your muscles will have weakened whilst resting from your sport.

96 Use strapping to protect your injury from further damage and to give it support.

97 Get a regular massage. It is an excellent rehabilitation treatment after soft tissue injuries. It removes waste from the muscle and clears adhesions from the individual fibres. It also encourages the flow of blood and nutrients at the cellular level, aiding the recuperative process.

98 Use Ultrasound to speed up the healing process. It needs to be used 23 times per week, but is well worth it if time is of the essence. It can also make scar tissue more pliable.

99 stretch as soon as it is comfortable after injury. It stops the muscle losing too much of it's flexibility.

100 Reeducate your proprioceptors. These sensors tell the muscle when they have reached the limit of their safe movement. After injury one of the functions of rehabilitation exercises is to reeducate the proprioceptors about the proper range of movement that particular muscle or joint should be used for.

Eating

1. Eat what you are! You are approximately 70% water, so guess what your diet should consist of? Seventy percent water rich foods. Fresh fruit and vegetables are water rich foods. They break down quickly and are easily absorbed by the body.

2. Training hard requires plenty of calories (preferably carbohydrate). You need the energy. If you don't eat enough you will start training on depleted reserves, the result being that you start to feel tired and exhausted.

3. A modern "balanced diet" does not give us anywhere near the amount of vitamins and minerals we need. Fruits and vegetables are stored for long periods, losing their vitamin and mineral content. The soil is over farmed and lacking in minerals, so if it's not in the soil it can't be in the vegetables! Most fruits and vegetables are also carpeted in pesticides.

4. Vitamins and minerals can only be properly absorbed by the body when they are in the correct ratios to each other and in the right bio available form. For example, Calcium cannot be properly absorbed without Magnesium, Silicon, Boron and vitamin D being present.

5. Protect yourself with antioxidants, a vital part of diet. They counteract free radicals produced by biochemical reactions in the body, and (amongst others) pollution, radiation, sunlight, fried and burnt foods. Free radicals damage cells and are the cause of many chronic degenerative diseases. Vitamin C is a potent antioxidant.

6. Look for supplements with optimum amounts, these are much higher than the Recommended Daily Allowance, which is the amount just high enough to stop you getting a disease! Optimum levels of nutrition are clinical levels used by researchers. For example a study in 1996 looking into vitamin E supplementation and it's effect on coronary artery disease used over 400mg a day. The RDA is 10mg!

7. Eat unsaturated fats (olive oil, seeds, nuts, fish) rather than saturated fats (meat & dairy). Omega 3 oils are essential for certain functions and are especially important for the skin and brain.

8. Avoid sugar. Refined sugar is in virtually every prepared food you buy. Cut down! Use raw cane sugar or a good quality honey instead. A study conducted in 1981 amongst imprisoned juveniles over a 7 month period eliminated almost all sugar from one group. The result an average 50% drop in serious misbehaviour incidents and an 80% drop in continually trouble prone juveniles.

9. Eat less protein. Mother's milk contains 1.2 -1.6% about the same as fruit and that's for a growing baby! Most people eat far too much. Excess protein is stored as fat. Too much red meat leaches calcium from your bones.

Breathing & moving

10. Breathe deeply every day. Use this ratio; inhale for a count of 1, hold for 4, and exhale . and repeat ten times. This gets your lymph system going which drains all the toxins out of your body, and ensures that you use your lungs properly at least once a day! Do three times a day for best results. Breathe from your stomach push it out as you breathe in.

11. Cells that are starved of oxygen in laboratory conditions die or start to mutate. Studies where mutated cells have been put back into rats caused cancer.

12. Breathe when you do weights or callisthenics, it makes a huge difference! You'll be amazed to find how often you start to hold your breath when you concentrate on this.

13. Movement is a key to health. The human body is designed to move. In the current western society we move less on a daily basis than at any other time in history. We sit at home, in the car, and in the office. Is it any wonder that joint problems are on the increase? You need to use the full range of movement in your joints, on a regular

Energy Systems I

28. Movement is dictated by the co-ordination of muscles and nerves. The time it takes for a nerve impulse to leave the brain and reach the muscles to be moved is called Reaction Time. The speed with which someone can move that muscle(s) or limb is called Movement Time.

29. Movement requires energy fuel. Fuel can be provided for the muscles with or without using oxygen. Anaerobic exercise is done without oxygen. Aerobic exercise means oxygen is being used to supply the energy.

30. Train longer by doing less! Anaerobic exercise has two fuel sources; there is a certain amount of energy stored in the muscles that can sustain an all out effort for 5-10 seconds. Longer all out efforts produce lactic acid as a waste product, this lowers the pH of your cells and your muscles start to seize up (cramp). This allows you about one minute of all out effort. Try doing more work by keeping your sets shorter and avoiding a lactic acid buildup.

31. Aerobic exercise is done at a slow steady pace allowing the air you breathe in to meet the body's demand.

32. Understand the role each energy cycle has in your particular sport, then you can work out a training programme which addresses all areas in the right proportions. (Aerobic and 2 anaerobic phases).

33. Strengthen your heart and your muscles. There is no point in having a strong heart if all your other muscles are under developed and can't maintain proper posture.

Your Heart

34. Understand your heart rate. Children have high heart rates, 70-130 beats per minute (b.p.m.) as they grow it becomes lower. As people get into old age it starts to go up again. An adult's HR can vary greatly. Marathon runners and the like have a resting HR around 40 b.p.m. It is also affected by time of day, whether you are lying down, sitting, standing, your emotional state, and what you have just been doing.

35. Take your pulse at the same time, in the same position, every day e.g. after you wake up in bed in the morning. This will give you an accurate indication of heart rate over time.

36. Find out how fit you are. A basic fitness test is to take your HR lying down (after a few minutes relaxation) and then stand up and take it. The greater the difference, the worse shape you are in!

37. Maximum heart rate for a fit healthy adult in their twenties is from 170-190 beats per minute.

38. Talking to the pulse when the heart is really racing is difficult, so use a stopwatch and measure the time it takes to count 10 beats. Compile a reference chart to convert this into beats per minute. When you count 10 beats you are less likely to make a mistake.

39. Recovery is a good indication of fitness. The less time it takes the fitter you are! Take your pulse every 30 seconds for 5 minutes after exercise and make a comparison over weeks or months. Weight & Resistance Training

Weights & Resistance training

40. Use weights for strength or for stamina. Doing 6-10 reps over 3 sets, using weights at 60% of your maximum for one rep, will give you strength increases. Using weights at approximately 30% of your maximum for 1 to 20 reps over three or more sets will have a stamina building effect. Then increase the load as your muscles adapt.

41. Don't lose your strength. It is gained and lost very quickly. Significant strength losses can

happen. Look what happens to tools with moving parts that aren't used for long periods of time.

14. Poor posture accounts for many degenerative diseases, including wear & tear in joints and muscles. Your joints should be in line and form right angles in the body. Your shoulders should be directly over the hips, which should be directly over the knees etc. The lifestyle we lead these days coaxes our body out of alignment from an early age. This is why sports people are suffering more injuries. It is not due to the pressure of competing.

15. Be active. You have 206 bones and most of them need regular movement. The Chinese do Tai Chi every morning, look how sprightly the elderly ones are. This is one way of getting quality movement every day.

16. Any time you begin a new fitness programme, start slowly and build up gradually. Give your body time to adapt.

Muscle

17. Muscle is good! It gives you shape, and it holds your bones in position. Your posture is dictated by how well your muscles are functioning.

18. Exercise to keep good muscle mass in later life. Muscle releases Glutamine which plays an important part in the immune system.

19. Burn fat by keeping good muscle mass. Muscle needs energy. This burns more calories giving you a faster metabolism.

20. Don't do crash diets that cause a lot of fast weight loss. They are unhealthy, and can initially result in the fat cells being replaced with water, making you heavier! Water is heavier than fat.

Aerobics

21. Jog thirty to forty minutes at a steady rate at least once a week if you are training for a power-based sport. Aerobic activity is vital to good health.

22. Feel refreshed after aerobic activity. It should increase your energy levels! If it doesn't, your pace is too high. Aerobic exercise strengthens the heart, increases its ability to pump more blood with each beat, so making it more efficient. This means that when at rest, it beats much slower than it normally would.

23. Run or jog at a steady pace for at least 20 mins, building to 30-45 mins to get a good aerobic workout. In fact a brisk one hour walk will actually be better for you than a twenty minute run! Do this 2-3 times per week, minimum.

24. Increase the size and strength of your arteries, capillaries, veins and the size and efficiency of your lungs with aerobic exercise. It also increases the oxygen (O₂) carrying capacity of the blood, so you increase your body's capacity to bring in oxygen and deliver it to the cells where it is combined with nutrients to produce energy.

25. Make your blood vessels more pliable and less resistant to blood flow with aerobic exercise. That means it will reduce blood pressure. It boosts fat metabolism, improves digestion, and sleep.

26. Exercise aerobically. Your aerobic rate is 70% of your maximum heart rate.

27. Jogging or steady running is the best exercise. It exercises the heart, uses a large muscle mass and is a weight bearing exercise which keeps the bones strong. Swimming is OK but doesn't stress your skeleton which you should be doing to maintain good joints.

be seen in just 2 to 3 weeks of inactivity. If you have devoted a substantial part of your year-round training to building up strength, keep at least one strength session a week as your training changes, or you will lose it.

42. Muscles contract in two ways; concentrically (getting shorter) or eccentrically (lengthening). You can handle more weight with eccentric contractions, for example when lowering the bar during a biceps curl.

43. Free weights require the participation of more muscle groups and develop greater co-ordination than fixed weight stations.

44. Always lift weights with a straight back. Keep your head up and focus on a point level with your eyes. Use your legs to take the weight instead of your back.

45. Strength and muscle mass can be gained in significant amounts by those well into their seventies, similar to the strength gain experienced by people 50 years younger!

46. Resistance training can be done in two ways, (a) by contracting the muscle through a range of movement, which is called ISOTONIC exercise, or (b) by contracting the muscle(s) against a fixed resistance, so there is no muscle/joint movement. This is called ISOMETRIC exercise.

47. Isometric exercise actually produces greater muscle mass gain but not necessarily as much strength as isotonic exercises. The muscle is only being exercised at one particular angle of its full range, and therefore could be quite weak in the rest of its movement.

48. Start with aerobics if you are not in the best of health, and remember that isometric exercises produce a higher blood pressure than other forms of exercise.

49. Incorporate strength gains with training in the field so that your body can coordinate the new strength into the movements required for your sport or event. Actions that the body undertakes whilst doing a sport are much faster than you can do with weights in the gym.

Performance

50. Train at the speed & intensity needed in competition. For example, running for 45 minutes 3 times a week will not prepare you for a 400m track race lasting 50 seconds, unless you want to run it really slowly!

51. Flat out? If your competitive event means you have to compete flat out, then guess what? A lot of your training will need to be done flat out, not all of it, but most of it.

52. Pushing your body to the limits, whatever the sport, means you need rest. If you are able to train every day then you need to complete a less intense session, or involve a different muscle group the next day. Muscles need time to recover. Exercise breaks your muscles down, if they don't get time to rebuild they are in a weakened state and prone to injury.

53. Co-ordination is a vital part of movement often overlooked. This can also be thought of as your skill level. This needs to be trained. Incorporate some complicated movements into your exercises. Astride jumps on a bench or star jumps are good examples.

54. Using your eyes improves your balance! That's why weight lifters stare directly ahead at a fixed point, it helps them balance with a huge weight over their heads. If you move a cardboard wall towards a standing baby, the baby will fall over. We use sight as a major part of balance.

55. Feedback from the body. We have sensors in our body, called proprioceptors. The proprioceptors in our muscles are called spindles. They constantly feedback information to our brain about the position of our limbs and what our muscles are doing.