

Introduction

I am doing a training programme for tennis. It will be 8 weeks long, training 3-5 times a week. One of my goals will be to improve endurance; this is so I can last a whole tennis match without becoming too tired. The types of training I will use to help achieve my goals:

- 1: To improve endurance throughout a tennis match.
- 2: To improve strength in my legs around the court.

Are for 1.: -

- Cardiovascular endurance training
- Continuous training

I have already tested my endurance with a bleep test where I achieved a level 8. By the 1st of October I would like to take the bleep test again and achieve a level 9. My pulse count at rest is 102 bpm, after jogging for 30 seconds it is __ bpm then it takes __ seconds to go back to normal resting time. This is a simple test I will do on the 1st of October to see if my recovery rate has improved, because this will show how fit I am.

My second goal is to improve the strength in my legs around the court. The types of training I will use to help achieve this goal will be:

- Plyometrics training
- Strength Training

I have tested this with the vertical jump, where I jumped __ cm. By the 1st of October I would like to increase this by at least 10cm.

The principles of fitness are as follows:

- **Specificity** - related to this tennis-training programme I would be specifically trying to improve the strength in my legs by running.
- **Progression** - For tennis I would slowly increase the training I would also increase the intensity of training I put on myself when doing the training.
- **Overload** - to progress you need to overload in training, I would e.g. jump on the spot 20 times in one minute, and the next time that I did this I would do the same amount of jumps in 50 seconds, then maybe next time I would do 25 jumps in 50 seconds so I am progressing the strength in my legs needed for playing a tennis match.
- **Reversibility** - I would make sure to train at least three times a week because fitness can be reversed easier than it can be gained, and in tennis you need to keep up your level of fitness for a long match with high intensity of play.
- **Testing** - I will test with vertical jump and multi-stage fitness test because this will test the strength in my legs that a tennis match needs along with the endurance that is needed as a vital component to making a good tennis player.

The main fitness components required for tennis are: -

- **Endurance** - is the ability to keep going with a movement or activity for as long as

- *Strength* – **static strength** – the greatest amount of force that can be applied to an immovable object, **explosive strength** – this is the strength that is used explosively in one short sharp movement, **dynamic strength** – this is the strength someone needs to support their body weight over a long period of time, or type of force they're able to apply against an object.
 - Agility – How quickly you can change direction
 - Flexibility (suppleness) – Is the range of movement at and around a joint.
 - Speed – **reaction time** – how quickly a performer can react to something, **movement time** – how quickly a performer can actually carry out a movement.
- I am trying to improve my endurance and strength in a tennis match. This doesn't mean that I only consider these aspects in my programme though. It is important for me to consider other aspects of fitness, but I am recognising that strength and endurance are factors that need to be improved and have identified them as my weak points.

My Endurance needs to be improved, because a tennis match can last for hours and stamina is needed to keep standard of play up to your opponents level, and if the match is lasting a long time usually it would mean players abilities are nearly equal and endurance can be the only difference between the players. In this case the player with more stamina wins because his/her endurance has meant that he/she can easily reach shots compared to someone with little stamina who is out of breath and finds it hard to keep to the pace of the match.

I have identified strength as a fitness component I need to improve as during a tennis match your legs are being used the whole time. You are always running around exerting the muscles to carrying your body weight for a long time. This means that your quadriceps, hamstrings and calf muscles need to be strong for as long as you need them to be, so also be strong for the time of a tennis match. This is mainly dynamic strength.

Profile

Age: 15

Gender: Female

Weight: 8st 10lb

Height: 5ft 6in.

Enjoyment: Tennis, swimming, jogging.

Total amount of training a week: 7 hours 20 mins

Health Problems: none

Injuries: None

Current level of health: Good level of health, no illnesses

Training at the moment:

- Tennis 3.30- 4.30 after school Wednesdays – 40 mins of play
- Rounders 3.30-4.30 after school Thursday- 40 mins of play

- Usually a match once a week or more, lasting a minimum of an hour.

Current level of Fitness: Exercise regularly, generally fit, slightly over weight.

Bleep test – good, I attained a level 8,7 which I was pleased with because it showed I was relatively fit, although there is room for improvement which is why I am aiming to improve my cardiovascular endurance.

vertical jump – poor. I jumped the lowest in my class (30cm) and I feel as though with extra training on my leg muscles I could fulfil my potential but at the moment I don't think this is at a very good standard.

Sports Facilities near: Bromley pavilion centre, Orpington Walnuts centre, West Wickham gym and swimming pool, Beckenham Spa and Amida health club.

Reasons for training programme: Want to get fitter, lose weight, tone up muscles and improve skills in tennis.

Heart Rate: Resting heart rate is 120 bpm and my maximum heart rate is 205 bpm (220 – age)

Goals

1: To improve endurance throughout tennis match, by the 1st of October and test this by 1st of October. I am going to test this by doing the multistage fitness test, which I did before and achieved level 8.7. I aim to achieve at least level 10 by the date stated.

2: To improve strength in my legs around the court by the 1st of October and test this by 1st of October. I will test this by increasing my vertical jump from 30cm to 35cm at least.

1. Endurance (Stamina) Cardiovascular: is the ability for the heart and lungs to keep supplying the body with the sufficient amount of oxygen that the body needs to sustain physical movement.

2. Dynamic Strength - This is the strength that you need to support your own body weight over a long period of time, or it could be the ability to apply a force against an object, but in this case its to do with carrying my body weight, and how strong your muscles are. This relates to muscular endurance, which is the ability of muscles or group of muscles to keep working against resistance.

Fitness Tests

Multi-stage fitness test (bleep test)

testing your cardiovascular endurance, and seeing how long you can run for increasing your speed as you go.

If you have a higher maximum volume it means the fitter you are, compared to if you had a low maximum volume. But the larger the person then generally more O_2 they will intake because they have larger muscles. The bleep test will indicate whether you are getting fitter, e.g. test at beginning of month before training programme and then at the end of the month during the training programme and then another test after the training programme has been completed. If you are getting fitter then your VO_2 maximum will be increasing.

Equipment

- Cones to run in between
- A tape with the programme on

Method

1. Run 20-metre shuttle between the cones. Your foot should be over the line on which the cone is on each time the bleep sounds.
2. When the bleep comes faster then you need speed up your running
3. Stop when you cant keep up with the bleeps. The level and amount of shuttle you ran should be recorded.

Vertical Jump Test

Usually the stronger you are in your legs then the higher you will be able to push yourself from the ground using them.

What this works on:

This tests the explosive strength of muscles in your legs. You need good leg power for sports such as high jump, long jump, basketball and netball.

Equipment

- A high wall
- Talcum powder

Method

1. Dip the palm of your hand into the talcum powder
2. Stand sideways to the wall with your feet flat on the floor stretch you hand up as high as you can and touch the wall so that the mark of talcum powder is on the wall.
3. Dip the palm of your hand in the talcum powder again; bend your knees and jump as high as you can, making the second mark as high as possible.
4. Do this three times and work out how high you jumped each time and then take the largest measurement and work out how high you jumped.

This relates to my goal (to improve strength in my legs around the court) for tennis because this is showing how the muscles in my legs are improving or not.

Types of Training

There are 8 types of training methods:

- **Continuous** – *improving stamina by working at 60% of your maximum heart rate.*

(see below)

- **Fartlek** – Training that involves many changes in speed. You can use it to improve your aerobic and anaerobic systems.

- **Interval** – Improves endurance but also improves acceleration and improves the body's recovery as you become fitter. Basically it is exercising with rest

- **Aerobic** – usually carried out in a class. Exercising every part of you body, in a fun way with music. You work at a pace that keeps your body at the aerobic training zone, this will help your cardiovascular endurance.

- **Weights** – *training to increase muscle strength in your body making you generally stronger*

- **Sprint** – Training to develop maximum speed for short distances

- **Plyometrics** – *explosive training designed to increase training (see below)*

- **Mobility** – training to improve flexibility

Continuous training

This is a good way to improve aerobic system, which is exercise with oxygen so it isn't training for a fast event; it is an event like 800m where you need oxygen to complete the event. This is the training that will burn body fat, which is a reason for this training programme (see profile). This is similar to cardiovascular endurance training but it is a lower percentage of your maximum heart rate. In continuous training you start training at 60% of your maximum heart rate and increase training after about 15mins should be

But as this is a tennis training programme a few sprints sessions are needed so you couldn't use this method of training alone.

Improving Cardiovascular Endurance

To improve cardiovascular endurance using this method of training you have to overload by either increasing time, distance or speed, and as you become fitter maybe you can increase all three, but not moving into the training zone. The types of activities you would do for this are jogging, swimming and cycling, this is also going to improve the strength in my legs because the dynamic strength is being improved.

What are the Training and Aerobic zones?

Maximum heart rate

- Your maximum pulse is 205 for someone who is 15 years old. This is the highest my pulse rate should ever be.
- Your training zone is the level at which your pulse should be raised to for maximum benefit. Training at approximately 80%-90% of your age-predicted maximum heart rate (220 minus your age in years)
- Your aerobic zone is 60%-80% of your maximum pulse and also can help to increase endurance levels, but isn't as intensive as the training zone.

Plyometric Training

Plyometrics training is explosive movements designed to increase power. Plyometrics are drills or circuits, which improve and develop the quality in an athlete's performance, linking strength and power. This produces explosive energy and reaction movement, which is all needed in tennis. Plyometrics increase:

- Your vertical jump
- Your efficiency of movement
- Your muscle quickness

I am trying to improve strength of muscles in legs so improving vertical jump would mean I am doing this, one of my tests is the vertical jump.

Improvement of strength in legs

Overloading on drills such as again would improve strength in legs: 30m jump over thirty

Strength Training

Strength training makes your muscles grow thicker. It makes the contractions stronger. I am focussing on improving dynamic and explosive strength of the muscles in my legs. The muscles become stronger because the tendons get bigger and stronger and the muscles

fibres grow thicker. Dynamic strength is what I need to be focussing on and this is closely related to endurance, because of the fact the muscles need to be working continuously during a tennis match.

Improvement in Strength in Legs

Although jogging and swimming is improving strength in legs I think that going to the gym and using the weights there would benefit me. I would use machines that specifically are designed to increase strength in quadriceps, hamstrings and gastrocnemius muscles. I will do 20 reps the first time I go specifically on each set of muscles. I will increase the amount of reps every other time by 5 so I am overloading and progressing. I will use a 20kg weight and increase this by 5 every two weeks as well as increasing amount of reps.

There are other types of training that I could use but I think for myself this would be the type of training that would suit me as a performer the most. For example isokinetic training would probably help the progression of the strength in my legs but the equipment needed isn't accessible to me.

Principles of Training

Defined for my goals for tennis:

Specificity – as I want to improve the strength in my legs I wouldn't lift weights with my arms because although this would improve strength in my arms and wouldn't harm my play of tennis it wouldn't be fulfilling my goal and helping my weakness which is strength endurance in my legs. As I am also trying to improve my stamina for a tennis match I wouldn't use the same training programme for someone who was trying to improve their flexibility, although improving flexibility would help tennis match this wouldn't be specifically helping my weak point which is stamina in a tennis match.

Progression – In a tennis training programme to improve endurance for a tennis match. The progression for my training programme will be more obvious in the beginning. The progression of my endurance will probably make me feel healthier in myself, and after a few training sessions, I probably could feel as though I could train for longer or at a higher intensity (see overload). When I first start training to make the muscles in my legs stronger. At first it will probably make my legs ache as usually I don't train hard specifically on my legs, so the time, intensity and frequency of training should be low so

Progressive Overloading – To improve my cardiovascular endurance and muscular stamina I will have to overload. This means pushing myself harder than easy training. A few extra jumps, or an extra few metres when you are swimming or jogging each training session can make a huge difference over a few weeks, because this is overloading making you fitter in specific parts of your body. When I am training to improve stamina I will e.g. go swimming. After I have done a number of lengths each day I might be finding it easy and not a challenge. This is when I would start to overload to improve my stamina and progress in my performance. To overload I would maybe increase the amount of lengths I did. Then when that became unchallenging I would do this in a faster time, increasing my heart rate up to 75% of my maximum heart rate. If you have done this successfully you may want to increase the frequency (amount of lengths), time (speed) and intensity (heart rate level) of the exercise you may want to increase all of these at the same time and keep trying to achieve a certain level each time you do a section of your training programme, so that you are overloading without overtraining (below). When I am training specifically to improve strength of muscles in my legs I will do the same type of thing but I will do something like amount of jumps.

Overtraining- you don't want to overtrain. It can leave your body feeling weak and your muscles and joint aching, so that you find it difficult to train mentally and physically. Overtraining can cause a performer to loathe training because of the effect it is having on his or her body. In addition overtraining can lead to exhaustion and injury, and stop the performer from entering competitions for which he or she is training for in the programme. You can overtrain easily unless you periodise your training. While this allows you to progress it makes sure that your body is able to recover after training without causing any injury. It is better to start with training that is too easy than too hard. So when I am training I won't start jogging 5 miles every day, maybe I will build up to this after weeks of training but if I started jogging this distance it would exhaust me and I wouldn't look forward to training as much as I would if I knew I was challenging myself but able to do it without damaging my body. I am also going to give my body at least 2 days rest a week so that I don't feel fatigued through out the week because my body has recuperated. I am going to rest on Tuesdays and Saturdays mainly.

Reversibility - sadly however it takes longer for your body to get fit compared to how long it takes for your body to become unfit. This is why this programme is designed for training at least 3 times a week, so that the exercise that I do isn't going to be reversed because I haven't trained in over a week, so I give my muscles time to recover.

exhaust myself. Before I do any exercise I will have to warm up and when I have finished training I will have to cool down, this is all in detail below. When I am swimming I will have to make sure that I don't do training that will tire me out so that I can't even move to the side of the pool and be safe, this is another reason why I would periodise my training.

When I am training to improve the muscles strength in my legs, using weights at the gym I will have to make sure I warm the muscles I am working up thoroughly so that I don't damage them and do something e.g. tear a ligament. Also when I am using weights I have to start from a low weight so that I don't strain anything, this is why I will have to periodise and use progression rather than start on a high weight, it is better to start low and progress than start high and struggle.

When I am actually playing a tennis match and training on court I will have to wear loose clothing that I can move around in easily and run for the ball without feeling uncomfortable and wear white soled trainers as to not mark the tennis courts. I will have to make sure that my trainers are done up properly so I don't trip over.

Before I go on court to play I will have to make sure there is no debris on court that could trip me up or that could hurt me in any way.

When jogging to warm up I will have to make sure that where I run there is no obstruction and that I am not obstructing anyone else.

When someone else is training on the court I will have to make sure that I don't walk behind or through their training otherwise I may be hit by a ball at a fast speed that could injure me.

The following are part of a balanced diet:-

Diet and Nutrition

Carbohydrates

This food type is the most important for an athlete. Carbohydrates contain the fuels that provide us with energy. **Glucose** in the form of **glycogen** is broken down from carbohydrates to provide energy. We get carbohydrates from:

- ❑ Bread and grains
- ❑ Beans and legumes
- ❑ Rice and Pasta
- ❑ Vegetables
- ❑ Fruit

carbohydrates the previous day to an event the next day and then not eat anything else so all the energy they need is stored up in their bodies.

Carbo-loading is done especially to sustain endurance. In a tennis match this is important because the match could be any length and any intensity. SO to ensure you can stay on your toes as a top class tennis player you will have to carbo-load so that the amount of glycogen in the muscles is increased which helps delay and tiredness.

It would help if I ate a fair amount carbohydrates within the 8 weeks I am doing my training programme so that my energy levels are high for when I go jogging or swimming and I can push myself harder to increase my endurance.

Protein

Foods high in protein are necessary to enable us to grow and repair muscle. Anyone who trains with weights or competes in strength events would need a high daily intake of proteins. Proteins are found in:

- ☐ Meat and fish
- ☐ Beans and legumes
- ☐ Nuts and Soya products
- ☐ Dairy products and eggs

It is important for a tennis player to eat the amount of protein in their diet that they need, because the amount they use of their muscles during matches and training, if they didn't eat enough protein their muscles wouldn't be able to withstand the strenuous activity training puts upon them, and when muscles are injured they need protein for them to grow back healthily.

I will have to make sure that I eat enough protein during the 8 week period of my training programme because I need my muscles to be on top form so I can increase the amount of work I do on my leg muscles especially, and if I injure myself slightly I have the nutrients in my body to repair them.

Fats

We all need fat in our diets. Fat allows the body to process certain vitamins and minerals which cannot be absorbed into the body any other way. Fat provides very slowly released energy, which is why you will be hungry sooner after eating a bowl of corn flakes, than you will be after eating a boiled egg. The fat in the egg keeps you going longer.

Fat also forms an insulating layer under the skin to keep you warm. This is why you crave foods like stew and dumplings in the wintertime, and less in the summer.

Tennis players shouldn't take in too much fat in their diets, although they do a lot of

compared to an over weight player who wouldn't be able to because of all the excess weight.

I will not eat much fat whilst doing my training programme because I can put on weight very quickly and this will probably slow me down, and as one of my reasons for doing a training programme is to lose weight then if I eat too much fat then this will be pointless.

Fats come from two sources:

- Plant fat – Oils (sunflower, corn, Soya, etc.) and margarines
- Animal fat – Solids (butter, lard, cheese, suet)

Fibre and water

These two go hand in hand, and are extremely important in maintaining good health. Fibre is found in the form of plant material that we cannot absorb and is passed through the body. Fibre is found in:

- ☐ Vegetables and hard fruits
- ☐ Whole grains and seeds
- ☐ Brown rice
- ☐ Oats

Water causes the fibre to swell, which can make you feel more full and stop cravings for junk food. Water works in conjunction with soluble fibre to control the absorption of sugar into the bloodstream.

The human body is 75% water. In ordinary living, we lose between 2 and 3 litres a day through our urine, sweating and exhaling. When exercising the body loses even more water, and is at risk of dehydration if it is not replaced. Symptoms of dehydration include fatigue, lack of concentration and headaches.

It is essential to keep taking a small amount of fluid at regular intervals during exercise to enable the body to function properly.

This is why in tennis matches even in the winter players have a short interval to have an intake of water so that they replace the water they have lost throughout the match in sweat. So they don't get de-hydrated and over heated, and whilst training I will have to drink enough water to stop myself from dehydrating as I am training for a long period of time a lot of my body fluids will be lost through sweat and I will need to replace them.

Vitamins and minerals

These are needed in small quantities but are vital to the body. Vitamins and minerals are found in the foods we eat, and a healthy diet should provide as much as the body needs. Heavy exercise, however, can cause the body to use more than the average Recommended Daily Allowance (RDA). Some isotonic drinks replace what is lost through exercise.

This is why players should have the recommended daily intake of vitamins and minerals a day so that then muscles and joints are working properly because e.g. if calcium intake is good and bones are healthy, and as in tennis you are moving around the court a lot, you should have good vitamin and mineral levels because of the strain that is put on the joints of performers because of the amount they move around the court, it has to be ensured the muscles and joints are healthy, otherwise other problems may occur.

The Programme

Warm Up

I will raise my heart rate first by jogging on the spot at around 5 miles per hour or on the running machine for 3 minutes. This is so that I am mentally prepared for training and my heart rate is increased, and I avoid injury from getting sufficient amount of oxygen to my muscles so that they are prepared for training and are contracting properly. Also if I have developed an injury that isn't necessarily obvious because I haven't put much pressure on it, I could find this before I start training and avoid serious injury. I would then stretch using different ways to do this. I will mainly concentrate on warming up my lower body (quadriceps, hamstrings, gastrocnemius and abdominal muscles), especially when I am training to improve muscles in legs, so that I don't get muscle fatigue after training because of lack of preparation.

Warm Up Stretches

Joint Rotations

From a standing position with your arms hanging loosely at your sides, flex, extend, and rotate each of the following joints:

- Fingers
- Wrist

- Neck
- Trunk and shoulder blades
- Hips
- Knees
- Ankles
- Feet and toes

Leg Swings

- Flexion/Extension - Stand sideways onto the wall
- Weight on your left leg and your right hand on the wall for balance
- Swing your right leg forward and backward
- 10 to 12 repetitions on each leg

Cross-Body flexion/Abduction

- Leaning slightly forward with both hands on a wall and your weight on your left leg, swing your right leg to the left in front of your body, pointing your toes upwards as your foot reaches its furthest point of motion
- Then swing the right leg back to the right as far as comfortable, again pointing your toes up as your foot reaches its final point of movement
- 10 to 12 repetitions on each leg

Hip Stretch

- Rotate hips in a circular motion - 1min.
- **Upper Back Stretch** – crossover legs bend down keeping legs bent and touch your toes. – for 30 seconds
- **Shoulder and Tricep Stretch** – bend arm around the front of your face and pull elbow towards face with other arm. For 30 seconds on each arm.
- **Hamstring Stretch** put legs next to each other with the heel next to the toe of the opposite legs which is bent , lean on the bent leg – 30 seconds on each leg.
- **Calf Stretch** – stand with legs shoulder width apart, stand with feet flat on the floor and lift your body up and down onto the balls of your feet.

Cool Down

The reason I will have to do this after training is because if I stop suddenly after training is because my heart will still be beating at a fast rate and if I stop suddenly then the muscles are unable to pump blood back at the previous rate, this can cause the blood to pool in the veins and this makes the lactic acid remain in the blood stream, and this can

cause stiffness and soreness. After all training I will walk for 3 mins at a slow pace until I feel my heart rate slowing down dramatically. I will do a few gentle stretches to ensure my muscles wont be stiff after training.

I will do some of the above stretches, I will especially do the stretches acting upon the leg muscles when cooling down. Otherwise I will just jog then slowly walk for three minutes to reduce heart rate.