Video Lecture 3A (*with slides*)

Components of Fitness, Training Methods, Programming and Timetabling, Principles of Training

Knowledge & Application of Personal Training

LECTURE 3A

Hello, and welcome to Video 3A

Components of Fitness, Training Methods, Programming and Timetabling, Principles of Training

Hello, and welcome to your third video on Knowledge and Application for Personal Training. We're going to be looking at the factors to consider when planning a training programme. So by the end of this video you should know a variety of training methods and their suitable application. There are some things to consider when planning an exercise or fitness programme and timetable - or a programme as part of the timetable - as well as principles of training and exercise.

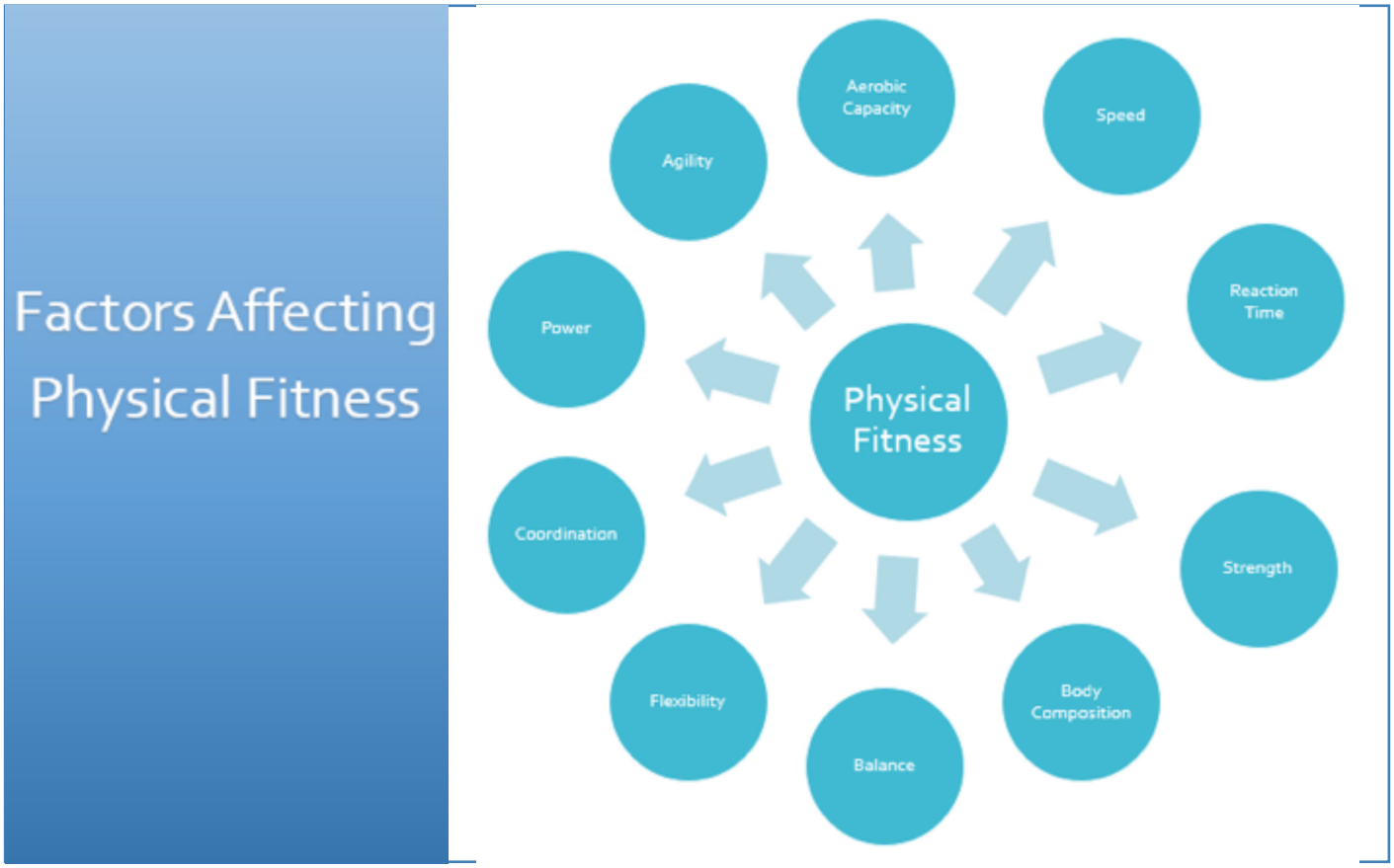
Firstly, we're going to look at the concept of fitness and what we understand fitness to be? If we can do that, we can then start to explore the factors that affect fitness and the things that we should be focusing on when training clients. And it doesn't matter if you're looking at aiming your training towards high-end sports performers or average Joe members of the public. We're looking at ALL the factors that could affect someone's fitness; understanding fitness, which is the ability to cope with the demands of our environment while maintaining sufficient energy levels.

What does that mean?

So - you have a working day - you might be a single person living in an apartment by yourself, a single apartment - going to work, coming home again, socializing. And having sufficient energy levels that when you come home, you're not exhausted, and you have sufficient energy levels to start your next day.

What happens when you change?

You might change your working environment. Imagine if you were to simply move from one type of building to another, when from having stairs, your different building has no stairs. Those types of very small changes to our environment will change the definition and terminology as to whether we are fit and able to cope with those changes in our environment. If you go from having no children to having children, that certainly puts a new demand on your environment. Demands at work change if you go from working shifts to working straight-hour days. All these types of things can affect our fitness and our ability to be fit. If you are quite a sedentary person and then you take up physical fitness (physical activity), this will have a big impact on your energy levels and your performance to meet the other demands of your lifestyle. So if we can improve that, you will furthermore have an ability to cope with a surplus in addition to your current environment demands.



What I want you to do now is to look at the above slide and then we're going to move on - we'll return to it later on. We are going to look at these and think, "How have you incorporated all of these into your training regime? What aspects do you focus on more than others?"

Let's use the example of a high-sports performer:

If somebody was to come to you and say,

> *"I'm pretty strong, good body composition, good balance. I want to be faster, I want to improve my reaction time, and I want to be a more explosive runner."*

How would you still maintain the factors that are important, that they've already got, while then focusing on the new ones? And I use this example because often when we're learning, we departmentalize concepts and knowledge, but obviously with physical training, we can't always departmentalize. We'll always be developing one thing adjacent to another. So having that awareness is really important; given that awareness to our clients is just as important.

Let's think about the exercise and the movement of a squat and how to perform a squat.

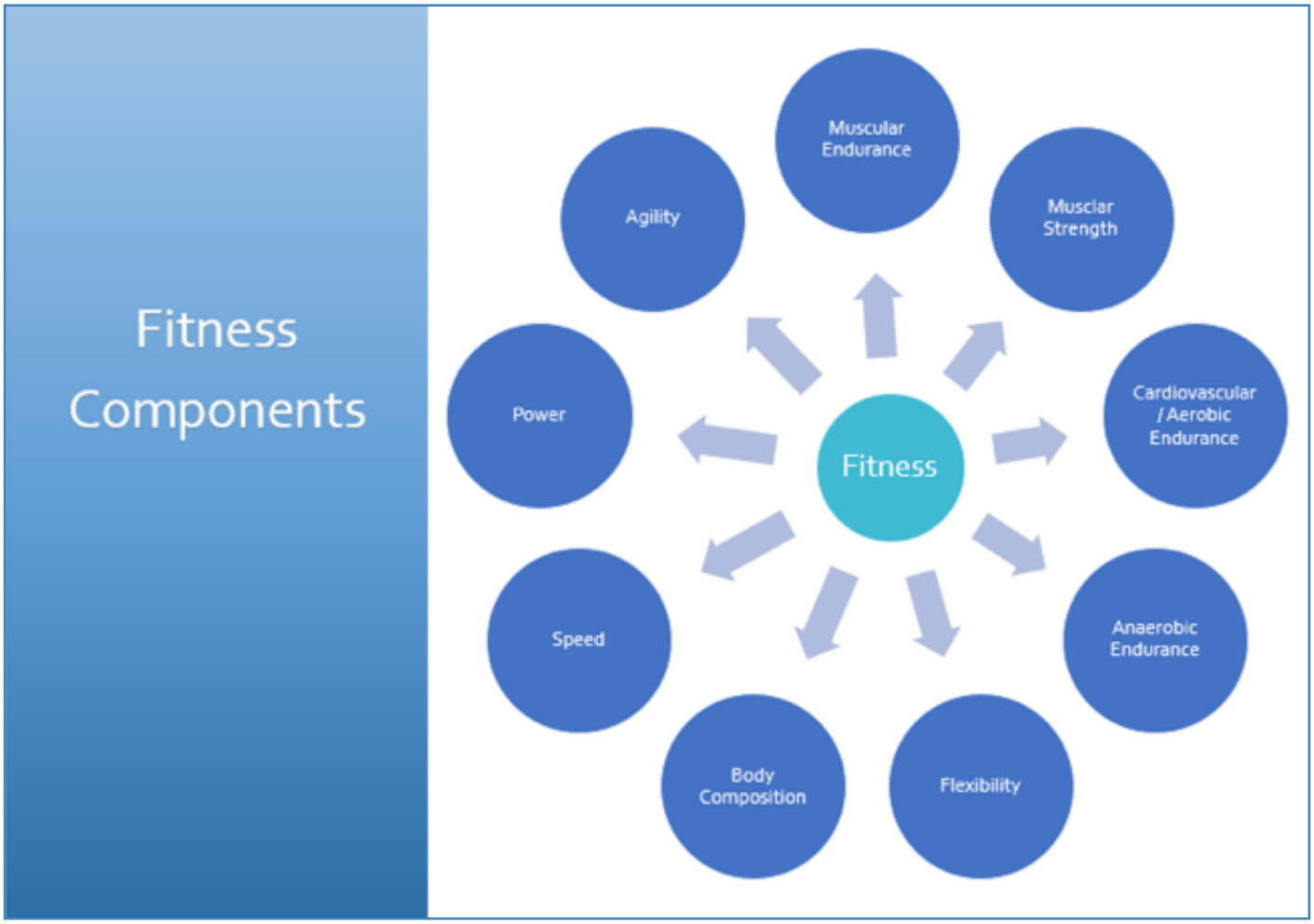
Quite simply, it's about having our feet shoulder-width apart, feet planted on the floor, our knees bent forward, our hips dropped down, our torso staying aligned. The squat comes down into a deep range - hopefully the knees could go beyond 90 degrees. We then drive those hips up, the knees come back in line with the body and the hips go forward to return to the standing position.

For that simple movement alone, we're going to be looking at flexibility, balance, strength and coordination (see the slide above). If we think about that movement solely, you might think of it as a training exercise. And it's a training exercise that is utilized by team-sports people, high-performance athletes and track runners. It's present in every training programme for high-performing athletes, but it's also an action that we do when we sit on an office sofa or step into a bath and progressively lower ourselves into that bath. Also, when we get in and out of the car - and there's a bit more of a dynamic rotational performance that takes place as well. But that knee action with the hip action and ankle alignment as well as the squat action will enable an older person to stay living in their home and stay independent.

So when we're thinking about some of this terminology, you might immediately jump to high- performance trainers, but it has a relevance and an impact for the wider public as well. We could say that to be a personal trainer, we could give you a book of 5,000 exercises - an archive of 5,000 exercises and say:

> *"These are the exercises and how to do them. There you go, you're a personal trainer."*

But often we know there's more to it than that. There's more to it than just the prescription of exercises. We need to understand movement. We need to understand its relevance because if you adjust a movement by applying more weights, more speed (or the reverse), then that will work on different components of fitness and different factors that affect fitness as well.



So now, as I've mentioned, we're just going to move on a little bit, but we will return to the **Factors Affecting Physical Fitness** slide again. Here on the above slide are the **Fitness Components**.

When doing additional research elsewhere, you might come across other readings that have fewer components of fitness - maybe six or five. We've got our components of fitness here and this is the number that we'll look at. Sometimes you'll see some of the ones that are mentioned here as "Skill Components" and "Health Components" as well. When we're training and performing - when we're working in a physical training environment, these are the aspects that we'll be working on. And these are the ones that we need to be aware of and focus on and not to departmentalize them too much.

So firstly, we've got **Muscular Endurance** and with muscular endurance we're thinking about a collection of muscle groups working for an extended period of time. **Muscle Strength** is the ability of the muscles to exert a force in a particular direction.

Cardiovascular/Aerobic Endurance is the ability of heart and lungs to function over an extended period of time. Your ability to breathe in oxygen, to expel the waste product from the body and to work efficiently. Usually between muscular endurance and cardiovascular endurance, we're looking at a period in excess of more than three minutes.

Anaerobic Endurance is without oxygen. So if you look at that terminology there, aerobic **with**, anaerobic is **without**. One teaching principle used to be that anything in the sprint categories, 400 metres and less was considered to be anaerobic. So you held your breath and performed. You might even still see that reading today. But if you watch athletics, you'll see a lot of the athletes now are not holding that breath continuously throughout that movement. There are lots of different coaching practices with lots of different ideologies. We're not going to go down that road at the moment. We're simply going to use a good example: trying to swim the length of a swimming pool underwater is a good definition of anaerobic endurance.

Flexibility. As we go on down through these videos, especially between Videos 7, 8 and 9, we'll look at these in a little bit more depth, but with flexibility, the definition that you'll often find is just solely regarding joint movement and joint action and the range available in a joint or a series of joints. But just be really aware of all that is involved in joints and the soft tissue and the complexity of a joint. We've got ligaments that connect bone to bone, and we've got tendons. People often think of a tendon as separate tissue from anything else, but it's the connective tissue of the muscle - how the muscle connects itself to the bone to enable movement.

Look at a muscle with its tendons - the belly of the muscle. (Think about the bicep on the humerus - the forearm, the upper part of the arm. It's often the muscle that people flex and show – there you will see the belly of the muscle).

And with pictures: if you look at pictures of muscles and bodies and you look at those anatomical diagrams, you will see that the belly of the muscle is very red - lots of blood capillaries within that. As you go down towards the tendons, they become white in image and actually have fewer blood capillaries. So their ability to develop in cohesion with that whole tissue is different. The belly of the muscle will recover quicker and develop quicker – the tendon, not as much.

Think about all the relationships that take place there. If you've got a very big belly of muscle, really strong, lots of blood capillaries there, which has grown over a quicker period of time and it's been able to recover over an extended period of time. The tendon will not recover and perform as efficiently as the belly of the muscle. So we need to think about this flexibility as a relationship between the belly of the muscle, the tendons and the ligaments to enable that range of motion at a joint. And we'll talk about that a little bit more towards the end of the video.

Body composition: one of my favourite things to talk about with clients. And if we think about SMART goals, body composition is everything that makes up the body. Immediately some people's thoughts might go straight to body fat. But actually, body composition is all the tissues: all the muscle, ligaments, tendons, bones, organs, body fat - different types of fat - that you have within the body - water, blood, everything that makes up our body.

So if somebody comes to me and says, "I want to tone up, I want to tone up my body." I think, "What does tone up mean?" What they relate to as "toned up" and what you do as a coach would be very different. And we talk about this a little bit more when we talk about strength in some of the videos to come.

Speed: the ability to move. Velocity is speed in a certain direction. So when we think about speed, we often think about running - running in a certain direction, where if we really want to get the science correct, that's velocity. Speed in a direction is velocity. So thinking about speed - being able to move quickly, being able to move efficiently, whether it's because of an internal or external stimulus.Imagine something's been thrown at us. Can we move out of the way quickly? We've stepped into the road and a car's coming. Can we immediately step back out of the road to make sure that we're safe? That's what we're thinking about with speed. Think about how do we train that?

This is a really good thing to talk about? We're going to talk about muscular strength later on. But if you can bench press 50 kilograms, will being able to bench press 55 make you faster? If you could squat 50 kilograms, will being able to squat 60, make you faster? That's a really good thought process - just start to think about some of these things. Think about your understanding of these definitions - how you would train someone, how you can change one exercise. Go back to my example of a squat. As we're looking through each of these components of fitness think about how we can change a squat to work on muscular endurance or strength or cardiovascular - and so on and so forth. Can we work on more than one component of fitness within one exercise? And the answer to that is "yes".

Power. Thinking about power now, what is power? Power is that explosivity - (if you think about 100 metres) being able to propel your body quickly out of the blocks. Think about when we're lifting and moving weights - to train power, we do fewer repetitions and we're more explosive. Again, we do talk about this a little bit more within Videos 8, 9 and 10. So if you're not too sure, do some additional reading and then when you come back, and we start to talk about it a little bit further, you'll have a good understanding.

Agility: often speed and agility are bagged together. And it's understandable because agility is being able to change the direction and speed of movement within a certain direction. What does that mean? Imagine you've got some things laid out in front of you that could be markers on the ground. If you run to your first marker and then immediately turn 90-degrees to your left and run even faster. Can you run to the first marker on the ground, turn 90 degrees to your left and accelerate from that marker to go even faster? It's often something that's talked about in game play and in sports. Agility -if you were walking on an icy path and you slip with one leg, do you have the stability, balance and strength on the one leg to support your body weight and enable that other leg, that slipped out to come back and through to your body. Flexibility and agility are in a relationship. Often people talk about their knees. They have bad knees that they've fallen or twisted and their knee has given way. Often people don't realize that the problem is actually the relationship between your hip, your knee and your ankle. Your knee is probably no problem at all. It's forced to take the stress and the pressure when your ankle and your hip don't have good range of motion.

So again, we can talk about these in isolation, but when we're training clients, they often impact on each other so we need to have that awareness when we're training.

So now, let's go back to the Factors that Affect Physical Fitness slide. You can see there's a little bit of repetition. We talk about "aerobic capacity" and "cardiovascular endurance". Again, you can see how different terminologies can often mean the same thing. We've got "muscular strength" or "strength". There's a slight duplication within these. But these are the factors that can affect our fitness so if we don't look at **all** of them, we're not going to have the elements there. These are the

components of fitness. When you do additional research, you might see “sports-related fitness components” or “health-related components”. But what we've done is we've grouped them together and we've tried to move away from the concept of the terminology of just sports and instead think about sports and high performance.

If you think about the action when you get into a bath - you may put two hands either side of the bath and lower yourself down. You will often put one foot out in front of the other before the other foot follows. If you were to remove the vision of a bath, that's a pistol squat. Think about doing a pistol squat: standing on one foot, lowering your body to the ground with the other foot out in front of you and that foot out in front of you is straight with the heel not touching the ground. It's a very difficult movement indeed. So we've got to really try and remove this idea that there's a top-end way of training top-end athletes, there's a lower end, and there's somewhere in the middle for rehab. That's really not the case.

When we think of exercise and training, we're thinking about movement, we're thinking about stability and we're thinking about strength. How we build these other aspects into that is about your exercise selection, and then how we adapt the exercise selection to meet those needs. You will always have to “think-trainer-talk-clients”. We do talk about the factors affecting fitness after we've talked about goals and SMART goals, because your client might come along and say, "I want to tone up." And you're going to think “body composition”.

Some people say,

> *"Well I want to tone up, which is just body fat, and I want to lose body fat. So I'm just going to do endless amounts of cardiovascular."*

And there's often a talk about what's better? Muscular endurance? Cardiovascular endurance? Muscular strength? Explosive power movements? And we can start to see that when we look at the factors affecting fitness, there's a relationship between all of them. To try and departmentalize and focus on one which will achieve my goal better than others is not a good way to train.

Your client will have a perception of what they think they need to work on. And the difficulty you'll have is going to be that you will have to do things that the client will think is going to have an effect that meets what they've asked for while teaching them and coaching them to understand what you know is good for them. For example, looking at body composition - when you lose fat, you need to develop muscle density. So we need to do some strength work and power work as well. And by doing that strength and power work, you're not going to change your body composition greatly in the opposite direction of what you're trying to achieve (thinking about females who say they don't want to be big, bulky and muscular).

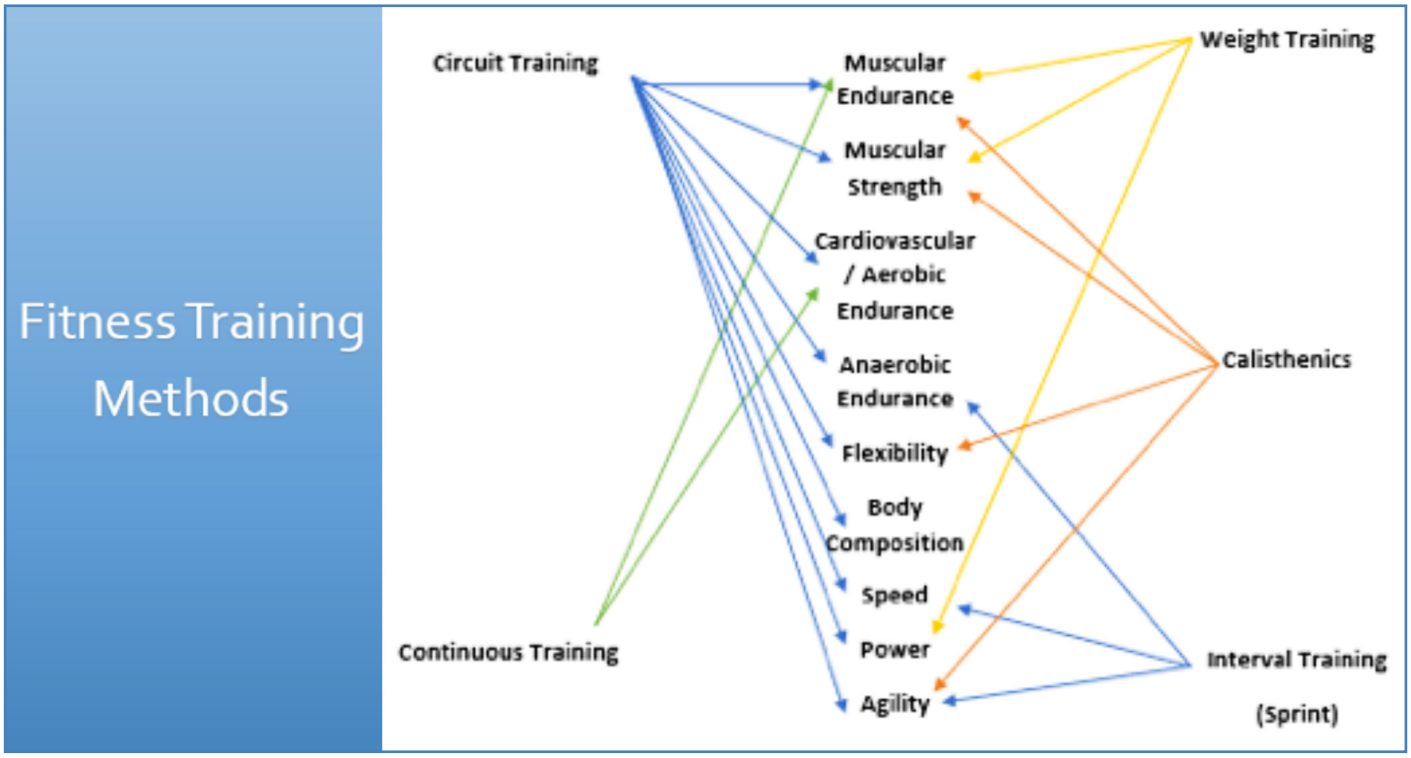
I always say,

> *“As a guy, I'm trying to be big and muscular, and unless you're doing extreme training methods and lifestyle adjustments, it's very difficult to have a change of more than 10%”.*

So that can be reassuring for some people when we're talking about why we’re focusing on different aspects at different times. Again, I said before, looking at the factors affecting fitness, often as an individual, I'll look at this and think, “Do I change training these other elements? Or am I solely focusing on one thing?”. You may want to ask your client, “Do you ever look at any of these other aspects”? Because there's a chance to add a bit of variety to their training and see where their training has got to.

A client might come to you saying they want to work on their speed and get faster. Well, if they haven't got good aerobic capacity, they're not going to be able to do that. If they haven't got good flexibility and agility, they're not going to be able to work well with balance and coordination to get that speed. So speed could be their goal, their ambition - but they need to work on other concepts to enable that journey to take place. These are the things that you've got to explore and you're not going to get the answers within the first session of training your client.

What do we need to get from this? What you need is to be comfortable with these terminologies and definitions. You need to make sure that you “talk client, but think trainer”, be conscious about your language and how you start to improve the language of your client to make sure that you're both on the same page regarding what you're talking about. The purpose of Video Number 3 is actually to think about what methods we can use in order to train these components of fitness.

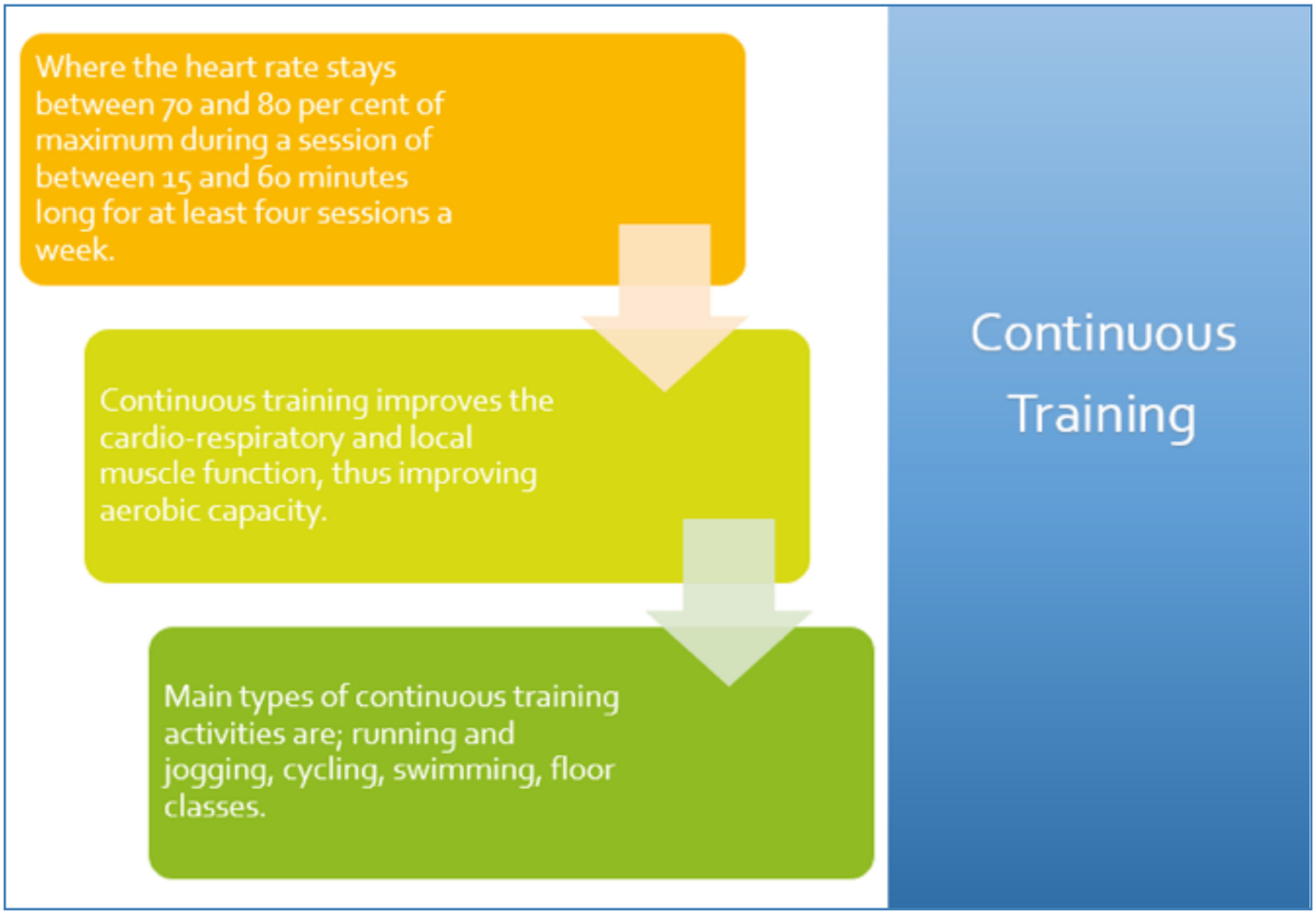


There are different training methods that you can use, which will focus on different components of fitness. So the journey that you're going to make with your client is you're going to consult with them and they're going to give you their fitness ambition, their goal. You're going to make it into a SMART goal. Think about the elements that need to come in there to make it a SMART goal. Then you're going to identify what components of fitness that SMART goal relates to? How do I train that component of fitness? And if you're still a little bit unsure when I've gone through the definitions of these, hopefully looking at the training methods will start to get you familiarity with them.

Training methods: you can have weight training, calisthenics, interval training, sprint training, continuous training, and circuit training. As we explore these, I want you to reflect upon how you train? How do you organize your exercises and what do you usually go towards? And how can you diversify that a little bit.

Continuous training. This is where we're looking at working for a continuous period of time. There's a few concepts here where we're thinking about training the heart rate for an extended period of time in a particular zone. If you push your heart rate too high, you will not be able to do the extended training - you will reach your threshold. And so we want to make sure we maintain that continuous training zone so that we could extend it for a period of between 15 and 60 minutes.

You may be familiar with continuous training and you may be familiar with “fartlek” (it means “speed play” in Swedish and is continuous training with interval training). And we're going to talk about this now. Often when we're younger, the types of activities that we get into are team sports: football, rugby, hockey, netball, different activities like that. And they relate more to interval and fartlek training where they are regular in their pattern.



You'll walk for five metres, going immediately from a standing position to sprinting. You might be jogging, then sprinting and then running backwards.

What often happens is as we get older in life, as we go from compulsory education and doing regular PE lessons, other elements of our lifestyle take priority: work, lifestyles, family, socializing, elements like that. And we might find that our body has changed in ways that we're not happy with. We put on a little bit of extra weight that we want to lose. We think about how we used to look and how we used to perform. Perhaps when we're running up the stairs, we're all of a sudden out of breath. You're at work and you're walking up a flight of stairs, not able to maintain a conversation. So you think,

> *"Right, I'm going to go for a run. I'm going to do some regular running now. And I'm going to go out and run once a week".*

If you think about if you've ever gone for a run, no matter what the distance might be: round the block, a mile, four miles, or even if you're seriously into you're running - when you're training, you will often stay within your comfort zone. So if I was to go for a run, I'd decide,

> *" I'm going to leave my house and I'm going to get back to my house."* OR
>
> *"I'm going to drive to a location, park up, go for a run, come back to my car, drive home".*

Now you may walk during certain periods of the run, but often you'll adjust your effort level to maintain a running pace. And if you can't, you start to build that up as you go along: walking and running, walking and running, gradually reducing the walking phase. But often you'll stay in a comfort zone. And people that go in for those sort of runs, find that it doesn't have a good impact on their fitness ambitions.

It's an important thing to do because we need to maintain a base level of fitness. Continuous training and going for a continuous run can actually help with recovery as well as part of a broader training programme.

But there are fashions and people often compare and contrast different types of training as though one is better than the other. And that is not the case; it's often an issue with mis-programming - that we're not putting the programming in place correctly. There are certain training trends and programmes out there relating to part of the training or speed play. It's continuous training, but with regular bursts of speeds of 5 or 10 seconds every two to three minutes, and it's done often to help people improve their performance if they're working in sports play. But lots of people are starting to do this now as a means of dropping body fat in a short period of time and getting toned and stronger in comparison to doing continuous training.

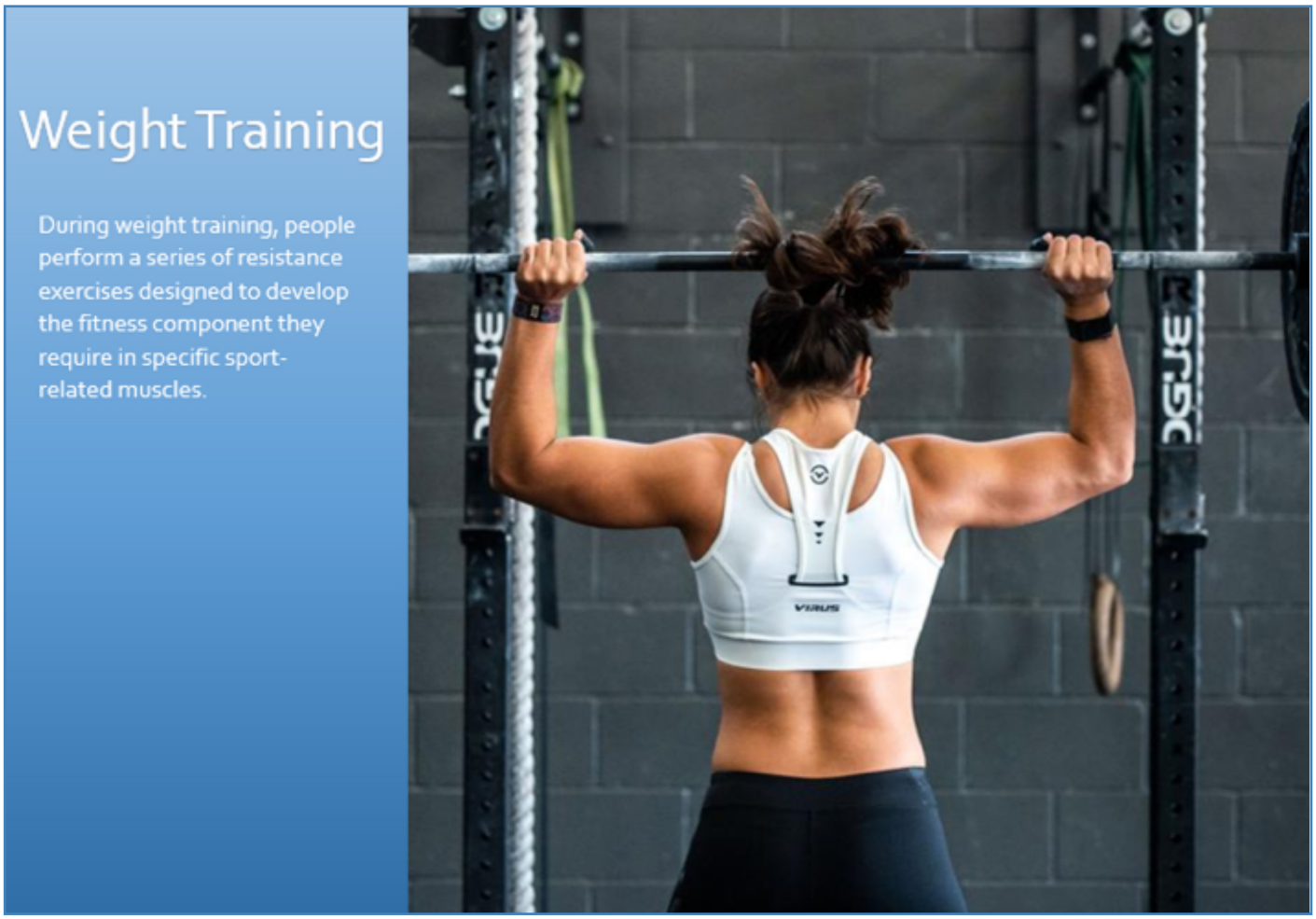
The problem with that is that you do need to build a base of cardiovascular fitness to enable you to do this because some people might be able to just do regular speeds of five seconds and have longer durations of recovery.
And so losing that impact of the fartlek training. To do fartlek training well, you need to have a good cardiovascular-base fitness and to develop that we need to do continuous training. But you might hit a plateau with your continuous training and even if you are an endurance athlete, you're running half marathons or full marathons, and you want to get a faster time, you would incorporate fartlek. If you're thinking about people that are doing the Couch to 5K, Couch to 1K, Couch to 3K, how can we support them? Doing a bit of speed work might help them push through that ceiling that they've reached with their training.

They get a bit bored going out, doing long-distance continuous-training runs. They're saying that they haven't got a lot of time and they're hitting a ceiling with their training. They're not making a lot of progress.
So we can advise them to go out for a short period and do some speed play - just to mix it up a little bit and change their body type. If this is programmed correctly, when they then go back out to do their continuous training again, they will see an improvement. As I've already said, this is a practice for someone who is doing Couch to 5K or a Couch to 3K. but it's also something that's practised by top-level Olympic athletes. And if you do some research, especially with GB athletes, they will share this with you. How do they improve their 10K run, their 5K run, their half marathons? They often incorporate a little bit of fartlek training as part of a well-programmed training regime.

However, If we jump straight into this, that's when injury can occur. And that's what I really want to point out. You'll see that around January time, people will be talking about what is better? Will cardiovascular training or weight training get more results quicker? In comparison with each other, which is better? They don't understand that if you look at it in isolation and not look at it as part of a continuous training programme, this is when injuries occur and people stop training.

Weight training. Resistance-based training can be used to train muscular endurance, muscular strength, and an aspect of cardiovascular endurance as well. Just taking an exercise and applying additional load, (whether it's holding the weight above your shoulders or holding the weight below your hips) will have an impact on your cardiovascular performance and how you breathe and how your heart will pump.

So it's something to think about. People get too in-depth with exercise selection, and often don't consider that exercise selection is just part of the variety. We should be applying load in different ways and apply resistance in different ways. Your biggest argument for resistance training is that it will help with **bone and muscle density**. Do a few Google searches: there's some great images of cross sections of muscles. And it's very popular. If you're on social media, you may have seen this - where they do a cross section of a leg at the top part of leg so that you can see the quads and the hamstrings. And they look at someone who's in their late 70s or early 80s, who's done endurance training in triathlons and somebody who hasn't. And when you look at the muscle density, it's really quite impressive what the muscle looks like on the inside from doing weight-bearing and weight load training.



One in five men will get osteoporosis while one in three women will develop osteoporosis. So the argument for weight training and weight resistance training is really important.

If your client is new to weight training, it's really important to tell them about the immediate responses - that after doing 40 minutes to an hour's worth of resistance-based training, when they go back into the changing room and put their top back on, it may feel a little bit tighter - that immediate response. Talk to them about it, make them aware of it so they don't get misconceptions about how their body may change visually on the outside, but in reality what is actually taking place. It's something that's growing in trend and popularity.

And again, you will see lots of people talking about "this training programme is better than this one - this one's not as good as that one". But actually, if people are moving, people are doing exercises, then well done! We need to encourage movement and we don't need to be putting down one training method over another. Some people will brand things such as "functional fitness". Some people will brand things such as "CrossFit training" or "resistance-based training". Actually, all training is good for you. It depends where you are as an individual in your training journey. Of course, jumping straight from being completely sedentary into something like CrossFit or extreme weight training is not good for anybody.

Training injuries occur from doing "too-much-too-soon" after "too-little-too-long" - or the incorrect selection of training. And our job as personal trainers is to make sure that our clients are not doing that - that they recognize the journey.

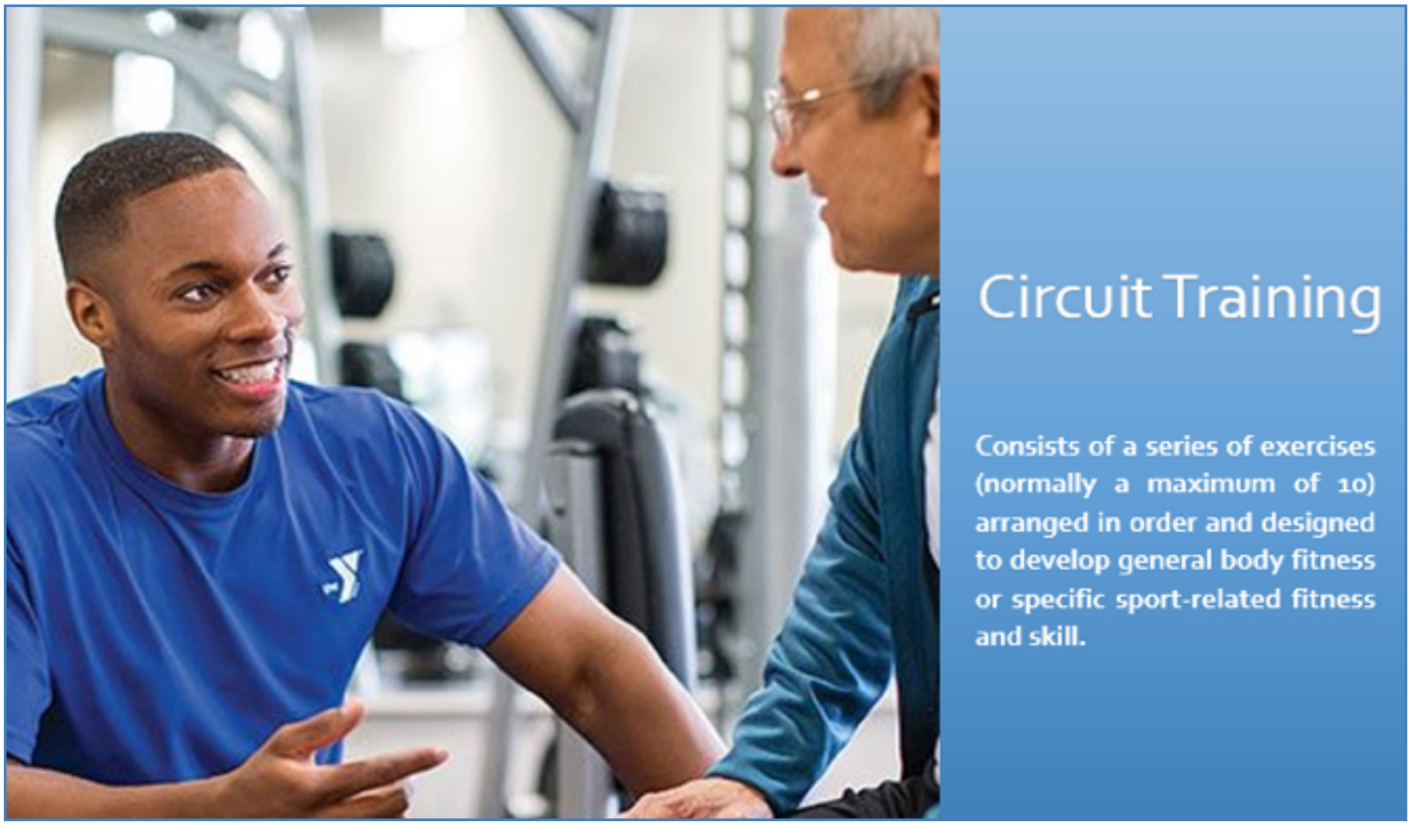
It can be a little bit frustrating for some clients who are looking to excel in a certain period of time or have certain

expectations. That's when your consultation is so important when we talk about the SMART goals and talk about how you're going to test them, how are you going to show them the journey? So it's really important to talk about this and to remove the old thought process that females should be doing certain sets and repetitions and males should be doing different ones. Or for endurance training you should be doing X, Y, and Z and for strength, you should be doing something different. Any type of weight-loaded resistance training is going to have a positive effect.

Interval Training. Talking about interval training then: interval training is a bit more structured than fartlek. If you think about fartlek in the traditional sense, you can have some markers laid out on a field and you're going to run from Mark 1 to Mark 2, you're going to jog backwards, you're going to sprint. But the distance between those markers is varied. In interval training, they're the same. And every time we do the repetition, it's the same. So, whereas fartlek speed play on the first interval you might jog or the second time round, you sprint between the first marker and the second marker – or you jog backwards. It's just mixing and matching to really be valid towards a training environment. If you are going to work with top-level athletes (you'll see this in your assessment booklet, where you're looking at sports conditioning in kinesiology), we just look at the movement and the demands exactly as we would do with an average member of the public.

We look at what movements they do, look at the demands of their lifestyle and try and match that accordingly. Different sports, different positions will have different demands within different areas of the performance. So it's really important to look at that. And personally as a trainer, I've made mistakes with top-level athletes where I've tried to apply a blanket approach with all top level athletes. And if you try and apply that blanket approach with members of the public, and not individualize it toward the demands of their performance, that's where the training doesn't work. So these are the types of changes that you can do for interval training, where we're thinking about structured intervals and structured changes.

Circuit training is often listed as a training method. There are lots of trainers out there who don't think of circuit training as a method of training.



And that's understandable. Some people will just look at it as “this is how I organize my exercises”. So if we think about group training (and we're going to talk about group training in a moment) but if you're going to have a selection of people in a certain space, you may lay out 8 to 10 stations in a circle and the clients will come in, you warm up together, you will show them each individual exercise on each individual station. The clients then perform that and you will have a certain number of repetitions, a certain timeframe that each person will spend on the circuit and then they will move around in the same direction.

The circuit can be designed towards different components of fitness. And if you scroll back up to the Fitness Training Methods slide, you’ll see from the diagram that actually, circuit training does hit quite a lot because it's just an order. I just think of it as an order of exercises. And it's really good to experiment and play with them. Often, if you're working one-to-one with a client, you will have a series of exercises that they'll work around and work through, not too dissimilar to circuit training.

But often in circuit training, we don't have any more than 8 or 10 stations because by the time your client gets to Number 7, they've probably forgotten what Number 8 station's going to be. But you will have imagery and instructions. You would have demonstrated you're there to coach. It is a great way to incorporate and diversify your group training.

If you get 8 to 10 people in a room at one time, you will find that the demands on your knowledge are considerable. You’ll say to the clients, “okay, you're doing squats”, you're doing press-ups”. One client will then say they've got a knee issue. Another client says they've got shoulder issue, or they don't feel comfortable doing press-ups. How can you progress or regress, or give an alternative exercise to those clients to train on the same group of muscles, to have that same training demand, but not too dissimilar to what they were meant to be doing? A really hard skill. If you can do that in a group, you can definitely do that on a one-to-one basis. So it's a really good thing to look at.

Lots of trainers will do circuits in different ways. Some trainers may only lay out four stations at a time, but then you can turn the cards over and there'll be a different exercise. So there'll be one circuit for warmup, one circuit for the main session and so on and so forth, working on different areas of the body.

There's so many varieties and ways to play. The best thing to do, the best advice I can give you is to go and watch other trainers, go and join other classes. You'll see things that maybe you won't like to do and you don't see yourself applying. You can steal ideas from different people. Personally, I've worked from grassroots coaching all the way to high world-class performers. And I've definitely mixed and matched elements from those, to work with different clients in different ways. Watching different coaches, different instructors, training different people. And I've taken something from high-performance and tweaked it a little bit and offered that to Average Joe. Find your way, experiment, keep it fresh. And it's really important to see what different people are doing.

So we're going to pause Video Number 3A there for a moment and then we're going to come back to Video 3B.