Video Lecture 8 *(with slides)*

Planning a flexibility training programme and components for planning a cardiovascular session

Knowledge & Application of Personal Training

LECTURE 8

Hello, and welcome to Video 8

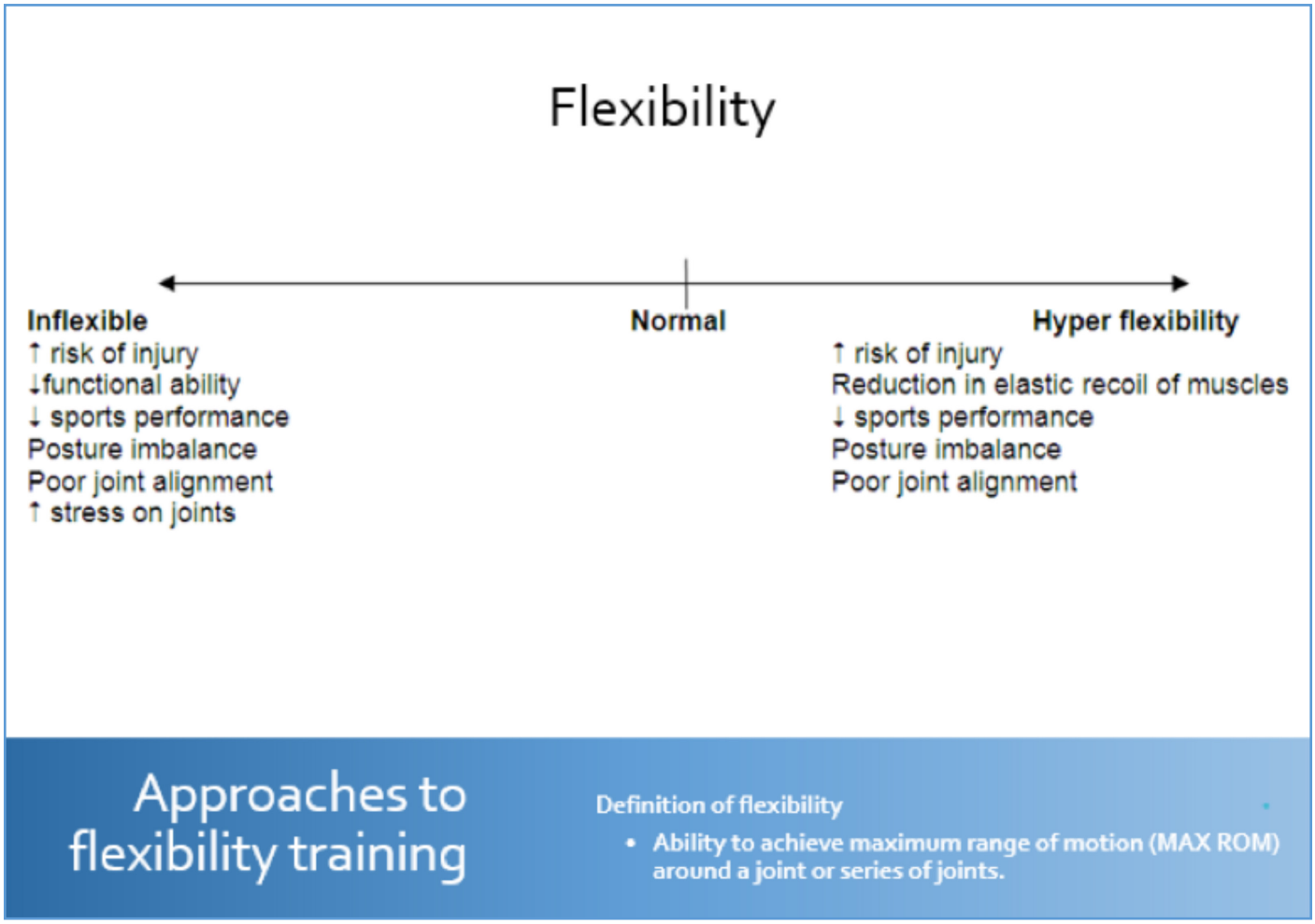
of your series for Knowledge and Application of Personal Training

Hello, and welcome to Video Number 8 of your series for Knowledge and Application of Personal Training. In the previous video, we looked at periodization, structure, and planning. And now what we're going to do is look at some of those individual components when we're planning for particular components of fitness and how we can structure and work towards them, and what part they play in the full training programme picture.

The first thing we're going to be looking at is planning a flexibility-training programme. So if we're looking at flexibility (something that is very much a contentious issue). The definitions and terminology that you'll look around is

> *"the ability to achieve maximum range of motion around a joint or series of joints".*

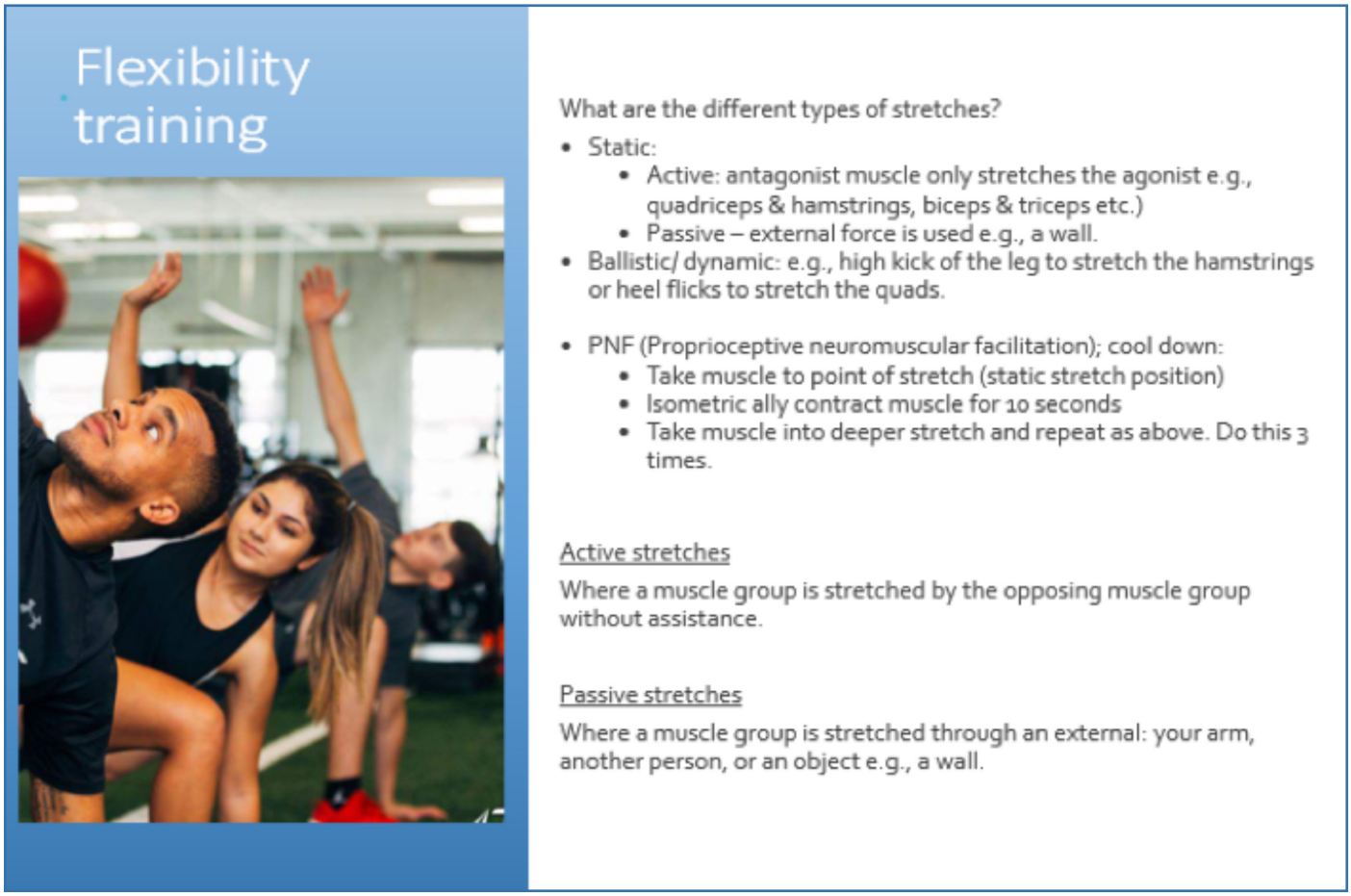
When it comes to the terms "mobility and flexibility", more often than not, mobility isn't even regarded as a component of fitness and doesn't get a lot of attention regarding its importance as part of a training programme.



Now, a lot of trainers talk about mobility and they talk about the importance of it and have a good idea of what it is but actually, when it comes to formal academics, this isn't really put across very well. When we think about a joint and what is involved in a joint, it's more than just muscles, and that's where we need to be a little bit careful when it comes to our definition. Flexibility is more to do with the **belly** of the muscle and the **range** of the muscle because when we're looking at a joint, what is involved in a joint is ligaments and tendons - the tendon being the tissue that connects the muscle to the bone area and ligaments that connect bone to bone.

Now you cannot improve the flexibility of the **ligaments**. It's a kind of contradiction in terms to use the word flexibility when discussing ligaments and everything that's involved within a joint, especially a synovial joint - so when we think about knees, ankles, hips, elbows, shoulders, and joints of that nature. Improving your flexibility, improving the suppleness and the range of the muscles will in turn have an impact on the joints. This is where having knowledge of anatomy and physiology and having a really good ability to visualize and have a good comprehension of the structure and design of anatomy is quite crucial.

When we think of a **tendon** and a muscle, they're not two different things - the tendon is the same tissue that is connected to the bone. There's a difference between the area of the tendon, which is basically part of the muscle - the difference between that and what we refer to as the belly of the muscle. If you think about a bicep and if you flex your arms to show your biceps and tense the bicep, the belly of the muscle is the oval shape that you would see. That's the belly of the muscle and whenever we look at pictures of muscles, especially the belly, you see the muscle fibres. There's lots of lines indicated, very red, because there are actually lots of blood capillaries around the area. Now, when it moves towards the tendon, there are fewer capillaries, and the growth is slower at that range. So this is where the complexities and the discussions around balance of strength training, and the need for flexibility and suppleness to bring alignment between all those connective tissues.



How do we then compensate flexibility with mobility and balancing our potential strength-needs as well? It's an evolving science and there's still some discussions at higher levels than Level 3. And I'd really encourage you to go and look at these. Often what it is, is that there is lots of variability when it comes to conducting a test and conducting a test of some nature.

Static stretches, PNF stretches, (and I will show you visuals for all these types of stretches in a moment) Should they be done at the beginning of a training programme and at the end of a training programme - and so on and so forth?

I'm going to give you some of my insights into this which is supported by research, but it is an evolving picture and I'll be really interested to see how it comes out in future research papers. But flexibility is a very important concept when we're thinking about muscle suppleness, recovery and elite performance as well. If you think about someone who wants to be a sprinter, and if you look at any world-class performing sprinters, they look at the relationship between hip mobility, increased range of movement and the suppleness and flexibilities of those muscle groups.
So actually, if you build big powerful muscles, there's no point having a powerful muscle if it doesn't have the explosive range, if it isn't strong in every position - and that's where flexibility comes and helps us.

You'll hear the terms, “hypermobility” and “conditions of hypermobility. You'll see that I've talked about hyper-flexibility, and there are terms such as a “tight muscle”, and “balances of muscle”. I believe the term “tight” is not an appropriate term when used to describe muscles. We can have “overactive” and we can have “underactive, underperforming” muscle groups with something like the hamstrings, where it's a complicated relationship between lots of smaller muscles - with particular origin points where the muscle starts and insertion points where the muscle ends, and each has a role in relationship within performance. And if you've got underlying muscles that don’t have the ability to support the movement - and you'll hear that I'm being very careful in my language because some people talk about “activation” and the muscle “not activated”, or “under condition”. And I don't think these terms are actually appropriate when using that.

It's usually because we haven't done a particular movement to engage the relationship with those muscles, or we've been inactive in a certain range for a certain period of time. Simply by doing more of an adjustment of a movement, you will then bring alignment into those muscle relationships, and they will work in better cohesion with each other. So be very mindful about your language, because it is really easy to slip into it, especially when you're talking to clients.

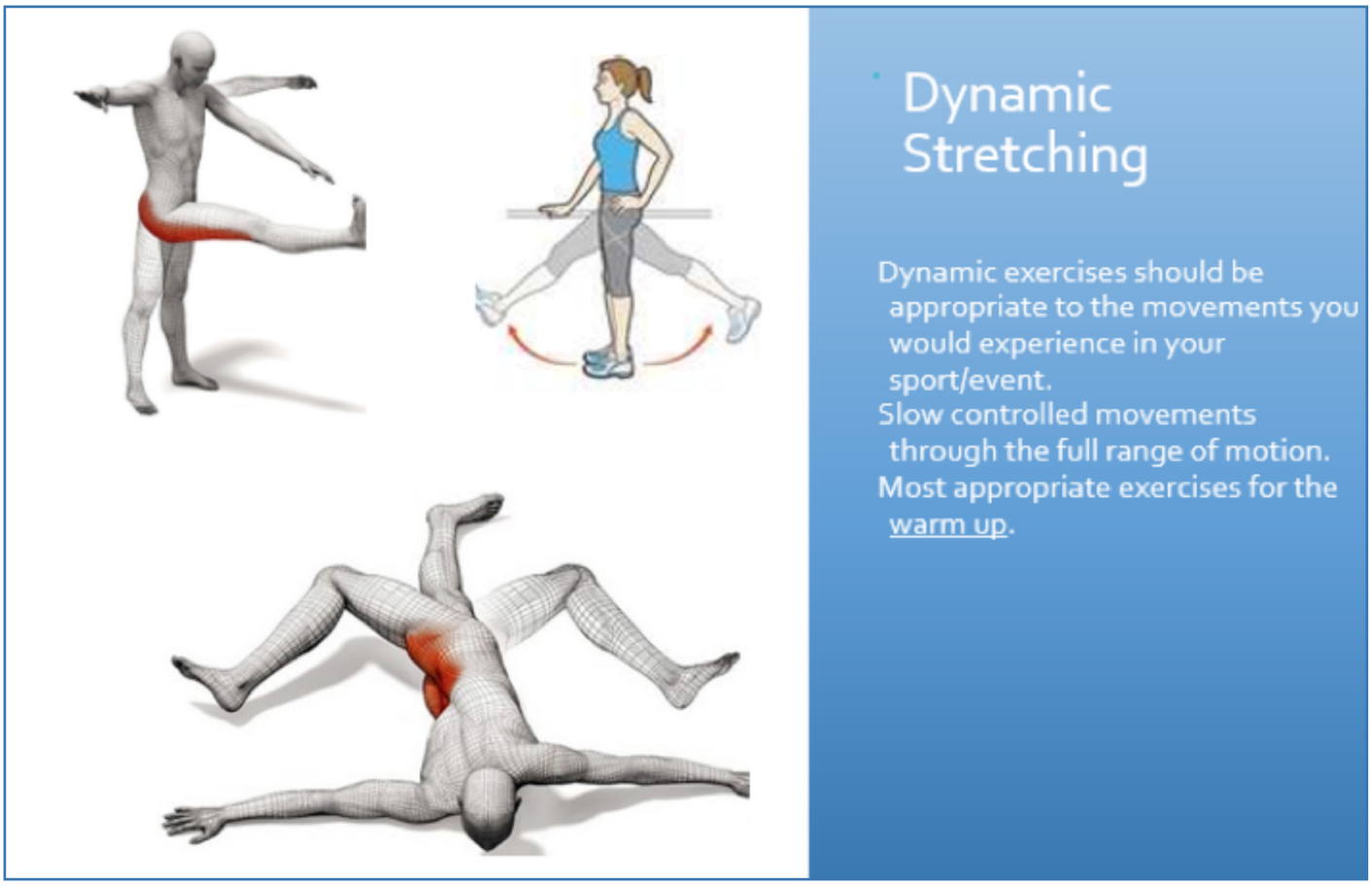
Now your clients, aren't going to be particularly catching onto the phrases that you use. But I think as you move along in your relationship with your client, be really clear about your terminology. And you can be very concise in

your language when they start to ask you problems that they may be having in their training, because let's be fair, people do not warm up properly and they do not cool down properly and they do not allow for mobility training, flexibility training, and balancing their training needs.

So what do we mean by that?

What we're looking at is there are different types of stretching. You've got your static stretching, ballistic stretching, and PNF stretching, just to discuss a few to start with. (See slide above) We've got a term such as “dynamic stretching”. A dynamic stretch is anything that has a movement with it really, and these are ideal at the warm-up stage (activation stage) of a warmup. And if you even just look at the image below where you've got the lady holding on to a bar and swinging one leg, the leg that is actually supporting her while she's swinging, is getting its activation, it's getting its work involved as well. And it's going to be potentially related to the actions that they're going to be doing in their training programme.

So this is that discussion about validity. If you're going to be doing a shoulder workout, why would you just sit on a bike for 10 minutes and then go and do some shoulder strength training?



We want to be doing some mobility. You want to be thinking about that ball and socket joint and all the potential movements that can occur at that joint and try and simulate that in our training, - actively preparing it as well.

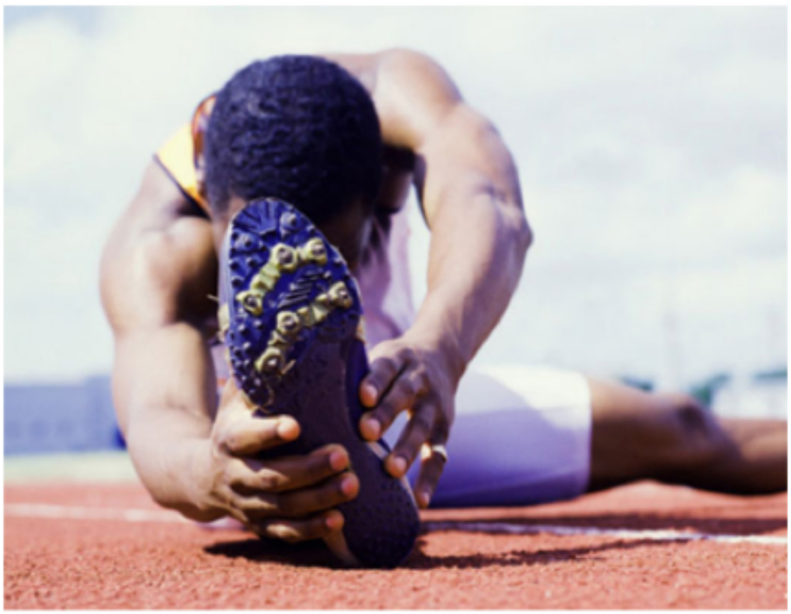
Static stretches, very common - lots of people are aware of them. (See the slide below). When we think about static stretches, you are holding a stretch for an extended period of time. A typical quad stretch is where you stand on one foot, grab your ankle and bring your heel into your bum - how do you actually do that stretch correctly?

Are static stretches bad for you? Should you not do them? Should you do them? It's one of those things that if you get any health professionals, especially fitness professionals into a room (if you ever attend a conference with people that are sitting down for a period of time), if you scan the room, you see lots of people doing static stretches to help relieve any muscle tension that they may have at that moment of time.

Guidelines for Flexibility: Static

When to stretch

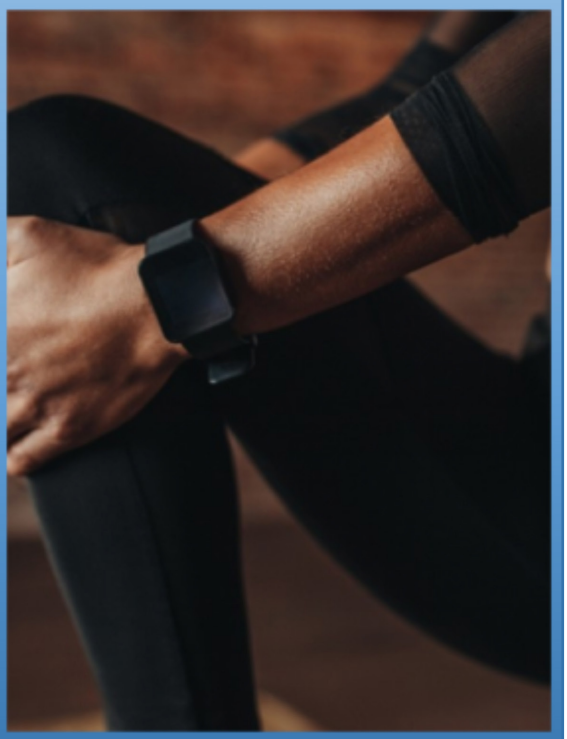
- Short (preparatory) stretching.
  - During warm up
- Maintenance stretching
  - During cool down
- Developmental stretching
  - During cool down or in specific stretch sessions



Guidelines for Flexibility

Factors affecting flexibility.

- The structure of the joint
- Ligaments and tendons
- Opposing tissue bulk (muscle or fat tissue)
- Muscle and its connective tissues
- Gender
- Age
- Time of day
- Temperature



I believe that it is a good practice to do your dynamic stretches at the start of a training regime. If you're going for a run -something that a lot of people don't do, is do a good warmup before they start their run. And maybe just start to reflect on your own training. It's something that I really do because obviously, when you're teaching them and you're training yourself, you start to think,

> *"Do I do the things that I actually tell my students to do?"*

So when we're looking at the types of stretches that you might be able to do, think about, do you prepare your body well enough to actually perform the action you're about to do? When we maybe have had experience of team sports, whether that might've been at school - if you're already doing sports where you may be training on a Tuesday, Thursday evening, playing your fixtures at the weekend or whatever event it might be - really question yourself.

I remember warming up in a team and going through our team warmup, and actually really thinking,

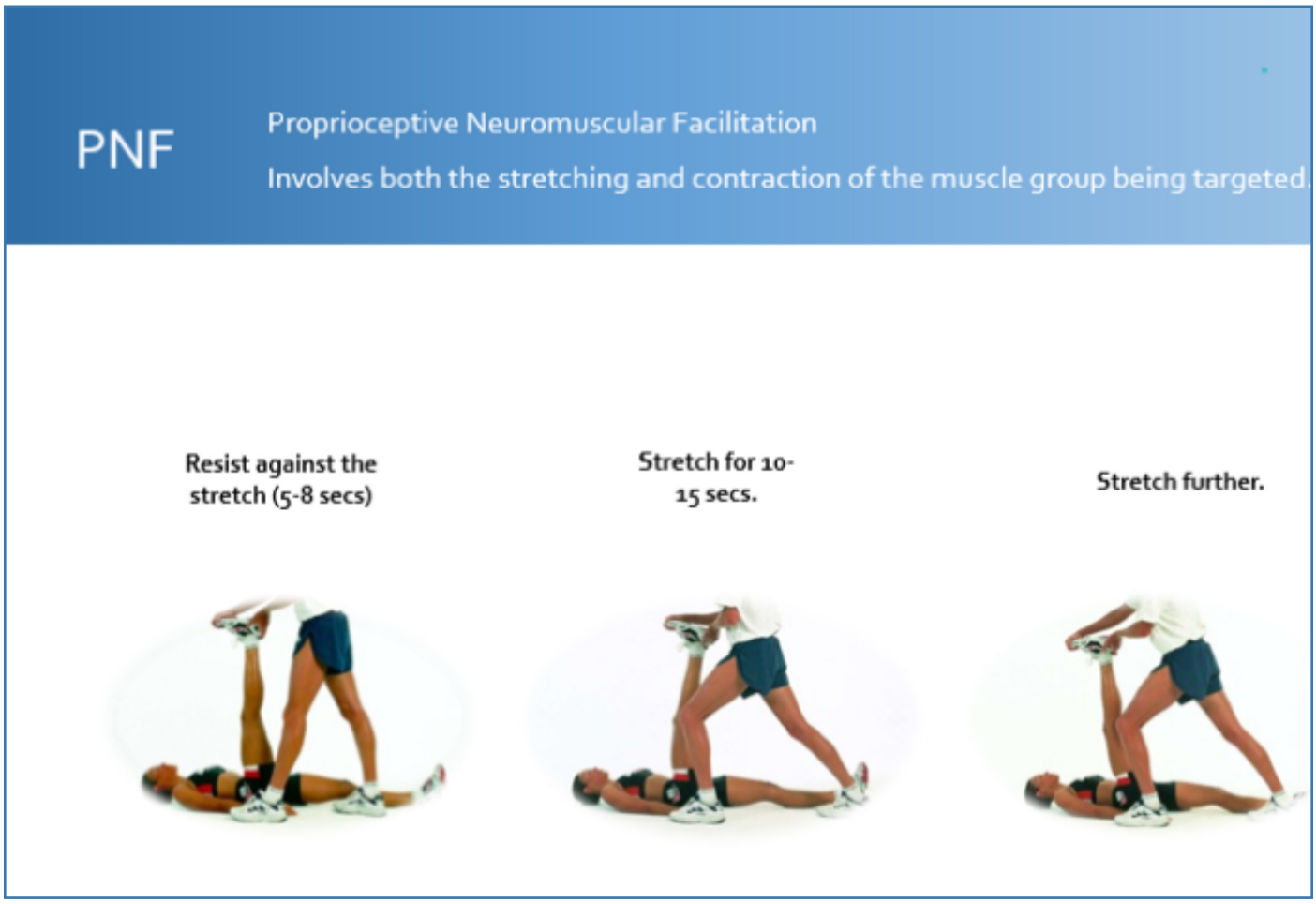
> *"I'm not ready to perform in the event I'm about to do. I don't feel ready to go into action."*

And people talk about a second wind and talk about the muscles becoming ready halfway through maybe a fixture, a game of some sorts, or a performance, where actually we could really challenge:

> *"Was the warm-up effective? Did we take ourselves to an exhaustion point that is relevant to the event we're about to do? And how can we then further challenge that?"*

I often feel that if I'm going for a run and I've got excessive DOMS, shin splints, acute shin splints, issues while I'm running, it's usually because I haven't cooled down properly after the last run that I've done, or the last series of working out that I've done. If I have a particularly low-level performance in a training routine, whether that be a run, gym-based exercise, or weight-bearing exercises, it's usually because I've rushed it. I haven't allowed for a good warmup, and a good extensive time for cool down as well.

Now people might talk about that actually they haven't got a lot of time to be spending for a full period of time where you can allow for full, effective warmup and full effective cool-down. If that's the case, this is when you can talk to your clients about building this in to their training programmes - doing a full 45 minutes or hour of simple mobility exercises. You know that your client's probably going to be sore after the previous session that you've done if you've done some hypertrophy, high-intensity training with them. Could you spend 40 minutes to an hour doing mobility work with them, doing recovery work, which can link from starting with dynamic movements, doing some PNF stretching, (Proprioceptive Neuromuscular Facilitation),.



Proprioceptive Neuromuscular Facilitation

Say it really quickly, as many times as you can or simply say PNF.

What does that mean? It's a stretch against resistance as illustrated by the diagram above.
I personally really enjoy these stretches - I really enjoy doing these stretches with a client. If you've been able to take a client through some very good dynamic stretching and dynamic performance, gone into a workout where we've taken them to a real high standard, really pushed their limits. And then we finish on something like PNF. In this picture, I'd make it a little better by putting a mat on the floor, then a towel, having the client's water next to them as well. You will see by the images here - and this is something you might be working with in your practical sessions. You've got to really talk your client through what you're about to do. If your client is new to training and has never done this before, this could be quite intimidating to do with them.

If you have a male who's on the floor, who's particularly strong and powerful, and you ask him to push against you and you haven't got the means to hold that resistance, you might want to adjust your body position by having yourself side on. So in this image, the leg would actually be supporting shoulders facing towards. In this direction, there'll be using the side of that body to support that. Now, a male could do that to a female. To make the female more comfortable, a female can put their body weight into positions so they can train a male or anybody that might be a little bit of a higher muscle density than themselves, so you can make them feel more comfortable. You can lay alongside the client with a towel or a band, and give them some of these exercises maybe to do at home.

Have a look at a series of PNF stretches - do this in your practical. It's really good to get a routine together that you can give your clients. Talk to your clients and bring them into it as you go along. I do a lot of dynamic work with my clients in the beginning. I do static stretches at the end. There was a time and there are some other training providers, when it comes to group exercise instruction to do static stretches at the beginning. There is no benefit to doing static stretches at the beginning of a workout. It can be a psychological thing for people. And so what I do is I allow an opportunity for people to do any stretches they feel more comfortable doing.

So even if I'm working with an elite team and I'm writing up their warmup, their pre-game routine, I'll have lots of dynamic work in there. I'll go through the RAMP process, and I'll always allow a small section to say,

> *"Right guys, if you'd like to stretch any part of your body that you perhaps feel hasn't had a stretch so far, feel free to do so now".*

Because some people just enjoy doing static stretches - it's psychological. So should you stop them from doing it? It's not going to cause them any harm by doing it. I want to coach people: we're becoming very reliant on static stretches because we haven't got a broad archive of what dynamic movements we can do throughout the whole body. So maybe think about what sort of band movement you can do going up and over the body for the upper body actions, side leg swings, holding on to your toes, taking your hips up and down, bending your knees. Really explore a range that you can do. Build an archive.

I do take a wide range of clients where I do not do static stretches at the beginning. These are clients who

- are 60 years of age and older,
- with experience of physical activity
- a reduction in physical activity,
- no experience of physical activity at all,

and they do not pick up injuries. You really have to allow for that really good structure in your session.

So your MET (Muscle Energy Techniques) training is exactly the same as PNF, but with 10% force, resisting the stretch there. And thinking about the different positions that your client can be in and the different joint actions that you can apply resistance to.

So your static stretches, - I always like to think of as developmental stretches. I would take my clients through dynamic movements on the warmup, lots of movement base, take them through some static stretches before I would then progress into MET stretches or PNF stretches. That's my progression to these. And talk to them about how to progress those - that's one way you can introduce better stretching routines, and the guidelines between what we're trying to do and what impact that we're trying to have - and issues that can affect flexibility as well.

There are some guidelines from the American College of Sports Medicine (ACSM) for stretching. And actually, I just think a lot of people don't do this. If you look at high-elite professionals now, they're building so much more mobility and flexibility - have been from sort of the late '90s, where teams, are employing yoga instructors, Pilates instructors, doing flexibility - dance instructors are going into sports teams to help them with the flexibility work and trying to embed this as part of a full training programme.

American College of Sports Medicine (ACSM)

ACSM Guidelines for Stretching	
Frequency	Minimum 2–3 times per week, ideally 5 – 7 times per week
Intensity	3 – 4 reps per muscle group to the end of the range of motion, without inducing discomfort
Time	10 – 30 seconds for each stretch
Type	Static whole body approach

And it just diversifies. Thinking about your client who says, "I'm really sore. I can't train today," or, "It takes me a long time to recover", you can start talking about fluid intake, and actually start to talk about and change their attitude towards their training. They're not just coming into the gym to punish themselves.

Some people find the stretching process a little bit boring and tedious, but actually if you really engage them in conversation and actually set a structure where they're doing dynamic stretching - quite simply something that I take myself through, something I'm going to take my clients through.

- Come into the gym,
- a nice bit of cardio,
- something where they're sitting down,
- a cross-trainer taking out the impact,
- depending on the client, 8 to 12 minutes warmup,
- steady state cardio,
- dynamic movement,
- mobility movements,
- static stretches,
- PNF stretch, assisted or unassisted, or assisting with yourself and using a towel or a band,

your client will experience that actually they get fatigued in the sense that their body temperature will be raised, they will be sweating. And it really helps support that type of progression with them and that awareness of their training programme, reducing that injury.

When we think about how long should you hold a stretch for, whether it be static stretch - any one of them in the slides above. When it comes to stretching, what I say to clients, when it comes to static stretching, you get yourself into a position, let's say similar to the seated forward bend in the slide above, and you would take your torso over to when you feel the stretch, when you feel the resistance in the muscle group. You may not even get your hands past your knee, and you might feel the resistance. You hold the stretch there. Then you make a conscious effort to relax your entire body. The only place that should be feeling tension is the muscle group you are stretching. So go through that mental process of relaxing the muscle groups there. Visualize each muscle group that you're doing.

After a while, the tension will ease and you'll be able to push a little bit more and that will be different for each client. So when it comes to doing classes (a group exercise classes, PT sessions), they're often set to an hour or 45 minutes. You may get some clients that will want to train with you for an hour and a half or two hours. So when it comes to saying how long should you hold a stretch for, stretch guidelines are put together so we can have a start and an end to a segment of a training session. That's all it is. So if we really think that we're not perhaps getting effective stretching at the end of our sessions - if we're not really, for every muscle group, stretching, relaxing our body, and waiting for the tension to ease to have progressed that a little bit more, wouldn't it be really good if we could just, all of a sudden say,

> *"Do you know what? We're going to take out a training session today, where we were going to do high-intensity strength work. Instead we're going to do mobility stretching, - a flexibility routine."*

It's a really good thing to explore. Explore it with yourself within your own training, and see how you're going to apply that to your clients.

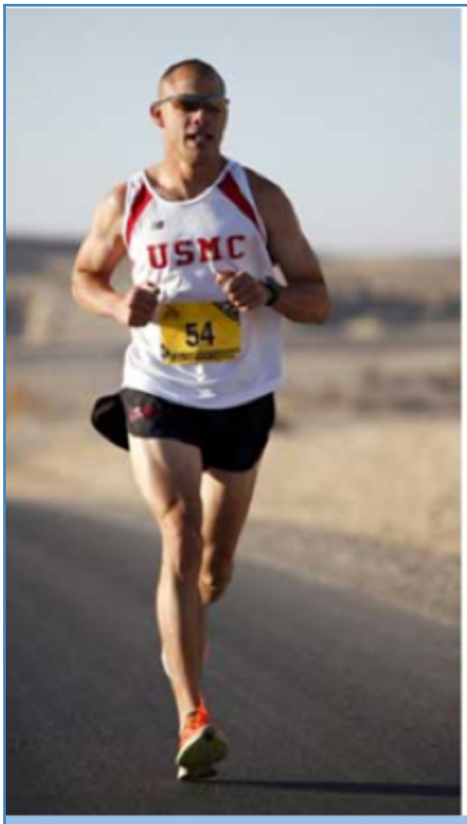
Components for Planning a Cardiovascular Session

When we're looking at this, you've got the American College of Sports Medicine guidelines, which is often the go-to text here where it goes through some real good guidelines on how often you should be doing this and the impact of that as well.

Thinking about where you want to take your client. Again, if you're looking at higher reading papers, when we start to talk about maximum heart rate and heart rate, and the flaws within - how we can monitor this. Generally, all it is, is the equation being

- 220 minus your age is your maximum heart rate.
- Divide that by 100
- Multiply by either 50, 60, 70, 80, or 90 which will give you an indication of where to train.

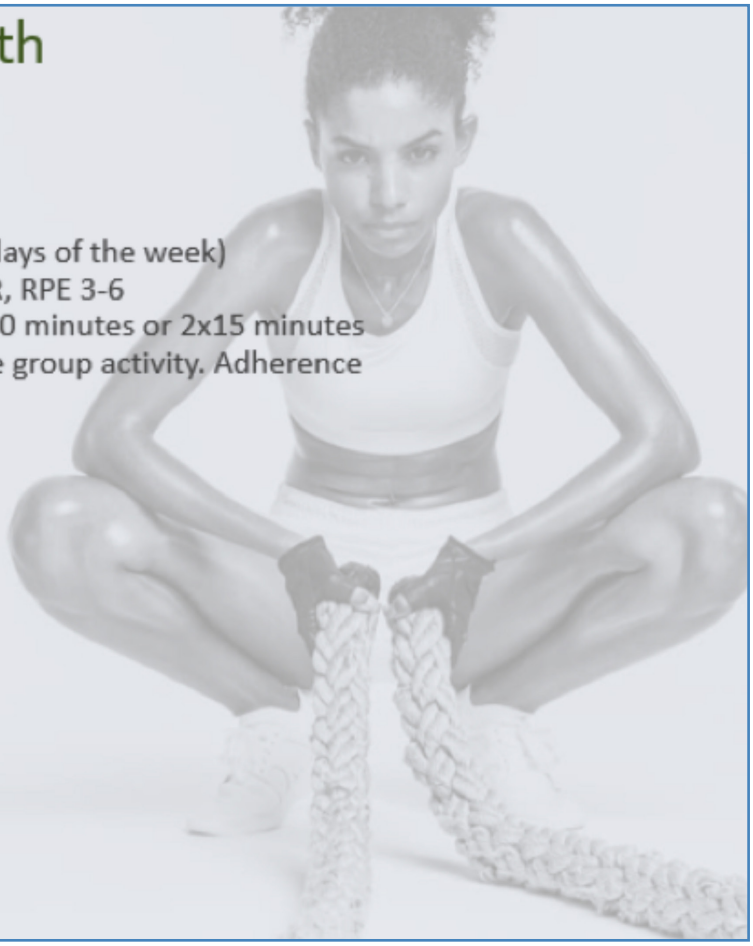
Now for me, I like to make sure that I'm aware of this because I like to do recovery runs where I only train for no more between 50 to 55 minutes, not taking my heart rate above 50/ 55% of my maximum heart rate.






COMPONENTS FOR PLANNING A CARDIOVASCULAR SESSION

ACSM guidelines for Health



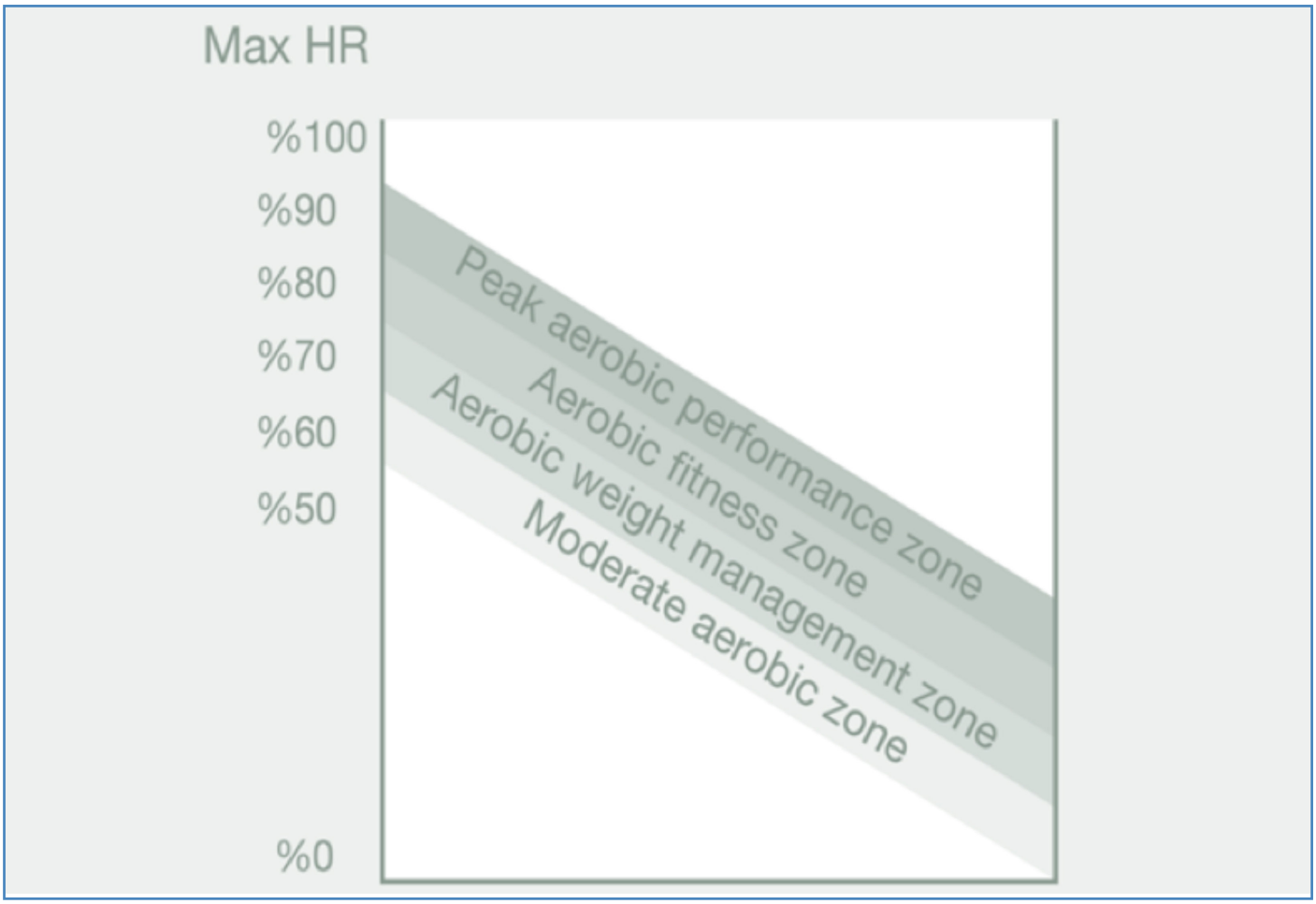
Frequency - **5-7** times a week (or most days of the week)
Intensity - moderate: 55 - 69% Max HR, RPE 3-6
Time - **30** minutes continuous, 3x10 minutes or 2x15 minutes
Type/ specificity - Large, rhythmic muscle group activity. Adherence

That's a really good recovery training system to do. If I'm doing some sort of Tabata training (high-intensity sprints training), I want my heart rate working between 80 and 90%.

If I'm looking to do a half-marathon and I'm training and I'm doing maybe an eight mile or six mile run, I want to be able to achieve that in the timeframe that I want, not really exceeding between 70 to 80%. if I could be between 60 to 70%, that's even better.

So when I look at this and when I talk to my clients about this, I talk about the efficiency of your body. Can your body perform to the demands you want and work efficiently? It's kind of like if you're in a car and the temperature starts to rise because of the way that you're driving the car and its systems are not efficient for the performance that you're trying to get out of it. It's a little bit different with our bodies, that if we keep training and we keep performing, we'll be able to get better and we become more efficient.

And I think that's a really good language to start using, just to flip the ideology there with your clients.



ACSM guidelines for Fitness

Fitness

Frequency - 3-5 times a week

Intensity - vigorous: 70%+ Max HR, RPE 5-9 (depending on fitness level and goals of the client)

Time - 20-60 minutes

Type/ specificity - Large, rhythmic muscle group activity Adherence

Monitoring Intensity

People have got watches now, smart watches that can do all sorts of monitoring. But I do think some of the subjective ones where if you're able to maintain a conversation while going for a run or while walking up the stairs, maintain focus on tasks, even when you're at exertion, this is a really good point. And you can start to link heart rate with this as well, because a client might actually say, "I'm finding this 7, 8, or 9, or even 10, where I'm actually exhausted," and they find it very difficult. But they could have a smart watch on or heart rate and they're not actually getting much above 60 to 70% of their (maximum) heart rate.

Monitor intensity

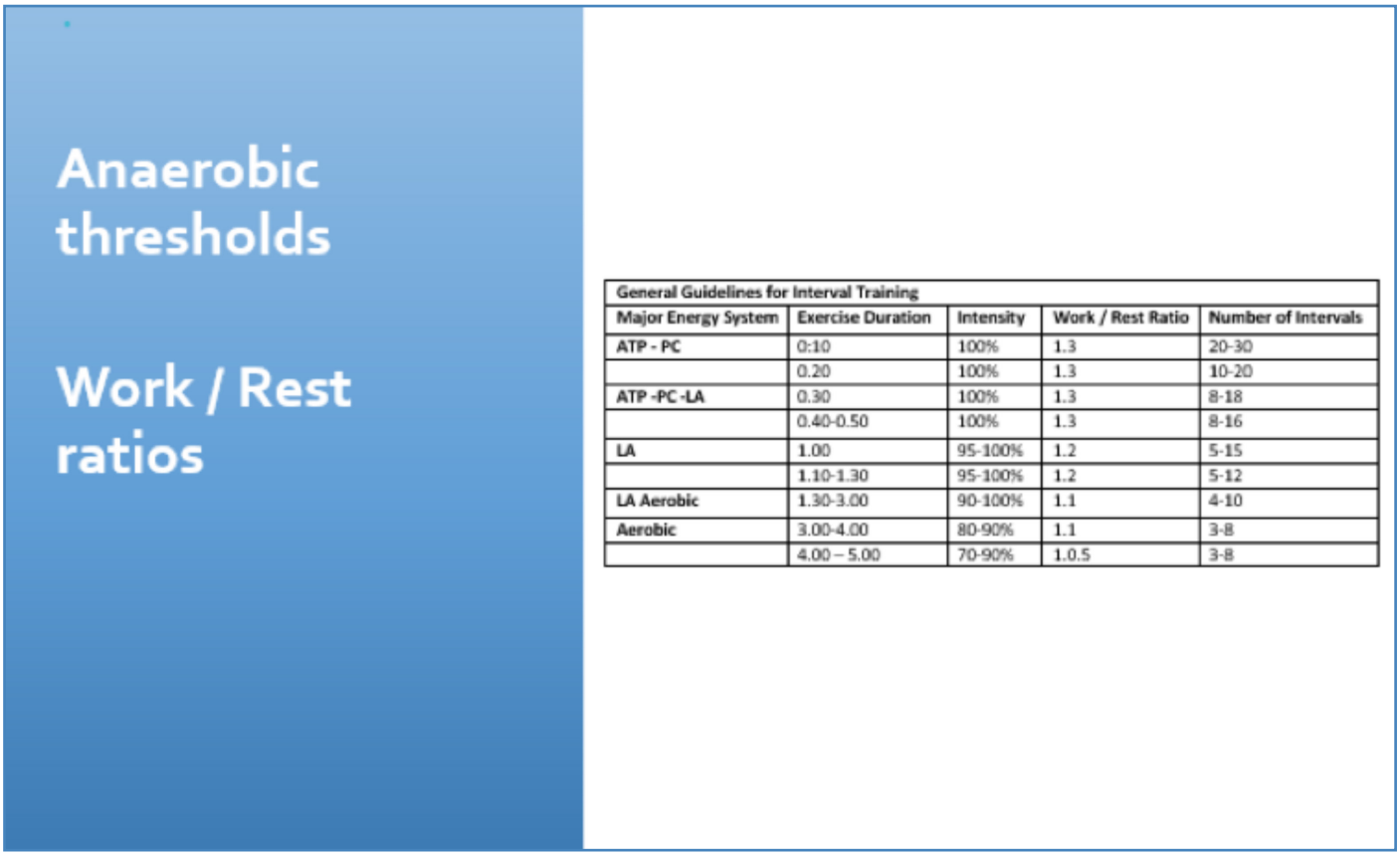
Observation
Talk test.
Rating of Perceived Exertion (RPE)
- 1-10
- 6-20

Heart rate monitoring (HR)
- maximum heart rate
- heart rate reserve/karvonen formula

How your body feels	RPE	'MHR'	How your breathing feels
Nothing at all	0-0.5	<55%	Normal/ resting
Very light/ weak	1	55% (Pulse Raiser)	Very easy
Light (weak)	2		Easy
Moderate	3	60-80% (Rewarm/ aerobic curve)	Fairly easy
Somewhat hard/ strong	4		Beginning to feel puffed
Hard/ strong (Getting warmer and starting to sweat)	5		Beginning to feel puffed
Hard/ strong (Getting warmer and starting to sweat)	6	85%	Feeling puffed
Very hard/ strong (Tiring, sweating)	7		Feeling very puffed
Very hard/ strong (Tiring, sweating)	8	90%	Breathing heavily
Extremely hard (limbs starting to feel heavy: fatigue)	9		Breathing really heavily
Exhausted/ Maximal	10	100%	Maximal. Can't do any more, must stop.

If you were to take someone's “lactic acid read” and take blood readings, which is not something that we do at Level 3 PT, that is really an indicator between the three numbers. You can have the heart rate while they're running, you can have their number feedback and their lactic acid as well. Because this is a good thing to look at. And why is it good to look at? Well, you could have clients who could be in the ages of 40 and above, and have not done any physical activity since PE at school, and perhaps a negative experience of physical activity from that. So they may not have experienced exertion for quite a few years – decades maybe. So their first experience with that could be a bit frightening. And as PTs, people that perhaps work out quite a lot, train quite a lot, it might be very hard for us to empathize with that. But it's just something to keep in mind.

I have trained clients who have felt that they were in excessive pain, and I do use that word “pain”. We know that if we feel pain, we should stop, but some clients will associate fatigue with pain, exertion of muscle groups as pain, and it's something they should do, because they haven't felt it for so long, they've been so sedentary and inactive - this is how they feel. So we need to be prepared for that. We need to coach them through that and how we can maintain and manage that, and how we could give them a recognition of actually how hard they are working.



If you're thinking about your energy systems and thinking about how we can work on different energy systems and what intensities of work we could be up, I'll allow you to read these slides in your own time. But this is really important. If we start talking about HIT training (high intensity training), think about the purpose as to why we are doing that. If you have got a good aerobic training threshold that has been developed, you won't be able to work in that elite performance level for very long, or if you've got people that work particularly in that continuous 60 to 70%, and don't stretch their window, who are perhaps getting exhausted doing eight-mile run intervals, six-mile run intervals - trying to convince them to do a one mile timed run, improving their speed to have that impact on some particular energy systems, this is something that I would definitely recommend. Just have a read and have a bit of a reflection on your own training.

I'm going to stop there and then we're going to be going into speed and strength training in the next video, so I look forward to seeing you then.