

Video Lecture 5 *(with slides)*

Fitness Testing - terminology, a range of laboratory-based and field-based fitness tests, health-screening techniques, administering appropriate fitness tests, interpreting the results of fitness tests and providing feedback.

Hello, and welcome to Video 5 of Knowledge and Application of Personal Training

Hello, and welcome back to Video 5 of Knowledge and Application of Personal Training.

We've been on such a journey of knowledge so far and, hopefully, you're starting to see how this maps across to what we're trying to achieve with you. So again, from when a client walks in to when a client walks out, what do we need to be able to know and do to offer a good personal training session?

There are lots of terminologies around the titles of personal trainers and one aspect I really like to use is the concept of "coaching". How do we coach somebody, coach somebody toward better fitness, better lifestyle performance - that's really what we're doing.

So I want to re-map and just re-visit and remind you about what it is that we're doing here. We're building a lot of content knowledge and understanding around personal training, but actually then, its **application to real life**. It's important to be able to walk on the gym floor and have the confidence to walk on any training floor or approach people when it comes to their training and understanding their needs. And how to map this knowledge across. So what you're doing is you go to your class in your training facility each week, over 10 weeks, to learn the actual applications of personal training. And you're trying to understand the context of knowledge behind that as well.

Your **Anatomy and Physiology** - why do we look at that? Well, a lot of what we're looking at there is to help us justify our choices with our training programmes.

Nutrition - we always say that 70% of training and exercise and health and wellbeing is in the kitchen and 30% is in the gym. So that's why we do have that onus on nutrition because we need to understand it to be able to apply it to our training. And then we have our **Programming** and we have our **Performance**, which is all mapped together with the fitness training programme.

When we're doing our nutrition, we need to know the limitations of our qualification, that we **cannot diagnose** and we **cannot prescribe**. There's a little bit of a grey area with that of course, because if somebody has high blood pressure, we take their blood pressure reading and we say,

"You have high blood pressure, and you can now exercise to help reduce that".

So in a sense, you have diagnosed and you have prescribed. But within the limitations and the context of our qualification, we should be looking at **empowering** our clients and thinking about why does training for some people not work. It's because we tell people what to do and generally, everybody knows what they should and shouldn't be doing and how to live a better lifestyle. But what we try to do as personal trainers is **empower** them and give them a strategy and a pathway between this knowledge to enable them to be successful with their training needs.

How do we get people on board and how do we do that?

The clue's in the name, "personal training". You need to develop a personal relationship with people. You're not going to buy anything from someone you don't like. You're not going to learn anything from someone you cannot connect with. So it's quite important that we establish that journey. We talk about it like a linear process: start to end. Now obviously, we need to link it because we want our clients to continuously come back to us. So thinking about that reward: re-assessing, re-testing.

I've tried to challenge us in the language that we're using. Try to use the language: "assess your client", "assess their needs", "look at their lifestyle performance", "look at their efficiency as they train". And if you start to use different language, different approaches, different phrases, people will relate to you in a different way. They may have had experiences of exercise, health and lifestyle - ones that are going to be positive and ones that are going to be negative. You may work with a client who is in their late 40s and 50s and perhaps hasn't done any type of formal exercise training since they did school PE and that may be their last experience of it. And it might not have been a positive one. So how are you going to re-engage that person's activity, health and lifestyle?

Also, if you Google anything health and fitness-wise, you get a lot of nonsense out there, or you get a lot of people using scientific terms either to push a product or push a service onto you to try and get money out of you one way or another. People are reading this and there's a lot of wrong

information being put out there quite frankly. And you have to try and get through all the noise with science that is common sense. So we're not trying to blind our clients with lectures on health, fitness, lifestyle and training, but we're trying to use low-level terminology and common sense.

If you are pushed to justify the things that you're doing, there should be a reason behind everything that you do and one that you should be able to justify, a competency that you're comfortable with. We're not asking you to take yourself to a high level of science out of the range of Level 3. It is good to try and push and challenge your understanding a little bit further and read additional journals and training provisions. But we are working on the gym floor

with people, and that is the nature of the business and what we're trying to aim towards.

So just flicking through all the elements that we've come on to, we're now looking at fitness testing terminology. We talked about it at the end of the last video and it's what we'll be looking at - and the terminology that we'll be looking at as well. So from a sporting context, we need to look at the physiological and psychological and anatomical states - measuring fitness, measuring and using fitness tests. So there are a range of different ways in which you can test the body with different components of fitness and elements like that as well.

Identify a starting point.

Fitness Testing Terminology



On completion you should:



1 Know a range of laboratory-based and field-based fitness tests



2 Know health-screening techniques



3 Know how to administer appropriate fitness tests



4 Know how to interpret the results of fitness tests and provide feedback.

Health

- a state of physical, emotional, and social wellbeing, freedom from disease.

Physical fitness

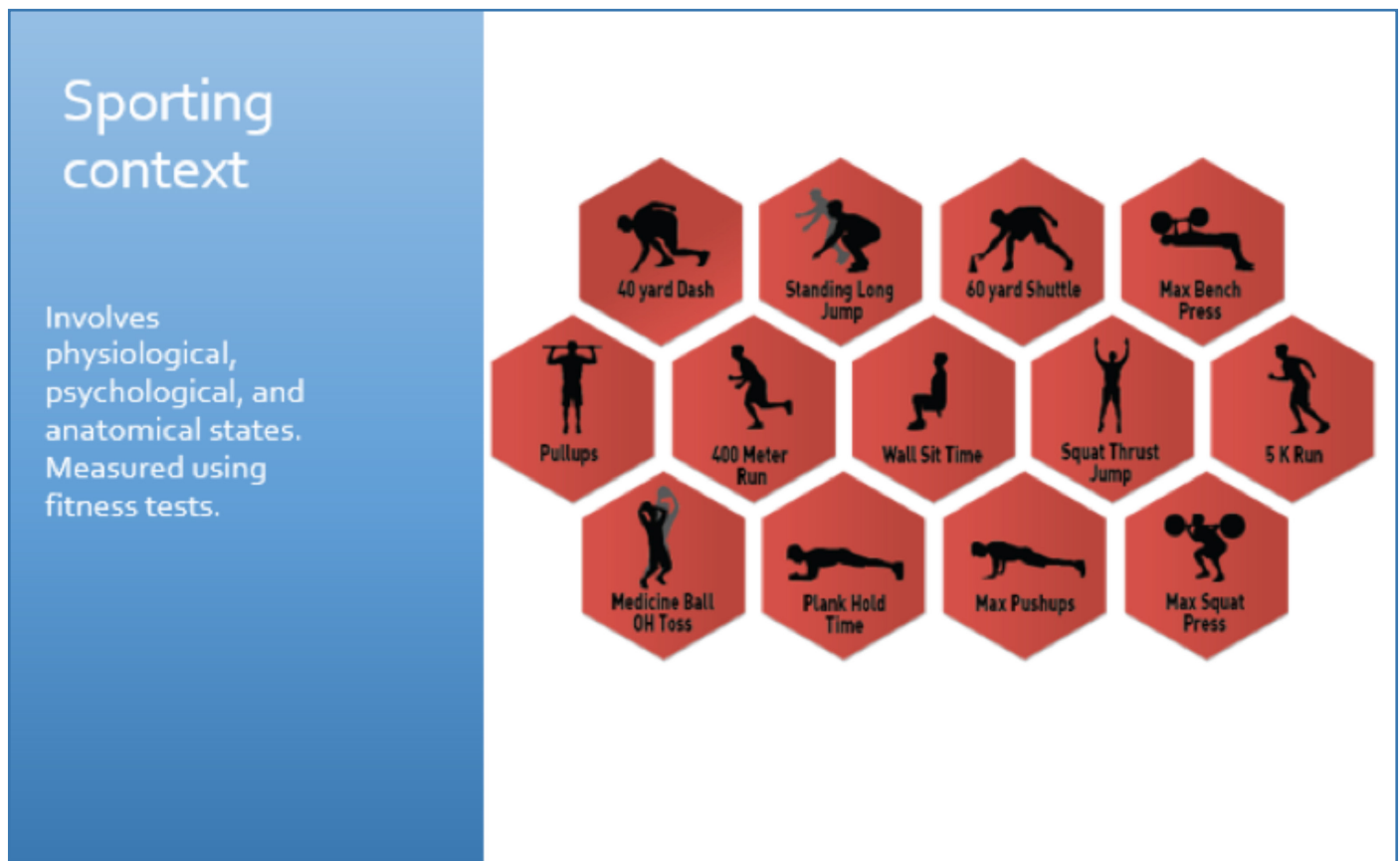
- One of the basic requirements of life - enables us to carry out daily tasks without undue fatigue. The ability to cope within your own environment.

Now I've spoken to other gym owners who have actually done tests where they opened up a Testing Day for their clients to come and attend and there has been things like, "How many pull-ups can you do", "What's your one-rep max" - and they got their scores linked to their clients.

What happened to a lot of these gyms is actually they found that their clients' retention dropped by almost 15%. Clients turn up to assessment days and they loved it because it's good fun day, they're doing their tests - a bit of competition in the air - really enjoyable and fun. But actually, they weren't getting any better with their

results. Clients were getting fitter, clients were getting healthier with the training, but they weren't getting better results with the Fitness Test Day and that's why their client retention dropped by up to 15%. And the gym owners I was talking to said that they found there was more value in attendance and monitoring attendance and supporting people literally just to turn up than it was to get quantitative objective data.

And that's what you've got to look at. What is the purpose of your test? Why are you testing? What information are you getting? How are you then going to use that information?



We may want to test our clients to see how fit or unfit they are. And do you know what? I think something that we need to move away from as an industry is "before and after" photos. I see trainers doing that all the time on themselves and their clients.

"Look at my client before, look at my client now",

That's a visual representation and I don't think that it's healthy. I don't think that's something we should be trying to push with clients. It's something that can be done on a personal basis - somebody may want to take a picture of themselves and track how they look moving forward. But actually, I'm sure we can find better ways. We do need progress reports and we need to have motivational goals. We need to be looking at the education and risk assessment and health benefits of what we're doing as well so it needs to be informed when we're working with our clients.

Purpose of Fitness Tests



1. Fitness status - how fit/unfit



2. Progress reports



3. Motivational goals



4. Fitness education - risk assessment, health benefits

Fitness tests

1. Motor fitness test - skill related exercise (e.g., basketball shooting)
2. Physical fitness test - anatomical and physiological components of a person's physical performance capacity - direct measurements of hearts rate (HR), blood pressure (BP), flexibility etc.

So we've got different types of tests that we can do. And you know what? There are so many - some that involve equipment, some that don't involve a lot of equipment, but we need to have a good understanding of each one.

You've got strength training – look at the slide with the hand-grip strength test where you squeeze it together. Now I've used this a lot with sports-specific training exercises. There has been some investigations at Level 5 and 6 where they're looking at the hand-grip strength related to cardiovascular disease, which is an interesting new emerging topic that they're looking at.

But hand-grip strength is a really good indicator of your overall health and wellbeing. It's an interesting new concept and if you look at the slide again, you'll see that it puts a data figure there. You can compare this to what we call normative data, which is published standardized data where it will say, according to your gender and age range, what number you SHOULD be getting. Compare this to YOUR number and you'll be able to determine whether you are above the national average or below the national average. And that's it, really.

Strength

Force exerted by muscles during a single maximal contraction (measure max weight lifted - 1 RM)



Endurance

Ability to sustain movement/effort over time.

Muscular endurance - ability to repeat movements without fatigue - number of press ups, chins, sit-ups etc.

Speed

Maximum rate of movement of a person over a specific distance - 30m run.



Cardiovascular endurance - ability to transport oxygen to muscles during sustained exercise.

Submaximal/maximal exercise - cycle ergometer, treadmills, step tests, 12-minute run, bleep test.

Physical fitness (sporting)

Ability to meet the physical demands made by a sport without excessive fatigue (where they can no longer continue).

So someone does a strength test, and unless you are looking at that higher-level learning where we're thinking about how it relates to cardiovascular disease and overall health, why are you doing a hand-grip strength test? How does that relate to the lifestyle performance? How will you progress that on? And it does have its relation to certain things, but you then have to determine why you're doing that test.

You've got different types of endurance, sit up tests, pushups, chin ups, different types where you're doing local muscular endurance tests. And again, if you are going to do that with a client, why?

You might work with people that are going to join the public services, whether it be the military, armed services, police or ambulance service, where you have to do tests on entry. And something I've always really enjoyed is working with people to get better at doing pull-ups and that's perhaps where the hand- grip strength test might come in and balance with endurance. But yes, being able to assess somebody - where they're at and how to build them up to be able to do more pull-ups is a really interesting avenue.

Looking at speed and the context of speed when it's related to lifestyle or sports performance.

Flexibility

Range of movement possible at a joint - affected by type of joint and muscle attachment (men vs. women). Sit and reach test.



Body composition

Hydrostatic (underwater) weighing - fat is less dense than water (bone & muscle not) - using calculations a fatter person will be lighter underwater than a more muscular person of the same weight.

Skinfold measurements - skinfold calipers measure the amount of fat under the skin (subcutaneous) at 3-5 sites of the body. Relative percentage of fat-free body tissue (muscle) and fat (men 15% fat vs. women 25%).

Excess body fat is harmful (obesity - 20% more than recommended for height / weight).



I'm always really interested in flexibility and the use of flexibility - how we can test someone's flexibility when it comes to injury avoidance and performance as well - and it's relevant to everybody. And there are lots of different types of flexibility that you can do and joint movement linked to flexibility also - some very basic tests. Obviously, you've got some advanced equipment in the Flexibility Slide but you don't always need equipment of that nature. You can have simpler equipment and if you look at the resources, we have given you the protocols of each test that you can do. (See Written Lecture 7 and 8)

Do you need to know every test and its correct protocols off the top of your head?

No, you don't.

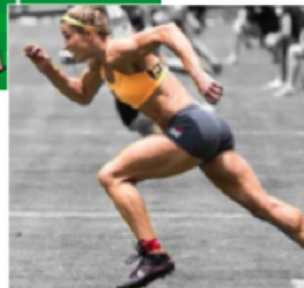
And I'll explain why a little bit further along because we're going to be looking at key terms when it comes to testing and then its application to your clients.

You can look at health and cardiovascular health. Obviously, we've always got new developments in smart technology when it comes to health and wellbeing - how we can test and assess that as well as different types of health-related equipment that you can use.

You can look at very sports-specific types of tests and actually, believe it or not, people who are looking to train for lifestyle performance do actually quite enjoy some of these sports-based tests that you can do. They're fun. They're different, they're something that perhaps the client's not done before. So maybe think about how you can diversify your training. If you're in the gym all the time working on equipment, take them outside and let's do a test. It could be just a fun, unrelated test such as the T-test that you can do with people. So do a little bit of research. Find out the different types of tests out there and think what would you do with your client and why?

CV system refers to the heart and the circulatory system. CVS contains a pump and fluid and works on pressure differences. The circulatory system is made up of arteries and veins.

Transports hormones around the body. (Adrenaline, insulin etc).

[illegible]

Decrease % body fat
and maintain or
increase lean body
mass (LBM).

So - we are thinking about key terms when it comes to testing and this is perhaps where a lot of people fall down, especially at the elite sports level.

Reliability - how reliable are the test results if you're using advanced technological equipment, smart watches, things like that. Whenever we're testing, we only ever change one aspect. So for example, if you've got somebody on a bioimpedance machine (which measures body composition), we can connect them up with electrodes which sends a mild electric pulse around the body. You can't feel it, but it can determine what your body composition is - whether the tissue is fat, muscle or water - by the amount of wattage required to move around. It gives you a feedback on a digital screen.

Now, if you get one person and you connect the electrodes up to them and you run the test and your readings are one figure, and then immediately, somebody else picks up that piece of equipment, tests your client again, can they get exactly the same number and the same data - or close to the same?

Reliability

How dependable are test scores?

Will the same results be the same if the test is repeated?

This is the consistency of test results from one test to another.

What Affects Reliability?

Environment (weather, temperature, noise & crowd)

Personal Factors (mood, health, diet)

Prior Test Experience (nerves)

Test Surface

Time of Day

Personality of Tester (encouraging)



Specificity

Sports specific to athlete:

- Runner - Treadmill Test
- Swimmer - Paddle Ergometer
- High Jumper - Vertical Jump
- Cyclist - Cycle Test

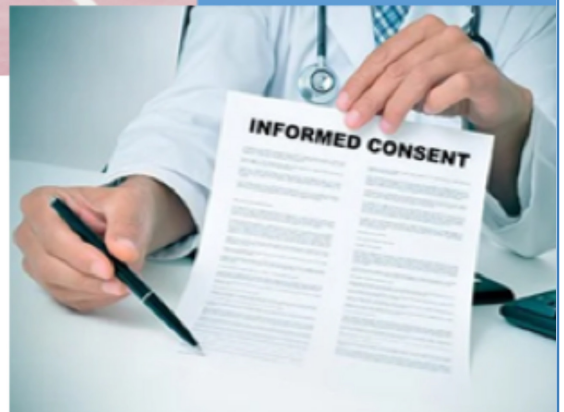


Consent Forms

People need to be willing to participate in test or exercise programme.
Consent for the implementation of the test & fully understand the test procedure.
PARQ

Validity

Does each test measure what it aims to?
A test may be valid for one purpose but not another.



Objectivity

Implies that the test produces measurable definite results.
Human error and opinion must not be allowed to influence results.
Test protocol must eliminate inaccuracies.



Eliminate Inaccuracies

Efficient and accurate recording
Same conditions repeated for each test.
Controlled warm up.
Elimination of crowd effects.

That's reliability. If you're getting lots of different readings, the test is not reliable. Or if you're using two different bits of equipment and the test results are really different with the data that you're getting, the equipment and the test is not reliable.

Being specific. Are you doing a test for a specific reason? For example, making a trampolinist-gymnast do the Mile and Half Speed Test perhaps isn't that specific to the needs of what they're doing. A more specific test for a trampolinist - a gymnast trampolinist - would be perhaps a Vertical Jump Test or Flexibility Sit-to-Reach Test. So it needs to be specific. It needs to be valid. Are we actually testing what it is that we're looking to test? If you want to test endurance and you're doing an explosive power test, that's not really relevant.

It's very important that we have **informed consent**. We talked about informed consent before - that the client is really aware of what they're about to do, the reasons behind what they're about to do and then the risks and benefits of those as well. And that perhaps we get something documented because if we're going to test someone, potentially, we're looking at pushing them to the limits of their already natural ability.

Are we being **objective** in what we're doing? If we would allow human error to influence us, do we have a strict test protocol, step-by-step that is going to ensure that we've controlled all variables. So if you're going to get someone to do something like the Bleep Test, (the multi-stage Bleep Test), and you test them on a Tuesday morning before breakfast, Thursday afternoon after a week of training and when they've had dinner or perhaps haven't had that much fluid. You've got a lot of variabilities there, a lot of inaccuracies. Can we be objective enough to remove those? That's what we're looking at with that test as well.

Thinking about skill-related tests, you might want to test someone's power, their speed, balance, reaction time, coordination, and agility.

Things that can affect someone's fitness can be their natural genetics, their gender, age, body type, training status, how experienced they are, and their lifestyle factors as well as their nutrition. Do they smoke? What's their alcohol consumption? Do they have any prescription or other drugs? What is their rest- stress ratio as well and the relationship between the two.

When you're actually considering doing tests, there are some advantages and disadvantages; the cost of the equipment and the time that it takes to administer the test as well. How are you going to transport the equipment? The training area that you might need (the facility), the level of skill of the person carrying out the test. Also - you as an individual: do you feel competent in doing the test? And is it suitable to test the person in the method that

you've selected. Talking about reliability and validity that we've spoken about already - these need to be controlled.

We're going to start looking at performance testing and taking some of the influence of that into lifestyle testing. So there are lots of different types of tests that you can do. And we've linked some of these tests up to the components of fitness as well. So if somebody comes to you with a fitness goal (a SMART goal), and you've related that to a particular component of fitness and you've related that to a training method, you need to select the correct test that's going to be valid for what you're about to do. There are some published tests that you can look at. And we've included all of the protocols. (See also Written Lectures 7 and 8)

Now believe it or not, a lot of strength and conditioning coaches and a lot of people actually construct their own tests. There is a quite notorious test called the Harvard Step Test and there's the St. Mary Step Test as well. Now the two-step tests are just very different in the sense of how their protocols are applied, but it often involves stepping up and down on a particular height of step, usually about 40 centimeters from the ground to the top: stepping up, stepping down to a set rate of steps per minute. So, there's a beat that you have to follow, anything from 120 to 150 beats per minute. You do that for about three to five minutes, and then you take your heart rate.

Now, if you've got someone who's coming to your gym and you want to do a cardiovascular assessment with them or a muscular endurance assessment, you can do the Bleep Test if you really want to do something as regimented as that. But not a lot of people are going to like that, to be honest with you. So you can come up with your own tests. There's nothing wrong with coming up with your own tests, as long as you standardize them and as long as you do them exactly the same way as you did before.

So do you have to do the actual Harvard Step Test and St. Mary Step Test? No. You can come up with your own protocol. You can have a slightly lower step if you want to. You can do: "How many squats can they do where their bum goes down to a step and back up again, repeatedly doing the squats and then assess their heart rate while they're doing that as well. Each week maybe lowering the step to get them to get a deeper squat. That's just one off-the-cuff example. But what we're trying to say is that your tests don't have to be so formal. You can actually do a test and select a test and change the protocol to match your client's training history and training needs.

It's really important to be aware of particular definitions and what those definitions are. I said before, when you start to do research, people use terminology, especially on social media platforms. They use it incorrectly and for the wrong reasons. To define something and use it in its current nature is really important. So here, again, you can just pause

these videos and start to get a little bit of an understanding of different terminology and what their applications and further training actually is. Perhaps be a little bit mindful of your own terminology. What you say and do and how you discuss things with clients can be either really successful or can be detrimental to your long-term relationship with them and their understanding of health and fitness and training. So again, just go through these, having a little look. We've talked about some of these as we've gone along, and they're just a really good reminder.

Also, it might just stop me as a teacher to maybe make sure that I've understood that when I've said "protocol" for example, you guys know that's a system of rules for using a test, a different terminology that I might've dropped in with the wider discussions. So just help your understanding that a little bit more.

Okay, guys, we're going to pause there and I will see you on Video Number 6 where we're going to look at some more health definitions and then start to talk about the impact of fitness training on long-term medical conditions. Look forward to seeing you then.

Skill Related Fitness



Speed

The ability to move the body or body parts quickly over a set distance.
<http://www.youtube.com/watch?v=By1JQFxfLMM>

Power

It is a combination of strength and speed to produce a fast/ explosive effort.

<http://www.youtube.com/watch?v=aNara4ZIEvQ>

Balance

The basic skill needed in order to keep your centre of gravity within your base of support. Maintaining stability and equilibrium.

<http://www.youtube.com/watch?v=v-KEmElymxo>

Reaction Time

The time it takes a person to respond to a stimulus and then for movement to be produced.

<http://www.youtube.com/watch?v=rrVCWddQHN8>

Coordination

The ability to execute movements of the body in co-operation with the body's sensory functions e.g. catching a ball.

<http://www.youtube.com/watch?v=BiTX-zeLoGc>

Agility

The ability to change the direction of the body at speed but within a controlled movement.

<http://www.youtube.com/watch?v=E3gqhSD-Yzg>