LECTURE 2

Introduction to Programme Design

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- **Programme Design**
- **Resistance Training**
- **Considerations when Training Beginners**
- **Training Variables**
- **Cardiovascular Fitness**

Programme Design

Programme design is probably one of the main reasons you have decided to become a personal trainer, to be able to devise programmes to help clients achieve their goals…

There are three aspects we need to discuss in this lecture.

Initially you should be aware of the three elements of programming you need to consider, which are as follows:

- Resistance exercise.
- Cardiovascular exercise.
- Flexibility.

Resistance Training

Let's look at resistance training first…

When planning resistance training there are some important things to consider…

- Programme for muscular balance – choose exercises that will allow the body to progress overall. This means making sure your programmes have a balance of anterior and posterior muscles as well as upper and lower body.
- Train 'big-to-small' – the biggest muscle groups not only require the more energy but yield the best results. They will produce the greatest training benefits, both physiologically and hormonally. They will also utilise other synergistic muscles in their exercises.
- 'Complex-to-simple' – the more complex an exercise is the more demand it will place on the neuromuscular system. For this reason, it is a far safer approach to train the client through the most complex exercises earlier in the session.

Considerations When Training Beginners

You will probably spend a lot of time working with beginner exercisers, and then helping people progress from the beginner stage through to more advanced training styles. A client who has a largely sedentary lifestyle and lack of exercise stimulus will generally also have poor body awareness and proprioception. With new exercisers you might see issues that may affect their ability to train safely and effectively, such as poor motor control and muscular compensations. The PT must consider these issues and programme exercises that will allow the beginner to progress.

These issues may include:

- Lack of strength.
- Low muscular endurance.
- Poor postural control both statically and dynamically.
- Poor exercise technique.
- Poor core stability and control.
- Low motor skills.

In an ideal world you utilise all the equipment you have available to tackle the issues above. Ideally you can progress the client to a point in which they are able to perform multi-joint (compound) movements using large muscle groups well. If they can do this with good technique, then any less-demanding exercise shouldn't be a problem. You should focus on endurance training early in their training career and progress as you move forward. Consider using a total-body approach for beginners to spread the exercise demands across the body, rather than focusing on specific areas.

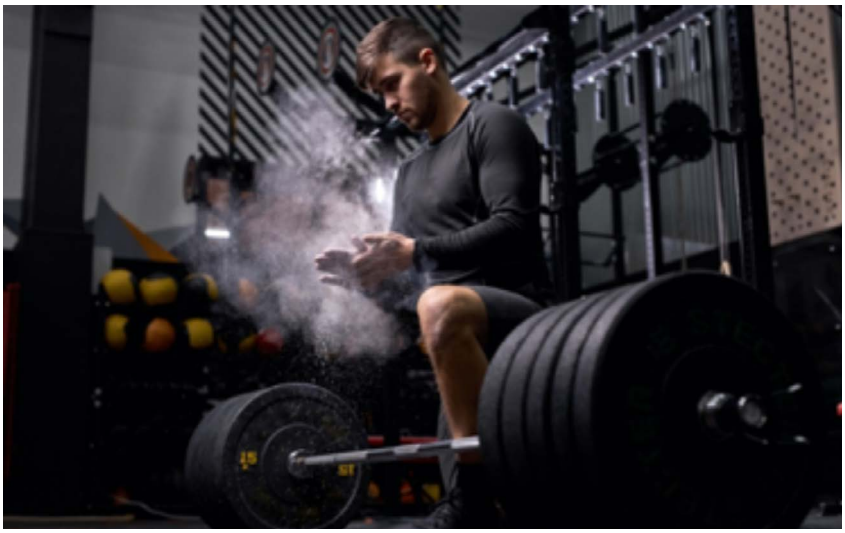
Training Variables

We will now look at the training variables for various types of goals. The body is very adaptable to the stimulus it is subjected to, and as such we need to carefully consider the exercises as well as the sets and reps we programme for our clients...

Hypertrophy

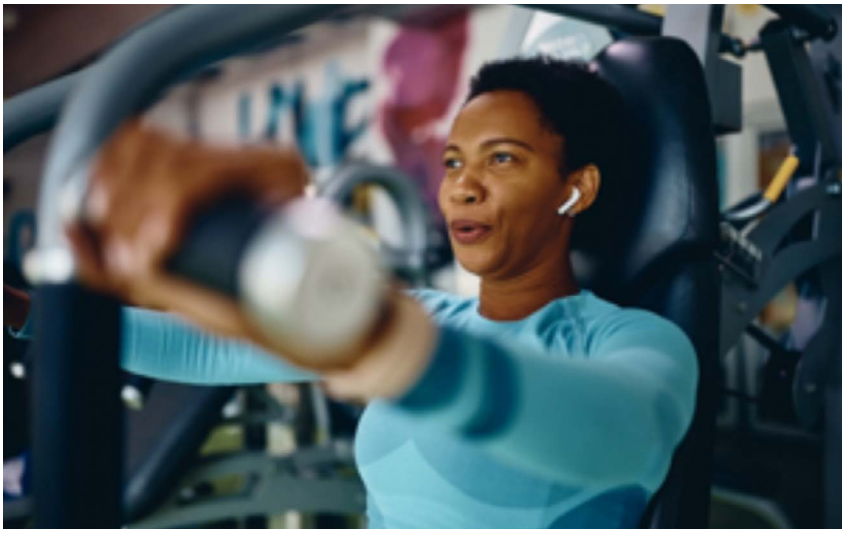
Hypertrophy is the name given to an increase in muscle size. For this type of training, we need to pay attention to the progressive overload of the clients training as it relates to local muscular stress, volume, overload and time under tension (TUT).

Strength



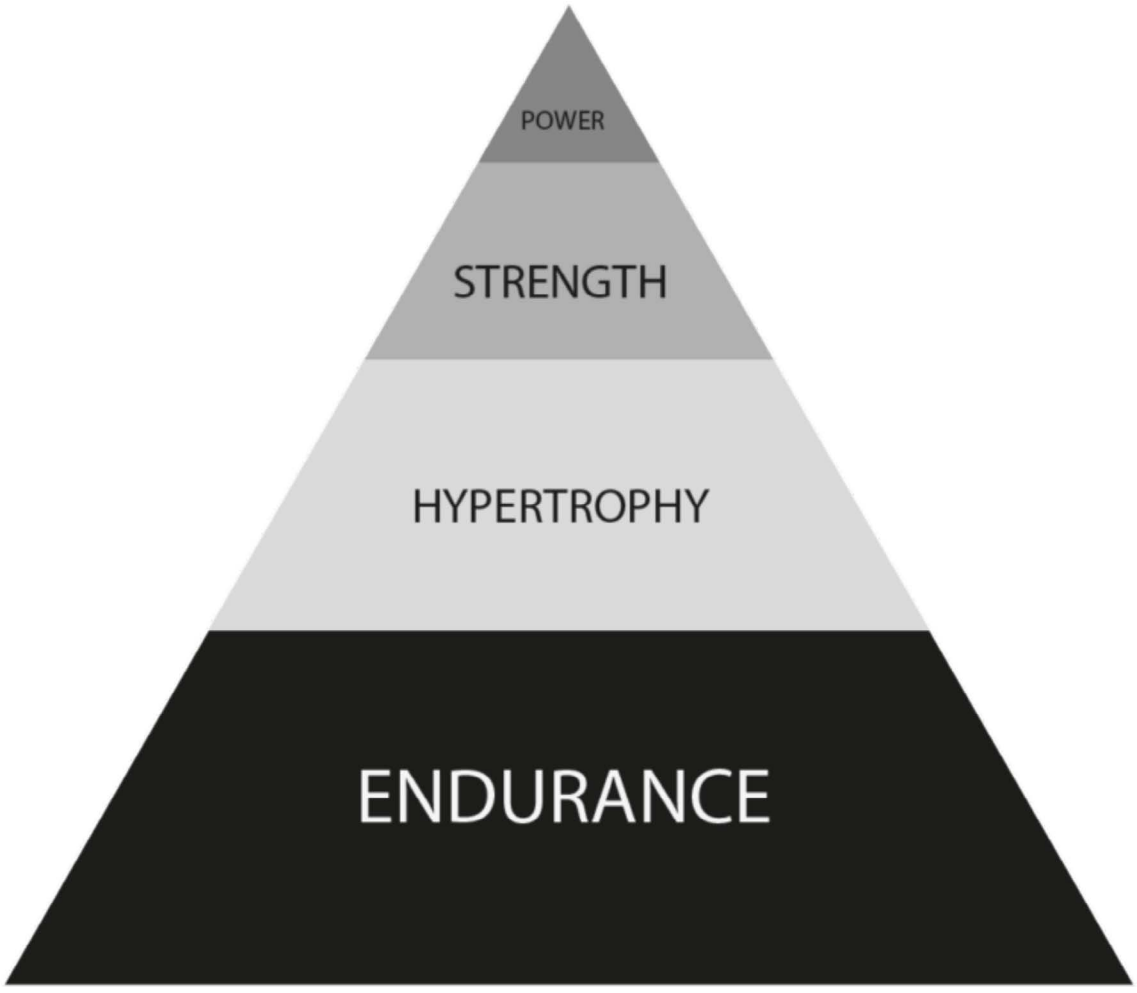
Typically not for beginners, this is an advanced training style. It differs from endurance and hypertrophy in so far as the progression is related to the nervous system primarily rather than the musculature and local stress.

Endurance



Endurance in a muscular sense is the ability of the muscles to perform a task for a prolonged period of time. We can develop this by remaining within specific training parameters that demand extended efforts.

Let's clarify what exactly we mean by endurance, hypertrophy and strength, as well as looking briefly at power training. Then we will look at how you manipulate the training variables to suit each goal.



So, the base of our training pyramid, the part that holds everything else up and forms the foundation is **muscular endurance**, the ability to consistently perform a task over a period of time without fatigue. This is also achieved through low-weights and high-reps, meaning the injury risk is low, and is a great choice for beginners. Consider total-body sessions as we mentioned earlier, and short rest periods. The body has an amazing ability to adapt to an exercise stimulus.
For this reason, the PT needs to plan well to avoid the chances of a client reaching plateau.

Split Routines

The most natural progression is from muscular endurance to hypertrophy training - which is training with high volume and low rest for maximal muscular growth. With hypertrophy is it customary to utilise 'split routines' as this allows more sets of each exercise and greater volume - which equates to muscular overload.

The split routine offers the participant the opportunity to overload their muscles more when they train as they are dedicating an entire session to specific muscles / muscle groups. This also offers more rest between training sessions for the muscles to recover. Below we highlight examples of 2-way and 3-way split routines which divide muscle groups up to ensure greater overload when they are trained…

Example of a 2-way split						
Mon	**Tues**	**Wed**	**Thur**	**Fri**	**Sat**	**Sun**
Rest	Lower body	Upper body	Rest	Lower body	Upper body	Rest

Example of a 3-way split						
Mon	**Tues**	**Wed**	**Thur**	**Fri**	**Sat**	**Sun**
Legs and shoulders	Rest	Chest and triceps	Rest	Back and biceps	Rest	Rest

Variables

What are some of the variables we can control?

Angles

Making changes to the angle of an exercise will offer different stress to the muscle. For example, changing a bench press to an incline or decline.

Rest Period

Adjusting the rest period can make a workout more difficult or easier. Reducing rest makes it harder whilst increasing can make it easier.

Exercise Tempo

The time under tension (TUT) of an exercise can be manipulated to change the emphasis. For example, you might focus on 2-0-2 in a dumbbell shoulder press which means 2 seconds lower, no pause and 2 seconds press.

Type of Exercise

Variation across the types of exercises - for example, free weights, machine, compounds and isolation.

Number of Exercises per Muscle Group

Adding extra movements for the same muscle group can increase the stimulus you put it under by working it in different ways.

Number of Sets

This will increase or decrease the overall workload.

Training Frequency

You can alter the overall training frequency to put more emphasis on either recovery or increased difficulty.

Number of Repetitions

Increasing the number of reps to make the training volume higher.

Exercise Difficulty

You can make the exercises more difficult to increase the stimulus. For example moving from a chest press machine to a dumbbell chest press.

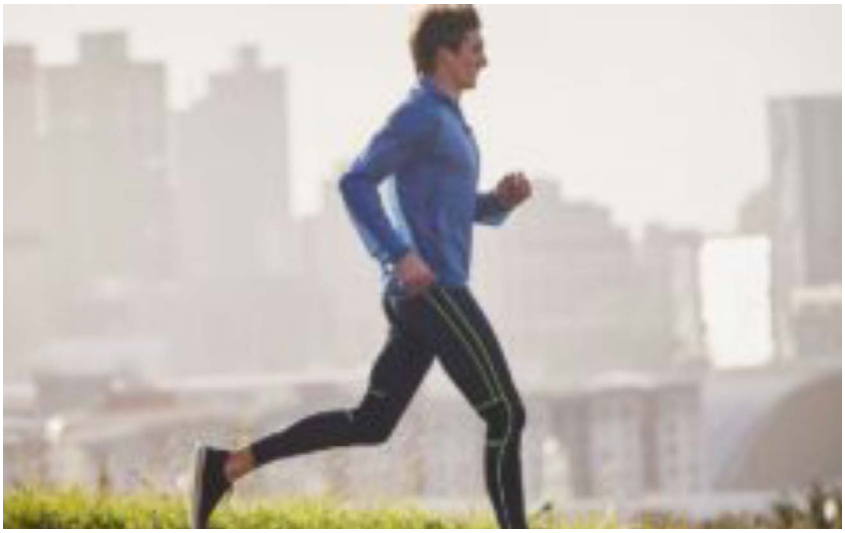
What about training strength & power?

Strength and power training are both more related to the nervous system, and its control of muscle mass and recruitment patterns. Typically, low reps with high load for strength training, and low reps with moderate load (that which can be moved quickly) will be used in power training. Neither of these training styles are suitable for new exercisers and we will discuss more around these training styles in lectures further down the list.

Cardiovascular Fitness

A person's cardiovascular fitness is their ability to take in and use oxygen. There are so many different exercise modalities that can improve this aspect of fitness, including CV machines, running, swimming and sports.
Loosely, there are three different types of cardio programme designs that you should be aware of...

Long Slow Distance Training (LSD)



Structured long duration work is excellent for building your cardiovascular foundation, and will form a big part of your training if you're planning to enter longer duration events.

The main variables you can manipulate are pace, duration and distance (and resistance if you're using CV machines such as a bike or treadmill. There will be a trade-off in terms of pace and duration however, as it will become harder to sustain the exercise as the intensity increases.

Interval Training

This consists of structured periods of work and rest that can be manipulated to achieve a number of different goals. They can be useful for fat loss, as well as increasing a participant's lactate threshold.
Interval training will be structured using a work-to-rest ratio, expressed like this –

- 1:1 which would indicate a one-to-one ratio - meaning if the participant runs for 30 seconds they get 30 second's rest. Generally the longer the rest period the harder the work period can be, assuming the work period remains the same.

Fartlek Training

Unstructured periods of work and rest. Harder to quantify and to ensure progression, but great for a PT because you can challenge your client based on how they are responding to the exercise.

It is advisable to set out some parameters for Fartlek sessions such as upper and lower limits for durations and intensity if using a CV machine. This way you have at least some basis for future sessions to compare to.

Training For Beginners

The accepted guidelines suggest that we should all attempt to take part for between 20-60 minutes of aerobic exercise 3-5 times per week. This prescription will vary based on our ability and fitness level - also the intensity will vary among different people.

Training For Intermediate & Advanced Clients

Once a client can comply with the previous guidelines and is able to achieve more, it is worth re-evaluating their goals and manipulating the FITT principle around their current ability. It might be that they want to push the intensity higher, or the duration. At this point it depends on their aspirations.

People at this stage may also wish to progress into interval training and are likely to be able to work at a higher intensity. You also need to remember the need for adequate recovery as intensity increases, and make sure the client is healthy enough to undertake higher-intensity efforts before you plan them.

HR Training Zones

Let's discuss the heart rate (HR) training zones. You can utilise these in your clients' training to ensure they are working at the right intensity. Loosely speaking you can use the equation (220 – their age) to ascertain a guide as to the clients' theoretical maximum HR, but remember this is only a guide.

Zone 1 – very light (50%-60%).
Low level effort. Improves health and recovery.

Zone 2 – light (60%-70%).
Improves low level endurance and fat loss.

Zone 3 – moderate (70%-80%).
Improves aerobic fitness.

Zone 4 - hard (80%-90%).
Improves performance capacity.

Zone 5 – maximum (90%+).
Develops maximal performance capacity.