

PRINCIPLES OF STRENGTH TRAINING

Principles of Strength Training

- Training is a complex process guided by several principles
- Training principles are fundamental guidelines that forms the basis for the development of exercise program
- These principles help the coaches to design appropriate, specific, individualised and safe program
- To get optimum training adaptation, the principles must be followed

1. Principle of Overload

- Most fundamental principle
- For a training effect to occur, overload training is required
- When a muscle is stressed beyond its normal demands, it reacts to that stress
- If the stress is greater than the normal, the muscle responds positively
- The most perplexing problem is to determine the correct amount of overload

Ways to apply overload

- Increase the weight lifted
- Increase volume of work
- Changing the exercise
- Modify the order of exercise
- Alter the rest interval
- Increase lifting velocity
- The degree of overload should be individually determined
- General overload is about 5%

2. Principle of Progression

- Progression is the change in overload in response to adaptation
- Progressive overload involves:
 - (1) The exercise that are employed in training program (simple to complex).
Regression – Progression
 - (2) Total amount of work that is done in training:
 - (a) Increase the number of reps (volume)
 - (b) Gradually increase intensity
 - (i) Increase relative percentage of one RM (50,60,70% of 1RM).
 - (ii) Use greater absolute loading with constant reps (50,55,60 Kgs)
 - (3) RM Range (8-12 RM) - Add weight after reaching the RM range

3. Principle of Specificity (SAID Principle)

- Adaptations are specific to the load
- For maximum training benefit use specific exercises
- To bring specificity
 - i) Muscles mostly involved in particular event.
 - ii) Similar type contraction
 - iii) Similar speed of contraction
 - iv) Sports Specific energy metabolism

Movement patterns

- **Movement velocity**
- **Exercise modality**
- **Free weight versus machine**
- **Open versus closed kinetic chain**
- **Unilateral versus bilateral**
- **Movement specific training (implement throw/ plyometrics)**

4. Principle of Variation

Variation is systematic process of altering one or more program variables overtime to allow the training stimulus to remain challenging and effective.

- Human body adapts rapidly stress and variation is critical for subsequent adaptation
- Systematic variation of volume and intensity is most effective long-time variation

Short-term variation

- Periodisation
- Alternation of training means, method, loading pattern etc. ↳

Short-term variation

- Variation in the magnitude of load
- Variation of type of muscle contraction
- Variation of speed of contraction
- Variation of exercises (modalities)

5. Principle of Individualisation

- People respond differently to the same training stimulus
- Individualised exercise prescription for effective training adaptation
- Personalised exercise prescription should be based on:
 - (i) fitness level
 - (ii) age
 - (iii) sex
 - (iv) training goal
 - (v) response to training
 - (vi) nutritional status
 - (vii) recovery from training etc

6. Principle of Diminishing Return

- When the athlete reaches his genetic potential, the strength gain decreases
- Beginners will experience large strength gains
- Highly trained will make small gains
- Window of adaptation is small at later stages of training

7. Principle of Reversibility

- When the training stimulus is removed the strength gains will revert back to the initial level
- De-training, reduction in frequency, volume or intensity will result in performance reduction
- The magnitude of strength loss depends on fitness of the athlete, length of training period before de-training and the duration of de-training