RESISTANCE TRAINING PROGRAME DESIGN

Dr. K. P. MANILAL
SENIOR SCIENTIFIC OFFICER
SAI, NSSC, BANGALORE
RESISTANCE TRAINING

Definition

A systematic programme of exercises involving the exertion of force against a load used to develop strength, power, strength endurance, hypertrophy of the muscular system.
RT is used for:

• Improvement of overall health
• Rehabilitation of injury
• Changing physical appearance
• Competitive sport performance.
RT is to be done:

- Under skilled supervision
- Proper instruction in form
- Breathing techniques
- Body mechanics
- Prescription of loads
Resistance Training Modalities

• Any piece of equipment that supplies some degree of resistance can be used for training strength.
• Quality strength training programme can be designed with inexpensive equipment also.
1. Body weight

- The human body is the most basic form of resistance
- Body weight exercises (squat, pull-ups, push-ups, etc.)
Body weight exercises can be made more difficult by:

- Changing grip, stance width
- Leverage
- Using unilateral versus bilateral exercises
- Increase repetitions/reducing rest intervals etc.

e.g.: push-ups, easy-way (performing on knees), difficult-legs on the chair.
However, some individuals may not be able to do body weight exercises due to large body weight.

- Effective for athletes of all fitness levels
- Equipment also can be used (dip bar, horizontal bar, benches etc) to increase the degree of difficulty
2. Partner resistance

ADVANTAGES

• Dynamic/isometric RT exercises can be performed
• Exercises can be performed anywhere
• No cost and injury free
• Low/high resistance can be applied
• Resistance can be adjusted according to the fatigue
• Adding variety
DISADVANTAGES

• Difficulty in consistently quantify resistance
• Low exercise selection/ variation
• Using partner with sufficient level of size and strength
• Exercise technique to be maintained
3. Free weights

- Weight can be moved freely in any direction
- Free weights include barbell, dumbbells, plates, collars etc.

Advantages
- Less expensive
- Less maintenance
- Greater balance and coordination
- More variation
- Can perform many exercises with little equipment
- Unilateral/bilateral exercises
• Can target CONCENTRIC, ECCENTRIC, ISOMETRIC contraction
• Allow performance of power exercises
• Easy to replicate athletic movements/skills
Disadvantages

- Greater risk of injury
- Difficult to load/unload
- Require more time to learn exercise technique
- Require spotter
4. Machines

- Several types of RT machines are available
  
  e.g. plate loaded
  hydraulic
  computerised
  cable pulley
  smith machines
Advantages

• Safe to use and easy to learn
• Easy to load/unload
• No need of spotter (smith machine)
• Easy to evaluate progress
• Some machines are multi unit (combo machines)
• Some specific exercise can be done/ excellent muscle isolation
Disadvantages

- More costly, more maintenance
- Large and heavy
- No proper development of coordination/balance
- Less variation
- May not provide enough resistance
- Difficult to accommodate individuals with different height/weight etc
5. Medicine balls, stability balls etc

- Can be used for general RT, calisthenics and plyometric exercises
- Stability ball for core strength
- BOSU balls (balance trainer)
6. Elastic bands, tubing, chains

- Provide variable resistance to athletes
- Sport specific exercises
- High degree of functionality and variation.
7. Movement specific resistance devices

- For loading specific motor skill
  e.g. power chutes, harness, weighted vests, sled etc
8. Strength implements

- Increasing popularity in recent years
- Provides specificity
- Provides different stress
- Provides unbalanced resistance

  e.g. kettle bells, tyres, sand bags, kegs (fluid filled drums)
9. Water and environment

- Fluid resistance
- Aqua exercises
  - e.g. aqua dumbbells etc
- It reduces stress on joints and skeletal system
- Good for rehabilitation
Environmental factors

- Hills
- Sand running

The decision to use a type of modality should be based on:

- Your needs
- Training goals
- Training experience