

Principles of Training and Conditioning for Physical Activities



1. **Principle of Progressive Overload:** The principle of overload suggests that in order to see an improvement in fitness (i.e., response), the dose of physical activity must exceed that to which the individual is already accustomed. The dose of physical activity is controlled by the manipulation of frequency, intensity, time, and type of exercise, otherwise known as the FITT principle. However, for overall/absolute training progress, the individual's muscles or muscle groups must be subjected to greater and greater overloads over time.
2. **Principle of Specificity:** The principle of specificity suggests that improvements in physical fitness are specific to the demands or characteristics (e.g., FITT, speed, angle, acceleration, muscle fibre recruited) imposed by the physical activity. This principle is also known as the SAID principle (specific adaptation to imposed demands).
3. **Principle of Reversibility/Regularity:** The principle of reversibility/regularity suggests that any improvement in physical fitness due to physical activity is entirely reversible. In other words, "use it or lose it." This principle suggests that regularity and consistency of physical activity are important determinants of both maintaining and improving fitness.
4. **Principle of Diminishing Return:** The principle of diminishing return suggests that the rate of fitness improvement diminishes over time as fitness approaches its ultimate genetic potential. Colloquially stated, as fitness improves, "you receive less bang for your buck."
5. **Principle of Stress/Rest:** The principle of stress/rest suggests that, following an exercise session or workout, the body requires adequate rest to recover the energy that was expended and to make repairs to the muscle tissues. The length and kind of rest depend upon the intensity of the exercise session or workout and the fitness level of the individual. If sufficient recovery time is not allowed for adaptation, fitness may decrease, fatigue may set in, and injury may occur. This is commonly referred to as over-training.
6. **Ceiling Principle:** The ceiling principle suggests that as an individual increases his or her physical fitness, the rate of improvement gets smaller to the point of no improvement, referred to as a plateau. Everyone has his or her own ceiling for improvement, which is affected by genetics (e.g., proportion of slow-twitch to fast-twitch muscle fibres). Strategies to minimize the ceiling effect include: a temporary layoff from the workout schedule, a change in routine, a change in the intensity of the workout, and cross-training (i.e., a variety of exercises incorporating cardiovascular, strength, endurance, and flexibility choices).
7. **Maintenance Principle:** The maintenance principle suggests that once an individual reaches a level of fitness that meets his or her needs, it is possible to maintain the results gained through a reduction in training frequency (up to one third); however, the intensity and duration must remain the same.

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Principles of Training and Conditioning for Physical Activities (continued)



8. **Principle of Individual Variability:** The principle of individual variability suggests that the individual response (i.e., adaptation) to physical activity is highly heterogeneous. In other words, no two individuals will respond in exactly the same way to a similar dose of physical activity.
9. **Starting Point Principle:** The starting point principle suggests that in order to bring about long-term physical changes/improvements in the way the body functions, the body must be provided with greater stress than it regularly encounters in "everyday life." The lower the baseline or starting point is, the easier it is to see improvements, and the higher the starting point is, the harder it is to see significant gains.
10. **FITT Principle:** The four variables that need to be considered when developing an exercise program are:
 - **Frequency:** the number of training sessions per week; depends on the intensity and duration of the activity to allow for sufficient recovery.
 - **Intensity:** the level of execution on how hard an individual must work to create an overload without injury.
 - **Time:** the length or duration of the workout; depends on the intensity and goals of the program.
 - **Type:** the type of exercise to meet objectives, goals, and needs (e.g., aerobic, anaerobic, resistance programs).

Refer to RM G-5: FITT Principle Guidelines.

References:

- Manitoba Education, Citizenship and Youth. *Guidelines for Fitness Assessment in Manitoba Schools: A Resource for Physical Education/Health Education*. Winnipeg, MB: Manitoba Education, Citizenship and Youth, 2004.
- Manitoba Fitness Council. *Active Healthy People: Fitness Theory Manual*. Winnipeg, MB: Manitoba Fitness Council, n.d.
- . *Resistance Training Manual*. Winnipeg, MB: Manitoba Fitness Council, n.d.
- Temertzoglou, Ted, and Paul Challen. *Exercise Science: An Introduction to Health and Physical Education*. Toronto, ON: Thompson Educational Publishing, Inc., 2003.