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**COURSE CODE: PHS 402**

**COURSE TITLE: SPORT AND AVIATION PHYSIOLOGY**

**QUESTION:**

**Discuss how 6 principles of Sports physiology training can be applied to improve athletes performance during international competition**

**1. SPECIFICITY PRINCIPLE:** According to the specificity principle, adaptations are specific to the muscles trained, the intensity of the exercise performed, the metabolic demands of the exercise, and the joint angle trained. For instance, if the goals of the training program were to maximize strength gains, then performing low intensity, high-volume exercise would not be specific to the objectives of that particular program. Likewise, one would not prepare for a marathon by concentrating solely on running short sprints.

Resistance training is often part of an athletic conditioning program with the primary objective being to improve sports performance. For strength increases to positively affect spots performance, the training program must have a high carryover to the sport. Except for actual practice of the sport, no conditioning program has 100% carryover. To optimize the transfer of strength from the weight room to the field of play, it is important to select exercises that train the specific muscles recruited during performance. In addition, the exercises selected need to place a similar demand on the neuromuscular coordination of movement that is used during performance (choose exercises that best simulate the actual movement performed on the field of play.

**2. OVERLOAD PRINCIPLE:** the basis behind the overload principle is that for training adaptations to occur, the muscle or physiological component being trained must be exercised at a level that it is not normally accustomed to. If the training intensity is not high enough (e.g., heart rate does not reach the required range), then the desired physiological adaptations that can result in an improved aerobic capacity will not be attained.

**3. PROGRESSION PRINCIPLE:** During the course of training program, adaptations occur that change the relative intensity or volume of training. In order to maintain the same absolute training stimulus (i.e., intensity or volume of training) the resistance used continually needs to be modified. This process of progressive overload is continually being performed throughout the training program.

**4. INDIVIDUALITY PRINCIPLE**: The individuality principle refers to the concept that people respond differently to the same training stimulus. The variability of the training response may be influenced by such factors as pre-training status, genetic predisposition, and gender. Many elite body builders publish their training programs, and aspiring body builders attempt to perform the same training regimen with hopes of duplicating the results. Unfortunately, more often than not, their results fall far short of their desired outcome. Although there may be many factors that relate to their disappointment, the primary factor is most likely the large variability between people in response to similar training stimuli.

**5. PRINCIPLE OF DIMINISHING RETURNS**: The principle of diminishing returns states that performance gains are related to the level of training experience of the individual. Novice weightlifters will experience large strength gains after a relatively short period of time. In contrast, athletes who have strength-trained for several years will make small strength gains over a long period of time.

The principle of diminishing returns highlights the importance of being able to interpret performance results of the athlete who is training.

**6. PRINCIPLE OF REVERSIBILITY**: Progress is rarely linear, predictable, or consistent. When an individual’s adaptation or performance levels off, a plateau has been reached. If it decreases, retrogression has occurred. A plateau should be interpreted relative to the training regimen. Too much time spent doing the same type of workout using the same equipment in the same environment can lead to a plateau. Either too little or too much competition can lead to a plateau. Plateaus are a normal consequence of a maintenance overload, and may also occur normally, even during a well-designed, well-implemented step-loading progression. Variety and rest may help the person move beyond a plateau.

However, if a plateau continues for some time or if other signs and symptoms appear, then the plateau may be an early warning signal of overreaching or overtraining. Retrogression may signal overreaching or overtraining. Reversibility is the reversal of achieved physiological adaptations that occurs after training stops (detraining).