Modern science has resulted in the growing use of computer technology to enhance an individual’s work performance. Computerized sports training programs have become popular in recent years, especially strength training and conditioning computer programs.

These programs are designed to help strength and conditioning coordinators, coaches, athletic therapists, and personal trainers better serve their athletes, patients, and clients by developing effective strength training and conditioning regimens.

Coaches can make use of a computerized strength training and conditioning program to help them develop and monitor training regimens for numerous athletes from many teams in an effective and efficient manner. The variation of training necessary for an effective program can be simplified with the aid of a computer.

Changes in performance can also be effectively monitored and recorded, thus providing important information for the next training period. Compared to handwritten methods, an effective computerized strength and conditioning program allows the user to record and keep track of large numbers of athletes. Computers expedite the entire process and eliminate many of the mathematical errors that can occur with hand calculations.

Coaches can monitor the performance of their athletes at the beginning, middle, and end of a season or training period, with little or no trouble collecting, storing, and analyzing the data. They can design strength training and conditioning programs with greater detail since changing variables such as rest periods and training volumes and intensities is made much easier.

Athletic therapists who work in an environment that has no strength training and conditioning coach often must take on these additional responsibilities. A computerized training program can greatly facilitate this process, whether it is for rehabilitative purposes or is simply the general training program for healthy athletes.

An additional benefit of a computerized training program is that athletic therapists can record injuries and the effectiveness of the rehabilitation programs they are using. The rehab program can then be easily modified as the patient makes progress.

A library of effective rehabilitation programs can be developed to make for efficient use of time. These rehab programs can be easily tailored by changing the variables such as number of sets, type of muscle action used (concentric or eccentric), or the range of motion used.

The personal trainer’s success depends on the progress of his or her clients. Personal trainers who use a computerized strength training and conditioning program would be better able to monitor progress. Progress is not simply limited to measures of strength but can also include changes in body composition or caloric expenditure, all of which can be charted in graphs and presented to the client.

Personal trainers could save time designing workouts and conducting progress tests by using such a program. These are just a few things that would make a personal trainer more professional in his or her approach to help clients achieve their goals.

**Periodization and Program Design**

A successful strength and conditioning program depends on proper use of the principles of periodization, or program variation. Periodization training principles have been adopted by strength and conditioning professionals around the world. The goal
of periodization is to enhance human performance by avoiding overtraining and enhancing physiological adaptations. Periodization organizes training programs into cycles that have distinct goals and purposes.

In the classical concept, periodization is generally separated into three cycles: macro, meso, and micro. The macrocycle is generally a year in length but it can be any length that is more appropriate for the particular sport or activity. For example, an Olympic athlete may have a macrocycle that is 4 years long.

The mesocycle, the next cycle in the periodization theory, is generally weeks to months in length depending on the person’s goals. For an athlete, the number and dates of competitions may dictate the number and length of the mesocycles used.

The shortest training cycle is the microcycle, which is often 1 week long.

Within each mesocycle there can be three distinct training periods: a preparatory period, a transitional period, and a competition period.

In addition, after every competition phase there is usually a period of active rest that helps keep the individual from becoming overtrained both physically and mentally. It typically consists of only light recreational activity. The preparatory period follows the active rest and prepares the athlete for competition.

Whether training athletes for maximal performance, helping to rehabilitate someone, or designing a program for general fitness in a healthy population, training variation is critical. Variation avoids the monotony and boredom that can occur over long periods. It also provides an ever-changing stimulus to which the body must adapt.

Training stimulus in a strength program can be changed by manipulating five acute training variables: (a) choice of exercise, (b) order of exercises, (c) volume of training (i.e., total number of reps), (d) intensity of training (i.e., % of maximum used), and (e) rest intervals between exercise sets.

If you consider all the possible combinations, it is easy to see there are literally thousands, many of which are very effective. The tricky part is to keep track of all these possibilities, and this is where a computerized program can come in handy.

In general it is important to remember that when strength training volume is high, training intensity must be low. Conversely, when training volume is low, training intensity can be high. Violation of this basic principle can easily result in overtraining and burnout. The use of an effective periodized program will help avoid these problems.

**Computer Technology—Advantages and Disadvantages**

The obvious advantage to computerized strength training and conditioning programs is the ability to do more in less time. When large numbers of athletes, clients, or patients are being trained, it is critical that the programs be tailored to each person’s needs. Such customizing of training can involve any or all of the five acute training variables listed above.

Rather than calculating and designing the programs by hand, the training variables can be effectively manipulated by computer. Another advantage is the ability to store and save training and testing data.

The disadvantages are few but noteworthy. One possible disadvantage is that an individual may rely too heavily on the computer program because of a lack of knowledge of strength training and conditioning theories and techniques. The individual might mistakenly believe that the program will make up for his or her lack of knowledge.

A computerized strength and conditioning program should not be viewed as a “black box” that does all the work for you. The operator must know something about program design. The resulting computer program is only as good at the information the operator puts into it. Instead of doing your thinking for you, it simply allows you to manage a large number of variables and programs effectively.

A lack of computer knowledge can also be a disadvantage for the user since it would prevent him or her from using the full program capabilities, or using them correctly.