

**Sore No More**



**workout**



# Gym Smarts

by **Wendy Carvalho-Ashby** and **Kevin Ashby**

Illustration by **Fred Rix**

Efficiency and diligence will improve your results in the gym.

**HOW CAN THE** average weekend warrior or amateur athlete improve strength-training results with greater ease? Many professional and elite athletes are surrounded by a team of top doctors, coaches, trainers, and nutritionists. Most amateurs lack these resources. This article will provide guidelines to improve efficiency of strength-training and overall fitness programs to yield better results.



As members of the health and fitness industry, we complete thousands of training sessions and patient visits per year with many amateur and some professional athletes. It is interesting to see how some individuals achieve their fitness goals with apparent ease, while others seem to struggle throughout their journey. You may be one of those individuals who hit the genetic jackpot and can lose twenty pounds in a short period of time, while your colleague seems to train ten times harder without achieving the same goal. Is it necessary for your colleague to work harder, or is it possible to work smarter on fitness and health goals?

Here are some fundamentals to make your workout more efficient and to motivate diligence in training.

## 1. GOAL-SETTING YIELDS PROGRESS

It is difficult to embark on a fitness journey when you are unsure of your path or what you are doing. It is more challenging to be diligent with your newfound desire to train if you have no specific end goal. Goal-setting is an integral component to consistent training and also provides motivation to support diligence with training. It is important to set both short- and long-term fitness goals that are realistic and achievable. If your long-term goal requires a long period of training, then smaller short-term goals must be set along the way to maximize motivation. Additionally, a plan must be laid out if you desire to see results for overall improvements in strength, lean body mass, endurance, power, flexibility, or even sport. See Table 1 for an example of how goal-setting may be organized with a periodized plan of action.

## 2. PERIODIZATION HELPS YOU ORGANIZE GOALS AND MAXIMIZE RESULTS

Periodization is a great way to ensure that goal-setting is organized to avoid common mistakes in training such as overtraining, inefficient programs, and plateaus in results. There are many models

of periodization; each model aims to achieve different results, depending on the goals of the athlete. It is important to clearly identify one's goals in order to set the appropriate repetitions, sets, intensity, frequency, and type of training. Progression in resistance training is necessary to stimulate changes in muscular strength, power, and endurance. Some of the key points to look for in an optimally designed strength-specific program include the following:

**a.** The program should include concentric, eccentric, and isometric muscle actions, and the performance of bilateral and unilateral single- and multiple-joint exercises, according to researchers who developed the 2009 progression models in resistance training for healthy adults for the *American College of Sports Medicine (ACSM)*.

**b.** The 2009 ACSM progression models, written by Dr. Ratames and colleagues, state that strength-training programs should sequence exercises to optimize the preservation of exercise intensity (large before small muscle group exercises, multiple-joint before single-joint exercises, and higher intensity before lower intensity exercises).

**c.** Some of the ACSM guidelines published in the 2002 *Medical Science*

*Sports and Exercise* study by Kraemer and colleagues remain unchanged in 2009. When training at a specific repetition maximum load, it is recommended that a two- to ten-per-cent increase in load be applied when the individual can perform the current workload for one to two repetitions over the desired number.

**d.** An Arizona State University study conducted by Rhea and colleagues compared single and multiple sets of weight training for strength gains in recreationally trained individuals. Multiple sets are superior to single sets for maximal strength development, according to the 2002 study, published in the *Journal of Strength and Conditioning Research*.

**e.** The 2009 ACSM recommendation for training frequency is two to three days per week for novice training, three to four days per week for intermediate training, and four to five days per week for advanced training.

**f.** A periodized program should include rest days. There should also be a change in volume or intensity throughout training cycles in order to allow for recovery and injury prevention. A program that involves persistent volume without a break may lead to non-functional training or overtraining, according to a study published in *Sports Medicine* in 2006 by Nederhof and colleagues (See Table 2).

**TABLE 1.** Twelve-Week Strength & Conditioning Periodized Program (Example for an athlete training for a Fitness Competition)

WEEK 1-4			WEEK 5-8			WEEK 9-12		
Rep, Set Range (8-12 RM, 2 Sets)			Rep, Set Range (1-12 RM, 3 Sets)			Rep, Set Range (1-15 RM, 3-4 Sets)		
Lower Body Monday & Friday			Lower Body Tuesday & Saturday			Lower Body Wednesday & Sunday		
Arms Tuesday & Saturday			Arms Wednesday & Sunday			Arms Monday & Friday		
Chest & Back Wednesday & Sunday			Chest & Back Monday & Friday			Chest & Back Tuesday & Thursday		
CARDIO								
Mon 30-min Run	Wed 30-min Bike	Fri 30-min Cross-trainer	Mon, Wed 30 30-min Run	Fri 1-hour spin class	Tues 45-min Cross-trainer	Mon, Wed 1-hr Cross-trainer	Fri 45-min run	Tues, Thurs 45-min Bike
Flexibility Saturday, Restorative Yoga			Flexibility Saturday, Restorative Yoga			Flexibility Saturday, Restorative Yoga		
Rest Thursday			Rest Thursday			Rest Saturday		
GOAL CHECK POINT:								
Weight Loss goal #1 (inches lost)			Weight Loss goal #2 (reduction in body fat %, and objective improvement in strength)			Weight Loss goal #3 (optimal body fat % and inches lost, participate in long-term goal "Event")		

**TABLE 2.** Definition and effects of overtraining, functional and non-functional overreaching

NAME	DEFINITION	DEFINITION
Functional Overreaching (FO)	Performance decrements and fatigue are reversed within a pre-planned recovery period.	FO has no negative long-term consequences; it might even have positive outcome.
Non-functional Overreaching (NFO)	When performance does not improve and feelings of fatigue do not disappear after the recovery period.	Overreaching has not been functional and is thus called NFO.
Overtraining Syndrome (OTS)	OTS only applies to the most severe cases	OTS shows similarities with chronic fatigue syndrome and major depression (MD).



### 3. EFFICIENT USE OF TIME

“Lack of time” is a common reason why people don’t fit regular exercise into their lifestyle. If time is your limiting factor try the following time-saving strategies to help improve your efficiency:

**a.** Target the weakest link: If your upper body is very strong and your legs are your weakness, try to focus your limited time training your legs.

**b.** Focus on compound exercises: Isolation exercises restrict movements to one joint and one muscle group. A common example would be the leg extension (which isolates the quadriceps) performed on specialized machines to ensure that movement only occurs around the knee joint. Such exercises are often used to help improve the mass and definition of a single muscle group. Alternatively, compound exercises involve multiple joint movements that work several muscle groups at once. An example would be the squat, which engages numerous muscles (quadriceps, hamstrings, glutes, calves, and core), while movement takes place around various joints of the lower body and core. Many athletes use a combination of isolation and compound exercises in their programs. However, compound exercises are recommended when time is limited.

### 4. REDUCING DEPENDENCY ON MUSCLE SORENESS

In 2005, Marginson and colleagues published a study in the *Journal of Applied Physiology (JAP)* demonstrating that strenuous, eccentric, strength training may lead to muscle damage, especially when the athlete is unaccustomed to that type of exercise. Symptoms include delayed-onset muscle soreness (DOMS), the presence of intramuscular proteins in the blood, and prolonged decrements in muscle function, as evidenced by reductions in strength,

power, range of motion, and rapid dynamic muscle function. The symptoms associated with exercise-induced muscle damage are substantially reduced after a second bout of unaccustomed eccentric exercise. This effect is commonly referred to as “the repeated-bout effect” and is attained even if the symptoms after the first bout are mild. A 1999 review for *JAP* by Morgan and Allen on early events in stretch-induced muscle damage states that the speed of this training effect is more rapid than improvements in strength or fibre-type conversion, which require weeks or months for a substantial effect. It is important to note that concentric exercise produces much less muscular damage than eccentric training. A properly periodized training program should have a combination of concentric and eccentric muscle training.

---

You can train as hard as you like, but if you are not eating right, it will limit your results.

---

An over-reliance on muscle soreness as an indicator of exercise effectiveness should be avoided. It is clear that, due to the “repeated-bout effect,” symptoms of muscle soreness will eventually decline, and an athlete may not “feel” the same after each workout. Hence, it is important to pay attention to overall improvements in strength and performance rather than rely solely on muscle soreness as a gauge for the effectiveness of a training program.

### 5. SEEK PROFESSIONAL HELP

As practitioners, we want to highlight the fact that sometimes other factors (such as overtraining, injuries, metabolic or hormonal disturbance, and disease) may play a role in dampening progress. When an athlete has maximal diligence with goal-setting and laying out a program but

continues to see little improvement or progress, it may be necessary to consult with a professional. It is important to have your workout technique and intensity reviewed. Oftentimes gym-goers fall into the category of having “repetitive error syndrome,” which is, simply put, a habit of poor technique. Having a personal trainer or fitness professional examine your technique can save you hours of inefficient time spent in the gym.

In addition, proper nutrition is essential to progress in and out of the gym, and clearly a topic worth an entire article itself. Consulting with a nutritionist, dietician, or other health professional could help you organize caloric intake or expenditure and proportions of essential macro- and micro-nutrients needed for your sport or activity. You can train as hard as you like, but if you are not eating right, it will limit your results. Furthermore, training with an injury is inefficient and may lead to more serious long-term complications. It is important to consult with a health professional such as a chiropractor or physiotherapist for a proper diagnosis or assessment if you continue to train while injured. Oftentimes, a simple assessment will lead to the prescription of preventative and restorative exercises, which will yield faster healing, progress, and eventual goal attainment.

Efficiency and diligence are essential keys to a successful strength and overall fitness training program. In order to maximize the potential of your program, it’s important to start with a specific set of goals and a periodized plan. Time constraints, scheduling conflicts, and an overreliance on muscle soreness often challenge persistence during your journey. Ultimately, consulting with a professional may help to improve technique and increase the overall effectiveness of a fitness plan of action. ■