H.I.T. HIGH INTENSITY TRAINING
NEWSLETTER
Reliable and Sensible Information on Strength Training and Conditioning
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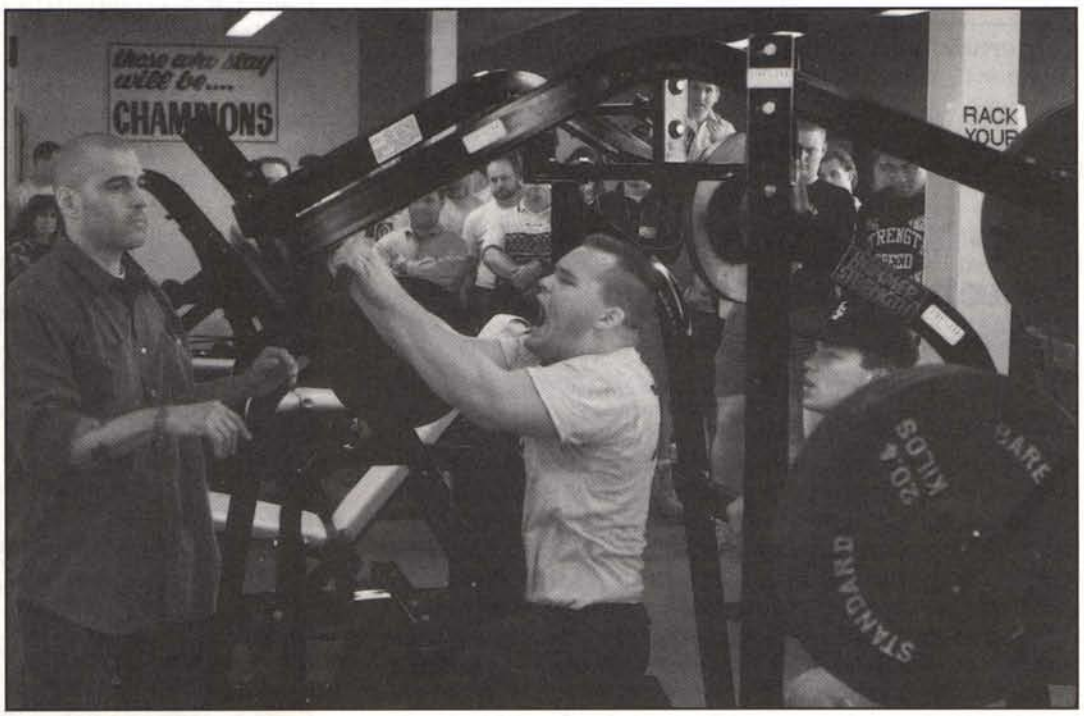
Purposeful Training

By Dr. Ken E. Leistner

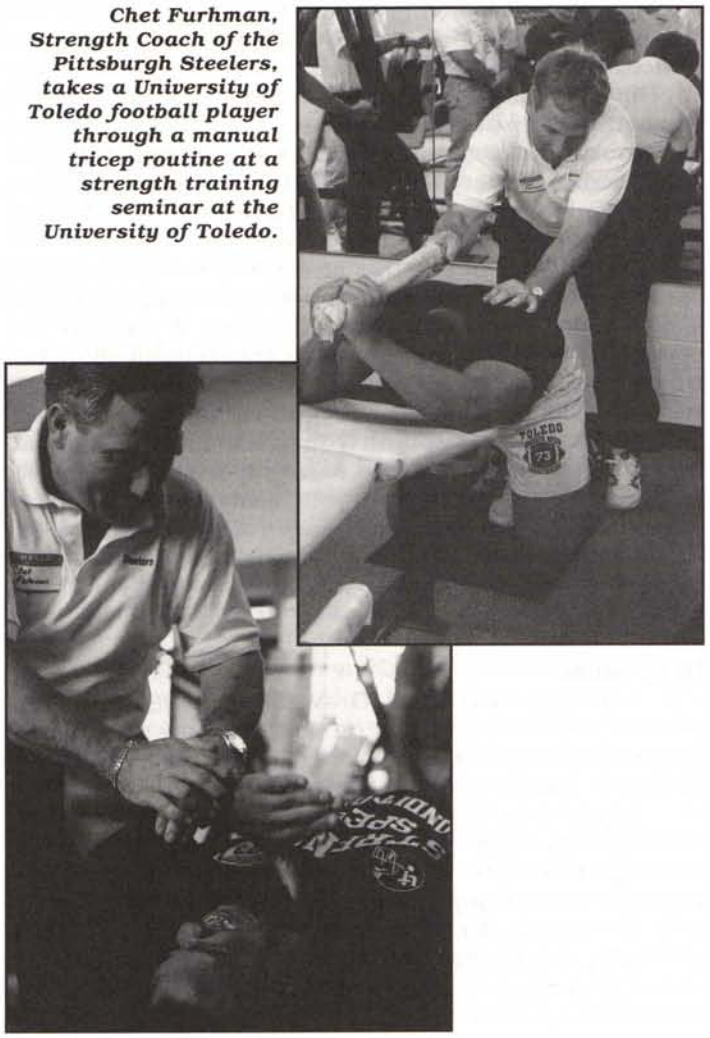
When I first began my weight training activities, I was fortunate because I did almost everything correctly. I used a limited number of basic multijoint exercises that provided work for the major muscular structures of the entire body. I did one or two sets of each movement, using as much weight as I possibly could for 8-20 repetitions per set. I would usually terminate a set when I could no longer push out another complete or correctly performed rep. I trained three times per week, but often had to cut that back to two when very tired or involved with other athletic activities. Without knowing a damned thing about proper strength training procedures, I became very strong and gained approximately fifty pounds of muscular bodyweight in a two year period, much of that coming in my first six months of proper training.

Note that I said that most of my gains came in my first months of proper training. Like most youngsters who are interested in getting bigger and stronger, I read most of the available muscle building magazines. My first few months of barbell work was patterned after the routines I saw in these publications. Although I worked as hard as I thought was possible, my progress was limited. I shunned the heavy basic work for easier isolation type movements, just like the "champs". Having a certain amount of naturally occurring strength, I was puzzled as to my lack of progress. Fortunately, I more or less stumbled upon the common sense principles that were not within the magazine pages, but which truly promote increases in muscular size and strength, and was well rewarded for my efforts. Over many years of training, I would occasionally leave my own garage, basement, or loft for the stimulating environment of a commercial gym or club. Unfortunately, I would often be influenced, as most trainees are, by the lifting activities I was exposed to. In literally every instance, my progress suffered because I was swayed from my usual training procedures.

Training has to be purposeful to be effective. Every rep and every set has to count for something. I believe that one can make progress on almost any type of routine if he or she works hard at it, but training should be efficient, providing maximal gains in the briefest period of time. This includes time spent in the gym and the accumulation of training time over weeks, months or years. Training must lead to the attainment of a goal. One of the major problems with most strength training programs designed for football players is that most of the emphasis is placed upon the lifting of heavy weights, not necessarily the increasing of strength specifically for improvement as a football player. Powerlifters do many things in the gym that are either unnecessary for or counterproductive



Dr. Ken Leistner spots Greg Roman on a set of Hammer Strength Hi rows at a strength clinic at the University of Toledo.



Chet Furhman, Strength Coach of the Pittsburgh Steelers, takes a University of Toledo football player through a manual tricep routine at a strength training seminar at the University of Toledo.

enough. He is well respected and extremely knowledgeable. I can recall conversations we had in the late 1970s and early 1980s when he was directing a center in New Jersey and his experience speaks for itself. This is another positive. Fred has seen and worked with many, many athletes and presents what I feel are realistic stepping stones to an overall goal. Many similar programs are presented by those who just don't combine knowledge with the type of experience Fred Koch has.

The organization of the plan into an annual "goal" to be reached with incrementally smaller parcels leading to that goal is basic, yet well presented and often missed by the training public. Like anything that is for sale, it is dressed up; "Size and Strength", "Maximum Mass Phase", "Growth Activation Phase" are terms designed to capture one's attention. I am from the school of thought that believes every "phase" of training is for the purpose of developing size and strength, and activating growth! The use of training percentages is based on one rep maximum "tests" which I don't believe is viable except for the competitive lifter. I believe that keeping accurate records, varying the exercises used, rep schemes, number of exercises per workout, number of workouts per two or four week period, etc. provides all of the "cycling" one needs, but this is my opinion. The fact that the Ironman System utilizes percentages based upon well spaced one rep tests does not make it a "bad" system. The organization that this procedure plugs into can certainly keep the trainee well directed towards an overall long term goal, and realistically, many trainees enjoy doing a one rep max as they "feel strong" doing it.

The primary purpose of the program, in addition to providing an organizational framework, is to avoid overtraining. While I may believe that doing multiple sets in most exercises will in fact lead to overtraining, the emphasis on the basic movements and the constantly repeated theme that the typical bodybuilder reduce the amount of work being done, is very positive. Realistically, if the typical bodybuilder followed the Ironman Program, they would in fact be undertraining relative to their usual quantity of work I'm sure. The basic physiology materials are good and easy to understand. Again, for the trainee on his or her own it is very valuable.

In summary, one could do a lot worse to have this "system" in their library. Dr. Koch has gone to great lengths in producing a marketable yet useful system of training that presents many sound and fundamental tenets of training. While I don't agree with some of the procedures, I believe it can be very valuable for taking a "typical" bodybuilder or bodybuilding type and bringing him or her closer to what I believe proper training methodology is.

Abdominal H.I.T.

By Matt Brzycki
Strength Coach,
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The importance of strengthening the abdominals (or "abs") cannot be overemphasized. The functions of the mid-section include flexion, lateral flexion and rotation of the torso as well as flexion of the hip. Collectively, the muscles of this region keep the abdominal organs compressed and assist in forced expiration (as during vigorous exercise). Therefore, virtually all sports require the use of the abdominals to some degree.

Basic Anatomy and Muscular Function

The abdominal muscles can be divided into two groups: the upper and the lower.

Upper Abdominals. The upper abdominal wall consists of four pairs of thin muscles arranged in layers connecting the rib cage with the pelvic girdle. The muscle fibers run in three different directions: diagonally, vertically and horizontally. This myological arrangement helps to strengthen the abdominal wall and to stabilize the trunk.

The external obliques are the outermost covering of the three layers on both sides of the abdomen. The fibers of this broad muscle form a "| /" across the front of the abdominal area, extending diagonally downward from the lower ribs to the pubic bone. The function of the external obliques is lateral flexion to the same side and rotation of the torso to the opposite side.

The internal obliques lie immediately under the external obliques on both sides of the abdomen. These fibers form a "/ |" (and inverted "| /") along the front of the abdominal wall, extending diagonally upward from the pubic bone to the ribs. The function of the internal obliques is lateral flexion to the same side and rotation of the torso to the same side.

The rectus abdominis lies on the same layer as the

internal oblique. It is a long, narrow muscle that runs vertically across the front of the abdomen from the rib cage to the pubic bone. The fibers of this muscle are interrupted along their course by three horizontal fibrous bands, which give rise to the phrase "washboard abs" when describing an especially well-developed abdomen. The rectus abdominis flexes the torso toward the lower body.

The transverse abdominis is the innermost layer of the abdominal wall. It is the thinnest of all abdominal muscles and its fibers run horizontally across the abdomen. The primary function of this muscle is to constrict the abdomen such as during respiration.

Lower Abdominals. The lower abdominal muscles are primarily the illiacus and the psoas major which are located on the front hip area. These two muscle are often jointly referred to as the iliopsoas, since they have a common tendon of insertion. The main function of the iliopsoas is to flex the hip (bring the knees to the chest).

General Guidelines

The following general guidelines apply when training the abdominals:

1. **Exercise the abs at the end of your workout.** Remember, the abdominals stabilize the rib cage and aid in forced expiration. So, it would not be wise to fatigue your mid-section early in your workout since this would detract from your performance in the other exercises that involve the larger, more powerful muscles (i.e. the hips, legs and upper torso).

2. **Exercise the upper abs before the lower abs.** For example, when performing a conventional sit-up, a person uses his rectus abdominis and iliopsoas (or hip flexor). The iliopsoas is the "weak link" in executing a sit-up. This means that your hip flexors—i.e. your lower abs—will fatigue well before your upper abs. Therefore, it would be a mistake to pre-fatigue the hip flexors first because you'd then weaken an already weak link thereby limiting the effect of the exercise on the upper abdominals.

3. **Perform all exercises in good form.** Good form is raising the weight without the use of momentum in about 1 - 2 seconds, pausing distinctly in the contracted (or mid-range) position and lowering the weight under control in about 3-4 seconds. This will ensure that your abdominal muscles are raising the weight (rather than momentum) and that your chances of incurring an injury while strength training are minimized.

4. **Avoid hyperextending the spine.** People frequently complain of low back pain while executing abdominal exercises. This is usually the result of having relatively weak lumbar extensors, performing the exercise incorrectly or a combination of the two. For instance, sit-ups (or any variation of a sit-up) should be performed with your knees bent and your chin tucked into your chest. This will help keep your lower back flat, thereby reducing the amount of stress placed on it during the performance of the exercise. Under no circumstances should the so-called "Roman Chair" sit-up be done because this particular movement hyperextends the spine and places undue stress on the low back area. In the case of weak low back muscles, strengthening exercises (such as back extensions) should be prescribed.

5. **Keep tension on the abdominals throughout the entire duration of the exercise.** As an example, your abdominals are used during the first 30 degrees of a conventional bent-knee sit-up movement (with respect to the horizontal). So, its not necessary to bring your torso all the way up to your legs. In fact, when performing a bent-knee sit-up you should stop before your upper torso goes beyond a point that is perpendicular to the ground. In addition, don't let your head touch the sit-up board between reps. Otherwise, you'll take the tension off your abdominals allowing them to rest and momentarily recover.

6. **Reach momentary muscular failure between 8-12 reps (or 40-70 seconds).** Momentary muscular failure may best be defined as that instant when it is literally impossible for you to perform another repetition in good form. It is not necessary to perform thousands—or even hundreds—of repetitions in order to strengthen the abdominals. The abdominals should be treated like any other muscle group. Once the activity for the abdominals exceeds about 70 seconds in duration, it becomes a test of endurance rather than strength.

Exercises

The following is a specific description of various abdominal exercises which can be performed using conventional equipment:

1. **Sit-ups.** Perhaps the most traditional movement for exercising the abdominals is the sit-up. Unfortunately, this exercise is usually performed improperly. The correct starting position for a sit-up is to lie down on a sit-up board and place your feet under the roller pads. Your knees should be bent so that the angle between your upper and lower legs is about 90 degrees. Fold your arms across your chest and lift your head off the board so that your chin is tucked into your chest. To do the movement, bring your torso up until it is almost perpendicular to the ground. Pause briefly in this position and then lower yourself under control to the starting position (don't let your head touch the sit-up board). Avoid throwing your arms and/or head forward as you perform the exercise. Once you can perform a set of 12 reps in strict form, you can increase the workload on your muscles by holding onto a weight, by increasing the incline of the board, by performing the exercise slower or by having someone apply manual resistance to your shoulders.

2. **Crunches.** A "crunch" is actually a modified sit-up with a restricted range of motion. The beginning position for a crunch is to lie on the floor and place the backs of your lower legs on a bench or a stool. The angle between your upper and lower legs should be about 90 degrees. Placing your legs on a bench or a stool in this manner will cause your iliopsoas muscle to relax, thereby reducing the load on your lumbar spine. Fold your arms across your chest and lift your head off the floor so that your chin is tucked into your chest. (You can also keep your arms flat on the floor at your sides.) To do this movement, bring your torso up as high as possible. Pause briefly in this position and then lower yourself under control to the starting position (don't let your head touch the floor). Once again, avoid throwing your arms and/or head forward as you do the exercise.

3. **Side bends.** The external and internal obliques are generally the weakest of the abdominal muscles. One of the best movements for exercising the obliques with conventional equipment is a side bend. The starting position for this exercise is to stand upright and hold a dumbbell in your right hand at your side. Spread your feet about shoulder width apart and position your left hand against the left side of your head. Without moving your hips, bend your torso to the right as far as possible. To begin the movement, pull your upper torso to the left

as far as possible. Pause briefly in this position and then return the weight under control to the starting position. After performing a set for your left side, repeat the exercise for the right side.

4. **Torso twists.** The obliques may also be strengthened with twisting movements of the trunk. The movement is basically the same as either the sit-up or crunch described previously except that instead of bringing your upper torso straight up, you turn or twist your torso to the side during each repetition.

5. **Knee-ups.** A knee-up is a productive exercise for training the iliopsoas and the lower portion of the abdominals. To assume the starting position, reach up, hang from a chin-up bar and cross your ankles. To begin the movement, simply bring your knees up to your chest, pause briefly in this position and then lower your legs under control back to the starting position. Once you can perform a set of 12 reps in strict form, you can increase the workload on your muscles by performing the exercise slower or by having someone apply manual resistance to your upper legs.

Addressing The Issues

In a recent issue of a popular magazine high intensity training was criticized as being non-motivating, unproductive for high school and college athletes, and hated by all who try it. It is the purpose of this article to address several points 1) What kind of training is safe for adolescents? 2) Is high intensity training truly unproductive and we just don't know it? 3) What motivates athletes and why do they hate high intensity training?

Issue #1 Training the Adolescent

By Dr. Paul Kennedy

Controversy has persisted for many years concerning the safety as well as the efficacy of strength training by prepubescent and pubescent adolescents. Much of the confusion and rancor stems, at least in part, from a failure to understand the differences between strength training and weightlifting and the contribution of strength training to musculoskeletal development.

Basically, strength training is a noncompetitive form of eliciting increases in strength from the muscle tissue, while weightlifting is a competitive endeavor concerned with performance on one repetition maximum lifts. The difficulty in the strength training profession is to separate the competitive mentality and the purported but unproven 'carryover' of certain exercises and lifts accomplished in the strength training facility.

Many well-meaning but misinformed and dogmatically directed coaches insist on 'explosive' movements and single repetition maximum lifts as the consummate indication of strength for a suspiciously wide variety of sports and activities. These relationships, or the "How much can you bench?" mentality, can many times be counterproductive and even dangerous. In a pubescent or adolescent population, it can be downright irresponsible. One must remember that the strength training facility is a place to gain strength (in all the musculature, not just a few muscles), and not merely to demonstrate it.

The American Academy of Pediatrics uniformly rejects weight lifting for prepubescent children due to its high potential for injury. Indeed, a 1982 report from the National Electronic Injury Reporting System showed nearly 70,000 injuries nationwide related to weightlifting activities, with many of these injuries occurring during the prepubescent and teenage years. The solution to the controversy, then, lies in the technique.

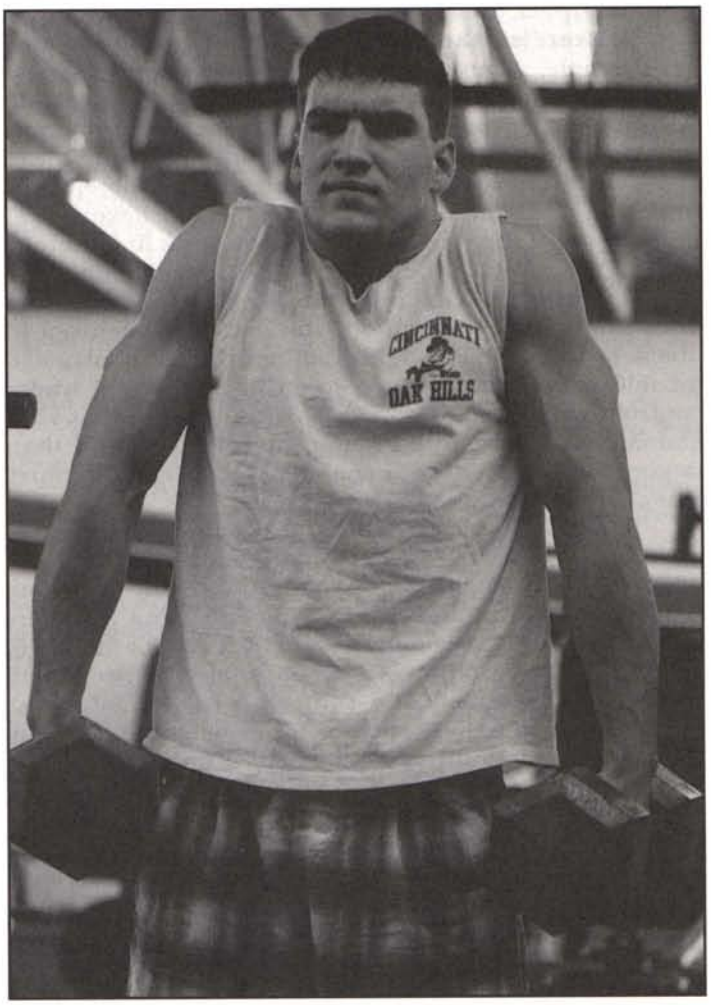
Two questions

The questions surrounding the efficacy of strength training can be reduced to two areas. Does strength training produce gains in strength in younger children and adolescents? Is there an unacceptable risk of injury in the pursuit of these strength gains?

Strength training regimens for adolescents, as opposed to weightlifting, have been shown in recent studies to produce noticeable and significant gains in strength with no apparent musculoskeletal trauma or reduction in flexibility (1,2,4).

The area of greatest concern is, of course, injury to the growth plates. Evidence does exist that skeletal trauma and damage to the epiphyses can occur. One recent study (6) found that the power clean resulted in a lumbar ring apophyseal fracture in an adolescent trainee. Once again, the difference between weightlifting, or lifting in an 'explosive' manner, and strength training must be understood so as to avoid these types of musculoskeletal trauma.

It is well documented that increases in strength can reduce the level of sport-related injury and lessen the recovery periods after them. Additionally, some psycho-



Corey Hinton, a 6' 195lbs. high school football and baseball player, has increased his muscular size and strength as a result of high intensity training.