Strengthening The Abdominals

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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 "V" 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 "Λ" (an inverted "V") 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.

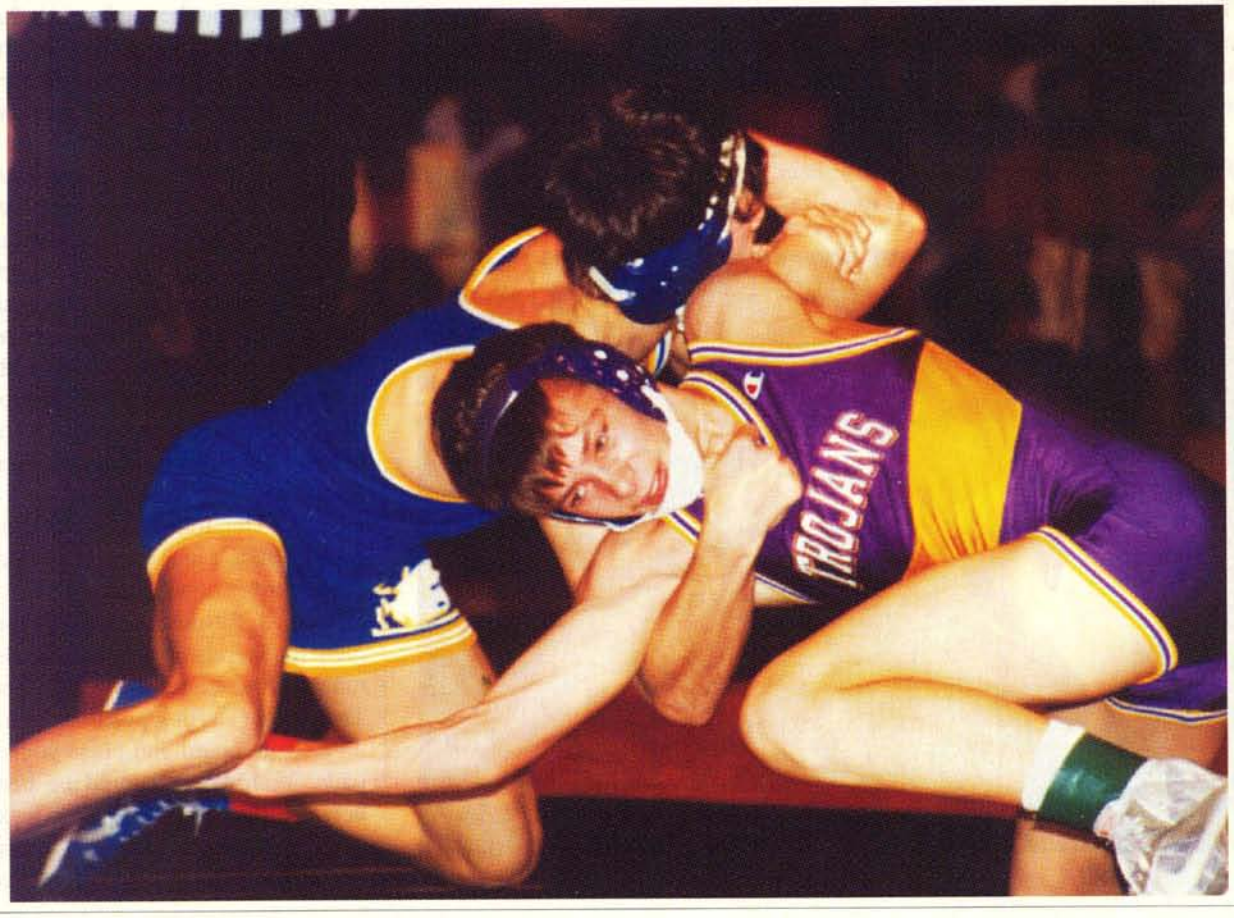
The transverse abdominis is the innermost layer of the abdominal wall. It is the thinnest of all abdominal muscles and its fibers run horizontally across the abdomen. The primary function of this muscle is to constrict the abdomen such as during respiration.

Lower Abdominals.

The lower abdominal muscles are primarily the iliacus and the psoas major which are located on the front hip area. These two muscles 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



South Carolina - Ryan Harvey of Northwestern reaches for control but loses 11-8 to Clay Cavanaugh of Lexington in the 103 lb. South Carolina State finals. Photo by Mark Buford

apply when training the abdominals:

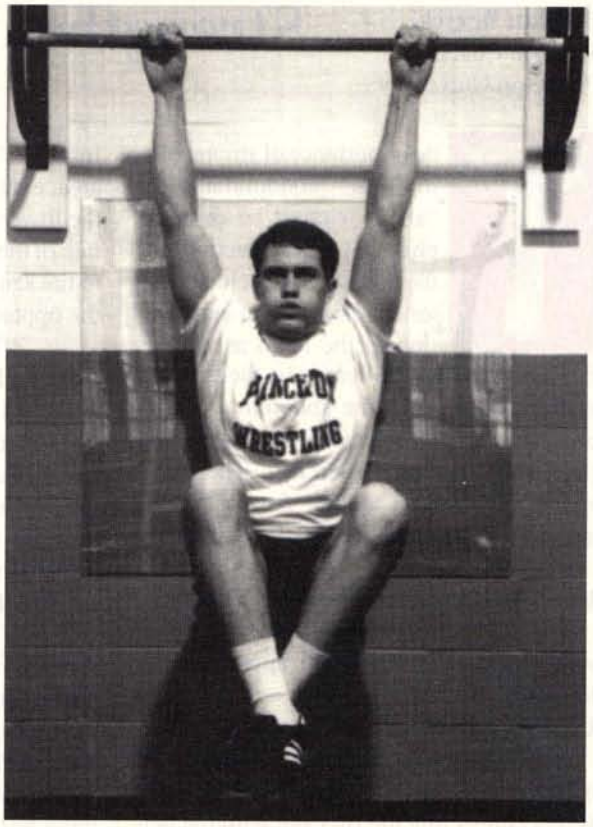
1. Exercise the abs at the end of your workout. Remember, the abdominals stabilize the rib cage and aid in forced expiration. So, it would not be wise to fatigue your mid-section early in your workout since this would detract from your performance in the other exercises that involve the larger, more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



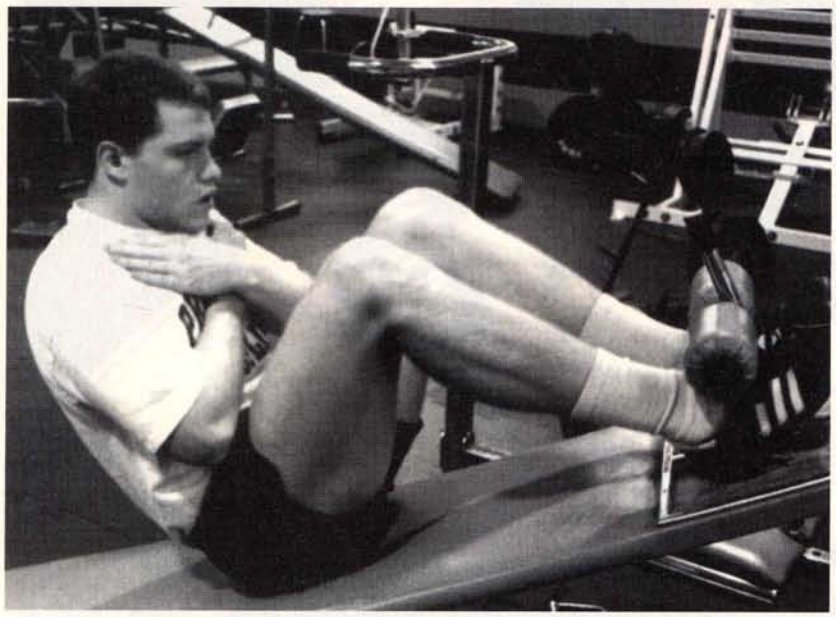
KNEE-UPS

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 an 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



SIT-UPS

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. ○