Exercise Technique:

The torso abdominal pull-down and torso abdominal crunch

Bert L. Fairbanks, Ph.D.
University of Lethbridge
Lethbridge, Alberta, Canada

Although the torso abdominal pull-down and torso abdominal crunches are two of the best exercises for strengthening the abdominals and strengthening and sustaining the lower back region, they are unknown to the majority of exercise specialists and almost completely unknown to most fitness enthusiasts. These are excellent exercises for reducing the unsightly and voluminous protrusion of the abdominal wall (pot belly: usually a combination of weak abdominal muscles and excessive fat deposits) which has almost become a universal tradition in adult males over 30 years of age. Because the length of the head, neck and trunk is much greater than the distance from the hip joint to the knees, it is absolutely necessary to have an elevated kneeling platform to allow for this exercise to be carried through a full range of motion. When working with heavy resistance this platform must be secured to a base to ensure its absolute stability.

Muscles Most Involved

The abdominal girdle, the rectus abdominis, external and internal obliques and the transversus abdominis are the muscles most involved. The rectus abdominis is a relatively long, slender muscle that runs vertically down the abdominal wall from the chest and sternal area to the pubic symphysis and the crest of the pubic bone. The medial tendon originates from the pubic symphysis and the lateral tendon originates from the crest of the pubis. The insertion is the anterior surface of the xiphoid process and the surface of the costal cartilages of the 5th, 6th and 7th ribs. Functionally the rectus abdominis compresses the abdomen, supports the abdominal viscera and is active in forced expiration. In relation to abdominal exercise its most important function is that it flexes the pelvis and vertebral column. It is divided into a right and left half and is separated by a flat tendinous strip or aponeurosis about one inch wide called the linea alba.

The rectus abdominis is the major and most obvious of the abdominal muscles. It has a slight curvature as it passes under the aponeurosis of the inner muscles to attach to the pubic bone.

The external and internal obliques cover the sides and front of the abdomen lateral to the rectus abdominis. The external oblique originates from interdigitating slips from external surfaces of the lower eight ribs at the upper end and inserts into the anterior half of the outer lip of the iliac crest, also into a wide aponeurosis of the anterior abdominal wall at the lower end. The fibers run diagonally downward and inward from the upper origin on both sides of the abdomen and form the letter “V” at about the same angle that would be formed by an individual placing his hands into his front trouser pockets.

The external oblique is located directly underneath the external oblique and its fibers run at near right angles to the external oblique fibers in the middle and upper portion of the abdominal wall to form an inverted “V”. The fibers originate from the lumbar fascia, the anterior two-thirds of the middle lip of the iliac crest, and from the lateral two thirds of the inguinal ligament. The upper fibers insert into the cartilages of the last three ribs, and the remainder spread fan-like into an aponeurosis extending from the tenth costal cartilage to the pubic bone, forming the linea alba in the ventral mid-line of the anterior abdominal wall.

The external and internal obliques both perform the same basic functions which are: compressing the abdomen, supporting viscera, acting in forced expiration and acting to flex the vertebral column approximating the thorax and pubis
anteriorly. Both of these muscles are involved in lateral rotation to the same side. Both are also involved in rotation but the external oblique is involved in rotation to the opposite side, while the internal oblique is involved in rotation to the same side.

The transverse abdominis originates on the inner surfaces of costal cartilages of the lower six ribs, the middle layer of lumbar fascia, anterior two thirds of inner lip of iliac crest and lateral third of inguinal ligament. The fibers run transverse or horizontal and insert into the linea alba by means of a broad aponeurosis, and the lower fibers insert into the pubic crest and pecten of pubis. This muscle acts like a girdle to flatten the abdominal wall and compress the abdominal visera. It also helps to stabilize the linea alba and thus helps to facilitate more efficient trunk flexion by the other abdominal muscles.

**Muscle Action**

In this exercise the muscles perform spinal flexion in which the upper torso is rotated downward and proximally describing an inward arc toward the pelvic girdle. This is much like the basic action involved in the regular sit-up but the resistance of the weight stack is more uniform since it is working directly against gravitational pull throughout the range of motion. There is also more freedom of muscle action since the base of support is the lower legs rather than the pelvic girdle and sacroiliac area which are somewhat restricted by a supporting base in the conventional sit-up.

**Sports**

The torso abdominal pull-down is important in all sports and especially in those sports that require maximum abdominal strength for lifting the legs up high or in forcefully flexing the trunk, or for rotating the trunk. The abdominals form a keystone area in transferring and coordinating lower and upper body movements. For example, gymnasts need strong abdominals and hip flexors in raising the legs to a 90 degree angle or higher in many of the stunts executed on the apparatus and in free exercise. Throwers and hitters as seen in track and field, baseball, football and racquet sports need strong abdominals for forceful trunk rotation in execution of their skills. Body builders, especially women, need strong abdominals to maintain a relatively flat lower abdominal wall, which is so important in posing and also in maintaining good everyday postural form.

**Execution**

Kneel on the elevated platform facing the pull-down cable attachment, with the dorsum of the foot extended over the posterior protrusion of the platform. This allows one to stabilize the body, especially when sufficient muscular strength and endurance is developed to require heavier poundages to give adequate resistance. The trunk should be fully extended but not in hyperextension, and the hand should have a firm grip on the pull-down cable attachment in a comfortable position just over the top of the head (Figure 1). Keep your arms in the same flexed position throughout the entire exercise, during both the concentric and eccentric contraction phases. Pull your head and

![Figure 1. Torso abdominal pull-down begins with trunk fully extended, hands gripping the cable attachment.](image1)

![Figure 2. Pull head and elbows down and backward toward the trough of the platform.](image2)

![Figure 3. For an abdominal crunch, lower the body until the hamstrings rest on the back of the lower leg.](image3)
elbows down and backward in a continuous arc toward the "U" trough of the elevated platform (Figure 2). Avoid sitting down on the backs of the lower legs as this utilizes body weight and inertia to accomplish the exercise rather than putting the major stress on the abdominal muscles. To obtain maximum range of motion, in the last portion of the concentric contraction try to bring the head in and up toward the pubic symphysis as far as possible. Return to the initial position and repeat the movement as many times as you are able.

2. Avoid the tendency to allow hyperextension of the trunk when returning to the starting position for each repetition.

3. To perform the exercise in the same way as the abdominal crunch exercise, lower the body until the hamstring muscles are resting on the back of the lower leg (Figure 3). This will limit the range of movement somewhat because it will isolate the hip joint flexors out of the exercise so that the abdominal muscles are required to do all of the work. Repeat the exercise as described above but always maintain contact between the hamstring and lower leg, so that no cheating actions from the hip joint flexors can assist in performing the movement.

4. If you perform this exercise correctly you will experience a feeling of complete muscular contraction and control that you cannot duplicate in any other abdominal exercise. With selectorized resistance you can readily select the right resistance to properly facilitate whatever stage of development you are at in your abdominal conditioning.

5. Abdominal exercises are often recommended for helping in lower back support and stability. This particular exercise, if done correctly, will add stability and support to the lower back which will help to both alleviate and avoid nagging back problems.

---

**BUMPERS U.S.A**

**Solid Rubber**

45 lbs. BLACK
35 lbs. RED
25 lbs. BLUE

**Colored Bumpers**

Saves wear and tear on olympic bars and floors - Protects the athlete.

**Contact:**
Barrett Murphy
504/383-6932

**MANUFACTURED BY:**
Call or Write:
Nick Antonino
Qualiform, Inc.
350 State Street
P.O. Box 28
Wadsworth, Ohio 44281
216 / 336-6777