

To AJKA-International  
AJKA-I of PA  
Instructor Trainee's Report #11

Subject: **“Body Rotation Power in Karate”**

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In karate, there are three ways for a karateka to create power and to transfer the force into the target: body vibration, body rotation, and body shifting. Rotation is developed by the circular motion of the body mass. The purpose of rotation is to make distance, generate power and take a position against an opponent. Control of rotation is centered on the use of the hips. Through the use of hip rotation it is possible to create very powerful techniques in a small space.

The force generated by hip rotation is nearly as powerful as that developed by shifting the body weight. Rotation is more subtle than body shifting, since the movement is smaller. Hip rotation is most effective at close range, usually about an arm's length away from an opponent. Because of this one of the most common uses of hip rotation is with blocking and counter-attacking combinations. Hip rotation can be used from almost any stance but is most commonly used in the front stance, back stance and the side stance.

Power is defined as the amount of work done. It is equivalent to an amount of energy consumed per unit of time. Power is a combination of strength and explosiveness. It is created by releasing maximum muscular force at maximum speed. To increase power, you must increase both speed and strength. By exerting strength with speed, you take advantage of both the force generated by the muscles and the momentum created through the speed.

Power is derived from muscular ability. The human body contains over 400 muscles that can be broken in two classes: smooth and striated. Smooth muscles are those that perform the involuntary functions of the body like circulation and digestion. Striated muscles are those that can be voluntarily contracted, such as the muscle groups in the arms and legs. These muscles are the source of power.

When rotating in karate, one starts from a position of stable balance and remains stable throughout the process, unlike body shifting where one starts out stable, then passes through a short period of imbalance, returning again to a position of stable balance. Using body rotation, one's center of gravity does not move laterally; instead, it rotates. If the center of gravity moves at all, it does so vertically by dropping.

As we have discussed in early papers, a person's center is called *tanden*, or more specifically *seika tanden* - "below the navel". The *seika tanden* is located inside the body in your abdomen (*hara*) area. It is located at least two finger widths down from the bellybutton for a male (55%) and three fingers for a female (56%).

Since body rotation is using one's center you are using both hip and muscles in the abdomen to create the rotation. The abdomen muscles are made up of two types of Striated muscles fibers: slow-twitch (type I) and fast-twitch (type II). **Slow twitch fibers** give you stamina, not explosiveness. Slow-twitch muscles help enable long-endurance feats such as distance running. They have a high capacity for aerobic energy production and can remain active for a long time while producing relatively small amounts of lactic acid. This is important because lactic acid

build-up in the muscle tissue causes the muscle to fatigue and eventually renders it unable to continue working.

**Fast twitch** gives you explosiveness but they do not have good stamina. Fast twitch muscles are used in powerful bursts of movements like sprinting. Fast twitch fibers have a great capacity for anaerobic energy production, which allows them to produce intense power and speed of contraction. This intensive work also causes them to accumulate large amounts of lactic acid and fatigue quickly.

Fast-twitch muscles break down into two categories: moderate fast-twitch (type IIa) and fast-twitch (type IIb or IIx). Moderate fast-twitch muscles are thicker, quicker to contract, and wear out more rapidly than slow-twitch. Fast-twitch, the most powerful and lowest in endurance and are activated when the body nears maximum exertion. During aerobic exercises such as running or swimming, slow-twitch fibers are the first to contract. When the slow-twitch fibers become tired, fast-twitch fibers begin to take over.

There are two basic ways that force is generated and controlled. The contraction of a muscle is determined by the types of muscle fibers recruited and the firing rate of the neurons within the muscle. The voluntary contraction of a muscle begins with the recruitment of the smallest units of slow twitch muscles. These muscle fiber groups have the lowest response threshold, create the least amount of tension and are the most resistant to fatigue. As muscle tension increases, more muscle fiber groups are recruited from the larger fast twitch fibers. As tension continues to rise, fewer motor units need to be activated because the large fast twitch units contain more plentiful and more powerful muscle fibers. But because these large fibers are the ones that generate peak tension in the muscle, they fatigue quickly and require more recovery time.

Proper rotation requires proper posture. The spine is vertical, the head sits straight upon the shoulders and the stomach muscles are under slight tension, which tucks the gluteus beneath the spine. This will allow for the greatest speed of rotation around one's center. The greater the rotation speed, the greater the power generated.

For Americans the movement should look familiar since it is utilized in various sports – such as baseball or golf. The baseball player stands with his feet and hips perpendicular to the path of the oncoming ball in a side-facing position. As he begins his swing he steps towards the pitcher and moves his forward foot outward and rotates his hips as he begins the swing of the bat. As he finishes the swing his feet will be about one shoulder' width apart and his hips will face directly towards the pitcher. There is no doubt that the baseball player used the rotation of his hips and body in order to give power to his swing. The hip rotation used in the baseball player's swing is almost identical to the execution of a karateka's reverse punch.

The karateka stands in a left front stance. His left hand is in the downward blocking position and his body is in a half stance. This means his hips are in line with the path that his fist will travel as it goes from his hip to the target. The punch begins with his hips being rotated counterclockwise toward the opponent. As they turn about one-half of the way forward the karateka will begin his punch. His hip and fist complete their movement at the same time. Just

like the baseball player, the karateka cannot get any power into his punch without moving his hips. One of the factors that help to develop power through body and hip rotation is the principal of centrifugal force. This requires that the hips be rotated sharply with a snap.

As master Nakayama's research indicates, the hips and lower abdominals are the basis for proper body movement. When the hips and seika tanden work together they enable the body to generate tremendous power. When your core muscles are connected and working in unison the rest of your body can become relaxed and your movements are much quicker and stronger.

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