TOPIC OF THE MONTH FOR MARCH 2010

HOW CAN KICKERS AND PUNTERS INCREASE POWER?

Imagine yourself as the quarterback for a winning Super Bowl team. You survived the season because your eyes read opponent defenses, your hands allowed you to execute plays (without you looking at the ball as you handled it), and your feet carried you automatically to correct spots for protection and execution. How successful would you have been if you were restricted to standing on only one leg for every hand-off or pass?

Increasing power in kicking and punting is not a simple matter of gaining body strength or body mass. In fact, adding muscle mass can seriously decrease power potential if flexibility and balance are lost. Power for throwing footballs, swinging baseball bats and golf clubs, and shooting basketballs comes from two feet helping the hips shift body weight, with the back arched and the muscles in the lower back controlling movement, timing, and strength. Restricted to one foot, the athlete would have to land on that foot with the back/body already arched .... and with perfect balance on each repetition. The "landing" on that foot would dictate the efficiency of any arm or torso movements.

Power for kicking and punting footballs also comes primarily from the butt and lower back, not from the quadriceps muscles on the front of the kicking leg thigh. The formula for power in kicking and punting has the same basic variables as the equation for power in swinging a baseball bat or a golf club:

POWER = THE DEGREES OF ROTATION (OF THE KICKING FOOT OR GOLF CLUB HEAD) ON A PERFECT CIRCLE TIMES THE SPEED OF ROTATION

Individual variables include leg length, body height, kicking leg lock at knee and ankle, flexibility of the hip joints, stability of the torso, and balance on the plant foot. Even a "perfect" swing is hostage to the balance on the other foot; poor footing or shifts in balance pull the kicking foot out of alignment for the swing path to strike the football in the optimum spot. Golfers struggle for years to find the "perfect" swing, and they are gripping the club in their hands and standing on two feet.

Unless bunting, the baseball batter starts with the tip of the bat somewhere behind the head or shoulders. That means the bat tip has been rotated approximately 180 degrees backward on a circle parallel to the ground that starts over the plate. During the swing, the bat tip gains momentum moving around the circle, transferring power to the baseball if the two objects connect. As the batter's body shifts and pivots, the bat continues on its path for at least another 90 degrees. (Backswing = 180 degrees, forward swing = at least 270 degrees.)

Unless putting, a right-handed golfer starts with the golf club head somewhere above and outside the left shoulder. That means the club head has been rotated more than 200 degrees backward on a circle perpendicular to the ground that starts at the tee or ball. During the swing, the weighted golf club head gains momentum traveling around the circle, transferring lift and power to the golf ball when the two objects connect. As the golfer's body pivots, the golf club continues around the circuit. (Backswing = 200+ degrees, forward swing = 360 to 400 degrees.)

During kicking and punting, when the plant leg positions the body for the swing, the kicking leg should bend at the knee and position the kicking foot tight behind the butt or lower back, on the side where that leg is attached. Picturing the knee as the center of a circle, that means the kicking foot has been rotated backward more than 100 degrees. During the swing, the toe leads the leg around the circle, with the knee locking straight before the foot contacts the football. As the kicker/punter follows through, the foot remains embedded in the ball for as long as personal flexibility and balance allow. (Backswing = 100 to 160 degrees, while forward swing could = up to 320 degrees.)

Applying the above formula, the following changes are ways for kickers and punters to gain power, in relative order of importance:

1. **Improve balance on the plant foot, thereby allowing for a complete follow-through and improving the path the kicking foot follows.**
    a. **Decrease the size of the final step.**
    b. **Adjust the plant spot to leave the kicking leg room to swing freely through the strike zone without bending at the knee or forcing the toe to lift.**
    c. **Keep head/helmet over shoulder pads at plant. (Leading with the head, chest over grass, shifts hip weight backward onto plant leg heel and decreases kicking leg speed and degrees of rotation.)**

d. Keep head/helmet over the plant foot, not over the football or kicking leg. (Shifting the head to the kicking side of the body forces hip weight to drift away from the swing and severely decreases the space needed by the kicking leg. The kicking leg must bend at the knee, swing wide, or rotate the toe upward to prevent the kicking foot from striking the ground.)

e. Buy a better-constructed plant shoe.

f. Strengthen the plant ankle.

2. Increase flexibility, thereby increasing degrees of leg rotation backward and forward.

a. When seated in butterfly position, flexibility in groin muscles should allow knees to come close to the ground.

b. Elasticity in hip flexor and quadriceps muscles enhances the backswing of the kicking/punting leg.

c. Flexibility through the butt and lower back increases capacity to reach complete follow-through of the kicking/punting leg.

3. Increase leg speed of the kicking leg.

a. Decrease step size, so that the kicking/punting leg is free to tuck up behind the body. (It is not the job of the kicking/punting leg to eject or jump the body onto the plant foot.)

b. Work on plyometric jumping.

4. Standardize the elliptical path covered by the kicking foot, thereby increasing the frequency of the kicking toe striking the sweet spot on the football.

5. Build strength in the lower back ---- the same muscles used to swing baseball bats and golf clubs, to shoot basketballs, to throw footballs, and to maintain upright posture.

a. Work on back extensions.

b. Incorporate resistance training, using stretchy bands and medicine balls.

c. Swim laps, and work legs against water resistance.

6. Focus on more precise target zones. (Narrow field of vision or imagination to five yards of width or less.)

7. Buy footballs with better-constructed bladders, and inflate all footballs to 13 PSI before each practice and game.

8. Practice over tall, narrow objects, thereby demanding more height in ball trajectory, leading to more distance.

Body type dictates how the power formula may be applied to individual athletes. Asking the family pediatrician to predict eventual body height through study of growth plates allows for emphasis on the part of the formula that best applies over a period of years. Kicking and punting are one-footed activities, requiring exceptional balance on the foot on the ground. Each time the body adds an inch or a pound, balance changes, and kicking leg path is affected. Try not to change weight before or during the playing season. The following generalizations should help in selection of methods to gain power.

* **Height-challenged athletes (people with short legs) must rely on leg speed for power. Taking huge steps, jumping from kicking leg onto plant foot, and moving head and shoulders during kicking/punting will slow the kicking leg.**

* **Athletes with long legs should increase degrees of rotation. Since a tall golfer has longer clubs, the weighted club head travels faster around this larger circle. However, the tall golfer also has hips higher above the ground, leading to greater variation in balance and swing path. Long-legged kickers and punters will never have "quick" legs, although they can increase foot speed through better balance. To maximize potential, keep the hips and lower back still while increasing backswing and follow-through extension. The taller the athlete becomes, the shorter the steps should be, because the entire body weight must transfer onto the plant foot without leaving the kicking/punting toe stuck in the ground pushing the weight forward before swinging through the ball.**

* **An athlete is weight-based if any loss of balance on the plant foot pulls the body off plant position faster than the kicking/punting motions pull the body through the motion. When body weight drifts sideways or backwards, the kicking leg is also pulled that direction. Both the swing path is imperfect, and the follow-through is abbreviated. Weight-based athletes must land the plant with torso directly over the instep of plant foot ---- not hip weight outside or back on the heel.**

Young kickers and punters may change body type as the bone structure grows. Continuing to use a kicking or punting motion that fit a previous body size will limit progress in performance. Never change form during or immediately prior to football playing season. Evaluate the body immediately after each season, and make changes during the winter and spring.

Lifting free weights shortens muscles as they gain mass. This is adequate for a position player who wants to hit an opponent and sustain contact. A kicker or punter with a "big leg" (thick thigh and calf) may outkick teammates but may be far from maximizing personal power potential. Kicking and punting require elongated muscles with flexible tendons and ligaments attaching them to the bones. Both legs must move smoothly through the full range of the hip joint. Think of the shoulder dexterity needed by tennis players and the hip flexibility seen in track athletes who clear hurdles. (Quarterbacks do not have massive arms like Popeye.)

For most young kickers and punters, improving lower back strength is much more important than increasing leg strength. The general approach to strength training for them is to decrease amount of weight and increase quantity of repetitions, striving for perfect control through the range of each motion. Most activities should have the hips or butt stationary, seated on a bench or resting on the ground. A large variety of seated medicine ball throws increase lower back strength and flexion. Front leg lifts while seated flat against a wall and side leg lifts while lying completely straight on the floor work muscles on the back of the hips. Back extensions, leg curls, and pull-downs on cable weight machines strengthen the back without shortening leg muscles.

To strengthen leg muscles for kicking and punting, the work must be through the full range of the leg motion, not pushing a weight up and down. Resistance training using elasticized bands of various lengths and strengths allows this range of motion. Swim leg laps in a pool (using a flutter board as a floatation devise), emphasizing full separation of straightening legs, not splash power from kicks. Standing waist deep in water, slowly work leg backswing or forward motion against the resistance of the water ---- without causing ripples around the waist.

Power is not how hard a kicker or punter strikes a football. Because of the structure of a football (air-filled prolate spheroid), the most effective swing allows the knuckle bone behind the big toe to impact the sweet spot of the football and remain imbedded unmoving inside the ball for as long as possible while leg and ball rise on the same trajectory. The goal is to force the air inside the football into two-thirds of its original space, raising the pressure to 18-20 PSI. Once the foot shifts or leaves the ball, the air inside returns to normal pressure and activity. Players of any body type can become proficient in this process.