



## CORE DEVELOPMENT THROUGH THE USE OF SLED TRAINING

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There are up to 29 muscles that comprise the core, which includes the lumbar spine muscles, abdominal musculature, hip musculature, and the diaphragm. In his research regarding injury prevention and performance enhancement, Stuart McGill has suggested that stiffness of the core is essential for everyone (3). In a study done by McGill and graduate assistant Ben Lee, they concluded that isometric-based exercises were superior to the dynamic program exercises in creating core stiffness which translates into enhanced power production during a variety of athletic movements (2).

Enhancing the core through foundational training principles has also been supported in *Developing the Core* (1). In this book, the authors state that due to increased instability while lifting weights, there is an increased activity of the core muscles needed to maintain technique (1). The authors also point out there are endless variations to progressively challenge the athlete to develop strength, power, and endurance in the core musculature (1).

This article highlights a variety of sled training exercises designed to target the core musculature. Although the sled/prowler pushes and pulls are common “go-to” sled exercises, the sled and its benefits are still misunderstood by many. In that, the weighted sled can be used for more than just lower-body conditioning. Using the sled closely mimics real-time sports performance movements and activities because of the horizontal resistance opposing the vertical movements typically seen in a weight room setting.

The core-focused sled training exercises highlighted below are designed to train the “crisscross” design of the body at the torso, which has been named the serape effect (4). According to Juan Carlos Santana, the function of the serape effect is to provide the muscles of the core with optimal length-tension environmental efficiency for force production, which maximizes the interaction of the rhomboids, the serratus anterior, external obliques, and internal obliques (4). There is a wide variety of effective core exercises that utilize the serape effect using medicine balls, stability balls, bands, and pulleys. The following are sled training exercises that can be implemented to target the core musculature utilizing the serape effect.

## EXERCISES

### PALLOF PRESS

The Pallof press is one of the most optimal exercises to help build a strong core. Many personal trainers believe that targeting the core consists of countless sit-ups, leg lifts, and/or hanging leg raises. While the latter may be beneficial for certain goals this approach to target the core neglects much of the entire core musculature, which includes the shoulder and hip complexes as well as the abdominal wall. The Pallof press is an anti-rotation movement that can be used to target this core musculature. It has endless variations and should become an essential part of many training programs. The following is a variation that can be utilized through the use of a sled.

#### Lateral Sled Pull with Pallof Press (Figures 1 and 2)

- Load the sled (light to start) and attach straps to the front of the sled. Stand to the side of the sled and grasp the straps with both hands near the chest.
- The feet should be under the hips with the knees slightly flexed.
- Brace the core musculature to create tension throughout the whole body.
- Step laterally with the leg furthest from the sled, then press the strap away from the chest and pull the sled (repeat for minimal distance).



FIGURE 1. LATERAL SLED PULL WITH PALLOF PRESS—STARTING POSITION



FIGURE 2. LATERAL SLED PULL WITH PALLOF PRESS—ENDING POSITION

#### Lateral Sled Pull with Pallof Press—Isometric Hold (Figure 3)

- Load the sled (light to start) and attach straps to the front of the sled. Stand to the side of the sled and grasp the straps with both arms extended in front of the chest.
- The feet should be under the hips with the knees slightly flexed.
- Brace the core musculature to create tension throughout the whole body.
- Keep the straps in the center of the chest with the arms fully extended.
- Step away from the sled with the outside leg, and pull the sled to full tension and hold this position.



FIGURE 3. LATERAL SLED PULL WITH PALLOF PRESS—ISOMETRIC HOLD

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### Lateral Sled High Pull (Figures 4 and 5)

- Start with a very light load on the sled with straps attached to the front of the sled. Stand to the side of the sled and grasp the straps with both arms down near the waist and the straps at full tension.
- The feet should be under the hips with the knees slightly flexed and the hips pushed back without arching the back.
- Explosively thrust the hips forward to raise the straps over the head. Be sure to keep the elbows high and the heels flat on the floor.
- Once a high pull is completed, return the straps to a position near the waist at full tension before beginning the next repetition.



FIGURE 4. LATERAL SLED HIGH PULL—STARTING POSITION



FIGURE 5. LATERAL SLED HIGH PULL—ENDING POSITION

### BIRD DOG

The bird dog exercise is one of the most popular core and spinal stabilization exercises that should remain a staple in any training program. The bird dog is an effective movement that reinforces proper spinal alignment and core recruitment. To perform the Bird Dog exercise without a sled, the spine should be kept neutral while kneeling on the floor in a quadruped position with the knees under the hips and the hands under the shoulders. From this position, the opposite arm and leg should raise simultaneously, keeping the abdominals braced with the whole body in a straight line. Try to resist rotation, which makes the movement ineffective. Once proficient with the bird dog exercise, using a sled with the bird dog exercise (utilizing a pull through) can help increase stability demands and activation of the core.

### Bird Dog Crawl with Pull Through (Figures 6 and 7)

- Start with a very light load on the sled with straps attached to the front of the sled. Begin in the quadruped position facing away from the sled with a strap in each hand.
- Perform the bird dog movement by extending an arm (pull through) and leg on opposite sides of the body.
- After each extension, maintain a neutral spine and crawl forward slightly to position the body for the next repetition with the opposite arm and leg.
- During the extension of the arms and legs, the front arm should not be extended above the head, and the leg should not be extended above the hips.



FIGURE 6. BIRD DOG CRAWL WITH PULL THROUGH—STARTING POSITION



FIGURE 7. BIRD DOG CRAWL WITH PULL THROUGH—EXTENDED POSITION

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