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Speed Development in a 100-Meter Sprinter Using a Wetsuit

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Developing speed in any athlete is a challenge. Track coaches, strength and conditioning specialists, and sport scientists have been contemplating how to provide the right amount of resistance without negatively affecting the sprint mechanics of a sprinter for years. Current resistance exercises and investigations have been limited to sled pulling, harness oriented sprinting, and running up inclined slopes (1,2,3,4,6). One specific form of contemporary resistance training is the use of compression garments to enhance muscle temperature and improve peak power generation (5,7). The use of a wet suit takes this concept one step further by providing the following: 1) Optimal resistance, which allows for specific upper and lower body recruitment of muscle fibers and, 2) Optimal increase in temperature of the muscles specific to sprinting. This article aims to identify a new method for enhancing a sprinter's acceleration and speed in a 100-meter sprint through the use of stored elastic energy transfer.

Wetsuit Design

There are many types of wetsuits out on the market. Wetsuits are made from neoprene rubber ranging in thickness from 3mm to 6mm in order to fit individual need. Normally, wetsuits are worn by divers to help maintain body temperatures in extremely cold water. The pressure changes underwater force a thin layer of water between your body and the wetsuit, hence the name wetsuit. The body then heats this layer, while the neoprene insulates from the outside cold. In this article, a full body 3mm size 6 wetsuit manufactured by Parkway Scuba is used. This particular wetsuit was selected because the thickness provides enough resistance and/or restriction in the sprinter's movement to be effective, and ensures the sprinter's normal range of movement

Figure 1. Putting on the wetsuit indoors

pattern remains unchanged. The weight of the suit used in this training program was measured at 2.26 lbs.

Training Methodology

During training the wetsuit was initially used indoors in a climate controlled room. On these days the athlete should warm up for five minutes on a Monark Ergometer followed by stretching. The stretches include the modified hurdlers stretch, sit and reach, gastrocnemus stretch, followed by foot drills. Wetsuit training consists of two phases, an indoor and an outdoor phase. Once the sprinter completes her warm up routines, the wetsuit should be put on (figure 1).

In this example, a 60 foot 3/8th inch rubberized indoor runway was set up with the blocks to the individual sprinter's specifications. The sprinter then takes three consecutive block starts on the indoor runway (figure 2).

Voice commands are given to simulate actual race start conditions, e.g., runners to your mark, set, and go. Since these drills are done indoors no starter's pistol is used. The average time between the completion of one block

Figure 2. Indoor block start

Figure 3. Putting on the wetsuit outdoors

Figure 4. Outdoor block start

start, a 20-meter sprint, and the next block start is set at three minutes. If this schedule is followed the total time the runner spends in the wetsuit is 12 minutes. After the completion of the last block start, the wetsuit is taken off.

Taking off the wetsuit is typically faster and requires approximately only one minute unassisted. The sprinter proceeds to the blocks again, and the same start procedures are implemented. Only three minutes should be allowed between block starts just as before. The sprinter now experiences more explosive power; they should feel lighter, and faster. Initially, there will also be a period of synchronization as the sprinter makes finite adjustments in speed. This training procedure should be used once a week to develop timing and to take advantage of motor recruitment patterns as they relate to the 100 meter sprint and block starts.

The use of the wetsuit during the outdoor phase includes:

- 800-meter jog
- Static stretching (quadriceps, hamstrings, calfs, back, hips, etc)
- Leg drills (rear heal kicks, etc)
- Put the wetsuit on
- Three 40-meter stride-outs, or build-ups on the grass.
- Put spikes on
- Three practice block starts (20 meters)

The wetsuit is now used late in the evening when the outdoor temperatures are typically cooler. Since the wetsuit retains heat, use of the wetsuit in temperatures over 85 degrees Fahrenheit should not be used. Once the sprinter completes about 80% of her warm up routines, the wetsuit is put on (figure 3).

The sprinter now performs three to four 40 meter build ups or accelerations. After completing this, the sprinter puts on her track spikes, and proceeds to set the blocks on the track to their appropriate settings. Next, the sprinter takes three practice starts approximately 20 to 25 meters (figure 4).

If used during the warm up for a race, the sprinter now waits for the starter to call runners to their blocks. While waiting the sprinter removes her spikes (to prevent wetsuit damage) and then the wetsuit itself. Taking off the suit should take about 60 seconds. The sprinter now puts on her spikes and waits to be called to her blocks.

The quest for speed in most sports is endless; we are always searching for more effective ways to improve speed in sprinters. There is documentation of various training methods to improve speed. However, no documentation in the review of literature includes the use of a wetsuit as a form of resistance training for the 100-meter sprinter. A harness and parachute have typically been used in the past, but these devices have their own inherent limitation(s). Pulling on a harness if the load is too heavy changes a sprinter's mechanics. Using an incline that is too big turns the sprinter into a climber, changing the sprint mechanics as well. The use of 3mm 2.26 lb wetsuit during the late phase of warm up clearly demonstrates movement specific muscle fiber recruitment and results in power synchronization while maintaining the sprint mechanics of the athlete. Using a 3mm wetsuit to create the transfer of stored elastic energy will greatly enhance muscle recruitment, increasing the production of power required to generate an explosive 100 meter sprint block start, while simultaneously maintaining optimal muscle temperature. ■

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