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> February 11, 2012 11:00-11:50am Evergreen 3-4

"Making Your Sprinter Faster-It's All About Velocity!"

Static Stretching Before the Activity

Long hold static stretching desensitizes the stretch receptors, which are necessary in the stretch reflex and storage of elastic energy in the muscle. If this receptor is not switched on, the athlete's power output capacity is reduced.

Validation has been done using a no warmup and perform and a long hold static stretching program. Testing protocols of the vertical jump and 40 yard dash were used. The static stretching group always performs more poorly than the no warm-up group.

Don't STRETCH UP, WARM UP!

FOCAL POINTS ON THE BODY

*CHEEKS-LOOSE

*HEELS AND TOES UP

*BIG TOE - GREAT FLEXIBILITY/MOBILITY

(There are special receptors in the flexor halicus longus that control the gain on the spinal motor neurons to the lower extremity. With increased rate and magnitude of stretch you are essentially able to recruit more motor units)

*HIPS - GREAT FLEXIBILITY/MOBILITY-JROM=Joint Range of Motion

*EYES AND HIPS - OCCULO PELVIC REFLEX-Eyes up, hips under---Eyes down, hips back.

SPRINT PROJECTIONS

30 BLOCK	30 FLY	60 BLOCK	150 STAND	100 METERS	200 METERS
3.58-3.61	2.48-2.51	6.22-6.27	14.87-14.97	10.09-10.16	20.17-20.32
3.62-3.65	2.52-2.55	6.28-6.33	14.98-15.08	10.17-10.24	20.33-20.48
3.66-3.69	2.56-2.59	6.34-6.39	15.09-15.19	10.25-10.32	20.49-20.64
3.70-3.73	2.60-2.63	6.40-6.45	15.20-15.30	10.33-10.40	20.65-20.80
3.74-3.77	2.64-2.67	6.45-6.51	15.31-15.42	10.41-10.48	20.81-20.96
3.78-3.81	2.68-2.71	6.52-6.57	15.43-15.54	10.49-10.56	20.97-21.12
3.82-3.85	2.72-2.75	6.58-6.63	15.55-15.66	10.57-10.64	21.13-21.28
3.86-3.89	2.76-2.79	6.64-6.69	15.67-15.79	10.65-10.72	21.29-21.44
3.90-3.93	2.80-2.83	6.70-6.75	15.80-15.92	10.73-10.80	21.45-21.61
3.94-3.98	2.84-3.88	6.76-6.81	15.93-16.06	10.81-10.90	21.62-21.88
3.99-4.03	2.89-2.93	6.82-6.87	16.07-16.20	10.91-11.00	21.89-22.09
4.04-4.08	2.94-2.98	6.88-6.93	16.21-16.35	11.01-11.09	22.10-22.30
4.09-4.13	2.99-3.03	6.94-6.99	16.36-16.51	11.10-11.19	22.31-22.50
4.14-4.18	3.04-3.08	7.00-7.05	16.52-16.68	11.20-11.29	22.51-22.72
4.19-4.24	3.09-3.14	7.06-7.12	16.69-16.86	11.30-11.40	22.73-22.95
4.25-4.30	3.15-3.20	7.13-7.19	16.87-17.03	11.41-11.51	22.96-23.19
4.31-4.36	3.21-3.26	7.20-7.26	17.04-17.25	11.52-11.62	23.20-23.43
4.37-4.42	3.27-3.32	7.27-7.33	17.26-17.46	11.63-11.73	23.44-23.69
4.43-4.48	3.33-3.38	7.34-7.40	17.47-17.67	11.74-11.85	23.70-23.95
4.49-4.54	3.39-3.44	7.41-7.50	17.68-17.88	11.86-12.01	23.96-24.27
4.55-4.60	3.45-3.50	7.51-7.60	17.89-18.09	12.02-12.17	24.28-24.64
4.61-4.70	3.51-3.60	7.61-7.70	18.10-18.30	12.18-12.33	24.65-24.98
4.71-4.80	3.61-3.70	7.71-7.80	18.31-18.55	12.34-12.49	24.99-25.30
4.81-4.90	3.71-3.80	7.81-7.90	18.56-18.81	12.50-12.65	25.31-25.65
4.91-5.00	3.81-3.90	7.91-8.00	18.82-19.12	12.66-12.85	25.66-25.99
5.00-5.01	3.90-4.00	8.00-8.10	19.20-19.60	12.90-13.10	26.00-26.50
5.10-5.20	4.00-4.10	8.10-8.20	19.60-20.00	13.10-13.30	26.50-27.00
5.20-5.30	4.10-4.20	8.20-8.30	20.00-20.40	13.30-13.60	27.00-27.50
5.30-5.50	4.20-4.40	8.30-8.40	20.40-20.80	13.60-13.90	27.50-28.80

<u>BOYS</u>

FLY-3.0-3.3 STAND/BLOCK-4.0-4.3

<u>GIRLS</u>

FLY-3.5-3.8 STAND/BLOCK-4.5-4.8

Speed Training Vs. Speed Development (There is a difference)

Speed Training-Maintain your velocity/speed

Speed Development-Improve you velocity/speed/your 30 meter fly time

What is pace lock?

Testing

*30 METER FLY-Indicator of top end speed

*OVERHEAD BACKWARD THROW WITH SHOT-Indicator of total body power and coordination

*STANDING LONG JUMP-Indicator of leg power

*STANDING TRIPLE JUMP-Leg power, acceleration, and coordination

*30 METER BLOCK-Leg power and ability to accelerate

*60 METER FLY-Toe end speed and mechanics

*150 STANDING START-Top speed and speed endurance

*250 STANDING START-Long Speed endurance and Anaerobic power

*10 BOUNDS-Leg power, coordination, speed endurance, acceleration

TRAINING ENERGY SYST	EM		
DURATION OF SESSION EFFORT	ENERGY SYSTEM(S)	POWER/CAPACITY	TRAINING EFFECT
0 TO 0.2 SEC.	NERVOUS		REACTION
O TO 0.2 SEC. (PER LEG)	ALACTIC (STORED MUS. ATP)	POWER	INITIAL THRUST
0 TO 0.1 SEC.	ALACTIC (CP SYSTEM)	POWER	SINGLE LEG THRUST AT TOP SPEED
1 TO 2.0 SEC.	ALACTIC (NERVOUS + STORED ATP + CP)	POWER	STARTS
2 TO 5.0 SEC.	ALACTIC (CP SYSTEM)	POWER	ACCELERATION
5 TO 15.0 SEC.	ALACTIC (CP SYSTEM)	POWER	MAXIMUM SPEED (FLYING START)
15 TO 30.0 SEC.	ALACTIC (EXTENDED CP SYSTEM)	CAPACITY	SPEED (ABILITY TO HOLD >95%)
30 TO 45.0 SEC.	LACTIC	POWER	ABILITY TO PRODUCE ENERGY without 02 OR CP
45 TO 90.0 SEC.	LACTIC	CAPACITY	AS ABOVE, PLUS ABILITY TO TOLERATE LACTIC ACID
90 TO 300.0 SEC.	LACTIC WITH AEROBIC SUPPORT	AEROBIC POWER LACTIC CAPACITY	ABILITY TO USE 02 TO HOLD UP PACE AS LACTIC ACID ACCUMULATES
5 TO 10.0 MIN.	AEROBIC WITH MINOR LACTIC	AEROBIC POWER	MAX 02 RATE
10 TO 12.0 MIN.	AEROBIC	POWER CAPACITY	RAISE ANAEROBIC THRESHOLD
20 TO 60.0 MIN.	FUEL: GLYCOGEN	CAPACITY	ABILITY TO MAINTAIN STEADY PACE
ABOVE 1 HOUR	AEROBIC FUEL: GLYCOGEN + FAT	CAPACITY	ABILITY TO MAINTAIN STEADY PACE FOR THE MARATHON

Positively and Negatively Effecting Speed

Positively Effecting Speed

Short Jumps Weights Joint Range of Motion Contrast Training Runs under 60 meters Hills at a slight grade-Up and Down

<u>Negatively Effecting Speed</u> Weight lifting every day Long distance running Running up step hills Lack of Joint Range of Motion Static-Stretching before the activity. *poor nutrition

*Do NOT wear a high healed shoe. This shortens the gastro (Calf) Muscle.

Jumps Training-Suggested Progressions

- **1. Jump Ropes**
- **2.** In-place jumps

3. Short jumps-Standing Long Jumps, Standing Triple Jumps, Hurdle Hops

4. Endurance Bounds

5. Depth Jumps

WHAT ARE INS AND OUTS

Ins and Outs training is based around the premise that the nervous system cannot integrate high intensity signals representing a rapid cyclical movement at maximum output levels for more than three to four seconds.

For Ins and Outs training, the sprinter is instructed to accelerate over a distance of 20 to 30 meters. The subjective level of effort should approximate 9/10ths of maximum effort. The sprinter is instructed that, while accelerating, gradually inhale. The point of highest speed should coincide with full inspiration at the first maker. This marker signifies the IN segment.

The talk-oriented cues for the IN segment are as follows. While continuing to hold your breath, bear down. Using proper running mechanics, attempt to sprint faster than you ever have before, using fast frequency. Initially, the specific focus should be on improved recovery mechanics.

WHY SHOULD ATHLETES HOLD THEIR BREATH?

Holding the breath while exerting maximally encourages the execution of the Valsalva maneuver. Soviet research has long shown that more force can be produced while holding your breath. The Valsalva maneuver increases the blood pressure, particularly in the carotid arteries, those arteries providing the blood flow to the brain. This increased pressure stimulates receptors sensitive to pressure, baroceptor, in the carotid body. Through a neural network, the impulses sent by these baroreceptor, facilitate the recruitment of greater numbers of motor units.

Weight training literature suggests that on the work stroke of any lift, the lifter should exhale. This being the second best situation for producing force, especially when back pressure is used, protects the cerebral vessels from very high intracranial pressure and possibility of rupture. Inhaling while trying to produce force is the least advantageous situation.

Second, holding one's breath while attempting to exert force, especially when the lower extremities are involved, stabilizing the pelvis and the lower back.

from: Loren Seagrave - Speed Dynamics- Intergration of Specific Strength and Power Training with Speed Development -Training for Potentiation of Maximum Velocity and Acceleration