

**Itcca Presentation 09**  
 New Trends in Sprinter training  
 By Chris Korfist

## Sprints

### Fly 30's

- Longest distance someone can hold a max velocity sprint is 30m- Most top sprinter can get 20.
- Too far for us- we start at fly 10's and gradually move up from there

	Ben '88	Carl '88	Mo '99	Mo '01	Tim '02	Asafa '05	BOLT '08
RT	0.132	0.136	0.162	0.132	0.104	0.150	0.165
0-10m	1.83	1.89	1.86	1.83	1.89	1.89	1.85
10-20m	1.04	1.07	1.03	1.00	1.03	1.02	1.02
20-30m	0.93	0.94	0.92	0.92	0.91	0.92	0.91
30-40m	0.86	0.89	0.88	0.89	0.87	0.86	0.87
40-50m	0.84	0.86	0.88	0.86	0.84	0.85	0.85
50-60m	0.83	0.83	0.83	0.83	0.83	0.85	0.82
60-70m	0.84	0.85	0.83	0.83	0.84	0.84	0.82
70-80m	0.85	0.85	0.86	0.86	0.84	0.84	0.82
80-90m	0.87	0.86	0.85	0.89	0.85	0.85	0.83
90-100m	0.90	0.88	0.85	0.91	0.88	0.85	0.90
TIME	9.79	9.92	9.79	9.82	9.78	9.77	9.69

Courtesy of SpeedEndurance.com

- We start with 10m and work up to 30m
- To work on endurance we repeat the 30's with a walk or jog back

### Tempo runs

- We don't practice running slow
- Most of our races or anaerobic capacity
- 100m 15-20% aerobic
- 200m- 20-25% aerobic
- 400m-40-45% aerobic
- Females more aerobic than males
- Does your training model the requirements?

### 8x200's?

- Goal to improve lactic acid toleration
- Highest point 6 min after run
- Blood lactate reaches highest point at 27 sec
- Takes 8 minutes for Creatine phosphate to replenish

The relationship between maximal oxygen uptake and repeated sprint performance indices in field hockey and soccer players.

[Aziz AR](#), [Chia M](#), [Teh KC](#)

Sport Medicine & Fitness Division, Singapore Sports Council, Singapore. Abdul-Rashid-Aziz@ssc.gov.sg

- Maximal oxygen uptake was not correlated with the fastest 40 m sprint time but was moderately correlated with total sprint time. Since the shared variance between maximal oxygen uptake and total sprint time was only 12%, improving aerobic fitness further will only be expected to contribute marginally to improving repeated sprint performance of the team game players

### Sample workout

- **Monday**
- Flys
- Drops
- Fast feet-line hops, tramp runs for 30 sec

### Wednesday


- Block 30's or curves
- bounds

### Saturday

23 sec runs

### Core work

T or F ?  
 The rectus abdominus is an important core muscle



**FALSE!!**

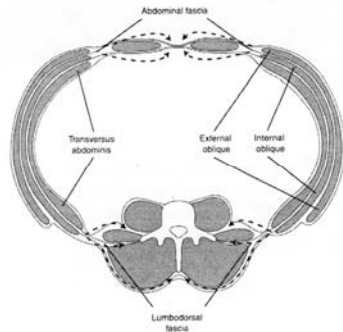


**Rectus Abdominis**

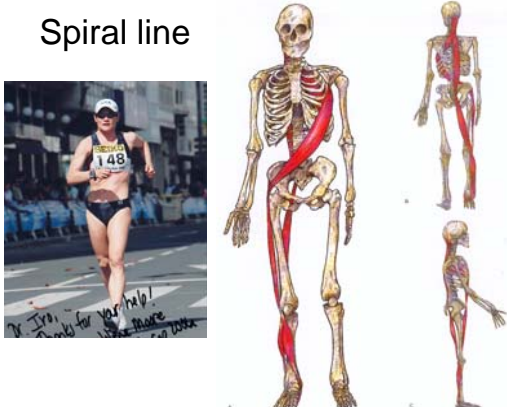
- A** Flex the vertebral column
- O** Pubic crest, pubic symphysis
- I** Cartilage of fifth, sixth and seventh ribs and xiphoid process
- N** Branches of intercostals

What are the “Core” muscles?

- Internal and external abdominal obliques
- Gluteus maximus and medius
- Lumbar erectors
- Latissimus dorsi
- Quadratus Lumborum
- Multifidus and rotatores



Spiral line



T or F ?  
 Stretching prevents spinal injuries



### FALSE!!!

- Hamstring tightness NOT linked to LBP
  - Biering Sorenson 1984, Hellsing 1988
- Spine ROM has little to do with function at work
  - Parks, et al 2003
- Static stretching of the spine can cause muscle spasm and diminishes the stretch reflex
  - Solomonow 2003
- Initial static stretches can decrease subsequent coordination by resetting some of the muscle and joint proprioceptors
  - Drabek 1996

### The sit-up

### Sit-ups are a safe exercise



**Table 4.2**  
Low back moments, abdominal muscle activity, and lumbar compressive load during several types of abdominal exercises.  
Note: MVC contractions were isometric. Activation values higher than 100% are often seen during dynamic exercise. Reprinted with permission, Med.Sci.Sports.Ex., Axler and McGill, 29 (6): 804-811, 1997.

	Moment (Nm)	Muscle Activation		
		Rectus Abdominis (%MVC)	External Oblique	Compression (N)
Straight Leg Situp	148	121	70	3506
Bent Leg Situp	154	103	70	3350
Curlop feet Anchored	92	87	45	2009
Curlop Feet Free	81	67	38	1991
Quarter Situp	114	78	42	2392
Straight Leg Raise	102	57	35	2525
Bent Leg Raise	82	35	24	1767
Cross-knee Curlop	112	89	67	2964
Hanging Straight Leg	107	112	90	2805
Hanging Bent Leg	84	78	64	3313
Isometric Side Bridge	72	48	50	2585

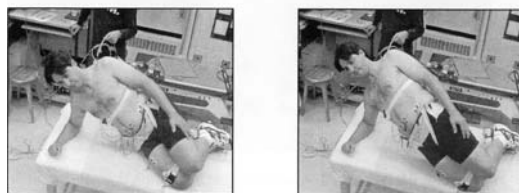
Bad

Good

## The Plank

## Bad

## Good



**Figure 11.12** Using the "hip hinge" to achieve the Side Bridge. The hips may remain slightly flexed, or the challenge is increased with full hip extension.



**Figure 11.12** Using the "hip hinge" to achieve the Side Bridge. The hips may remain slightly flexed, or the challenge is increased with full hip extension.

## The chair

Crawl variation

Towel Variation

Squat



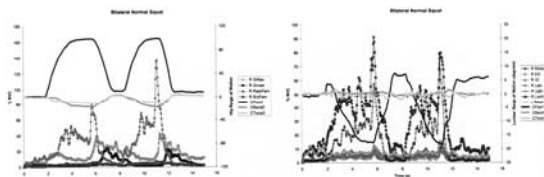
Traditional squats are best for training the glutes



False!

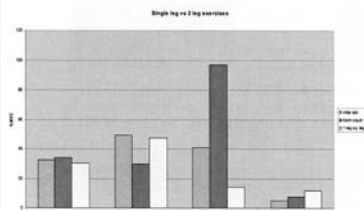
- Traditional squats train the quadriceps

Traditional squats produce non functional activation patterns

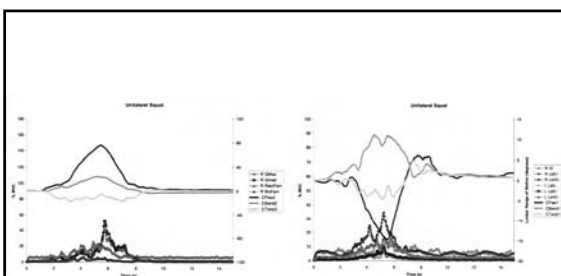


**Figure 10.16** The traditional squat exercise with a barbell on the shoulders produces non-functional activation patterns of hip extension and spine stabilization for many athletes. Gluteus medius activation is too low, as is gluteus maximus activation until quite deep in the squat position. These types of squats are dominated by the quadriceps and can be good quad exercises, but fail the performance athlete.

Only single legged and only for the glue med



**Figure 10.18** Traditional squats are superior for challenging the quadriceps. Single-legged squats, even with no additional weight, are superior for training the gluteus medius.



**Figure 10.17** In contrast to the traditional squat, a one-legged squat activates the gluteus medius immediately to assist in the frontal plane hip drive necessary for leaping, running etc, together with sooner integration of gluteus maximus higher in the squat motion.

Larkin video

Why bad...quads or glutes

Quad dominant

Shut off core

A good squat

Feet

Knees

Lower back

Olympic lifts





### Alternatives

- Deadlift

### Single leg/split leg exercises

### Isometrics

### Plyometrics

### Going up...?

### Or...going down

## Fichter graph

**Comparison of loaded and unloaded jump squat training on strength/power performance in college football players.**  
[Hoffman JR](#), [Ratamess NA](#), [Cooper JJ](#), [Kang J](#), [Chilakos A](#), [Faigenbaum AD](#)

Department of Health and Exercise Science, The College of New Jersey, Ewing, New Jersey 08628-0718, USA. hoffmanj@tcnj.edu

- the eccentric phase of this ballistic movement appears to have important implications for eliciting these strength gains in college football players during an off-season training program

## Stretching

- 20m-sprint performance in trained rugby union players can be improved by using an
- active dynamic stretch protocol, while the use of static stretching appears to decrease
- 20m-sprint performance (static dynamic stretching was found to have no significant
- effect on performance). Coaches and athletes need to be aware of the potentially
- negative effects of both passive and active static stretching on immediate performance
- of short sprints and the potential positive effect of doing specific movement pattern
- rehearsal (active dynamic stretching) before performance.

**Static stretching impairs sprint performance in collegiate track and field athletes**

**Autores:** [Jason B. Winchester](#), [C. Schexnayder](#)

**Localización:** [Journal of strength Arnold Nelson](#), [Dennis Landin](#), [Michael A. Young](#), [Irving and conditioning research: the research journal of the NSCA](#), ISSN 1064-8011, Vol. 22, Nº. 1, 2008 , pags. 13-18

- The results of this study suggest that performing a SS protocol following a DW will inhibit sprint performance in collegiate athletes.

Acute effects of passive muscle stretching on sprint performance  
**Authors:** [Nelson, Arnold](#); [Driscoll, Nicole](#); [Landin, Dennis](#); [Young, Michael](#); [Schexnayder, Irving](#)  
**Source:** [Journal of Sports Sciences](#), Volume 23, Number 5, Number 5/May 2005 , pp. 449-454(6)  
**Publisher:** [Taylor and Francis Ltd](#)

- Thus, it appears that pre-event stretching might negatively impact the performance of high-power short-term exercise

**The effect of static stretching on phases of sprint performance in elite soccer players.**

**Savers AL**, **Farley RS**, **Fuller DK**, **Jubenville CB**, **Caputo JL**.  
 Middle Tennessee State University, Murfreesboro, USA. asayers@mtsu.edu

- Static stretching before sprinting resulted in slower times in all three performance variables. These findings provide evidence that static stretching exerts a negative effect on sprint performance and should not be included as part of the preparation routine for physical activity that requires sprinting.

## Form drills



## Why Not?

- Form is an expression of what is working
- Athlete will default to pattern where they are strong
- Form drill will not fix a weakness
- Could be strengthening a poor pattern