

# Tricks to improve performance on race day!

## Introduction

You know the routine. We train hard and recover well. Leading into a major meet such as the recent National Swim we taper to peak for competition day. After (hopefully!) a good night's sleep we ensure we eat well before the meet and keep up the fluids. We arrive at the pool, set ourselves up for the day, then we warm-up. Eventually we get called to the marshalling area and we finally compete.

Recently I came across a fantastic paper in the highly-respected and highly-applied peer-reviewed journal *International Journal of Sports Physiology and Performance*. The article focused on race day six strategies that may improve our performance, particularly in the sprint events where explosive power is used. Some are novel and may be unrealistic but I want to share these with you. As always, try them and see if they work for you.

### 1. Warm-Up harder and closer to the event

Typically we warm-up upon arriving at the pool. If we are smart we also warm-up closer to the actual event. This is because the main effect of warm-up is increasing muscle temperature which in turn increases muscle power. The effect of a warm-up lasts about 30-45 minutes but drops pretty quickly after 20 minutes. How long the effect lasts depends on the intensity and duration of the warm-up, as well as the environmental conditions and what you do after warm-up in terms of clothing and more activity.

A 2010 review of all published research showed that 79% of studies showed improved performance with warm-up. For example, one study showed a 4% increase in leg power output for every 1°C increase in muscle temperature. Thus, larger increases in muscle temperature have been shown to improve power outputs even more. This suggests harder warm-ups.

A recent 2013 study on bob-sledders not only increased the intensity of the normal warm-up by 30% to improve performance, they also reduced the after warm-up recovery time from 35 minutes to 15 minutes and improved 20 m sprint running performance even more. The bottom line is to warm-up harder and closer to the event.

### 2. Stay warm after that warm-up

It's normal to warm-up and then stand, sit or lie around in the stands, tents or marshalling area where we can't be active to stay warm and keep that all-important muscle temperature up. Wearing track suits or even outdoor adventure parkas and pants will help keep the arms (all strokes) and legs (NB form strokes) warmer.

These days you can even buy heated clothing or heating pads to keep the muscles warm that you are going to use in your race. Research has shown that keeping the muscles warmer in any way leads to improved speed and power.

### 3. Post-activation potentiation (PAP)

I'm sounding like an academic now aren't I? PAP means that if we stimulate (activation) our muscles with high intensity efforts, there is a period after that (post) where the muscles are more ready (potentiation) for the hard work about to come in the actual race. Why? Because by firing up the muscles with hard work just before the event, both the nervous system and muscles are activated and ready for action. Sprinters doing squat jumps or explosive wall push-ups before racing are examples.

PAP is affected by the initial strength level you have, the timing between the original stimulus (eg. squat jumps) and the event, and both the intensity and volume of the original stimulus. Heavy weights (75-95% of 1 RM [Repetition Maximum] or heaviest weight you can lift) done 8-12 minutes before the event has been shown to be most effective in Rugby players sprint performance.

But is it realistic to have weights available? Usually not. But doing squat jumps or ballistic activities with hand weights or depth jumps is. All these activities have been shown by research to increase power output in athletes. Performance improvements in power have been shown between 2 and 6 minutes after doing these activities.

#### 4. Remote Ischemic Preconditioning (RIPC)

How do academics come up with names like this? Simply put, RIPC means briefly cutting off the blood supply to the legs or arms by using a blood pressure cuff or tourniquet (to pressure levels similar to when your blood pressure is taken) for 5 minutes then opening up the tourniquet or cuff for 5 minutes (alternating legs/arms) to have the blood flush back through the muscles. It's been suggested this procedure done before warm-up might not only increase blood flow but also increase muscle excitability and power.

For me personally this method looks a little risky, especially in masters swimmers who may have blood pressure issues or have heart disease risk factors. I'd strongly suggest having a chat to your family doctor about this method before trying it.

#### 5. Exercise in the morning for an afternoon or evening meet

Research over many years has shown that speed, power and endurance performance is always better in the late afternoon. Why, because our body and muscle temperature is usually 1<sup>0</sup>C higher in the afternoon which makes energy production reactions happen faster in muscles.

A couple of research projects have shown that both 800 m and 400 m run times as well as muscle power performance are improved when a short but sharp morning workout is done 3-6 hours before the actual event.

#### 6. Prime the hormones

Higher blood testosterone levels have been shown to be related positively to greater power performance. Moreover, higher testosterone levels have also been linked to higher levels of motivation and confidence to compete.

Strategies to increase testosterone levels include watching yourself perform well in video clips and being reinforced by a coach or significant other(s) and/or watching videos of aggressive or intense training sessions. Watching others or fellow competitors has the opposite effect.

#### Conclusion

So putting all these strategies together, Table 1 below shows how these strategies might be scheduled on race day.

**Table 1:** Theoretical timeline for pre-competition strategies on competition day (Modified from Kilduff and others, 2013)

6 hours before	45 min before	20 min before	15 min before	8-12 min before	0 hour
Morning workout (short/sharp)	RIPC	Active Warm-Up	Video Clips  Positive feedback	PAP	Compete
				Passive heating	

RIPC = Remote Ischemic Preconditioning; PAP = Post-activation potentiation (see above)

I've always been a believer in 'trying before you buy'. So give some of the strategies above a go in training or at minor competitions and see if they work for you. If they do, hold onto them. If they don't, move on.

In the next issue, I will be discussing the important role of lactate production and lactate tolerance training in masters sprint swimmers. Mark from Sea Pirates, I hold true to my word!

### **Bibliography**

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