

SWIMMING SCIENCE BULLETIN**Number 57****Copyrighted by****Professor Emeritus Brent S. Rushall, San Diego State University**

THE GENESIS OF ULTRA-SHORT RACE-PACE TRAINING**Brent S. Rushall, PhD****January 20, 2016**

Professor Abou El Ell Fattah, Professor of Physiology of Sport at Helwan University in Cairo, Egypt and periodic national coach of Egypt Swimming teams, is very well known in Middle Eastern countries. He has employed USRPT for the past 15 months in his swimming programs. During that time, Professor Fattah translated numerous USRPT articles which had been published in the *Swimming Science Bulletin*.

At the end of 2015, he completed a volume in Arabic that is to be published as a book titled *SWIMMING TRAINING METHODS: Ultra-short Race-pace Training*. The volume contains some chapters authored by Professor Fattah and his translations of selected USRPT articles. The authors of the book are Drs. Brent S. Rushall and Abou Fattah.

Two prefaces have been included in the forthcoming book. That which was written by this author is a very brief introduction to the reasons why USRPT came about. It is reproduced below.

[Reproduced from Rushall, B. S. & Fattah, A. (in print). *SWIMMING TRAINING METHODS: Ultra-short Race-pace Training*.]

Preface**Professor Emeritus Brent S. Rushall**

After 50 years of involvement in elite competitive swimming, in the early 2000s my personal experiences in science attained a position where I could no longer tolerate the beliefs, dogma, and fantasies of high-level swimming coaches. The science of human movement had reached a point where most features of swimming performance and coaching conduct were accounted for in evidence-based research. That the large coaching organizations had ignored the mass of factual evidence was a disgrace. Unfortunately, those organizations are still fighting to preserve their mysterious proposals in contradiction of what is known in science.

I was prompted by my colleagues in Australia, Canada, and the USA to find a better way of determining what was rational and superstition in the coaching of swimming. In 1994, colleagues and I put to rest the reliance on Bernoulli's Theorem for explaining propulsion in swimming (Rushall *et al.*, 1994). Initially, the American Swimming Coaches Association administrators resisted the sane dismantling of the Bernoulli explanation and did not embrace evidence which clearly showed drag resistance to be the overwhelming physical force, as opposed to lift forces, that propelled swimmers forward in their strokes. That resistance was a harbinger of what was to

come if the implications of swimming science contradicted the myths of institutionalized swimming coaching education.

Circa 2005 I embarked on reviewing as much research concerning swimming performance that I could find. It has been my habit for 60 years as an academic to always read six research articles per weekday. In 1994 San Diego State University allowed me to develop two WWW sites, the *Coaching Science Abstracts* (<http://coachsci.sdsu.edu/index.htm>) and the *Swimming Science Journal* (<http://coachsci.sdsu.edu/swim/index.htm>). Those sites still function today in the 22nd year of their existence. Those sources of information and others provided by my colleagues around the world when analyzed revealed a very different swimming coaching model to that which had been popularized without critical review over decades.

The outcome of my industry in determining what research tells us about swimming led to a number of fundamental evidence-based principles.

1. Technique is the main swimming feature that discriminates standards of performer.
2. Swimming technique is dependent upon the velocity of swimming. Slow-swimming does not practice the movement patterns or coordinations that occur in the higher movement velocities of races. Slow or even moderate-pace swimming does not prepare a swimmer to perform at the highest level in races.
3. The energy to support the function of race-pace swimming is different to that which activates slow- or moderate-pace swimming.
4. To develop racing techniques, a coach must be an excellent teacher of motor skills. A poor teacher would not offer valuable services. A good teacher embracing the principles of *sport pedagogy* should be able to stimulate continual performance improvement in even the oldest swimmers.
5. It became very apparent that training at race-pace was the way to practice race-relevant techniques and energy systems. However, a race also requires cognitive activity to enhance performance. The research of my students, colleagues, and me in the realm of performance psychology made it clear that "*racing thoughts*" needed to be practiced at the same time as racing techniques and energy provision. Mental skills content is an integral part of relevant swimming training.
6. To perform practice activities at race-pace requires a high-level of effort and movement velocity. The work of Woldemar Gerschler and his colleague Dr. Herbert Reindell in the late 1930s and Swedish researchers in the late 1950s and early 1960s showed that short-work short-rest interval training produced the greatest amount of training at high intensities. The volume of irrelevant training that could be achieved with lower intensities over longer intervals or continuous training can be substantial but to what avail? A term needed to be developed to depict the short-work short-rest form of training and in 1967 I advocated it be called *ultra-short training*.
7. To practice the greatest number of skill trials, accompanied by appropriate cognitive activity, all energized by specific physiological functioning, in 2011 became to be called Ultra-short Race-pace Training (USRPT). USRPT was totally relevant for racing performances. Slower longer work required non-race techniques, the provision of energy that was peculiar to the slow velocities, and rendered psychological skills as being moot. Such training, the training dictated by traditional thinking and practices, is irrelevant for preparing swimmers to race.

8. Overtraining serves no valuable purpose for competitive swimming despite it being a very common outcome of traditional swimming training. USRPT avoids that by having swimmers cease performing in a set when they no longer can hold race-pace that is, they experience neural fatigue. There is no point in striving to swim at irrelevant slower than race-pace velocities.
9. Traditional training mostly requires all swimmers to complete a specified number of repetitions irrespective of their capabilities. USRPT individualizes training by having swimmers cease participation in a set when they no longer can maintain their race-velocity. The avoidance of excessive training stress and debilitating levels of fatigue allows USRPT swimmers to expect improvements at every training session and usually in all races. Motivation to participate in the sport is high in USRPT swimmers.
10. Consequently, swimming activities at practices can be designated as being relevant or irrelevant for their potential to improve competitive swimming performances. It would seem that one would want to participate in relevant training.

USRPT and the science upon which it is based is a completely different format of coaching to traditional coaching. Coaches have to work harder, particularly in providing feedback about aspects of technique; swimmers receive performance feedback every practice item in a training session and are therefore motivated to participate in the sport more willingly, with enthusiasm, and with an expectation of often daily performance improvements. Those characteristics do not exist in traditional training settings.

I was particularly encouraged when Professor Fattah approached me about translating my works on USRPT into Arabic. This volume will serve as a valuable resource for young coaches. It is a feature of human nature that individuals who have done well under an old or existing regime (e.g., traditional training) will criticize a new format, whether or not it is evidence-based. Swimmers also perceive valuable training experiences and USRPT is almost universally accepted by serious swimmers of all ages when they are exposed to it.

I hope that USRPT will be considered with an open mind and given at least a trial implementation over perhaps a month before casting it aside because of coach's lack of familiarity. This book has the potential to propel swimmers in the middle-east to greater achievements.

Respectfully,

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January 20, 2016

Reference

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