

Sport Coach USA Intelligence Update

October 2011



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This Intelligence Update provides sport coaches the summary findings from the latest coaching and sport science research information, the latest essential reading, and news from the Institute for Sport Coaching's Research and Information Team. The Team monitors and reviews over 60 leading journals, magazines, websites and databases in the sports industry seeking the latest information of interest to sport coaches.

Table of Contents

Must Read.....	1
Biomechanics & Physiology.....	1
General Coaching	2
Sports Psychology	2
Sports Nutrition	3
Strength & Conditioning	4
Youth Sports	4
New Technology for Coaches	5

Must Read

Title: The Athlete's Clock; How Biology and Time Affect Sport Performance

Author: Thomas W. Rowland, MD

Publication Type: Book

Publisher: Human Kinetics 2011

Keywords: Sport Performance | Speed Development | Sports | Circadian Rhythms

Abstract/Summary: This book explores how time, aging and our internal biological clocks affect sports performance. It also investigates how human control systems such as the central pattern generator (CPG) impact athletes. Another topic the author examines is how perceptuomotor timing allows humans to do remarkable things on the baseball and cricket fields of play.

Link: <http://www.humankinetics.com/products/all-products/Athletes-Clock-The?associate=6382>

Biomechanics & Physiology

Title: The Science of Speed: Determinants of Performance in the 100m Sprint

Authors: Majumdar, Aditi S. (Univ of New Mexico) & Robergs, Robert A. (Charles Sturt Univ)

Publication Type: Journal

Publication: International Journal of Sports Science & Coaching, Sept 2011, Vol. 6 Issue 3



Keywords: Acceleration | Sprinting | Speed Development

Abstract/Summary: Performance in the 100m sprint is influenced by a multitude of factors including starting strategy, stride length, stride frequency, physiological demands, biomechanics, neural influences, muscle composition, anthropometrics, and track/environmental conditions. The sprint start, the accelerative phase of the race, depends on muscular power. Three considerations of the sprint start are reaction time (time to initiate response to the sound of the starting gun), movement time (onset of response until end of movement), and response time. Maximal velocity running is a result of stride length and frequency. While stride length can be greatly limited by an individual's size and joint flexibility, stride frequency can be affected by muscle composition, neuromuscular development, and training. Although 100m sprint world record times have progressed drastically, there is limited evidence for how technology has contributed to such improvement. As such, physiology and physique combine to be the most influential determinants of improved sprint performance.

Link: <http://www.multi-science.co.uk/sports-science&coaching.htm>

General Coaching

Title: Paralympic Sport: An Emerging Area for Research and Consultancy in Sport Biomechanics

Author: Keogh, Justin W. L. (Auckland Univ of Technology)

Publication Type: Journal

Publication: Sport Biomechanics, Sept 2011, Vol. 10 Issue 3

Keywords: Coaching | Exercise Physiology | Adapted Physical Activity | Disabled Athletes

Abstract/Summary: The number of athletes participating in the Paralympics and related competitions has dramatically increased over the past ten years in the United States especially among the population of wounded veterans. The Paralympic Games are the pinnacle of sport for many athletes with a disability and represent a growing area for coaching. The overall purpose of this paper is to highlight the role that the field of biomechanics specifically and sports science in general may play in improving the performance in various summer Paralympic sports through research. To achieve this broad aim, this review provides some history and background on the Summer Paralympic Games, discusses the eligibility and classification rules, describes the potential for the constraints-led approach of dynamical systems theory to inform practice and research in this area, and reviews selected studies examining the biomechanics of the primary forms of Paralympic locomotion. Some recommendations on how sports biomechanics can help facilitate improvements in Paralympic athletic performance through applied research are provided, along with commentary on what may be some of the more important issues addressing Paralympic sport.

Link: <http://www.tandfonline.com/action/pricing?journalCode=rspb&>

Sports Psychology

Title: Developing Young Athletes: A Sport Psychology Based Approach to Coaching Youth Sports

Authors: Jack C. Watson, II, Ian Connole, & Peter Kadushin (West Virginia University)

Publication Type: Journal

Publication: Journal of Sport Psychology in Action, July 2011, Vol. 2, Issue 2



Keywords: Youth Sport | Coaching | Sport Psychology

Abstract/Summary: Youth sport is a social institution designed to help improve the health and wellness of the athletes and provide an opportunity for positive youth development. Coaches have a strong influence upon the benefits experienced by youth athletes. Given the importance of the coaching role, the purpose of this article is to outline several positive steps that coaches can take to help youth athletes develop life skills in the areas of leadership, autonomy, intrinsic motivation, and decision making. This article looks at some of the ways in which coaches can effectively incorporate sport psychology techniques into their practice of coaching. These include:

- Find ways to allow your players opportunities to practice leadership, including by leading drills or pre-practice/pre-game warm-up routines, which will also give the coach time to do other things (such as work with parent volunteers)
- Allow athletes to control parts of practice. One way might be to give athletes several drills for working on a skill and let them choose which drill to do.
- Allow athletes to be “self-informed learners” by encouraging peer mentorship during practice (e.g. allowing older players to coach younger players)
- Empower athletes by asking questions to provide feedback, rather than simply giving directive feedback
- Using the ICE method of communication, Information-Change-Encouragement, as a method for providing feedback. Be sure that feedback is non-judgmental and focused on the process (e.g. strategy, technique, effort)

Link: This article can [be found and purchased online](http://www.tandfonline.com/doi/pdf/10.1080/21520704.2011.586452) at:
<http://www.tandfonline.com/doi/pdf/10.1080/21520704.2011.586452>.

Sports Nutrition

Title: Fluid replacement requirements for child athletes.

Author: Thomas W. Rowland, MD (Springfield College)

Publication Type: Journal

Publication: Journal of Sports Medicine, August 2011, Vol. 41 Issue 4

Keywords: Dehydration | Body Temperature | Hyponatremia

Abstract/Summary: The main point of this study is to show how much fluid children need to make sure they are functioning properly throughout their competition. Water is the obvious choice, not to mention the least expensive choice, but when dealing with adolescent kids, taste is going to be the best option to ensure they are getting the overall hydration needed. Thermoregulatory responses to exercise differ in prepubertal athletes compared with their adult counterparts. It is important, therefore, to consider fluid requirements specific to this age group to prevent risks of dehydration and diminished sports performance. Relative to their body size, children demonstrate lower sweat water losses during exercise than adults. Nonetheless, percentage levels of incurred dehydration are similar in pre- and postpubertal athletes. Moreover, voluntary drinking volumes in children in respect to their body size are comparable or greater than those of adults. Given an adequate opportunity to drink during exercise, volume intake driven by thirst should be expected to prevent significant levels of dehydration in child athletes. The amount can be calculated conservatively as an hourly fluid intake of 13 mL/kg (6mL/lb) bodyweight. Equally important is post-exercise fluid replenishment (approximately 4 mL/kg [2 mL/lb] for each hour of exercise) to avoid initiating



subsequent exercise bouts in a dehydrated state. Choice of fluid should be dictated by taste preference, since volume of intake, rather than fluid content, is the most critical issue in child athletes. Since children may lack motivation for proper fluid intake behaviors, the responsibility falls to coaches and parents to assure that young athletes receive appropriate hydration during and after exercise bouts.

Link: <http://ajs.sagepub.com/>

Strength & Conditioning

Title: Bench speed: news on how rep speed impacts your strength and hormones

Author: Dan Wagman and James Krieger

Publication Type: Journal

Publication: Journal of Pure Power, April 2011, Vol. 6 Issue 2

Keywords: Max Strength | Strength Training | Hormones

Abstract/Summary: A simple way to look at this through a coach's eye would be to ask yourself, how many movements in (insert sport here) requires slow controlled movements? The answer is not many. Explosive movements (primarily concentric) are the crux of nearly every sport out there. Slow movements may be integral to the beginner to focus of correct form, but as the athlete progresses, teaching an explosive movement will be an important component of increasing gains in strength and power. This study involved two groups of lifters with more than two years experience who performed a series of bench press reps with different repetition speeds. The first group performed the press while eccentrically moving two seconds and concentrically moving two seconds until lockout (expressed 2/0/2), whereas the second group performed the movement with a 2/0/4 timing. Hormonal changes that were monitored were: lactate levels, plasma volume, testosterone, Human Growth Hormone, IGF-1 and creatine kinase levels. The researchers also looked at 1-RM (one rep max lift), total work (measured in joules), total work in the fourth set, total number of repetitions in the fourth set, total power in the fourth set (measured in watts), heart rate, RPE total body, and RPE chest. Group 1 proved to be better in every category measured by the researchers. The quicker tempo bench presses yielded 1-RMs 3.9% higher than the slower tempo, also total work performed across all sets done at the faster tempo was 10.8% greater compared to the slower group.

Link: www.jopp.us

Youth Sports

Title: Strategies for Helping Coaches Facilitate Positive Youth Development through Sport

Authors: Martin Camiré, Tanya Forneris, Pierre Trudel, & Dany Bernard (University of Ottawa)

Publication Type: Journal

Publication: Journal of Sport Psychology in Action, July 2011, Vol. 2

Keywords: Skill Development | Philosophy | Relationship Building | Positive Coaching

Abstract/Summary: Coaches are arguably the most important actors in the youth sport context and play an influential role in facilitating or hindering the development of youth. Despite the great impact they can have on youth development, most coaches have limited training or knowledge on



how to structure suitable environments to facilitate youth development. Over the last several years, our research group has conducted a number of studies with exceptional youth sport coaches. In this article, we present some of the strategies these coaches implemented in their coaching practice to promote positive development along with examples of challenges they confronted. These strategies include:

- Developing a thoughtful philosophy and approach to coaching
- Develop meaningful relationships with
- Intentionally plan developmental strategies into
- Don't just talk about life skills, make your athletes practice life
- Teach your athletes how life skills transfer to non-sport settings

Link: This article can be [found and purchased online](http://www.tandfonline.com/doi/abs/10.1080/21520704.2011.584246) at <http://www.tandfonline.com/doi/abs/10.1080/21520704.2011.584246>.

New Technology for Coaches

Name: Basketball Training Aid

Technology Type: Ball sensors

Company: 94Fifty Sports Technologies

Description: The technology uses an array of accelerometers and angular rate gyros inside a basketball to capture a full 360 view of the ball's movement. The ball transmits its movement information wirelessly via wi-fi to a laptop or wi-fi enabled device in real-time to provide instant feedback to both athletes and coaches. 94Fifty is currently developing similar technology for soccer and hockey.

Link: www.94fifty.com

For more information regarding the Sport Coach USA Intelligence Update, please check the Institute's [website](#) or contact Christopher Hickey via [email](#) or phone (978-201-1024).