Health & Fitness Journal
of Canada

Volume 7 **September 30, 2014** **Number 3**

THE PRACTITIONER'S CORNER

From "Locker – Rack – Shower – Repeat" to a coaching focused model of strength and conditioning.

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Abstract

Background: This paper proposes a coaching focused model of professional strength and conditioning. In this proposal we challenge the current philosophy and present a model of practice that considers the evidence base of professional knowledge. Specifically we present a challenge to the dominance of a biomedical model of practice. It argues that personal interaction as opposed to science should form the foundations of understanding the professional practice. Ultimately we attempt to define the nature of the strength and conditioning profession and the factors that underpin its effectiveness in meeting its professional objectives. **Health & Fitness Journal of Canada 2014;7(3):42-50.**

Keywords: Coach-athlete relationship, sports science, applied practice

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Introduction

In this paper we propose a model of professional strength and conditioning (strength and conditioning) practice, which is implied but rarely made explicit in education or training. In making this proposal we challenge the current philosophy underpinning professional strength and conditioning coaching. We take the position that the philosophical basis of a profession provides the means by which practical and ethical delivery questions are answered. The model of provision derived from a philosophical position offers the practitioner a means to consider the evidence base of professional knowledge. Ultimately it defines the nature of a profession and underpins its effectiveness in meeting its professional objectives. Therefore we begin by addressing the question: *Why do we believe that strength and conditioning is not currently a coaching focused philosophy?*

To answer this question we begin by considering the changes that took place in science in the early 18th Century during what became known as the Enlightenment period. It was around this time that a revolutionary development occurred in medicine with empirical science overtaking anecdote and 'wisdom' as the basis of medical practice (Bates, 2010, Porter, 2002). It was also the period in which a new model of preventive medicine began to emerge which recognised the impact of external forces on human health. Through the development of microscopes, bio-chemical procedures and laboratory techniques, scientists were able to see the work of viruses and bacteria on the body. The later development of X-rays and other technologies allowed the internal workings of the body to be exposed. These scientific developments helped support Descartes' philosophy that the mind and body are separate entities (Soma and Hetherington, 1990). A consequence of this worldview was that each anatomical part of the body could be independently analysed and dangerous

'invasions' defeated. An important impact of these developments for today's strength and conditioning is the view of the body as a machine. In this view, the body can be reduced to a set of parts that need maintenance to avoid breakdown with the practitioner working as a technician (Marcum, 2004).

At this point, it should be clearly stated that this paper does not set out to challenge the effectiveness of contemporary medicine. All the authors and many of the readers of this paper owe much of their health and wellbeing to modern medicine. The positive impact of science on human health is well documented and undisputed. The eradication of such diseases as Small Pox is testament to the power and value of a scientific approach. Our argument is that whilst the contemporary approach to medicine is effective it is not engaging with all the elements of the 'health' process. Therefore, it is not as effective as it could be in some situations. The position argued in this paper is that contemporary medicine 'threw out the baby with the bathwater' when it dismissed anything which did not fit the paradigm shift of the 18th century. If strength and conditioning science exclusively adopts the same biomedical philosophy an unintended consequence may be the inheritance of the same inadequacies identified in the medical literature (e.g. Polman et. al., 2013, Marcum, 2004, Soma and Hetherington, 1990).

Rise of the biomedical model

Before the period described above medical practitioners used a very different model:

> *"Although, since the time of Aristotle, in the fourth century BCE, anatomy has been a part of the Western tradition, anatomical pathology only began to develop in the late 18th century. In other words, prior to that time, morphology—knowledge of the body's structure—had very little to do with concepts of how the person was sick, beyond the idea that the body is a container with an internal, dynamic landscape where disturbances occur."* (Bates, 2000 p506)

In ancient Egypt, India, Greece and Rome health was viewed as a balance between the body, spirit and mind (Berdolt, 2008). The body, spirit and mind were seen not as separate entities but as a complex, interwoven, whole. Scientists who came out of the 18th century Enlightenment dismissed this view of health partly because the early cultures thought that disease was the result of religious and spiritual factors (Porter, 2002). Arguably this criticism of the archaic view of health can be challenged on the ground that it over states the importance of 'Gods'. Specifically Ancient Greek philosophers, such as Aristotle, developed a secular model of human health. This Greek philosophy from the 5th Century BCE, emphasised the need for a holistic balance between all the elements of life (for a detailed discussion see Bergdolt, 2008). This model reached its peak when it was adopted and disseminated by Galen, a Roman medical practitioner and devotee of the Hippocratic method. Galen developed the theory of four humours, which dominated the medical world for centuries (Porter, 2002).

Using Galen's model, medical practitioners recognised the need to examine the life of the patient as a whole;

lifestyle, exercise and diet were viewed as key elements of health and wellbeing (Bergdolt, 2008). Therefore, the Hippocratic-Galenic model emphasised the need for a truly individualistic, holistic process in which body, medicine and lifestyle were all considered essential to create health.

Whilst this 2500-yr-old approach to health has a resonance with much contemporary strength and conditioning practice, the dominant biomedical model does not adopt a similar approach (Krieger, 2014). Arguably if one strips back much contemporary medical research one finds a worldview that has reduced our concept of health to one that is a simple mathematical model. If a person exhibits symptoms, A, B & C then the cause must be D: A+B+C=D (Wade and Halligan, 2004). Furthermore, some physicians work with symptoms as if they are an expression of a cause, a cause which is not a shift in balance, but the work of an 'external invader' (Marcum, 2004). A second issue is not only the reduction of the body to individual 'cogs' but also the development of practice and knowledge similarly based on expertise focusing on each specific element. Hence, within the medical realm specialists in key areas have arisen. In critiquing contemporary medicine an argument can be made, that the practitioner seeks only to know the symptoms so as to recognise the disease within their discrete area of knowledge. Whilst this is a somewhat stereotypical and simplified view of modern medicine but nonetheless it has some value in helping us understand possible future issues in strength and conditioning.

The biomedical approach to medicine has become widely applied and in its own way is so effective that sociologists such as Ritzer (2010) now write of the 'McDonaldisation' of medicine. McDonalds is suggested as having an almost perfect business model in terms of efficiency and profit. Built around the notions of uniformity, organisational process, and homogeny, McDonalds represents for some the pinnacle in 'scientific productivity' (Ritzer 2010). Whilst such an approach may be appropriate for a company selling beef burgers, it is concerning that key social interactions such as the doctor-patient encounter appear to replicate a McDonald's like process line. This is not the fault of practitioners, but the worldview, which shapes modern medicine and the mechanism that underpins current policy (Polman et al., 2013).

Not surprisingly given the dominance of the biomedical model and the close links between medicine and fitness the same factors described above have shaped professional practice in strength and conditioning. Where perhaps once the key element was the coaching encounter it appears that today's strength and conditioning is a race to find the perfect McDonald's like processes for the development of athletes. Using Taylorism as a model of critique, Kiely (2012) challenges a process line model of strength and conditioning. Kiely (2012) describes Taylorism as a concept of scientific management. This concept essentially describes that all construction processes can be presented as 'scientific production line'. Historically, this approach has been successfully applied to such industries as car, food and other industrial assembly processes. However Kiely's (2012) critique highlights that similar production line thinking often underpins contemporary athletic

development. Yet the issue arises that the process of human talent development may be a very different matter to that of a factory assembly line. Kiely (2012) concludes "*findings challenge the appropriateness of applying generic methodologies, founded in overly simplistic rule-based decision making, to the planning problems posed by inherently complex biological systems*" (p242).

There appears to have been a division of sports science and coaching into isolated specialisms. Specialist courses now run for strength and conditioning, sport psychology, biomechanics, nutrition, physiology etc. As a result expert knowledge in athletic development is presented in a categorised and isolated manner. It is argued here that embracing the dominant biomedical model may not be wholly appropriate and may result in negative unintended consequences.

Proposing an alternative perspective

Consider the typical process in an strength and conditioning coach's profiling of an athlete as illustrated in (Figure 1).

Figure 1: Typical process for strength and conditioning practice.

In this model the athlete undergoes some form of screening or physical testing. The data created produces an analysis of their needs and the strength and conditioning coach then writes a training programme. This is analogous to the medical process presented earlier, with the coach looking for 'symptoms' and then prescribing interventions. Furthermore literature often uses the terminology of the medical world with concepts such as training prescription and dose-response relationships (e.g. Peterson et al., 2004). Rather than take two tablets a day, strength and conditioning coaches use the language of 5-7 to 10-12 RM loading for hypertrophy (Zatsiorsky and Kraemer, 2006). We believe this model adequately sums up the fundamental process of what many strength and conditioning coaches do, and many texts advocate (e.g. McGuigan, 2014).

Arguably this medicalization of strength and conditioning has gone so far as to now demonstrate elements of McDonaldisation. Use of online strength and conditioning coaching/personal training and computers embedded into lifting platforms mean athletes may not need to have face-to-face interaction with coaches. Simply walk into the session and do the movements at the prescribed intensity. No need for coach-athlete interaction, just follow the conveyor belt – 'locker - rack - shower – repeat'. It is our concern that in its haste to be recognised as a credible and scientific profession, strength and conditioning may have marginalized many of the key factors, which made it effective in the first place. Specifically the danger arises that should professional practice in strength and conditioning become dominated by a reductionist biomedical process there may be the loss of the strength and conditioning coach – athlete relationship. A growing body of research has demonstrated the importance of the coach-athlete relationship (for a detailed discussion see Cassidy et al., 2008). We argue the concept of a relationship and the understanding of coach-athlete interaction is the element that is missing

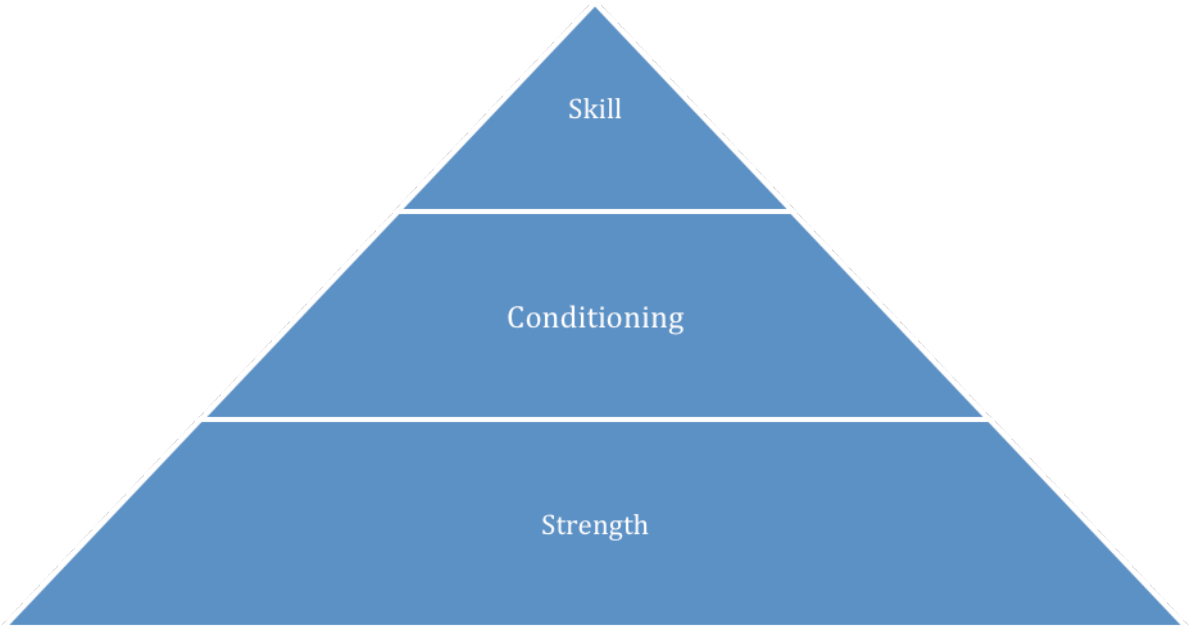
from the philosophy of strength and conditioning.

At present we suggest that the current strength and conditioning philosophy is as illustrated in Figure 2 below. The top of the pyramid represents the ultimate aim of strength and conditioning work (i.e., the improvement of skilled performance). Regardless of sport, performance enhancement is the overall objective. However, it can be stated the ability to reproduce a skill effectively is based on the level of an athlete's conditioning. Whilst it can be considered the level of conditioning is a function of an individual's strength. Therefore Figure 2 includes a foundation of strength upon which conditioning and skill are built.

these factors into a more holistic definition that considers the athlete's ability to move effectively and efficiently. Such a definition is highlighted by contemporary approaches including Gray Cook's Functional Movement Screen (see Cook, 2010), Vern Gambetta (see Gambetta, 2007), Paul Chek (see Chek, 2004) and Craig Ranson and David Joyce (see Ranson and Joyce, 2014). The key message is if an individual cannot move efficiently then conditioning is merely adding 'bad fitness' to bad technique. This ultimately impedes skill and can lead to injury and other major barriers to performance.

Despite a contemporary shift from a focus on weightlifting, and the improved role of strength and conditioning with regards to injury pre-/rehabilitation, this

Figure 2: Proposed model of the relationship between skill, conditioning, and strength.



Importantly the definition of strength in Figure 2 is not the concept of maximal strength or the ability to work against a resistance. Rather it is the integration of

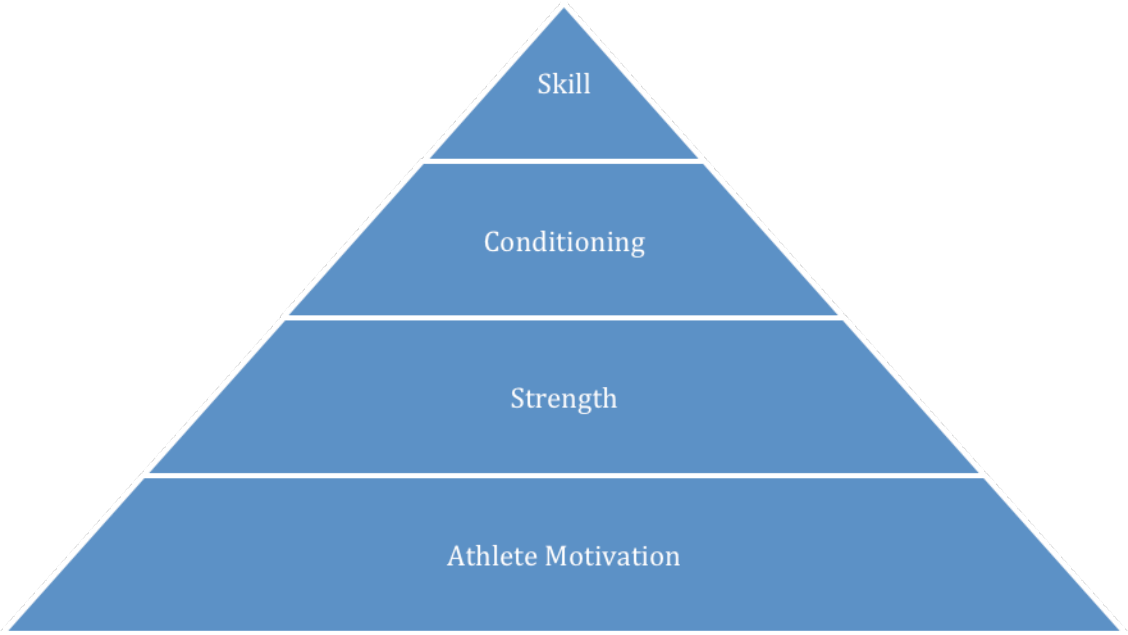
emerging model may still have limitations in accurately capturing the reality of strength and conditioning work. In Fig 3, we propose that people do not move effectively unless they are motivated to

do so and act in a goal-orientated manner. We contended that the quality of human movement quality is substantially based on motivation. Regrettably, the motivational base of the 'performance pyramid' is rarely recognised in strength and conditioning specific texts and education.

There is a large body of literature on training prescription but many textbooks and professional courses fail to explicitly recognise the importance of motivation. We suggest that the over focus on biomedical science has turned strength and conditioning sessions into an exercise laboratory. Such are the perils of not understanding the nature of training rituals, the coach-athlete encounter and the psychology of the athlete.

There is an even deeper level that needs to be made explicit in strength and conditioning coaching. Again it is one which specific strength and conditioning literature has not yet made fully explicit. The motivation, or will, to do something is suggested as being based on personal objectives and the culture/environment in which an individual is placed (Gallucci, 2013). Some sport psychologists suggest that each strength and conditioning session has a motivational climate and that this climate is shaped, substantially, by human interaction and relationships (Martindale and Mortimer, 2011). Similarly, Perlman and Vangelisti (2006) argue that all human interaction has at its basis the notion of relationships. With these insights in mind we propose that it is the relationship between the strength and conditioning coach and athlete that determines much of the athlete's motivation.

Figure 3: Proposed relationship between motivation and the physical performance factors.



From this proposition we argue that the ultimate foundation underpinning the performance of an athlete is the personality of the coach in the delivery of their practice as we present in Figure 4. Relating it to our previous comments, it

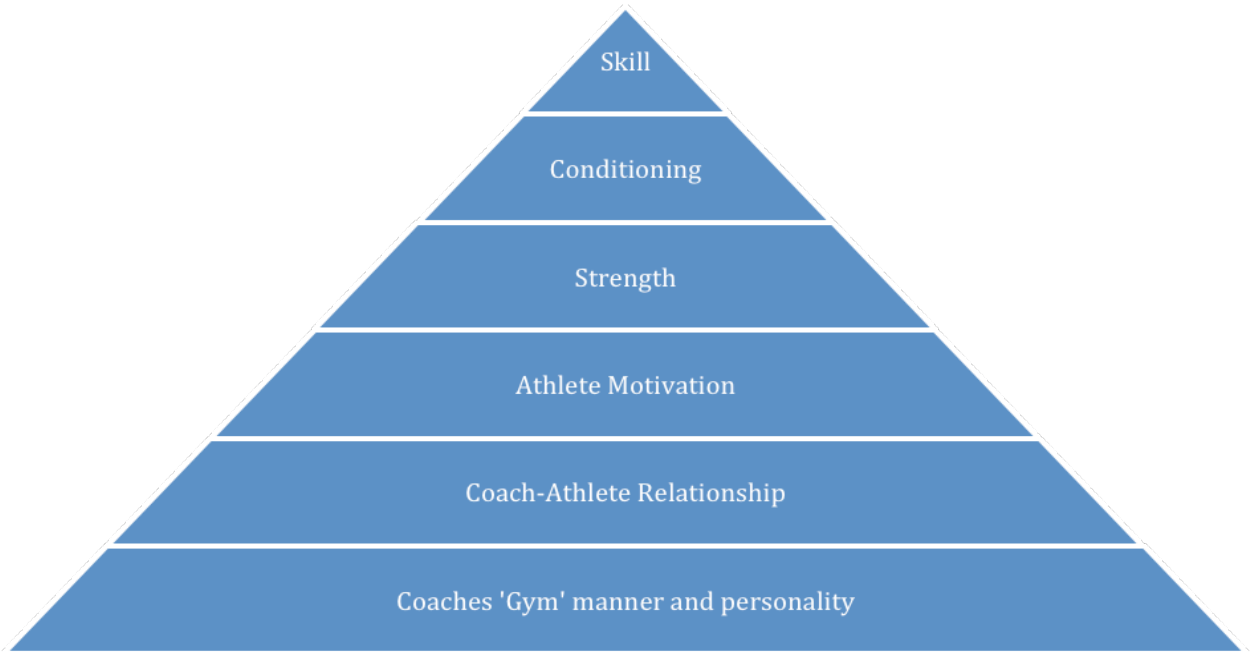
can be said the better the 'bedside manner' the better the quality of the coach-athlete relationship. As supported by literature (e.g. Nicholls and Jones, 2013), the better the coach-athlete relationship the greater the motivation to train. Greater motivation in turn means the better the efficiency of movement. Better movement leads to a greater quality of training allowing for a greater improvement of conditioning. So it is the way in which we interact, motivate, educate and manage which are key; not necessarily the latest development in isokinetic technology. We suggest that the philosophy of strength and conditioning needs to take a coaching focused approach. That is a greater emphasis needs to be made to understand the impact of the deliverers and their methods of interaction. This requires a shift in focus from the mechanisms of scientific training to the mechanisms of personal coaching.

Conclusions

In concluding we answer the question posed in the first paragraph of this paper. We feel that strength and conditioning may not be coaching focused because there appears to be an over-emphasis on the biomedical aspects of the training process. This dominance of a single perspective is often unrecognised or dismissed in our technological, medicalised and McDonalised society (Kiely, 2012, Ritzer, 2010). So whilst not wishing to negate the positive impact this philosophy has had on strength and conditioning, the possible negative unintended consequences of the biomedical model needs to be made explicit.

Our concern is that in a rush for the 'perfect' science of strength and conditioning based on norms, scientifically determined loading and complex planning, we seem to be ignoring the very thing that makes it all work: the

Figure 4: Proposed model that the foundation of strength and conditioning is not based entirely on scientific knowledge but the personality of the coach.



strength and conditioning coach. Coaching is a complex and multifactorial process requiring knowledge of a wide and varied body of knowledge (Nicholls and Jones, 2013). However, a brief look through the key texts suggests that motivational climate, the interaction between coach and athlete and the psychology of the training environment is minimised.

In summary we propose that the profession of strength and conditioning should progress its understanding of the biomedical, physiological and biochemical sciences which have improved its capabilities. However a lack of recognition within the literature and research of what we propose as the underpinning foundations may limit the development of expert deliverers and coaches. An understanding of strength and conditioning through the prism of motivation and relationships should be developed in parallel not in isolation from the sports science laboratory. Ultimately the gym and training field should become places not just where technology and medical science meets physiology and biomechanics, but a place where people meet people to achieve their goals.

Authors' Qualifications

The authors' qualifications are as follows: John Gray MSc. ASCC.FHEA., Prof. Andy Smith MBE. PhD. SSCi FBASES., and Dr. Hazel James PhD.

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