

The Warm-up: A Behavioral Solution to the Challenge of Initiating a Long-Term Athlete Development Program

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ABSTRACT

LONG-TERM ATHLETE DEVELOPMENT (LTAD) IS NOT LACKING MODELS AND DATA-DRIVEN ARGUMENTS, BUT PROGRESS IS STILL LIMITED. INSIGHTS INTO BEHAVIORAL SCIENCE OUTLINE THAT CHANGES TO PRACTICE MAY BE EASIER TO ATTAIN WHEN THEY ARE EASY TO APPLY AND DO NOT OVERTLY ALTER CURRENT PRACTICES. THIS ARTICLE OUTLINES HOW RETHINKING WARM-UPS USING A PRACTICAL BEHAVIORAL APPROACH CAN PROVIDE A SIMPLE, FLEXIBLE BUT EFFECTIVE WAY IN WHICH TO INTEGRATE LTAD INTO ANY PROGRAM.

INTRODUCTION

The concept of long-term athlete development (LTAD), to achieve true practical significance, needs a shift of emphasis from theoretical models to implementation (12). This in turn needs a change in focus from “what” to do, to a focus on “how” to do it. In many instances, the application of LTAD will be dependent

on changing the behaviors of the key players involved in its implementation. Effective implementation solutions need to be guided, not just by physiology and motor control, but crucially by the insights into behavioral sciences. Ease of intervention and removal of barriers to application are plausible solutions to implementing LTAD. This article outlines how warm-ups can provide a simple and effective practical solution to address many of the behavioral challenges (12) and enables an LTAD program to be initiated.

BEHAVIORAL REQUIREMENTS OF EFFECTIVE INTERVENTIONS

Key behavioral challenges to effective LTAD interventions have been identified, addressing 3 biases that greatly affect people’s perception and decision-making processes—the status quo bias, present bias, and salience (12). These are by no means all possible biases, as many exist, all of which have the capacity to affect human decision-making (14,15). However, these do provide significant challenges to the application of LTAD, and if biases are not addressed, they will affect the success of any program. The status quo bias, with an inherent tendency to keep doing what has always

been done, will always be a major obstacle to the implementation of any new approach (13,14). Addressing this requires that any intervention should be easy to implement and should not disturb natural activities to any great extent (14).

In addition, present bias, the tendency to look for short-term effects over any long-term impact, will always be a challenge to any approach that explicitly states its goals in terms of the longer term. (14) Consequently, any intervention must have clear short-term benefit and long-term impact (15). Effective interventions also need to be salient—addressing issues that the coach and athlete perceive as having direct impact on performance (7). Subsequently, there should always be some focus on capabilities that the coach and athlete can see directly enhancing sport-specific performance (7).

Addressing these biases requires a move away from idealistic models to find effective and pragmatic solutions that contribute to LTAD, but which crucially address the challenges of implementation. This requires the

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development of methods that are easy to implement, address short-term and long-term performance, and enhance the variables which coaches and athletes consider as key to performance in their sport (9). Imagine the potential if we could advise coaches that we had a training mechanism that helped them achieve their goals yet required no additional training time and fit in to the existing structures of training sessions. The irony is that the field already possesses such a tool, but biases obscure it. The warm-up, which addresses short-term performance needs, but critically is also designed to address longer-term athletic development issues, is such a tool (9). However, to use it effectively as a tool for LTAD requires a shift in perspective and a reconsideration of the overarching aims and objectives of a warm-up, and an evaluation of the most effective ways of delivering a warm-up to elicit both short- and long-term benefit.

AN EASY TO IMPLEMENT SOLUTION

Change is notoriously challenging, and the first step is often the most difficult, as it normally requires a change in behavior (14,15). Typically, the easier a change is to implement, the more likely that change is to be successful (12,14,15). Consequently, initiating LTAD through modifying warm-up practices can be especially useful (10). As practically every session an athlete undertakes already begins with a warm-up, a slight modification to a warm-up protocol does not require additional time or athlete effort and is less likely to contravene the status quo bias than an attempt to add an additional athletic development session (7,9). In this way, a modified warm-up is a highly efficient method by which to initially implement LTAD. However, to optimally use the approach requires a shift of focus away from a purely physical approach to one which focuses equally on the development of athletic skills (9).

A SHIFT IN FOCUS—TRADITIONAL TO TRANSFORMATIONAL

As strength and conditioning coaches, we naturally have a bias toward the

consideration of physical capacities. Typically, a warm-up is judged solely on its effect on the athlete's physical capacities in the upcoming session—what could be considered as the traditional approach (4,6,9). Indeed, most research on warm-up solely focuses on its direct effect on indicators of physical performance such as running speed and power production. Although this is still appropriate, and even critical for competition warm-ups, it does not optimize the use of warm-ups as a tool for athletic development (9). Even where a short-term focus dominates, a shift in the thought process can be illuminating. Additional considerations such as focusing on the time efficiency of the warm-ups, considering the optimal structure of the warm-ups to ensure that each activity leads naturally into the next, and also reflecting on how the warm-up combines with the goals of the upcoming session can lead to more effective planning and implementation (9). However, further transformation occurs when activities are considered, not just for their short-term benefit, but also in relation to their long-term impact. This opens the door to far more creative planning and to a host of potential benefits and applications (9,10).

One of these benefits is the skill development potential that a warm-up can bring (9). Although there are many factors that ultimately affect the level of skill development, perhaps, the most crucial is the accumulated quantity of deliberate practice (3). Subsequently, any mechanism by which deliberate practice on key athletic skills such as accelerating, decelerating, starting, jumping, landing, etc, can increase, especially when it can be performed without a concomitant increase in training time, provides a valuable tool to a strength and conditioning coach (9).

Simple mathematics shows the potential value of thinking of warm-ups as skill development opportunities. Two sessions per week, with a warm-up allocation of 15 minutes, is 30 minutes

of potential skill development opportunity each week, which in turn translates to 2 hours per month. When extrapolated into a training year, and especially multiple years, this provides a considerable amount of potentially productive athletic development work. In addition, skill development is typically enhanced when athletes are free from fatigue and is recommended to be practiced early in a training session (5,8). Here again, a warm-up naturally provides an ideal opportunity to undertake extensive skill-based development. However, to exploit this, focus needs to shift from the traditional short-term benefits of the warm-up to consideration of how time can be used to develop skills that are also fundamental to the long-term development of the athlete (9).

THE NEED FOR A NEW STRUCTURE

Moving to a transformational approach requires a shift in thinking and critically a shift in nomenclature. Traditionally, the standard structure has been of a general followed by a specific phase of warm-up (1,6). While often providing the physiological-based elements required for effective performance, the structure, and especially the language used, is not necessarily conducive to athletic development (9). The term general, in itself, suggests that temperature-related elements of warm-up can be achieved through “any general exercise” (9). This can lead to activities being used that may contribute to the short-term goal, but which have little, if any, longer-term benefit. If the warm-up is to be used effectively as an athletic development tool, then the concept of a “general” phase needs to be replaced, and consideration given to what activities can contribute to both short-term and critically longer-term performance. Similarly, the specific aspect of the warm-up, while focusing on the skill-related aspects of the sport, has no real clear guidelines as to the type of activities to be used and to the intensities used (4,9). Including a phase that is highly targeted in relation to the

activities used, progressive in terms of skill development, and also progressive in relation to intensity provides an optimal opportunity to address key performance components such as speed, agility, and skill application. It is here that the raise, activate and mobilize, and potentiate (RAMP) structure can be especially useful (4,6,8,9,11).

RAMP WARM-UPS—THINKING SHORT AND LONG

The RAMP structure addresses the previous shortcomings and allows for targeted actions to be planned and delivered throughout the warm-up sequence. In addition, its structure builds sequentially to highly specific activities that bring short-term and long-term benefits (9).

The RAMP structure itself refers to 3 distinct phases of warm-up, namely:

- Raise;
- Activate and Mobilize;
- Potentiate.

RAISE

Physiologically, the aim of the raise phase is to achieve the temperature-related requirements of the warm-up, along with key other physiological adaptations that result from a period of low- to moderate-intensity exercise (4,9). While this could be compared with the general elements of a typical warm-up, the key difference is that it aims to achieve the physiological goals through targeted, deliberate practice designed to achieve specific skill-related goals. So, from the outset, the aim is not simply to achieve the physiological goals of the phase, but to achieve these in a way that also contributes to skill development (9,10).

Raise phases of the warm-up are typically delivered in a range of activity setups, where a high-density of movement activity can be achieved in a relatively small area, such as agility squares (8). The density of movement allows for frequent repetition of the skills concerned, while the small area set up allows a coach to view as many of these as possible to ensure that these are performed in a technically correct manner. This reflects the importance of

coaching throughout the warm-up. When developing skills, effective technique is crucial; the body does not differentiate between warm-up and the main session, and so, ensuring high-quality patterns are used throughout is critical (10).

The raise phase is particularly useful in developing a range of locomotor skills that are used in most of the team and court sports and which develops a sound basis of movement literacy. Including a wide variety of movement patterns in the raise phase of a warm-up allows each to be introduced and then progressively developed (5,8,11). Progression can be provided through a range of methods, for example, movements can initially be introduced as discrete movements and subsequently developed through combining movement patterns, adding open more reactive elements, and eventually more task-based activities (8). This progression and variety provide for a rich skill development environment (11).

ACTIVATE AND MOBILIZE

The raise phase will have achieved an increase in overall body and muscle temperature, resulting in an increase in muscle elasticity and a decrease in the transient bonds in the muscle—enabling a greater range of motion to be achieved (1,6). Consequently, the aim of the activation and mobilization phase is to progressively move the athlete through the ranges of motion required in the higher intensity activities of the potentiation phase and in the sport. Critically, from a long-term perspective, the activation and mobilization phases enable the athlete to practice and progress the key movement patterns required for both performance and injury reduction. As the title suggests, the focus is on mobility, rather than simply range of motion. This has the advantage of developing fundamental movement capacities but also helps maintain the temperature-related benefits of the raise phase (9). As mobility involves the ability to control movement by the appropriate development of motor control and

stability (2), it potentially brings more long-term benefit than a focus on static stretching. The activation element emphasizes that the aim is to actively move through the required movement pattern and not simply to achieve this through more ballistic movements (4,11). Thus, this controlled movement through key fundamental patterns has a short-term benefit but also critically a long-term benefit through enhanced movement capacity. As with the raise phase, focus should be on the quality of technical performance, and again quality coaching is crucial to the process.

In deciding what activities to include, Cook's functional movement screen is a useful starting point (2). Cook has outlined movements considered essential to human performance (2), and these can subsequently form the basis of the movement selections in the activation and mobilization section (2,9). Figure 1 outlines the key movement groupings built on Cook's model: squat, lunge, single-leg stance, and brace. By choosing an activity from each of these, all the key movement skills can be practiced in each warm-up. By adding 2 additional components (reaching and hinging) into these basic movements, each major joint can be appropriately mobilized before the more intense activities of the potentiation phase. As befits the longer-term approach, added challenge can be added to each exercise over time once basic competency is achieved. This allows for the sequential development of each movement pattern thus facilitating appropriate skill development in each of these patterns. As an example, a lunge pattern can initially be performed in place, then as a walking lunge, then adding additional components such as reaching or rotating. Subsequently, this phase does not just contribute to performance in the short term, it allows for the practicing of each of these key movement patterns in each and every session (9,10). This should lead to a wider and more complete movement vocabulary, which will consequently enhance athletic development and injury.

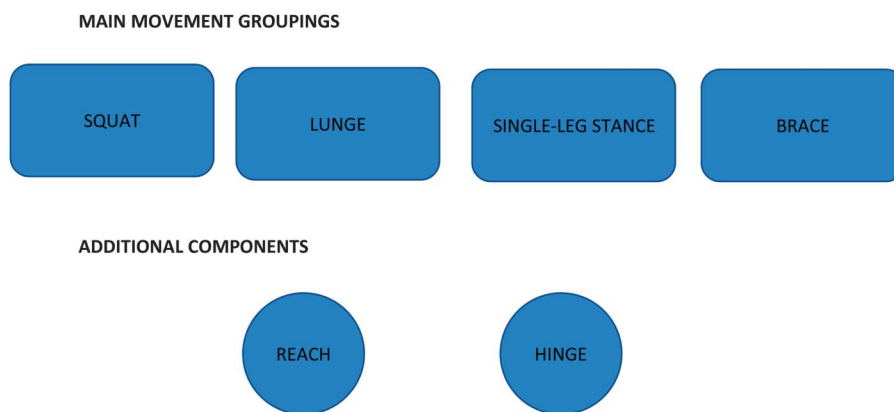


Figure 1. Mobility groupings. Choose one exercise from each section to address the major movement patterns identified by Cook (2). The selection should be based on the individual's competency. Over time, each movement pattern can be progressed based on competency, for example, an in-place lunge can progress to a walking lunge. Where possible and appropriate, add an additional component (reach/hinge) to one or more of these main groupings, for example, the lunge pattern mentioned above can be combined with a hinge and/or a reach.

POTENTIATE

Track and field athletes, among others, instinctively know that maximal performance requires a sequenced buildup of intensity up to the levels required in the performance itself. Yet, despite this, a potentiation phase is still often omitted from many warm-ups (9). This clearly jeopardizes short-term performance but can have large effects on the potential for long-term development. This is because the potentiation phase provides for one of the most powerful tools for athletic development—a chance to practice key movements in a nonfatigued state, at progressive intensities up to maximal performance. In this way, the potentiation phase, as well as optimally preparing the athlete for the upcoming session, also provides the opportunity to undertake development important to athleticism—especially in terms of the development of speed, agility, and power-based activities. Incorporating these types of activities into a warm-up allows for extensive practice to be achieved without an unnecessary increase in training time. Again, this is a highly efficient way of ensuring this type of training is incorporated into the athlete's development program each and every week.

The potentiation phase can be planned as a sequence into the main session or

can be used as a discrete session itself. In the former, for example, where the main session will focus on offensive skills, the potentiation phase can incorporate acceleration and change of direction activities to optimally prepare the athlete for the upcoming session. In this way, it helps rehearse and develop the very skills needed for effective offensive performance. This is a powerful way of, not only preparing the athletes physically for the upcoming session, but also working on some of the skills that will allow them to optimally perform tasks in the main session. Importantly, from a behavioral standpoint, it also provides the required salience to demonstrate how the activities in the warm-up are contributing to sports performance.

Although this is a very powerful form of planning, it must not be considered as the only methodology available. Another key component of an effective potentiation phase is the ability to incorporate methodologies that are currently missing from the athlete's main training and where the warm-up is planned as a discrete session in itself. In this way, focus may be on movement skills such as jockeying or maximal speed running, which may not feature in the main body of work, but which are an important component of the athlete's

overall development plan. Subsequently, speed and agility inputs can be delivered on a regular basis, but with no increased requirement of time. This requires planning on a short-, medium-, and long-term basis, identifying the necessary movement skills required for optimal performance and ensuring that these are integrated into the athlete's overall development plan.

Potentiation phases could be thought of as falling on a continuum, from simple to complex. In relation to their implementation within a single session, the phase can start with simple activities and progress these into complex task-specific activities as the session progresses. In relation to the athlete's stage of development, beginner athletes can focus more on the simple activities while advanced athletes can focus to a greater degree on the task-specific activities. To facilitate the planning process, potentiation phases can be planned around themes, allowing activities to be selected that address the necessary skills required to perform the identified theme. These themes can be relatively unitary, such as developing acceleration capacity, or complex such as developing offensive skills. Figure 2 outlines some typical themes, and these can be varied, within, and between, weeks to ensure

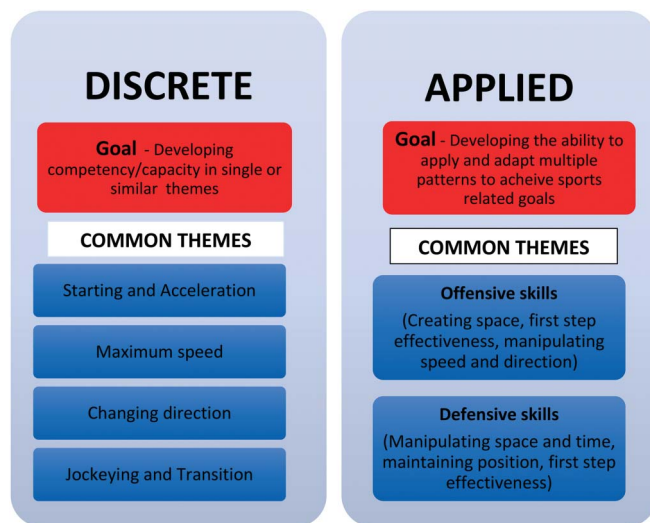


Figure 2. Warm-up themes. Warm-up activities are designed around developing capacities associated with a given theme. Activities are subsequently chosen in each section of the warm-up to contribute to the development of these capacities.

that a full spectrum of skills are developed over any period. As these themes are built around the movement requirements of sports performance, they again address the issue of salience that is important to effective implementation.

SUMMARY

From the behavioral approach provided in this article, effective application of LTAD programs necessitates simplicity, and that barriers to execution are progressively removed. This often involves changing the behaviors of the key people required to facilitate the application of the athletic development program. This, in itself, requires an understanding of why people make decisions and how these are affected by biases. Similarly, it requires a pragmatic approach where idealism is put aside, and an approach taken whereby execution is made possible. Using RAMP warm-ups is an initial way of implementing an athletic development program that

addresses many of the key biases that may prevent the uptake of an LTAD program. In addition, it is an efficient and effective way of laying the foundations of an athlete's development. Switching from a traditional, short-term approach to warm-up, to a transformational long-term approach allows a much wider lens to be used and the incorporation of methods and activities that, not only enhance an athlete's performance in the short term, but perhaps more importantly, also in the long term.

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