Guidelines for Implementing a Dynamic Warm-up for Physical Education

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As doubts about the value of static stretching grow, dynamic exercise offers a more beneficial warm-up procedure.
in warm-up procedures that involve the performance of dynamic movements designed to elevate core body temperature, enhance motor unit excitability, improve kinesthetic awareness, and maximize active ranges of motion (Cissik & Barnes, 2004; Rutledge & Faccioni, 2001). This type of pre-event protocol is called “dynamic exercise,” and it typically includes low-, moderate-, and high-intensity hops, skips, jumps, lunges, and various other exercises for the upper and lower body.

During a dynamic exercise, the muscles are stretched to a new range of motion and then forced to contract to perform the desired action. Since muscles are actually used in a new range of motion, it is logical to assume that they will be better prepared for the main activities of physical education class. It is important to understand that a dynamic stretch does not involve a bouncing-type movement, which is characteristic of a ballistic stretch, but rather a controlled elongation of a specific muscle group. Since dynamic exercises actually prepare the body for movement during physical activity, the term “movement preparation” is also used to describe this type of warm-up (Verstegen & Marcello, 2001).

Dynamic Motivation

Getting students ready for physical education class is not just about low-intensity aerobic exercise and static stretching. A well-designed warm-up can set the tone for the class and establish a desired tempo for the upcoming activities. If a warm-up is slow and monotonous, then performance during the main physical activities that follow may be less than expected. However, if the warm-up is brisk, exciting, and diverse, our observations suggest that performance during the physical education lessons will likely meet or exceed expectations. In short, a dynamic warm-up satisfies the need for students to move when they enter the gymnasium and helps to focus their attention on listening and learning.

During our warm-up sessions, we want our students to do more than increase their body temperature. We want to turn on their neuromuscular systems, improve mobility, enhance flexibility, and properly prepare them for the main activity portion of the physical education lesson. We refer to this sequence as “warm up, turn on, and work out.” “Warm up” refers to exercises that prepare the students for the physical education lesson. Instead of three laps around the gym,
6. **Crunches**: Begin by lying on ground with knees bent at 90 degrees, feet flat on the ground, and arms crossed on chest. Crunch upward, aiming the elbows toward the thighs. Progress to crunch punches by increasing the velocity of the crunch action while pushing both arms from a chest crossed position to an extended arm position above the knee. Emphasize a slow controlled return to starting position for safety and proper technique.

7. **Marching Lateral Shuffle**: From a standing side-stance with feet at hip width, hop and land with feet at shoulder width and body lowered to a semi-squat position. While maintaining this position, move laterally by taking a lead step followed by a short secondary step. Progress to a quick lateral shuffle by increasing the speed of the lateral movement.

8. **High-Knee Skips**: Rapidly skip forward while focusing on knee lift, arm action, and reduced ground time. To progress to kick away, jog forward while kicking heels backward with extended leg. Emphasize proper form by allowing the knee to bend at the end of the kick away to assist the return of the foot to the ground quickly.

9. **Partial Push-ups**: From a standard push-up position, lower body until elbows are at 90 degrees, then return to the starting position. Progress to push-up and lift one hand a few inches off the floor after returning to the starting position. Maintain a three-point base of support for a few seconds, then return hand to starting position and repeat on opposite side.

10. **Run and Go**: From a standing position, lean forward as you run to the five-yard mark and then sprint through the 10-yard mark. Focus on arm action, knee height, and accelerating as fast as possible. Progress to run and stop leaning forward as you sprint through the five-yard mark and then stop at the 10-yard mark. Focus on decelerating by lowering your body, bending your knees, and increasing foot contacts (i.e., chop feet several times).

we use a variety of dynamic activities that require balance, agility, coordination, flexibility, strength, and power. “Turn on” refers to the activation of the neuromuscular system to excite the proper muscles. Since most students have been sitting in class before physical education, their muscles need to be “turned on” for the main activity component of the lesson. This is accomplished by performing low-, moderate-, and high-intensity dynamic movements. “Work out” refers to the conditioning aspect of our warm-up protocols, which can result in meaningful improvements in fundamental movement skills and fitness performance. Unlike static stretching, a dynamic warm-up prepares the body for the more vigorous, random movements that occur during some physical education lessons.

A fundamental principle of our dynamic warm-up protocol is that our warm-up exercises are similar in design and function to the activities that the students will be performing in the main activity segment of our physical education classes. While we recognize the value of traditional stretch-and-hold exercises, we incorporate static stretching exercises into the cool-down of our physical education class rather than the warm-up. Remember that the goal of traditional stretching is to relax the muscles whereas the goal of a dynamic warm-up is to activate them. During the performance of a dynamic exercise, not only do muscles lengthen (as they do in a static stretch), but they contract and move within a new range of motion. This type of movement-based training can enhance muscle strength, improve posture, develop kinesthetic awareness, and maximize active ranges of motion. In addition, warm-up activities that are active, engaging, and challenging, and that provide an opportunity for children to gain confidence in their ability to perform fundamental movement skills, are far more enjoyable than traditional stretch-and-hold activities, which some students in our classes find boring.

Dynamic warm-up protocols may also offer cardiovascular benefits. In one study, we found that the average heart rate (measured by portable heart-rate monitors) during a traditional warm-up (low-intensity aerobic exercise and static stretching) averaged 109 beats per minute, whereas a dynamic warm-up protocol elicited an average heart rate of about 150 beats per minute (Faigenbaum et al., 2005).
These findings suggest that warm-up protocols that include dynamic exercise may increase the amount of time children engage in moderate-to-vigorous physical activity, which is an important public health objective (National Institute of Child Health and Development, 2003).

**Developing a Dynamic Warm-up**

Our dynamic warm-up routines do not require equipment or a lot of space. Students perform each functionally based movement for about 10 yards, rest a few seconds, and then repeat the same movement as they return to the starting position. Students generally perform eight to 12 different exercises that progress from relatively simple movements to more challenging exercises involving more complex movement patterns. After we demonstrate each exercise, students perform them as we provide instruction to maintain proper form (e.g., vertical torso, knees towards chest, up on toes). Our physical education classes use a seamless transition from a five-to-ten-minute dynamic warm-up to the start of the main physical activity lesson.

Table 1 describes a progressive, dynamic, warm-up routine that we use for school children in our physical education classes. Since there are literally hundreds of exercises that can be incorporated into a dynamic warm-up, the sample exercises should be used as a starting point or guide to help physical educators develop a routine that is consistent with the needs and abilities of each student. Although a dynamic warm-up may feel like a workout, remember that its goal is to prepare students for the main activity segment of class without undue fatigue. Additional ideas for developing dynamic warm-up protocols for physical education classes and sports practice are available elsewhere (Chu, Faigenbaum, & Falkel, 2006; Mediate & Faigenbaum, 2004).

**Summary**

A dynamic warm-up routine can add a new, exciting, engaging, and beneficial dimension to a physical education class. By gradually progressing from simple to more complex movements, students will gain confidence in their abilities while getting ready for the main activities of physical education. Additional research on the acute and chronic effects of dynamic exercise on youth will help physical education teachers optimize warm-up procedures for students.

**References**


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