

DYNAMIC STRETCHING

THE REVOLUTIONARY NEW
WARM-UP METHOD
TO IMPROVE POWER,
PERFORMANCE AND
RANGE OF MOTION

MARK KOVACS

Photography by Austin Forbord

Ulysses Press 

DYNAMIC STRETCHING

THE REVOLUTIONARY NEW
WARM-UP METHOD
TO IMPROVE POWER,
PERFORMANCE AND
RANGE OF MOTION

MARK KOVACS

Photography by **Austin Forbord**

Ulysses Press 

Table of Contents

[Title Page](#)

[part 1: getting started](#)

[introduction](#)

[what is dynamic stretching?](#)

[understanding the terms](#)

[Warm-Up](#)

[Range of Motion](#)

[Flexibility](#)

[Stretching](#)

[why dynamic stretching?](#)

[The Myths Surrounding Pre-Exercise Static Stretching](#)

[Practical Application for Athletes at All Levels](#)

[before you begin](#)

[Playing It Safe](#)

[part 2 : - the programs](#)

[how to use this book](#)

[BASEBALL/SOFTBALL](#)

[BASKETBALL](#)

[BODYBUILDING](#)

[CYCLING](#)

[FIELD HOCKEY](#)

[FOOTBALL, AUSTRALIAN RULES](#)

[FOOTBALL—SKILL POSITIONS](#)

[FOOTBALL—LINEMAN](#)

[GOLF](#)

[GYMNASTICS](#)

[ICE HOCKEY](#)

[LACROSSE](#)

[RACQUETBALL/SQUASH](#)

[RUGBY](#)

[SKIING](#)
[SOCCER](#)
[SWIMMING](#)
[TENNIS](#)
[TRACK AND FIELD—DISTANCE](#)
[TRACK AND FIELD—SPRINTS & JUMPS](#)
[TRACK AND FIELD—THROWS](#)
[VOLLEYBALL](#)
[WRESTLING](#)

[part 3 : - the exercises](#)

[toe walk](#)
[heel walk](#)
[side ankle walk](#)
[knee to chest walk](#)
[walking quad stretch](#)
[knee to shoulder lateral walk—frogger](#)
[one-leg walking opposite—ostrich](#)
[upper body handwalk](#)
[hamstring handwalk—inchworm](#)
[spiderman crawl](#)
[straight-leg march](#)
[linear walking lunge](#)
[straight-leg walking lunge](#)
[rotational walking lunge](#)
[elbow to knee lunge](#)
[knee-to-chest hold into lunge](#)
[lateral lunge](#)
[overhead squat progression](#)
[sumo squat walk](#)
[low squat walk](#)
[figure-4 squat](#)
[glute ham bridge](#)
[lateral pass](#)
[overhead pass](#)
[ankle flips](#)
[split jumps/lunge jumps](#)
[countermovement squat jumps](#)
[repeated squat jumps](#)
[concentric squat jumps](#)
[power skips](#)
[high-knee run](#)

[jump jump sprint](#)
[backpedal](#)
[backward run](#)
[a-walk, skip, run progression](#)
[overhead squat](#)
[b-walk, skip, run progression](#)
[bent-leg bound](#)
[straight-leg bound](#)
[ankle taps](#)
[quick feet sprint](#)
[squat jump sprint](#)
[triple jump sprint](#)
[burpee sprint](#)
[lateral shuffle](#)
[10-yard movement sequence](#)
[carioca](#)
[high-knee lateral skip](#)
[dynamic empty can](#)
[hugs](#)
[cheerleaders](#)
[wipers](#)
[scorpion](#)

[*endnotes*](#)
[*recommended reading*](#)
[*index*](#)
[*other ulysses press books*](#)
[*Acknowledgements*](#)
[*about the author*](#)
[*Copyright Page*](#)

DYNAMIC STRETCHING

THE REVOLUTIONARY NEW
WARM-UP METHOD
TO IMPROVE POWER,
PERFORMANCE AND
RANGE OF MOTION

MARK KOVACS

Photography by Austin Forbord

Ulysses Press 

part 1: getting started





introduction

It is exercise alone that supports the spirits, and keeps the mind in vigor.

—Marcus Tullius Cicero

Sweat pours down your face. Your heart pumps out of your chest. The crowd chants an indistinct roar. Everything you've trained for your entire life comes down to less than 10 seconds. After what seems like a lifetime, the gun reverberates and the sprinters are off for the race of their lives—the 100-meter sprint in the Olympics.

You look over at the sprinter next to you and wonder if he has trained as hard as you, if his blood, sweat and tears have left stains in his T-shirts the way yours have. Stains not even bleach can fully remove.

Feet pounding on the track, the runners fly by in a blur of motion. Less than 10 seconds later, it's all over. You cross the finish line fifth while the guy next to you crosses first, and you wonder what could've made the quarter of a second difference in being on top of the world and finishing out of the medals.

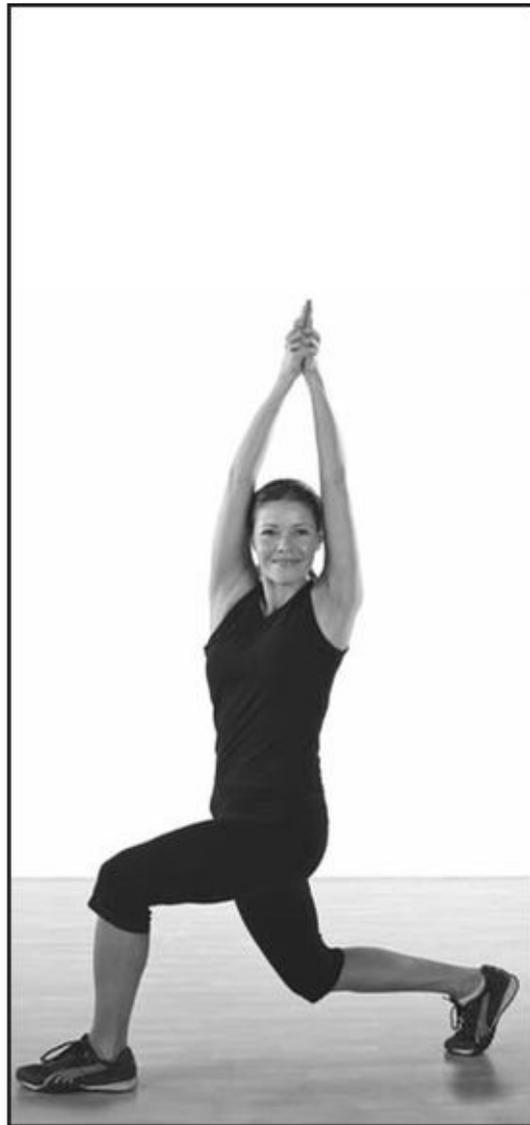
One reason could've been the way you both warmed up before races: dynamic versus static stretching.

From elementary school up through the professional ranks, and even for senior athletes, the virtue of stretching has been espoused by coaches, parents, sport scientists and medical professionals. The major question is what type of stretching is best. When most people think stretching, the first image people get is someone bending and touching his or her toes, and holding this position for 15-30 seconds.

This stretch-and-hold variety is known as "static" stretching. There is great value in this traditional stretching technique, as it is relatively safe and has been shown to improve range of motion about the joint(s) being stretched. Good flexibility in all parts of the body is vital for effective sports performance, reducing the likelihood of many types of injuries and also improving the health and functionality of everyday activities. However, like all good things in life, there is an optimum time and place to perform this type of stretching, and the greatest benefits are seen when static stretching is performed *after* activity.

Over the last decade, researchers, coaches and medical professionals have found that there are more optimum methods to warm up for physical activity, and that the traditional static stretching routine before sports should be replaced with a more dynamic activity that can also provide a number of other benefits to the athletes. "Dynamic warmups" and "dynamic stretches" are the terms used throughout the book to describe exercises and movement patterns that are great to perform before physical activity and can help improve performance and reduce the likelihood of injury in both the short and long term.





what is dynamic stretching?

Over the last decade, a lot of information and misinformation has been disseminated through the media, coaches, trainers, athletes and parents about the positives and negatives of stretching.

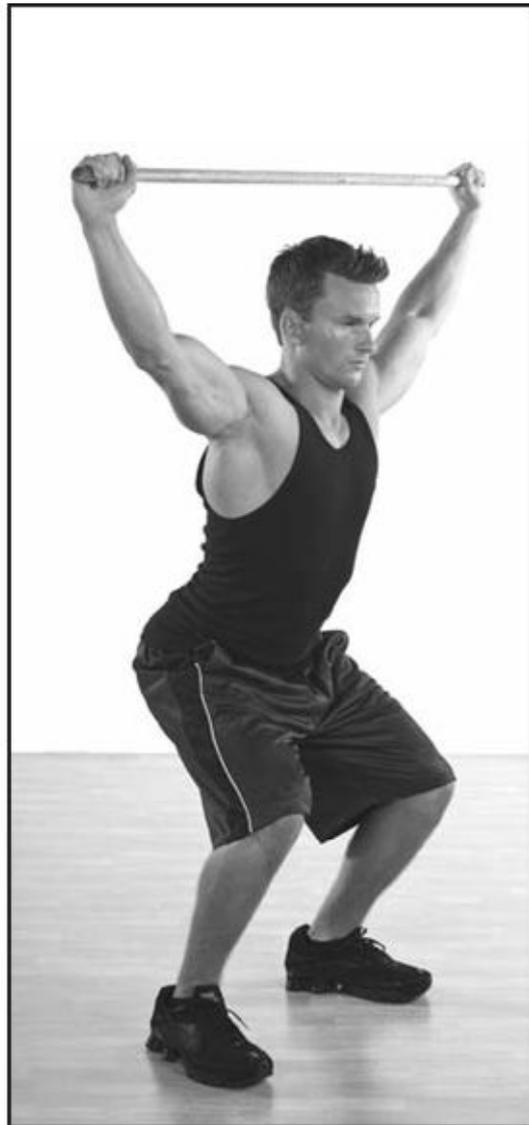
Much of this information is very good, practical and useful, yet stretching is still an area of training that is not that well understood compared to the other major areas of athletic performance, such as speed, endurance or strength training.

Part of the difficulty with the information that is available on stretching is the

inconsistent use of terminology and the fact that many coaches and trainers use different words to describe the same types of stretching. This terminology will be explained in more detail in the next section.

The best way to think of the difference between dynamic stretching activities versus traditional static stretching activities is that in the dynamic movements, once the muscle is lengthened, a contraction occurs and the muscles, joints, tendons and ligaments have to provide force in this stretched position, creating greater functional ability in these extended ranges of motion. Some good examples are the walking lunge with rotation and the hamstring handwalk. Both of these exercises require a combination of strength and flexibility, and are a perfect way to increase strength, flexibility, balance and coordination while also warming up before a sport or specific physical activity. The use of dynamic activities during the warm-up period provides greater “bang for your buck,” with more benefits than that of a static routine.





understanding the terms

As mentioned earlier, the biggest difficulty regarding flexibility is the inconsistency with terms. Let's define some of the major terms that will be used throughout this book. This section provides an easy-to-understand reference based on the most commonly accepted principles.

Warm-Up

An effective warm-up will increase muscle temperature and the body's core temperature, and improve blood flow through the entire system.

A warm-up period is important before any athletic event or performance. There should be multiple goals for the warm-up, including preparing the athlete both physically and mentally for the physical activity and/or competition ahead. Successful warm-ups should provide the following positive results as outlined in the *National Strength and Conditioning Association's Essentials of Strength Training and Conditioning* :

- Faster muscle contraction and relaxation of both agonist (contracting) and antagonist (relaxing) muscles
- Improvement in the rate of force development and reaction time
- Improvement in muscle strength and power
- Lower resistance in the muscles
- Improved oxygen delivery via an increase in temperature
 - Increased blood flow to active muscles
 - Enhanced metabolic reactions that result in greater fuel utilization.

Range of Motion

Range of motion is the degree of movement that occurs at a joint. For athletes, it's important to have functional or sport-specific range of motion in the plane of motion, and movement patterns that the athlete uses during practice or competition.

Flexibility

Flexibility is the measure of range of motion and has both static and dynamic components. Static flexibility is the range of movement about a joint and its surrounding muscles, ligaments and connective tissue during a passive movement. *Static flexibility* requires no voluntary muscle activity. The force produced for stretch comes from an external source such as a partner, gravity or a machine. *Dynamic flexibility* is the available range of motion during active movements and therefore requires voluntary muscle actions. An athlete's range of motion is typically greater dynamically than statically.

Stretching

There are three major types of stretching that have been performed prior to sporting

activities: static, dynamic and ballistic. *Static stretching* is a constant stretch held at an end point for anywhere between 15 seconds and 5 minutes.

Dynamic stretching is an activity-specific functional stretching exercise that should utilize sport-specific (or activity-specific) movements to prepare the body for activity. Dynamic stretching focuses on movement patterns requiring a combination of muscles, joints and planes of motion, whereas static stretching typically focuses on a single muscle group, joint and plane of motion.

Ballistic stretching involves active muscle effort and uses a bouncing-type movement to increase the range without holding the stretch at an end position. Unlike static stretching, ballistic stretching triggers the stretch reflex and can increase the likelihood of injury in individuals who have not progressed appropriately or do not have the correct training background for this form of stretching. Ballistic stretching is typically not recommended as a component of an effective warm-up for the vast majority of the population. It should be avoided by individuals with a history of lower back and/or hamstring injuries.





why dynamic stretching?

The warm-up should not be used purely as a time to increase body temperature before more strenuous activity. If this were the only purpose of the warm-up, then jumping rope, jogging or riding a stationary bike would be enough to prepare for athletic performance.

The warm-up is a time that can be used to gain numerous training adaptations in many aspects of physical conditioning. These benefits can include improved strength, flexibility, muscular endurance, coordination and the correction of major and minor

muscle imbalances. A great aspect of an effective dynamic warm-up is that it can be a complete total-body workout for athletes with time constraints; if performed correctly, this warm-up can result in positive training adaptations to improve performance. The dynamic warm-up can be a time to focus on improving strength, power, speed and agility.

Recreational athletes typically perform a dynamic warm-up of 10 to 20 minutes, but the more advanced an athlete becomes, the more time should be spent on the warm-up. It's not uncommon for professional athletes to spend 30 to 60 minutes focused on the warm-up. The warm-up provides multiple benefits to the athlete in addition to warming the body for future activity; it's a specific workout in itself and many of the activities mimic movements and muscle recruitment patterns of the sport.

The Myths Surrounding Pre-Exercise Static Stretching

Pre-exercise static stretching has been used by coaches and athletes for decades in the hope of improving performance and preventing injuries. In the 1980s and mid-'90s, it had been suggested in scientific literature as a good addition to athletes' warm-up before physical activity.^{1, 2} Since the early 1990s, many researchers from Japan to Australia to the U.S. have been performing studies on stretching, looking at the best methods to improve athletic performance. This section summarizes some of the research on stretching, performance and injury prevention, but if the science behind stretching is of interest to you, a detailed reference section is included at the end of the book to guide you to some of the most beneficial studies in this area.

Despite early evidence in the 1960s that static stretching prior to activity did not improve sprinting performance,³ static stretching has been a common practice by most coaches and athletes in warm-up routines for physical activity. However, contrary to the typical belief that static stretching improves physical performance, there have been numerous studies that demonstrate that traditional static stretching actually has the reverse effect. It can decrease performance in strength, speed and power activities.^{3,4,5,6,7,8,9,10,11,12,13,14} Depth-jump performance (when an athlete jumps from a small height to the ground and then explosively jumps up again), which is a good practical indication of power output, is significantly reduced following static stretching.^{11, 13} Vertical jump height has also been significantly reduced when prior static stretching was used.^{12, 14} Research studies on strength and power performances following static stretching have shown decreases in immediate performance by as much as 30 percent.^{4, 5, 7,8,9} This can have a tremendous influence on performance, especially in sports that require quick, explosive bursts of power and strength, such as sprints, jumps and throws in track and field, short distance swimming events, Olympic weightlifting, powerlifting and bodybuilding.

The deficit in performance following static stretching may be dependent on the type of stretching and mode of activity that follows the stretching routine. The deficit in

performance following static stretching has been shown to last approximately 60 minutes after the stretching routine.⁹ Researchers around the world are studying the exact cause of this decrease in performance. There are theories as to why it reduces performance but, as of this writing, no definitive mechanism has been verified. Some of the theories include changes in reflex sensitivity, muscle/ tendon stiffness and/or neuromuscular activation.^{9, 13, 15, 16}

BENEFITS OF A DYNAMIC WARM-UP

- Stretching
- Power
- Endurance
- Flexibility
- Coordination
- Balance
- Neuromuscular activation
- Speed
- Mental preparation

The positive or negative effect on performance after static stretching may be dependent on the speed of movement of the exercise involved. Reduced performance has not been shown when high-velocity movements were undertaken after a static stretching routine.¹⁷ For instance, the static stretching routine had no effect on either speed or accuracy (performance) of an explosive tennis serve.¹⁷ A suggested reason for why static stretching prior to the tennis serve did not reduce performance, as had been seen in other studies, was that the pre-activity stretching may not decrease performance in high-speed and/or accuracy-related movements.¹⁷ The authors refer to a study that showed results of significant reductions in isokinetic strength, but only at low speeds of joint rotation.⁵ However, this theory has not always been supported, as was seen in a recent study on sprint speed times (which involves high-speed explosive movements) over 20 meters in highly trained athletes. It was found that, compared to no stretching, static stretching significantly reduced performance by increasing sprint speed times.¹⁰

It appears clear from the numerous studies performed that pre-activity static stretching reduces physical performance in strength, speed and power activities.^{3, 4, 789101112131415_16} Therefore, athletes that perform sports that require strength, speed or power should limit or avoid slow static stretching within about an hour of training or competition. These academic studies, along with the years of coaching practice that have found a limitation on performance with static stretching, provide another reason why performing dynamic warm-ups offer a great benefit for improved athletic performance. This improvement in performance is highlighted in sports that rely heavily on strength, speed or power.

Apart from the traditional and sometimes misinformed belief that pre-exercise static stretching improves performance, a second major reason that many coaches and