



Agility and Coordination

Mark Verstegen and Brandon Marcello

Michael Jordan has the ball with four seconds left in the 1998 NBA finals. It's showtime. MJ holds the ball in his triple-threat position, his eyes processing every aspect of his defender's position. In the blink of an eye, he fakes his body one way and, with incredible efficiency, reacts opposite to the defender's commitment. He explodes past the defender with his first step, gracefully stops on a dime, spins and ascends vertically, and then pauses in midair, creating a stable platform from which to launch the game-winning shot! Another championship goes to MJ and his teammates. This sequence of events is the archetype of coordinated movement, which is the essence of every sport. If we were to break down the sequence, we would be able to fill a whole book.

Agility and coordination are the building blocks that make up sport and the tools that athletes use to express their game, whether it's the smooth yet powerful golf swing of Tiger Woods; the dynamic and graceful synchronization of arms and legs of Mike Powell propelling himself over 29 feet, 4 inches into the long-jump pit; or the wondrous balance and deception of Terrell Davis as he evades three would-be tacklers in a small space. Coaches and spectators often look at coordination and agility as the key components in determining whether someone is an athlete. Try to identify a sport that doesn't require a high degree of coordination or agility. Chances are you won't find one.

The prospect of developing and possessing outstanding coordination and agility is exciting because these movement skills transcend all sports boundaries. Contrary to popular belief, an athlete can do much to improve his or her athletic ability and movement skills. Everyone accepts without question a coach's demand that players practice for hours to improve a particular skill such as free-throw shooting. Coaches use this approach with great success in sports such as baseball, golf, and tennis; they concern themselves with the way the hands and fingers interact while gripping a ball, club, or racket and judge whether making a change might improve performance.

From the way he or she moves the arms all the way down to the way the feet interact with the ground, an athlete needs to develop the most efficient way of moving, stopping, starting, spinning, landing, and so on. Chances are that most athletes have had to figure out these basic movements and develop them on their own. We used to assume that anyone who could walk and run didn't need to take any time to further develop specific movement skills. However, an athlete who trains these skills optimally with the help of the knowledge provided in this chapter can be a significantly better athlete.

Movement is what people refer to as athleticism, the "innate" skills some people have to succeed in many sports, often spectacularly at one. There is no definitive answer as to why some people are able to perform athletic skills better than others. It goes back to the age-old argument of nature versus nurture. Athletes benefit or suffer from the environment to which they were exposed just as they benefit or suffer from the biological parents they "picked" (genetics). Nevertheless, those of us in the performance-enhancement field have yet to meet an athlete, regardless of ability, who has achieved his or her full genetic potential.

The purpose of this chapter is to provide some insight about how athletes learn the most efficient movement systems and to divulge some strategies that facilitate athletes' achieving their maximum potential. We start by briefly defining agility, coordination, and the required physical abilities. Coupling this scientific knowledge with basic movement patterns and sport-specific needs, we then present a model for improving athletic performance.

AGILITY

Agility is not easily defined because it is the culmination of nearly all the physical abilities that an athlete possesses (figure 8.1). When integrated with a coordination system, agility permits an athlete to react to a stimulus, start quickly and efficiently, move in the correct direction, and be ready to change direction or

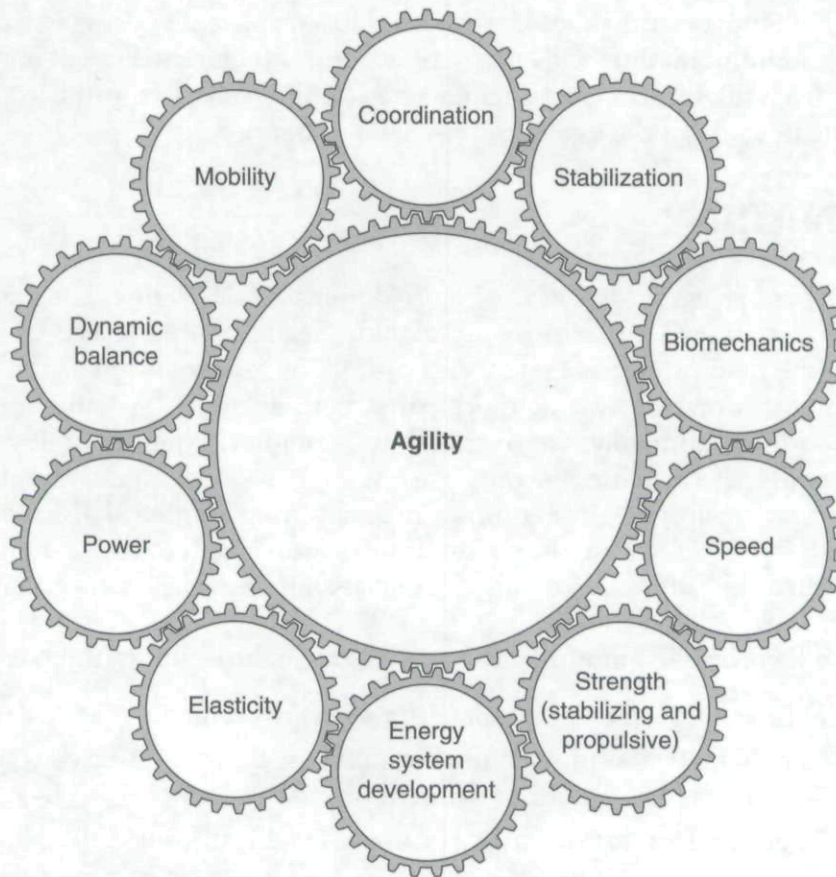


Figure 8.1 The relationship between agility and physical abilities.

stop quickly to make a play in a fast, smooth, efficient, and repeatable manner. People possess several types of agility:

- Whole-body horizontal changes of direction such as faking and avoiding
- Whole-body vertical changes of direction such as jumping and leaping
- Rapid movements of body parts that control movement of implements in sports such as tennis, squash, and hockey

An athlete who possesses high-quality agility can use it to advantage in competition. High-quality agility decreases the potential for injury, improves performance and evasiveness by allowing the athlete to fake or neutralize the competition, and refines the athlete's ability to adjust to an outside object such as a puck or ball.

An athlete can be compared with a computer system; both demonstrate a lot of power and potential. Without agility, however, the athlete is as ineffective as a computer that lacks the appropriate software—great potential but limited performance. There are two critical elements in developing agility, coordination, and skill. The role of coordination is to execute the movements chosen in response to a stimulus. The role of skill is to orchestrate these coordinated abilities into an efficient and effective set of general, special, and sport-specific movements.

These movements should be executed in a manner that uses maximum certainty with minimum time and energy. Specific acts require the use of unique qualities. When athletes struggle to achieve great agility, it is usually due to a deficiency in one or more of the qualities illustrated in figure 8.1.

COORDINATION

Taber's Cyclopedic Medical Dictionary (Thomas 1993) defines coordination as "the working together of various muscles for the production of a certain movement." In the field of exercise science, coordination is recognized as the ability of the body to organize two or more patterns to achieve a specific movement goal. Coordination involves an intricate and complex sequence of activities. Simply stated, these activities encompass reacting to sensory input (stimulus), choosing and processing the proper motor program from learned skills (motor learning), and, finally, executing the action. Information is sent to the brain for prediction, evaluation, and adjustment. The entire process occurs in a matter of milliseconds.

The process of motor learning itself can be broken into four steps:

1. Muscle movements stimulate the sensory receptors.
2. The sensory receptors send information to the central nervous system (CNS), which acts as a processor for the information.
3. The CNS executes, adjusts, or improves this information.
4. The CNS sends the information back to the required muscles via the motor pathways.

Because any external or internal stimulus can affect the outcome at any level of the process, the system is both complex and effective. This is what makes the study of motor learning so challenging.

The process of motor learning is the systematic change of movement behavior leading first to attainment and later to perfection of a certain motor skill. While learning a motor skill is complex and not completely understood, several vital steps can be identified (see figure 8.2).

- *Stimulus identification.* Athletes receive information through an external (exafferent) pathway and an internal (reafferent) pathway. The external pathway comes from external stimuli, whereas the internal pathways receive information relayed to the CNS from ongoing motor behavior. The bottom line is that the information comes in from one, or more likely a combination, of our five basic sensory analyzers: kinesthetic-proprioceptive, tactile, static-dynamic vestibular, optic, or acoustical.
- *Response selection.* The incoming information is processed in this stage. After the information has been processed, the athlete's library of existing motor programs is accessed. A selection is then made to elicit the most suitable response based on the information acquired.
- *Response programming.* Response programming executes the motor program that best fits the situation, simultaneously creating a reference to that choice. This motor program is then executed by passing through the CNS to the

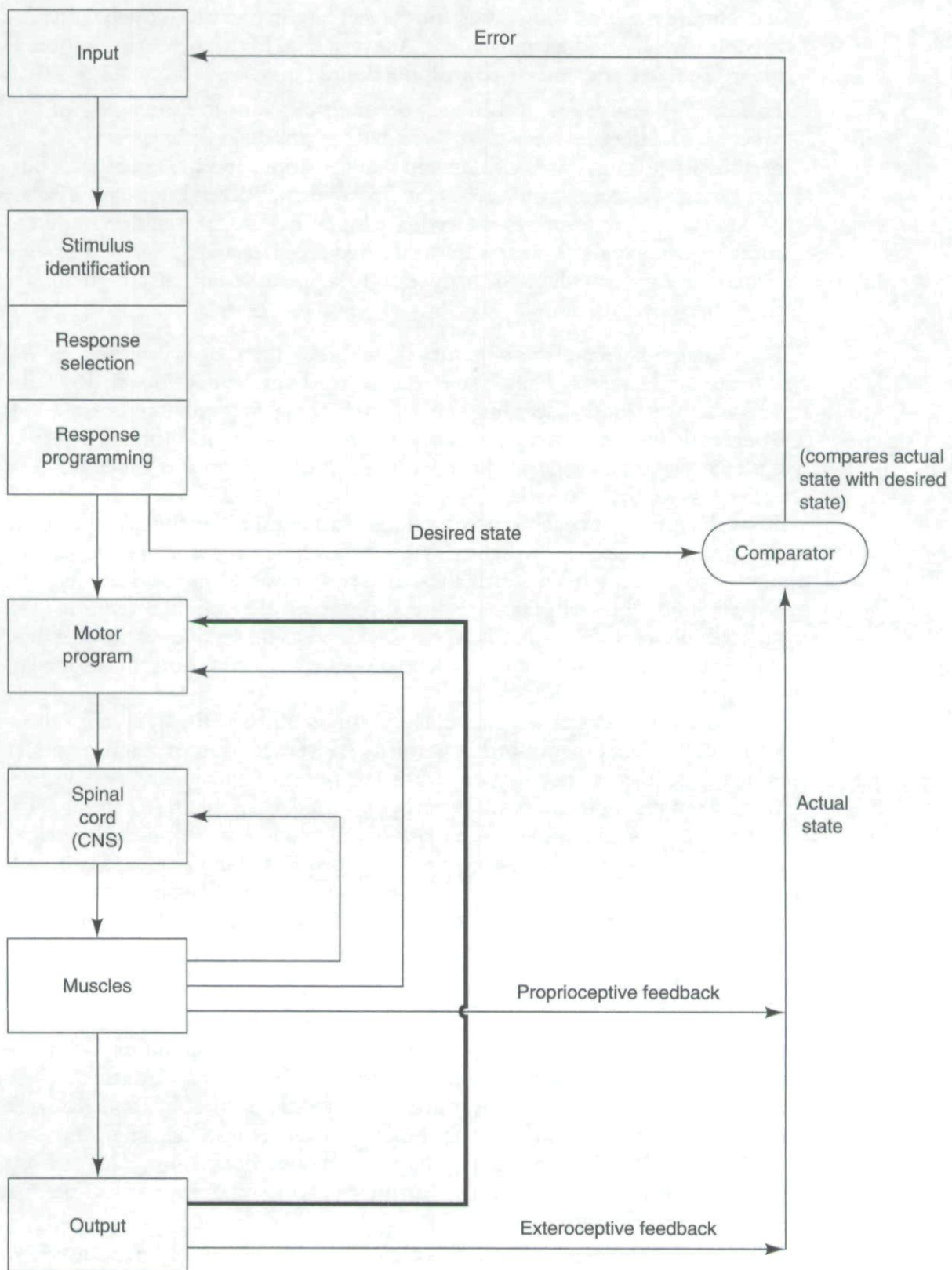


Figure 8.2 The process of motor learning.

appropriate muscles, stimulating the correct motor-unit recruitment and synchronization to produce movement. At every level of this process, feedback is being sent back and compared with the desired outcome.

- *Feedback.* Several types of feedback occur throughout the execution of this process. The muscles relay their force and length, the proprioceptors and kinesthesia report on joint position and body position, and the visual and auditory systems add information about the environment. All this information passes back up the response-produced feedback highway. The information is used to compare the actual program with the desired program and to initiate the *error elimination process* by which the body starts to suppress actions that might hinder the desired performance.

The valuable aspect of this system is that athletes learn from each action—by trial, error, and success. They discover what works and what doesn't. Remembering what was good, discarding the bad, they try again, building on the good. Through this process of adjusting and building on what works (practice), effective motor programs are laid down to be recalled with greater efficiency and effectiveness on the next task.

From the minute a coach starts developing athletes, he or she lays down the motor programs, skills, and habits that will be the basis for all future performance. The athlete's brain learns these habits by creating memorized patterns called *engrams*. These engrams are motor programs that are "burned into" the tissue protoplasm of the brain when practiced a sufficient number of times. These permanent fixtures can be either positive or negative based on the quality of what is put in.

The old saying, "Practice makes perfect" is not entirely true. It is more accurate to say, "Perfect practice makes perfect." Insist that athletes practice perfect techniques in everything they do, from the onset of movement preparation through strength augmentation to energy-system development. Accepting inefficient habits puts athletes at greater risk of injury and compromises their right to athletic success. An athlete who has developed less than optimal motor programs will need substantial time and effort to suppress the existing program and rebuild new, effective motor programs for peak performance. These new programs will be the athlete's tools for future performance, tools that will produce outcomes of better quality with less effort.

There are three main stages in coordination refinement.

- *Crude coordination (general)*—In this stage the athlete attempts to learn a new task and must consciously comprehend all movements. The athlete must be aware of his or her body in order to control the new task. He or she will rely heavily on visual and auditory input systems because the other senses of the body aren't quite ready to give highly accurate information. This sensory hierarchy will invert itself as the learning process progresses into fine and superfine refinement.
- *Fine coordination (special)*—In this phase the athlete starts to internalize how movements should feel, relying less on the visual and auditory systems, with the exception of input from the coach, and more on the depth receptors, proprioceptors, and dynamic and static contact receptors. The athlete uses feed-

back-chain mechanisms that refine the motor skill while inhibiting undesirable actions and enhancing the efficiency of the goal-outcome skill.

- Superfine coordination (specific)—This is the final stage of motor learning, when integration of the automated motor programs that have been cleaned of superfluous activity allows the athlete to execute movement effectively under a variety of conditions.

Within this coordination refinement process, the body learns how to improve the efficiency of desired movements. Efficiency can be increased by improving intramuscular and intermuscular coordination. *Intramuscular coordination* involves the ability to coordinate many neuromuscular units to act simultaneously to perform a muscular contraction. *Intermuscular coordination* is the cooperative interaction of several muscles in order to perform an action. Progressive loading of body weight, resisted movement methods, or assisted movement methods may significantly enhance these abilities.

FOUNDATIONS OF AGILITY AND COORDINATED MOVEMENT

Most sports require athletes to possess general movement skills. In order to excel, athletes should learn and master the building blocks of sport-specific movement.

Balance and Base of Support

Balance—the ability to maintain the center of body mass over a base of support—has long been classified as an important aspect of motor development. It is the underlying component of all movement skills, especially agility (for more on developing balance, see chapter 7).

Defining a few terms will afford a more precise discussion of the contribution of balance to athleticism. *Center of mass* is the hypothetical balance point of the body, which is located at 55 percent of height in women and at 57 percent of height in men (Hay and Reid 1988). The center of mass is a constant and will always lie within the body. Height, gender, and body type affect an athlete's center of mass.

In a static, erect position, the center of mass will be located at the same point as the *center of gravity*. The difference is that the location of the center of gravity shifts with movement; it will fluctuate within the body, and many sport actions will shift it outside the body. This shift of the center of gravity away from the center of mass creates movement.

Balance is traditionally classified into two categories, *static* and *dynamic*. Static balance is inner-zone balance, that is, standing in place while highlighting the intricate systemic feedback system and neuromuscular activity required to stay still. Outer-zone balance is how far outside the inner zone an athlete can go without losing balance. The point where an athlete loses control is the *balance threshold*.

Sport is the essence of *dynamic balance*, of being able to maintain body mass over the base of support while the body is in motion. Consider the critical role of

balance within every joint of the body to align and stabilize the entire dynamic kinetic chain to produce or reduce the forces creating movement. Essentially, dynamic balance is efficiently manipulating the balance threshold. Athletes push the edge of this threshold, functionally moving in and out of balance in a way that creates fluid movement. The nature of sport presents further challenges by requiring athletes to compete on various surfaces, against opponents, in variable environmental conditions, and so forth. It should be evident that balance is critical to an athlete's agility and overall performance. Regardless of the location of the center of mass, it is advantageous for an athlete to get back within his or her base of support to keep the center of gravity in check. By gaining control of the center of gravity, the athlete takes the first step toward efficient and successful movement on the court or field.

A solid base of support, or base, creates the foundation on which the athlete can apply *positive angles*. The term positive angles refers to correct placement of the ankles, knees, and hips in relation to the torso (see figure 8.3). These body segments should create proportional angles to allow the athlete to manipulate his or her balance threshold. Positive angles within the base of support enable the athlete to decelerate, accelerate, cut, and jump by creating great leverage between a stable center of mass and the ground. This becomes even more important when outside forces such as other players and obstacles act on the base of support. Great movers in all sports possess awesome positive angles that they exploit in competition. You might have noticed that Michael Jordan would look a little knock-kneed while playing defense or before making a great move to the basket. MJ used great positive angles to be able to stop, start, and redirect his body instantaneously.

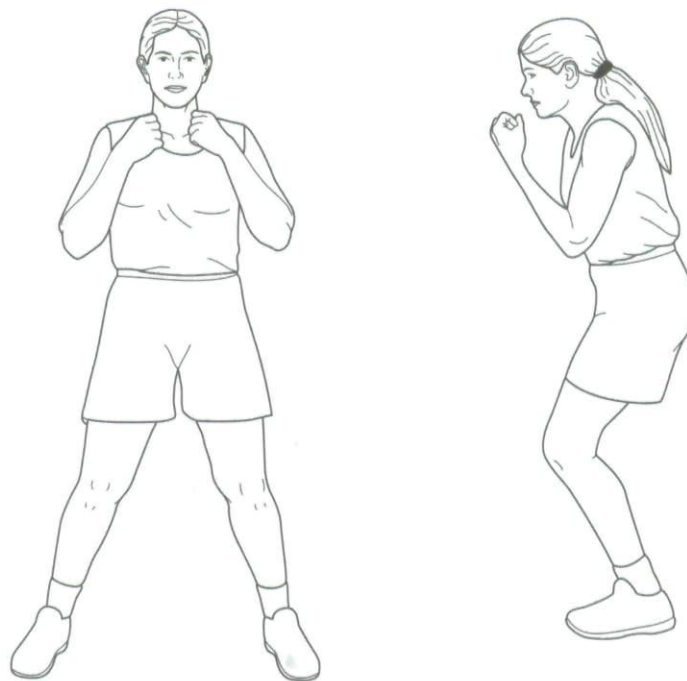


Figure 8.3 Positive angles enable an athlete to manipulate his or her balance threshold to facilitate quick changes in speed and direction.

Posture

Good posture is critical to athletic performance and is seen in an erect trunk. It is the result of good core stability, which in turn is created by a harmony of contractions by the transverse and rectus abdominis, erector spinae, and many other muscles that help stabilize the pelvic and thoracic regions. Stability is gained by drawing in the stomach, as if trying to touch the belly button to the spine while breathing dynamically. This helps create intrathoracic pressure, which acts as a stable platform from which the forces of the legs, hips, torso, and arms can be transferred more efficiently into the ground to create movement and improved balance.

Athletes perform only as effectively as they process information, relying heavily on visual input. Core stability acts as a solid foundation for the head, which should be in line with the trunk. This in turn creates a consistent, stable environment for the eyes to gather reliable information to add to the feedback system. Having dependable information is a critical component in decreasing the potential for injury and achieving a high level of performance in every position, style, and sport.

Once the trunk is stable, the correct stance depends on the sport and situation. For most applications from a static start, the athlete should sit the hips back and lean slightly forward at the waist so that the shoulders and chest are just over the knees. The knees should be aligned slightly inside the toes, and the feet should be nearly flat with the weight forward of the arch and on the inside ball of the foot. (For some sports such as tennis it will make more sense to stagger the feet under the hips.) The torso should be parallel with the forward angle of the shins. The athlete might not feel comfortable in this stance at first but will in time feel well balanced and powerful, and will create positive angles with the ground (see also chapter 7).

Foot Interaction With the Ground

How an athlete's foot interacts with the ground is as important as how a pitcher's hand interacts with a baseball or how a golfer's grip interacts with the golf club. Athletes spend countless hours perfecting technical skills, but how often do they think about how the foot hits the ground? In fact, for most positions in sport, improving foot-ground interaction can offer greater performance rewards than working on specific technical skills.

The calf represents only about 14 percent of the power within the kinetic chain, yet this component either activates or compromises all the bigger muscle groups within the chain such as the legs, hips, torso, and arms. Whether performing agility drills, practicing, or competing, it is imperative to dorsiflex at the ankle, or pull the toe up toward the shin. The toe-up position should become automatic every time the knee lifts up. Assuming this position prepares the leg to reaccelerate back down through the ground by transferring power through the forefoot back up through the kinetic chain. For most activities the foot will actually look as if it is flat, with 75 percent of body weight forward of the instep. It may be possible to slide a pencil under the heel, but the weight is definitely not up on the tips of the toes. If an athlete runs, cuts, or jumps from on tiptoe, the likelihood of injury (cumulative or traumatic) to the ankle, hip flexor, and ham-

string increases and performance decreases because he or she is not able to take advantage of the ground reaction forces.

While moving laterally or cutting, the athlete should keep the toes of the lead foot pointed perpendicular to where he or she wants to go. It is common for basketball players and others to shuffle with the lead toe pointed out in the direction they are headed, literally pulling themselves along! This is exactly the opposite of efficient technique; the athlete should push with the back foot. The lead foot should continue to point perpendicularly to the desired direction, enabling the athlete to cut with the weight in the forefoot, specifically on the inside ball of the foot. The athlete lifts the front foot and pushes off the back foot. This applies even when making a transition from a dynamic movement.

Ground Reaction Forces

Ground reaction forces develop from the ability of the body to deliver force into the ground, transfer energy, and produce an equal and opposite reaction that propels the body and limbs in the desired direction. This method of movement takes advantage of innate reflexes such as the phasic spinal cord reflex of crossed extension in which the flexion of one leg elicits extension of all joints of the other leg. The elastic nature of the muscle improves efficiency and performance.

The lifting of the leg should be relatively low for multidirectional movement. The reason the knee and dorsiflexed foot come up at all is to prepare the foot to reaccelerate back through the ground and push the athlete in the desired direction. The sound of the dorsiflexed feet driven powerfully into the ground should be a series of rhythmic, hard, crisp taps. If the tapping is quiet, the athlete probably isn't putting much power into the ground, probably because he or she is trying to run up on the toes. This must be corrected in order to maximize ground reaction forces.

Reaction

Reaction will be improved by using the proper stance and weight distribution as well as taking a positive first step in the desired direction. Improved coordination from evolved motor programs will help. Reaction will be significantly improved with practice in visual, auditory, technical, and tactical anticipation.

Acceleration and Deceleration

Acceleration relies on great posture, a total-body lean, positive shin angles, and aggressive piston-like leg and arm action (see also chapter 9). Deceleration requires great relative strength and technique. Deceleration occurs during cutting and stopping with various levels of abruptness; it is critical to bend or yield to stop.

Starting Quickness

Starting quickness and first-step quickness are related to stance, reaction, and knowing where to go. A balanced stance with great positive angles helps propel the athlete in the desired direction. Make sure the athlete does not false step! The first step should attack the ground with positive shin angles, regardless of

the direction the individual is going (forward, sideways, backward). Remember that a first step that strikes out in front of the hip (center of gravity) is too long and will slow the movement. One starting step, the jab step, involves short distance, quick reaction, and a movement backward of the lead foot relative to the center of gravity. (Refer to chapter 6 for more information on quickness.)

Cutting

Cutting, or executing a change of direction, requires rapid deceleration and reacceleration while performing various movements. Cutting can link movement in one direction with the same movement in another direction, or link different types of movement.

Crossover Ability

A crossover is a transition from lateral to backward or forward movement, enabling the athlete to cover a lot of distance in a short time when immediate reaction is not required. The crossover may also occur at speed. The back foot crosses over the front while staying close to the center axis of rotation. The action uses a push off from one or both feet.

Drop Stepping

The drop step is a transitional step that links any forward-facing movement with diagonal crossover runs or that effects the transition from a backpedal to a turn and run. The athlete drops the inside foot while pushing off the outside foot and then aggressively gets the dropping leg back down on the ground with power.

Backpedaling

A backpedal is a preliminary movement, traditionally used while marking or guarding an offensive player or while making a transition into cutting or linear movement.

After athletes master these individual skills, it is time to link them together in a predetermined progression.

DESIGNING AN AGILITY PROGRAM

A drill is an exercise designed to address a specific aspect of a greater skill. Today we see people train by “just doing” a myriad of drills meant to improve speed, agility, or quickness without understanding how the drills will help. Coaches continue to use these drills repeatedly without analyzing them or having a specific goal or outcome in mind.

It is important to classify drills based on how much they contribute (by percentage) to the desired motor ability (mobility, biomechanics, strength, energy-system development, and so forth). Drills should be classified as to whether they are general, special, or sport-specific exercises for a given skill, movement, player, sport, or position.

Evaluate Athletes

To improve and maximize the effectiveness of a training program, it is important to evaluate the needs of the athletes. Every drill prescribed will have some effect on motor programming, the nervous (neuromuscular) system, the energy system, and so on. Thus, to maximize the performance program, it is important to take into account the percentage of contribution and the degree of taxation each drill will have. Compare this with the needs of the athletes.

Evaluate each athlete by answering these questions:

- What is the developmental level of the athlete (age, skill, etc.)?
- What is the current state of his or her movement?
- What is the athlete's limiting factor? Is it coordination? Motor ability (i.e., mobility, strength, etc.)? A combination? See chapter 2 for tests to use in evaluating athletes.

Structure the Workout Plan

This is the fun part—time to attack the limiting factors across all motor abilities. Several methods are available to improve performance, any one of which can help athletes become faster, more agile, and so forth. But only the correct synergy between the relevant variables will maximize athletes' performance *most efficiently*. The workout plan is the culmination of the scientific and artistic aspects of coaching. Remember that no part of the body is totally independent from other parts. Every exercise or drill affects motor programming, the nervous system, the metabolic systems, and so on. Understanding the extent and importance of each variable, as well as which components the drill or exercise focuses on, is critical to proper exercise selection and the success of the program.

Drills and exercises are tools to help athletes accomplish their goals. Drills are powerful tools if they are properly organized, prescribed, progressed, and mastered. To help athletes get the most out of their workouts, coaches should do the following:

- Plan a specific goal for each movement session.
- Strive for perfect technical execution of every rep, every set, every drill, and every skill.
- Remember that quality (proper execution and intensity) is far more important than quantity ("just doing it" or volume).
- Work on simple skills before complex skills; that is, work on preprogrammed (closed) skills before random (open) skills.
- Have athletes master fundamental (general) movement skills before progressing to more advanced (special and specific) skills.
- Attack fundamental limiting factors systematically instead of "shotgunning" everything.
- Provide accurate feedback with visual and auditory cues, and encourage athletes to use sensory input.

- Work on stride frequency (rapid response, quickness, adjustment, deceleration) and stride length (short and long, power).
- Remember: starting is extending and stopping is bending.

Each workout should include the basic components of movement preparation, biomechanics work, neural innervation, and, finally, coordinated movement drills.

Movement Preparation

The goals of movement preparation are to elevate the core body temperature; actively elongate the muscles; activate the nervous system, proprioceptors, and stabilizers; improve kinesthetic awareness; and work on technique by reinforcing critical motor programs daily.

Essentially, movement preparation is warming up in a way that is similar to the way the athlete plays. This segment of the workout is designed to maximize the active ranges of motion required for fluid, high-performance movement. These exercises incorporate and reiterate correct posture, core stabilization, balance, coordination, and range of motion through all planes of movement. Movement preparation is divided into three categories that follow a specific order—from low-level activities that increase core temperature to higher intensity sport-specific dynamic movements that prepare the athlete for training or competition.

1. Warm-up. Start with basic, active movements such as a sprinter's jog, side sweeps, carioca, weaves, spins, or even light games that improve kinesthetic awareness.
2. Joint mobility. This type of work mobilizes and strengthens segments of the body in flexion, extension, and rotation. These drills actively ease the body into motion, gradually elongating and preparing the muscles for more intense dynamic flexibility. Examples include the drop lunge and side lunge (see chapter 7, page 123).
 - Lying supine or prone (hip crossover series, leg-overs, and scorpions)
 - Standing (standing torso rotations and diagonal patterns)
 - Moving (forward, backward, and lateral hand walks; drop lunges; and over-and-under hurdles)
3. Dynamic flexibility. Dynamic flexibility work consists of a progression from walks, marches, and skips through runs, which start at the feet and progress up the body toward the head. These movements start slowly with small amplitude, then progress into large, fast movements that activate the performance systems essential for practice or competition. Two components exist within dynamic flexibility—general and specific. The general component involves movements that target body areas and is not specific to any sport. The specific component matches the types of movements within a particular type of workout session or competition.

Biomechanics Work

This is a fundamental component of every drill or exercise. The material principles—dorsiflexion, positive angles, arms, posture, core, ground reaction—are

built in and executed with feedback in every aspect of the athlete's performance. At this point the athletes are thoroughly warmed up and tuned in; this is the time to establish the day's goal or lesson plan. For novice athletes, this training segment may take a significant amount of total workout time.

Neural Innervation and the Stretch-Shortening Continuum

We use neural drills not only to improve the elastic properties of the muscles but also to improve the athletes' motor learning and comprehension of the overall workout. Select these drills by considering first the goal of the training session, then where they fall within the progression from beginning to intermediate to advanced (see table 8.1* on the next page).

1. **Rapid response.** These drills require high neuromuscular frequency through high velocity and low force. The best analogy is moving your limbs like a sewing machine. Rapid-response exercises improve various types of coordination and lay the foundation for a progression from movement skills to higher level plyometrics. Examples of rapid-response drills would be over-the-line jumps and hops and coordination patterns (see chapter 6, pages 109 to 117) and ladder drills.
2. **Short response (minimal yield).** Short-response drills require minimal yield (amortization) and possess a low frequency, a higher amplitude, and a higher force. The best analogy is a Super Ball instantaneously rebounding after it hits the ground. In these drills you want your athletes to be "springy," minimizing the time in contact with the ground (switching from eccentric to concentric muscle contraction). Perfecting these drills will help the athletes become more elastic. Examples of short-response exercises are ankle and tuck jumps (see chapter 5, page 88), reactive step-ups (see chapter 7, page 124), and low depth jumps (see chapter 5, page 95).
3. **Long response (long yield).** These drills require longer yield, lower frequency, moderate amplitude and force, and maximal rate of force development. The action in these drills is analogous to a heavy kid on a pogo stick who compresses the spring along its entire length and then explodes straight up into the air. Long-response exercises develop speed strength by letting the muscles go through a more complete range of motion before executing an explosive, maximal contraction. Examples of long-response plyometrics are squat jumps (see chapter 5, pages 89 to 90) and split jumps.
4. **Very long response.** These drills require very long yield, moderate to high amplitude and force, and maximal rate of force development. This type of action definitely blends into speed and explosive strength. The movements include some types of resisted movement jumps, certain medicine ball throws, traditional weightlifting movements at various intensities (see chapter 4, pages 69 to 73), eccentric manipulation, and isometric and concentric exercises done with maximal rate of force development.

Movement Drills

This is the actual application of the lesson plan, incorporating into the drills all the elements specifically aimed at attacking the factors that are limiting an athlete's performance. Follow this progression for effective learning:

Table 8.1 Plyometric Continuum

	Rapid	Short	Long	Very long
Upper-body movement				
Pressing	Running or seated fast-arm movements Wall chest pass	Chest pass with partner Punch pass and throw Chest pass with lateral movement	Medicine ball chest pass Explosive push-up	
Throwing	Cuff dribble Walking wall dribble Body blade	Overhead pass	Vertical jump	
Rotating	Rotational twist	Short ball routine	Medicine ball drills: • chopping • swing pass • rotational power throw • rotational overhead throw	
Lower-body movement				
Vertical	Bunny hop Jump rope	Jump rope Pogo stick Tuck jump Jump over obstacle Depth jump One-leg tuck jump	Jump-up to box Vertical jump Power skip Dip-and-drive step-up Squat jump Power step-up Split jump High depth jump	Vertical medicine ball throw Resisted vertical jump Reactive jump
Linear	Jump rope Ladder drill Over-the-line drill Quick skip, jump, hop Run in place Box run Backward or forward jumping jacks	Ankle skip Bounce and go Jump over low obstacle Bounding Tuck jump Depth jump Box bound	Power skip Medicine ball throw and chase Standing long jump Standing triple jump Multiple long jump Medicine ball knee punch Crossover dip-and-drive Crossover power step-up Crossover power skip	
Lateral	Lateral ladder drill Lateral over-the-line drill Lateral bounce	Lateral quick bound Lateral box run Lateral depth jump Lateral box jump (to sprint) Lateral jump over low obstacle Lateral quick hop	Lateral bound Lateral squat jump Lateral dip-and-drive Lateral hop Lateral high depth jump	Resisted lateral bound
Multiplanar	Ladder Over-the-line drill Rotational jumping jack Rotational pogo stick work	Spin jumps Leg external rotational jumps Medicine ball with partner (back to back) Figure 8 throw Medicine ball rotational throw Leg external rotation hop	Medicine ball drills: • chopping • swing pass • rotational power throw • rotational overhead throw Depth jump with spin	

*In each movement category in table 8.1, exercises are listed from those for beginners to those for more advanced athletes. Some drills noted in this table are described in chapters 5 through 7 in detail. For more plyometric exercises, see D.A. Chu, 1998, *Jumping into plyometrics*, 2nd ed. (Champaign, IL: Human Kinetics).

1. Preprogrammed closed skills with variations such as eyes closed, shoes off, resistance or assistance, uneven surfaces
2. Preprogrammed with outside stimulus such as a ball, hand signals, or commands, progressing to random agility (open skills)
3. Random agility progressing from reaction to a single stimulus to reaction to several stimuli or sensory input systems

Closed Skills

In preprogrammed closed-skill movements, athletes know exactly what is expected of them; these drills allow athletes to go through the initial stages of motor learning and to progress within a controlled environment. Closed-skill drills can then be progressed through volume, rest intervals (performing at fatigue), and often resisted movement or assisted movement methods. After the athletes have refined the motor programs within preprogrammed movement, move on to random agility by getting them to react to outside stimuli such as claps, directional signals given by hand, other athletes, kinesthetic awareness, and so on.

Complex Training *Complexing* refers to a protocol that combines some form of training stimulus that activates high levels of neuromuscular excitation with a complementary activity such as jumping or running, with the goal of improving performance. A physiological phenomenon results from the high demand placed on the system by heavy strength exercises; resisted runs, jumps, or throws; or specific plyometrics that improves the summation and synchronization of the desired motor units. These neuromuscular changes last between two and five minutes. There are two main ways to maximize this window. The first way is to extend an already very short set by 7 to 10 seconds, and then take a prescribed rest interval for the set. Second, the athlete can take a two- to five-minute rest if the excitation exercise is more demanding. Empirical evidence indicates that various types and depths of excitation may enhance performance for several hours. As a guideline for trying to match or exceed the previous altered experience, use a ratio of two or three aided reps followed by one or two free applied reps.

Resisted Movement Resistance training provides several benefits:

- Increased coordination through summation and synchronization
- Increased stride length through specific coordination strength
- Kinesthetic learning through nonvisual, nonauditory senses
- Improved biomechanics.

A standard recommendation is to resist specific movements between 5 and 15 percent 1RM. This ensures that the training is enhancing the specific skill, not creating a new motor program. However, using much heavier resistance is effective during specific drills. For example, using an appropriate harness system and attaching a thick or doubled-up bungee cord on the athlete's right hip, then significantly assisting and resisting the athlete during the right-foot cutting action requires the athlete to drop the hips, establish positive angles with the weight on the inside ball of the dorsiflexed foot, and focus on loading and exploding off the outside leg. The same principle holds true in teaching the feel of accelera-

tion by having athletes lunge, march, and run through very heavy sled pulls, push objects, or run up very steep inclines. These exercises teach athletes to have great forward total-body lean, hip separation, back-side extension, and front-side flexion.

When using any type of external resistance or assistance, be sure to follow the product safety guidelines.

Assisted Movement Assistance training is extremely effective in slightly raising athletes' performance ceiling by exposing the body to higher rates of movement. It is important not to assist athletes beyond 5 to 15 percent of their unaided performance. The goal for the athlete is not to let the assistance do the work but to relax, using efficient biomechanics to "outrun" the device. If assistance negatively alters technique, it is exceeding the athlete's current potential, and the amount of assistance should be lessened. Examples of assisted movement are running downhill at a 3 to 5 percent grade and using assisted pulley and rope systems or bungee cords.

Open Skills

Open skills are required in order to react to an outside stimulus perceived by the sensory input systems. The open skills that comprise random agility—reacting to a ball, an opponent, an obstacle—are essential for success in most sports. To prepare for competition, then, the athlete is enrolled in a chaotic environment to simulate sport through specific movements. Begin training random agility by adding a simple outside stimulus, such as a change of direction given by hand, to mastered preprogrammed work. Another step in the progression is to add assistance or resistance to these now-random drills. The ultimate measure of random agility may be competitive tag games such as mirror tag, shark-in-the-tank tag, freeze tag, and others. This type of game provides an opportunity to evaluate what the athletes have learned and whether they can apply it in a random, chaotic, competitive environment. Use these games to highlight specific instances of success or failure as they relate to the goal of the movement session.

Each of the following drills can be varied to help the athlete progress from closed-skill movements (complex, resisted, and assisted) to open-skill or random linked movements.

Lateral Wave

Purpose

To teach cutting, dynamic balance, positive angles, foot interaction with the ground, and elastic muscle strength

Procedure

The athlete will move laterally between two points three to six yards apart. He or she should do the following:

1. Keep the body erect and stable, and keep shoulders and hips parallel.
2. Rapidly cut to the outside leg, then push back in the other direction
3. Repeat.

Variations

Beginners should work on mastering cutting technique, then progressing volume and speed. More advanced athletes should perform the drill wearing an elastic cord around the waist that is tethered to a fixed object. Add an outside stimulus to make the drill more random, then progress to using resistance and assistance methods while reacting to the outside stimulus.

Crossover

Purpose

To teach the crossover step and develop dynamic balance and elastic strength needed for deceleration

Procedure

The athlete will move between two cones three to six yards apart using a crossover step. He or she will do the following:

1. Keep an erect posture with a solid base of support and keep shoulders and hips parallel.
2. Drive the left leg across to the right by rotating from the core, pushing the left foot through the ground.
3. Square the hips back into a position parallel with the shoulders to help decelerate with positive angles.
4. Repeat, moving to the other side with the opposite leg.

Variations

Progress from walking to doing this drill at all-out speed. Then add assistance and resistance to accentuate the kinesthetic learning and improve deceleration. Progress further to random linked movements by accelerating in all directions in response to an outside stimulus. Apply resistance and assistance from both sides.

Cone Wheel

Purpose

To link various motor skills such as lateral to backward or forward, crossover, drop steps, and so forth

Procedure

1. Set up a circle of cones with a three- to five-yard radius.
2. The athlete starts at one cone and picks a movement pattern to use to move around from cone to cone, linking each movement with other skills.

Variations

Make this drill more advanced by adding assistance and resistance and working on the transitions between linked skills. Have a partner roll balls randomly within the cone area, rolling or throwing the next object the instant the previous one has been caught.

Ball Drop

Purpose

To develop stance, reaction, one-step acceleration, and redirection agility

Procedure

The athlete should do the following:

1. Stand erect with the weight on the balls of the feet and face a partner four or more yards away who holds a ball at the top of his or her reach.
2. Explode toward the ball with a positive first step as the partner releases it. Drive the arms back to enhance acceleration.
3. Try to catch the ball before it hits the ground a second time.
4. Have the partner move back in one-yard increments each time the athlete succeeds.

Variations

Try the drill facing sideways or backward, turning and exploding instantaneously to catch the ball. Have the partner yell the moment the ball is released. Also try incorporating rapid-, short-, or long-response plyometrics or various starting positions. Or use multiple balls so that the object is to get ball two or three.

One-on-One Tag

Purpose

To incorporate acceleration and deceleration from a balanced base and to react to a random situation

Procedure

1. Mark a clear playing area of 10×10 yards (for beginners) or 15×15 yards (for more advanced athletes) and have athletes form two lines at opposite edges of the box. One line is made up of taggers; the athletes in the other line are "avoiders" (who try to avoid being tagged).
2. Have the first tagger sprint toward the avoiders, decelerate, and gain his or her balance as the first avoider comes out and makes a move to get away from the tagger.
3. Once the avoider is tagged or reaches the opposite edge of the playing area, the next two athletes in each line take a turn.

Variations

Start the line of avoiders facing away from the taggers and call "go" when the tagger is halfway across the playing area. Toss a ball to the avoider before he or she makes a move to avoid the tagger.

Shark-in-the-Tank Tag

Purpose

To incorporate and randomly link together all preprogrammed drills

Procedure

1. Create large playing area with boundaries (approximately 20×50 yards).
2. Pick one to five "sharks." Everyone else is a "minnow." The sharks try to catch the minnows.
3. Time how long it takes each shark or team of sharks to tag the minnows.
4. Watch athletes for positive or negative instances of agility and movement. Reward those who are tagged early with some core, balance, stability, strength, and conditioning exercises to do while they are waiting for the game to finish.

Variations

Change the game by increasing the shark-to-minnow ratio up to 1:10, by increasing or decreasing the size of the playing area, or by changing the game to freeze tag (in which the athletes may move to unfreeze tagged teammates). These variations require more strategy, greater energy-system demands, and a higher level of movement skills.

Implement Your Program

To introduce a drill to athletes, clearly define the name, purpose, procedure, key points, and the specific role the drill will play in making the athletes better during competition. The athletes will then have a clear understanding of what they need to do. Offer feedback verbally and visually during the workout through

coaching cues, demonstrations, and video. Don't forget that one of the best ways for athletes to learn is by sensory input that is nonverbal and nonvisual (Brisson and Alain 1996). The emphasis of the teaching and the structure of the practice must provide opportunities for the learner to develop skill in all processes involved in the performance of the particular motor tasks. In other words, place athletes in situations in which they will learn by doing and feeling.

Treat drills to improve agility in the same manner as speed work. Have athletes perform these drills while they are fresh, in the prescribed order, and with ample rest for most phases of development. Eventually, athletes will achieve high levels of performance in the required skills. Then use the drills after inducing progressive levels of fatigue; this mimics the conditions athletes experience in the competitive environment.

After athletes master individual skills, it is time to link them together. Start with the same rules used for the progression of preprogrammed (closed) drills, focusing on making efficient transitions from one motor program to the next. Once these various motor programs are seamlessly linked together, progress into random (open) drills. The amount of motor learning that has occurred will be evident in the athletes' execution of the random drills. Only those athletes who have engrained all the specific patterns will express movement skills effortlessly to achieve efficient movement. Inform the others, during and immediately after the session, which aspects of the drill they need to work on.

Follow these guidelines as athletes progress from beginner to advanced stages:

- **Beginners**—Use the prescribed order at the beginning of the practice. Technique is more important than speed. The goal is to establish the foundation.
- **Intermediate**—Use the prescribed order, progressing intensity, density, and volume. Have the athletes perform the drills before or during practice.
- **Advanced**—Vary the order, intensity, density, and volume. Have the athletes perform the drills before, during, or after practice.

During the general preparatory phase of training, the goal is to establish a conditioning foundation. The most effective way of doing this is to spend a lot of time working on movement preparation activities. Teach general and special movement skills. Teach and prepare proper foot interaction with the ground using a variety of rapid-response activities as well as low-level short- and long-response activities. Enhance energy-system work with creative games played barefoot on sand, grass, or turf.

The special preparatory phase builds on the general preparatory phase. Work on mastering special skills in preprogrammed work, mixing altered (resisted and assisted) movements with free movements. Progress all drills gradually after athletes demonstrate mastery so that the athletes are continually challenged. Increase complexity or intensity of rapid-, short-, and long-response drills to improve the athletes' ability to withstand eccentric forces within the ankle, knees, hips, core, and so on.

After athletes have mastered the various special skills and can perform them under altered conditions, start linking them together. Athletes should focus on mastering every combination of preprogrammed drills. Incorporate random exercises. An example of linking using lateral and base movements would be lateral to straight ahead, left, right, and backward accelerations.

Once athletes have mastered special drills and have started linking pre-programmed movements, it is time for them to start applying these actions to sport-specific sequences. This will greatly enhance their speed, and more important, will improve their movement efficiency. When the learned sport-specific linking has been burned into a skill, challenge athletes with a variety of random (open) skills, increasing the complexity and intensity while insisting that they express perfected, engrained motor skills.

SPORT-SPECIFIC DRILLS

This section highlights some major areas of each sport and shows how to combine the special motor programs to create efficient sport-specific movement skills. Linking is the critical element. The ability to link movements together provides the competitive edge in elite-level athletics. The athlete who can link movements can create separation or close ground. He or she has a quicker first step, jump, or cut.

In sport-specific drills, athletes combine special skills and sport-specific links in the most random (open), chaotic environment possible. Clearly, athletes who can execute these links subconsciously in this environment have mastered the movement skills necessary to react during competition.

Football

Football requires diversity of movement skills based on positional requirements. For simplicity, the positions are broken into three main categories, grouping both offense and defense:

1. Line, which includes offensive and defensive lines as well as defensive ends
2. Combo, which includes linebackers, strong safeties, tight ends, and fullbacks
3. Skill positions, which include running backs, wide receivers, defensive backs, and quarterbacks

Line

Defensive ends require great explosion and acceleration skills tailored to running on an arc, quickly regaining balance, and redirecting agility to pursue an agile quarterback or a scampering running back.

Players in the offensive and defensive lines must be able to manipulate balance. They must explode for run blocking, moving past their balance threshold by delivering force to another lineman. At the same time, they must be able to regain their balance immediately when the player they are blocking comes off the block. They must possess the skills to drop the hips within the base immediately, staying on the feet so that they can quickly pick up another player. Athletes who can do this also reduce their chance of injury.

Teaching movement skills to line players is critical. Chances are that they were the big kids who were always sent over to hit the bags and work in the post. Meanwhile, all the smaller kids their age were exposed to countless hours of running, cutting, and agility work. This scenario explains why late-maturing ath-

letes tend to be the best in the end. Offensive and defensive line players will often make the greatest gains and benefit the most from movement skill training.

Combo

Individuals who play combo positions must possess the power and size to deal with the line as well as the movement skills to react and compete with the skill players. Players at these positions will need a lot of integration of movement training throughout their development of hypertrophy and relative strength so that every pound is highly coordinated and innervated. Tight ends and fullbacks must have blocking skills and be able to apply the movement skills that are crucial for skill positions (deceleration, power cuts, spins, and speed cuts in the open field). Linebackers must be proficient in using their lateral and base programs as the foundation for explosive first-step quickness. They must also be able to drop step to open the hips so that they can fall back into coverage using the crossover motor programs. The crossover step will also be useful to them in linking their lateral and base positions.

Skill Positions

Players at skill positions tend to cover more ground and operate in open-field situations more frequently. Wide receivers have the advantage of being able to master preprogrammed (closed) routes and vary them based on their opponents' defense and options within the play. They must be able to cut at speed using the inside leg heavily to cut at angles less than 90 degrees and be proficient in the use of "power cuts," which use the outside foot to redirect at an angle greater than 90 degrees. Players at all skill positions use the same skills, linked with various movements such as backpedaling, drops, crossovers, and so on. These athletes will benefit greatly from kinesthetic awareness drills such as decelerating, drop stepping, and keeping the foot close to the center axis; they can use the skills practiced in these drills to link transitions and transfer to spinning. Players should master general and special skills thoroughly and then spend a majority of their time applying these tools in random movement activities, such as various tag games and competitions. Speed, elasticity, and relative strength will be major long-term developmental goals for athletes at skill positions.

Tennis

Movement skills in tennis are critical to success and often determine both shot selection and the ultimate outcome of each point. Dynamic balance is highlighted in tennis, not just during movement but also in the instant just before ball contact with the racket. Moreover, players must be able to recover their balance to avoid leaving the rest of the court open. Tennis movements are broken into three main areas: close proximity, wide-ball recovery, and baseline to volley.

Close proximity is the area within approximately four meters of the offensive position, usually around the center mark where the players hit the majority of their shots. The critical movement skills are lateral and base, allowing the players to move with perfect balance to offensive or defensive forehands and backhands. In tennis, the base stance allows the athlete to be poised for lateral movement.

Wide-ball recovery occurs out around the doubles alley or beyond. The critical components are squaring up with improved balance and positive angles, linked with a single powerful crossover step, linked with a lateral and base slide. Players must keep the base so that they can make any shot required.

Baseline to volley starts with the multidirectional stance, which enables players to react in a 360-degree arc. They must take a positive first step; link together three to five explosive, accelerative steps; and then link into deceleration and lateral and base (split step), making sure to keep the hips down. This will put them back in perfect position to react to a great volley and recover immediately into a good stance to repeat the action.

Baseball and Softball

Baseball and softball have a variety of positions. On the defensive side of the ball, movement packages are broken into infielders, outfielders, catchers, and pitchers.

Infielders rely heavily on their sensory input reactions to send a message to link their effective stance with a powerful first step, crossover, deceleration, and get-up skills.

Outfielders must use visual stimuli and be able to link that with the correct movement selection (first-step quickness straight ahead, crossover, or a drop step). Outfield movement requires many types of transitions. An outfielder may need to use a drop step, crossover running, acceleration, and absolute speed to fill the gaps. Smooth transitions between these movements will lead to superior performance.

Catchers must work on reacting from the catching position. Starting them in proper position will drive concentric muscle action, because their elastic energy will have dissipated. Catchers must react quickly and possess blocking skills. They must be able to throw to various positions, execute crossover steps, accelerate, and decelerate. Progression of these skills with eyes shut or looking upward can improve agility.

Pitchers require special attention, both on and off the field. They should develop their specific skills from various postpitch positions. They must be able to accelerate or execute a crossover while maintaining balance during total-body deceleration. Practice will decrease the chance of their making an awkward, off-balance throw to which their body is not accustomed and that may result in injury.

Offensively, the roles of assorted baseball and softball players are much more similar. The movements that help players get out of the box quickly and increase on-base percentage are activities that link rotational movements with acceleration skills and transitional backward or forward speed. Softball players can enhance base-stealing skills through drills in which they anticipate the pitcher and then apply acceleration, maximizing the first steps by using the bag. In baseball, players can improve base-stealing performance by assuming the proper stance. Players can do this by sliding back and slightly opening up the right foot to the instep of the left, achieving positive angles with both legs. The back should be flat with a slight lean forward. The player should lean to put 70 percent of the

weight on the forefoot, and keep the arms relaxed in front of the body. During the steal, the arm action should be rotating the right elbow back, linking the crossover program to acceleration. The player should aggressively drive the arms and legs "back, back, back." For baserunning, baseball and softball players should practice their stride patterns, using body lean in the turns. Be sure that players run both ways around the bases.

Soccer

A fundamental rule to remember is that movement is king in soccer. Consider that the average player touches the ball less than 2 percent of the time. Of course, a player who develops movement skills can win more balls and increase that percentage! Soccer movement requirements depend on the position. Distance from the goal is a useful way to categorize requirements.

Goalkeepers need to work especially hard on stance, reaction skills from all positions, crossover steps linked to jumping and diving, landing and tumbling, and a modified base stance to give them the best opportunity to react in every direction, including vertical and horizontal jumping.

Fullbacks must work on acceleration and deceleration linked to a modified lateral and base so that they can position themselves to react to the offensive player. To make these linked skills more specific in drills, have athletes take a position against an opponent. As with all positions in soccer, fullbacks will greatly benefit from working on S-style runs.

Front-line players (forwards) should concentrate on being able to link many different skills. They cover significantly greater ground than other players and benefit from being able to link acceleration to transition. Players should train modified absolute speed while being bumped along the way by another player. Many drills require the linking of movements while moving fast. Soccer players should become proficient at all special and specific stride-frequency drills to enhance their ability to dribble at speed.

Basketball

Movement requirements in basketball depend on the position, but the distinctions are becoming blurred as bigger athletes gain more movement skills. The primary movement in basketball is lateral, not vertical. On the defensive side of the ball, every player must have mastery of the lateral and base movements, with the emphasis on both toes facing fairly straight ahead and pushing with the back leg, not pulling with the front leg and the toe opened up. Players must be able to move in this way while keeping a base so that they are always moving within balance and able to react to their opponent. (The stealthy offensive player will exploit the defender who brings his or her feet together!) Players must link movement skills to cutting and crossovers back to the base stance.

On the offensive side of the ball, it is critical to work on a stance that sets up the right positive angles in order to gain the effective first-step quickness that can create separation. Players should then link the stance to acceleration, deceleration, vertical jump, and spinning.

Cycling

Agility and coordination are essential requirements in cycling. Coordination promotes a smooth and efficient pedaling action; cyclists must build specific coordination motor programs to pull the toe, heel, and leg up from the six o'clock position to the one o'clock position. Agility comes into play as riders constantly push their balance threshold by leaning and by bumping with competitors. Core stability plays a huge role in efficiently controlling the normal cycling action and in maintaining balance during turns. Serious cyclists should practice and master the special skills of rolling and tumbling to decrease their injury potential in case of a mishap.

Volleyball

Volleyball is a game composed of acts of agility. Defensively, blockers must work on developing the base stance that readies them for lateral movement. They must develop crossover to base components and then link them with vertical jumping. These athletes must learn to link the inertia from lateral movement to a vertical jump by redirecting ground reaction forces. Defensively, backcourt players must master the stance; they must maintain positive angles, keep their weight forward by bending the legs and hips, and maintain good posture in the receiving position.

Offensively, setters need to be proficient at linking every movement skill. This is their world. Outside hitters must be incredibly agile so that they can link several explosive accelerative steps, then decelerate and transfer this energy through positive angles and a stable core to vertical movement. Once airborne, the stable torso acts as a platform that allows athletes to maintain balance, generate spiking forces, and stick the landing without going into the net.

Golf

Golf relies heavily on the coordination system to maximize the kinetic linking required for a flawless swing. Balance and stability play a huge role in the golf swing. Golfers must stay within a stable base of support in order to turn ground reaction forces into rotational movement. They must transfer this energy into a disassociation of the shoulders and hips, creating a coiling effect while maximizing the stretch reflex cycle. Development of club-head speed is a result of the ability to accelerate the body segments while maintaining balance. Golfers also possess a highly evolved sense of kinesthetic awareness and can effectively use sensory feedback.

Gymnastics

Gymnastics is a perfect example of a sport in which athletes master general and special drills and then link them together to produce awe-inspiring physical acts. We believe gymnastics demonstrates the underlying role that balance plays in agility. Kinesthetic awareness is enhanced by a well-developed sensory feedback system. Gymnasts learn to rely on nonvisual, nonauditory cues.

Track and Cross Country

Track and field and cross country are sports in which performance is measurable and finite. They are also sports that require very special motor skills. Agility plays some role within every event, probably reaching its highest expression in some of the throwing events that require spins or rapid deceleration. Agility drills complement all the workouts of runners and jumpers, enhancing coordination patterns and muscle balance in strength and flexibility.

Wrestling

Wrestling relies heavily on agility. This combative sport is built around using balance and leverage to disrupt the balance of the opponent.

SUMMARY

Enhanced movement skills make great athletes. Movement is sport. Athletes are born with an inherent set of gifts that they can maximize with this approach. Success in achieving these goals is up to the athletes. They must realize that these are learnable skills. Every step they take builds the foundation for the future. Ensure success by demanding perfect technique. Perfect practice will lead to peak performance by developing the multisensory feedback system. This system enables athletes to learn rapidly through trial and error. Remember that athletes learn efficiently through nonverbal, nonauditory input. The reward for mastering general and special movement skills is a decreased potential for injury, improved athleticism, and strong, efficient movement programs that link together to produce efficient, high-performance, sport-specific movement.

Manipulating the dynamic nature of balance is the underlying foundation of agility. Athletes need to develop all of the coordination and physical tools, including core stability, mobility, speed, elasticity, power, strength, and energy systems. Doing so enables them to achieve incredible movement skills, sustaining them throughout competition to achieve the ultimate victory—reaching their potential! Enjoy the exciting process of teaching, learning, progressing, and challenging athletes to become great “wired-up” movers.

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