Chapter

9

Speed

You can cut up to a tenth of a second off your time from home to first in six weeks. With proper training, you can learn to run faster and reach your genetic potential for speed. You may not make the track team, but that shouldn't be your primary goal. Your goal should be to run faster in game situations.

You don't need an extremely high aerobic capacity to be successful in baseball. Baseball is an anaerobic game that requires mostly short bursts of all-out activity, not sustained submaximal effort. As a rule, if you can run a mile in 7 minutes or 1.5 miles in 10.5 minutes, your aerobic fitness should be sufficient for baseball.

Most runs in game situations are less than five seconds in duration, which means that quickness and acceleration are more important than pure speed. The average major-league player can run 60 yards in about 7.0 seconds, with the best in the game, Kenny Lofton, Deion Sanders, and Brian Hunter, running the distance in 6.2 or 6.3 seconds. Managers once believed that, no matter what they did, they couldn't make a slow athlete fast. They were right if *fast* is an arbitrary standard. The reality is, however, that good training can make any athlete faster and more efficient. How much faster is determined by genetics, but regardless of your genetic potential, you can get faster or you can get slower. Speed is an asset, but it's not the sole requisite for success. You can compensate for a lack of speed if you can react and start quickly, accelerate, stop under control, change direction, and avoid slowing down.

FIVE KEY COMPONENTS OF SPEED

Mechanics
Quickness
Acceleration
Agility
Speed-Endurance

You can take three steps to running faster: improve your running mechanics, improve your quickness, and improve your acceleration. You'll find the exercises and explanations in this chapter organized around those three steps. Start by noting your strengths and weaknesses. Use the drills outlined in this chapter to correct deficiencies and achieve your speed potential (see table 9.1 on page 213).

How much and when you work on each component will vary by position and where you are in the training year. Use the early off-season to develop a strong strength and aerobic base from which to launch an effective speed training program. Make your drills more sport-specific and position-specific as the season approaches. Pitchers, for example, need more aerobic and interval work, and position players require more speed-quickness. If you improve just one key component, you'll get faster. Improve them all and you'll achieve your speed potential.

You've run sprints for years without any measurable improvement? Don't continue to run meaningless sprints. Work on each of the key components of speed and you will get faster. Start with mechanics to develop good running technique. Then do speed intervals, quick starts, and sprints for acceleration. Run short shuttles for agility and long shuttles for speed-endurance. Lift for speed-strength and do plyometrics (see chapter 10) for speed-power. Don't forget to warm up, stretch, and cool down to avoid injury.

Improving Running Mechanics

The first step to running faster is to improve mechanics. Regardless of how much you run, how strong you get, or how much you stretch, you'll run only as fast as your mechanics permit. Develop good mechanics and spend three to five minutes on them every day. Don't take speed for granted.

Components of Running Mechanics: PAL

Robin Roberts, *on being told that he could get to first base one step faster if he worked on running mechanics: "A lot of good that will do. I'm getting thrown out by three steps now."*

The three basic components of good mechanics are posture, arm action, and leg action, or PAL (also see chapter 2).

Learn one component at a time. Work on the first component (posture) at half speed. Walk back and run again. Do five reps over 30 yards at half speed, rest one

to two minutes, and then do five more reps at three-quarters speed. Rest and repeat the component at full speed. Then, try the next component (arm action). After learning each component in isolation, put them together in a single 30-yard run at half speed. Walk back and run again. Do five reps at half speed. Rest and do five reps at three-quarters speed. Rest and repeat at full speed. Stop when you become tired and start to slow down. When you run slow, you practice being slow. You have to run fast to be fast. Allow 24 to 36 hours of recovery between speed workouts.

COMPONENTS OF RUNNING MECHANICS

Posture
Arm action
Leg action
} = **PAL**

Posture

Posture describes the alignment of the body, especially the head and trunk. Your head weighs about 10 pounds, and where it goes, the rest of your body follows. Look down and you lean forward. Look up and you lean back. Excessive lean in either direction reduces speed. Turning your head side to side or cocking it to one side keeps you from running in a straight line.

Body lean comes from the ankles, not the waist. To find proper body lean, stand tall and shift your weight toward your toes until the heels just leave the ground. The point at which your heels leave the ground is your proper body lean. Run the same way you walk, tall and relaxed, not hunched over. Keep your body tall and straight, as you would if looking over a fence.

Arm Action

Arm action involves the position and rate of movement of the arms and hands. Your arm pivots about the shoulder with the elbow locked at about 90 degrees. Assume that you have a rod through your shoulders and that each elbow is in a right-angle cast. The only movements possible at the shoulder are flexion and extension. Your elbows can't bend or open. If they open and close, most of your force goes up and down, not forward. Keep your elbows close to your sides. If they move away from your body, your trunk rotates side to side and you lose speed. Keep motions directly upward and backward from the shoulders.

Run cheek to cheek. Bring your hand forward to cheek level and then back past your pockets with your palms toward the body, thumbs on top of your hands, and hands relaxed. Bring your hand up to chest height on the front swing and down past your pocket on the down swing. Your arms and legs work together. The driving action of your hand past your buttocks coincides with the triple extension of the opposite leg to help propel you forward.

Your arms, not your legs, control speed. Don't believe it? Try this: jog slowly and check your arm action. Is it short and slow? Do your arms swing side to side across your body? Look at your stride. Is it slow and choppy? Now, pump your hands from cheek to cheek and watch your stride length increase. Want more

speed? Pump your arms faster. Your arms and legs work together. Your legs move longer and faster to keep up with your arms. Pumping your arms from cheek to cheek makes you take faster, longer steps, which in turn increases speed.

SPEED TIP—SMOOTH AND EFFORTLESS

Accelerate without thinking about it. If you try to run harder, you'll tighten up and slow down. How many times have you tried to move your legs faster to beat out an infield hit or tried to kick it in after rounding third only to tighten up and slow down? Have you ever tried harder but failed to get to the ball? Speed is not about trying harder or forcing your legs to move faster. Use your arms, and your legs will automatically move faster.

Leg Action

Leg action focuses on the foot, ankle, knee, and hip. Lift your knee *forward, not up,* and let your lower leg relax and hang down. Keep your toe up and snap the foot down and back to drive you forward. Your foot should strike the ground directly under your center of gravity and push you forward. Ankle flexion occurs when you lift your toes toward your shin. Extension occurs when you push off or extend your foot. You have to load the ankle (flex it) before you can push off (extend it). Make sure that you pull the toe up toward the shin as your lead, or nonsupport, leg comes forward during recovery to load the ankle just before the foot strikes the ground. An unloaded ankle can't explode quickly on ground contact. You have to flex it while it's on the ground before you can get it in position for explosive movements. Loading the ankle while it's on the ground wastes time and slows you down.

Don't worry about stride length now. Reaching out causes you to overstride and slows you down. Also, forget high knee lifts. When your foot strikes the ground, the rebound will drive you forward and push your knee up. Punch the knee forward and let the rebound push it up.

Push the body forward! Place your foot on the ground and push away from the direction you want to go. Don't reach and pull. Push down and back to create an angle from the head to the foot that will move you forward.

Each component of running mechanics (posture, arm action, and leg action) affects the other two. If one is off, compensation of some form will always occur in the other two. The first area to break down is usually posture. Most athletes lose their eye focus or stand up too straight too soon. Both conditions disrupt normal arm action, reduce stride rate, and decrease stride length.

Drills for Running Posture

Eye Focus

Run 20 to 30 yards at half speed, keeping your head still. Look straight ahead and focus on an object at eye level near the point to which you are running. Walk back and repeat at three-quarters and full speed.

Table 9.1 Running Drills

Mechanics	Posture	Arm action	Leg action
	Eye focus	Seated arm runs	Leg cycles
	Cheek to cheek	Ins and outs	"A" skip
	Rise, fall, and run	Arm runs	
Quickness	**First step**	**Reaction**	**Quick feet**
	Wheel drill	Ball drops	Dot drill
	Get-ups	Reaction ball	X-jumps and hops
			Down-the-line drills
			Cone jumps/hops
			Supported jump-ups
			Rope jumping
			Quicks
			Wall runs
			Ladder drills
Acceleration	**Start**	**Accelerate**	**Resisted/assisted runs**
	5-yard starts	Build-up runs	Parachute runs
	Sprints	Acceleration sprints	Towing runs
	Jump/hop into a run		Hill runs
			Water running
Agility	**First step**	**LSA**	**Resisted movements**
	Box crossover	5-10-5 drills	Shuffle
		Microhurdles	Crossover
		Ball pick-ups	Backpedal
			Over the shoulder
			W drills
Speed-endurance	**Gassers**		**Speed-aerobics**
	200-400 shuttles		Repeat 100s
	Down/back in 15 sec		10 × 100 in 10 min
	30:30s		100-yd pick-ups
			60s and pick-ups
			Pole sprints
			Hollow sprints

Cheek to Cheek

Jog slowly with your elbows close to your sides and fixed at a right angle. Accelerate to half speed by bringing your hand forward to cheek level and then back past your pockets. Run for 20 to 30 yards keeping your elbow fixed and all movements at the shoulder. Walk back and run at three-quarters and full speed.

Rise, Fall, and Run

For proper body lean, stand with your feet parallel and about shoulder-width apart. With one arm forward and the other back, keep your body straight and rise up on your toes until you have to step forward to catch yourself and then sprint 10 to 15 yards.

Drills for Arm Action

Seated Arm Runs

Sit with your legs extended out straight. Keep your head up and arms relaxed with elbows fixed at a 90-degree angle and close to the sides. Move your left hand back past your pocket as your right hand comes up to your shoulder. As the hand passes the hip, turn the palm out slightly so the thumb brushes the hip to help keep your hands relaxed. Gradually increase arm speed as you pump your arms for 10 seconds. Do three sets and increase arm speed each set.

Ins and Outs

Stand with one arm forward and the other back. Keep your trunk erect, knees bent, head still, and eyes focused straight ahead. With your elbows fixed and arms and hands relaxed, slowly and rhythmically move your hands from cheek to cheek for 5 seconds. When your rhythm is good, use quick, pistonlike actions to accelerate to three-quarters speed for 5 seconds. Slow down to half speed for 5 seconds and then accelerate to maximum speed for 5 seconds. Repeat the drill three to five times going from half to three-quarters to full speed with a 10- to 15-second rest between sets. Then go from half to full speed and from zero to full speed. Gradually increase the duration of the drill to 10 seconds to simulate taking an extra base. Once you reach top speed (after about 5 seconds), let your arm action smooth out and become less pistonlike.

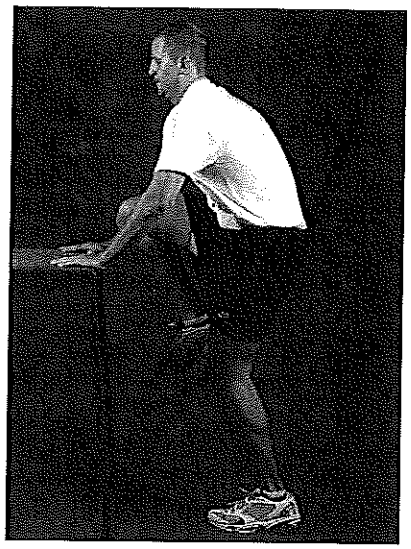
Arm Runs

Jog 30 yards at half speed moving your arms slowly. After 30 yards, keep your arm speed about the same but increase the length of your swing by moving your hands from cheek to cheek. Notice how your stride length increases as you get up on your toes. Keep this pace for 30 yards and then pump your arms as fast as you can and keep moving your hands from cheek to cheek. Did you get faster?

You had to. Your arms and legs work together. If you increase the range of motion and rate at which your arms move, your legs automatically move farther and faster to keep pace with your arms. Using your arms lets you speed up without having to think about it. It happens automatically.

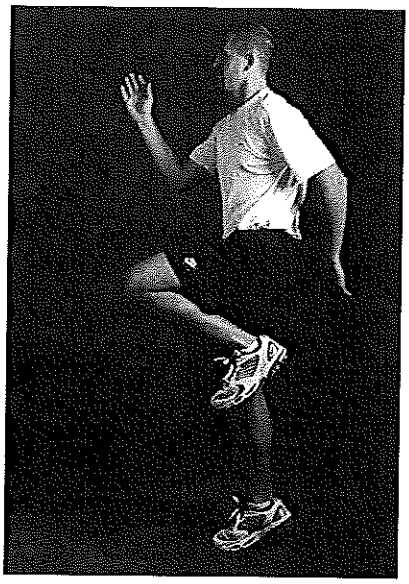
Drills for Leg Action

Leg Cycles



Lean against a wall or rail. Cycle one leg through in a sprinting action. Emphasize keeping the leg from extending behind the body and having the foot kick the butt during recovery. Paw the ground with your foot to end the action. Dorsiflex the foot (pull the toes up) as the leg comes forward. Start slowly and gradually increase speed.

"A" Skip



Skip forward moving your arms opposite your legs. When you have established a good rhythm, lift the knee to waist height, keeping the toe up, and then forcefully extend the hip, knee, and ankle to drive the foot into the ground. Alternate right and left leg skips for 20 to 30 yards. Repeat the drill three to five times and gradually increase speed each set.

Improving Quickness

Speed is what you achieve after five or six steps. Quickness is what you get after the first one or two steps. You can learn to be quicker. You may never become lightning quick, especially if you're weak and your speed is mediocre, but you can become quicker. Small improvements can make a big difference. A fraction of a

second can be the difference between a game-saving play and a run-scoring hit. To improve quickness, learn proper starting mechanics, improve reaction time, and develop quick feet. Incorporate starting and foot speed into your daily training routine. Give maximum effort on each rep. Limit drills to 10 to 30 seconds' duration in the early off-season to build a quickness base. Shorten the time to 10 seconds or less as the season approaches.

Starting Mechanics

Quickness begins with your starting position and first step. Start from a relatively low body position with the joints at a right angle and 75 percent of your body weight on your forefoot and 25 percent on your heel. Your first step determines where you're going and how fast you'll get there. Move only in the direction you want to go. Never give a step. Go directly to the ball or base, not up or down. Keep your center of gravity low for the first three steps to maximize leg drive. Gradually increase the length of each succeeding step. Throw your hands in the direction that you want to go to help start your arms pumping. Practice starting from different positions.

First Step

Your hips always move first. Practice being quick in all directions and practice all four types of first steps when going in different directions. Use a crossover step when moving a relatively long distance, as you would when stealing a base or going into the hole to field a ball. Use an open step when you need to move a relatively short distance. Use a drop step when going backward or diagonally backward to catch a fly ball. Do a turn and run to get to a ball that's over your head.

First Step Drills

Crossover Power Step

Turn your hips, throw your arms, cross over with the back foot, and drive off the ball of the foot of the front leg. Push off the right foot when going right and off the left foot when going left. Rotate your trunk and shoulders as you cross over, not before.

Open Step

Step out with the lead foot and push off with the back foot. Step quickly in the direction you want to go. Step with the right foot when going right and the left foot when going left. Move your hips and drive off the lead foot. Make your first step short and powerful.

Drop Step

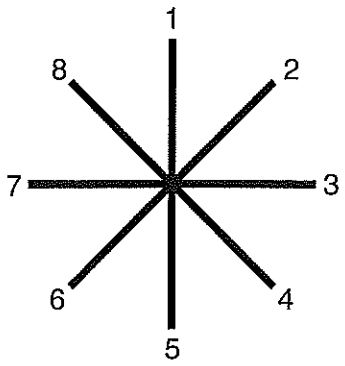
Turn your hips and step out and back with the right foot when going right and with the left foot when going left. When going right, for example, start by turning your hips. Then move your right foot back 6 to 12 inches, throw your arms, and drive off the right foot.

Turn and Run

Open your hips in the direction of the run, take a drop step, pivot on the back foot, and drive off the lead foot. When going to your right, for example, turn your hips to the right, throw your arms, drop back a step with your right foot, pivot on your left foot, and drive off your right foot.

Wheel Drill

This drill helps develop a quick first step for all game situations. Begin with straight-ahead movements from a ready position using an open step. Go forward with your feet parallel. Then change your stance and go forward with your right foot forward and left foot back, and vice versa. When you can go forward, work on diagonal, lateral, and backward movements using crossover steps, drop steps, and turn-and-run techniques.



Stabilization

Learn how to stop on one foot. Start from a ready position in the middle of the wheel. Take one quick step and hold it for three to five seconds for balance. Stay low and return to the starting position. Then drive out low and fast for three to five steps. Break down and hold.

Get-Ups

Use the following drills to learn how to get up off the ground quickly when running the bases.

Head-first

Lie down as if you just slid head first into a base. There's an overthrow—get up quickly and sprint to the next base.

Feet-first

Lie down as if you just slid feet first into a base. Get up quickly and sprint to the next base.

Dive Back

Lie down as if you just dove back into a base. There's an overthrow—get up quickly, turn around, and sprint to the next base.

Reaction Time Drills

Reaction time is the interval between the stimulus and first movement. Reactions are much slower than reflexes. Reflexes (pulling your hand back after touching a hot stove) are involuntary actions that occur below the conscious level. Because you don't think about them, you can't control or train them. Reactions (getting a jump on the pitcher) are *conscious, voluntary* actions that you can think about, control, and train. Reaction drills require you to recognize a stimulus and quickly execute the right movement. Quick reactions start with being in the right place at the right time. Game-saving plays are the result of alertness, anticipation, focus, position, and training. Reactions are explosive. Do drills when you're rested and alert—fatigue makes you slower.

MAKE THE PLAY IN A HALF-SECOND OR LESS

Line drives and one hoppers through the infield are often clocked at 100 to 120 miles per hour. At these velocities, most balls will be on a first or third baseman standing even with the bag in a half-second. A pitcher standing about 56 feet away at release has less than three-tenths of a second to make the play or get out of the way.

Ball Drops

A partner stands about six feet in front of you and drops a tennis ball from head height. From a ready position, explode forward and catch the ball, without diving, before it bounces twice. Move up or back as needed. Make the drill more difficult by moving back or by dropping the ball from a lower height. Change the starting position and difficulty by using a crossover step before moving to the ball. Repeat in both directions. Change the drill by using two balls. A partner holds one ball in each hand and drops one or the other. Decide which ball is dropped, sprint forward or laterally, and catch it before it bounces twice. Make the drill more challenging by turning your back to the ball. Stand in a ready position with your back to a partner. On the command "drop," take a drop step with your right foot, turn right, find the ball, explode forward, and catch it before it bounces twice. Repeat turning left and repeat using two balls.

Reaction Ball

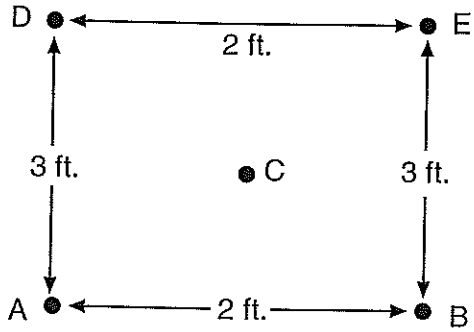
Stand in a ready position. A partner throws a Z-Ball to you on one bounce. Catch it before it bounces twice.

Quick-Foot Drills

Quickness starts with the first step, ends with the last step, and is controlled by the central nervous system (CNS). It begins in the brain and ends in the muscles. For maximum quickness, you have to reprogram the CNS to transmit faster signals, generate rapid contractions, and produce coordinated movements. Work on technique first and speed second. Learn how to do each drill correctly before adding speed. Keep the drills short and quick (five seconds or less). In time, you won't have to think about what's happening. You'll react automatically and take quicker, more powerful steps.

Dot Drill

Draw a two-foot-by-three-foot rectangle on the floor. Put a three-inch dot in each corner and in the middle of the rectangle. This drill has five parts. Do five reps of the first part as fast as you can and then, without resting, do five reps of each of the other parts.



Up and Back

Stand at one end of the rectangle with the left foot on dot A and the right foot on dot B. Jump off both feet and land in the middle dot (C) with both feet at the same time. Immediately jump off both feet and land with the left foot on dot D and the right foot on dot E. Jump backward and come back in the same way.

Right Foot

Finish the up-and-back drill by landing with the left foot on dot A and right foot on dot B. Jump to dot C on the right foot and then, in order, jump to dots D, E, C, A, B.

Left Foot

End the right-foot drill with the right foot on dot B. Jump to dot C on the left foot and then, in order, jump to dots D, E, C, A, and B.

Both Feet

End the left-foot drill with the left foot on dot B. Jump to dot C and land on both feet. Now, jump in order to dots D, E, C, A, and B on both feet.

Turn Around

End the both-feet drill on dot B. Jump to dot C and land on both feet. Jump forward and land with the left foot on dot D and right foot on dot E. Quickly jump up and turn 180 degrees, face the other way, and land with the right foot on dot

D and left foot on dot E. Jump and land on dot C with both feet and then jump to dots A and B with feet split. Spin 180 degrees and repeat the drill.

X-Jumps and Hops

Stand on one side of an X. Jump from side to side 10 times on both feet. Keep your feet close to the ground and jump as fast as possible. Repeat the drill, jumping front to back and then jumping front to back and side to side. Repeat on one foot.

Down-the-Line Jumps and Hops

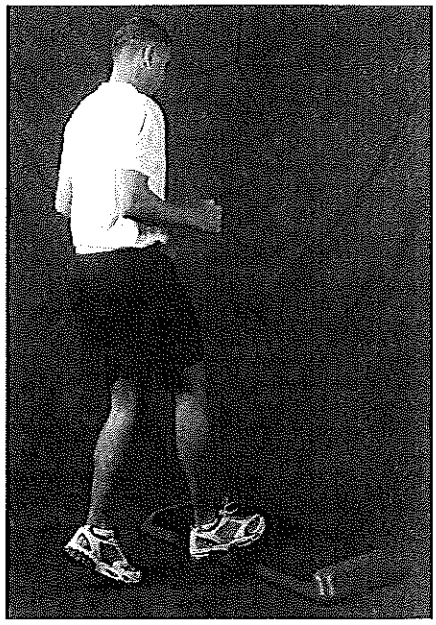
Stand to one side of a line five feet long. Move forward as you jump side to side as fast as you can. Jump to the end of the line. Rest and repeat moving backward. Repeat on one foot.

Down-the-Line Lateral Jumps and Lateral Hops

Stand with your toes on a line five feet long. Move to your right as you jump back and forth across the line as fast as you can. Jump to the end and come back moving to your left. Repeat on one foot.

Quicks

Stand facing a two-inch-high box with most of your weight on your left foot. Lightly place the ball of your right foot against the front edge of the box. Jump up quickly and cycle your feet so that most of your weight is on your right foot and your left foot is against the front edge of the box. Do 10 touches with each foot as quickly as you can.

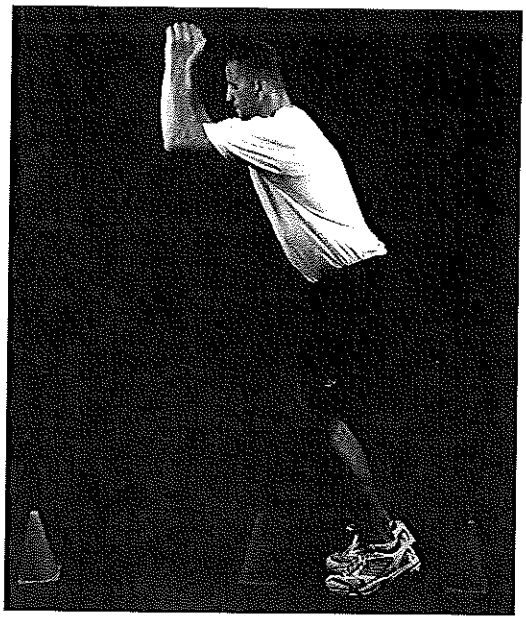


Wall Runs

Stand at arm's length from a wall. Place both hands on the wall for support. Lean into the wall and slowly run in place bringing your knees up. When you get into a good rhythm, sprint for 10 contacts with your foot. Slow down, stop, rest, and repeat.

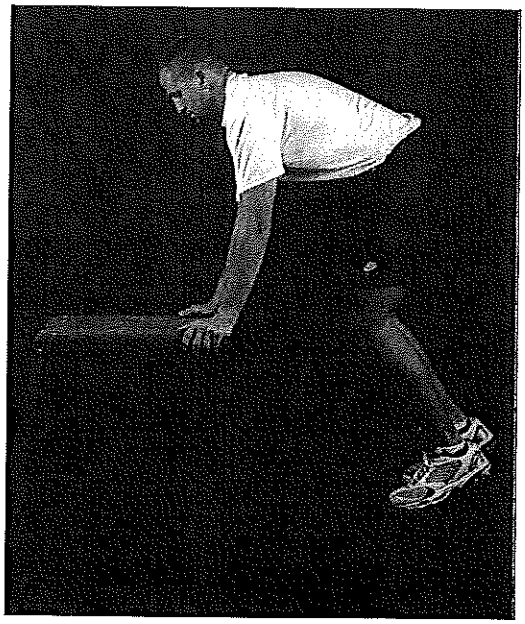
Cone Jumps and Hops

Jump front to back over a six-inch cone as fast as you can. Repeat the drill jumping side to side and then jump front to back and side to side. Repeat on one foot.



Supported Jump-Ups

Place a 12-inch-by-12-inch square box that is 6 inches high next to a 30-inch box. Stand in front of the taller box and at arm's length away from the box. Place both hands on the box for support. Lean into the box and jump up on to and down off the box with both feet as quickly as possible. Make 10 jumps and rest. Repeat the drill with 12-inch, 18-inch, and 24-inch boxes.

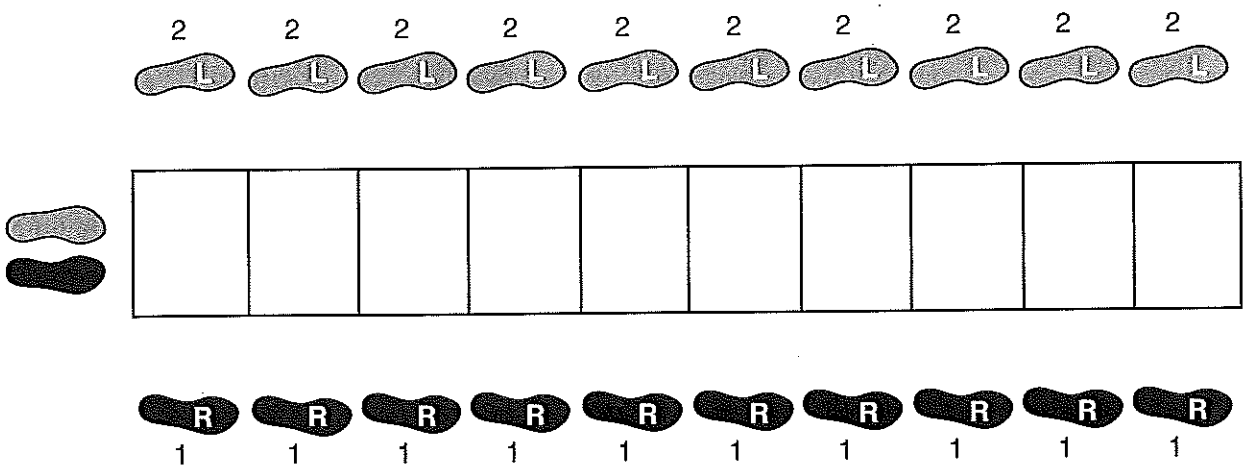


Ladder Drills

Do ladder drills for foot speed and rhythm. Do a walk-through before you attempt to do each exercise with speed. Go as fast as you can, not as fast as you can't. Don't try to push speed to the point that you can't finish an exercise without goofing it up. Let your ability to complete all the steps be the limiting factor on your speed. Use the ladder to train movement quality, not just speed and quickness. Follow the word cues given below. Tell your feet what to do and they will obey. Don't stop at failure. Ladder exercises have a fast learning curve. Everyone looks and feels awkward the first few times through a new exercise. Relax, follow directions, and let learning happen.

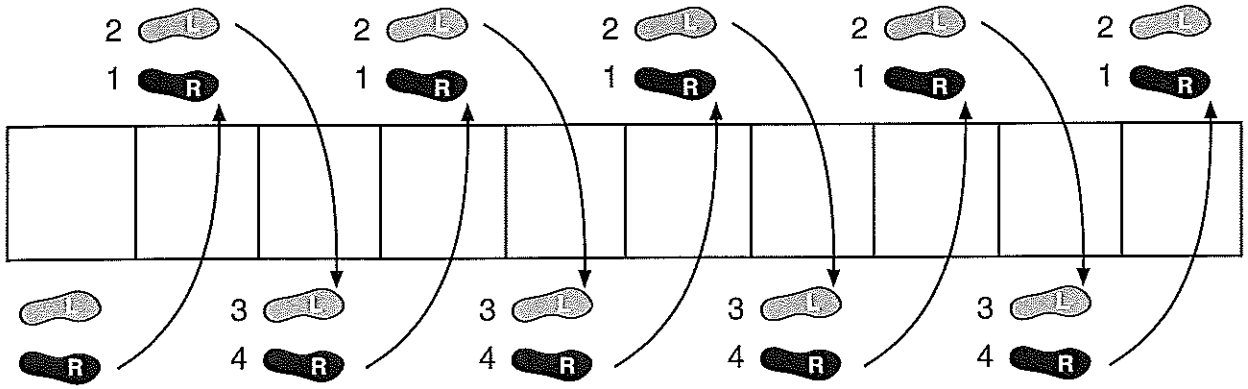
Forward and Backward Wide Skip

Straddle the ladder. Skip forward down the ladder with your feet outside the ladder. Bring your knees up high and wide to increase range of motion. Repeat the drill going backward. Push your toes through the ends of your shoes to push your body backward. Push; don't reach back.



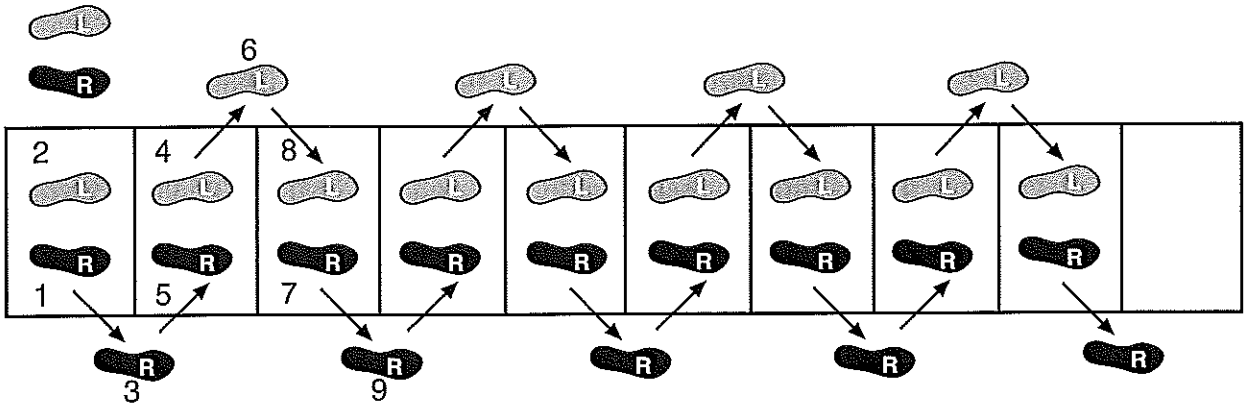
Skip and Crossover

Stand with both feet on the right side of the ladder. Skip across the ladder with your outside (right) foot. Land on the opposite side with your right foot outside the ladder. Skip back across with the outside (left) foot. Keep your head and chest facing straight ahead as your hip and knee cross over the ladder. Repeat the drill going backward.



Icky Shuffle

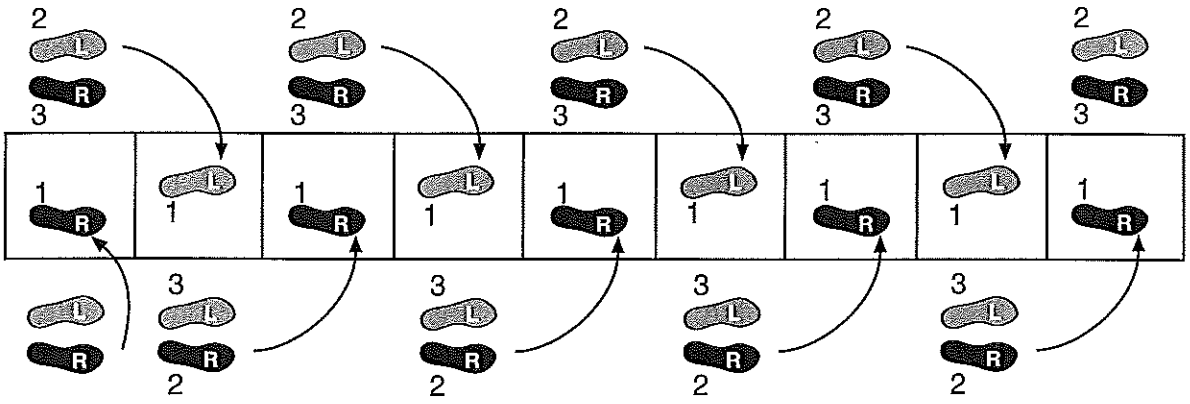
Do this drill to develop a quick open or side step. Stand to the left of a ladder with both feet outside the first box. The drill starts with a side step and has three steps: in-in-out. Step into the first box with your right foot and then your left foot. Step across the ladder and outside with your right foot. Reverse the steps to the left, moving forward to the second box (left foot in, right foot in, left foot out).



Always start with the foot nearest the ladder. Once you have the drill down pat, add a plyometric component to improve your ability to stop, balance, and cut back the other way. Start and increase the length of your third step as you leave the ladder (in-in-out). Push the outside step at least a yard or so beyond the outer edge of the ladder and then cut back as quickly as you can to the right. The increased length of the step forces you to lower your center of gravity as you prepare to change directions. Don't push the outside step too far out or you will have difficulty getting back to the ladder. Repeat going backward.

Crossover

Your word cues are "cross-out-out, cross-out-out." Start on the right side of the ladder, but this time cross your right (outside) foot over your left to land in square one. Then step outside the ladder with your left foot and then your right. Reverse the steps to the right (left foot in, right foot out, left foot out). Repeat going backward.



Two-Foot Hopscotch

Stand facing down the ladder with both feet together. Jump into the first square and land on both feet. Then jump up, spread your feet, and land with your feet straddling the second square. Continue going down the ladder, alternately placing two feet in and two feet outside each square. Repeat going backward.

One-Foot Hopscotch

Stand facing down the ladder with both feet together. Jump into the first square and land on the right foot. Then jump up, spread your feet, and land with your feet straddling the first square. Continue going down the ladder, alternately placing the right foot in and both feet outside each square. Repeat on the left foot.

Alternate One-Foot Hopscotch

Stand facing down the ladder with both feet together. Hop into the first square and land on the right foot. Then jump up, spread your feet, and land with your feet straddling the first square. Then hop into the second square and land on the left foot. Jump and straddle the second square. Continue going down the ladder, alternately placing the right foot and left foot in and both feet outside each square.

Rope Jumping

Short, fast jumps develop foot speed and improve your ability to make sudden changes in direction. Longer, slower jumps improve aerobic endurance. Jumping strengthens the ankles, knees, and shoulders and, because it requires constant shifting of body weight, improves balance and eye-foot coordination. Use a speed rope made of solid plastic PVC. Speed ropes are light and aerodynamically designed for speed and mobility. They are easy to handle, and you will progress more quickly than you would using leather, nylon, or heavy ropes. Wear cross-training shoes with good forefoot padding for shock absorption. Jump on softer surfaces (rubber flooring, gym mat, grass, or artificial turf) for aerobic endurance and harder surfaces (gym floor, carpet, or dirt for foot speed and quickness. Never jump on concrete. Always warm up with two or three minutes of shadow jumping (without a rope) and stretching.

Use the first two weeks of the off-season to learn proper technique and master the double leg and the stride jump. Jump only high enough to clear the rope. Land lightly on the balls of the feet. Stretch your calves during rest periods. Learn the basic jumps in table 9.2 and do a 10-minute circuit program using a mix of different types of jumps.

Table 9.2 Basic Jumps

Starting position	Feet together, body in line, eyes straight ahead, arms close to sides, and rope resting behind calves.
Rope measurement	Stand on center of rope with one foot. Pull handles along side to reach chest or underarm.
Double-leg jumps	Jump with feet together.
Stride jump	Jump and alternate feet, one forward and one back.
Skiers jump	Alternate jumping a few inches to the right and then to the left. Keep feet together and trunk straight ahead.
Crossover jump	Start with two-foot jump and cross one foot over the other on the second jump. Alternate crossing and uncrossing feet every other jump.
Single-leg jump	Jump on one foot.

Improving Acceleration

Acceleration gets you out of the box quickly and lets you steal bases, break up double plays, and get to balls in the gap. It helps you reach maximum speed in the shortest possible time. Although pure speed is good, acceleration is essential. Most plays cover 5 to 10 feet and rarely do you have to run longer than 30 yards, so success depends more on how much ground you can cover in the first 5 or 10 steps than how fast you can run 100 yards. Acceleration starts with the first step. Focus on starting mechanics, stay low, and make your first 5 or 6 steps explosive.

Starting Drills

Use these drills to achieve maximum speed quickly.

Five-Yard Starts

From a ready position, with your right foot slightly forward, sprint five yards. Walk back and repeat with the left foot forward. Repeat using a crossover step to the right and left.

Sprints

Sprint forward for 30 to 60 yards from a staggered stance. Repeat with a crossover step to the right and left.

Jump and Hop Into a Run

Jump forward three or four times on both feet. Land on one foot and sprint 20 yards. Repeat and land on the opposite foot. Repeat on one foot.

Acceleration Drills

Build-Up Runs (Jog, Stride, Sprint)

Jog 10 yards, stride 10 yards, and sprint 10 yards. Decelerate, walk back, and repeat. Gradually increase the distance to 15, 20, 25, and 30 yards.

Acceleration Sprints (Sprint, Jog, Sprint)

Sprint 10 yards, jog 10 yards, and sprint 10 yards. Slow down, walk back, and repeat. Gradually increase the distance to 15, 20, 25, and 30 yards.

Improving Agility

Baseball is a game of quick starts and stops, all of which you must make under control if you're to make the play and avoid injury. The ability to start, stop, and

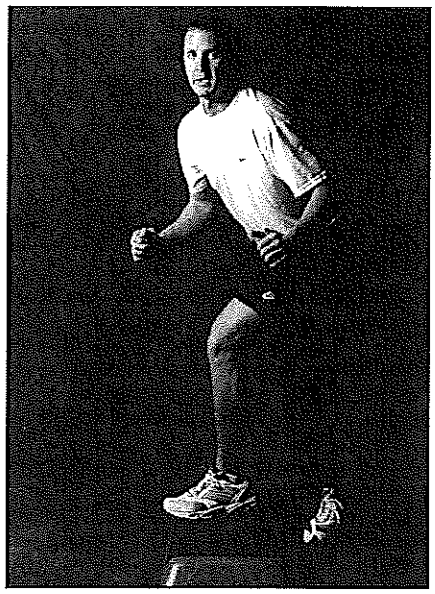
change direction is called lateral speed and agility (LSA). Success is related to how well you can start, stop, and change direction while keeping your body under control. On most plays, you'll take one or two steps sideways and then three or four steps straight ahead. Errors and injuries are often associated with plays involving an all-out change of direction.

Don't focus only on starting; you must also emphasize stopping. All movement involves both starts (force production) and stops (force reduction). Force production occurs when you break out of the box, go in the hole, or steal a base. Force reduction lets you stop under control, plant your foot, and make the throw.

LSA drills teach you to move quickly in all directions and control your body when moving at maximum speed.

First-Step Agility Drill

Box Crossover

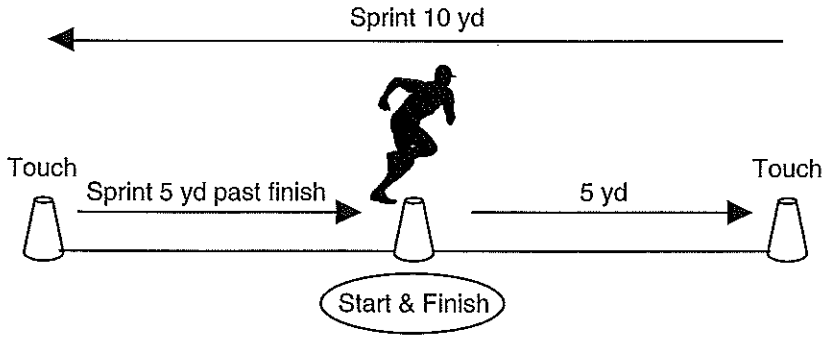


Assume a ready position, with your right side next to a four-inch-high box. Use a crossover step and step onto the middle of the box with your left foot. Push off the box with your left foot and land in a ready position two to three feet on the opposite side of the box. Cross over onto the box with your right foot and drive your body back across the box. Make the drill more gamelike by doing ball pick-ups on each side of the box.

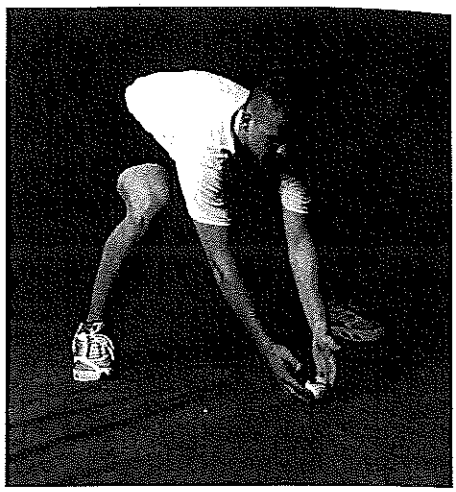
LSA Drills

5-10-5 Shuttles

Place three cones 5 yards apart. Start in the middle. Sprint to one end, stop, turn around, and sprint to the opposite end. Stop, turn around, and sprint to the middle. Repeat the drill using a mix of forward, backward, and shuttle movements. Then repeat the drill by sprinting 10 to 15 yards at the end.



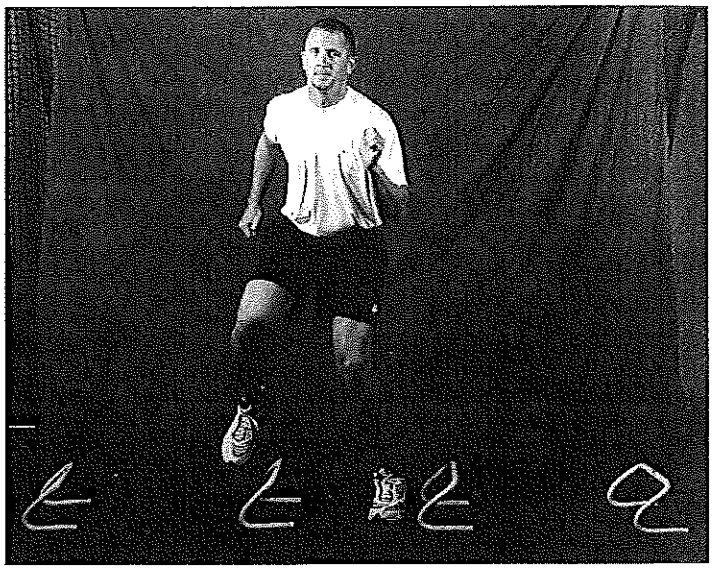
Ball Pick-Ups



Assume a ready position three to four feet away from a partner. Shuffle five to six feet to the right as your partner rolls you a baseball. Squat down with good form (head up, back straight, and knees bent), pick up the ball, and toss it underhand back to your partner. Immediately shuffle to the left and field another ball.

Microhurdle Drills for LSA

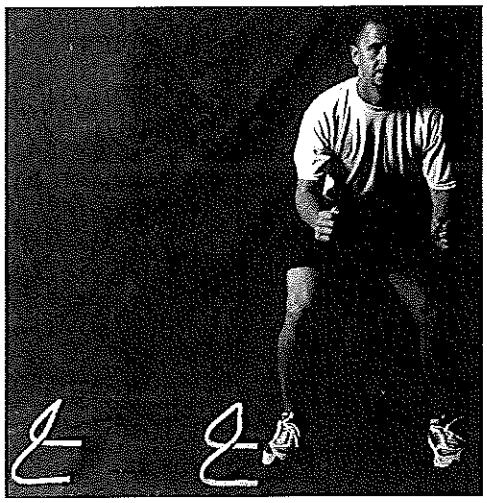
High Steps



Set up four six-inch microhurdles three feet apart. Start by standing with both feet outside the end hurdle. Lift the inside foot (knee up, heel to buttocks, and toe up), push off with the outside foot, and step laterally over the first hurdle with first the inside foot and then the outside foot. Continue to move laterally over each hurdle (stepping first with the lead foot). When you get to the end, stop with both feet outside the last hurdle. Then change direction and come back the other way. Increase speed when you get the rhythm down. Go over and back four times. Rest and repeat. For more speed, don't pause at each end. When you get to the end, place the lead foot outside the last hurdle and then quickly change direction and come back the other way. Repeat the drill with three hurdles for more speed and quicker changes of direction. For maximum speed, repeat the drill with two hurdles.

High Steps—Two-Hurdle Crossover

Stand with both feet outside the first hurdle. Cross over the first hurdle with the outside (left) foot. Then step over the second hurdle with the lead (right) and back (left) foot. Stop when both feet are outside the second hurdle. Go the other direction using a crossover step with the outside (right) foot. Go over and back four times. For maximum speed, don't pause at either end.

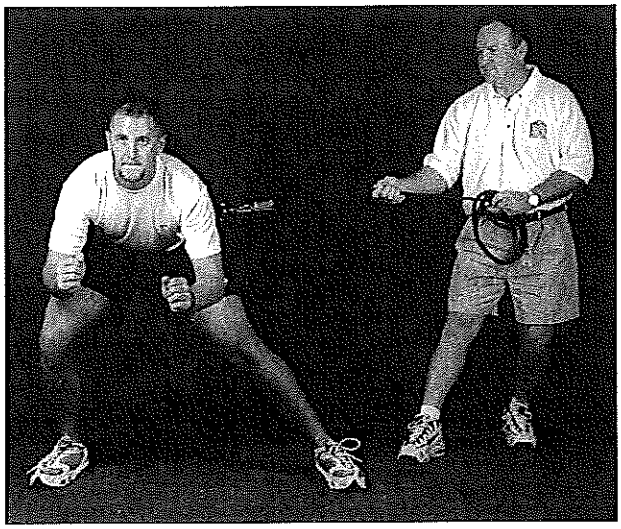


Resisted Movement Drills for LSA

Attach an eight-foot strip of tubing or bungee cord to a belt positioned at waist height. Have a partner hold a moderate amount of tension on the cord. From a ready position, move away from your partner using one of the following techniques. Walk back and repeat.

Lateral Shuffle

Shuffle five steps to the right, break down into a fielding position, and field a ground ball. Repeat to the left.



Crossover

Execute a crossover step and sprint five steps to the right. Break down and field a ground ball. Repeat to the left.

Backpedal

Backpedal five steps, break down, and catch a line drive.

Over the Shoulder

Pivot on your inside foot, turn, and break over the opposite shoulder. Run five steps and catch a fly ball. Repeat to the opposite side.

W

Inscribe a W as you move forward and backward five steps. Start with a backpedal, run forward, backpedal, and run forward. Stop and repeat the drill going the opposite way. Then do the drill by going forward on the first movement. Repeat the drill, moving a W laterally. Start with a shuffle to the right, shuffle back, shuffle right, and shuffle back. Stop and repeat the drill going the opposite way. Then do the drill by going left on the first movement.

Improving Speed-Endurance

Rarely will you run more than 30 yards in a game, but when you do, you can't slow down. Speed-endurance will give you the stamina to pitch into the late innings, take an extra base, and score without slowing down. Build general speed-endurance in the off-season using 200- to 400-yard interval sprints. Switch to sport-specific speed-endurance in the preseason with 30:30s and down-and-back runs.

Speed-Endurance "Gasser" Drills

200-, 300-, and 400-Yard Shuttles

Run 50 yards, stop, change directions, return, and repeat until you have run 200 total yards. Rest and repeat. Gradually build to 3 × 300 and 3 × 400.

30:30s

Start at one foul line. Stride around the warning track to the other foul line in 30 seconds or less. Rest 30 seconds and run again. If you can't make it in 30 seconds, run as fast as you can.

Down and Back (100 yards) in 15 Seconds

Start at one foul line. Sprint 50 yards, stop, change direction, and sprint back in 15 seconds or less. Rest 30 seconds and run again. If you can't go down and back in 15 seconds, run as fast as you can.

Interval Drills for Speed-Aerobics

Baseball is a game of speed, reaction, and power, not endurance. Although it's important to have an aerobic base, endurance training should not be the major focus of your training program. If you spend 80 percent of your time jogging, you'll

spend 80 percent of your time practicing to be slow. Jog, cycle, or use the StairMaster early in the off-season to develop a base and then switch to interval sprints to improve speed, speed-endurance, power, and aerobic capacity in the same workout.

Repeat 100s

Stride 100 yards in 20 to 24 seconds. Rest 30 seconds and repeat. To make the drill more difficult, gradually reduce running time or rest.

100-Yard Pick-Ups

Place marks at 25-yard intervals on a 100-yard field. Start slowly and increase speed at each marker. Reach top speed at the 75-yard mark and hold it to the finish line. Run from start to finish in 15 to 20 seconds. Rest for 30 seconds and run again.

10 × 100 in 10 Minutes

Run ten 100-yard runs in 10 minutes. These are not continuous jogs. You have one minute in which to stride down and jog-walk back. Start your stopwatch and stride 100 yards at a comfortable pace (about 17 to 20 seconds), turn around, and jog back. Walk when you get within about 20 yards of the start. When one minute has elapsed, run again. Repeat the drill 10 times.

60s and Pick-Ups

Sprint 60 yards, walk back, and run again. After six sprints, do 20 to 25 ball pick-ups. Rest (30 seconds) and repeat.

Pole Sprints

Start at one foul line. Jog around the warning track to the opposite foul line, turn, and without stopping sprint straight across the outfield. Stop when you're about even with second base. Walk to the foul line and run again. Try to get even with second base in 45 seconds or less.

Hollow Sprints (Sprint, Jog, Sprint, Walk)

Sprint 60 yards, jog 60 yards, sprint 60 yards, walk 60 yards, then run again.

ADVANCED DRILL TECHNIQUES

Resisted running is running uphill on sand, with a weighted vest or body suit, up stadium stairs, or against a harness, sled, or parachute. These techniques can develop speed-specific strength and dynamic balance in the muscles used in sprinting. Attempting to achieve maximum speed against resistance will help you maintain a positive angle from the hip to

the ground, achieve a strong leg drive, and generate maximum force from the ground up. With resisted running, the body recruits more muscle and nerve fibers and then transfers their effects to the task of sprinting. Running with ankle weights, however, has a negative effect on technique and stride length and should be avoided. For best results, observe the 10 percent rule when providing resistance and use a 10- to 15-yard running start on level ground before running uphill or against resistance. To keep mechanics and velocity as sport-specific as possible, limit resistance to no more than 10 percent of your body weight and make all runs at 90 percent of maximum speed or greater.

Assisted running is called overspeed training. With overspeed training, you run 10 to 15 percent faster than normal, develop the feel or sensation of overfast movement, and learn how to function under faster conditions. When these faster than normal conditions are removed, your body remembers the previous feeling of speed and applies it to normal conditions. Downhill running and towing are good methods of overspeed training.

The Speed Chute, developed for the 1988 Russian Olympic sprint team, is an effective aid to improving both running speed and running technique. These miniparachutes provide a drag as you run. The faster you run, the greater the resistance. Chutes can be used when running forward, backward, and around bases. By changing chute size and combining different sizes, you can vary the resistance, which is essential for breaking speed barriers.

Hydro, or water, running is used to maintain or improve fitness while avoiding the lower-extremity pounding that often comes with land-based running. Besides improving performance, there is evidence that water running can facilitate healing. There are two basic methods of water running. Deep-water running occurs in water that is over your head. A flotation device is used to keep your head and shoulders above water as you run. Shallow-water running occurs in waist-deep water at the shallow end of a swimming pool. Deep-water exercise is easy to do. All you need is a pool at least six feet deep and a flotation device like a ski vest or belt. The water provides resistance, and the vest keeps your head above water. For a more intense workout, try a scuba mask and snorkel. The mask will keep water out of your eyes, and the snorkel will allow you to breathe under water. Breathing under water increases the pressure on your thoracic cavity (makes it harder to raise and lower your ribs) and produces higher metabolic responses. First, you assume a vertical position in deep water and then run without touching the bottom. As you bring your thigh up, reach out and stride from your knee. Pull your leg down, under, and back, trying to kick yourself in the buttocks with your foot. Run tall with your hips under your shoulders. Don't let your buttocks drift backward. Keep your hands lower than your elbows. The hand of your lead arm should move no farther forward than the front of your chest and come back past your pocket on the back swing. Breathe naturally.

Slideboard training is excellent for burning calories and developing endurance as well as LSA, leg strength, coordination, and balance while moving laterally and without the impacts associated with running and jumping. You use a 12-foot-by-3-foot slippery board with adjustable, angled end stops and a pair of wool socks or booties. Shorten the board to 3 to 5 feet for rehabilitation drills and 7 to 9 feet when working on LSA and quickness. Place the booties over your shoes and assume a ready position at one end of the board with your head up, knees bent, back arched slightly, and arms bent to 90 degrees at the elbow. Stay low and push off with the back foot. Move the opposite leg and both arms in the direction you want to go to help overcome inertia. Glide to the opposite end, stop, and return. Beginners start with 10 to 12 reps (over and back is one rep) on a 9-foot board using 30-second work-rest intervals. Do 6 reps on day 2 with 60-second work-rest intervals and 10 reps with 15- to 30-second work-rest intervals on day 3. Work on LSA on day 4. Shorten the board to 8 feet and see how many times you can touch each end in 15 seconds. Rest 45 seconds and repeat the drill 10 times. Do an aerobic workout on day 5. Lengthen the board to 10 to 12 feet and slide continuously for 5 to 15 minutes.