



Agility Drills – Low Extremity

Agility drills serve as an important component in the functional rehabilitation of the lower extremity (hip, knee, ankle). The drills are designed to replicate the movement demands of the sport and to promote confidence in the returning athlete. Specific areas of development include joint proprioception and coordination between agonist/antagonist muscle groups, and muscle recruitment, which contribute toward improving the dynamic stability of the knee joint. The involved joint should be pain free, have no significant amount of swelling and possess adequate strength, endurance, and flexibility to execute the drills.

A warm-up is important prior to performing the drills. Lower extremity stretching (calf, groin, quadriceps, hamstring, hip flexor, etc.) is recommended. Following the agility drills, repeat the stretching routine and apply a cold modality (ice pack, ice cup massage, etc.) to reduce cellular damage and decrease the inflammatory response to microtrauma.

The following list of agility drills will be added to the treatment program as tolerated by the athlete. If problems arise, contact your physical therapist, athletic trainer, or physician.

Agility Drills - Instructions

STRAIGHT RUNNING:

Run at a steady pace progressing to one 2-3 mile or 20-30 minute run.

Straight running produces loading at the knee joint, which is reasonably higher than walking on level ground.

HIGH KNEE DRILLS:

Run in place lifting knees as high as possible for 15-30 seconds. Repeat 3-5 times.

High knee drills produce repetitive loading forces at the knee joint.

LATERAL RUNNING:

Run sideways 50-60 yards with knees and hips slightly flexed (crouched position). Run on the balls of the feet. Begin with 8-10 repetitions, progressing to 12-15 repetitions.

Lateral running (shuffling) increases the varus and valgus stress on the knee joint. It also increases the compression forces between the femoral condyles and tibial plateau.

BACKWARD RUNNING:

Run backwards at one-half speed, 50-60 yards, progressing to three-quarter speed, then full speed. Begin with 5-8 repetitions, progressing to 12-15 repetitions.

Backward running places excessive stress primarily on the quadriceps mechanism. With the hip and knee in a flexed posture, this drill also develops strength and endurance of the gluteal and calf muscle groups.

VERTICAL JUMPING:

Jump up to a mark on the wall from a standing start. Repeat 15-20 times, progressing to 25-30 times.

Vertical jumping demands a coordinated effort between the gluteal, calf, and quadriceps mechanism. The strength and endurance of the muscle groups become even more important in controlling the body as the knee joint flexes and rapidly extends. Increased knee flexion places greater demands on the quadriceps at the beginning phase of the jump.

WIND SPRINTS:

Run at full speed, 40-50 yards, beginning with 5-8 repetitions. Progress to 12-15 repetitions.

Wind sprints produce increased loading forces at the knee joint as compared to long distance running (jogging).

Run sideways crossing legs in front and then behind the lead leg (involved), 40-50 yards. Begin at one-half speeds, progressing to three-quarter and full speed. Repeat 8-10 repetitions, progressing to 12-15 repetitions.

The carioca step requires fast footwork and develops confidence in moving laterally. The crossing step increases the varus stress at the knee joint in the lead leg.

STAIR CLIMBING:

Begin with one flight of stairs, or the equivalent, progressing to five flights of stairs, (20-25 steps/flight). Running down the stairs at one-half speed is an option as tolerated by the athlete. Repeat 4-5 repetitions.

Stair climbing is a functional movement pattern and is a strengthening and endurance exercise to all lower extremity muscle groups. Descending stairs adds a greater demand on the quadriceps in controlling knee flexion.

JUMPING ROPE:

Jump rope landing on alternate feet (e.g., jogging in place) progressing from 5-20 minutes.

Jumping rope offers conditioning to the cardiovascular system and increases the endurance in all lower extremity muscle groups with emphasis on the quadriceps and calf muscles. Repetitive loading forces at the knee joint during single limb weightbearing are also produced.

FIGURE 8 RUNNING:

Run a figure eight pattern 30 yards long (e.g., length and width of a basketball court) at one-half speed 8-10 times. Progress speed and repetitions until the athlete is able to perform 15-20 repetitions at full speed. Progress to a smaller figure eight pattern, 15 yards (e.g., about half the length of a basketball court and gradually narrowing the width), then 5 yards (e.g., the size of a key on a basketball court) each time progressing from one-half speed to three-quarter speed to full speed.

Figure eight drills are performed to incorporate angled running and cutting and places increased demands on all structures (muscles, ligaments) at the knee joint.

LINE TOUCH DRILL:

Identify three points, 10 yards, 20 yards, and 30 yards, from the starting line. Run at one-half speed and touch point A (10 yards) with your hand. Perform a 180° pivot on the lead leg (involved) and return to touch the starting line. Proceed to touch points B (20 yards), pivot, and return to the starting line. Complete the sequence by touching point C (30 yards), pivoting, and returning to the starting position. Performing the sequence equals one repetition. Progress to three-quarter and full speed running. Repeat 8-10 repetitions, progressing to 12-15 repetitions.

The 180° pivot maneuver provides a knee valgus and rotational stress combined with tibial external rotation on the lead leg. Increased demands are placed on the quadriceps, pes anserinus, medial hamstring group, and ligaments.

Cutting Drills

RUN AND CUT:

A. Side Set Cut (Lateral Cut): Run at one-half speed for 10 yards and pivot on the right leg (involved) pushing off and cutting to the left at a 90° angle. Progress to three-quarter, then full speed running. Begin with 8-10 repetitions and progress to 15-20 repetitions.

The side step cut at 90° places increased valgus and rotational stress and tibial external rotation at the knee joint. Increased demands are placed on the static and dynamic stabilizers of the knee joint.

B: Cross-Over Cut: Run at one-half speed for 10 yards and perform

a crossover cut. The athlete pivots on the right leg (involved) and crosses over with the left leg at a 45° angle. (If the left leg is involved, pivot on the left and crossover with the right leg). Progress to three-quarter speed, then full speed running. Begin with 8-10 repetitions and progress to 15-20 repetitions. Increase the cutting angle from 45° to 90° as tolerated.

The crossover cut at 45° places an increase rotational stress and tibial internal rotation at the knee joint. Increased demands are placed on the static and dynamic stabilizers of the knee joint.

ZIGZAG RUNNING:

Run a zigzag pattern, 40-50 yards, at one-half speed. In 10-yard increments, perform side step or crossover cuts. Progress to three-quarter speed and full speed running. Begin with 8-10 repetitions and progress to 15-20 repetitions.

Zigzag running places an increase in rotational stress at the knee joint. Increased demands are placed on the static and dynamic stabilizers of the knee joint.

SPORT DRILLS:

The athlete may begin drills specific to the sport (i.e., football, basketball, baseball, etc.)