

Flexibility Training

Flexibility refers to the range of motion around a joint. Improving flexibility is a fundamental element of a young athlete's training program, as good flexibility enables the athlete to perform various movements and skills easily and helps prevent injury.

The ability to perform many movements and skills successfully depends on the range of motion, which has to be greater than the skills of the sport require. For instance, to hit a high ball during a soccer game, players have to lift their leg to the chest level, so they must be flexible enough to go beyond that level. If they don't have that flexibility, they won't be able to learn and perfect the various movements required of the sport.

Flexibility training is also an injury-prevention strategy. Most sports involve repetitive movement, often through a limited range of motion, such as running. This can lead to muscle tightness and possibly muscle strains and tears. An immediate, careful, and progressively increased flexibility program will stretch the muscles, relieving muscle tightness and helping prevent injury. Developing flexibility, therefore, means not only meeting the needs of the sport, but also exceeding the range of motion normally required in the sport and developing a flexibility reserve to prevent injury.

The best time to perform stretching exercises is at the end of a general warm-up (jogging and calisthenics), during the rest interval between exercises, and at the end of the training session.

Developing Flexibility

Young children are flexible, but flexibility performance often decreases with age after puberty, especially for boys, presumably because of gains in muscle size, stature, and muscle strength. Flexibility therefore requires training throughout the stages of a young athlete's development. Because athletes can more easily develop flexibility at a young age, it has to be part of the training program for each young athlete, irrespective of sport specialization. Once they achieve the desired degree of flexibility, their objective for the flexibility program is to maintain that level. Maintenance is important year-round, as athletes quickly lose flexibility with inactivity, and reduced flexibility can make them prone to injury.

The initiation stage is therefore the ideal time for starting a good program to develop flexibility. Emphasize overall flexibility that involves all the joints of the body, because this will result in good basic development. This is important because specialization does not occur until later stages of athletic development, and no one knows which muscles will require the most flexibility as a result of training for a specific sport.

As boys start to build stronger muscles and grow in size, they begin to show some decline in flexibility, reaching the lowest level in the second part of pubescence. At the same time, girls continue to perform well. Puberty is the development stage when gender differences in flexibility are the largest.

During postpuberty, the trend of gender differences continues. Girls still show better flexibility than boys, although the difference is not as large as during puberty. As girls approach adolescence, however, they seem to reach a plateau (Docherty and Bell, 1985), which might maintain or even decrease during maturity. This is why overall flexibility training should be a constant concern for everyone involved in athletics.

Methods of Stretching

The best way to improve flexibility is to perform stretching exercises. There are three methods of performing stretching exercises: statically, ballistically, and using proprioceptive neuromuscular facilitation (PNF).

Before briefly exploring each method, it is important to mention that there exists some contradiction regarding which method is most efficient. Many coaches and athletes prefer the static method, fearing that the ballistic method may lead to muscle pulls. Although PNF has some limitations in its application it is often the preferred method.

Static stretching involves stretching to the limit of motion without forcing the stretch and holding the position without movement for a given time. Throughout the performance of static flexibility, the athlete should attempt to relax the muscles to achieve the maximum range of motion.

For both the static and PNF methods, the athlete tries to position the joints to enhance the sought flexibility. Then the performer statically maintains the position for a number of seconds for each set. The athlete then builds the time requirement progressively over a long period. Static stretching is pressure solely from the athlete's own force, and PNF is pressure applied by a partner.

Ballistic stretching involves bobbing or active movements to the limits of motion. The athlete does not hold the final position. For instance, take a standing

position with arms above the head and feet apart. Lower the trunk dynamically toward the knees to reach maximum range of motion. Repeat this several times, in each repetition attempting to reach the most acute angle. Stop when you feel any discomfort or pain.

PNF involves stretching to the limits of motion, doing a static contraction for a few seconds against the resistance of a partner. The athlete then lifts the limb voluntarily to a more acute angle beyond previous limits. Once again, the athlete performs the same routine, a strong isometric contraction against the resistance of a partner.

Designing a Program

The best time to start developing flexibility is during the initiation stage, because the early stages of anatomical development in children do not play any restrictive role. During this stage, aim training programs at developing all joints, especially hips, shoulders, and ankles. Ankle flexibility is crucial for any skills requiring running and jumping, and athletes must use flexion and extension to bring the toes toward or away from the calf. I advise the static method, with maximum attention at the extreme point of the stretch where discomfort may result from overstretching. Don't overdo it!



Flexibility training should also be emphasized throughout the formation stage. This allows the child to continue developing strong joints while addressing the anatomical problems (such as the legs growing disproportionately and a change in leverage between the legs and the trunk) that may occur during puberty. The more time you dedicate to developing flexibility during prepubescence and pubescence, the fewer problems will appear in the later stages of athletic development.

A flexibility session should not be boring! You can combine it with play and games; however, do not create a competitive environment because this can result in overstretching and eventual harm.

The flexibility that athletes develop during prepubescence is general or overall flexibility. What they develop from pubescence on you can regard as specific or sport specific. As such, parents, instructors, and coaches should pay attention to the joints required in a given sport, particularly ankle and hip flexibility because these areas have been underemphasized in the past. This does not mean that you should neglect the other joints. Athletes need a maintenance program in place for the non-specific joints during puberty and throughout their athletic careers.

Orient flexibility in the specialization stage toward maximizing specific flexibility, giving it a dynamic or ballistic emphasis. Remember that athletes perform sports and certain moves ballistically. As such, the athletes have to train to perform moves dynamically and with the highest amplitude. It is the lack of such training that results in injuries and not the nature of the ballistic exercises themselves. If an athlete does not have adequate flexibility, even this mechanism might not help. Develop good flexibility to protect athletes from injury.

For the annual periodization of flexibility, athletes must strive to gain most of their flexibility during the off-season. Regard the competitive season as a maintenance period, when athletes will direct the energy and strain they place on muscle groups toward specific training. In either case, flexibility has to be part of everyday training, and athletes should incorporate flexibility exercises at the end of the warm-up part of a training lesson. Increase the range of motion of an exercise progressively and carefully throughout performances. At first, athletes may perform exercises with an amplitude, magnitude, and extension that does not challenge them; then they should increase progressively up to their limits. From this point on, each repetition should aim at reaching this maximum limit and even furthering it.

View the following exercises only as guidelines. Parents and instructors can incorporate many other exercises, as long as athletes do them in a progressive way. All the exercises in this chapter are appropriate for all stages of athletic development. Some of the exercises have ballistic and PNF options that may be used with athletes in the specialized stage of training. Please refer to tables 3.1 and 3.2 for an example of an appropriate progression.

Table 3.1 Periodization Model for Flexibility Training

Stage of development	Training method	Exercises
Initiation	Static	• Trunk and hip flexion • Large body circles • Flex to opposite leg • Ankle double touch • Seated toe touch • Straddle stretch • Opposite toe touch
Athletic formation	Static PNF	• Hamstring stretch • Shoulder bow stretch • Ankle stretch • Diagonal ankle press • Double kicks • Exercises with a partner to enhance flexibility by using the static and PNF method, on the floor and standing.
Specialization	Static PNF Ballistic	• Perform stretching exercises with and without a partner using static and PNF methods. • You can use most exercises with partners for ballistic flexibility. For ballistic stretching, be careful at the extreme points of flexibility.

Note: Refer to exercises on the following pages.

Table 3.2 Progression for Flexibility Training

Type of flexibility	Stage of development	Number of reps or seconds per set	Number of sets per joint	Rest interval between sets
Static	Prepuberty	4-5 sec	2	1 min
	Puberty	6-8 sec	2-3	1 min
	Postpuberty	6-12 sec	3-4	30 sec
PNF	Puberty	6-10 sec	3-4	1 min
	Postpuberty	6-12 sec	3-5	30 sec
Ballistic	Postpuberty	4-8 reps	2-4	30 sec

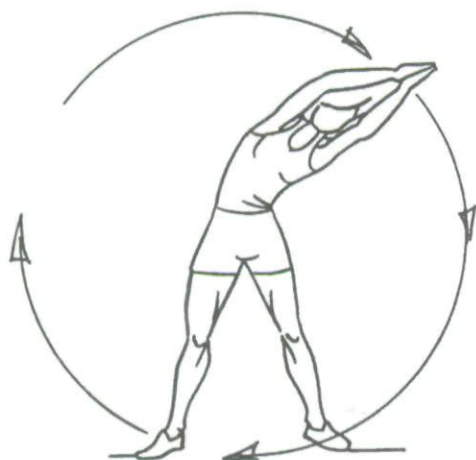
Note: The ballistic method is for postpuberty on, only after achieving high degrees of flexibility during prepuberty and puberty via static and PNF methods.



TRUNK AND HIP FLEXION

Area stretched: hips and side of the trunk

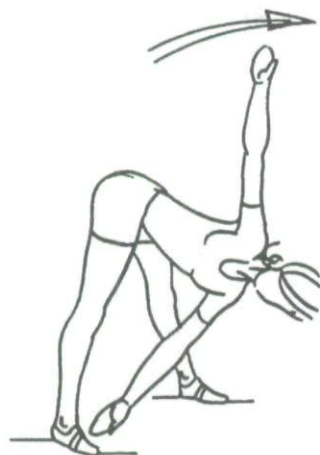
1. Stand with feet shoulder-width apart and arms at your sides, palms facing up.
2. Bend the body to the left swinging right arm over head until palms are touching. Keep elbows straight. Hold for four to six seconds.
3. Repeat on the right.



LARGE BODY CIRCLES

Area stretched: trunk, hips, and hamstrings

1. Stand with feet shoulder-width apart and arms above the head, palms together.
2. Make large rotations with arms and body, down the left side to the floor and up the right side to above the head.
3. Repeat four rotations in the opposite direction.



FLEX TO OPPOSITE LEG

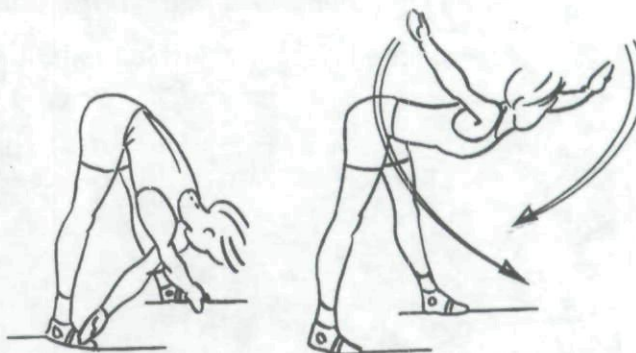
Area stretched: hips, trunk, and hamstrings

1. Stand with feet wider than shoulder-width apart and arms above the head.
2. Flex the hips, driving the right arm toward the foot of the left leg; leave the left arm up and hold for four to six seconds.
3. Return to the starting position.
4. Repeat the movement with the other arm toward the opposite leg for four to six seconds.
5. Return to the starting position.

ANKLE DOUBLE TOUCH

Area stretched: hips, chest, shoulders, and hamstrings

1. Stand with feet apart and arms above the head.
2. Flex the upper body, touching the opposite leg with each hand, and hold for four to eight seconds.
3. Bring the upper body to the horizontal, swinging the arms to the side and up.
4. Return to the starting position.



SEATED TOE TOUCH

Area stretched: hips, hamstrings, and calves

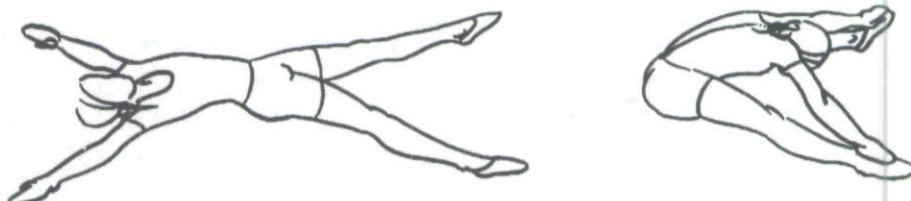
1. Sit with legs straight and arms extended above the head.
2. Flex the upper body forward while exhaling, with arms extended as far as possible toward toes, and hold for four to six seconds.
3. Return to the starting position.



STRADDLE STRETCH

Area stretched: hips, shoulders, and calves

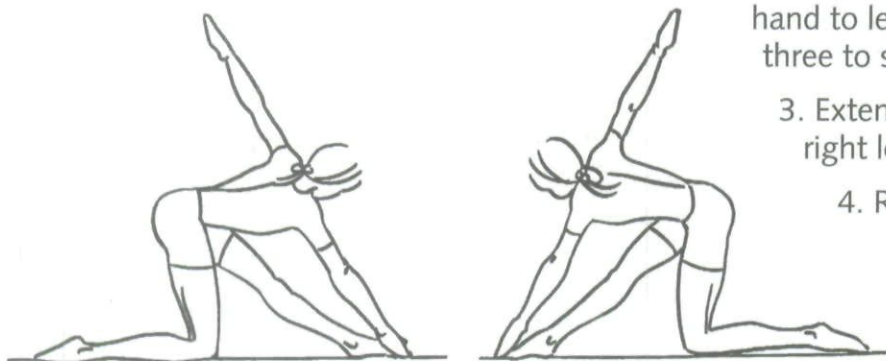
1. Lie on your back with arms stretched over head, and toes pointed.
2. Raise the upper body and flex it over the legs attempting to touch hands to toes. Hold for four to six seconds.
3. Return to the starting position.



OPPOSITE TOE TOUCH

Area stretched: hips, hamstrings, and shoulders

1. Kneel on right leg, left leg extended forward, arms raised to shoulder level.
2. Twist trunk to left while touching right hand to left toes. Hold this position for three to six seconds.
3. Extend the upper body and bring the right leg back to the starting position.
4. Repeat with the opposite leg.

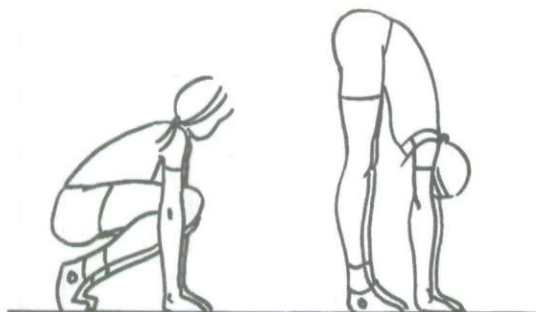


Variation

Perform this exercise by extending the leg diagonally.

HAMSTRING STRETCH

Area stretched: hamstrings and hips

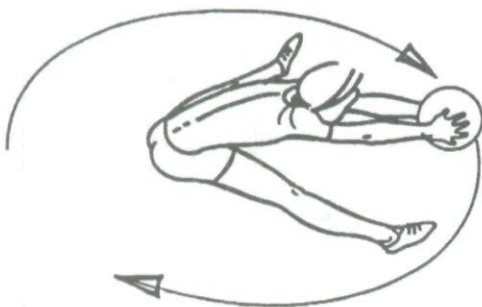


1. Flex the knees and hips, and place your hand on the floor.
2. Extend the knees, keeping the hands on the floor, and hold for three to five seconds.
3. Return to the starting position.

STRADDLE MEDICINE BALL ROTATIONS

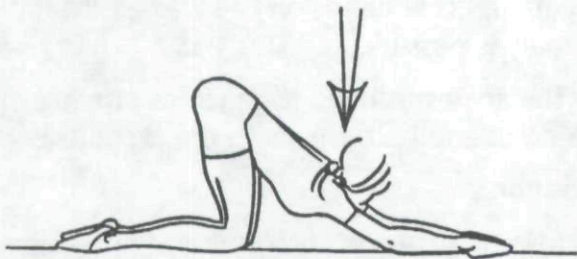
Area stretched: shoulders, groin, hips, and hamstrings

1. Sit with legs far apart, holding a medicine ball in front of the chest.
2. Perform a complete, large rotation to the right.
3. Repeat to the other side.



SHOULDER BOW STRETCH

Area stretched: shoulders and chest



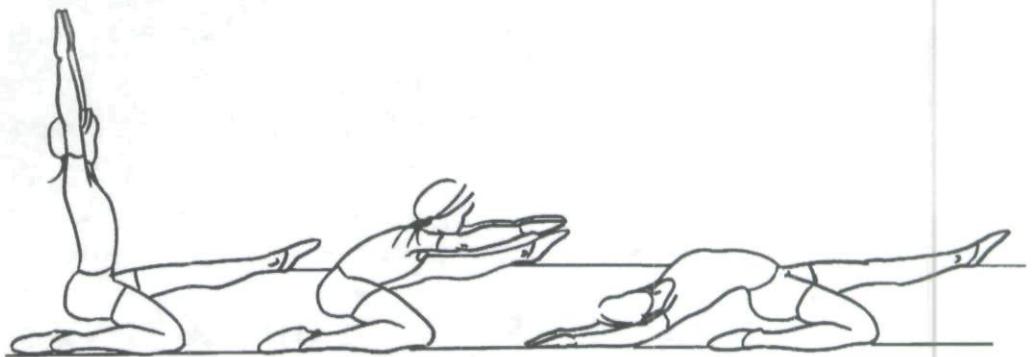
1. Kneel on both legs, with hips flexed and arms on the floor above the head.
2. Press the chest toward the floor for four to six seconds.
3. Return to starting position. Repeat three to six times.

HURDLE STRETCH

Area stretched: back, hips, quadriceps, and shoulders

1. Sit with right knee bent and pointing to the side, left leg extended, and arms together above the head.
2. Flex the hips, lowering the arms attempting to touch hands to left foot. Hold for three to four seconds.
3. Raise the upper body, lowering it backward toward the floor, and hold three to four seconds.
4. Return to starting position.
5. Repeat, alternating each leg.

Note: To do this exercise ballistically, perform hip flexion dynamically, bobbing three or four times.

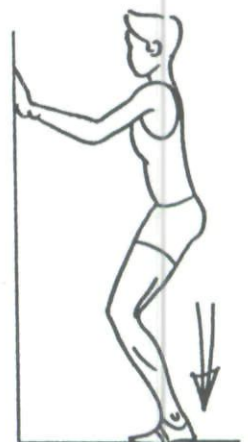


ANKLE STRETCH

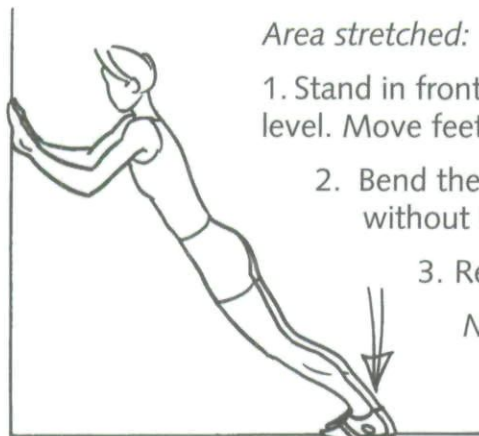
Area stretched: calf muscles

1. Stand in front of a wall with feet together and far enough away from the wall so the knees don't reach the wall. Place hands on wall at chest level.
2. Bend ankles and knees toward the wall, and hold for six to eight seconds without lifting the heels off the floor. The main pressure should be on both ankles.
3. Return to starting position.

Note: To perform this exercise ballistically, move the knees up and down ballistically six to eight times.



DIAGONAL ANKLE PRESS

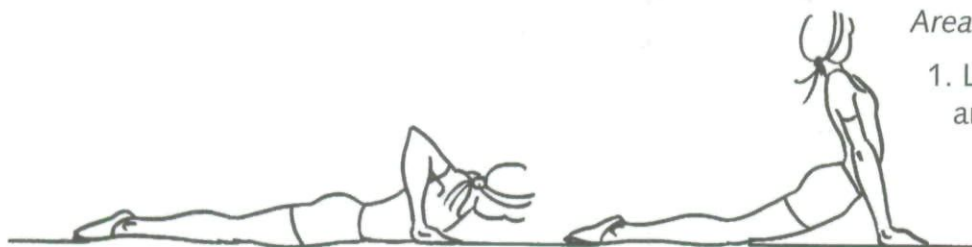


Area stretched: calf muscles

1. Stand in front of a wall with feet together. Place hands on the wall at chest level. Move feet as far away from the wall as possible.
2. Bend the knees slightly, forcing the ankles to bend as much as possible without lifting the heels off the floor, and hold for six to ten seconds.
3. Return to the starting position.

Note: For ballistic stretch, raise heels off the floor and bob them back dynamically.

SEA LION STRETCH

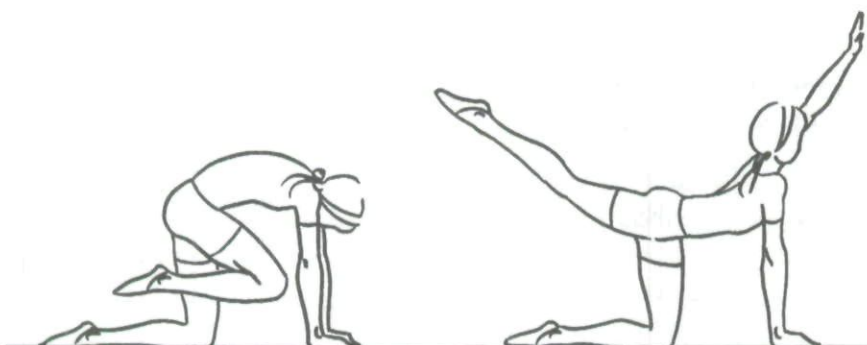


Area stretched: trunk and groin

1. Lay on stomach, flexing arms and placing hands on the ground at shoulder level.
2. Extend the arms, arching the upper body while the hips are still on the ground. Hold this position for two to four seconds.
3. Flex the arms and lower the upper body to the starting position.

DOUBLE KICK

Area stretched: shoulders, back, and groin



1. Kneel with the hands on the floor.
2. Dynamically swing the right leg and left arm upward, arching the back.
3. Return to the starting position.
4. Repeat movement with the opposite limbs.
5. Return to starting position.

SEATED HIP FLEXION

Area stretched: hips and hamstring muscles

1. Partner A sits on the floor with arms extended. Partner B stands behind A and places hands on back.
2. Partner B presses A's upper body forward and down, holding the position for four to six seconds.
3. Relax and return to starting position.

Note: To perform it ballistically, press the trunk dynamically six to eight times.

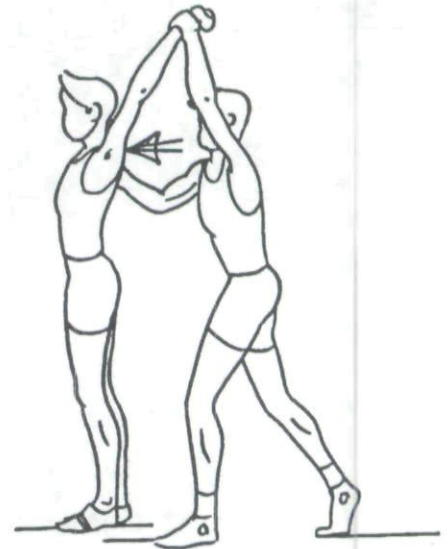


STANDING SHOULDER STRETCH

Area stretched: chest and shoulder muscles

1. Partner A stands with arms above the head. Partner B stands behind, placing right hand below shoulder level, while left hand grasps the partner's hands.
2. Partner B presses the upper back forward and pulls the arms to extend backward. Hold the position for four to six seconds.
3. Relax and return to starting position. Alternate roles continuously.

Note: For ballistic flexibility, pull the arm dynamically backward four to eight times.



PARTNER SHOULDER STRETCH

Area stretched: chest, shoulders, groin, and abdominal muscles

1. Partner A lies on the stomach with arms above the head. Partner B stands with legs straddling A's upper body and grasps the hands.
2. Partner B slowly raises A's arms and holds the position for four seconds.
3. Return to starting position.
4. Repeat with partners changing roles.



SCALE STRETCH

Area stretched: groin, quadriceps, and trunk



1. Partner A stands three feet in front of partner B.
2. Partner A raises the left leg back and up, with upper body vertical. Partner B catches the ankle with both hands.
3. Partner B slowly presses A's leg upward. Hold in this position for two to six seconds.
4. Lower the leg and return to starting position. Alternate leg action and partners' roles.

Note: For a ballistic stretch, bob the leg upward three to six times.

Variation

While in the hold position, flex and extend the knee of the supporting leg.

PARTNER HAMSTRING STRETCH

Area stretched: hamstring and hip muscles

1. Partner A lies on the back with arms above the head. Partner B stands at A's left side.
2. Partner A raises the right leg. Partner B catches the ankle with both hands.
3. Partner B applies a constant pressure downward against the partner's leg.



4. Partner A returns the leg to the starting position.

5. Alternate legs and partners' roles.

Note: For a ballistic stretch, bob the leg downward four to eight times.

Variation

Partner A pulls the leg above the head, while partner B holds the opposite leg against the ground.

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