

Stretching Anatomy

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LEARNING OBJECTIVES

After reading Stretching Anatomy, the participant will be able to :

1. List and describe the major types of stretching and flexibility programs
2. Explain the benefits of stretching
3. Describe the various Levels and recommendations for stretching programs
4. Identify stretches for the neck and the muscles targeted
5. Select variations for neck stretches to increase the stretching benefits
6. List the muscles associated with various neck movements
7. Identify the muscles and associated movements for the shoulders, back and chest
8. Identify stretches for the shoulders, back and chest along with the muscles targeted
9. Describe how to perform a variety of stretches for the shoulders, back and chest
10. Select variations for shoulders, back and chest to increase stretching benefits
11. Identify the muscles and associated movements for the arms, wrists and hands
12. Identify stretches for the arms, wrists and hands along with the muscles targeted
13. Describe how to perform a variety of stretches for the arms, wrists and hands to increase the stretching benefits
14. Identify the muscles and associated movements for the trunk
15. Identify stretches for the trunk along with the muscles targeted
16. Describe how to perform a variety of stretches for the trunk
17. Select variations for trunk stretches for those with low back concerns and/or to increase stretching benefits
18. Identify the muscles and associated movements for the hips, knees and thighs

19. Identify stretches for the hips, knees and thighs along with the muscles targeted
20. Describe how to perform a variety of stretches for the hips, knees and thighs
21. Select variations for the hips, knees and thighs to increase stretching benefits
22. Identify the muscles and associated movements for the feet and calves
23. Identify stretches for feet and calves along with the muscles targeted
24. Describe how to perform a variety of stretches for the feet and calves
25. Select variations for the feet and calves to increase stretching benefits
26. Indicate where foot stretches will be felt when performed correctly



CEC/CEU Test for Stretching Anatomy

Remember to choose the BEST answer for each question.

1. Most people stretch less than _____ a day though major benefits require at least _____.
 - A. 5 minutes, 15 minutes
 - B. 5 minutes, 20 minutes
 - C. 10 minutes, 20 minutes
 - D. 2 minutes, 15 minutes
2. What is the basic functional contractile unit of a muscle?
 - A. Fiber
 - B. Myofibrils
 - C. Sarcomere
 - D. Motor Unit
3. Which of the following is the most commonly performed type of stretch?
 - A. Static
 - B. PHF
 - C. Ballistic
 - D. Dynamic
4. Which of the following stretching techniques is a sport specific warm up?
 - A. Passive
 - B. Ballistic
 - C. Dynamic
 - D. Static

5. Stretching benefits includes all of the following except:
- A. Increased muscular strength
 - B. Increased muscular endurance
 - C. Decreased muscular strength
 - D. Decreased muscular soreness
6. Which type of stretching better prepares athletes for explosive movements?
- A. Dynamic
 - B. Ballistic
 - C. Static
 - D. PNF
7. Which of the following is not one of the borders of the anterior triangle of the neck?
- A. Mandible
 - B. Sternocleidomastoid muscle
 - C. Sternum
 - D. Clavicle
8. Which of the following major muscle groups are used in neck rotation?
- A. All major muscle groups of the neck
 - B. Posterior muscle group of the neck
 - C. Anterior muscle group of the neck
 - D. All major muscle groups of the upper chest
9. During the Neck Extensor Stretch the targeted muscle stretched is the _____.
- A. Scalene
 - B. Longissimus capitis
 - C. Sternocleidomastoid
 - D. Upper trapezius
10. Which additional muscle is “most stretched” when rotation is added to the Neck Extensor Stretch?
- A. Scalene
 - B. Trapezius
 - C. Sternocleidomastoid
 - D. Splenius capitis

11. To create a greater stretch during the Neck Flexor Stretch:

- A. Stand and hunch the shoulders as the head is pulled back
- B. Sit and hunch the shoulders as the head is pulled back
- C. Stand upright and point the chin forward as the head is pulled back
- D. Sit upright and point the chin back as the head is pulled back

12. What muscles of the neck are typically painful when breathing is modified due to stress?

- A. Anterior neck muscles
- B. Posterior neck muscles
- C. Trapezius
- D. Longissimus capitis

13. When anterior neck muscles become tight, the head protrudes forward which is called:

- A. Torticollis
- B. Duck head
- C. Vulture neck
- D. Protrusion of the head

14. Which of the following actions is not a shoulder movement:

- A. Retraction/Protraction
- B. Supination/Pronation
- C. Elevation/Depression
- D. Abduction/Adduction

15. Shoulder stabilization actions include which of the following:

- A. Elevation/Depression
- B. Flexion/Extension
- C. Abduction/Adduction
- D. External/Internal Rotation

16. The anterior deltoid, pectoralis major, serratus anterior and coracobrachialis are targeted muscles in the _____ stretches.

- A. Shoulder Extensor
- B. Shoulder Adductor
- C. Shoulder Flexor
- D. Elbow Flexor

17. To increase the stretching benefit of the Advanced Shoulder Flexor Stretch:

- A. Bend the elbows
- B. Increase the forward lean
- C. Lower the arms
- D. Move the lead foot closer to the back foot

18. By raising the arms above the head in the Shoulder Flexor and Depressor Stretch, the _____ will be included in the stretch.

- A. teres minor
- B. teres major
- C. pectoralis major
- D. pectoralis minor

19. Raising the hand higher than the shoulder during the Intermediate Shoulder Extensor, Adductor and Retractor Stretch will:

- A. Decrease the stretch on the serratus anterior
- B. Increase the stretch on the serratus anterior
- C. Decrease the stretch on the deltoids
- D. Increase the stretch on the deltoids

20. Which of the following are most stretched during the Shoulder Adductor, Protractor and Elevator Stretch?

- A. Posterior deltoid, latissimus dorsi, triceps brachii, lower trapezius
- B. Posterior deltoid, latissimus dorsi, biceps brachii, lower trapezius
- C. Anterior deltoid, latissimus dorsi, triceps brachii, lower trapezius
- D. Anterior deltoid, latissimus dorsi, biceps brachii, lower trapezius

21. Of the modifications listed, which of the following will increase the stretch during the Shoulder Adductor and Extensor Stretch?

- A. Bend forward at the waist
- B. Rotate the trunk externally
- C. Rotate the trunk inwardly
- D. Grab the door frame at shoulder height

22. Based on the Stretching Anatomy text, which of the following stretches is performed in a sitting position?

- A. Shoulder Adductor and Extensor Stretch
- B. Shoulder Flexor Depressor Retractor Stretch
- C. Shoulder Adductor, Protractor, and Elevator Stretch
- D. Shoulder Extensor, Adductor, and Retractor Stretch

23. The most stretched muscle during the Assisted Shoulder Abductor Stretch is?

- A. Subscapularis
- B. Pectoralis major
- C. Anterior deltoid
- D. Supraspinatus

24. If you wanted to stretch the trapezius, which of the following shoulder movements would accomplish this?

- A. Elevation, Retraction and Abduction
- B. Adduction, Retraction and Depression
- C. Depression, External Rotation and Extension
- D. Depression, Protraction and Adduction

25. In order to get an effective stretch during the Tricep Brachii Stretch, it is important to:

- A. Keep the elbow straight
- B. Keep the elbow bent
- C. Keep the arm at shoulder height
- D. Keep the arm at waist height

26. Which of the following muscles are stretched during the Elbow Extensor Stretch?

- A. Triceps brachii and the Posterior Deltoid
- B. Triceps brachii and Brachialis
- C. Triceps brachii and the Brachioradialis
- D. Triceps brachii and the Palmaris longus

27. The Forearm Pronator Stretch will stretch all of the following EXCEPT:

- A. Pronator teres
- B. Brachialis
- C. Brachioradialis
- D. Biceps brachii

28. The Forearm Supinator Stretch targets the _____ and the _____.

- A. biceps brachii, supinator
- B. teres major, supinator
- C. biceps brachii, anconeus
- D. triceps, biceps brachii

29. The _____ would stretch the tight muscles associated with tennis elbow.

- A. Wrist Extensor Stretch
- B. Wrist Flexor Stretch
- C. Shoulder Adductor & Extensor Stretch
- D. Elbow Extensor Stretch

30. The best way to perform the Wrist Ulnar Deviator and Extensor Stretch is to:

- A. Sit in a chair placing both hands palm down on the thighs and lean backwards
- B. Kneel on the floor with palms facing down and lean backwards while bending the elbows
- C. Kneel on the floor, flex the wrists so the back of the hands are on the floor and the fingers point outwards, lean backwards keeping the elbows straight
- D. Inside a door frame with both palms at waist height pressed against the edges, lean forward keeping the elbows straight

31. When performing the Wrist Radial Deviator and Extensor Stretch:

- A. Point the fingers laterally
- B. Keep the elbows bent
- C. Keep the palms flat on the floor
- D. Point the fingers medially

32. The Intermediate Wrist Flexor Stretch will target all of the following muscles EXCEPT:

- A. Flexor carpi radialis
- B. Flexor digitorum profundus
- C. Brachialis
- D. Supinator

33. The Wrist Radial Deviator with Dumbbell targets the following muscles EXCEPT:

- A. Flexor carpi radialis
- B. Brachioradialis
- C. Extensor indicis
- D. Extensor carpi radialis

34. If you use support under the arm while performing the Wrist Ulnar Deviator Stretch with Dumbbell, the shoulder angle should be at:
- A. 80 degrees
 - B. 90 degrees
 - C. 75 degrees
 - D. 45 degrees
35. Which of the following modifications would increase the intensity of the Finger Extensor Stretch?
- A. Flex the elbow to 90 degrees
 - B. Fully flex the elbow
 - C. Make a fist
 - D. Keep the hand flat
36. Overworking the extensor pollicis longus and brevis or abductor pollicis longus can lead to which condition?
- A. Turf finger
 - B. Game keepers thumb
 - C. Trigger finger
 - D. Drummer boy palsy
37. Which muscle is involved intersection syndrome?
- A. Extensor pollicis longus
 - B. Flexor carpi radialis brevis
 - C. Extensor carpi radialis brevis
 - D. Palmaris longus
38. The erector spinea includes which of the following prime trunk extensors?
- A. Iliocostalis lumborum, longissimus thoracis and spinalis thoracis
 - B. Iliocostalis, quadratus lumborum and interspinales
 - C. Iliacus, intertransversarii, and psoas major
 - D. Multifidus, interspinales and psoas major
39. According to the text, rotation of the trunk involves all of the following EXCEPT:
- A. Trunk Flexors
 - B. Trunk Extensors
 - C. Lateral Flexors
 - D. Hip Flexors

40. Backward rolls can potentially injure the:

- A. Thoracic Spine
- B. Cervical Spine
- C. Lumbar Spine
- D. Sacrum

41. Which of the following stretches would be most appropriate for someone wanting to stretch the rectus abdominus with weak abdominal muscles or sway back?

- A. Lower Trunk Flexor Stretch (Back Lying)
- B. Lower Trunk Flexor Stretch (Front Lying)
- C. Seated Lower Trunk Extensor Stretch
- D. Reclining Lower Trunk Extensor Stretch

42. The Lower Trunk Flexor Stretch (Back Lying) “most stretches” the

- A. Rectus abdominus, rotatores, psoas minor
- B. Rectus abdominus, external oblique, internal oblique
- C. Iliocostalis, multifidus, intertransversarii
- D. Iliocostalis, multifidus, quadratus lumborum

43. Which of the following techniques will reduce stress on the lower back during the Lower-Trunk Flexor Stretch?

- A. Bend the knees
- B. Arch the lower back
- C. Squeeze the shoulder blades together
- D. Squeeze the buttocks

44. By angling the head toward a knee during the Seated Lower-Trunk Extensor Stretch Variation, which of the following will also be *partially* stretched?

- A. Lateral flexors
- B. Trunk flexors
- C. Trunk extensors
- D. Abdominals

45. By raising the buttocks off the floor during the Reclining Lower-Trunk Extensor Stretch_____.

- A. rotatores will be targeted
- B. hyperflexion can be avoided
- C. torque on the knee will be reduced
- D. internal obliques will be targeted

46. Stand _____ away from a wall during Standing Lower-Trunk Lateral Flexor Stretch.
- A. six inches
 - B. a foot
 - C. against
 - D. an arm's length
47. Which of the following reduces the effectiveness of the Seated Lower-Trunk Lateral Flexor Stretch?
- A. Flexing at the waist
 - B. Extending at the waist
 - C. Laterally flexing at the waist
 - D. Both A and B
48. Which of the following trunk stretches is the most potentially dangerous for someone with weak abdominals and sway back?
- A. Seated Lower-Trunk Lateral Flexor Stretch
 - B. Advanced Standing Lower-Trunk Lateral Flexor Stretch
 - C. Standing Lower-Trunk Flexor Stretch
 - D. Seated Lower-Trunk Extensor Stretch
49. The Advanced Standing Lower-Trunk Lateral Flexor Stretch would be recommended for someone _____.
- A. with weak abdominals and sway back
 - B. with tight abdominals and sway back
 - C. who is very stiff without sway back
 - D. who is very stiff with sway back
50. According to the text, which of the following are the least stretched of the lower body?
- A. Internal hip rotators
 - B. Hip flexors
 - C. Hip extensors
 - D. External hip rotators

51. If you reached toward your right extended leg during the Seated Hip External Rotator and Hip Extensor Stretch, which of the following muscles would be stretched the most on the right side?
- A. Semitendinosus, semimembranosus, biceps femoris, gluteus maximus, gastrocnemius
 - B. Soleus, gastrocnemius, plantaris
 - C. Gluteus medius, gluteus minimus, piriformis, quadratus femoris
 - D. Latissimus dorsi, semitendinosus, soleus
52. If you wanted to include the lower leg muscles in the Seated Hip External Rotator and Hip Extensor Stretch, you would:
- A. Bend the trunk toward the bent leg
 - B. Reach and grab the dorsiflexed toes of the straight leg
 - C. Reach and grab the plantarflexed toes of the straight leg
 - D. Not be able to stretch these muscles
53. Increasing the stretch during the Hip External Rotator Stretch would require:
- A. Placing the bent leg on a table at knee height
 - B. Placing the bent leg on a table at hip height
 - C. Placing the bent leg on a table 1-2 feet higher than the hip joint
 - D. Placing the bent leg on the floor
54. During the Recumbent Hip External Rotator and Hip Extensor Stretch, bend the right knee and bring the foot:
- A. Toward the midline
 - B. Toward the left shoulder
 - C. Laterally toward the floor
 - D. Next to the left knee
55. The Hip External Rotator and Back Extensor Stretch “most stretches” the:
- A. Gluteal muscles
 - B. Semimembranosus and semitendinosus
 - C. Rectus femoris and sartorius
 - D. Adductor muscles
56. To increase the Hip Extensor and Back Extensor Stretch:
- A. Bring both knees toward the chest simultaneously
 - B. Bring the ankle toward the opposite armpit
 - C. Plantarflex the foot as it is being pulled to the chest
 - D. Bring the knee toward the armpit

57. By bringing the heels close to the buttocks during the Seated Hip Adductor Stretch _____.
- A. the gluteal muscles will be stretched more
 - B. pressure on the knees will be reduced
 - C. the stretch will be greater
 - D. the stretch intensity will be decreased
58. In addition to the hip adductor muscles, what other muscles are stretched during the Standing Bent Knee Hip Adductor Stretch?
- A. Gastrocnemius and soleus
 - B. Rectus femoris
 - C. Vastus medialis and lateralis
 - D. Semimembranosus and semitendinosus
59. Which of the following movements would stretch the gracilis?
- A. Hip flexion and internal rotation
 - B. Hip abduction and external rotation
 - C. Hip extension and internal rotation
 - D. Hip adduction and internal rotation
60. When performing the Seated Hip Adductor and Extensor Stretch, shifting the trunk over the right knee will:
- A. Stretch the right lower back muscles more
 - B. Stretch the left lower back muscles more
 - C. Stretch the right adductor muscles more
 - D. Stretch the left side hip extensors more
61. All of the following muscles are part of the hamstring EXCEPT:
- A. Semitendinosus
 - B. Semimembranosus
 - C. Rectus femoris
 - D. Biceps femoris
62. According to the text, which of the following muscles groups are best able to withstand muscular stress?
- A. Thigh
 - B. Calf
 - C. Foot
 - D. Both A and B

63. Of the following muscles, which will have an increased stretch if you turn the forward foot outward and bend the trunk medially during the Standing Knee Flexor Stretch?
- A. Semitendinosus
 - B. Soleus
 - C. Gastrocnemius
 - D. Biceps femoris
64. During the Seated Knee Flexor Stretch _____.
- A. keep your knees slightly bent
 - B. keep your feet plantarflexed
 - C. keep your feet relaxed and ankles close together
 - D. keep your hands next to your knees while bending forward
65. Indicate how the Seated Knee Flexor Stretch is modified to include stretching the ankle, shoulder and back?
- A. Grab the toes and slowly pull them toward the knees
 - B. Grab the back of the knees and pull them toward the chin
 - C. Move the ankles shoulder width apart
 - D. Round the back while reaching for the toes
66. When performing the standard Raised-Leg Knee Flexor Stretch which muscles of the standing leg are "lesser stretched"?
- A. No muscles are stretched on the standing leg
 - B. Sartorius and rectus femoris
 - C. Sartorius and hamstrings
 - D. Quadriceps and gastrocnemius
67. Which of the following modifications will increase the stretch during the Recumbent Knee Flexor Stretch?
- A. Bend the knees
 - B. Curve the back
 - C. Move the buttocks farther away from the door frame
 - D. Move the buttocks closer to the door frame

68. By pulling the toes and foot toward the head with a towel during the Recumbent Knee Flexor Stretch Variation, which of the following muscle groups will experience an increased stretch?
- A. Erector spinea
 - B. Biceps brachii
 - C. Anterior deltoid
 - D. Supraspinatus
69. What movement is easy, yet not appropriate to do when performing the Recumbent Knee Flexor Stretch?
- A. Tilt the pelvis and flatten the back
 - B. Tilt the pelvis and arch the back
 - C. Bend the knee and hurt the lower back
 - D. Straighten the knee and hurt the lower back
70. By raising the leg that is being stretched during the Exert Raised-Leg Knee Flexor Stretch, what will happen to the standing leg?
- A. A lesser stretch of the posterior thigh/hip muscles
 - B. A greater stretch of the posterior thigh/hip muscles
 - C. A lesser stretch of the anterior thigh/hip muscles
 - D. A greater stretch of the anterior thigh/hip muscles
71. The average age for injuries to the quadriceps to occur in those individuals engaged in daily living activities only is:
- A. 30
 - B. 15
 - C. 65
 - D. 45
72. Arching the back in the Advanced Kneeling Knee Extensor Stretch will:
- A. Decrease the stretch of the quadriceps
 - B. Decrease the stretch of the hamstrings
 - C. Increase the stretch of the hamstrings
 - D. Increase the stretch of the quadriceps
73. Protect the knee structure during the One-Leg Standing Hip Flexor and Knee Flexor Stretch by avoiding _____.
- A. over-flexing the knee
 - B. rotating the body medially
 - C. rotating the body laterally
 - D. hyperextending the knee

74. Of the following stretches, which has the highest risk of hyper-flexing the knee?

- A. One-Leg Standing Hip Flexor and Knee Extensor Stretch
- B. Supported One-Leg Standing Hip Flexor and Knee Extensor Stretch
- C. One-Leg Kneeling Knee Extensor Stretch
- D. Lying Hip Flexor and Knee Extensor Stretch

75. According to the text, to safely perform the Lying Hip Flexor and Knee Extensor Stretch, concentrate on:

- A. Core stabilization
- B. Knee flexion
- C. Hip extension
- D. Hip rotation

76. The largest ligament in the lower foot is the:

- A. Lateral collateral ligament
- B. Deltoid ligament
- C. Talo-fibular ligament
- D. Achilles

77. The broad connective tissue that supports the arch in the foot is called the:

- A. Plantar fascia
- B. Dorsal lumbricles
- C. Achilles tendon
- D. Retinaculum

78. Which of the following muscles does not share the Achilles tendon?

- A. Soleus
- B. Gastrocnemius
- C. Popliteus
- D. Plantaris

79. The muscles of the sole of the foot are responsible for:

- A. Flexing the toes
- B. Extending the toes
- C. Spreading the toes
- D. Both A and C

80. DOMS is felt most often in which of the following muscle groups?

- A. Calves
- B. Quadriceps
- C. Hamstrings
- D. Core

81. Which of the following is a lesser stretched muscle when performing the Beginner Seated Toe Extensor Stretch?

- A. Extensor digitorum longus
- B. Extensor hallucis brevis
- C. Peroneous tertius
- D. Dorsal interosseous

82. During the Seated Toe Extensor Stretch, where will the stretch be felt on the foot?

- A. Plantar side of the foot
- B. Dorsal side of the foot
- C. Lateral side of the foot
- D. Medial side of the foot

83. Indicate where will the stretch be felt during the Seated Toe Flexor Stretch?

- A. Plantar side of the foot
- B. Medial side of the foot
- C. Lateral side of the foot
- D. Dorsal side of the foot

84. By bending the knee and moving it forward in the Standing Toe Flexor Stretch the:

- A. Calf muscles will be excluded from the stretch
- B. Calf muscles will be included in the stretch
- C. Hamstrings will be included in the stretch
- D. Quadriceps will be included in the stretch

85. During the basic Single Leg Plantar Flexor Stretch, keep the ____ of the back leg _____.

- A. knee, bent
- B. toes, turned medially
- C. heel, on the ground
- D. heel, off the ground

86. Where is the most vulnerable location for chronic inflammation of the lower leg?

- A. Achilles tendon
- B. Deltoid ligament
- C. Plantar fascia
- D. Lumbricles

87. When performing the Advanced Plantar Flexor Stretch, if the body is not supported, what might happen?

- A. It might lead to a sprained ankle
- B. It might cause the quadriceps to fatigue faster
- C. It might cause the gastrocnemius and soleus to contract, not stretch
- D. Really nothing will happen because it doesn't matter if you are supported or not.

88. Slightly bending the knee at the end of the Plantar Flexor and Foot Inverter Stretch will_____.

- A. Increase the stretch on the calf muscles
- B. Reduce the stretch on the hamstrings
- C. Reduce the stretch on the quadriceps
- D. Both A and B

89. When performing the Dynamic Hip Adductor and Abductor Stretch, which muscles is NOT the most stretched muscle of the outer thigh?

- A. Gluteus medius
- B. Gracilis
- C. Upper satorius
- D. Tensor fascia latae

90. Which is not a most-stretched muscle for the Dynamic Trunk Rotator Stretch?

- A. Multifidus
- B. Rotatores
- C. Rectus abdominus
- D. External oblique