

# **Core Training Anatomy**

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## Core Training Anatomy Course Objectives

**After completing the Core Training Anatomy course, the participant will:**

1. Gain knowledge in developing core training programs
2. Determine appropriate exercises, length of workouts, repetitions and more for various exercisers
3. Describe how to perform a variety of exercises for the core
4. Describe how to incorporate stretches for areas such as hip flexors and low back
5. Explore breathing techniques and relaxation exercises on various devices such as the stability ball
6. Describe advanced exercise techniques to work the core
7. Understand how to utilize and incorporate accessories and machines into core training



## Core Training Anatomy Course Examination

For each of the following questions, circle the letter of the answer that best answers the question.

1. Which of the following is not one of the six good reasons to take care of your core?
  - A. To improve athletic performance
  - B. To reduce the risk of developing Type I diabetes
  - C. Maintain cardiovascular health
  - D. Protect the spinal column
  
2. When is it appropriate to consider trying 4 workouts per week?
  - A. Between 2 and 6 weeks
  - B. Within 4 weeks
  - C. At 2 months
  - D. After 3 months
  
3. Which of the following statements is FALSE?
  - A. It is safe for healthy and goal oriented individuals to exercise twice per day
  - B. The central nervous system creates differences in individuals as to what time of day is best for them to exercise
  - C. Most athletes are strongest between 6 – 7pm
  - D. Core workouts are best when spaced out during the week as much as possible
  
4. Which of the following statements is TRUE?
  - A. Single set core exercises will help eliminate fat
  - B. Multiple sets for abs and core is not advisable
  - C. Only 30% of athletes have muscles that adapt to strength with only 1 set
  - D. A beginner can safely do 6-7 sets of core training
  
5. What is the main disadvantage to performing a single exercise for the core?
  - A. It will not result in waist size reduction
  - B. Lack of motivation
  - C. It does not burn as much body fat
  - D. It can lead to overuse injuries
  
6. What is the appropriate range of repetitions if the client wants to lose inches from the waist?
  - A. 8-12
  - B. 35-80
  - C. 20-50
  - D. 100 or more

7. How long should one repetition take if the focus is on strengthening the core?
  - A. 3-5 seconds
  - B. 1-3 seconds
  - C. 2-4 seconds
  - D. 6-7 seconds
  
8. Which technique or range of motion is the most dangerous and least effective when working the core?
  - A. Lifting the torso or legs
  - B. Using a soft surface
  - C. Placing a stability ball under the lumbar spine
  - D. Maintaining a neutral spine
  
9. In order to improve athletic performance, range of motion should
  - A. Is not important
  - B. Be slightly less than what is required of your sport
  - C. Be greater than what is required of your sport
  - D. Match that required of your sport
  
10. When the focus of core training is to reduce inches from the waist, how much time should be taken between sets?
  - A. 1-2 minutes
  - B. 3-5 minutes
  - C. 30 seconds or less
  - D. 24-48 hours
  
11. Which statement is correct when trying to determine the appropriate weight for each exercise?
  - A. You must both use proper form and feel the resistance in your muscles in zone 1
  - B. You can cheat in order to lift when in zone 3
  - C. Zone 4 utilizes the heaviest weight with the most challenging form
  - D. Zone 2 uses the lightest weight
  
12. What muscle group tends to be recruited the further your resistance moves from your center of gravity when training core?
  - A. Rectus abdominus
  - B. Hip flexors
  - C. Hamstrings
  - D. Gluteals
  
13. Which of the following is not a sign that your program needs to be changed?
  - A. When you have one to two poor workouts
  - B. When you lose your enthusiasm
  - C. When you are overtraining
  - D. When you have a lack of interest in exercise
  
14. To help in the recovery from a hard workout that leads to stiff muscles, you should:
  - A. Rest more between days to decrease soreness
  - B. Change the exercises because the current program is not right for you
  - C. Take a few days off and reassess your program
  - D. Exercise again, but workout lightly

15. At what percentage of body fat would a male begin to see the abdominal 6-pack?
- A. 20%
  - B. 3%
  - C. 17%
  - D. 15%
16. Which statement is false?
- A. Flaccid abdominal muscles are relatively smooth
  - B. Your body stores fat on your least active muscles
  - C. Even if your abdominal muscles are toned, they will not be visible with high body fat
  - D. A contracting muscle gets some of its energy from the fat that is covering it
17. When exercising the abs for a smaller waist, what should be the first focus?
- A. Repetitions
  - B. Frequency
  - C. Diet
  - D. Intensity
18. What is ptosis?
- A. When an organ protrudes through a muscle due to muscle weakness
  - B. Downward movement of an organ due to weakened structures
  - C. A type of supplement that contains BCAAs
  - D. When visceral fat causes the abdomen to protrude, otherwise known as a "potbelly"
19. Which of the following reduces the absorption of carbohydrates?
- A. Decaffeinated coffee
  - B. Caffeinated coffee
  - C. Soft drinks
  - D. Sweet tea
20. Which statement is true regarding BCAAs?
- A. They are made of 6 amino acids
  - B. They help increase the secretion of insulin to help reduce fat absorption
  - C. They fight against the accumulation of fat
  - D. They make up the majority of all muscle proteins
21. Which of the following statements is false?
- A. Calcium is stored in the fat cells
  - B. Those taking less than 500 mg of calcium per day are 2x as likely to be overweight
  - C. The beneficial effects of fat loss and calcium improve if more than 800 mg are taken per day
  - D. The most noticeable area of the body that shows the benefits of calcium and fat is the abdominal area.
22. How much calcium in a healthy diet is utilized each day?
- A. 50%
  - B. 100%
  - C. 15%
  - D. 25%
23. What time of day is the best time to supplement calcium?
- A. Morning
  - B. Evening
  - C. Meal-time
  - D. Right before meals

24. Which statement is true regarding the abdominal muscles?
- The transverse abdominus is superficial to the obliques
  - The internal obliques are deep to the external obliques
  - The transverse abdominus is commonly referred to as the “abdominal muscles”
  - Only the internal obliques are located on either side of the rectus abdominus
25. All of the following control the curve of the lower spine EXCEPT:
- Biceps femoris
  - Psoas
  - Illiacus
  - Rectus femoris
26. Which statement is incorrect concerning “fake” abdominal exercises?
- Scissor-like exercises do not tone the abs
  - When the abs contract isometrically, large amounts of lactic acid accumulate
  - Isometric exercises can tone the abdominal exercises
  - Exercises that involve holding the legs in the air can damage the spinal discs
27. Which of the following is a proper position for the back when doing abdominal exercises?
- Arched back
  - Rounded back
  - Extended back
  - Neutral back
28. What is the most common mistake made when performing abdominal exercises?
- Bracing the feet
  - Rounding the back
  - Looking at the ceiling
  - Lowering too quickly
29. While holding your breath during ab exercises can help with strength, it will also:
- Create more pressure in the lumbar area
  - Lead to an increase in power in the abdominals
  - Create more tension in the transverse abdominus
  - Move the tension from the abs to the psoas muscle
30. What is the proper range of motion in a crunch?
- Until the entire torso is off the floor
  - Until the middle of the back is off the floor
  - 10 inches
  - 6 inches
31. Which hand position is the easiest when performing a crunch?
- Arms straight out in front of you
  - Hands behind your head
  - Hands on your shoulders
  - Hands in above of your head
32. To avoid pulling on your neck, what is the proper placement of the hands on the head?
- Hands behind head with fingers interlocked
  - Hands next to the ears
  - Hands behind the neck with fingers interlocked
  - Hands behind head with one hand over the other and elbows pulled in

33. All of the following will increase resistance during a crunch EXCEPT:
- A. Perform them on a hard surface as oppose to a mattress or soft surface
  - B. Have your partner place a foot on the navel area
  - C. Hold a weight plate behind your head
  - D. Put a weight on your navel area
34. In order to reduce the use of the hip flexors when your feet are anchored, you should:
- A. Keep the knees together as close as possible
  - B. Cross the ankles
  - C. Drop the knees as wide as possible with the knees bent at 90 degrees
  - D. Turn the toes in so that the feet are pigeon-toed
35. Which of the following techniques is incorrect when performing the lying leg raise?
- A. Lift the hips more so than the legs
  - B. Stop as soon as the hips come up off the floor
  - C. Make the exercise easier by straightening the legs
  - D. Lower the abs towards your chest
36. Which version of the lying leg raise is more likely to hurt the spine?
- A. Bent knee
  - B. Straight legged
  - C. Rotation
  - D. Unilateral version
37. Which statement is true regarding the seated leg raise?
- A. The straighter the legs, the easier the exercise
  - B. Pause at the lowest point of the exercise
  - C. Try not to touch your knees to the chest
  - D. The closer your torso is to parallel to the floor, the harder the exercise
38. Which statement is false regarding the seated leg raise?
- A. The next level after seated leg raises become too easy is leg raises on the pull up bar
  - B. When sitting, weight pressing on the pelvis impedes movement on the spine
  - C. Curve the low back very slightly
  - D. The lying leg raise offers requires more resistance than the seated leg raise
39. Which muscles are called Apollo's Belt?
- A. Obliques
  - B. Transverse abdominus
  - C. Rectus abdominus
  - D. Internal obliques only
40. Which abdominal muscle had the least aesthetic value?
- A. Rectus Abdominus
  - B. External obliques
  - C. Transverse Abdominus
  - D. Internal Obliques
41. What structure divides the left abdominals from the right?
- A. Linea alba
  - B. Linea aspera
  - C. Apollo's belt
  - D. Transverse fascia



42. Why is the opposite arm outstretched during the twist crunch?
- A. It provides balance
  - B. It limits lumbar spine movement
  - C. It helps to accentuate the lateral rotation
  - D. It makes the exercise easier for beginners
43. Why is the twisting crunch an ideal exercise for circuit training or cardio work?
- A. Because the sets take so long
  - B. Because the rotation movement helps the heart rate to increase
  - C. While working one side, the other side can recover thus leading to more reps
  - D. Because the breath can safely be held which helps to increase the heart rate
44. The side crunch targets which abdominals?
- A. Obliques
  - B. Transverse abdominus
  - C. Linea alba
  - D. Rectus abdominus
45. How can you decrease the resistance when performing the side crunch?
- A. Stretching your arm towards your thigh and keeping it in line with your body
  - B. Raising your arm in the air
  - C. Stretching your arm above your head while keeping it in line with your body
  - D. Bending you elbow with your hand behind your ear
46. When performing the side crunch, if you lift your leg instead of your torso, the leg should not be lifted any higher than:
- A. 75 degrees
  - B. 30 degrees
  - C. 60 degrees
  - D. 45 degrees
47. When is it best to work your obliques?
- A. At the beginning of your core workout
  - B. At the end of your core workout
  - C. In the middle of the core workout
  - D. It does not matter
48. Why is it not advisable to move your head to help you get one or two more repetitions in?
- A. It will fatigue your abs before you are done with your core workout
  - B. It will decrease resistance
  - C. It can damage the cervical spine
  - D. It will affect the strength of the abs by providing momentum
49. Which is not correct when performing the static stability exercise with the back against the wall?
- A. Stop moving your feet towards the wall when you feel the lumbar spine coming off the wall
  - B. Press the lower back into the wall as much as possible
  - C. Hold the isometric contraction for only 10 seconds
  - D. Move your feet forward about 20 inches at the beginning of the exercise
50. Why do people tend to avoid the static stability exercises?
- A. Because it is dangerous to the lower back
  - B. Because it is not an impressive exercise
  - C. Because it is a beginner exercise
  - D. Because it requires special equipment

51. Who will benefit the most from plank exercises?
- A. Swimmers
  - B. Body builders
  - C. Those who sit at work
  - D. Athletes who participate in combat sports
52. In order to benefit the most from rib cage expansion exercises to strengthen inhalation muscles, how many repetitions should be performed?
- A. 50 minimum
  - B. 40 minimum
  - C. 30 minimum
  - D. 20 minimum
53. What is the biggest concern while performing the diaphragm contraction exercise?
- A. Hyperventilation
  - B. Hypoventilation
  - C. Fatigue
  - D. Hypervolemia
54. Which muscle is not weakened with kyphosis?
- A. Spinalis
  - B. Rectus abdominus
  - C. Longissimus
  - D. Iliocostalis
55. As the hip flexor range of motion improves, you will notice all of the following changes during a lunge EXCEPT:
- A. The step forward is larger
  - B. The back leg is able to flex more at the knee
  - C. The torso is more erect
  - D. The back leg is straighter at the knee
56. What happens if the psoas is stretched too much in an inflexible person?
- A. The pelvis tilts posteriorly
  - B. The hamstrings tighten
  - C. The low back arches
  - D. The trunk develops kyphosis
57. Why might a client wake up feeling tired and having persistent backaches when doing the abdominal workout programs?
- A. Too much stretching
  - B. Loss of height during the day due to disc compression
  - C. Herniated disc
  - D. Overactive muscles
58. How long should you hold the stretches on the stability ball?
- A. 1-3 minutes
  - B. 3-4 minutes
  - C. 10-15 seconds
  - D. 30-60 seconds

59. When hanging from a pull-up bar, if too much weight is in your hands, what will happen?
- The back will relax more
  - Your rotator cuff will be injured
  - The back will contract instead of relax
  - The abdominal muscles will contract
60. Which of the following is not considered a difficulty when working the abdomen and incorporating advance exercises?
- The obliques are not as strong as the lower abs
  - The six pack is not developed enough
  - Lack of tone creates a large belly
  - The lower abs are not as strong as the upper abs
61. Why do you need to work upper abs separately from the lower abs?
- Because both ends of the rectus work equally hard
  - You do not need to, crunches work the entire rectus abdominus when done correctly
  - Because the two areas are innervated separately
  - Because the upper rectus abdominus tends to be weaker than the lower
62. Which of the following is true regarding the lower rectus abdominus?
- It supports the spine the least
  - It is less likely to have fat stored in this area
  - Strong lower abs helps lessen bloating
  - It is the easiest area to develop
63. If you client is concerned about the appearance of his abdominals, what percentage of your ab workout should focus on the upper abdomen?
- 30%
  - 50%
  - 20%
  - 70%
64. What does "frying your pathways" mean?
- Doing the same abdominal exercises all the time
  - Going for the burn
  - Working your abs in a heated room
  - Stretching the ab muscles too much
65. What is the correct order of hand placements for a sit up going from easiest to hardest?
- Lower chest, shoulders arms straight above the head, in front of the body
  - In front of the body, lower chest, shoulders, behind head
  - Shoulders, in front of body, behind head, lower chest
  - Behind the head, in front of the body, lower chest
66. When performing a sit ups, how would you target the middle section of the rectus abdominus?
- Use gravity boots while hanging upside down and move the pivot point to the upper of the rectus abdominus
  - Hold a weight behind your head
  - Use gravity boots while hanging upside down and move the pivot point to the center of the rectus abdominus
  - Brace the feet while using an incline bench

67. If throwing a medicine ball to create and advance ab exercise, when does the exerciser throw the ball to the trainer?
- As the client lowers his torso before reaching the contracted position
  - As the client lifts his torso after reaching the contracted position
  - As the client lifts his torso before reaching the contracted position
  - As the client lowers his torso after reaching the contracted position
68. Which procedure for the Pelvic Tilt on the Pull-up Bar is incorrect?
- Too much resistance on the arms will prevent the lower abs from working correctly
  - Your feet should not support your body
  - Position yourself so your thighs are at a 120 degree angle to the floor
  - Keep the spine in neutral while pulling your buttocks back
69. What is the most common mistake when performing the Hanging Leg Raise?
- Starting with the thighs parallel to the floor
  - Starting with the knees "looking" at the floor
  - Lifting the pelvis as high as possible
  - Avoiding swinging
70. When performing the Hanging Leg Raise to the Side, how do you properly decrease the resistance?
- Work one leg at a time
  - Work both legs at the same time
  - Begin lying on the floor, then as you fatigue, move to the hanging leg raise
  - Keep the knees straight
71. Which of the following is NOT a purpose of professional machines found in the gym?
- They decrease the monotony of ab exercises
  - They offer a wide variety of resistance
  - You need them to do core work
  - They provide the optimal angle and trajectory of movements
72. Which exercise should be done in long sets of 25 reps or more?
- Rocking machine crunch
  - Standing cable crunch
  - Ab coaster
  - Cable twist
73. When performing the side-bend exercise, what is the furthest you should laterally bend?
- 60 degrees
  - 45 degrees
  - 15 degrees
  - 90 degrees
74. What is the major disadvantage to including side bend exercises in your core workout?
- The movement is not utilized in most sports
  - They are redundant because of other exercises typically done in an ab workout
  - It is hard to add resistance
  - It is hard to target the oblique muscles correctly
75. All of the following exercises are designed to reduce belly fat EXCEPT:
- Side crunch
  - Lying leg raise
  - Machine crunch
  - Seated leg raise