

# **Pilates Anatomy**

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*Pilates Anatomy*  
Course Objectives

**After completing the Pilates Anatomy course, the participant will:**

1. Have an understanding of the basic principles of Pilates
2. Understand the importance of proper breathing while performing Pilates
3. Gain knowledge on the spine, core, and the importance of proper body alignment
4. Gain knowledge in alignment deviations and Pilates exercises to help improve these.
5. Understand the movement of the body and be able to know how to incorporate this properly in to mat exercises
6. Gain knowledge in proper skills and cues for various mat exercises
7. To gain an understanding in when, why, and how to modify exercises due to flexibility issues.
8. To understand how to take an exercise from beginner, intermediate, to advance progressions.



*Pilates Anatomy*  
Course Examination

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

1. What is considered the fuel that “drives” Pilates?
  - A. Core
  - B. Breath
  - C. Concentration
  - D. Flow
  
2. How many processes are involved in respiration?
  - A. 1
  - B. 2
  - C. 3
  - D. 4
  
3. Which structure is not part of the lower respiratory system?
  - A. Pharynx
  - B. Trachea
  - C. Alveoli
  - D. Bronchi
  
4. Which ribs increase thoracic volume in a forward and backward type movement?
  - A. Lower ribs
  - B. Middle ribs
  - C. Upper ribs
  - D. Floating ribs
  
5. Which muscle is not recruited to help elevate the ribs?
  - A. Pectoralis major
  - B. Serratus anterior
  - C. Pectoralis minor
  - D. Scalenes
  
6. When performing the Hundreds exercise, how many beats total are performed during both inhalation and exhalation?
  - A. 5
  - B. 8
  - C. 10
  - D. As many as you can

7. How many bones are in one hand?
  - A. 12
  - B. 17
  - C. 25
  - D. 27
  
8. Which section of the vertebral column has fused vertebrae?
  - A. Sacrum
  - B. Lumbar
  - C. Thoracic
  - D. Cervical
  
9. Facet joints in the vertebrae:
  - A. Increase rotation in the lumbar region, but limit it in the thorax
  - B. Allow a great amount of gliding movement between the vertebrae
  - C. Is the area of the vertebrae where the disc is located
  - D. Increase rotation in the thorax, but limit it in the lumbar region
  
10. What is the name of the tendinous band running vertically down the center of the abdomen?
  - A. Aponeurosis
  - B. Linea aspera
  - C. Linea alba
  - D. Pectineus
  
11. Which deep muscle of the back can help prevent the slumped upper back posture when strong?
  - A. Longissimus
  - B. Semispinalis
  - C. Multifidus
  - D. Quadratus lumborum
  
12. Which muscle is not a part of the erector spinae group?
  - A. Longissimus
  - B. Semispinalis
  - C. Iliocostalis
  - D. Spinalis
  
13. The borders of the core include all of the following EXCEPT:
  - A. Linea alba
  - B. Bottom of rib cage
  - C. Line across the anterior hips
  - D. Base of the buttocks
  
14. When the ASIS is anterior to the pubic symphysis, this is called a(n):
  - A. Lateral pelvic tilt
  - B. Posterior pelvic tilt
  - C. Pelvic rotation
  - D. Anterior pelvic tilt
  
15. Why is it thought the original Pilates emphasized squeezing the gluteal muscles together?
  - A. Because it makes the exercises more challenging
  - B. Because it modifies the exercise to make it easier
  - C. Because it relaxes the overworked abdominals
  - D. Because we tend to lose tone in these muscles as we age

16. Co-contraction of which muscle helps to facilitate the contraction of the transverse abdominus?
- A. Hamstrings
  - B. Gluteal muscles
  - C. Pelvic floor muscles
  - D. Piriformis
17. Where is the only true bone connection of the shoulder girdle to the axial skeleton?
- A. Acromioclavicular joint
  - B. Glenohumeral joint
  - C. Scapulothoracic joint
  - D. Sternoclavicular joint
18. Which movement best describes upward rotation of the scapula?
- A. When the glenoid cavity (outer bony landmark) moves downward
  - B. When the glenoid cavity (outer bony landmark) moves upward
  - C. When the medial border of the scapula moves upward
  - D. When we shrug our shoulders
19. A flatter abdomen is best achieved when which muscle is drawn inward?
- A. Transverse abdominus
  - B. Rectus abdominus
  - C. Linea alba
  - D. Lower portion of the rectus abdominus
20. An example of a fibrous joint is:
- A. The femur and the tibia
  - B. The ribs to the sternum
  - C. Sutures of the skull
  - D. The scapula and the ribs
21. When the arm is raised forward to shoulder height, the movement is called:
- A. Rotation of the shoulder
  - B. Abduction of the shoulder
  - C. Flexion of the shoulder
  - D. Adduction of the shoulder
22. The two types of indirect connections of muscle to bone are:
- A. Tendon and retinaculum
  - B. Tendon and cartilage
  - C. Tendon and ligament
  - D. Tendon and aponeurosis
23. All of the following are secondary muscles to lateral flexion of the spine EXCEPT:
- A. Rectus abdominus
  - B. Longissimus
  - C. Semispinalis
  - D. Rotatores
24. Which muscle is not a part of the hip adductor group?
- A. Pectineus
  - B. Sartorius
  - C. Gracilis
  - D. Adductor magnus

25. In addition to the peroneus tertius, what other muscle assists with dorsiflexion?
- Extensor hallucis longus
  - Flexor hallucis longus
  - Flexor digitorum
  - Gastrocnemius
26. The actions of the coracobrachialis are:
- Elbow flexion and shoulder flexion
  - Shoulder flexion and horizontal abduction
  - Shoulder flexion and horizontal adduction
  - Elbow flexion and shoulder extension
27. Which rotator cuff muscle does not rotate the shoulder?
- Infraspinatus
  - Supraspinatus
  - Subscapularis
  - Teres minor
28. Two muscles that move the forearm that also assist the biceps brachii in elbow flexion are:
- Brachialis and pronator teres
  - Brachioradialis and pronator teres
  - Brachioradialis and brachialis
  - Brachialis and supinator
29. Which statement is false concerning antagonists?
- The antagonist relaxes during many movements
  - When the antagonists fails to fire, it means the movement will be less effective
  - Antagonist work with the agonists in order to decelerate a body part
  - When the agonist and antagonists work together with the same force, this is called co-contraction
30. What is provides the primary external resistance in Pilates?
- Work of the agonist
  - Force of the antagonist
  - Weight of the limb being raised
  - Gravity
31. Torque is most important when applied to the:
- Legs
  - Neck
  - Back
  - Shoulder
32. What part of the body was not emphasized in Joseph Pilates original work?
- Neck
  - Pelvic floor
  - Ankle
  - Shoulder
33. How do the hamstrings produce hip extension in Pilates?
- By lifting the pelvis
  - By moving the legs
  - By bending the knee
  - By adducting the legs

34. A variation to the chest lift that will increase the co-contraction of the abs and spinal extensors is to:
- Squeeze the gluteal muscles
  - Slightly anteriorly tilt the pelvis
  - Keep the pelvis in neutral
  - Hold your breath
35. Which cue is incorrect for the leg lift supine exercise?
- Avoid shifting your weight as the leg lifts
  - Contract the knee flexors
  - Maintain the knee angle
  - Feel the lightness in the moving leg
36. Which muscles is the most important when stabilizing the core during limb movement?
- Rectus abdominus
  - External oblique
  - Internal oblique
  - Transverse abdominus
37. Which muscle is not a targeted muscle when performing the leg lift side?
- Quadratus lumborum
  - External oblique
  - Quadriceps
  - Erector spinae
38. How do you lift the leg higher in the leg lift side?
- By activating the quadriceps of both legs
  - By activating the abductor muscles of the top leg
  - By activating the adductor muscles of the bottom leg
  - By activating the lateral flexors of the spine
39. How do you avoid activating the lower back too much during the leg lift side exercise?
- Allow the feet to come forward slightly
  - Allow the feet to move backwards slightly
  - Lift the legs higher
  - Contract the erector spinae
40. The purpose of the leg pull side exercise is to:
- Strengthen the hip abductors
  - Strengthen the hip adductors
  - Strengthen the lateral flexors of the spine
  - Strengthen the hamstrings
41. Why is it important to work the adductor muscles in the Leg Pull Side exercise?
- These muscles are used a lot in Pilates exercises that require the legs to move together
  - These muscles help maintain form and release pressure from the lower back
  - These muscles are important to help keep the knees extended properly
  - These muscles are important for proper lifting techniques
42. When performing the Chest Lift with Rotation, how can you challenge the obliques more?
- Flattening the spine
  - Flexing the trunk
  - Maintaining the C-curve in the spine
  - Tilting the chin



43. When rotating the trunk to the left during the Chest Lift with Rotation, where should the client feel the contraction?
- Left side of the trunk only
  - Right side of the trunk
  - Both sides of the trunk
  - Right lower back
44. Which is incorrect procedure for the Back Extension Prone?
- Keep the legs together
  - Press the arms to the floor
  - Lift the upper and middle trunk off the floor
  - Feet are gently pointed
45. Why is it important to keep the arms in the correct position for the Back Extension Prone?
- It works the latissimus dorsi which helps to stabilize the trunk
  - It works the quadratus lumborum which helps to stabilize the trunk
  - It enables the client to lift straight up instead of to the side
  - It takes pressure off the neck
46. When performing the One-Leg Circle, which statement is false?
- Lie prone on the floor/mat
  - The palms should be facing the floor
  - The foot on the mat should be dorsiflexed
  - The foot in the air should be dorsiflexed
47. All of the following muscles are used during the One-Leg Circle except:
- Iliopsoas
  - Popliteus
  - Tibialis anterior
  - Soleus
48. What is the main purpose of the One-Leg Circle exercise?
- A static stretch for the hamstrings
  - A strengthening option for the hamstrings
  - A dynamic stretch for the hamstrings
  - A static strengthening exercise for the quadriceps
49. When performing the Roll-Up, which procedure is incorrect?
- Flex the feet as the head comes off the mat
  - Draw the abdominal wall inward
  - Chin and neck remain in a neutral position
  - Lift arms toward the ceiling
50. Which statement is true regarding the Roll-up exercise?
- The straight-leg position should be avoided by all
  - The straight-leg position provides potential hamstring and lower back flexibility
  - The straight-leg position makes it easier to achieve a posterior pelvic tilt
  - The bent leg position challenges the abdominals more
51. Which muscle is not targeted or an accompanying muscle for the Neck Pull?
- Iliopsoas
  - Tibialis anterior
  - Transverse abdominus
  - Neck flexors

52. What is the main difference between the Neck Pull and the Roll Up?
- The Neck Pull creates more torque on the abdominals
  - The Neck Pull creates more torque on the neck
  - The Roll Up creates more work and challenge for the abdominals
  - The Roll Up targets erector spinae while the Neck Pull targets the abdominals
53. When performing the Hundreds, in order to achieve the correct end position in the second step, the client should:
- Keep the pelvis stable while the lower back stays in contact with the mat
  - Activate the hip abductors
  - Focus on maintaining a firm erector spinae
  - Slightly arch the back
54. All of the following should avoid the Hundreds EXCEPT:
- Those with disc problems
  - Advanced Pilates exercisers
  - Those with high blood pressure
  - Beginner Pilates participants
55. How can you appropriately modify the Single-Leg Stretch to emphasize the abdominals more?
- Flex the knee to lower the opposite leg to the floor to increase the torque
  - Bend the leg so the thigh is just beyond vertical and the trunk is curled higher
  - Switch legs faster to increase torque on the abdominals
  - Straighten the bent leg so it is vertical to the floor
56. What is the breathing pattern for the Hamstring Pull
- 5 breaths per 1 pulse
  - 2 breaths per 1 pulse
  - 1 breath per 2 pulses
  - 1 breath per 5 pulses
57. What is the position of the scapula during the Hamstring Pull?
- Adducted
  - Elevated
  - Abducted
  - Neutral
58. How can you modify the Hamstring Pull in order to limit a posterior pelvic tilt?
- Do not lift the top leg as far
  - Raise the bottom leg to 45 degrees
  - Do not lift the head and upper back
  - Lower the bottom leg all the way to the mat
59. Which statement is true concerning the Double-Leg Stretch?
- The One Leg Stretch is more difficult than the Double Leg Stretch
  - The Double Leg Stretch is appropriate for everyone
  - The Double Leg Stretch is much more difficult than the One Leg Stretch
  - Keep the thighs just beyond vertical when the knees bend to make the Double Leg Stretch easier
60. What is the most common mistake when performing the Crisscross?
- Spinal lateral flexion
  - Spinal flexion
  - Trunk rotation
  - Trunk extension

61. Which of the following is incorrect procedure for the Teaser?
- A. Prevent anterior pelvic tilt by pulling the abdominal wall in firmly
  - B. Avoid elevating the scapula
  - C. Move the legs up and down slightly throughout the exercise
  - D. Keep your arms parallel to the legs
62. If you have difficulty rolling up into a high V-position when performing the Teaser, you should:
- A. Not perform the exercise
  - B. Flex the hips slightly
  - C. Bend the knees slightly
  - D. Swing the arms to create momentum
63. When each vertebrae moves sequentially in relation to the next vertebrae during a Pilates movement, this is referred to as:
- A. Spinal articulation
  - B. Fine articulation
  - C. Trunk flexion
  - D. Facet articulation
64. All of the following should avoid bearing weight on the neck EXCEPT:
- A. Peri-menopausal women
  - B. Pregnant women
  - C. Young women
  - D. Women with osteoporosis
65. Which teaching cue is incorrect for the Spine Stretch?
- A. Keep your head close to your trunk
  - B. At the end of step 2, tilt the pelvis posteriorly
  - C. Reach the arms forward to maximize the hamstring stretch
  - D. Dorsiflex the feet
66. Which of the following is an appropriate modification to the Rolling Back exercise for those tight in the lower back?
- A. Roll harder to get more momentum
  - B. Straighten the legs as you roll up
  - C. Start with one hand on the back of each thigh below the knee
  - D. Roll more onto the neck to ease tension on the back
67. Which teaching cue is incorrect for the Seal exercise?
- A. Hip flexors contraction helps keep the legs off the mat
  - B. Hips are in the externally rotated position
  - C. Once you reach the balance position, clap your feet 10 times
  - D. Keep the thighs close to the chest
68. Which statement is true in regards to the Crab exercise?
- A. To reverse the direction of motion at the beginning of step 3, use the hip flexors to bring your thighs away from your chest
  - B. When shifting your weight over the knees in step 3, the angle of knee flexion increases to allow the trunk to come forward
  - C. When the head is on the mat in step 3, use the most momentum
  - D. The lowering phase is performed best by using fine eccentric contractions of the knee and hip extensors

69. Who can safely perform the Crab exercise?  
 A. Those with neck problems  
 B. Advanced Pilates exercisers  
 C. Those with knee problems  
 D. Those with hip problems
70. Which muscle is not an accompanying or targeted muscle in the Rocker with Open Legs exercise?  
 A. Pectoralis major (sternal)  
 B. Quadriceps femoris  
 C. Sartorius  
 D. Anterior deltoid
71. What is the benefit to performing the Rocker with Open Legs with a flat back?  
 A. It allows the exerciser to use the spinal extensors without letting the pelvis tilt posteriorly  
 B. It removes the pressure off the back muscles for those with spinal problems  
 C. It allows the exerciser to use the spinal extensors without letting the pelvis tilt anteriorly  
 D. It creates more tension in the abdominal muscles to help maintain a posterior pelvic tilt
72. All of the following are targeted muscles in the Rollover With Legs Spread exercise EXCEPT:  
 A. Pectineus  
 B. External oblique  
 C. Iliopsoas  
 D. Hamstrings
73. Modifications and variations for the Rollover exercise include all of the following EXCEPT:  
 A. Allow the knees to bend slightly if the hamstrings are tight  
 B. Feel the weight supported on the neck and shoulders  
 C. Bend your elbows and use your hands to support your pelvis  
 D. keep the ankle dorsiflexed
74. What muscle should initiate lifting the legs in the Boomerang?  
 A. Abdominals  
 B. Hip flexors  
 C. Hip adductors  
 D. Hamstrings
75. Which teaching cue is incorrect for the Control Balance exercise?  
 A. Use the hip extensors to lift the thigh so it is in line with the pelvis during step 2  
 B. Keep the lower leg stable  
 C. Use the lower back to help maintain the C-curve in step 1  
 D. Use the plantar-flexors to point the feet
76. What should you do for the client who is extremely tight in the lower back area who cannot perform the Control Balance exercise correctly?  
 A. Have them shift their weight to their shoulders  
 B. Have them hold the lower leg stationary with the foot above the mat  
 C. Have them work through the exercise to challenge the back muscles  
 D. Have them work on flexibility by performing the Rollover exercise
77. When do you bring the legs back into the vertical position during the repetitions?  
 A. When the pelvis comes into full contact with the mat  
 B. When the pelvis begins to touch the mat  
 C. When you have fully exhaled  
 D. When you have fully inhaled

78. Which muscles is used as an accompanying muscle during the Jackknife exercise?
- Rectus abdominus
  - Transverse abdominus
  - External oblique
  - Internal oblique
79. Early in step two of the Jackknife exercise, the abdominals are used to:
- Laterally tilt the pelvis
  - Keep the pelvis neutral
  - Anteriorly tilt the pelvis
  - Posteriorly tilt the pelvis
80. What is the main difference between the Leg Pull exercise and the Shoulder Bridge exercise?
- The Leg Pull uses a neutral spine while the Shoulder Bridge uses a slightly arched position
  - The Shoulder Bridge fits the definition of bridging while the Leg Pull does not
  - The Leg Pull fits the definition of bridging while the Shoulder Bridge does not
  - The Leg Pull uses a slightly arched position while the Shoulder Bridge uses a neutral spine
81. Why is the core used differently in the Leg Pull Front and Push Up than other exercises in this book?
- Not all of the abdominal muscles are used
  - It is not encouraged to keep the spine in neutral on these two exercises thus causing the core muscles to work less
  - The trunk is facing down instead of up which causes the low back to arch and hips to extend
  - The trunk is facing upward which causes the lower back to posteriorly tilt and the hips to flex
82. Which muscle is not an accompanying muscle in the Shoulder Bridge exercise?
- Rectus femoris at the hip
  - Trapezius
  - Latissimus dorsi
  - Gastrocnemius
83. The Shoulder Bridge exercise offers dynamic flexibility to the:
- Hamstrings
  - Quadriceps
  - Iliopsoas
  - Sartorius
84. A tight Iliopsoas can lead to:
- Lumbar hyperkyphosis
  - Lumbar hyperlordosis
  - A posterior pelvic tilt
  - A high hip
85. All of the following are accompanying muscles for the Bicycle exercise EXCEPT:
- Hamstrings
  - Rhomboids
  - Iliopsoas
  - Gastrocnemius

86. What position should the scapulae be in during the Bicycle exercise?
- Elevation
  - Lateral rotation
  - Abduction
  - Adduction
87. Weakness in what muscle can lead to winged-scapula?
- Trapezius
  - Rhomboids
  - Levator scapula
  - Serratus anterior
88. In step 4 of the Twist exercise, what muscle rotates the trunk to the opposite side?
- Rectus abdominus
  - Erector spinae
  - Quadratus lumborum
  - Iliopsoas
89. How do you best modify the Corkscrew exercise if the hamstrings are tight?
- Bend the knees slightly
  - Arch the back
  - Begin with the legs vertical
  - Lift the trunk off the floor at a 45 degree angle
90. When performing the Hip Circles Prep exercise, what position is the pelvis in for the starting position?
- Neutral
  - Posterior tilt
  - Anterior tilt
  - It does not matter
91. Exercises where extension is used to strengthen the back emphasize what muscle group?
- Gluteals
  - Quadratus femoris
  - Rectus abdominus
  - Erector spinae
92. The extension exercises are not appropriate for which population:
- Advanced Pilates exercisers
  - Older adults
  - Disc rupture
  - Athletes
93. What is the function of the serratus anterior muscle during the One-Leg Kick exercise?
- Adduct and depress the scapula
  - Extend the shoulder and abduct the scapula
  - Abduct and depress the scapula and
  - Depress and extend the shoulder
94. During the One-Leg Kick exercise, the leg movements include provide all of the following EXCEPT:
- Power
  - Stability
  - Hip extensor muscle tone
  - Endurance benefits

95. How far should the legs be lifted off the mat when performing the Double Kick exercise?
- A. 4 inches
  - B. 3 inches
  - C. 2 inches
  - D. 1 inch
96. Why does the Double Kick exercise provide a greater ability to improve strength and endurance in the erector spinae muscles than the One-Leg Kick?
- A. Only one leg is lifted during the One-Leg Kick exercise which does not engage the muscles as much
  - B. The Double Kick does not use the arms for support and the legs/back are raised more repetitively than for the One Leg Kick
  - C. The One Leg Kick does not use the arms for support and the legs/back are raised higher than the Double Leg Kick
  - D. They both are very similar and work the muscles the same so there really is no difference
97. How many breath cycles are performed in the Swimming exercise?
- A. 3
  - B. 10
  - C. 5
  - D. 8
98. In order to keep the trunk stationary and not rotate during the Swimming exercise, what muscles must be stabilized?
- A. Hip flexors
  - B. Abdominals
  - C. Quadratus lumborum
  - D. Multifidus
99. What is the main difference between the Rolling back exercise and the Rocking exercise?
- A. The body is in extension for the Rocking exercise
  - B. The body is in flexion for the Rocking exercise
  - C. The body is in extension for the Rolling exercise
  - D. The trunk is held in neutral for the Rolling exercise
100. Why is the Swan Dive exercise such a high risk even for the advanced Pilates exerciser?
- A. Due to the pressure placed on the neck
  - B. Due to the severe hyperextension of the back
  - C. Due to the Valsalva-like breathing that is required
  - D. Due to the pressure it places on the knees