

# **AMTA MBLEx (English) - Quiz Questions with Answers**

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# Anatomy & Physiology

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Anatomy & Physiology

1.

What does a ribosome assemble, and to create what?

**Amino acids; proteins**

Proteins; amino acids

Lipids; a bilayer

Proteins; muscle tissue

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*Correct answer: Amino acids; proteins*

*A ribosome is a type of organelle which assembles amino acids to create proteins. Organelles are the basic structures found in a cell that play specific roles during mitosis and interphase. Amino acids are the building blocks of proteins. In most cells, the ribosome combines amino acids into proteins, which are then stored with lipids by the Golgi apparatus. Proteins are essential for cellular function and especially important for muscular health.*

*Amino acids form proteins, not the other way around.*

*The cell membrane is composed of a lipid bilayer.*

*Although muscle tissue is indeed made up of proteins, the process of organizing these proteins into muscle tissue is not performed by the ribosome.*

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2.

Blood is composed of red and white blood cells and plasma. What is plasma mostly composed of?

**Water**

Gases

Electrolytes

Hormones

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*Correct answer: Water*

*Plasma is mostly composed of water. 90% of plasma is water. The remaining 10% of plasma consists of gases, hormones, electrolytes, and nutrients.*

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**3.**

Which type of sensory nerves respond to change in position and movement?

**Proprioceptors**

Mechanoreceptors

Nociceptors

Chemoreceptors

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*Correct answer: Proprioceptors*

*Proprioceptors respond to changes in position and movement. The main proprioceptors influenced by massage are the muscle spindle and Golgi tendon organs. Proprioceptors (and mechanoreceptors) are located in the fascia, muscles, tendons, and joints.*

*Soft tissue consists of four basic categories of sensory nerves:*

- 1. **Mechanoreceptors** respond to touch, pressure, and movement.*
  - 2. **Proprioceptors** respond to changes in position and movement.*
  - 3. **Chemoreceptors** respond to chemical changes such as oxygen levels and acid-base balance.*
  - 4. **Nociceptors** respond to irritation and pain.*
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4.

Which of the following ligaments spans the lateral aspect of the knee from the femur to the fibula?

The LCL

The MCL

The ACL

The PCL

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*Correct answer: The LCL*

*The LCL stands for the Lateral Collateral Ligament and works to stabilize the lateral aspect of the knee. It connects the lateral side of the femur to the lateral side of the fibula.*

*The MCL stands for the Medial Collateral Ligament and works to stabilize the medial aspect of the knee. It connects the medial side of the femur to the medial side of the tibia. The ACL stands for Anterior Cruciate Ligament and stabilizes the joint by attaching the superior surface of the tibia (connecting to the anterior portion of that surface) to the inferior surface of the femur (towards the posterior portion of that surface). The PCL stands for Posterior Cruciate Ligament and stabilizes the joint by attaching the superior surface of the tibia (connecting to the posterior portion of that surface) to the inferior surface of the femur (towards the anterior portion of that surface). The ACL and PCL form an X-shape between the tibia and femur.*

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5.

Complex molecules are broken down and energy is released during:

**Catabolism**

Anabolism

Metabolism

Mitosis

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*Correct answer: Catabolism*

*During catabolism, complex molecules are broken down and energy is released. This is one function that falls under the umbrella of metabolism, which is the process in which energy is released or used by the cells.*

*Anabolism, another function of metabolism, is a chemical reaction that uses energy to join simple molecules together to form more complex molecules such as carbohydrates, lipids, proteins, and nucleic acids.*

*Mitosis is another word for cell division, in which the cell duplicates itself.*

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**6.**

Which of the following lymph nodes are located around one's knees?

**Popliteal nodes**

Cervical nodes

Axillary nodes

Pectoral nodes

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*Correct answer: Popliteal nodes*

*The popliteal nodes are located around one's knees. The popliteal lymph nodes, small in size and some six or seven in number, are embedded in the fat contained in the popliteal fossa, sometimes referred to as the 'knee pit'.*

*Cervical nodes are located around one's neck. Axillary nodes are located around one's armpit. Pectoral nodes are located around one's breast.*

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7.

What is the function of growth hormone (GH)?

**Promotes cell division and tissue repair**

Contributes to parental bonding, feelings of attachment, and lactation

Contributes to mood regulation and pain modulation

Influences motor activity and elevated mood

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*Correct answer: Promotes cell division and tissue repair*

*Growth hormone (GH) stimulates most cells to divide and grow in size. This is useful for both muscle growth and the repair of damaged tissue. As we age, the total amount of GH produced by the body declines.*

*Oxytocin contributes to bonding and feelings of attachment, and is also important in lactation. Serotonin regulates mood and mood lifters that support satiety. Dopamine influences motor activity and mood.*

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8.

An individual's thyroid can be found:

**Below the larynx in the neck**

Below the thalamus in the center of the brain

Below the thalamus and the hypothalamus in the center of the brain

Just above the kidneys

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*Correct answer: Below the larynx in the neck*

*An individual's thyroid can be found below the larynx in the neck. It is contraindicated to massage directly over the thyroid. The thyroid functions as part of the endocrine system and regulates metabolism.*

*The hypothalamus can be found below the thalamus in the center of the brain. The pituitary gland can be found below the thalamus and the hypothalamus in the center of the brain. The adrenal glands can be found just above the kidneys.*

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9.

What type of pain is diffused around the site of origin, and not clearly localized?

**Radiating**

Phantom

Referred

Recurring

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*Correct answer: Radiating*

*Radiating pain is diffused around the site of origin, and not clearly localized.*

*Phantom pain is frequently experienced by clients who have undergone limb amputation. An individual with phantom pain feels as if they have pain in a body part they do not possess.*

*Referred pain occurs in an area distant from the site of the stimulus.*

*Recurring pain happens repeatedly and may occur in any area of the body.*

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10.

In most healthy adults, how long is the small intestine?

**24–30 feet**

Half the size of the large intestine

40–100 feet

Proportionally, as long as they are tall

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*Correct answer: 24–30 feet*

*In most healthy adults, the small intestine is 24–30 feet long. It is called the "small" intestine because its diameter is smaller than that of the large intestine. The small intestine is much thinner but much longer than the large intestine.*

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**11.**

Which of the following cranial nerves innervates the tongue?

**Hypoglossal**

Trigeminal

Trochlear

Vagus

*Correct answer: Hypoglossal*

*The cranial nerve that innervates the tongue is the hypoglossal (XII) nerve. It arises in the medulla and contains mostly motor neurons, innervating the tongue and throat.*

*The cranial nerves include:*

*I. **The olfactory nerves**, which transmit taste and smell information to the brain.*

*II. **The optic nerves**, which transmit visual information to the brain.*

*III. **The oculomotor nerves**, which transmit information about eye movement.*

*IV. **The trochlear nerves**, which innervate the muscles of the eyeball.*

*V. **The trigeminal nerves**, which transmit information about sensation in the head, face, and facial skin, and include motor neurons for mastication.*

*VI. **The abducens nerves**, which include both sensory and motor neurons related to eye movement.*

*VII. **The facial nerves**, which have sensory neurons for taste and motor neurons for facial expression, tear production, and salivation.*

*VIII. **The vestibulocochlear nerves**, which receive information about hearing and equilibrium.*

*IX. **The glossopharyngeal nerves**, which relate to taste, saliva production, swallowing, and the gag reflex.*

*X. **The vagus nerves**. These nerves contain sensory neurons for the pharynx, larynx, trachea, heart, carotid body, lungs, bronchi, esophagus, stomach, small intestine, and gallbladder. Their motor neurons carry impulses to the pharyngeal and laryngeal*

*muscles and the abdominal viscera. They control heart rate and other visceral activities.*

*XI. **The accessory nerves** mainly contain motor neurons for speaking, turning the head, and moving the shoulders.*

*XII. **The hypoglossal nerves** contain mostly motor neurons, which innervate the tongue and throat.*

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**12.**

Which of the following is the mechanism responsible for the movement of food along the GI tract?

**Peristalsis**

Concentric contraction

Mastication lubrication

Mechanical digestion

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*Correct answer: Peristalsis*

*Peristalsis is the process of pushing food along the alimentary canal. This action is performed by smooth, involuntary muscles. It is a wavelike contraction that moves food through the GI tract.*

*Concentric contraction is the shortening of a voluntary muscle, typically describing the skeletal musculature. Mechanical digestion is the process of converting large particles of food into small particles of food. Mastication lubrication is the process of secreting saliva while chewing food.*

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**13.**

All of the following muscles are part of the rotator cuff **except**:

**Rhomboid major**

Subscapularis

Infraspinatus

Supraspinatus

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*Correct answer: Rhomboid major*

*Rhomboid major is not considered to be part of the rotator cuff. This muscle originates at the spinous processes of the T2-T5. It inserts on the medial border of the scapula, between the spine and the inferior angle. Its concentric actions are retraction (adduction), elevation, and downward rotation of the scapula.*

*The rotator cuff consists of four muscles: subscapularis, infraspinatus, supraspinatus, and teres minor. This muscle group is sometimes referred to using the acronym "SITS."*

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**14.**

Which of the following is stored for energy and an important part of the cell membrane and also a part of the myelin sheath?

**Fats**

Carbohydrates

Proteins

Sugars

*Correct answer: Fats*

*Fats are one of the major food groups, along with proteins and carbohydrates. Cell membranes and the myelin sheaths of neurons are both made up of fat. Excess fat is also stored for energy.*

*Carbohydrates, or sugars, are the primary source of fuel for the cell. Proteins broken down into amino acids and are used for metabolic activities. While both carbohydrates and proteins are a part of the cell membrane, and fats and proteins are part of the myelin sheath, only fat is stored for energy.*

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**15.**

What is a canal in a bone, such as the canal in the skull that runs from the external ear to the eardrum?

**Meatus**

Foramen

Fossa

Sinus

*Correct answer: Meatus*

*A meatus is a tunnel or canal found in a bone, such as the canal in the skull that runs from the external ear to the eardrum.*

*A foramen is a rounded hole in the bone, such as the foramen of a vertebra, which allows the spinal cord to pass through the length of the spine.*

*A fossa is a shallow depression in the surface or at the end of the bone, such as the infraspinous fossa of the scapula.*

*A sinus is an air cavity in the bone. Examples include the frontal sinuses, located in the skull.*

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16.

Which of the following is **true** of cardiac muscle?

**It is a type of muscle found in the heart.**

It is a voluntary muscle.

It is a type of muscle found around blood vessels.

It is the type of muscle that allows bones to move.

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*Correct answer: It is a type of muscle found in the heart.*

*Cardiac muscle, also known as striated involuntary muscle, is found only in the heart. It contracts rhythmically and involuntarily, continually pumping blood through the heart, the lungs, and the rest of the body.*

*Smooth muscle is found around blood vessels. Skeletal muscle is a voluntary muscle and allows bones to move.*

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**17.**

If a client's condition relates to inflammation, what suffix would **most** likely be added to the root word?

**-itis**

-algia

-osis

-pnea

*Correct answer: -itis*

*The suffix -itis means inflammation. For example, arthritis refers to the inflammation of a joint.*

*The suffix -algia means pain. For example, neuralgia refers to nerve pain. The suffix -osis usually refers to an abnormal condition. For example, necrosis refers to the abnormal or pathological death of cells. The suffix -pnea means breathing. For example, sleep apnea occurs when a person intermittently stops breathing while asleep.*

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**18.**

What type of bone is the cuboid?

**Short bone**

Flat bone

Irregular bone

Sesamoid bone

*Correct answer: Short bone*

*The cuboid bone, which is one of the tarsals, is a short bone. Short bones have a thin cortex of compact bone and no cavity.*

*Flat bones are generally flatter than they are round. The ribs are flat bones. Irregular bones, such as the scapulae, have complex shapes. Sesamoid bones, like the patella, are round bones and are often embedded in tendons and joint capsules. Sesamoid bones are a subcategory of irregular bones.*

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**19.**

The muscular system's functions include all the following **except**:

**Calcium storage**

Body movement

Posture and support

Movement of lymph

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*Correct answer: Calcium storage*

*Calcium storage is a function of the body's skeletal system, not the muscular system.*

*The muscular system includes muscles which attach to bone. When the muscles contract, they can create movement, change the body's posture, and provide support for the joints. Muscle contraction assists in the movement of lymph through the lymphatic system of the body.*

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**20.**

Which of the following structures is **not** located in the lower respiratory system?

**The pharynx**

The larynx

The bronchi

The alveoli

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*Correct answer: The pharynx*

*The pharynx, or throat, is located in the upper respiratory system. It is divided into the following three sections:*

- 1. **The nasopharynx** is a pathway for air and a continuation of the nasal cavity.*
- 2. **The oropharynx** is a pathway for food and extends back from the mouth. This is the part of the throat that is visible when a person opens their mouth, containing the tonsils.*
- 3. **The laryngopharynx** is a pathway for both air and food. It begins at the hyoid bone and then separates into the esophagus and the larynx.*

*The larynx (voice box) connects the pharynx to the trachea (windpipe). Both the bronchi and the alveoli are located within the lungs. The larynx, trachea, bronchi, and alveoli are all part of the lower respiratory system.*

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**21.**

Which of the following sensory nerves responds to chemical changes within the body?

**Chemoreceptors**

Nociceptors

Proprioceptors

Mechanoreceptors

*Correct answer: Chemoreceptors*

*Chemoreceptors detect chemical changes within the body and report that information back to the central nervous system.*

*Soft tissue consists of four basic categories of sensory nerves:*

- 1. **Mechanoreceptors** respond to touch, pressure, and movement.*
  - 2. **Proprioceptors** respond to changes in position and movement.*
  - 3. **Chemoreceptors** respond to chemical changes such as oxygen levels and acid-base balance.*
  - 4. **Nociceptors** respond to irritation and pain.*
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**22.**

Of the following, what is the **best** description of ground substance?

**A gelatin-like structure that supports the fibers of fascia and is sensitive to temperature**

The collagen and elastic fibers of the fascia

A gelatin-like structure that supports the fibers of fascia and is insensitive to temperature

Scar tissue

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*Correct answer: A gelatin-like structure that supports the fibers of fascia and is sensitive to temperature.*

*Ground substance is a gelatin-like structure that supports the fibers of fascia and is sensitive to temperature. This sensitivity makes it important to warm the muscles up slowly. As ground substance gets warmer, it becomes more pliable, allowing for more freedom of movement. This warm-up process is an essential part of any massage, workout, or stretching routine.*

*Ground substance supports the collagen and elastic fibers that are also part of the fascia. Fascia plays a role in the creation of scar tissue, but is more influenced by collagen fibers than by ground substance.*

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**23.**

Which of these options accurately describes the path blood takes through the heart?

**Right atrium, right ventricle, lungs, left atrium, left ventricle, aorta**

Left atrium, right ventricle, lungs, right atrium, right ventricle, aorta

Right atrium, right ventricle, aorta, left atrium, right ventricle, lungs

Left ventricle, left atrium, lungs, right ventricle, right atrium, aorta

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*Correct answer: Right atrium, right ventricle, lungs, left atrium, left ventricle, aorta*

*The blood moves in and out of the heart in a well-coordinated and precise rhythm. After bringing oxygen to the body, the blood travels back to the heart, through the lungs (where it is oxygenated again), and back out to the body. This is the path it takes during this process, in greater detail:*

*Body > Vena cava > Right Atrium (RA) > Tricuspid valve > Right Ventricle (RV) > Pulmonic valve > Pulmonary arteries > Lungs > Pulmonary vein > Left Atrium (LA) > Mitral valve > Left Ventricle (LV) > Aortic valve > Aorta > Body*

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**24.**

Where is the coracoid process found?

**The scapula**

The femur

The atlas

The humerus

*Correct answer: The scapula*

*The coracoid process is a small hook-like structure on the superior aspect of the scapula. It stabilizes the shoulder joint with the acromion, it is an attachment point for the pectoralis minor muscle, and it connects with the acromion via ligament to stabilize the shoulder.*

*While there are other skeletal processes, the coracoid process only occurs on the scapula. The femur is a large bone found in the thigh. The atlas, or C1, is the vertebra at the top of the spine, directly inferior to the skull. The humerus is found in the arm.*

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25.

Where are the adrenal glands located?

**The superior aspects of the kidneys**

The lateral aspects of the thyroid

Deep within the brain

Within the pelvis

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*Correct answer: The superior aspects of the kidneys.*

*The adrenal glands are located on the superior aspects (tops) of the kidneys. The kidneys are in the abdomen.*

*The parathyroid glands are located on the lateral aspects of the thyroid. The pineal gland is located deep within the brain. In the female reproductive system, the ovaries are located within the pelvis.*

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**26.**

Which layer of the skin acts as the insulation for the body?

**Subcutaneous tissue**

Epidermis

Dermis

Hair follicles

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*Correct answer: Subcutaneous tissue*

*The skin is made up of three layers: epidermis, dermis, and subcutaneous tissue. The subcutaneous tissue attaches the dermis to the underlying structures. It is made up of fatty adipose tissue and acts as insulation for the body.*

*The epidermis is the most superficial layer of skin tissue. It contains no nerves or blood vessels and is made up of 20–30 layers of flat, keratin-filled dead cells that are continually shed and replaced by deeper layers of tissue. The dermis is deep to the epidermis and superficial to the subcutaneous tissue. The dermis is much thicker than the epidermis and provides much of the structure and strength of the skin. Individual hair follicles are located within the skin.*

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27.

What is the periosteum?

**The dense, fibrous sheath of connective tissue that covers bones**

The process of smooth muscle contraction

A thin membrane of connective tissue lining the cavity of a bone

The tough, flexible connective tissue within a joint

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*Correct answer: The dense, fibrous sheath of connective tissue that covers bones*

*The periosteum is a dense, fibrous sheath of connective tissue covering a bone. When stretched, it provides mechanoreceptor information about the location of a joint.*

*Peristalsis is the process of smooth muscle contraction. The endosteum is a thin membrane of connective tissue lining the cavity of a bone. Cartilage is the tough, flexible, connective tissue within a joint.*

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**28.**

In what way are the left and right lungs different?

**The right lung has three lobes (upper, middle, and lower). The left lung only has two (upper and lower).**

The right lung is responsible for inhalation. The left lung is responsible for exhalation.

The right lung has three lobes (anterior, posterior, and medial). The left lung only has two (anterior and medial).

The left lung has three lobes (upper, middle, and lower). The right lung only has two (upper and lower).

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*Correct answer: The right lung has three lobes (upper, middle, and lower). The left lung only has two (upper and lower).*

*The lungs are not symmetrical. The right lung has three lobes: the upper lobe, middle lobe, and lower lobe. The left lung only has upper and lower lobes. The heart sits between these two lobes on the left side.*

*Barring pathology, the right and left lungs are equally responsible for both inhalation and exhalation. The lobes of the lung might be described as follows: the upper (or superior) lobe; the middle lobe, and the lower (or inferior) lobe. The lobes are neither anterior nor posterior to each other. The right lung is larger than the left lung.*

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**29.**

Which of the following options **best** defines phagocytosis?

**The process in which solids are engulfed by the cell membrane**

The stages of blood cell development that take place in red marrow

The process in which water is diffused through a semipermeable membrane

The process in which a substance moves from a higher to a lower concentration

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*Correct answer: The process in which solids are engulfed by the cell membrane*

*Phagocytosis is the process in which solids are engulfed by the cell membrane. It is a function of white blood cells, in which macrophages (a type of cell) engulf bacteria in a cell-eating process. This is an important function of the body's immune system in the process of fighting infection.*

*Hematopoiesis refers to the stages of blood cell development that take place in red marrow. Osmosis is the process in which water is diffused through a semipermeable membrane. Diffusion is the process in which a substance moves from a higher to a lower concentration.*

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**30.**

While calcium is important in healthy bones, it plays all the following roles **except**:

**Movement of sodium across cell walls**

Transmission of nerve impulses across synapses

Blood clotting

Muscle contraction

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*Correct answer: Movement of sodium across cell walls*

*Calcium helps to transmit nerve impulses across synapses, which is where an axon and a post-synaptic cell meet. It is also important in the processes of blood clotting and muscle contraction.*

*Chloride, which is an electrolyte, easily diffuses across plasma membranes. This movement is closely linked to the movement of sodium. Chloride helps regulate osmotic pressure differences and maintain the body's pH balance.*

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**31.**

Which neurotransmitter is responsible for influencing motor activity, especially fine movements?

**Dopamine**

Serotonin

Oxytocin

Cortisol

*Correct answer: Dopamine*

*Dopamine influences motor activity that involves movement, especially fine motor control. It also influences mood and the ability to focus one's attention. Low dopamine levels contribute to a lack of motor control and clumsiness. Individuals who have Parkinson's disease have a lack of usable dopamine in their brains, which contributes to the motor deficits of the disease. Massage can increase the availability of dopamine in the body.*

*Serotonin allows a person to maintain context-appropriate behavior and regulates mood. Oxytocin is a hormone that facilitates bonding and feelings of attachment. Cortisol is a stress hormone that is produced by the adrenal glands during prolonged stress.*

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**32.**

All the following are examples of digestive secretions, **except**:

**Plasma**

Saliva

Bile

Pancreatic juice

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*Correct answer: Plasma*

*Plasma is a fluid found in blood and lymph. It is not a digestive secretion.*

*Saliva is produced by the salivary glands and lubricates the bolus of food while also facilitating the mixing of food during the chewing process.*

*Bile, produced by the liver, increases the pH of the bolus of food, detoxifies it of harmful substances, and dilutes it in order to facilitate further digestion.*

*Pancreatic juice, produced by the pancreas, digests proteins, polypeptides, lipids, and other substances.*

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**33.**

The reaction that happens within cellular processes that is responsible for the production or consumption of energy is known as:

**Metabolism**

Absorption

Circulation

Reproduction

*Correct answer: Metabolism*

*Metabolism is a chemical reaction that occurs in cells to effect transformation, production, or consumption of energy. Energy comes from nutrients and is processed into ATP. The two types of chemical reactions that may take place during this process are anabolism, which uses energy to join molecules together, and catabolism, which releases energy by breaking down more complex chemical compounds.*

*Absorption is the transportation and use of nutrients. Circulation is the movement of fluids, nutrients, secretions, and waste from one area of the body to another. Reproduction is the formation of a new being or new cells in the body.*

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**34.**

Where is the humerus located?

**The upper limb**

The pelvic girdle

The lower limb

The axial skeleton

*Correct answer: Upper limb*

*The humerus is located in the upper limb of the skeleton. The other limbs in the upper limb are the radius, ulna, carpals, metacarpals, and phalanges.*

*The sacrum, coccyx, and pelvic bones (also called the ilium and ischium) are located in the pelvic girdle. The femur, patella, tibia, fibula, tarsals, metatarsals, and phalanges are located in the lower limb. The axial skeleton refers to the bones located along the central axis of the body, such as the vertebrae, ribcage, and skull.*

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**35.**

Which of the following vitamins is **not** fat-soluble?

**Folic acid**

Vitamin A

Vitamin D

Vitamin K

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*Correct answer: Folic acid*

*Folic acid is a water-soluble vitamin that aids in the formation of hemoglobin and nucleic acids. It is found in green vegetables, legumes, nuts, fruits, and whole grains.*

*Vitamin A, D, E and K are all fat-soluble vitamins. Vitamin A supports mucous membrane health, skin, hair, bone development, and retinal health. Vitamin D aids in the development of bones and teeth and assists in calcium absorption. Vitamin E conserves fatty acids and protects cell membranes. Vitamin K plays an important role in blood clotting.*

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**36.**

Which nerve plexus innervates the diaphragm?

**Cervical plexus**

Brachial plexus

Lumbar plexus

Sacral plexus

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*Correct answer: Cervical plexus*

*The cervical plexus is formed by the ventral rami of the upper four cervical nerves. The phrenic nerve, which is part of this plexus, innervates the diaphragm. Damage to this nerve can cause breathing dysfunction, often resulting in death.*

*The brachial plexus innervates the skin and muscles of the upper limbs. The lumbar and sacral plexuses innervate areas of the abdomen, pelvis, and legs.*

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**37.**

Which nerve root does **not** form part of the four nerve plexuses in the body?

**T8**

C3

C8

L1

*Correct answer: T8*

*The four nerve plexuses are the:*

- *Cervical plexus*
- *Brachial plexus*
- *Lumbar plexus*
- *Sacral plexus*

*Nerves T2-T12 do not form a plexus.*

*C3 is part of the cervical plexus. C8 is part of the brachial plexus. L1 is part of the lumbar plexus.*

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**38.**

What membrane of fibrous connective tissue connects the skin to the muscles and other underlying structures?

**Fascial**

Synovial

Serous

Mucous

*Correct answer: Fascial*

*Fascial membranes are layers of fibrous connective tissue that connect the skin to muscles and other underlying structures.*

*Synovial membranes are located inside the joints and produce synovial fluid that lubricates the joints.*

*Serous membranes produce serous fluid, which lubricates the internal organs of the pelvic, abdominal, and thoracic cavities.*

*Mucous membranes produce mucus that lubricates and protects the respiratory and digestive cavities.*

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**39.**

What happens when the stretch reflex is activated?

**The stretching of a muscle elicits a protective contraction of that same muscle.**

The contraction of one muscle causes its antagonist to relax.

Passive stretching increases flexibility.

The act of overstretching a muscle causes pain.

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*Correct answer: The stretching of a muscle elicits a protective contraction of that same muscle.*

*When the stretch reflex is activated, the stretching of a muscle elicits a protective contraction of that same muscle. This reflex guards against muscle injury. For example, if a person trips, forcing their hip into hyperextension, they may risk injuring the joint and surrounding muscles. In this scenario, the stretch reflex would cause the hip flexors to contract, pulling the joint back into a less dangerous position.*

*During reciprocal inhibition, the contraction of one muscle causes its antagonist to relax. Passive stretching can indeed increase flexibility, and the act of overstretching a muscle often causes pain; however, neither of these activities can be described as a reflex.*

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40.

The male reproductive system includes the testicles, epididymus, vas deferens, ejaculatory duct, urethra, penis, and scrotum. What is the epididymus?

**The site in which the sperm mature**

The site of sperm production

The site of ejaculation

The skin covering the penis

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*Correct answer: The site in which the sperm mature*

*The epididymis is the site in which sperm mature. Sperm is produced in the testicles, after which it travels to the epididymis. It then moves through the vas deferens and into the seminal vesicles.*

*The urethra is a vessel that runs through the penis. This is where both urination and ejaculation occur.*

*The skin is known as the epidermis.*

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41.

What muscle is able to respond to a stimulus?

**Excitable**

Contractible

Conductive

Elastic

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*Correct answer: excitable*

*An excitable muscle is able to respond to a stimulus.*

*A contractible muscle has the ability to shorten.*

*A conductive muscle transmits stimuli.*

*An elastic muscle returns to its original resting position.*

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**42.**

Which of the following cells are responsible for the formation of bones?

**Osteoblasts**

Osteocytes

Osteoclasts

Osteoderm

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*Correct answer: Osteoblasts*

*Osteoblasts are the cells that are responsible for the formation of bones.*

*Osteocytes are the cells that are responsible for maintaining the bones and producing collagen. Osteoclasts are the cells that break down the bone. Osteoderm is not an anatomical term.*

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**43.**

What type of immunity is obtained after an individual has had a specific disease?

**Acquired immunity**

Allergy

Antibody

Acquired immunodeficiency

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*Correct answer: Acquired immunity*

*Acquired immunity is resistance to a specific disease developed by people who have acquired the disease. The body is able to build up antibodies to the specific antigen related to that disease.*

*An allergy is a state of hypersensitivity to a particular substance with an overreaction of the immune system. An antibody is an immune protein produced by the body in response to a specific antigen. Acquired immunodeficiency is a group of symptoms caused by the transmission of a virus that causes a breakdown in the immune system (such as AIDS).*

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44.

Which plane of the body divides the body into left and right sections?

**Sagittal**

Diagonal

Transverse

Coronal/frontal

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*Correct answer: Sagittal*

*The sagittal plane of the body divides the body into left and right sections.*

*The diagonal plane of the body is not a commonly used term. The transverse plane divides the body into superior and inferior sections. The coronal (or frontal) plane divides the body into anterior and posterior sections.*

---

**45.**

If a person has a blockage in the urethra, what would they have difficulty doing?

**Urinating**

Defecating

Vomiting

Sweating

---

*Correct answer: Urinating*

*Urination is the process of expelling urine from the body. The urethra is a tube that transports urine from the bladder to outside the body. A blockage here would cause an inability or significant difficulty with urination.*

*The rectum, not the urethra, is responsible for defecation. Vomiting involves the stomach and esophagus. Sweating occurs on the epidermis.*

---

**46.**

Which of the following is a furrow in a bone that typically holds blood vessels, nerves, or tendons?

**Groove**

Sinus

Head

Meatus

*Correct answer: Groove*

*A groove is a furrow in a bone that typically holds blood vessels, nerves, or tendons. The radial groove of the humerus is one example.*

*An air cavity in bone is known as a sinus (e.g., frontal sinus).*

*A rounded projection found on top of the neck of a bone is a head (e.g., head of the femur).*

*A meatus is a tunnel or canal in the bone, such as the canal in the skull that extends from the external ear to the ear canal.*

---

**47.**

Varicose veins are caused by a breakdown of the:

**Valve system of veins**

Pump system of veins

Arterial capillaries

Valve system of the arteries

---

*Correct answer: Valve system of veins*

*Varicose veins are caused by a breakdown of the valve system of the veins. The valve system prevents circulatory backflow, and so keeps blood from pooling in the lower extremities. When a person spends too much time standing, they may develop varicose veins over time. This is a common condition for people who have spent their careers working as restaurant servers, for example.*

*Veins themselves do not have a pump system; however, the contraction of muscles surrounding veins work as a "muscle pump" to help blood move through veins.*

*Arteries do not have a valve system since blood travels through them at much higher pressures.*

---

48.

In medical terminology, which of the following Latin roots refers to the chest?

**Thorac(o)**

Therm(o)

Ren(o)

Phleb(o)

---

*Correct answer: Thorac(o)*

*The Latin root, or prefix, "thorac(o)" refers to the chest.*

*The root "ren(o)" refers to the kidneys. "Therm(o)" refers to heat. "Phleb(o)" refers to the veins.*

---

**49.**

The bones of the skull can be classified as cranial or facial bones. Which of the following includes examples of both a cranial bone and facial bones?

**Frontal; zygomatic**

Zygomatic; nasal

Sphenoid; temporal

Mandible; maxillary

---

*Correct answer: Frontal; zygomatic*

*The bones of the skull can be classified as cranial or facial bones. For example, the frontal bone is a cranial bone and the zygomatic bones are facial bones. The cranial bones surround and protect the brain. The facial bones support the muscles and other structures of the face.*

*The cranial bones are the parietal, sphenoid, temporal, frontal, occipital, and ethmoid bones.*

*The facial bones are the nasal, vomer, lacrimal, zygomatic, palatine, and maxillary bones, the mandible, and the nasal conchae.*

---

**50.**

Which of the following is **not** a cranial nerve?

**Sciatic**

Optic

Facial

Vagus

*Correct answer: Sciatic*

*The sciatic nerve is a lumbosacral nerve, which means it arises from nerves that exit the lumbar spine and the sacrum. It innervates the posterior thigh, leg, and sole of the foot.*

*The cranial nerves include:*

*I. **The olfactory nerves**, which transmit taste and smell information to the brain.*

*II. **The optic nerves**, which transmit visual information to the brain.*

*III. **The oculomotor nerves**, which transmit information about eye movement.*

*IV. **The trochlear nerves**, which innervate the muscles of the eyeball.*

*V. **The trigeminal nerves**, which transmit information about sensation in the head, face, and facial skin, and include motor neurons for mastication.*

*VI. **The abducens nerves**, which include both sensory and motor neurons related to eye movement.*

*VII. **The facial nerves**, which have sensory neurons for taste and motor neurons for facial expression, tear production, and salivation.*

*VIII. **The vestibulocochlear nerves**, which receive information about hearing and equilibrium.*

*IX. **The glossopharyngeal nerves**, which relate to taste, saliva production, swallowing, and the gag reflex.*

*X. **The vagus nerves**. These nerves contain sensory neurons for the pharynx, larynx, trachea, heart, carotid body, lungs, bronchi, esophagus, stomach, small intestine, and gallbladder. Their motor neurons carry impulses to the pharyngeal and laryngeal*

muscles and the abdominal viscera. They control heart rate and other visceral activities.

XI. **The accessory nerves** mainly contain motor neurons for speaking, turning the head, and moving the shoulders.

XII. **The hypoglossal nerves** contain mostly motor neurons, which innervate the tongue and throat.

---

**51.**

The autonomic nervous system (ANS) is divided into the sympathetic nervous system and the parasympathetic nervous system. Of the following options, which one is a sign that the parasympathetic nervous system is responding to stimuli?

**The individual's digestive system moves appropriately**

The individual's heart rate rapidly increases

The individual starts perspiring

The individual notices a heightened state of awareness

---

*Correct answer: The individual's digestive system moves appropriately*

*Normal digestive activity is controlled by the parasympathetic nervous system. The sympathetic nervous system activates the arousal responses of the "fight or flight" state. The parasympathetic nervous system reverses the actions of the sympathetic nervous system by returning the body to a non-alarm state, restoring "rest and digest" functions.*

*A sympathetic response might result in increased heart rate, perspiration, and/or a heightened state of awareness.*

---

**52.**

What is the term for a cutaneous part of the body supplied by a single nerve?

**Dermatome**

Myotome

Limb

Plexus

---

*Correct answer: Dermatome*

*A dermatome is a cutaneous part of the body (i.e., a section of the skin) supplied by a single nerve. There is some overlap between dermatomal patterns. General knowledge of dermatomes enables massage therapists to locate injuries in the spinal column, even when they present with distal pain.*

*A myotome is a skeletal muscle that is, or group of muscles that are, innervated by a specific spinal nerve. A limb is part of the axial skeleton; each limb has multiple dermatomes. A plexus is a network of intertwining nerves, such as the cranial plexus.*

---

**53.**

Where in the digestive system is the solid waste stored?

**Rectum**

Anus

Ascending colon

Peristalsis

---

*Correct answer: Rectum*

*The solid waste is stored in the rectum and part of the large intestine.*

*The anus is where the sphincter valve controls defecation. The ascending colon is part of the large intestine, running up the right side of the abdomen to the underside of the liver; it receives digested matter from the cecum, which connects directly to the small intestine. Peristalsis is the process of pushing food along the alimentary canal.*

---

**54.**

Which of the following tissues is **not** a type of muscle tissue?

**Hyaline cartilage**

Skeletal

Smooth

Cardiac

---

*Correct answer: Hyaline cartilage*

*There are two main types of cartilage: hyaline cartilage and fibrocartilage. Hyaline cartilage is found on the articulating surfaces of joints, between the ribs, and in the respiratory system. White fibrocartilage is found between the articulating surfaces of joints, such as the knee. This elastic substance is not a type of muscle tissue.*

*Skeletal muscles attach to the bones of the skeleton and move the joints. Smooth muscle is primarily found in the digestive system. Cardiac muscle is found only in the heart.*

---

**55.**

Which of the following cellular functions is responsible for the production of egg and sperm cells?

**Meiosis**

Mitosis

Cell division

Interphase

*Correct answer: Meiosis*

*Meiosis is a specialized form of cell division. During this process, the number of chromosomes is halved before being reproduced in a new cell. Meiosis results in the creation of ova or sperm cells, used in the reproductive process.*

*Mitosis is another word for cell division. Meiosis is a specialized kind of mitosis. Interphase is the stage in a cell's life cycle when it carries out most of its activities; this period of time does not include cell division.*

---

**56.**

A client is having pain along the tip of his shoulder, and it continues along the posterior aspect of the upper arm to the dorsum of the lower arm and hand and into the pointer and middle fingers. What dermatome is involved?

**C7**

C5

C6

C8

*Correct answer: C7*

*Pain along the tip of the shoulder, continuing along the posterior aspect of the upper arm and into the dorsum of the lower arm, reaching the pointer and middle fingers follows the path of the C7 dermatome. The easiest way to identify pain as being in the C7 dermatome is by determining which fingers are involved.*

*The C5 dermatome travels along the volar (anterior) aspect of the lower arm and does not travel into the hand. The C6 dermatome travels into the thumb, while the C8 dermatome travels into the ring and pinky fingers.*

---

**57.**

Which of the following serves as a reservoir for urine?

**Urinary bladder**

Kidney

Ureter

Urethra

---

*Correct answer: Urinary bladder*

*The urinary bladder serves as a reservoir for urine. It is a muscular, bag-like organ that lies in the pelvis.*

*Urine is produced in the kidneys. The ureters transport urine from the kidneys to the bladder. The urethra carries urine to the exterior of the body.*

---

**58.**

Which important area of the brain regulates essential functions of heart rate, respiration, and blood pressure?

**Medulla oblongata**

Midbrain

Cerebellum

Temporal lobe

---

*Correct answer: Medulla oblongata*

*The medulla oblongata connects the pons with the spinal cord. It contains the cardiac center (which regulates heartbeat), the vasomotor center (which regulates blood pressure), and the respiratory center (which regulates breathing).*

*The midbrain, or mesencephalon, correlates information about posture with auditory and visual reflexes. The cerebellum is the second-largest segment of the brain. It contains centers for balance, equilibrium, muscular coordination, posture, and balance. It also controls subconscious movements of skeletal muscle and receives input from proprioceptors. The temporal lobe is responsible for hearing and smell.*

---

59.

Which of the following is **not** a system of the body?

Cranial

Muscular

Cardiovascular

Respiratory

---

*Correct answer: Cranial*

*The cranium, or skull, contains the brain. This is an adjective used to refer to an area of the body, but not a system of the body.*

*There are 11 systems of the human body: the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic and immune, respiratory, digestive, urinary (renal), and reproductive systems.*

---

**60.**

What produce(s) a hormone that lowers calcium levels in the blood, and what is this hormone called?

**Thyroid; calcitonin**

Posterior pituitary gland; oxytocin

Adrenal glands; norepinephrine

Thyroid; thyroxine

---

*Correct answer: Thyroid; calcitonin*

*The thyroid produces a hormone that lowers calcium levels in the blood. This hormone is called calcitonin. It decreases levels of blood calcium by inhibiting the release of calcium and potassium from the bones.*

*The thyroid also produces thyroxine and triiodothyronine, which regulate the body's metabolism by maintaining an appropriate level of oxygen consumption on a cellular level.*

*The posterior pituitary gland produces oxytocin, which stimulates positive emotions and regulates lactation.*

*The adrenal glands produce norepinephrine (or noradrenaline) in response to stress.*

---

**61.**

Which glands of the endocrine system are located on top of each kidney?

**Adrenal**

Thyroid

Pituitary

Pineal

---

*Correct answer: Adrenal*

*There are two adrenal glands, each located on top of each kidney. Each gland consists of an outer layer called the cortex and an inner area called the medulla. They produce adrenaline (or epinephrine), noradrenaline (or norepinephrine) and cortisol.*

*The thyroid is located below the larynx in the neck. The pituitary gland is located beneath the thalamus and the hypothalamus in the center of the brain. The pineal gland is the small gland that is located in the midbrain of the brainstem.*

---

**62.**

What does the enteric nervous system innervate?

**The gallbladder, pancreas, and gastrointestinal tract**

The heart and lungs

The kidneys and bladder

Skin

*Correct answer: The gallbladder, pancreas, and gastrointestinal tract*

*The enteric nervous system is a division of the autonomic nervous system and innervates the gallbladder, pancreas, and gastrointestinal tract. It can act independently of the sympathetic and parasympathetic nervous systems. It is sometimes referred to as the "belly brain."*

*The heart and lungs, and the kidneys and bladder, are all innervated by the autonomic nervous system, but not the enteric nervous system. The skin is innervated by the somatic nervous system.*

---

**63.**

What is the function of the coronary arteries?

**To bring oxygen-rich blood to the cardiac muscle**

To deliver blood to the heart for oxygenation

To bring oxygen-rich blood directly from the lungs to the cardiac muscle

To bring oxygen-rich blood from the heart to the lungs

---

*Correct answer: To bring oxygen-rich blood to the cardiac muscle.*

*Coronary arteries bring oxygen-rich blood to the cardiac muscle, providing oxygen to the cells that make up the heart. They originate at the base of the aorta.*

*The venous system, including coronary veins, delivers blood to the heart. The heart pumps blood to the lungs for oxygenation. The coronary arteries are not directly connected to the lungs. The pulmonary arteries bring oxygen-poor blood from the heart to the lungs; oxygen-rich blood does not travel from the heart to the lungs.*

---

**64.**

The abdominal region is divided into four quadrants: right upper quadrant, left upper quadrant, right lower quadrant and the left lower quadrant. Which quadrant holds the appendix?

**Right lower quadrant**

Right upper quadrant

Left lower quadrant

Left upper quadrant

---

*Correct answer: Right lower quadrant*

*The right lower quadrant extends from the median plane to the right and from the umbilical plane to the right inguinal ligament. Pain in the right lower quadrant could be a red flag for appendicitis as the appendix is found within the right lower quadrant.*

*The right upper quadrant contains structures such as the liver, gallbladder and head of pancreas. The left upper quadrant contains structures such as the stomach and spleen. The left lower quadrant contains the descending colon and left ureter.*

---

65.

Which of the following planes of the body divides the body into *equal* left and right halves, running down the middle of the body?

**Midsagittal**

Coronal

Transverse

Frontal

---

*Correct answer: Midsagittal*

*The midsagittal plane divides the body into equal left and right halves.*

*The coronal plane, also known as the frontal plane, divides the body into front and back halves. The transverse plane divides the body into upper and lower halves.*

---

**66.**

Which of the following organ systems is responsible for the body's ability to produce hormones?

**Endocrine system**

Muscular system

Respiratory system

Integumentary system

---

*Correct answer: Endocrine system*

*The endocrine system is composed of glands which are responsible for the body's ability to produce hormones. These hormones regulate physiological functions in an effort to maintain homeostasis. Each hormone has a specific purpose, and serves to either stimulate or inhibit a particular function of the cells.*

*The muscular system is responsible for the body's ability to move. The respiratory system, which includes the lungs, is responsible for the body's ability to breathe and make use of oxygen. The integumentary system, which includes the skin, is responsible for many functions, including the regulation of temperature and protection from the contraction of pathogens.*

---

**67.**

Which of the following is **not** found in a female's reproductive system?

**Epididymis**

Cervix

Fallopian tube

Mammary glands

---

*Correct answer: Epididymis*

*The epididymis is found in a male's reproductive system, not a female's reproductive system. It is a highly convoluted duct behind the testes, where sperm mature and then pass to the vas deferens.*

*The structures in a female's reproductive system include the ovaries, fallopian tubes, uterus, cervix, vagina, vestibular glands, mammary glands, and vulva.*

*The structures in a male's reproductive system include the penis, scrotum, testes, epididymis, vas deferens, seminal vesicles, prostate gland, and bulbourethral gland.*

---

**68.**

What is the process of energy loss caused by friction when tissues are loaded and unloaded?

**Hysteresis**

Creep

Load

Thixotropy

---

*Correct answer: Hysteresis*

*Hysteresis is the process of energy loss caused by friction when tissues are loaded and unloaded. The tissues produce heat as they are loaded and unloaded, which happens with on-and-off pressure. Creating hysteresis reduces stiffness and improves tissue extensibility.*

*Creep is the continued deformation of a viscoelastic material under constant load. Load is the degree of force applied to a particular area. Thixotropy is a quality of colloids, in which rapid force increases the rigidity of the tissue.*

---

69.

The peripheral nervous system is composed of which of the following?

**The spinal nerves and cranial nerves**

The brain and spinal cord

The brain and cranial nerves

The spinal cord and spinal nerves

---

*Correct answer: The spinal nerves and cranial nerves*

*The peripheral nervous system is composed of spinal nerves and cranial nerves. It includes 12 pairs of cranial nerves and 31 pairs of spinal nerves. It is divided into the somatic nervous system and the autonomic nervous system.*

*The central nervous system is composed of the brain, the spinal cord, and the meninges. The meninges are three layers of connective tissue that cover and protect the brain and spinal cord.*

---

**70.**

If a patient is complaining of pain and tingling in the hand, which nerve plexus may have nerve damage or irritation?

**Brachial plexus**

Lumbar plexus

Sacral plexus

Carpal plexus

---

*Correct answer: Brachial plexus*

*The brachial plexus comprises nerves that are responsible for innervation of the hand. Irritation to this plexus could result in pain, numbness, or tingling into the hand. The brachial plexus is a network of nerves formed by C5-C8 and T1 (lower four cervical nerves and the first thoracic nerve). It passes through the anterior neck, over the first rib, and into the axillary region. Compression or irritation of part of the plexus can result in an abnormal sensation in the area that is innervated.*

---

**71.**

You accidentally touch a hot stove, and quickly pull your hand away. What sort of reflex causes this action to occur?

**Withdrawal reflex**

Righting reflex

Arthrokinetic reflex

Stretch reflex

---

*Correct answer: Withdrawal reflex*

*The withdrawal reflex is a protective response in which instantaneous muscle contraction occurs for protection. When a person touches a hot stove, the withdrawal reflex is activated to quickly pull their hand back and avoid further injury.*

*The righting reflex and the oculopelvic reflexes stimulate instantaneous contraction for joint protection and support an upright posture. The arthrokinetic reflex is the unconscious contraction of the muscles surrounding a joint in response to irritation. This is also known as splinting. The stretch reflex (such as the patellar tendon reflex) is a protective reflex that reacts to the quick stretch of a muscle or tendon, causing that same structure to contract in order to avoid injury.*

---

72.

Which of the following is **not** contained or embedded within the dermis?

**Nails**

Connective tissue

Hair follicles

Glands

---

*Correct answer: Nails*

*Nails are not contained within the dermis.*

*The dermis is located below the epidermis. The dermis is made of connective tissue and contains lymphatic vessels, blood vessels, hair follicles, and sweat glands.*

---

**73.**

The popliteal fossa is an endangerment site, in which the popliteal artery or nerve could be damaged by a massage. Where is the popliteal area located?

**The posterior knee**

The stomach

The elbow

The back of the neck

---

*Correct answer: Posterior knee*

*The popliteal fossa is another term for the posterior knee. This is an endangerment site for the popliteal artery and vein and the tibial nerve. As such, it should usually be avoided during massage.*

*The umbilicus, or stomach area, is an endangerment site for the aorta. The medial epicondyle of the humerus, located in the elbow joint, is an endangerment site for the ulnar nerve, radial artery, and ulnar artery. The lateral epicondyle of the humerus, located in the elbow joint, is an endangerment site for the radial nerve. The posterior triangle of the neck, or back of the neck, is an endangerment site for the brachial plexus, the brachiocephalic artery and vein superior to the clavicle, and the subclavian arteries and vein.*

---

**74.**

Which type of sensory nerves respond to touch, pressure, and movement?

**Mechanoreceptors**

Proprioceptors

Chemoreceptors

Nociceptors

---

*Correct answer: Mechanoreceptors*

*Mechanoreceptors respond to changes in position and movement. They are typically located in fascia, muscles, tendons, and joints.*

*Soft tissue consists of four basic categories of sensory nerves:*

- 1. **Mechanoreceptors** respond to touch, pressure, and movement.*
  - 2. **Proprioceptors** respond to changes in position and movement.*
  - 3. **Chemoreceptors** respond to chemical changes such as oxygen levels and acid-base balance.*
  - 4. **Nociceptors** respond to irritation and pain.*
-

**75.**

The small blood vessels that branch from the arteries are known as:

**Arterioles**

Veins

Venules

Capillaries

---

*Correct answer: Arterioles*

*Arterioles are the small blood vessels that branch from the arteries. They are the smallest arteries. They enter the tissues and branch into capillaries, supplying the cells of the body with oxygen.*

*Capillaries connect with both arterioles and venules, and function as the bridge between the arterial and venous systems. Venules are the small blood vessels that branch from the veins. Veins carry deoxygenated blood back to the heart.*

---

76.

Which of the following is not a smooth or cardiac muscle?

**Rectus femoris**

Heart

Intestine

Bladder

---

*Correct answer: Rectus femoris*

*The rectus femoris is a skeletal muscle.*

*The heart is a cardiac muscle.*

*Smooth muscles are involuntary and include the blood vessels, stomach, intestine, and bladder.*

---

77.

All of the following statements are true of fascia **except**:

**It is a network of connective tissue that protects muscles from inflammation.**

It is a network of collagen and elastic fibers.

It is a network of fibers embedded in ground substance.

It is a network of fibers found throughout the body, supporting various kinds of tissue.

---

*Correct answer: It is a network of connective tissue that protects muscles from inflammation.*

*Fascia does not protect muscles from inflammation. On the contrary, fascia is a major location of inflammatory processes.*

*Fascia is a network of connective tissue made up of collagen and elastic fibers embedded in ground substance. It is found throughout the body, and it supports many kinds of tissue. For example, layers of fascia surround every muscle as well as every individual muscle cell. It also supports the viscera.*

---

**78.**

If a massage is applied directly over the medial epicondyle of the humerus, what does the massage therapist risk damaging or irritating?

**Ulnar nerve, ulnar artery, and radial artery**

Radial nerve

Sciatic nerve

Umbilicus

---

*Correct answer: medial epicondyle of the humerus; ulnar nerve, ulnar artery, and radial artery*

*If a massage is applied directly over the medial epicondyle of the humerus, the massage therapist risks damaging or irritating the ulnar nerve, ulnar artery, and radial artery.*

*Massaging directly over the lateral epicondyle of the humerus endangers the radial nerve.*

*To avoid aggravating the sciatic nerve, the therapist must take care massaging around the gluteal region and along the path of the sciatic nerve.*

*Direct pressure or manipulation around the umbilicus can potentially cause discomfort or irritation, especially if the technique is too forceful or if the person has a medical condition affecting this area. Care should be taken to avoid excessive pressure or manipulation directly on the umbilicus to prevent discomfort or injury.*

---

**79.**

Which of the following is **not** considered fascia?

**Cartilage**

Retinacula

Muscle envelopes

Dura mater

---

*Correct answer: Cartilage*

*Fascia can be described as is the soft tissue component of the connective tissue system that permeates the human body. There are many body structures that can be considered types of fascia including septa, muscle envelopes, joint capsules, retinacula, dura mater, periosteum, perineurium, organ capsules, and bronchial connective tissue.*

*The fascial network does not include the skin, cartilage or bones. Cartilage is part of the skeletal system.*

---

80.

Smooth muscle tissue is responsible for the contraction of all the following **except**:

Heart

Uterus

Intestines

Blood vessels

---

*Correct answer: Heart*

*Cardiac muscle tissue, not smooth muscle tissue, is responsible for the contraction of the heart.*

*Smooth muscle tissue is responsible for the contraction of the uterus, bladder, diaphragm, intestines, and blood vessels.*

---

**81.**

If a client has lost voluntary control over the movement of his body parts, which body system is **not** functioning appropriately?

**Nervous system**

Skeletal system

Endocrine system

Integumentary system

---

*Correct answer: Nervous system*

*If a client has lost control over his body parts, his nervous system is not functioning appropriately. The nervous system is responsible for the communication of stimuli and control of responses. For example, a stroke (which is one form of injury to the brain) may cause a client to lose control over the actions of his body.*

*The skeletal and muscular systems are responsible for framework and movement. The endocrine system is primarily responsible for regulating hormones in the effort to maintain homeostasis. The integumentary system, which includes the skin, contains protective membranes, sensory receptors, and similar structures.*

---

**82.**

Regarding lung volume, what is the vital capacity of a normal, healthy adult?

**3.5 to 5.5 liters of air**

0.5 to 2 liters of air

2 to 3 liters of air

5.5 to 7.5 liters of air

---

*Correct answer: 3 to 5 liters of air*

*The vital capacity of air for a normal, healthy adult is 3.5 to 5.5 liters of air. This is the combined total of: the amount they inhale during a single breath (tidal volume); the amount they can forcefully inhale following a normal breath (inspiratory reserve volume); and the amount they can forcefully exhale after a normal exhalation (expiratory reserve volume). These amounts may be decreased in people with respiratory diseases such as asthma and emphysema.*

---

83.

What is a motor unit?

**A single motor neuron and all the muscle fibers it controls**

A motor neuron

A group of muscles working together to perform an action, stimulated by motor neurons

The muscle that controls an action, also known as a mover.

---

*Correct answer: A single motor neuron and all the muscle fibers it controls.*

*A motor unit consists of a single motor neuron and all the muscle fibers it controls.*

*While a motor neuron is part of each motor unit, the term "motor unit" includes the fibers it innervates. Groups of muscles that regularly work together have unique names, such as the hip flexors or the rotator cuff of the shoulder. The mover, or the muscle that controls an action, is the agonist.*

---

**84.**

Which anatomical organ is the largest?

**The skin**

Muscular tissue

The small intestine

A church organ

*Correct answer: The skin*

*The skin is the largest organ of the body. It is made of three layers of tissue, including the epidermis, dermis and the subcutaneous tissue. It serves to protect the body from injury and infection, as well as controlling body temperature.*

*There is a great deal of muscular tissue in the body, but the muscular system is not considered to be one single organ. The small intestine is a long organ that completes digestion, absorbs nutrients and water, and digests proteins, sugars and starches. A church organ is not an anatomical structure.*

---

85.

Which of the following are located in the lower extremity?

**Tarsals and metatarsals**

Carpals and metacarpals

Carpals and phalanges

Tarsals and carpals

---

*Correct answer: Tarsals and metatarsals*

*The tarsals and metatarsals are located in the lower extremity. The tarsal bones are located in the ankle. They attach to the metatarsal bones, which make up the instep of the foot.*

*The carpal and metacarpal bones are located in the wrist and hand.*

*Both the hand and foot contain phalanges, which are the bones of the fingers and toes.*

---

**86.**

How many pairs of spinal nerves are there, and how many of those are thoracic?

**31 pairs; 12 pairs**

24 pairs; 12 pairs

31 pairs; 8 pairs

24 pairs; 8 pairs

*Correct answer: 31; 12*

*There are 31 pairs of spinal nerves, of which 12 pairs are thoracic. The spinal nerves are organized as follows:*

- *8 cervical*
- *12 thoracic*
- *5 lumbar*
- *5 sacral*
- *1 coccygeal*

*Spinal nerves are easily associated with the vertebrae near which they originate. They contain both motor and sensory neurons.*

---

**87.**

What is the main difference between hormones and neurotransmitters?

**Location**

Function

Chemical makeup

Half-life

---

*Correct answer: Location*

*The main difference between hormones and neurotransmitters is location. When they are found in the bloodstream or in a tissue, they are called hormones. When they are found in synapses, they are referred to as neurotransmitters.*

*The same chemical may function as both a neurotransmitter and a hormone if it is found in both the tissue of the body and between nerve synapses. Therefore, the function, chemical makeup, and half-life of a chemical have no bearing on whether it is identified as a hormone or a neurotransmitter.*

---

**88.**

Which of the following is **not** a function of the reproductive system?

**Peristalsis**

Production of gametes

Production of eggs

Production of sperm

---

*Correct answer: Peristalsis*

*Peristalsis is the rhythmic contraction of smooth muscle that occurs in the digestive system. This is not a function of the reproductive system.*

*The reproductive systems of both males and females produce gametes, which are cells with half the DNA of their parent cells. In females, the gametes are eggs, or ova. In males, the gametes take the form of sperm.*

---

**89.**

Which part of the brain is responsible for controlling one's concentration, planning and problem-solving?

**Frontal lobe**

Temporal lobe

Occipital lobe

Postcentral gyrus

---

*Correct answer: Frontal lobe*

*The frontal lobe is the anterior area of the brain, positioned behind the frontal bone. It controls voluntary skeletal muscles in the precentral gyrus. In addition, it is essential for functions of problem-solving which involve planning and higher levels of concentration.*

*The temporal lobe is responsible for hearing and smell. The occipital lobe is responsible for eyesight. The postcentral gyrus is responsible for sensing temperature, pressure, touch, and pain.*

---

**90.**

The pulmonary artery and aorta are:

**Elastic arteries**

Part of the venous system

Arterioles

Capillaries

---

*Correct answer: Elastic arteries*

*The pulmonary artery and the aorta are elastic arteries. This means they are large arteries with thick walls, capable of undergoing passive stretching. The arteries closest to the heart need to be larger than other arteries, so they can accommodate more blood at one time.*

*Arterioles are the smallest of arteries, and are found further away from the heart.*

*Capillaries are some of the tiny blood vessels located between arterioles and venules.*

*The venous system includes the veins; arteries are part of the arterial system. Both the venous system and the arterial system are part of the cardiovascular system.*

---

**91.**

A massage therapist encounters a person who fell and hit the posterior aspect of their head resulting in a brain injury. What portion of the brain is **most** likely affected, and what would the person likely have difficulty with?

**The occipital lobe; vision**

The occipital lobe; speech

The parietal lobe; sensation

The parietal lobe; vision

---

*Correct answer: The occipital lobe; vision*

*The occipital lobe makes up the posterior aspect of the brain; therefore, if a person were to hit the back of their head, it would most likely result in an injury to this lobe. The occipital lobe is involved in vision; therefore, the person would likely have difficulty in this area.*

*The parietal lobe makes up the area just anterior and superior to the occipital lobe and would most likely not be affected by a blow to the back of the head. The parietal lobe is involved in sensation.*

---

**92.**

Regarding neurotransmitter physiology, which neurotransmitter regulates mood and produces a sense of calm and comfort?

**Serotonin**

Epinephrine

Oxytocin

Cortisol

*Correct answer: Serotonin*

*Serotonin is a neurotransmitter that allows a person to perform context-appropriate behaviors. It regulates mood and produces a sense of calm and comfort. It also regulates satiety in regard to such behaviors as eating and sex. Low serotonin levels are often associated with depression, impulsive behavior, and eating disorders. Massage appears to increase serotonin levels.*

*Epinephrine is produced as an immediate response to stress, activating the body's fight/flight response. Oxytocin is a hormone associated with feelings of attachment and empathy. Cortisol is a stress hormone that increases sympathetic arousal, and is produced during prolonged periods of stress.*

---

**93.**

Which tissue is responsible for connecting muscle to bone?

**Tendon**

Ligament

Fascia

Cartilage

---

*Correct answer: Tendon*

*Tendons are tissues that are responsible for connecting muscle to bone. Tendons are found at the end of a muscle belly.*

*Ligaments are short bands of tough, flexible, fibrous connective tissue that connect two bones or cartilages or hold together a joint. Fascia is connective tissue responsible for lining muscles, vessels, and nerves. Cartilage is the tissue that is responsible for cushioning joints and reducing friction between bones.*

---

94.

Osteoblast cells are found in the skeletal system. What is their function?

**To build bone**

To build cartilage

To maintain bone

To produce blood cells

---

*Correct answer: To build bone*

*Osteoblasts build bone during the ossification (or calcification) process.*

*Chondroblasts create the cartilage model of the bones. Osteoclasts are mature bone cells, which maintain the bone after it has formed. Red marrow, found at the ends of long bones and the center of certain other bones, produces blood cells.*

---

**95.**

Where does movement of the skeletal system occur?

**Joints**

Muscles

Nerves

Bones

*Correct answer: Joints*

*A joint is a place where two or more bones articulate with each other. Skeletal movement occurs at joints (although not all joints allow for movement).*

*Muscles generate movement in the skeletal system. Nerves innervate the tissues of the body and send messages from the brain to the muscles, initiating movement. The bones provide structural stability and act as moving parts.*

---

**96.**

Regarding the reproductive system, how long is the gestational period for women?

**38–40 weeks**

34–36 weeks

44–46 weeks

32–34 weeks

---

*Correct answer: 38–40 weeks*

*The full gestational period for humans is 38–40 weeks and is divided into three trimesters. It is important for a massage therapist to understand the varying trimesters of pregnancy in order to ensure safe and appropriate massage techniques for an expecting woman.*

- *The first trimester is a time of radical hormonal changes and changes in the mother, which may cause moodiness, fatigue, and nausea.*
  - *The second trimester is a time of increased blood volume and increased appetite.*
  - *The third trimester often includes postural changes and often discomfort.*
-

97.

Fascia is connective tissue that:

**Supports and lines muscles, vessels, and nerves**

Is made of liquid, blood cells, and plasma

Connects muscles to bones

Is located in the ears, nose, and joints

---

*Correct answer: Supports and lines muscles, vessels, and nerves*

*Fascia is the connective tissue that supports and lines muscles, vessels, and nerves. Fascia is a fibrous membrane. Because fascia both surrounds and is found inside every muscle, fascial release is an important massage technique.*

*Blood is the connective tissue that is made of liquid, blood cells, and plasma.*

*A tendon is a connective tissue that connects the muscles to the bones.*

*Cartilage is the connective tissue that is located in the ears, nose, and joints.*

---

98.

If a client fractures their sternum, which area of their body is injured?

Chest

Shoulder

Lower leg

Back

---

*Correct answer: Chest*

*The sternum is located in the chest. Some ribs are also located in the chest, while others surround the abdomen.*

*The shoulder contains the scapula, clavicle, and humerus. The lower leg contains the femur, patella, fibula, tibia tarsals, metatarsals, and phalanges. The back contains the scapula, vertebrae, ribs, sacrum, and coccyx.*

---

99.

Which of the following refers to a rounded bump on a bone?

**Condyle**

Crest

Spine

Tuberosity

---

*Correct answer: Condyle*

*A rounded bump on a bone is known as a condyle. Anatomical examples include the femoral condyle, occipital condyles, and tibial condyles.*

*A ridge on a bone is known as a crest.*

*A sharp bump on a bone is known as a spine.*

*A large, rough bump on a bone is known as a tuberosity.*

---

**100.**

What are the four major nerve plexuses?

**Cervical, Brachial, Lumbar, Sacral**

Spinal, Sternal, Pelvic, Femoral

Sympathetic, Parasympathetic, Voluntary, Involuntary

Cervical, Sternal, Lumbar, Axial

*Correct answer: Cervical, Brachial, Lumbar, Sacral*

*The four major nerve plexuses are the cervical, brachial, lumbar, and sacral plexuses. A plexus is an intertwining network of nerves that innervates a specific region of the body.*

*While the spinal, sternal, pelvic, femoral, and axial regions of the body are all innervated, none of these terms refer to major plexuses. The sympathetic nervous system is responsible for the body's fight/flight response and is activated due to stress. The parasympathetic nervous system is responsible for such functions as digestion and restoring homeostasis. Voluntary actions, like skeletal muscle movement, are performed consciously and intentionally. Involuntary actions, like digestion, are performed without conscious intention.*

---

**101.**

During a massage, you notice your client's heart rate is rapid, she produces a lot of sweat, and she has goosebumps. What branch of the nervous system is responsible for these findings?

**Sympathetic**

Parasympathetic

Central

Synaptic

*Correct answer: Sympathetic*

*The sympathetic branch of the autonomic nervous system is the "fight or flight" response. The production of epinephrine increases, blood vessels constrict, the pupils dilate, and the pilomotor muscles are stimulated (causing goosebumps). All of these reactions occur in response to stress. In this situation, it may be appropriate for the massage therapist to pause massaging the client and check in verbally, as the client may be experiencing acute distress.*

*The parasympathetic branch is responsible for the body's "rest and digest" response. The heart rate slows, blood vessels are dilated, pupils constrict, and digestive juice secretion increases, allowing for digestion. This occurs when stressful stimuli are not present. The central nervous system refers to the brain, spinal cord, and their coverings. The synapses are the spaces or connection points between individual neurons. "Synaptic nervous system" is not a commonly used term.*

---

102.

Which of the following is **true** of skeletal muscle?

**It is voluntary muscle.**

It is found in the heart.

It is found only in the limbs.

There are 50 skeletal muscles.

---

*Correct answer: It is voluntary muscle.*

*Skeletal muscles are voluntary muscles that attach to bone in order to move the joints of the body.*

*Cardiac muscle is found only in the heart. Skeletal muscle attaches to bones throughout the body; not only in the limbs. There are over 600 skeletal muscles in the body.*

---

103.

The nociceptors, which are part of the somatic nervous system, are:

**Pain receptors**

Temperature receptors

Movement receptors

Chemical receptors

---

*Correct answer: Pain receptors*

*The nociceptors are pain receptors. The word root noci- means pain. The nociceptors detect irritation or pain.*

*The thermoreceptors are temperature receptors. The mechanoreceptors detect touch, pressure, and movement. The proprioceptors respond to changes in position and movement. Chemoreceptors detect chemical changes in the body.*

---

**104.**

The lymphatic system includes all the following **except**:

**Platelets**

Axillary nodes

Thoracic duct

Plantar plexus

---

*Correct answer: Platelets*

*The lymphatic system is a specialized component of the circulatory system and is responsible for waste disposal and immune response. Unlike the vascular system, the lymphatic system does not include red blood cells or platelets. Instead of circulating blood throughout the body, lymphatic vessels circulate large molecules such as proteins, lipids, bacteria, and other particles.*

*The axillary lymph nodes are located in the armpit (axillary region). The thoracic duct is a large lymphatic vessel that receives lymph from other areas of the body. The plantar plexus is a network of lymphatic vessels located on the plantar surface of the foot (the sole of the foot).*

---

**105.**

A client's doctor diagnoses her with hypertension. What does this tell you that she definitely has?

**High blood pressure**

Low blood pressure

High anxiety

Chronic pain due to extremely tight muscles

---

*Correct answer: high blood pressure*

*A client's doctor diagnoses her with hypertension. This tells you that she definitely has high blood pressure. Hypertension is simply a technical term meaning elevated blood pressure. Most physicians consider blood pressure above 140/90 to fit this diagnosis.*

*Low blood pressure is called hypotension.*

*High blood pressure and high anxiety may be correlated, but either one of these diagnoses does not necessarily indicate that the other is present.*

*Chronic pain due to tight muscles could indicate a number of long-term conditions, or could be caused by acute injury.*

---

**106.**

What does the sternum consist of?

**Manubrium, body, xiphoid process**

Manubrium, body, coccyx

Head, body, xiphoid process

Head, body, sternal end

---

*Correct answer: Manubrium, body, xiphoid process*

*The sternum consists of the manubrium, the body, and the xiphoid process.*

*The coccyx, or tailbone, is located inferior to the sacrum in the pelvis.*

*The clavicle consists of the head, body, and sternal end.*

---

**107.**

What does the skeletal system include?

**The bones, joints, and ligaments**

The exoskeleton and the endoskeleton

The bones, joints, tendons, and ligaments

The bones and muscles

*Correct answer: The bones, joints, and ligaments*

*The skeletal system includes the bones, joints, and ligaments. It supports the body and allows for motion. Its seven major functions are:*

- 1. Supporting soft tissues throughout the body;*
- 2. Providing attachment points for bones and muscles;*
- 3. Protecting internal organs;*
- 4. Serving as levers to provide movement created by attached muscles;*
- 5. Storing calcium, phosphorus, and other minerals to be released into the body as needed;*
- 6. Producing blood cells in the red marrow; and*
- 7. Promoting endocrine activity.*

*Humans have an endoskeleton, which means that this system is internal.*

*Exoskeletons, which are external, are found in many other species, such as lobsters and various insects.*

*The muscles and tendons are part of the muscular system, not the skeletal system. Together, these two systems are often called the musculoskeletal system. However, when only discussing the skeletal system, muscles and tendons are not included.*

---

**108.**

Which of the following muscles performs hip extension?

**Gluteus maximus**

Gluteus minimus

Piriformis

Sartorius

---

*Correct answer: Gluteus maximus*

*The gluteus maximus muscle is the largest muscle of the buttocks. It is responsible for hip extension and lateral rotation of the thigh. It is especially active during walking and strenuous activities such as climbing and running.*

*Gluteus minimus performs thigh abduction and medial rotation, and allows for anterior tilt of the pelvis at the hip joint. Piriformis performs lateral rotation of the hip joint, and in certain positions it can also perform abduction and medial rotation. Sartorius performs flexion, lateral rotation, and abduction of the thigh, as well as flexion and medial rotation of the leg at the knee joint.*

---

**109.**

If a client is unable to feel your touch on a certain area of the leg, what type of nerves are **most** likely affected?

**Afferent**

Efferent

Cranial

Radial

*Correct answer: Afferent*

*Afferent nerves carry information (such as touch) from the body to the central nervous system. Dysfunction of these nerves would result in difficulty or complete absence of sensation in certain areas of the body.*

*Efferent nerves carry information from the central nervous system and result in motor (or movement) responses. Cranial nerves are only present in the head region. The radial nerve is a peripheral nerve that is only present in the upper extremity.*

---

110.

Which skeleton includes the head, vertebral column, ribs, and sternum?

**Axial**

Appendicular

Central

Frontal

---

*Correct answer: Axial*

*The axial skeleton includes the head, vertebral column, ribs, and sternum. It makes up the axis of the body.*

*The appendicular skeleton includes the limbs and their attachments.*

*"Central" is not a commonly used term to refer to the skeleton.*

*The frontal plane runs vertically and divides the body into anterior and posterior parts.*

---

**111.**

Which region of the body does the term "cephalic" refer to?

**Head**

Neck

Back

Chest

---

*Correct answer: Head*

*Cephalic is a medical term used to describe the head. The head can also be described as including the cranial (upper skull) and facial (face) areas.*

*Cervical describes the neck, dorsal describes the back, and thoracic describes the chest.*

---

**112.**

Which of the following best describes the function of the respiratory system?

**It exchanges oxygen and carbon dioxide between the blood and body cells.**

It exchanges carbon dioxide and oxygen within the lungs.

It is responsible for absorbing oxygen into the bloodstream.

It produces oxygen and removes carbon dioxide.

---

*Correct answer: It exchanges oxygen and carbon dioxide between the blood and body cells.*

*The respiratory system is primarily responsible for gas exchange between the blood and body cells during internal respiration. This process involves oxygen being delivered to cells and carbon dioxide being removed from them.*

*External respiration takes place in the lungs, where oxygen from inhaled air enters the bloodstream, and carbon dioxide from the blood is exhaled. However, the actual gas exchange within the body's cells occurs during internal respiration.*

*The lungs are not the location of the oxygen-carbon dioxide exchange within the body's cells; this happens in the tissues. The respiratory system absorbs oxygen but does not produce it, and the digestive system is responsible for ingesting substances, not the respiratory system.*

---

113.

Vasoconstriction occurs when:

**Any type of blood vessel contracts, getting smaller inside**

A vein contracts, getting smaller inside

A vein forcibly contracts, pumping blood to the extremities

Any type of blood vessel expands, getting larger inside

---

*Correct answer: Any type of blood vessel contracts, getting smaller inside*

*Vasoconstriction occurs when any type of blood vessel constricts, getting smaller inside. When this happens in response to inflammation, it is quickly followed by vasodilation, during which the inside of a blood vessel enlarges, flooding the capillary network with arterial blood.*

*Any type of blood vessel can undergo vasoconstriction. This can occur anywhere in the body, not only in order to bring blood to the extremities.*

---

**114.**

A massage therapist is working with a client who has strained a muscle. The client has pain on the ischial tuberosity, where the muscle originates. She also has pain on the medial aspect of the thigh when she brings her leg closer to the midline.

Which of the following muscles is strained?

**Adductor magnus**

Biceps femoris

Sartorius

Vastus lateralis

---

*Correct answer: Adductor magnus*

*In this example, the client's adductor magnus is strained. This muscle originates on the inferior ramus of the pubis, the ramus of the ischium, and the ischial tuberosity. It is a prime mover in thigh adduction (bringing the leg closer to the midline).*

*While a portion of the biceps femoris attaches to the ischial tuberosity, it is not a primary mover in adduction and is not located on the medial aspect of the thigh. The sartorius originates on the ASIS, and the vastus lateralis originates from various points on the femur including the greater trochanter and the intertrochanteric line.*

---

**115.**What is the **most accurate** term for the windpipe?**Trachea**

Larynx

Pharynx

Sinus

*Correct answer: Trachea*

*The trachea, also called the windpipe, is located in the lower respiratory tract. The lower respiratory tract includes:*

- 1. **The larynx** (voice box), which connects the pharynx to the trachea (windpipe).*
- 2. **The trachea** (windpipe), which is the main airway to the lungs, extending from the glottis to the junction of the two main bronchi.*
- 3. **The bronchi and alveoli**, which are within the lungs themselves. The bronchi are tubes which branch out from the trachea. They provide a pathway to the alveoli, which are the air sacs where external respiration takes place.*

*The pharynx is part of the upper respiratory system, and includes the nasopharynx, the oropharynx, and the laryngopharynx. The sinuses are air-filled spaces located in the skull.*

---

**116.**

When palpating for a pulse under the arm near the armpit area, which artery is felt?

**Axillary**

Brachial

Carotid

Radial

---

*Correct answer: Axillary*

*The axillary artery is closest to the surface of the skin in the armpit region (or the axilla) and is, therefore, able to be palpated in this area. Pulses can only be felt in arteries (and not in veins) because arteries carry a much higher blood pressure.*

*The brachial artery can be palpated between the elbow and shoulder just beneath the biceps. The carotid artery can be felt in the neck just medial to the sternocleidomastoid and lateral to the trachea. The radial artery can be felt just proximal to the wrist on the lateral side of the lower arm.*

---

**117.**

Which of the following **best** defines the Latin root “cephal/o”?

Head

Wrist

Heart

Cheek

---

*Correct answer: Head*

*The root, or prefix, "cephal(o)" is used to mean "head." Massage therapists often use the term "cephalic" in their documentation, referring to areas near or around the head.*

*The root "carp(o)" refers to the wrist. "Cardi(o)" refers to the heart. "Bucc(o)" refers to the cheek.*

---

118.

The central nervous system includes all of the following structures **except**:

**Cranial nerves**

Meninges

Brain

Spinal cord

---

*Correct answer: Cranial nerves*

*The cranial nerves are not part of the central nervous system; they are part of the peripheral nervous system.*

*The central nervous system is composed of the brain, spinal cord, and meninges (tissues that protect the brain and spinal cord). The peripheral nervous system includes the cranial and spinal nerves.*

---

**119.**

In relation to the physiology of building and maintaining bones, ossification includes all the following cell types, **except**:

**Fibroblasts**

Osteocytes

Osteoblasts

Osteoclasts

*Correct answer: Fibroblasts*

*The skeletal system does not contain fibroblasts cells. The skeletal system contains osteocytes, osteoblasts, and osteoclasts. The prefix (osteo) of the cells' names should indicate to you that they are bone-related; therefore, they would belong in the skeletal system.*

*Fibroblasts cells are the cells that produce fibrin for clotting in the integumentary system.*

---

**120.**

Which type of sensory nerves detect irritation and pain?

**Nociceptors**

Chemoreceptors

Proprioceptors

Mechanoreceptors

*Correct answer: Nociceptors*

*Nociceptors detect irritation and pain, and other noxious stimuli, such as pressure that is too deep or too hard. These sensory nerves are found in any body part that can detect pain, such as the skin, eyes, and mucosa.*

*Soft tissue consists of four basic categories of sensory nerves:*

- 1. **Mechanoreceptors** respond to touch, pressure, and movement.*
  - 2. **Proprioceptors** respond to changes in position and movement.*
  - 3. **Chemoreceptors** respond to chemical changes such as oxygen levels and acid-base balance.*
  - 4. **Nociceptors** respond to irritation and pain.*
-

**121.**

When a person is placed into an ankle cast for eight weeks and is subsequently unable to move that joint, the person will experience a loss of range of motion of the joint and its surrounding tissues. What property of connective tissue does this demonstrate?

**Thixotropy**

Crimp

Creep

Piezoelectricity

*Correct answer: Thixotropy*

*Thixotropy is a property of connective tissue that allows it to become more fluid when irritated and more solid when still. In this sense, irritation refers to movement/deformation of the tissue, and not necessarily to pathology or pain. When a body part is immobilized, it becomes more solid since there is no movement occurring.*

*Crimp refers to the wavelike structure of tendons and ligaments that allows them to undergo large forces. Creep is a property that allows tissues to deform or elongate when placed under prolonged loads. Piezoelectricity is a property of tissue that allows generation of electrical potentials as a result of mechanical deformation. While all answer choices refer to the deformation of tissue under loads, only thixotropy addresses the stiffness of tissues in response to immobility.*

---

**122.**

The vestibular system is essential in determining and reporting the head's position and direction of movement. Where are the vestibular sensors located?

**Inner ear**

Nasal passages

Within the eyes

Cervical plexus

---

*Correct answer: Inner ear*

*The vestibular sensors are located within the inner ear and continuously monitor head movements. They then report the head position, direction, and movement to the brain. These sensors also function to control movement of the eyes and compensate for movement of the head, thereby stabilizing vision.*

---

**123.**

What cellular process requires energy from ATP to join simple molecules together to form more complex molecules?

**Anabolism**

Catabolism

Mitosis

Meiosis

*Correct answer: Anabolism*

*Anabolism is a chemical reaction that uses energy to join simple molecules together to form more complex molecules such as carbohydrates, lipids, proteins, and nucleic acids.*

*Catabolism is a chemical reaction that releases energy as it breaks down complex molecules into simpler molecules. Mitosis is another word for cell division, in which the cell duplicates itself. Meiosis is a specialized kind of mitosis that creates reproductive cells.*

---

**124.**

If a client is unable to close their lips, which muscle is **most** likely damaged?

**Orbicularis oris**

Masseter

Orbicularis oculi

Buccinator

---

*Correct answer: Orbicularis oris*

*If a client is unable to close their lips, it is likely that the orbicularis oris muscle has been damaged. This muscle inserts at the modiolus, which is a fibromuscular mass at the corners of the mouth. It inserts at the skin and fascia of the lips. Its concentric actions are to close the mouth, protract the lips (causing them to protrude anteriorly), and draw the angle of the mouth medially.*

*The masseter plays a major role in chewing by elevating the mandible at the TMJ. Orbicularis oculi concentrically closes and squints the eye, depresses the upper eyelid, and elevates the lower eyelid. The buccinator muscle concentrically compresses the cheek against the teeth.*

---

**125.**What is the **best** definition of a bursa?**A sac filled with synovial fluid, usually intended to cushion a joint**

A sleeve around a joint, formed by dense connective tissue

An upper chamber of the heart

A ligament that crosses the knee joint

*Correct answer: A sac filled with synovial fluid, usually intended to cushion a joint.*

*A bursa is a sac filled with synovial fluid, usually intended to cushion a joint. Some bursae are found in other locations and cushion other structures that may rub against each other. Examples include the subcutaneous bursae, which are located between skin and bones, and the submuscular bursae, which are located between muscles and bones.*

*A joint capsule is a sleeve around a joint, formed by dense connective tissue. The upper chambers of the heart are the atria. The ACL and MCL are ligaments that cross the knee joint.*

---

126.

Which of the following is **not** a function of water in the human body?

**Transports toxic substances to the pancreas**

Aids oxygen transport from lungs to body cells

Distributes heat around the body

Provides a medium for chemical reactions

---

*Correct answer: Transports toxic substances to the pancreas*

*Water dilutes toxic substances and transports them to the liver and kidneys, not the pancreas.*

*Water has several physiological functions. It provides a medium for chemical reactions, regulates chemical distribution within cells, transports hormones and nutrients, aids in oxygen and carbon dioxide transport, dilutes toxins, and distributes heat around the body.*

---

**127.**

Which of the following is **not** a function of the lymphatic system?

**Detect and respond to changes in stimulation and outside environment**

Assist in maintenance of fluid balance by draining fluid from body tissues

Help in body's defense against disease-producing substances

Help in the absorption of fats from the digestive system

---

*Correct answer: Detect and respond to changes in stimulation and outside environment*

*The nervous system, not the lymphatic system, is responsible for detecting and responding to changes in stimulation and outside environment. These changes are detected by sensory nerves. Motor nerves deliver the impulses that cause the body's response.*

*The lymphatic system assists in the maintenance of fluid balance by draining fluid from body tissues. It also plays an important role in the immune system by processing and disposing of toxins. In addition, it assists with the absorption of fats from the digestive system.*

---

128.

Which of the following is a structure contained in the thoracic cavity?

**Pericardium**

Kidneys

Bladder

Stomach

---

*Correct answer: Pericardium*

*The thoracic cavity is a ventral (anterior) cavity superior to the diaphragm and surrounded by the ribs, which contains the pericardium, heart, lungs, esophagus, and other structures.*

*The abdominal cavity is a ventral cavity inferior to the diaphragm which includes the liver, kidneys, spleen, pancreas, stomach, and intestines.*

*The bladder is contained in the pelvic cavity, which is inferior to the abdominal cavity.*

---

129.

What is the primary function of the urinary system's urethra?

**To carry the urine away from the bladder to the exterior of the body**

To store urine

To transport urine to the bladder

To produce urine

---

*Correct answer: To carry the urine away from the bladder to the exterior of the body.*

*The urethra is responsible for carrying the urine away from the bladder to the exterior.*

*The kidneys are responsible for producing urine. The ureter is responsible for transporting urine to the bladder. The bladder is responsible for storing urine.*

---

130.

Which of the following describes the function of a ligament?

**It connects a bone to another bone.**

It connects a muscle to a bone.

It provides cushioning between joints.

It lines muscles.

---

*Correct answer: It connects a bone to another bone.*

*A ligament is a short band of tough, flexible, fibrous connective tissue that connects two bones or cartilages together, and provides stability in a joint.*

*A tendon connects a muscle to a bone. Cartilage provides a cushioning between joints. Fascia is the lining of muscles.*

---

**131.**

Which of the following is a neck flexor?

**Sternocleidomastoid**

Splenius capitis

Iliocostalis

Sternothyroid

*Correct answer: Sternocleidomastoid*

*The sternocleidomastoid is a flexor muscle that helps bring the chin to the chest. Scalenes are flexor muscles that also help bring the chin to the chest.*

*Iliocostalis, an erector muscle that extends the neck, among other actions. Splenius capitis is a deep posterior cervical muscle that extends the neck and performs ipsilateral rotation. Although the sternothyroid is located on the anterior of the neck, it does not assist with neck flexion; instead, it depresses and stabilizes the thyroid cartilage.*

---

132.

Regarding body cavities, which is **not** considered an anterior/ventral region of the trunk?

Cranial cavity

Thoracic cavity

Abdominal cavity

Pelvic cavity

---

*Correct answer: Cranial cavity*

*The cranial cavity is one of the body's dorsal (posterior) cavities. It is found in the skull, and contains the brain and related structures.*

*The thoracic, abdominal, and pelvic cavities are all anterior (ventral) cavities.*

---

**133.**

Which of the following actions does the sternocleidomastoid muscle perform?

**Neck flexion and rotation**

Lower jaw depression

Mandible elevation

Cheek movement

---

*Correct answer: Neck flexion and rotation*

*The sternocleidomastoid muscle is responsible for neck flexion and contralateral rotation (rotation to the opposite side). It originates at the manubrium of the sternum and the superior border of the medial third of the clavicle. It inserts on the superior surface of the mastoid process and the superior nuchal line of the occiput.*

*The platysma muscle is responsible for lower jaw depression. The masseter muscle is responsible for mandible elevation. The buccinator muscle is responsible for cheek movement.*

---

**134.**

The most outside aspect of the hip where a very large bony prominence is located on the femur is called:

**The greater trochanter**

The ischial tuberosity

The lesser trochanter

The ilium

---

*Correct answer: The greater trochanter*

*The greater trochanter is the most prominent bony landmark of the lateral femur and can be palpated on the lateral aspect of the hip. This structure serves as an attachment point for many gluteal muscles.*

*The lesser trochanter is located inferior and medially in relation to the greater trochanter; it is not as prominent as the greater trochanter. The ischial tuberosity and the ilium are both located on the pelvis.*

---

**135.**

A client you are working with states they have been diagnosed with a strain. What structure might this involve?

**The Achilles tendon**

The ACL

The radio-ulnar ligament

The ATFL

---

*Correct answer: The Achilles tendon*

*A strain is an injury only to a tendon. The Achilles tendon is located on the posterior aspect of the ankle; it tapers from the gastrocnemius and soleus muscles into the calcaneus.*

*The ACL (anterior cruciate ligament), ATFL (anterior talofibular ligament), and radio-ulnar ligaments are all ligaments. Injuries to ligaments are sprains, not strains.*

---

**136.**

During the process of digestion, a bolus of food travels through the stomach, small intestine, and large intestine. In which order does it progress through the areas of the large intestine?

**Ascending > transverse > descending > sigmoid**

Descending > transverse > ascending > sigmoid

Ascending > descending > transverse > sigmoid

Transverse > ascending > descending > sigmoid

---

*Correct answer: Ascending > transverse > descending > sigmoid*

*The large intestine reabsorbs water from the bolus. It also forms and stores feces. After entering the large intestine, food travels through the ascending colon, the transverse colon, and the descending colon, followed by the sigmoid colon. It ultimately reaches the rectum, and any remaining matter is expelled through the anus as feces.*

---

**137.**

Which of the following is **not** an easily palpated pulse point?

**Splenic artery**

Femoral artery

Dorsalis pedis artery

Radial artery

---

*Correct answer: Splenic artery*

*The splenic artery supplies oxygenated blood to the spleen. It branches from the celiac artery. It is located within the trunk cavity; therefore, is not a pulse point for palpation.*

*The femoral artery is easily palpated over the anterior aspect of the inguinal/hip region. The dorsalis pedis artery is easily palpated on top of the foot. The radial artery can be easily palpated over the lateral aspect of the wrist.*

---

**138.**

In the context of the human body, what is oxygen classified as?

**Molecule**

Atom

Organelle

Cell

*Correct answer: Molecule*

*Oxygen is a molecule, specifically a diatomic molecule (O<sub>2</sub>), meaning it consists of two atoms of oxygen bonded together. In the human body, it plays a crucial role in processes like cellular respiration, where it helps convert energy from food into a usable form for cells.*

*It is important to distinguish a molecule from an atom (a single oxygen atom is not sufficient for these processes), organelles (which are structures within cells), and cells (the basic units of life).*

*Common atoms in the human body include carbon, hydrogen, and nitrogen.*

*Mitochondria, nuclei, and ribosomes are examples of organelles.*

*Epithelial cells, nerve cells, and muscle cells are examples of cells.*

---

**139.**

A spinal cord injury at what level would still allow a person to continue breathing on their own?

**Below C5**

C2-C3

Above C3

C2

*Correct answer: Below C5*

*The diaphragm is the primary muscle responsible for breathing. It is innervated by the phrenic nerve which originates from C3-C5. Injury at or above this level would result in severe difficulty or complete inability to breathe on one's own. Think, "Stayin' alive, C3, 4, 5!"*

*Any injury to the level C5 or above would result in severe difficulty or inability to breathe since the signal for the phrenic nerve must travel through C1-C5 to carry the signal to the diaphragm. Spinal injuries at or inferior to the level of C6 do not necessarily inhibit breathing.*

---

140.

Skin is an organ that does all the following **except**:

**Synthesize vitamin C**

Protect the body's internal structures

Regulate the body's temperature

Assist in immunity

---

*Correct answer: Synthesize vitamin C*

*The skin does not synthesize vitamin C, although it does synthesize vitamin D.*

*The skin is an organ that has many functions. It is primarily responsible for:*

- *Protecting the body's internal structures.*
  - *Assisting in immunity by preventing the entry of bacteria and viruses.*
  - *Regulating the body's temperature.*
  - *Detecting the stimuli sensed through touch.*
  - *Excreting salts, water, and oils from the body.*
  - *Sensing touch.*
  - *Synthesizing vitamin D.*
-

**141.**

The meninges consist of three layers of tissue. Which layer of tissue is the **thickest** external layer?

**Dura mater**

Arachnoid membrane

Pia mater

Cerebrum

---

*Correct answer: Dura mater*

*The dura mater layer of tissue is the thickest external layer of the meninges.*

*The arachnoid membrane is the middle layer of the meninges. It is a web-like membrane containing many blood vessels. The pia mater is the innermost layer of the meninges. This is a thin layer of tissue that adheres directly to the brain and spinal cord. The cerebrum makes up 80% of the brain's total mass and is not part of the meninges.*

---

**142.**

When a person experiences orthostatic hypotension (feeling dizzy when standing up quickly), what occurs in the autonomic nervous system as a response?

**Signal frequency from baroreceptors decreases resulting in increased sympathetic stimulation**

Signal frequency from baroreceptors increases resulting in decreased sympathetic stimulation

Signal frequency from baroreceptors remains unchanged

Signal frequency from baroreceptors decreases resulting in increased parasympathetic stimulation

---

*Correct answer: Signal frequency from baroreceptors decreases resulting in increased sympathetic stimulation*

*Baroreceptors sense stretch in the large arteries of the body. When blood pressure decreases, less stretch occurs in the arteries, which results in decreased stimulation of baroreceptors. In order to maintain normal blood pressure, the body responds by increasing sympathetic stimulation resulting in an increase in heart rate and blood pressure.*

*When less stretch occurs in the arteries (lower blood pressure), signal frequency from the baroreceptors is reduced. When more stretch occurs (as during prolonged exercise), signal frequency from the baroreceptors increases, which resets blood pressure to an appropriate level.*

---

**143.**

Which ligament is **most** commonly injured with a hyperextension motion of the knee?

**Anterior cruciate ligament**

Posterior cruciate ligament

Anterior tibiotalar ligament

Deltoid ligament

*Correct answer: Anterior cruciate ligament*

*The anterior cruciate ligament (ACL) is a ligament of the knee. It connects the femur with the tibia and prevents excessive anterior displacement of the tibia. It is commonly injured or torn in sports injuries in which there is an excessive hyperextension force at the knee.*

*Regarding knee joint anatomy:*

*The lateral collateral ligament (LCL) works to stabilize the lateral aspect of the knee. It connects the lateral side of the femur to the lateral side of the fibula. The medial collateral ligament (MCL) works to stabilize the medial aspect of the knee. It connects the medial side of the femur to the medial side of the tibia. The anterior cruciate ligament (ACL) stabilizes the joint by attaching the superior surface of the tibia (connecting to the anterior portion of that surface) to the inferior surface of the femur (towards the posterior portion of that surface). The posterior cruciate ligament (PCL) stabilizes the joint by attaching the superior surface of the tibia (connecting to the posterior portion of that surface) to the inferior surface of the femur (towards the anterior portion of that surface). The ACL and PCL form an X-shape between the tibia and femur.*

*The PCL can be torn, but this occurs much less frequently. It prevents excessive posterior displacement of the tibia. The anterior tibiotalar and deltoid ligaments are ligaments of the ankle complex.*

---

**144.**

If a person experiences kidney dysfunction, what bodily process would **most** likely be difficult for them?

**The regulation of bodily fluids**

The transportation of urine to the bladder

Holding urine in the bladder

The elimination of urine

---

*Correct answer: Regulating body fluids*

*Kidney dysfunction may impair a person's ability to regulate bodily fluids. The kidneys are responsible for the regulation of bodily fluids as well as the production of urine.*

*The ureter transports urine from the kidneys to the bladder. The bladder stores urine. The urethra eliminates urine from the body.*

---

145.

Which of the following **best** describes the function of a synovial membrane?

**It lubricates joints and makes them mobile.**

It protects and lubricates the respiratory and digestive systems.

It lubricates the thoracic, abdominal, and pelvic cavities.

It connects the skin to the muscles and other underlying structures.

---

*Correct answer: It lubricates joints and makes them mobile.*

*The synovial membrane lubricates joints and makes them mobile. When stimulated by joint motion, this membrane secretes synovial fluid, which is thick, clear, and viscous.*

*The mucous membrane is responsible for protecting and lubricating the respiratory and digestive systems by lining their cavities. The serous membrane is responsible for lubricating the thoracic, abdominal, and pelvic cavities. Fascia connects the skin to the muscles and other underlying structures.*

---

**146.**

During knee flexion, the hamstrings contract while the quadriceps eccentrically lengthen. In order for this flexion to occur, the quadriceps must not concentrically contract. This is an example of:

**Reciprocal inhibition**

Muscle length/tension relationship

Golgi tendon organ function

Co-contraction

---

*Correct answer: Reciprocal inhibition*

*Reciprocal inhibition (also known as Sherrington's law of reciprocal inhibition) asserts that "the neurologic inhibition of the antagonist occurs when the agonist is working." In this case, the agonists are the hamstrings, which contract eccentrically to create knee flexion. The antagonists are the quadriceps, which must be inhibited to allow for knee flexion to occur.*

*The muscle length/tension relationship deals with the optimal length of a muscle and its strength. The Golgi tendon organ detects any change in tension in the muscle but is not responsible for inhibiting the antagonist during movement. Co-contraction occurs around joints and is one exception to the reciprocal inhibition rule. This occurs when an agonist and antagonist work together to create stability.*

---

**147.**

What cranial nerve affects the function of visceral organs?

**Vagus nerve**

Trochlear nerve

Trigeminal nerve

Facial nerve

*Correct answer: Vagus nerves*

*The vagus nerves contain sensory neurons for the pharynx, larynx, trachea, heart, carotid body, lungs, bronchi, esophagus, stomach, small intestine, and gallbladder. Their motor neurons carry impulses to the pharyngeal and laryngeal muscles, and the abdominal viscera. They control heart rate and other visceral activities.*

*The cranial nerves include:*

*I. **The olfactory nerves**, which transmit taste and smell information to the brain.*

*II. **The optic nerves**, which transmit visual information to the brain.*

*III. **The oculomotor nerves**, which transmit information about eye movement.*

*IV. **The trochlear nerves**, which innervate the muscles of the eyeball.*

*V. **The trigeminal nerves**, which transmit information about sensation in the head, face, and facial skin, and include motor neurons for mastication.*

*VI. **The abducens nerves**, which include both sensory and motor neurons related to eye movement.*

*VII. **The facial nerves**, which have sensory neurons for taste and motor neurons for facial expression, tear production, and salivation.*

*VIII. **The vestibulocochlear nerves**, which receive information about hearing and equilibrium.*

*IX. **The glossopharyngeal nerves**, which relate to taste, saliva production, swallowing, and the gag reflex.*

*X. **The vagus nerves**. These nerves contain sensory neurons for the pharynx, larynx, trachea, heart, carotid body, lungs, bronchi, esophagus, stomach, small intestine, and*

*gallbladder. Their motor neurons carry impulses to the pharyngeal and laryngeal muscles and the abdominal viscera. They control heart rate and other visceral activities.*

*XI. **The accessory nerves** mainly contain motor neurons for speaking, turning the head, and moving the shoulders.*

*XII. **The hypoglossal nerves** contain mostly motor neurons, which innervate the tongue and throat.*

---

**148.**

Of the following, which is the **best** description of ground substance?

**Ground substance is a transparent fluid, made up of 70% water, surrounding all the cells in the body.**

Ground substance is a transparent fluid, made up of 50% water, surrounding all the cells in the body.

Ground substance is connective tissue found only in the joints, and works as a stabilizer.

Ground substance is a thin, watery substance. Thickening ground substance is a sign of pathology.

---

*Correct answer: Ground substance is a transparent fluid, made up of 70% water, surrounding all the cells in the body.*

*Ground substance is found throughout the body and is 70% water. It is a **thixotropic** substance. This means that it becomes more fluid when agitated (through warmth or motion), and more solid when still. When athletes warm up at the beginning of a workout, they allow ground substance to become more fluid. This allows their muscles and joints to move more easily until they cool down again.*

*Collagen is a stabilizing connective tissue found in the joints, among other areas.*

---

149.

What is the definition of hyperplasia?

**Uncontrolled cell division**

The study of disease

Reproduction of abnormal and undifferentiated cells

Protective response of tissues to irritation or injury

---

*Correct answer: Uncontrolled cell division*

*Hyperplasia is uncontrolled cell division. It can result in a neoplasm, also called a tumor, which is an abnormal growth of tissue.*

*Pathology is the study of disease. Anaplasia is the reproduction of abnormal and undifferentiated cells which fail to mature into specialized cell types. Inflammation is the protective response of tissues to irritation or injury.*

---

**150.**

Which of the following options **best** describes the function of the heart's right atrium (RA)?

**It receives the oxygen-poor blood from the vena cava.**

It pumps oxygen-poor blood through the pulmonary arteries to the lungs.

It receives the oxygen-rich blood from the pulmonary veins.

It pumps the oxygen-rich blood into the aorta.

*Correct answer: It receives the oxygen-poor blood from the vena cava.*

*The right atrium is responsible for receiving the oxygen-poor blood from the vena cava. It then pumps blood to the right ventricle through the tricuspid valve.*

*In more detail, the blood follows this path from the body, through the heart and lungs, and back out to the body:*

*Body > Vena cava > Right Atrium (RA) > Tricuspid valve > Right Ventricle (RV) > Pulmonic valve > Pulmonary arteries > Lungs > Pulmonary vein > Left Atrium (LA) > Mitral valve > Left Ventricle (LV) > Aortic valve > Aorta > Body*

*The left ventricle pumps oxygen-rich blood into the aorta. The left atrium receives the oxygen-rich blood from the pulmonary veins. The right ventricle pumps oxygen-poor blood through the pulmonary arteries and into the lungs.*

---

151.

Which anatomical structure connects the two hemispheres of the cerebrum?

**Corpus callosum**

Temporal lobe

Frontal lobe

Cerebellum

---

*Correct answer: Corpus callosum*

*The corpus callosum connects the right and left hemispheres of the cerebrum. It facilitates communication between the two hemispheres and is the largest white matter structure in the brain.*

*The temporal lobe is part of the brain that is responsible for hearing, language comprehension, long-term memory, emotion, and personality. The frontal lobe is responsible for movement, intellectual functions, and speech. The cerebellum plays a large role in balance.*

---

**152.**

Which of the following carpals are correctly paired with their position in relation to the metacarpals?

**Trapezium; proximal**

Trapezoid; distal

Trapezius; proximal

Triquetrum; distal

---

*Correct answer: Trapezium; proximal*

*The carpals (the bones of the wrist), including the trapezium, are proximal to the metacarpals (bones of the palms). This means they are closer to the trunk of the body.*

*The trapezoid and triquetrum are also carpal bones, but they are not distal to the metacarpals.*

*The trapezius is a muscle found in the neck, shoulders, and trunk of the body.*

---

**153.**

Approximately what percentage of water is the human body is composed of?

**55% to 70%**

80% to 90%

30% to 40%

20% to 25%

---

*Correct answer: 70%*

*The human body is composed of approximately 70% water. Water is essential for all living things, both human and non-human. In the human body, the water content of body tissues varies. Adipose tissue (fat) has the lowest water content and the skeleton has the second-lowest water content. The tissues that have the highest water content include the muscle, skin, and blood. Some research suggests that male body composition includes a higher percentage of water than that of a female body.*

---

**154.**

Which of the following is **not** a type of neuron that exists in the human body?

**Neutralizing neurons**

Connecting interneurons

Efferent neurons

Afferent neurons

---

*Correct answer: Neutralizing neurons*

*Three basic types of neurons exist:*

- *Afferent/sensory neurons*
- *Connecting/associative interneurons*
- *Efferent/motor neurons*

*Afferent neurons carry impulses to the CNS. Connecting interneurons transmit impulses between neurons. Efferent neurons transmit impulses away from the CNS to muscles, organs, and glands.*

*To memorize the three types of neurons, remember 'ACE' for afferent, connecting, and efferent.*

---

**155.**

What fluid exists between the cells, and what is it known as when it enters the lymphatic system?

**Interstitial fluid; lymph**

Ground substance; lymph

Lymph; interstitial fluid

Lymph; ground substance

---

*Correct answer: Interstitial fluid; lymph*

*Interstitial fluid is a fluid that exists between the cells. When it enters the lymphatic system, it is known as lymph.*

*Ground substance is a gel-like substance found in the fascia, where it supports collagen and elastic fibers.*

---

**156.**

What is the medical term for a shallow depression on the surface of a bone?

**Fossa**

Process

Foramen

Sinus

*Correct answer: Fossa*

*A fossa is a shallow depression in the surface or at the end of the bone, such as the infraspinous fossa of the scapula.*

*A process is any prominent bony growth projecting from a bone, such as the olecranon process of the ulna. A foramen is a rounded hole in the bone, such as the foramen of a vertebra, which allows the spinal cord to pass through the length of the spine. A bone sinus is an air cavity in the bone. Examples include the frontal sinuses, located in the skull.*

---

**157.**

Which of the following originates at the pubic symphysis and is used for spine flexion?

**Rectus abdominis**

Psoas major

External oblique

Internal oblique

*Correct answer: Rectus abdominis*

*The rectus abdominis originates at the pubic symphysis and is used for spine flexion. It inserts at the cartilages of the fifth, sixth, and seventh ribs and the xiphoid process of the sternum. It also performs lateral flexion of the trunk, posterior tilt of the pelvis, and compression of the abdominal cavity (which supports the viscera).*

*The psoas major originates at the bodies and corresponding intervertebral disks of the last thoracic and all lumbar vertebrae, the anterior surface of the transverse processes of all lumbar vertebrae, and the tendinous arches extending across the sides of the bodies of the lumbar vertebrae. It inserts at the lesser trochanter of the femur. Concentrically, it performs thigh flexion and lateral rotation, trunk flexion, and lateral trunk flexion.*

*The external oblique muscle originates at the outer lip of the iliac crest, pubic bone, and linea alba. It inserts at the external surfaces of the lower eight ribs. It performs flexion, lateral flexion, and contralateral rotation of the trunk, among other movements.*

*The internal oblique muscle originates at the inguinal ligament, iliac fascia, anterior two-thirds of the middle lip of the iliac crest, and lumbar fascia. It inserts into the cartilage of the last three ribs and the aponeurosis that extends from the tenth costal cartilage to the pubic bone into the linea alba. It performs flexion, lateral flexion, and ipsilateral rotation of the trunk, among other movements.*

---

**158.**

Which of the following produce(s) estrogen and progesterone?

**Ovaries**

Uterus

Fallopian tubes

Vagina

---

*Correct answer: Ovaries*

*The ovaries are glands located in the lower abdomen and are part of the female reproductive system. They produce the sex hormones estrogen and progesterone, which control and regulate such functions as menstruation and pregnancy.*

*The uterus is located inferior and medial to the ovaries and is responsible for housing a developing fetus during pregnancy.*

*The fallopian tubes travel from the ovaries to the uterus, carrying eggs to the uterus during ovulation.*

*The vagina is a muscular canal that travels from the uterus to the exterior of the body.*

*While the uterus, fallopian tubes, and vagina are all involved in reproduction, none of them produce estrogen or progesterone.*

---

**159.**

What is the **best** description of the way lymph moves through the lymphatic system?

**In a peristalsis-like fashion, from higher pressure to lower pressure**

In a peristalsis-like fashion, from lower pressure to higher pressure

In a pressure-sensitive fashion controlled by the heart's pumping action

From the thoracic duct out to the rest of the body

---

*Correct answer: In a peristalsis-like fashion, from higher pressure to lower pressure*

*Lymph moves through the lymphatic system in a peristalsis-like fashion, from higher pressure to lower pressure. The flow of lymph is involuntary but is influenced and assisted by voluntary skeletal muscle movement.*

*While the movement of lymph is related to pressure, it is not affected by the pumping of the heart. Lymph moves from distal areas of the body toward the thoracic duct, where filtered lymph drains back into the rest of the circulatory system.*

---

**160.**

Which chemical is responsible for signaling one neuron to another?

**Neurotransmitters**

Synapse

Gyri

Dendrites

---

*Correct answer: Neurotransmitters*

*Neurotransmitters are signaling chemicals that relay information from one neuron to another. Common neurotransmitters include dopamine, serotonin, and norepinephrine.*

*Synapses are specialized gaps between nerve cells in which communication occurs. Gyri are outpouchings in the cerebral cortex which increase neuronal surface area. Dendrites are branching projections from the nerve cell body that carry signals to the cell body.*

---

**161.**

A CVA, the most common brain disorder, is often called a/n:

**Stroke**

Seizure

Tumor

Contusion

*Correct answer: Stroke*

*A CVA, often called a stroke, is the most common brain disorder. CVA stands for CerebroVascular Accident. This term may refer to a number of events, such as an aneurysm, blood clot, or hemorrhage in the brain. As you can tell from the name, these events occur in the vascular system of the brain.*

*A seizure is characterized by an abrupt change in brain function, and can result in a wide range of symptoms, ranging from mild behavior change to extreme convulsions.*

*A tumor is an abnormal growth of cells.*

*A contusion is a bruise.*

---

**162.**

Which of the following **best** describes a bone sinus?

**An air cavity within the bone**

A rounded hole in the bone

A shallow depression in the bone

A ridge on the edge of a bone

---

*Correct answer: An air cavity within a bone*

*A bone sinus is an air cavity in the bone. Examples include the frontal sinuses, located in the skull.*

*A foramen is a rounded hole in the bone, such as the foramen of a vertebra, which allows the spinal cord to pass through the length of the spine. A fossa is a shallow depression in the surface or at the end of the bone, such as the infraspinous fossa of the scapula. A crest is a ridge on the edge or side of a bone, such as the iliac crest.*

---

163.

Which of the following is **not** an anatomical structure of a woman's urinary system?

Uterus

Ureter

Kidney

Urethra

---

*Correct answer: Uterus*

*The uterus is an organ of the female reproductive system, not the urinary system.*

*The urinary system consists of the kidneys, ureters, bladder, and urethra. The kidneys filter about 100 L of blood per day, reabsorbing 99 L of filtrate and leaving about 1 L of urine in the average adult.*

---

**164.**

The extensor digitorum longus and the tibialis anterior move the ankle. What type of muscle are they?

**Dorsiflexor**

Plantar flexor

Invertor

Evertor

*Correct answer: Dorsiflexor*

*The extensor digitorum longus and the anterior tibialis muscles are dorsiflexor muscles that move the ankle. Ankle dorsiflexion brings the toes toward the anterior aspect of the leg.*

*Plantar flexor muscles move the toes away from anterior aspect of the leg.*

*Invertor muscles turn the plantar side of the foot (sole) toward the midline of the body.*

*Evertor muscles turn the plantar side of the foot away from the midline.*

---

**165.**

What is a macrophage?

**A large white blood cell that functions as part of the immune system**

A protein that plays a role in clotting

A compound found in red blood cells

A sensory receptor

*Correct answer: A large white blood cell that functions as part of the immune system*

*A macrophage is a large white blood cell that functions as part of the immune system. They perform phagocytosis, which is the process of one cell eating another cell which it deems to be a threat to the body's health, such as bacteria.*

*Fibrin is produced by fibroblast cells and plays an important role in clotting. Hemoglobin is an iron-protein compound found in red blood cells, which enables these cells to transport oxygen around the body. There are many types of sensory receptors, such as Golgi tendon organs and muscle spindles, but not macrophages.*

---

**166.**

Which of the following is not a function of the endocrine system?

**Produce neurotransmitters**

Regulate the metabolic processes

Produce hormones

Maintain homeostasis

---

*Correct answer: Produce neurotransmitters*

*The endocrine system produces hormones, not neurotransmitters. The main difference between hormones and neurotransmitters is their location. Hormones are found in the bloodstream and other tissues; neurotransmitters are found in the synapses.*

*The endocrine system's functions include the regulation of the metabolic processes, the maintenance of homeostasis, and the secretion of protein hormones directly into the blood. The endocrine glands include the thyroid, parathyroid, pituitary, adrenal, thymus, pancreas, ovaries, testes, and hypothalamus. There are many organs and tissues in the body capable of producing hormones.*

---

**167.**

What is an organelle that process and packages proteins for distribution to other areas of the cell?

**Golgi apparatus**

Golgi tendon organ

Endoplasmic reticulum (ER)

Mitochondria

---

*Correct answer: Golgi apparatus*

*The Golgi apparatus is an organelle that processes and packages proteins for distribution to other areas of the cell. It also does this with certain carbohydrates.*

*The Golgi tendon organ is a sensory receptor found in the skeletomuscular system.*

*The endoplasmic reticulum (ER) is a network of structures that exists throughout a cell's cytoplasm and is involved with the metabolic process in a number of ways, including storing proteins, processing lipids (fats), and eliminating toxins.*

*The mitochondria produce ATP, providing energy for cell activity.*

---

**168.**

Embedded in the posterior of the thyroid are four tiny glands, which are known as:

**Parathyroid glands**

Hypothalamus

Thyroidial glands

Endocrine regulators

---

*Correct answer: Parathyroid glands*

*The four tiny glands that are embedded in the posterior of the thyroid are known as parathyroids. They release a hormone called parathormone. This hormone combines with Vitamin D to regulate calcium levels throughout the body.*

*The hypothalamus is located below the thalamus in the center of the brain. While the thyroid and parathyroids are both part of the endocrine system, the term "endocrine regulators" is not commonly used. Thyroidial glands are not an anatomical structure.*

---

**169.**

Which of the following bones is located in the lower limb of the skeleton?

**Fibula**

Sacrum

Ulna

Sternum

*Correct answer: Fibula*

*The fibula is located in the lower limb of the skeleton. The other bones in the lower limb are the femur, tibia, patella, tarsals, metatarsals, and phalanges.*

*The sacrum and the sternum are located in the axial skeleton. The ulna is located in the upper limb.*

---

**170.**

What two structures does the larynx connect?

**Pharynx and trachea**

Pharynx and lungs

Pharynx and sinuses

Trachea and nose

*Correct answer: Pharynx and trachea*

*The larynx (or voice box) connects the pharynx (or throat) to the trachea (or windpipe). It allows for the passage of air into and out of the body, and it produces sound.*

*The pharynx, or throat, is located in the upper respiratory system. It is divided into the following three sections:*

- 1. **The nasopharynx** is a pathway for air and a continuation of the nasal cavity.*
- 2. **The oropharynx** is a pathway for food and extends back from the mouth. This is the part of the throat that is visible when a person opens their mouth, containing the tonsils.*
- 3. **The laryngopharynx** is a pathway for both air and food. It begins at the hyoid bone and then separates into the esophagus and the larynx.*

*The larynx (voice box) connects the pharynx to the trachea (windpipe). Both the bronchi and the alveoli are located within the lungs. The larynx, trachea, bronchi, and alveoli are all part of the lower respiratory system.*

*The lower respiratory tract includes:*

- 1. **The larynx** (voice box) connects the pharynx to the trachea (windpipe).*
  - 2. **The trachea** (windpipe) is the main airway to the lungs, extending from the glottis to the junction of the two main bronchii.*
  - 3. **The bronchi and alveoli** are within the lungs themselves. The bronchii are tubes that branch out from the trachea. They provide a pathway to the alveoli, which are the air sacs where external respiration takes place.*
-

**171.**

Which of the following is a serous membrane that lines the abdominal cavity and prevents friction?

**Peritoneum**

Periosteum

Omentum

Epididymus

---

*Correct answer: Peritoneum*

*The peritoneum is a serous membrane that lines the abdominal cavity and prevents friction. It secretes serous fluid that works as a lubricant and protects the abdominal organs. The abdominal cavity contains the major organs of digestion. The digestive tract consists of the mouth, pharynx, esophagus, stomach, small intestine, large intestine, rectum, and anus.*

*The periosteum is a thin membrane of connective tissue that covers certain portions of the bones.*

*The omentum is a support structure in the abdominal cavity that surrounds the intestinal organs, protecting them from inflammation and infection.*

*The epididymus is part of the male reproductive system.*

---

**172.**

If a client states that a muscle in his upper leg hurts when he flexes his knee, which of the following muscles is **most** likely causing the pain?

**Semimembranosus**

Tibialis anterior

Soleus

Flexor hallucis longus

*Correct answer: Semimembranosus*

*The semimembranosus is a part of the hamstring muscle group, which is located on the posterior thigh. This muscle group is responsible for knee flexion. Semimembranosus also participates in medial rotation of the leg (in certain positions) and extension of the thigh at the hip joint, among other actions. If a client experiences muscle pain during knee flexion, it is likely that one or more of the knee flexors is involved.*

*Tibialis anterior originates on the tibia, and soleus and flexor hallucis longus both originate on the fibula. All three of these muscles insert on various bones of the foot. Since none of them cross the knee joint, they are not involved in knee flexion.*

---

**173.**

Which of the following is an enzyme found in the stomach that is primarily responsible for digesting protein?

**Protease pepsin**

Amylase

Sucrase

Mucus

---

*Correct answer: Protease pepsin*

*Protease pepsin is an enzyme found in the stomach. It is primarily responsible for digesting protein. HCl, also found in the stomach, has a similar function.*

*Amylase and lipase are found in the pancreas. Amylase digests polysaccharides, and lipase digests lipids. Sucrase, which is found in the small intestine, digests sugars. The mucosal lining of the stomach protects the stomach from acid. If this lining breaks down, the acid may burn the stomach, resulting in an ulcer. Mucus is not responsible for the chemical process of digestion.*

---

**174.**

Which of the following options **best** identifies the pathway of blood from the lungs through the heart?

**Lungs > Pulmonary vein > Left Atrium (LA) > Mitral valve > Left Ventricle (LV) > Aortic valve > Aorta > Body**

Lungs > Vena cava > Right Atrium (RA) > Tricuspid valve > Right Ventricle (RV) > Pulmonic valve > Pulmonary arteries > Body

Lungs > Pulmonary vein > Left Ventricle (LV) > Mitral valve > Right Ventricle (RV) > Aortic valve > Aorta > Body

Lungs > Pulmonary vein > Right Atrium (RA) > Mitral valve > Right Ventricle (RV) > Aortic valve > Aorta > Body

---

*Correct answer: Lungs > Pulmonary vein > Left Atrium (LA) > Mitral valve > Left Ventricle (LV) > Aortic valve > Aorta > Body*

*The pathway of blood through the heart from the lungs is as follows: Lungs > Pulmonary vein > Left Atrium (LA) > Mitral valve > Left Ventricle (LV) > Aortic valve > Aorta > Body.*

*The pathway of blood through the heart from the body is as follows: Body > Vena cava > Right Atrium (RA) > Tricuspid valve > Right Ventricle (RV) > Pulmonic valve > Pulmonary arteries > Lungs.*

---

**175.**

Massage stimulates the production of which hormone?

**Oxytocin**

Prolactin

Norepinephrine

Potassium

*Correct answer: Oxytocin*

*Massage increases the body's available levels of oxytocin. Oxytocin is produced by the posterior pituitary gland and stimulates smooth muscle contraction, especially in the uterus. It also supports positive emotional responses, such as empathy.*

*Prolactin is a hormone produced by the anterior pituitary gland, which plays a role in breast development. Norepinephrine is produced by the adrenal glands in response to stress. Potassium is an electrolyte.*

---

**176.**

What process occurs when a cell divides into two identical cells?

**Mitosis**

Meiosis

Diffusion

Phagocytosis

---

*Correct answer: Mitosis*

*Mitosis is another word for cell division. This word is generally used to refer to the process in which a cell divides into two identical cells after the chromosomes of the DNA are duplicated.*

*Meiosis is a specialized form of mitosis which results in eggs and sperm. During meiosis, the cell divides into two cells which each have half of the chromosomes of the original cell. Diffusion occurs when a substance moves from a higher concentration to a lower concentration. Phagocytosis is the process in which solids are engulfed by the cell membrane. It is a function of white blood cells, in which they eat and destroy substances such as bacteria which are deemed a threat to the health of the body.*

---

177.

All the following are part of the integumentary system **except**:

**The lymph nodes**

The skin

The hair

The nails

---

*Correct answer: The lymph nodes*

*The lymph nodes are part of the lymphatic system, not the integumentary system.*

*The integumentary system includes the skin and its associated structures, including the hair and nails.*

---

178.

In relation to the ear, in what position could a massage therapist injure the carotid artery, facial nerve, or styloid process?

Inferior

Superior

Anterior

Posterior

---

*Correct answer: Inferior*

*If a massage therapist were massaging inferior to the ear, he could injure the carotid artery, facial nerve, or styloid process.*

*Inferior means "below."*

*Superior means "above."*

*Anterior means "toward the front of the body."*

*Posterior means "toward the back of the body."*

---

179.

Which of the following is **not** a function of the urinary system?

**Transporting antibodies throughout the body**

Regulating blood pressure

Regulating electrolyte balance

Eliminating excess water

---

*Correct answer: Transporting antibodies throughout the body*

*The transportation of antibodies throughout the body is a function of the lymphatic system, not the urinary system.*

*The urinary system's functions include the regulation of blood pressure, the regulation of electrolyte balance, and the elimination of excess water and toxins.*

---

**180.**

All the following structures are parts of the digestive tract, **except**:

**The kidneys**

The mouth

The pancreas

The pharynx

---

*Correct answer: The kidneys*

*The kidneys, along with the ureters and the urinary bladder, are part of the renal system. It is also sometimes called the urinary system.*

*The mouth, pancreas, and pharynx are all part of the digestive tract. The mouth is the first portion of the gastrointestinal tract. Food moves through the mouth to the pharynx, which connects to the esophagus. During the digestive process, the pancreas produces hormones that regulate levels of glucose in the blood.*

---

**181.**

Which of the following is the respiratory and digestive system's common passage for air and food?

**Pharynx**

Larynx

Trachea

Bronchi

---

*Correct answer: Pharynx*

*The pharynx, which is also known as the throat, is the respiratory and digestive systems' common passage for air and food.*

*The larynx, which is composed of vocal cords, muscle, and cartilage, is the respiratory system's passageway for air at the top of the trachea. The trachea, which is C-shaped cartilage, is the respiratory system's windpipe. The bronchi are the respiratory system's method of carrying air into the smaller branches of bronchioles of the lungs.*

---

**182.**

Which of the following organs has the greatest effect on a client's blood sugar levels?

**Pancreas**

Kidney

Spleen

Brain

---

*Correct answer: Pancreas*

*Faulty pancreatic activity affects insulin production. The body loses the ability to oxidize carbohydrates because of this. The insulin in the pancreas causes an individual's blood sugar level to drop and the glucagons in the pancreas cause an individual's blood sugar level to rise.*

---

**183.**

Which of the following describes a cutaneous region of the body supplied by a single spinal nerve?

**Dermatome**

Myotome

Plexus

Reflex

*Correct answer: Dermatome*

*A dermatome is a cutaneous (skin) part of the body supplied by a single spinal nerve. Dermatomes are useful when assessing for sensory response and determining nerve involvement for a particular condition.*

*A myotome is a skeletal muscle or group of muscles that are supplied from a given spinal nerve. A plexus is a network of intertwining nerves that innervate a specific part of the body (the lumbar plexus comes from the low back and innervates the legs). A reflex is an involuntary action performed by the nervous system in response to a stimulus.*

---

184.

A person deficient in iron and vitamin K might have difficulty with:

**The formation of new red blood cells and the blood clotting process**

The formation of new white blood cells and the ability to fight infections

The formation of new plasma and dehydration

The formation of new lymphocytes and allergic reactions

---

*Correct answer: The formation of new red blood cells and the blood clotting process*

*Iron is very important in the formation of new red blood cells, and vitamin K is very important in the blood clotting process. A low level of red blood cells is known as anemia. Difficulty in the clotting process is known as hemophilia.*

*White blood cell production is not affected by iron or vitamin K. They are involved in the body's immune response.*

*Plasma is 90% water and most affected by water intake.*

*Lymphocytes are a type of white blood cell.*

---

**185.**

What is cranial nerve V also known as?

**Trigeminal**

Olfactory

Vagus

Hypoglossal

*Correct answer: Trigeminal*

*Cranial nerve V is also known as the trigeminal nerve. The cranial nerves are classified as follows:*

- 1. The olfactory nerve (CN I) contains special sensory neurons concerned with smell.*
- 2. The optic nerve (CN II) contains sensory neurons dedicated to vision.*
- 3. The oculomotor nerve (CN III) provides motor function for all eye muscles except those supplied by cranial nerves IV and VI.*
- 4. The trochlear nerve (CN IV) provides motor function to the superior oblique muscle of the eye.*
- 5. The trigeminal nerve (CN V) is the principal sensory supply to the head (face, teeth, sinuses, etc.); it also provides motor function to the muscles of mastication.*
- 6. The abducens nerve (CN VI) provides motor function to the lateral rectus muscle of the eye.*
- 7. The facial nerve (CN VII) provides motor innervation to the muscles of facial expression, lacrimal gland, submaxillary gland, and sublingual gland, as well as sensory supply to the anterior two-thirds of the tongue.*
- 8. The acoustic nerve (CN VIII), also known as the vestibulocochlear nerve, provides sensory innervation for hearing and equilibrium.*
- 9. The glossopharyngeal nerve (CN IX) provides motor innervation to the pharyngeal musculature and sensory function to the posterior one-third of the tongue and pharynx.*
- 10. The vagus nerve (CN X) provides motor innervation to the heart, lungs, and gastrointestinal tract. It also provides sensory innervation to the heart, respiratory tract, gastrointestinal tract, and external ear.*
- 11. The accessory nerve (CN XI) provides motor function to the sternocleidomastoid and trapezius muscles.*

12. *The hypoglossal nerve (CN XII) is a pure motor nerve that innervates the muscles of the tongue.*

---

**186.**

During inspiration, in which direction does the diaphragm move?

**Down**

Up

Forward

It does not move

---

*Correct answer: Down*

*During inspiration, the diaphragm moves down, functioning as a bellows. This increases the volume of the pleural cavities and decreases lung pressure, allowing room for air to move into the lungs. During exhalation, the diaphragm moves up.*

---

**187.**

Blood is able to travel through the arterial system due to:

**The pressure of blood being pumped into the aorta**

Peristalsis

Blood pressure, which is consistent throughout the body

Skeletal muscle movement

---

*Correct answer: The pressure of blood being pumped into the aorta*

*Blood is able to travel through the venous system due to the pressure of blood being pumped into the aorta. This sets up a pressure wave that travels along the arteries and expands the arterial wall. Blood pressure readings provide doctors with important information about a patient's overall health.*

*Peristalsis, or involuntary smooth muscle contraction, occurs in the digestive system.*

*Blood pressure is not consistent throughout the body. As the blood vessels become more distant from the heart, pressure decreases.*

*Skeletal muscle movement is responsible for moving lymph, but does not move blood through the arteries.*

---

**188.**

When an adult individual is at rest, what is a normal respiratory rate?

**12 to 20 breaths per minute**

30 to 36 breaths per minute

6 to 10 breaths per minute

24 to 30 breaths per minute

---

*Correct answer: 12 to 20 breaths per minute*

*For a normal, healthy adult at rest, the normal respiratory rate is about 12 to 20 breaths per minute. This rate will increase if they are exercising, are a smoker, or have a pulmonary disease such as asthma or emphysema. It can also increase due to strong emotions. Fear, grief, and shock can slow the respiratory rate, while anger, excitement, and sexual arousal can increase it.*

*The normal respiratory rate for infants and children is higher than it is for adults. In infants, for example, it is about 35 breaths per minute.*

---

189.

Which of the following glands is responsible for the secretion of breast milk?

**Mammary glands**

Vestibular glands

Cowper's glands

Sudoriferous glands

---

*Correct answer: Mammary glands*

*Mammary glands are found in the breast and are responsible for the secretion of breast milk.*

*Vestibular glands secrete mucus during a female's sexual arousal. Cowper's glands are responsible for the secretion of lubricant in a male's urethra. Sudoriferous glands produce sweat.*

---

**190.**

A tubercle bump that is found on the surface of a bone is **best** described by which of the following options?

**Small, round bump**

Large, round bump

Ridge

Bump located above a condyle

---

*Correct answer: Small, round bump*

*A tubercle is a small, rounded bump on a bone, such as the adductor tubercle of the femur.*

*A tuberosity is a large, rounded bump on a bone, such as the tibial tuberosity. A crest is a ridge on the edge or side of a bone, such as the iliac crest. An epicondyle is a bump located on the condyle of a bone, such as the medial epicondyle of the femur.*

---

**191.**

Which of the following is **true** of the great saphenous vein?

**It ascends medially from the foot to the thigh, where it drains into the femoral vein.**

It descends medially from the femoral artery to the foot.

It drains into the aorta.

It naturally becomes varicose with age.

---

*Correct answer: It ascends medially from the foot to the thigh, where it drains into the femoral vein.*

*The great saphenous vein ascends medially from the foot to the thigh, where it drains into the femoral vein. It is one of the major veins of the lower extremity.*

*Veins do not connect directly with arteries; instead, they bring blood all the way back to the heart, where it is oxygenated before traveling back out through the arterial system. Therefore, it would not connect with either the femoral artery or the aorta, which is also arterial. While the great saphenous vein can develop into a varicose vein, this is not a symptom of pathology, not a natural process.*

---

**192.**

Muscle fibers are arranged in parallel bundles called:

**Fascicles**

Myofibrils

Sarcomeres

Sarcolemmas

*Correct answer: Fascicles*

*Muscle fibers are arranged in parallel bundles called fascicles. These bundles contain motor neurons, blood vessels, fascial tissue, a plasma membrane called the sarcolemma, and myofibrils.*

*A sarcomere is the structural unit of contraction in skeletal muscle fibers. These units are arranged in chains called myofibrils. The sarcolemma is the plasma membrane covering muscle cells. It is similar to the cytoplasm found elsewhere in the body, except it contains myoglobin and large amounts of glycogen.*

---

**193.**

A therapist is massaging a client. The client is lying prone (face down), and the therapist stands at their head. The therapist places their hands on the client's scapulae and uses a long, gentle stroke to move toward the client's iliac crests. What **best** describes the direction of the therapist's movement?

**Superior to inferior**

Lateral to medial

Anterior to posterior

Ventral to dorsal

---

*Correct answer: Superior to inferior*

*In this example, the therapist's hands are moving from a superior position to an inferior position. Any area closer to the head is superior, and any area closer to the feet is inferior. This is true regardless of the body's position in space; the head is still superior no matter their position; this remains true for clients who are standing, sitting, or lying down.*

*In a lateral to medial movement, the therapist would begin at the sides of the client's body and move toward the middle. In an anterior to posterior movement, the therapist would begin in the front of the client's body and move toward the back. Ventral is simply another word for anterior; dorsal is another word for posterior.*

---

**194.**

Which of the five basic senses is interconnected with the limbic system, therefore having emotional and behavioral implications?

**Smell**

Taste

Hearing

Vision

*Correct answer: Smell*

*The olfactory system, responsible for the sense of smell, is directly linked to the limbic system, which is involved in emotions, memory, and behavior. This connection explains why certain scents can trigger strong emotional responses and memories. The olfactory bulb, which processes smell signals, is one of the brain's structures most closely associated with the limbic system, highlighting the unique role of smell in influencing mood and behavior.*

*While closely related to smell, taste is processed primarily by the gustatory system, which does not have the same direct link to the limbic system. It is more concerned with identifying and interpreting flavors rather than generating emotional responses.*

*Hearing is processed by the auditory system in the temporal lobes of the brain. While sound can evoke emotions, it does not have the same intimate connection with the limbic system as smell.*

*The occipital lobe manages vision and is mainly focused on processing visual information. Like hearing, it can evoke emotional responses but does not have the same deep emotional connection to the limbic system that smell does.*

---

**195.**

The nose, pharynx, and larynx are all parts of the:

**Respiratory system**

Nervous system

Lymphatic system

Muscular system

*Correct answer: Respiratory system*

*The nose, pharynx, and larynx are all parts of the respiratory system.*

*The upper respiratory system includes:*

1. **The nasal cavity.**
2. **The pharynx**, or throat, which is divided as follows:
  - **The nasopharynx** is a pathway for air and a continuation of the nose and nasal cavity.
  - **The oropharynx** is a pathway for food and extends back from the mouth. This is the part of the throat that is visible when a person opens their mouth, containing the tonsils.
  - **The laryngopharynx** is a pathway for both air and food. It begins at the hyoid bone and then separates into the esophagus and the larynx.

*The lower respiratory tract includes the following:*

1. **The larynx** (voice box) connects the pharynx to the trachea (windpipe).
2. **The trachea** (windpipe) is the main airway to the lungs, extending from the glottis to the junction of the two main bronchi.
3. **The bronchi and alveoli** are within the lungs themselves. The bronchi are tubes that branch out from the trachea. They provide a pathway to the alveoli, which are the air sacs where external respiration takes place.

*The nervous system includes the brain, brainstem, spinal cord, and peripheral nerves. The lymphatic system transports lymph throughout the body. The muscular system includes the body's skeletal muscles.*

---

**196.**

Which of the following is a protruding area on a bone, functioning as an attachment point for tendons and ligaments?

**Spinous process**

Foramen

Fossa

Fissure

---

*Correct answer: Spinous process*

*A spinous process is a sharp or slender projection of a bone, such as the vertebral spinous processes or the spine of the scapula. This is a common point of attachment for tendons and ligaments.*

*A foramen is a rounded hole in the bone, such as the foramen of a vertebra, which allows the spinal cord to pass through the length of the spine.*

*A fossa is a shallow depression in the surface or at the end of the bone, such as the infraspinous fossa of the scapula.*

*A fissure is a groove or slit between two bones, such as the orbital fissure of the sphenoid bone.*

---

**197.**

Which of the following options **best** identifies the pathway of blood through the heart from the body?

**Body > Vena cava > Right Atrium (RA) > Tricuspid valve > Right Ventricle (RV) > Pulmonic valve > Pulmonary arteries > Lungs**

Lungs > Pulmonary vein > Left Atrium (LA) > Bicuspid valve > Left Ventricle (LV) > Aortic semilunar valve > Aorta > Body

Body > Pulmonary vein > Left Ventricle (LV) > Bicuspid valve > Left Atrium (LA) > Aortic semilunar valve > Aorta > Lungs

Lungs > Vena cava > Right Ventricle (RV) > Tricuspid valve > Right Atrium (RA) > Pulmonic valve > Pulmonary arteries > Body

---

*Correct answer: Body > Vena cava > Right Atrium (RA) > Tricuspid valve > Right Ventricle (RV) > Pulmonic valve > Pulmonary arteries > Lungs*

*The pathway of blood through the heart from the body is as follows: Body > Vena cava > Right Atrium (RA) > Tricuspid valve > Right Ventricle (RV) > Pulmonic valve > Pulmonary arteries > Lungs.*

*The pathway of blood through the heart from the lungs is as follows: Lungs > Pulmonary vein > Left Atrium (LA) > Mitral valve > Left Ventricle (LV) > Aortic valve > Aorta > Body.*

---

**198.**

Which nervous tissue is composed of neuroglial cells?

**Myelin sheath**

Synaptic vesicles

Nerve bundle

Neuron

---

*Correct answer: Myelin sheath*

*The myelin sheath is the nervous tissue that is composed of neuroglial cells. It is a type of connective tissue that serves to insulate a neuron.*

*The neuron is a type of cell that functions as part of the nervous system. The dendrites of a neuron receive information, and the axon fibers carry that information away from the cell's body. A nerve bundle is composed of multiple nerve fibers. Synaptic vesicles are structures located at the synapse (where neurons connect to each other) and contain neurotransmitters.*

---

**199.**

Which of the following blood vessels is a part of the respiratory system?

**Pulmonary artery**

Brachial artery

Carotid artery

Popliteal artery

---

*Correct answer: Pulmonary artery*

*The pulmonary veins and arteries are involved in the exchange of oxygen and carbon dioxide between the capillaries and the alveoli. "Pulmonary" is a medical term that refers to the lungs.*

*The brachial arteries are located in the arms. The carotid artery is located in the neck. The popliteal arteries are located in the legs.*

---

**200.**

A client comes to you who has recently been diagnosed with kidney stones. Her physicians would like her to try to pass them on her own. She is reporting significant flank (lower back) pain. This is **most** likely what kind of pain?

**Visceral**

Phantom

Musculoskeletal

Somatic

*Correct answer: Visceral*

*Visceral pain is derived from viscera (or internal organs). In this case, the pain is likely coming from the client's kidneys, ureters, and/or urethra. This is a common symptom of kidney stones.*

*Phantom pain occurs in people who have undergone limb amputation when they experience sensations in a missing part of the body. Musculoskeletal pain comes from bone or muscle structures; given this client's diagnosis of kidney stones, it is unlikely for these structures to be the cause of her discomfort. Somatic pain arises from pain receptors in the skin or fascia and is similar to musculoskeletal pain.*

---

201.

Which part of the brain is used for coordination, balance, and equilibrium?

**Cerebellum**

Cerebrum

Midbrain

Medulla oblongata

---

*Correct answer: Cerebellum*

*The cerebellum is the part of the brain that is used for coordination, balance, and equilibrium.*

*The cerebrum is the part of the brain that is known as "the seat of intelligence." It has many functions, such as interpreting sensory information, transmitting motor impulses to initiate voluntary movement, and learning. The midbrain controls visual and auditory reflexes. The medulla oblongata controls involuntary functions such as the heartbeat, blood pressure, and respiration.*

---

**202.**

What is the human body's sodium balance regulated by?

**The kidneys**

Baroreceptors

The parathyroid

Osmoreceptors

---

*Correct answer: The kidneys*

*The human body's sodium balance is regulated by the kidneys. Sodium is an electrolyte that plays an important role in muscle excitability and the regulation of fluid balance. Other important electrolytes include potassium, calcium, phosphorus, and magnesium.*

*Baroreceptors regulate blood pressure.*

*The parathyroid regulates calcium levels.*

*Osmoreceptors regulate fluid balance by stimulating a thirst response.*

---

**203.**

Which of the following is the function of the endocrine system's parathyroid?

**Fosters calcium movement from the bones to the blood**

Releases ADH

Regulates metabolism

Facilitates lactation

---

*Correct answer: Fosters calcium movement from the bones to the blood*

*The four tiny glands that are embedded in the posterior of the thyroid are known as parathyroids. They release a hormone called parathormone. This hormone combines with Vitamin D to regulate calcium levels throughout the body.*

*Antidiuretic Hormone (ADH) is also called vasopressin. This hormone is stored in the posterior pituitary gland, and it inhibits the urge to urinate. The thyroid regulates the body's metabolism. Oxytocin, also released by the posterior pituitary gland, stimulates feelings of love and belonging and also facilitates lactation.*

---

**204.**

There are 5 types of sensory nerves that supply each muscle. Which of the following is **not** one of them?

**Muscle fiber**

Golgi tendon organ

Muscle spindle

Nociceptor

*Correct answer: Muscle fiber*

*Muscle fibers make up muscle tissue. They are part of the musculoskeletal system, not the nervous system.*

*There are five types of sensory nerve receptors that supply each muscle:*

- **Type 1a: Primary muscle spindles** are primarily located in the belly of the muscle. These stretch receptors respond to sudden and excessive muscle lengthening. They also send signals to the antagonist muscle, via the spinal cord, inhibiting antagonist muscle action.
  - **Type 1b: Golgi tendon organs** respond to increased tension in the muscle belly. They regulate the amount of muscle contraction.
  - **Type 2: Secondary muscle spindle** (includes paciniform and pacinian corpuscles) are sensitive to deep pressure.
  - **Type 3: Free nerve endings** are sensitive to pain, chemicals, and temperature.
  - **Type 4: Nociceptors** detect pain and irritation.
-

**205.**

A client's physician has diagnosed her with hypothyroidism. What system does this involve?

**The endocrine system**

The integumentary system

The lymphatic system

The cardiovascular system

---

*Correct answer: The endocrine system*

*The thyroid is a part of the endocrine system. The endocrine system regulates the body's response to events in an effort to maintain homeostasis. It is primarily involved with physiological functions using chemicals called hormones. This system also includes the hypothalamus, hypophysis (or pituitary), thyroid, thymus (also in the lymphatic system), parathyroid, pineal, adrenal, pancreas, and the gonads (ovaries or testes).*

*The integumentary system involves the skin, hair, nail, sebaceous glands, sweat glands, and breasts. The lymphatic system involves lymph nodes, spleen, tonsils, and the thymus gland (also in the endocrine system). The cardiovascular system involves the heart, arteries, veins, and capillaries.*

---

**206.**

Where does the sciatic nerve arise?

**L4-S3**

L3-L4

The ventral surface of the brain

C5-C8

*Correct answer: L4-S3*

*The sciatic nerve arises from the nerves which exit the spine from L4-S3.*

*The femoral nerve arises from the nerves exiting the spine from L3-L4. The cranial nerves originate from the ventral surface of the brain. The axillary nerve arises from the nerves exiting the spine from C6-C8.*

---

**207.**

In regard to the molecular and anatomical level of organization in the human body, which of the following atoms in living things, such as humans, is the least common?

**Sulfur**

Hydrogen

Carbon

Nitrogen

*Correct answer: Sulfur*

*Atoms bond to form molecules, which comprise cells and all higher levels of human organs and tissues. The most commonly found atoms in living things (including humans) are hydrogen, carbon, nitrogen, and oxygen.*

*Sulfur is found in the human body but in very low amounts.*

---

**208.**

Which of the following is a 4- to 5-inch tube that begins at the glottis and functions as the main airway to the lungs?

**Trachea**

Pharynx

Larynx

Diaphragm

*Correct answer: Trachea*

*The trachea (or windpipe) is the main airway to the lungs. It is a 4–5 inch tube that begins at the glottis and ends at the junction of the two main bronchi, near the level of the sternal notch. The trachea is also called the windpipe.*

*The upper respiratory system includes:*

- 1. The nasal cavity.**
- 2. The pharynx**, or throat, is divided into:
  - **The nasopharynx**, a pathway for air and a continuation of the nose and nasal cavity.
  - **The oropharynx**, a pathway for food that extends back from the mouth. This is the part of the throat that is visible when a person opens their mouth, containing the tonsils.
  - **The laryngopharynx**, a pathway for both air and food. It begins at the hyoid bone and then separates into the esophagus and the larynx.

*The lower respiratory tract includes:*

- 1. The larynx** (voice box), which connects the pharynx to the trachea (windpipe).
- 2. The trachea** (windpipe), which is the main airway to the lungs, extends from the glottis to the junction of the two main bronchi.
- 3. The bronchi and alveolibranchi**, which are within the lungs themselves. The bronchi are tubes that branch out from the trachea. They provide a pathway to the alveoli, which are the air sacs where external respiration takes place.

*The diaphragm is the dome-shaped sheet of muscle attached to the thoracic wall that separates the thoracic and abdominal cavities and assists with breathing.*

---

209.

Which of the following **best** describes the endosteum?

**The thin membrane of connective tissue that lines the marrow cavity of a bone**

The thin membrane of connective tissue that covers the outside of a bone

The anatomical structure that connects muscle to bone

The anatomical structure that connects bone to bone

---

*Correct answer: The thin membrane of connective tissue that lines the marrow cavity of a bone.*

*The endosteum is a thin vascular membrane of connective tissue that lines the marrow cavity of a bone. It contains cells that aid in bone growth and repair.*

*The periosteum is a thin membrane that covers the outside of the bones; this membrane is not found on the ends of bones that form joints. Tendons connect muscle to bone. Ligaments connect bone to bone.*

---

210.

A crest is **best** described as what?

**The ridge of a bone**

The protruding posterior edges of the vertebrae

The top of the head

Every point where a muscle attaches to bone

---

*Correct answer: The ridge of a bone*

*A crest is a ridge on the edge or side of a bone, such as the iliac crest.*

*The protruding posterior edges of the vertebrae are known as spinous processes. The bones of the skull do not have anatomical crests. While muscles do attach to bony crests, this is not the only place where attachments are found.*

---

**211.**

What valve connects the right atrium and right ventricle?

**Tricuspid**

Mitral

Semilunar

Aortic

*Correct answer: Tricuspid*

*The tricuspid (also known as right atrioventricular) valve is located between the right atrium and the right ventricle.*

*The mitral valve (also known as left atrioventricular) valve is located between the left atrium and the left ventricle.*

*The semilunar valves control blood flow out of the ventricles into the aorta and pulmonary arteries.*

*The aortic valve is between the left ventricle and the aorta.*

---

**212.**

Where is the clavicle located?

**The appendicular skeleton**

The axial skeleton

The lower limb

The ribcage

*Correct answer: The appendicular skeleton*

*The clavicle, sometimes called the collar bone, is located in the appendicular skeleton. This is true even though it is adjacent to the ribcage.*

*The axial skeleton includes bones along the central axis of the body, such as the vertebrae, ribcage, and skull. The lower limb includes the femur, patella, tibia, fibula, tarsals, metatarsals, and phalanges. Although it is located near the clavicle, the ribcage is considered to be its own structure.*

---

**213.**

Of the following, what is the **best** description of edema?

**An excess of interstitial fluid**

An autoimmune condition

A symptom of dehydration

A warning sign for diabetes

---

*Correct answer: An excess of interstitial fluid*

*Of the available options, edema is best described as an excess of interstitial fluid. Edema often results in tissue swelling, and is common wherever lymphatic blockage occurs.*

*Edema is often a symptom of other diagnoses or pathologies; it is not itself an autoimmune condition. Dehydration is caused by a lack of adequate water, not an excess of fluid. Excessive hydration, however, is not a cause of edema. Edema can indicate pathological conditions of the liver, heart, or kidneys. Diabetes is characterized by pathology of the pancreas.*

---

**214.**

Which part of the brain, located between the midbrain and the medulla, assists in rhythmic control of breathing?

**Pons**

Medulla oblongata

Cerebellum

Hypothalamus

*Correct answer: Pons*

*The pons assists in rhythmic discharge of the respiratory center of the medulla, chewing, facial expressions, and eye movement. It is located between the midbrain and the medulla. It also contains cranial nerve nuclei and important centers for rapid eye movement (REM) sleep.*

*The medulla oblongata connects the pons with the spinal cord. The cerebellum plays a role in balance and the subconscious movements of skeletal muscle. The hypothalamus, located below the thalamus and above the pituitary gland, regulates functions such as heart rate, blood pressure, aspects of digestion, and temperature.*

---

**215.**

Which chamber of the heart is responsible for pumping oxygen-rich blood into the aorta?

**Left ventricle**

Left atrium

Right ventricle

Right atrium

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*Correct answer: Left ventricle*

*The left ventricle pumps oxygen-rich blood directly into the aorta.*

*The pathway of blood through the heart from the lungs is as follows: Lungs > Pulmonary vein > Left Atrium (LA) > Mitral valve > Left Ventricle (LV) > Aortic valve > Aorta > Body.*

*The pathway of blood through the heart from the body is as follows: Body > Vena cava > Right Atrium (RA) > Tricuspid valve > Right Ventricle (RV) > Pulmonic valve > Pulmonary arteries > Lungs.*

*The right atrium receives the oxygen-poor blood from the vena cava. The right ventricle pumps oxygen-poor blood through the pulmonary arteries and into the lungs. The left atrium receives oxygen-rich blood from the pulmonary vein.*

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# Benefits and Effects of Soft Tissue Manipulation

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Benefits and Effects of Soft Tissue Manipulation

216.

Which of the following is **not** a physiologic response to hydrotherapy cold applications?

Decreased muscle tone

Increased tissue stiffness

Decreased inflammation

Decreased digestive processes

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*Correct answer: Decreased muscle tone*

*There are many physiologic responses to cold and ice application. The application of cold hydrotherapy increases muscle tone. Other responses include increased tissue stiffness, decreased digestive processes, decreased pain and inflammation, increased white blood cell production, and decreased respiration.*

---

217.

What is a technique used to normalize the motor tone of muscles?

Oscillation

Kneading

Percussion

Friction

---

*Correct answer: Oscillation*

*Oscillation (shaking) is a technique used to normalize the motor tone of muscles. This is the rhythmic or dysrhythmic movement of tissues on a body part. This technique warms and prepares the body for deeper work. It intentionally confuses the positional proprioceptors, causing the surrounding muscle tissue to reflexively relax.*

*Kneading is used to stretch the tendons, release tension in the muscle belly, and mechanically soften superficial fascia.*

*Percussive techniques stimulate nerve responses.*

*Friction can be used to break up scar tissue.*

---

**218.**

Massage has a known impact on T cell activity, improving immune function and benefiting the client's:

**Lymphatic system**

Respiratory system

Nervous system

Integumentary system

---

*Correct answer: Lymphatic system*

*Massage has a known impact on T cell activity, improving immune function and benefiting the client's lymphatic system. Other benefits of massage to the lymphatic system include alleviating the symptoms of lymphedema, stimulating lymph circulation, and encouraging the body to process and remove toxins.*

*The respiratory system is responsible for breathing.*

*The nervous system receives stimuli and controls the body's voluntary and involuntary responses.*

*The integumentary system includes the skin.*

---

**219.**

Which of the following options is a benefit that a massage provides to the nervous system?

**Pain relief**

The increase of blood flow to the skin

Improved respiration

The removal of toxins

---

*Correct answer: Pain relief*

*Massage benefits the nervous system by relieving pain. This is one of many ways massage improves nervous system function. Nociceptors are sensory pain receptors in the somatic nervous system. Massage can temporarily alleviate noxious stimuli via the gate theory mechanism, or more permanently by addressing the cause of pain.*

*Massage benefits the integumentary system by increasing blood flow to the skin. It benefits the respiratory system by improving breathing. It benefits the cardiovascular system by removing toxins.*

---

**220.**

Of the following options, which is **not** a mechanical force that can be produced by massage techniques?

**Field force**

Shear loading

Bending stress

Torsion

---

*Correct answer: Field force*

*A field force is not a type of mechanical force. Gravity and magnetism are both examples of field forces. Field forces are not produced by massage techniques.*

*Shear loading is produced when tissues are made to slide against other tissues, as with frictioning techniques. Bending stress is a combination of compression and tension stress. Torsion is best described as pushing and pulling.*

---

**221.**

Which of the following is **not** a massage benefit for one's skeletal system?

**Stimulates the sensation of touch**

Improves the range of motion of joints

Improves the joints' flexibility

Improves the spine's curvature

---

*Correct answer: Stimulating the sense of touch*

*A massage does not benefit the skeletal system by stimulating the sensation of touch. The integumentary and neurologic systems' benefits include the stimulation of touch.*

*The massage benefits for the skeletal system are the improvement of the joints' range of motion, the improvement of the joints' flexibility, and the improvement of the spine's curvature.*

---

**222.**

Which of the following is a benefit of massage for the digestive system?

**It reduces constipation.**

It increases the body's oxytocin levels.

It decreases the body's cortisol levels.

It promotes the release of endorphins.

---

*Correct answer: It reduces constipation.*

*A massage benefits the digestive system by reducing constipation. Specific types of massage can target the large intestine, having a mechanical effect on this condition.*

*A massage benefits the endocrine system by increasing the body's oxytocin levels, decreasing the body's cortisol levels, and promoting the release of endorphins.*

---

223.

In which form of massage application is lubrication generally not used?

**Myofascial release**

Kneading

Skin rolling

Effleurage

---

*Correct answer: Myofascial release*

*In most cases, a lubricant is not used with myofascial approaches. This is because the drag quality on the tissue produces the greatest effect on fascia, warming the ground substance and breaking up adhesions. Using a lubricant reduces drag and makes this approach less effective.*

*A lubricant should be used when a therapist performs kneading, skin rolling, or effleurage.*

---

**224.**

What is increased with the use of cold and ice?

**Muscle tone**

Pain

Inflammation

Muscle spasm

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*Correct answer: Muscle tone*

*Muscle tone is increased with the use of cold and ice.*

*Pain, respiration, inflammation, muscle spasm, and circulation decrease with the use of cold and ice.*

---

**225.**

Which of the following is **not** an effect of hot stone massage?

**Decreased inflammation**

Increased inflammation

Increased circulation

Compression of deeper muscle tissue

---

*Correct answer: Decreased inflammation*

*Decreased inflammation is not an effect of hot stone massage. On the contrary, heat increases inflammation. When applied properly, this technique can kickstart the healing process.*

*Hot stone massage is known to increase inflammation and circulation. The weight of the stones compresses both superficial and deeper muscle tissue.*

---

226.

Which of the following is **not** an effect of using cold and ice on the body?

Decreased muscle tone

Increased tissue stiffness

Decreased pain

Decreased inflammation

---

*Correct answer: Decreases muscle tone*

*The application of cold or ice causes an increase, not a decrease, in muscle tone.*

*The use of cold and ice during massage can also increase tissue stiffness, decrease pain, and control inflammation. Other effects on the body include increased white and red blood cell production, decreased respiration, decreased digestive processes, decreased metabolism, and increased stimulation.*

---

227.

Which of the following is **not** an effect of hydrotherapy that applies heat?

**Increased white blood cell production**

Sedation and calming

Elimination of toxins

Spasmodic relief

---

*Correct answer: Increased white blood cell production*

*The application of heat decreases white blood cell production. If the goal is to increase white production, the therapist can apply cold hydrotherapy instead.*

*Heat produces a calming effect, eliminates toxins, and provides relief from muscle spasms.*

---

228.

Following a massage in which the therapist used essential oils, the therapist notices the client is much happier and more relaxed. Why did this **most** likely occur in reaction to the use of essential oils?

Stimulation of the limbic system

Stimulation of the sympathetic nervous system

Stimulation of the proprioceptors

Stimulation of the spinothalamic tract

---

*Correct answer: Stimulation of the limbic system*

*The sense of smell is highly tied to memories and emotion through the limbic system in the brain. This system deals with emotions and memory, and positive stimulation can result in improved mood and relaxation.*

*The sympathetic nervous system typically increases stress levels. Stimulation of the sympathetic nervous system should not occur during a massage; if it did, it would not result in the client appearing happier and more relaxed. The proprioceptors sense the body's location in space. The spinothalamic tract carries pain signals in the spinal cord. Neither the proprioceptors nor the spinothalamic tract would likely be stimulated by smell.*

---

**229.**

A massage benefits which system by relieving the inflammation of the tendons?

**Muscular system**

Cardiovascular system

Nervous system

Respiratory system

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*Correct answer: Muscular system*

*A massage benefits the muscular system by relieving the inflammation of the tendons. A massage also benefits the muscular system by stretching muscles, relieving muscle spasms, improving muscle tone, and promoting healing. The tendons are part of the muscular system; their primary function is connect muscles to bones.*

*A massage will benefit the cardiovascular system by improving circulation and the nervous system by releasing and balancing neurochemicals. To benefit the respiratory system, a massage can relax the muscles that control respiration and/or release phlegm from the lungs through tapotement.*

---

230.

What are the three most common goals of outcome-based massage?

Healing and rehabilitation, condition management, palliative care

Healing, relaxation, stress reduction

Pain relief, palliative care, hospice care

Diagnosis, treatment, outcome

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*Correct answer: Healing and rehabilitation, condition management, palliative care*

*The three most common goals of outcome-based massage are:*

- 1. **Healing and rehabilitation:** Healing and rehabilitation-oriented massage works toward a measurable goal*
- 2. **Condition management:** Condition management recognizes that a chronic condition will never go away entirely, but massage may help lessen or manage symptoms*
- 3. **Palliative care:** Palliative care is performed on patients near the end of their lives, and is purely for relaxation and comfort*

*Relaxation massage is not out-come based. Palliative care and hospice care are synonymous. Diagnosis is outside a massage therapist's scope of practice.*

---

**231.**

Entrapped and compressed nerves exhibit similar symptoms but different causes. Which of these conditions will receive the **most** benefit from massage and why?

**Entrapped nerves, because massage can release tension in soft tissue.**

Compressed nerves, because massage can release tension in soft tissue.

Entrapped nerves, because massage releases dopamine.

Compressed nerves, because massage releases dopamine.

---

*Correct answer: Entrapped nerves, because massage can release tension in soft tissue.*

*Entrapped nerves experience pressure exerted by soft tissue, such as muscles. Compressed nerves experience pressure exerted by bony structures. Because massage releases tension in soft tissue, it relieves the symptoms of nerve entrapment more effectively.*

*Although massage does release dopamine, this is not relevant to the treatment of entrapped or compressed nerves. These conditions are caused by mechanical or structural issues, not by chemical imbalances.*

---

**232.**

What is/are the primary purpose(s) of kneading?

**To stretch tendons, release tension in the muscle belly, and mechanically soften superficial fascia.**

To compress deeper tissues and enhance circulation.

To stimulate nerve responses.

To break up scar tissue.

---

*Correct answer: To stretch tendons, release tension in the muscle belly, and mechanically soften superficial fascia.*

*The primary purposes of kneading are to stretch the tendons, release tension in the muscle belly, and mechanically soften superficial fascia. This technique is performed rhythmically, and involves the manipulation of multiple layers of tissue at a time.*

*Compression techniques are used to compress deeper tissues and enhance circulation. Percussive techniques stimulate nerve responses. Friction can be used to break up scar tissue.*

---

233.

Which of the following techniques has the **greatest** effect on fascia?

Friction

Tapotement

Effleurage

Petrissage

---

*Correct answer: Friction*

*Frictioning techniques can be performed on superficial or deeper tissues. These movements create shear force to the tissue and are extremely helpful in breaking up adhesions and scar tissue.*

*Tapotement (percussion) is used to stimulate nerve responses. Effleurage (gliding) applies light to moderate pressure to superficial structures including the skin, fascia, and muscles. Although petrissage, or kneading, does have an effect on fascia and tendons, it primarily targets the belly of the muscle.*

---

**234.**

Massage will facilitate sebaceous secretions. Which system does this primarily affect?

**Integumentary**

Muscular

Cardiovascular

Nervous

---

*Correct answer: Integumentary*

*Massage will facilitate sebaceous secretions. This primarily affects the integumentary system. Sebaceous glands are located in the skin, most often connected with hair follicles. They secrete sebum, an oily substance that gives the skin and hair a glossy appearance.*

*While massage does benefit the muscular, cardiovascular, and nervous systems, none of these systems contain sebaceous glands.*

---

**235.**

A parent approaches a massage therapist with concern over her child's complaints of growing pains in her lower limbs. What is an appropriate solution?

**With parental consent and supervision, a 20-minute massage over the lower legs for pain relief**

With parental consent and supervision, a 75-minute massage over the lower legs for pain relief

It is not appropriate to massage children due to hypersensitive nervous system activity.

It is not appropriate to massage children for growing pains due to the risk of injury at the growth plates.

---

*Correct answer: With parental consent and supervision, a 20-minute massage over the lower legs for pain relief*

*Children have shorter attention spans and massage sessions should be limited to one hour or less. Most massage sessions for children are 15–30 minutes in duration. Massage in children is appropriate, and is an organized approach to touch. Massage does provide temporary relief to growing pains. It is essential to obtain informed consent from the parent, and for the parent to remain in the room to supervise the massage.*

---

**236.**

Of the following options, which is the **best** definition of a trigger point?

**A discrete area of pain and/or tenderness in a band of dense muscle tissue**

A pathology that produces referred pain

A build-up of lactic acid

An adhesion between two different muscles

---

*Correct answer: A discrete area of pain and/or tenderness in a band of dense muscle tissue*

*A trigger point is a discrete area of pain and/or tenderness in a band of dense muscle tissue. It may or may not refer pain and results from adhesions between different muscles.*

*While trigger points do often produce referred pain, this is not always the case. Many other pathologies, such as liver disease and gastrointestinal distress, may also produce referred pain.*

---

**237.**

Which of the following are examples of Eastern medicine techniques?

**Ayurveda, polarity therapy, jing lu**

Muscle energy techniques, polarity therapy, jing lu

Acupuncture, jing lu, myofascial techniques

Ayurveda, yoga, tai chi

---

*Correct answer: Ayurveda, polarity therapy, jing lu*

*Ayurveda, polarity therapy, and jing lu are all examples of Eastern medicine techniques. These complex modalities require extensive study.*

*Muscle energy techniques and myofascial techniques employ the principles of Western medicine.*

*Yoga and tai chi are not massage modalities.*

---

**238.**

Of the following options, which is **not** a goal of general massage?

**To release trigger points in the back**

To stimulate all sensory receptors

To touch all layers of tissue

To move all major joints of the body

---

*Correct answer: To release trigger points in the back*

*There are many goals of general massage, including the stimulation of all sensory receptors, touching all layers of tissue, and moving all major joints of the body. Each client is different, and therefore each massage is different, and so the goals of a particular massage should be tailored to meet the client's unique needs.*

*In some cases, the goal of massage may be to release trigger points in the back. However, general massage does not always have this goal.*

---

**239.**

Which of the following techniques should be avoided when treating a trigger point?

**Lymphatic drainage**

Hyperstimulation of the involved muscle and connective tissue

Massage to the area of referred pain

Stretching

---

*Correct answer: Lymphatic drainage*

*Lymphatic drainage is not a recommended technique for addressing trigger points. This method is primarily used to treat conditions affecting the immune and lymphatic systems, such as lymphedema. Trigger points, on the other hand, are best treated using techniques that directly address muscle tension, which is not the focus of lymphatic drainage.*

*Hyperstimulation of the involved muscle and connective tissue is commonly used to deactivate trigger points by applying sustained pressure to release the tight muscle fibers. Massage to the area of referred pain helps alleviate tension that may have spread to secondary areas, and stretching helps to reduce muscle tightness further and restore flexibility after the trigger point is released.*

---

**240.**

The massage therapist is working with an infant with wry neck. This infant keeps his head positioned looking to the left side. Massage therapy intervention is focusing on the relaxation of the neck muscles, stretching, and release of trigger points to improve range of motion. Of the following options, which muscle is most likely to be involved?

**Sternocleidomastoid**

Rhomboids

Anterior deltoid

Subscapularis

*Correct answer: Sternocleidomastoid*

*Torticollis, also known as wry neck, is a condition that involves the spasm or shortening of one of the sternocleidomastoid muscles. This results in turning of the neck toward one direction. Massage therapy is indicated to improve range of motion through relaxation, stretching and trigger point release.*

*The rhomboids, anterior deltoid, and subscapularis, are all located in the upper back and/or shoulder, and do not have a direct impact on neck positioning.*

---

241.

Which of the following options is **not** a common benefit of massage?

**Stimulation of the Sympathetic Nervous System**

Stimulation of the Parasympathetic Nervous System

General relaxation

Release of endorphins

---

*Correct answer: Stimulation of the Sympathetic Nervous System.*

*The Sympathetic Nervous System (SNS) is the "fight or flight" response in which little to no tissue healing occurs because the body is concerned with immediate survival. This is not a desirable outcome for massage, although some techniques may be painful and may briefly elicit some stimulation of the SNS. Ultimately, the client should remain in a parasympathetic-dominant state.*

*Most massages are performed in a relaxing atmosphere, which stimulates the Parasympathetic Nervous System (PNS). The PNS governs the body's "rest and digest" response. One exception to this might be massage in a medical setting when a doctor directs the therapist to perform techniques that may be painful but have extremely specific physiological goals. Massage triggers the release of endorphins, which is greatly beneficial.*

---

**242.**

A massage therapist positions a client's arm into elbow flexion and applies a prolonged force to elicit resistance in the triceps. What occurs in the tissue of the triceps during this technique?

**The fiber of connective tissue enters the plastic range.**

The fiber of connective tissue enters the elastic range.

The ground substance of connective tissue enters the plastic range.

The ground substance of connective tissue enters the elastic range.

---

*Correct answer: The fiber of connective tissue enters the plastic range*

*The technique described here is a stretch of the triceps (flexing the elbow lengthens the triceps, and with prolonged force, it becomes a stretch). Stretching targets the fiber of connective tissue and eventually moves it into the plastic range. The plastic range occurs when tissue is elongated beyond its normal length, and a lasting change occurs. Prolonged force into resistance in elbow flexion will have this effect on the triceps.*

*The elastic range of tissue occurs when tissue is elongated beyond its normal length and, when the force is removed, it returns to its resting length. Prolonged stretching will cause long-term elongation of the tissue, meaning it enters the plastic range. The ground substance is made up of glycosaminoglycans and is gelatinous; this is not the tissue targeted with stretching.*

---

**243.**

Why is massage an important part of a wellness program?

**It restores body balance and provides a connection with other human beings.**

It creates stronger muscles.

It increases tension and extreme alertness.

It promotes insomnia.

---

*Correct answer: It restores body balance and provides a connection with other human beings.*

*Massage is an important part of a wellness program because it restores body balance, in addition to providing a connection with other human beings. Although wellness is comprised of many components, the basic components of a wellness program include body, mind, and spirit. Individuals are considered well when body, mind, and spirit are in an ideal balance. Massage can address wellness for the body, mind, and spirit.*

*Exercise, not massage, encourages muscle growth. Massage decreases tension rather than increasing it. While massage can help with energy levels over time, it does not create a state of extreme alertness. It can decrease symptoms of insomnia, and will hopefully not increase them.*

---

**244.**

What does heavy percussion to the skin cause, and what release is it a result of?

**Vasodilation; histamine**

Vasodilation; epinephrine

Vasoconstriction; epinephrine

Vasoconstriction; histamine

---

*Correct answer: Vasodilation; histamine*

*Heavy percussion to the skin causes vasodilation, as a result of histamine release. This also occurs as a result of sustained light percussion.*

*Epinephrine is a vasoconstrictor, so it does not cause vessel dilation.*

*While histamine release is a result of heavy or sustained light percussion, it does not cause vasoconstriction.*

---

**245.**

Massage benefits many systems of the body. Of the following, which is a benefit of massage to the muscular system?

**Massage relieves the inflammation of tendons.**

Massage maintains healthy skin.

Massage removes toxins and metabolic wastes.

Massage promotes the release of endorphins.

---

*Correct answer: Massage relieves the inflammation of tendons.*

*Massage relieves the inflammation of tendons, which are part of the muscular system. Other benefits to the muscular system include: the relaxation of muscles, relief of muscle spasms, cramps, and pain, and the improvement of muscle tone.*

*A massage benefits the integument system by maintaining healthy skin, the cardiovascular system by removing toxins and metabolic wastes, and the nervous system by promoting the release of endorphins.*

---

**246.**

A massage therapist is working with a client with an upper extremity amputation. What can massage help with **most** in this case?

**Phantom pain**

Visceral pain

Complex Regional Pain Syndrome

Neurogenic pain

*Correct answer: Phantom pain*

*An amputation occurs when a part of a limb is removed. Frequently, after this type of surgery/accident, the person will experience pain that feels as if it is in the amputated portion of the extremity. For example, if the person had the arm from the elbow down removed, they may experience pain in the hand that is no longer present. Massage can be effective in reducing this type of pain.*

*Visceral pain is derived from organs (kidneys, pancreas, heart, etc.) and while a person with an amputation may experience this type of pain, they are more likely to experience phantom pain. Neurogenic pain is caused by dysfunction of the peripheral or central nervous system and may occur in clients with amputations, but phantom pain is a more common condition. Complex Regional Pain Syndrome (CRPS) (also known as reflex sympathetic dystrophy) is long-standing pain that is a result of a dysfunctional nervous system and occurs in one limb. A client may have CRPS in addition to an amputation, but phantom pain is more likely.*

---

247.

A massage therapist has a client whose lower body is paralyzed due to a spinal injury at the level of L5. This client uses a manual wheelchair. Of the following options, what is the **most** likely goal of massage for this client?

**Reducing tension in the shoulder as a result of daily wheelchair use**

A person with this condition is not an appropriate candidate for massage

Improving activation and tone of the shoulders

Stimulating a local inflammatory response in the quadriceps

---

*Correct answer: To reduce tension in the shoulder as a result of daily wheelchair use*

*A person who uses a manual wheelchair is likely to develop disproportionate strength and tension in their upper body. They may even sustain overuse injuries in their arms and shoulders. It is appropriate to provide massage in order to relieve any tightness or pain in this area of the body.*

*A person with lower extremity paralysis is absolutely appropriate for massage and would benefit from many techniques. A person with an injury to L5 who is still able to operate a manual wheelchair would likely have overactive arm muscles, and so improving the tone of the shoulder muscles is unnecessary. It is unlikely (although not impossible) that this client would benefit from massage to their lower body.*

---

**248.**

When applying massage with the main goal of improving circulation, which technique should the therapist use?

**Compression over the main arteries, moving distal to proximal**

Compression over the main arteries, moving proximal to distal

Compression over the lymphatic structures, moving distal to proximal

Compression over the main arteries, moving medial to lateral

---

*Correct answer: Compression over the main arteries, moving distal to proximal*

*Compression over the main arteries, moving distal to proximal, encourages the return of blood to the heart, improving circulation and preventing blood from pooling in the extremities. Moving distal to proximal (towards the heart) aids venous return and promotes the flow of oxygenated blood into deeper tissues. This technique supports overall cardiovascular health and is most effective for enhancing circulation.*

*Compression moving proximal to distal is incorrect because this direction could lead to blood pooling in the extremities, reducing circulation efficiency.*

*Compression over lymphatic structures focuses on lymph drainage rather than blood circulation, making it inappropriate for this goal.*

*Compression moving medial to lateral does not align with the body's circulatory pathways and would not effectively promote better circulation.*

---

**249.**

A massage therapist is employed at a sports performance center. She is working with an athlete who wants to increase circulation to her muscles to prepare for a volleyball game, which will begin in one hour. Which of the following techniques are **most** appropriate for this massage?

**Broad-based compression, shaking, tapotement**

Focused trigger point work, aggressive tapotement

Lymphatic drainage

Muscle energy techniques

---

*Correct answer: Broad-based compression, shaking, tapotement*

*Sports massage is usually intended to help the client prepare for or recover from an event. It may also be helpful for athletes recovering from injuries. When performing massage on an athlete any time in the 24 hours prior to an event, the therapist should exercise caution. The goal is to improve circulation and energize the athlete's muscles. This is not an appropriate time to treat injuries or underlying conditions, because such focused work may leave the client feeling sore. This type of massage can sometimes be appropriate for athletes, but should not be performed immediately before or after a competition.*

---

**250.**

What modality uses a map of the foot to show which areas affect different parts of the body and is most often performed on the foot?

**Reflexology**

Ayurvedic massage

Acupuncture

Reiki

---

*Correct answer: Reflexology*

*Reflexology is most often performed on the foot. This modality uses a map of the foot to show which areas affect different parts of the body. A therapist who wishes to perform reflexology should study this technique in detail before performing it on a client.*

*Ayurvedic massage was developed in India, and is grounded in a philosophy that relates the mind, body, and spirit to each other.*

*Acupuncture is a healing technique that uses needling to stimulate various areas of the body.*

*Reiki is a form of energy work that may or may not include physical touch.*

*Each of these modalities requires extensive, specific training.*

---

251.

A massage therapist applies a specific counterforce to the voluntary contraction of the client's muscles. This is an example of what?

**Muscle energy technique**

Passive stretching

Active assisted range of motion

Tapotement

---

*Correct answer: Muscle energy technique*

*A massage therapist applies a specific counterforce to the voluntary contraction of the client's muscles. This is an example of a muscle energy technique.*

*Muscle energy techniques involve a voluntary contraction of the client's muscle in a specific and controlled direction against a specific counterforce applied by the massage therapist. They are considered active techniques in which the client contributes to the corrective force. They are used in conjunction with stretching to help increase the client's stretch response.*

*Passive stretching does not include the voluntary contraction of the client's muscles. Active assisted range of motion is more focused on the ROM of a joint, and not necessarily on the activation of an isolated muscle. Tapotement, or percussion, is performed by the massage therapist and does not include voluntary muscle contraction by the client.*

---

**252.**

What type of massage is performed for general wellness, often in a spa setting, and the therapist follows a set routine?

**Protocol-based**

Superficial

Outcome-based

Swedish

---

*Correct answer: Protocol-based*

*In protocol-based massage, a therapist follows a set routine. This type of work is performed for general wellness, often in a spa setting. A protocol-based massage might include exfoliation, the application of pre-approved essential oils, or other relaxation techniques. The goal of these sessions is to give the client a particular kind of experience, not to address medical concerns.*

*Superficial and Swedish massage techniques may or may not be part of a protocol-based massage.*

*Outcome-based massage focuses on achieving a specific goal, and is most often offered to clients with concrete medical concerns.*

---

**253.**

A massage therapist is seeing a client who has a large scar after a total shoulder replacement. They schedule weekly sessions, during which the therapist uses friction techniques in the effort to improve scar mobility. However, after several weeks, no change has occurred in the tissue. What is a likely cause of this?

**The therapist is using massage oil with the technique.**

The therapist is performing the technique transversely to the scar.

The therapist is using the technique with the area stretched.

The therapist is using the technique with the area relaxed.

---

*Correct answer: The therapist is using massage oil with the technique.*

*Friction (especially deep friction) is used when attempting to target and move the tissues deep to the skin. If massage oil is used, the tissues will slide on one another, and the deep tissues will not be affected. Therefore, after weeks of using this technique in this scenario, it is likely the use of massage oil is inhibiting friction's beneficial effects.*

*Friction should typically be performed transversely to the scar, so this would not be the cause. There is currently disagreement whether using this technique with the tissues stretched or relaxed is best, but benefits have been found for both. Therefore, the technique should be used with the tissues relaxed and stretched.*

---

**254.**

Which of the following conditions is **not** regionally contraindicated for massage and will show benefit from massage to manage pain and increase range of motion?

**Epicondylitis**

Gout

Acute fracture

Dislocation

---

*Correct answer: Epicondylitis*

*Epicondylitis is a condition of inflammation of the humeral epicondyle and surrounding tissues. Therapeutic massage is beneficial when managing pain. It can also help to improve range of motion and upper extremity function. The goals of a massage for a client with epicondylitis should be to reduce inflammation and pain in the area.*

*Gout, acute fracture, and dislocation of a joint are regionally contraindicated for massage.*

---

**255.**

Of the following, which aspect of touch would make the **greatest** change in the Achilles tendon?

**Drag**

Depth of pressure

Direction

Rhythm

---

*Correct answer: Drag*

*Drag is the amount of stretch applied to the tissue during a massage. It primarily has an effect on the more superficial soft tissues, like muscles and tendons. It is distinct from the deep pressure that might be effective in manipulating a deeper muscle belly.*

*Depth of pressure should change based on the tissue being targeted. For example, dense, thick tissue requires deeper pressure. While the Achilles is a thick tendon, depth of pressure would not be the primary factor affecting change in the tissue. It is important to be mindful of both direction and rhythm, but they are not the primary ways of effecting change in the Achilles tendon.*

---

**256.**

When applying longitudinal stretching to the quadriceps, what occurs within the tissue?

**Collagen is aggregating, causing thicker tissue.**

Collagen is aggregating, causing thinner tissue.

Collagen is released from the tissue resulting in increased strength of the tissue.

Collagen is released from the tissue resulting in decreased muscle tone.

---

*Correct answer: Collagen is aggregating causing thicker tissue*

*A tensile force can be longitudinal stretching, traction, stroking, and tissue drag. When a tensile force (or tension force) is applied to tissue, it causes collagen to aggregate in the targeted tissue. These increased collagen levels make the tissue thicker which ultimately improves stiffness and strength of the tissue. It also allows for the orientation of fibers in the tissue to be laid down in an optimal pattern.*

*Increased collagen levels would make the tissue thicker, stronger, and stiffer rather than weaker and thinner. Collagen is not released from tissue during a longitudinal stretch but instead builds up in the targeted tissue.*

---

**257.**

When performing hot stone massage, what is it important for the therapist to do?

**Sanitize the stones prior to each massage**

Cool the stones to a temperature of 90 degrees F prior to each massage

Place the stones directly on the client's skin

Not use gliding strokes, as this may cause too much inflammation

---

*Correct answer: Sanitize the stones prior to each massage*

*When performing hot stone massage, it is important for the therapist to sanitize the stones prior to each massage. This is an essential component of hygiene and safety.*

*To achieve the benefits of heat, the stones should be heated to a temperature of 98–110 degrees F. Cooler stones do provide positive effects, but not in the same way as those used during hot stone massage.*

*The stones should never be applied directly to the client's skin; the therapist should protect the skin using a sheet or towel.*

*It is appropriate to use gliding strokes during hot stone massage.*

---

**258.**

When performing the Swedish friction stroke, what anatomical tool/s should the massage therapist use?

**Either the thumbs, fingers, palms, or elbows**

Only the palms or the fingers

Only the elbow

Only the thumbs or fingers

---

*Correct answer: Either the thumbs, fingers, palms, or elbows*

*When performing the Swedish friction stroke, the massage therapist may use either the thumbs, fingers, palms, or elbows. The friction stroke uses cross-fiber, circular, and compression pressure in order to move superficial tissue across the deep tissue. This stroke is known to increase circulation and promote flexibility.*

---

**259.**

When attempting to stimulate general nerve tissue, what type of mechanical force should the therapist use?

**Compression**

Tension

Bending

Shear

---

*Correct answer: Compression*

*Compression occurs when two structures are pressed together. This massage technique is used when targeting nervous tissue, circulation, and the malleability of connective tissue. It is important, however, to avoid long sustained compression to nervous tissue as this could damage it.*

*Tension is used with connective tissue to elongate and lengthen, while bending forces work to improve soft tissue pliability and stimulate proprioceptors (not general nervous tissue). Shear forces work to improve soft tissue mobility.*

---

**260.**

It is common for a massage therapist to be the only person who regularly sees the skin of a person's back. For that reason, it is important for therapists to know the warning signs of skin cancer, so they can refer at-risk clients to their doctor for testing. What are the four primary warning signs of malignant melanoma, the most dangerous type of skin cancer?

**Asymmetry, border irregularity, color change, diameter increase**

Heat, redness, swelling, pain

Asymmetry, blush of surrounding skin, color change, diameter increase

Texture, color, location, hair

---

*Correct answer: Asymmetry, border irregularity, color change, diameter increase*

*The four primary warning signs of malignant melanoma are asymmetry, border irregularity, color change, and diameter increase. The memory trick for these four signs is ABCD. If a massage therapist notices that a client has a mole with these qualities, they should suggest the client see a doctor for further testing.*

*Heat, redness, swelling, and pain are the signs of inflammation. The blush of surrounding skin is a common effect of palpation, and not necessarily a sign of pathology. The texture, location, and presence of hair on a mole do not indicate whether it might be cancerous. The color is only a sign of potential pathology if it is seen to change over time.*

---

261.

When performing a contract-relax-antagonist contract method of muscle energy technique for shortened quadriceps, what is the proper sequence?

**Contraction of quadriceps, relaxation of quadriceps, contraction of hamstrings**

Contraction of hamstrings, relaxation of hamstrings, contraction of quadriceps

Contraction of quadriceps, contraction of hamstrings, relaxation of quadriceps

Contraction of hamstrings, contraction of quadriceps, relaxation of quadriceps

---

*Correct answer: Contraction of quadriceps, relaxation of quadriceps, contraction of hamstrings*

*In this scenario, the quadriceps are being targeted by the exercise. Using the contract-relax-agonist contract (CRAC) method, the shortened tissue is contracted first (the quadriceps), followed by relaxation of the same muscle. Then the antagonist contracts (the hamstrings) which allows for lengthening of the shortened quadriceps.*

*This method must follow the sequence of contraction of the shortened muscle, relaxation of the same muscle, then contraction of the antagonist. In this scenario, the quadriceps are the shortened muscles and the agonist, and the hamstrings are the antagonists.*

---

262.

Which massage stroke prevents and breaks up local adhesions in connective tissues, over tendons, ligaments, and scars?

Friction

Vibration

Gliding

Compression

---

*Correct answer: Friction*

*Frictioning is a stroke that can be accomplished by using the thumbs, fingers, palms, or elbows. The friction stroke applies transverse pressure to an isolated area, which is aimed at moving the superficial tissue across deep tissue. The friction stroke is used to loosen the client's adhesions, fascia, and scar tissue, promote flexibility, and increase circulation.*

*Vibration (oscillation) is used to warm the body and temporarily decrease muscle tone. Gliding (effleurage) is a light stroke that warms the superficial tissues. Compression targets the muscle belly and triggers a reflexive response in the muscle spindles.*

---

263.

If a massage therapist notices certain signs of respiratory distress, it may be appropriate to refer the client to a physician for further assessment. Which of the following options is **NOT** a possible sign of disordered breathing?

**The shoulders do not move**

The scalenes are consistently activated during breathing

The inhale is longer than the exhale

The quadratus lumborum is consistently activated during breathing

---

*Correct answer: The shoulders do not move*

*In normal breathing, the shoulders should not move. A client whose shoulders are stationary during the breath cycle, who exhibits no other symptoms of respiratory distress, does not require a physician referral.*

*Clients with respiratory distress may activate accessory muscles of respiration during the breath cycle, such as the scalenes, quadratus lumborum, sternocleidomastoid, levator scapulae, rhomboids, and abdominals, among others. It is also a sign of respiratory distress if the inhale is longer than the exhale.*

---

264.

A client with lymphedema undergoes a hydrotherapy session which includes an immersion bath. Afterward, she notices a significant reduction in the swelling in her legs. What is the **most** likely reason for this?

**The hydrostatic pressure of water aids in lymphatic flow.**

The temperature of the water aids in lymphatic drainage.

The hydrostatic pressure of the water stimulates the autonomic nervous system.

The hydrostatic pressure of the water reduces static flow.

---

*Correct answer: The hydrostatic pressure of water aids in lymphatic flow.*

*When a body part is submerged in water, the water exerts pressure against the body; this is known as hydrostatic pressure. This pressure presses on both the venous and lymphatic systems which helps to drain stagnant fluid. This ultimately results in decreased fluid retention in the legs (or whatever region is affected).*

*While the temperature of the water does have an effect on the body, it does not promote lymphatic drainage. The hydrostatic pressure will stimulate the autonomic nervous system and the central nervous system, but this is not the mechanism through which fluid is drained from the affected area. It is the hydrostatic pressure of the water on the lymphatic system that allows for improved movement and drainage.*

---

**265.**

The muscular system receives all the following massage benefits, **except**:

**Improved spine curvature**

Muscle relaxation

Release of metabolic waste

Muscle tone and elasticity improvement

---

*Correct answer: Improved spine curvature*

*The muscular system receives all the listed massage benefits except spine curvature improvement. A massage does help improve spine curvature; however, this improvement is a benefit of the skeletal system, not the muscular system.*

*The massage benefits to the muscular system include muscle relaxation, the release of metabolic waste, muscle tone and elasticity improvement, muscle pain relief, circulation stimulation, and athletic performance improvement.*

---

**266.**

Which of the following is a small, hyperirritable area within a muscle that is painful when compressed?

**Trigger point**

Pressure point

Fusion point

Tendon point

---

*Correct answer: Trigger point*

*A trigger point is a small, hyperirritable area within a muscle that is painful when compressed. Trigger points can be located by palpating muscles. They are associated with muscle dysfunction and soft tissue pain. They often present with an area of referred pain, usually distal to the affected area, which may develop secondary trigger points.*

---

267.

Out of all the muscle energy techniques, which is the **most** effective to stimulate inhibited muscles?

**Pulsed muscle energy**

Contract-relax

Contract-relax-antagonist-contract

Postisometric relaxation

---

*Correct answer: Pulsed muscle energy*

*This technique involves a series of contractions of muscle at the location where the tissues are restricted. This technique can be used without stretching to aid in facilitating the contraction of a weakened muscle. It is usually performed with small contractions of about 20 in 10 seconds.*

*Both contract-relax and contract-relax-antagonist-contract are used to further aid in stretching and subsequent mobility of shortened tissues, not in stimulating inhibited muscles. Postisometric relaxation is used to facilitate relaxation of a muscle rather than contraction.*

---

**268.**

When applying a technique with compressive force to the area near the popliteal space, what is important to consider?

**Slight compressive force for a long period may cause damage to the nerves in this area.**

Intense brief pressure for a short period can cause damage to the nerves in the area.

There are no nerves in this area.

Slight compressive force for a short period may cause damage to the nerves in the area.

---

*Correct answer: Slight compressive force for a long period may cause damage to the nerves in the area .*

*It is important for the therapist to use caution with compression in areas with nerves close to the surface. The popliteal space has many sensitive nerve and vascular structures very close to the surface. Nerves can withstand brief pressure without risk of damage, while long sustained pressure can cause injury. Therefore, sustained deep pressure must be avoided in this area.*

*Intense brief pressure is not likely to cause injury to the nerves or vascular structures since nerves can withstand this type of pressure. Slight compressive force for a short period of time is also not likely to damage the nerves.*

---

**269.**

What is the purpose of traction?

**To stretch muscles by creating space between two or more body parts**

To create controlled, temporary inflammation

To establish contact with the client

To temporarily reduce muscle tone

---

*Correct answer: To stretch muscles by creating space between two or more body parts*

*The purpose of traction is to stretch muscles by creating space between two or more body parts. This technique is performed by grasping a body part, almost always a limb, and slowly but firmly pulling it away from another body part.*

*Frictioning techniques create controlled, temporary inflammation. Holding establishes contact between the therapist and client. Oscillation temporarily reduces muscle tone.*

---

**270.**

How does massage detoxify the body, and what does this primarily benefit?

**Promoting lymph circulation; lymphatic system**

Promoting lymph circulation; vascular system

Inhibiting lymph circulation; lymphatic system

Inhibiting lymph circulation; integumentary system

---

*Correct answer: Promoting lymph circulation; lymphatic system*

*Massage is known to detoxify the body by promoting lymph circulation. This primarily benefits the lymphatic system. The lymphatic system is responsible for removing waste and toxins from the body.*

*While the lymphatic system is considered part of the circulatory (cardiovascular) system, the vascular system includes only the veins, not the lymphatic vessels.*

*Massage does not inhibit lymphatic circulation.*

*The integumentary system includes the skin and its underlying structures, not the circulatory system.*

---

271.

What is **not** a possible positive effect of massage in the elderly population?

**Slowed digestion**

Release of chemicals that may temporarily improve mild depressive symptoms

Reduction in dose of some medications

Increased appetite

---

*Correct answer: Slowed digestion*

*In the elderly population, the effects of regular massage are wide-ranging. Instead of slowing digestion, massage can actually aid in digestion.*

*Regular massage can also reduce the use of medications, temporarily reduce depressive symptoms, improve appetite, provide sensory and emotional stimulation, and improve sleep. Often, simply a meaningful interaction with another person can make a massage worthwhile for an older adult. It is important to take into account certain precautions when working with older adults such as the use of different bolster positions, caution with thinner skin, caution with heat and ice, and awareness that sensory awareness may be reduced.*

---

272.

A massage benefits which system by increasing the blood flow to the skin?

**Integumentary system**

Muscular system

Lymphatic system

Nervous system

---

*Correct answer: Integumentary system*

*The integumentary system includes the skin and its appendages, such as hair and nails. A benefit to the skin is a benefit to the integumentary system. Massage benefits this system by increasing blood flow and facilitating sebaceous secretions.*

*The muscular system refers to skeletal musculature. The lymphatic system is a specialized component of the circulatory system and is responsible for waste disposal and immune response. The nervous system includes the brain, brain stem, spinal cord, and nerves. Massage may benefit any or all of these systems in addition to the integumentary system.*

---

273.

During an intake assessment, the massage therapist learns that a new client has a diagnosis of anxiety. What is the **best** course of action for the therapist to take?

**Proceed with the massage, paying close attention to the client's breathing patterns throughout the session.**

Proceed with the massage as usual.

Refer the client to a physician for further assessment prior to massage.

Refuse treatment; this client is not a candidate for massage.

---

*Correct answer: Proceed with the massage, paying close attention to the client's breathing patterns throughout the session.*

*Massage can provide significant benefits to clients who suffer from anxiety. When working with these clients, the therapist should pay close attention to their breathing patterns throughout the session, as overly fast or shallow breaths can indicate the onset of a panic attack.*

*Since the client in this example already has a diagnosis from a physician, there is no need to refer them out.*

---

**274.**

A client comes to the clinic with a hypertonic left arm. The massage therapist performs shaking and notices the hypertonicity significantly reduces. What is the mechanism for this?

**Disorganized input to the positional proprioceptors**

Organized input to the positional proprioceptors

Increased friction within the tissues causing therapeutic inflammation

Stimulation of nociceptors

---

*Correct answer: Disorganized input to the positional proprioceptors*

*Shaking (oscillation) is the quick, rhythmic or arrhythmic movement of a body part, usually a limb. This technique confuses the positional proprioceptors of the targeted area. Positional proprioceptors are present within joints and send signals to the brain regarding where the joint is in space. Conflicting and disorganized input to these receptors can confuse the brain because it is too disorganized to interpret. The response to this is relaxation.*

*While shaking does stimulate the positional proprioceptors, it is disorganized information. If it were organized, the response would likely be coordinated muscle contraction instead of relaxation. Increased friction occurs with techniques involving shear loading and would not immediately result in tone reduction. This technique should not stimulate nociceptors (pain receptors). If it did, this would likely increase tone rather than decrease it.*

---

**275.**

How can massage therapy help the impairments sustained after a person has been seriously burned?

**By improving connective tissue mobility**

By strengthening connective tissue

By activating the muscles under the burn

By weakening connective tissue

---

*Correct answer: Improve connective tissue mobility*

*After a person has been significantly burned and those burns begin to heal, scars develop. These scars can contract and pull the surrounding tissue. Sometimes people with these burns can experience contractures, a condition in which a joint becomes "stuck" and cannot move as a result of immobility in the connective tissues. The area surrounding the burn can feel very tight, so massage therapy can help to improve the mobility of this tissue. Myofascial release techniques can be especially helpful in this scenario.*

*The connective tissue that is laid down initially after a burn is scar tissue can become very strong and limit range of motion. Massage does not strengthen this tissue. While there may be some difficulty with muscles underlying the burn (depending on how deep the burn is), the primary impairment after a burn is lack of soft tissue mobility. While some massage techniques will improve connective tissue mobility, they will not weaken this tissue.*

---

276.

Although compression applies pressure directly to the belly of a muscle, this massage technique also triggers a physiological response in which of the following?

**Muscle spindles**

Dermis

Epidermis

Ligaments

---

*Correct answer: Muscle spindles*

*Although compression applies pressure directly to the belly of a muscle, this massage technique also triggers a physiological response in the muscle spindles. By stretching the muscle spindles, compression triggers the body's sense that the muscle is being stretched, causing it to reflexively relax.*

*Any massage technique will have an impact on the dermis and the epidermis, but compression does not produce a significant physiological response in these structures. Ligaments connect bone to bone, and should not be targeted by compression techniques.*

---

277.

A massage therapist is developing a treatment plan for a client. Of the following, which is the **best** example of a quantifiable goal (outcome)?

**Increase shoulder flexion range of motion by 20 degrees to allow for reaching overhead**

Need a reassessment of range of motion in 10 visits

Return to independence with washing hair

Return to normal activities of daily living

---

*Correct answer: Increase shoulder flexion range of motion by 20 degrees to allow for reaching overhead*

*A quantifiable outcome is one that can be measured in a specific and repeatable way. Range of motion (ROM) is easily measured, and so is an appropriate goal for treatment. By writing a clear treatment plan and including quantifiable goals, the massage therapist can plan regular reassessments of the client's condition. This demonstrates the efficacy of ongoing treatment, and gives the therapist enough information to edit the treatment plan if necessary.*

*The need for reassessment is not an outcome, although it is part of the plan for treatment. The "return to" various activities is a functional goal, not a quantifiable outcome.*

---

**278.**

When working with a patient with a large scar from a total knee replacement, which technique would be the **most** beneficial to use over the resulting scar?

**Friction**

Petrissage

Effleurage

Tapotement

*Correct answer: Friction*

*Frictioning techniques are used to break up adhesions and scar tissue through the use of shear force. They are most effective over connective tissue and scars. In this example, friction would be applied transversely across the scar. The scar after a total knee replacement is usually quite large and can restrict knee flexion. A therapist should only perform this technique over a scar after the acute healing phase has passed.*

*Petrissage is used to reduce muscle tension and can soften superficial fascia. It is not the most appropriate technique for scar mobilization. Effleurage can soften tissue but is more effective in improving venous and lymphatic drainage. Tapotement is used more for stimulation of muscles or with clearing mucus from the lungs. Friction is the only technique that directly targets scar tissue to improve mobility.*

---

**279.**

The tapotement stroke is a basic Swedish massage stroke that is often used to do which of the following?

**Release phlegm in one's respiratory tract**

Loosen fascia and scar tissue

Stretch muscles and fascia

Warm and relax the client

---

*Correct answer: Release phlegm in one's respiratory tract*

*The tapotement stroke is a basic Swedish massage stroke that is often used to release phlegm in one's respiratory tract. Tapotement (percussion) requires that the hands administer springy blows to the body at a fast rate. These are done to create a rhythmic compression of tissue and can be done more deeply to affect visceral structures in order to release lung secretions.*

*Friction is used to loosen fascia and scar tissue. Petrissage (kneading) is used to stretch muscles and fascia. Effleurage (gliding) is used to warm and relax the client.*

---

280.

What theory states that points in the feet and hands have an effect on organs and other body systems?

**Reflexology**

Ayurveda

Polarity

Jing luo

---

*Correct answer: Reflexology*

*Reflexology follows the idea that stimulation of the tissue beneath the skin can have an effect on other areas of the body. This can improve the function of specific areas or the body as a whole. It likely originated in China, and reflexology of the foot is the most well known.*

*Ayurveda and jing luo are both based on energy channels and flow but do not relate specifically to areas of the foot or hand causing change in areas far from the foot/hand. Polarity includes some of Ayurveda and jing luo and is a method of laying the hands on the body in an intentional way. It is not specific to the hands and feet.*

---

281.

A massage therapist is performing a percussive technique on a client and is targeting the muscle belly of the gastrocnemius. What kind of technique is the therapist using?

**Heavy percussion**

Light percussion

Light tapotement

Skin rolling

---

*Correct answer: Heavy percussion*

*Percussion (also known as tapotement) is a technique that involves quick blows to tissues and joints. Heavy percussion reaches deeply into the muscle belly and tendons as well as organs. Since the therapist in this instance is targeting the muscle belly, heavy percussion would be the appropriate technique.*

*Light percussion only reaches into the subcutaneous tissues of the body, so it would not reach the muscle belly of the gastrocnemius. Light tapotement is a synonym for light percussion. Skin rolling is not a form of percussion, but a technique that lifts the superficial layers of the skin and fascia from the muscle, and this does not target the muscle belly.*

---

282.

What is clinical reasoning?

**The process of collecting data, analyzing it, and developing an appropriate treatment plan**

The process of explaining the reason for a particular method of treatment

The process of collecting information about the client's health history

The process of tracking and recording changes over time

---

*Correct answer: The process of collecting data, analyzing it, and developing an appropriate treatment plan*

*Clinical reasoning is the process of collecting data, analyzing it, and developing an appropriate treatment plan. It is essential that every massage therapist, especially those who work in a medical setting, be comfortable with this process.*

*Justification is the process of explaining the reason for a particular method of treatment. An assessment or intake assessment is the process of collecting information about the client's health history. Reassessment is the process of tracking changes over time, and record-keeping is the process of recording those changes.*

---

283.

When attempting to clear fluid in the lungs, what technique would be **most** appropriate?

Percussion

Shaking

Rocking

Friction

---

*Correct answer: Percussion*

*Percussion techniques involve quick blows to the targeted area. Percussion is especially effective when targeting the chest and lungs, and this movement can help to move fluid/mucus from the lungs. Deep percussion is most appropriate when this is the goal.*

*Shaking and rocking are techniques primarily used for relaxation or muscle stimulation. These techniques would not be performed near the chest in order to clear mucus. Friction helps to improve adhesions in connective tissue and would have no effect on the movement of mucus or fluid from the lungs.*

---

**284.**

When attempting to maximize the amount of drag during a gliding technique, what should the therapist do?

**Use no oil or lotion.**

Mildly reduce the amount of oil or lotion used.

Significantly increase the use of oil or lotion.

Make no change in the amount of oil or lotion as this is entirely dependent on client preference.

---

*Correct answer: Use no oil or lotion.*

*Oil and lotion are lubricants. In order to maximize the amount of drag (or friction) on tissue during a technique, lubricant should not be used. Drag is considered how much pull is applied to tissue and can be used to elongate connective tissue.*

*While the type and amount of oil or lotion used is partially based on client preference, a change must be made in order to maximize the amount of drag during the use of a gliding technique. Any increase in the use of oil or lotion would reduce the amount of drag on the tissue.*

---

**285.**

A therapist has been seeing a runner as a weekly client for 5 years. She always requests a full body massage, with extra time spent on her legs, using especially deep pressure. The client becomes pregnant. How, if at all, should the therapist modify the massage?

**Perform general massage, and stop using such deep pressure on the client's legs.**

No changes are needed; continue massaging the client as usual.

Stop seeing the client until after the baby is born.

Perform massage as usual, but schedule the client for monthly massage instead of seeing her every week.

---

*Correct answer: Perform general massage, and stop using such deep pressure on the client's legs.*

*General massage can benefit a pregnant client, as it decreases cortisol levels and stimulates the parasympathetic nervous system. This creates a healthier environment for the growing fetus and can have a positive effect on the client's mood while decreasing physical discomfort. However, deep pressure on the legs of a pregnant client is contraindicated, because blood clots are common during pregnancy.*

*As explained, changes to the client's usual routine are indeed necessary. Because general massage is safe for pregnant clients, there is no need to either postpone treatment entirely or to see the client less often.*

---

**286.**

Massage can offer a variety of benefits to clients suffering from mental illness. For example, massage has a normalizing effect on:

**The autonomic nervous system**

The sympathetic nervous system

The parasympathetic nervous system

The involuntary nervous system

---

*Correct answer: The autonomic nervous system*

*Massage can offer a variety of benefits to clients suffering from mental illness. For example, massage has a normalizing effect on the autonomic nervous system. The autonomic nervous system (ANS) includes the sympathetic (fight or flight) and parasympathetic (rest and digest) nervous systems. By normalizing ANS activity, and particularly by activating the parasympathetic nervous system, massage can provide relief from many symptoms of various mental illnesses.*

*Massage usually decreases activity in the sympathetic nervous system and activates the parasympathetic nervous system.*

*Although the nervous system does control involuntary actions, such as respiration and reflexes, "involuntary nervous system" is not a commonly used term.*

---

287.

The massage therapist is using massage intervention to increase dopamine activity in order to manage symptoms of a disease in a client. What is the likely condition?

**Parkinson's disease**

Amyotrophic Lateral Sclerosis

Bell's Palsy

Poliomyelitis

---

*Correct answer: Parkinson's disease*

*Massage has been shown to increase dopamine activity. Therefore, it is often used in clients with Parkinson's disease to manage symptoms including tremor. Parkinson's disease is one in which there is degeneration of neurons responsible for the release of dopamine in the brain. Therefore, motor symptoms are impacted.*

*Amyotrophic lateral sclerosis, Bell's palsy, and poliomyelitis (polio) are not directly affected by the increase or reduction of dopamine levels.*

---

288.

Massage promotes homeostasis because it stimulates the:

**Parasympathetic nervous system**

Sympathetic nervous system

Respiratory system

Lymphatic system

---

*Correct answer: Parasympathetic nervous system*

*Massage promotes homeostasis because it stimulates the parasympathetic nervous system. The parasympathetic nervous system is responsible for energy building, food digestion, and assimilation. All of these processes are important aspects of its primary function: restoring homeostasis. The parasympathetic nervous system is active when the body is in a calm state, sometimes called "rest and digest." Massage promotes relaxation and releases endorphins, encouraging parasympathetic nervous system activity.*

*The sympathetic nervous system is active when the body is in activated "fight or flight" state.*

*The respiratory system is responsible for breathing.*

*The lymphatic system flushes toxins from the body.*

---

**289.**

A client who has been diagnosed by her physician with lymphedema in her lower extremities comes to the clinic because she would like to reduce the amount of fluid in her legs. Which technique should the massage therapist use?

**Short gliding strokes with light pressure near lymph vessels**

Short gliding strokes with medium pressure from the hips to the toes

Moderate pressure from the inguinal region toward the toes along the skeletal muscle fiber direction

This client is not a candidate for massage and should be referred back to her physician

---

*Correct answer: Short gliding strokes with light pressure near lymph vessels*

*Lymphedema occurs when the fluid in the interstitium is not moving into lymph vessels and not draining through those vessels effectively. Short gliding strokes with light to medium pressure are most effective in reducing interstitial fluid build-up. This technique helps this fluid move from the interstitium to lymph vessels which clears the fluid. This is most effective when done near lymph structures and from the toes toward the heart.*

*While short gliding strokes with medium pressure are acceptable, moving from the hips or inguinal region to the toes would move the fluid away from the heart and major vessels which would not help to remove the fluid. Moderate pressure in the direction of skeletal muscle fibers will help with lymphedema, but movement must be towards the heart and major vessels, not away. Massage therapists can treat clients with lymphedema as long as treatment is provided under the supervision of the client's physician, so this client would be appropriate.*

---

290.

Which of the following can a massage therapist stimulate by applying massage strokes directly over veins, in the direction of the heart?

**Venous return**

Arterial circulation

Respiratory rate

Proprioceptive response

---

*Correct answer: Venous return*

*Venous return refers to the process by which blood is returned to the heart via the veins. Massage strokes applied directly over veins, especially when performed in an upward (proximal) direction toward the heart, can help enhance venous return by mechanically assisting blood flow. This is particularly effective in the limbs where veins are more superficial.*

*Arterial circulation is primarily controlled by the heart and muscular arterial walls, which are much deeper in the body than veins. Massage does not directly stimulate arterial flow.*

*Respiratory rate refers to the number of breaths taken per minute, and although massage can promote relaxation and indirectly improve breathing, it does not directly influence the mechanics of respiration in this context.*

*Proprioceptive response is the body's ability to sense its position and movement in space. Massage can improve body awareness, but this is not the specific goal of venous return techniques.*

---

**291.**

Vibration and rocking are examples of oscillation. What, if anything, is the difference between these two massage techniques?

**Vibration is a smaller, faster oscillation than rocking.**

Rocking is a smaller, faster oscillation than vibration.

Vibration is a full-body technique; rocking is only performed on individual limbs.

Vibration is just another word for rocking.

---

*Correct answer: Vibration is a smaller, faster oscillation than rocking.*

*Oscillation is a style of massage in which the therapist moves the client's body or body part back and forth. During vibration, this movement is performed quickly, using very small movements. Rocking is usually performed on the entire body at once, often with the same rhythm as the client's pulse.*

---

**292.**

Which is **not** a physiologic effect of hydrotherapy on the body?

Ionic

Thermal

Mechanical

Chemical

---

*Correct answer: Ionic*

*The physiologic effects of hydrotherapy are primarily thermal, mechanical, and chemical. These effects are produced as follows:*

- *Thermal effects are produced when water is applied above or below the body temperature.*
- *Mechanical effects are produced by the impact of water on the body surface in the form of sprays, frictions, whirlpools, and hydrostatic pressure forces.*
- *Chemical effects are produced when water is ingested and when used to irrigate a body cavity.*

*Hydrotherapy is not known to produce ionic effects on the body.*

---

**293.**

The cold application of hydrotherapy can be antiedemic. In other words, what does it have the ability to do?

**Reduce swelling**

Reduce pain

Reduce spasm

Reduce infection

---

*Correct answer: Reduce swelling*

*Edema is a form of swelling in which the client has excess interstitial fluid in a particular area. An antiedemic technique is intended to reduce edema. Cold applications indeed reduce swelling, as well as pain and muscle spasms.*

*Cold applications are not known to have any impact on infections.*

---

**294.**

What might be a reason a person currently hospitalized with breast cancer is referred for massage?

**Reduce nausea**

Improve soft tissue mobility in the pectorals

Improve muscle activation of the pectorals

This person is not a candidate for massage.

---

*Correct answer: Reduce nausea*

*It is likely this person is experiencing nausea as a result of the treatment for cancer. Massage can be very effective in reducing nausea, and antiemetic drug use can subsequently reduce nausea further.*

*This client would be appropriate for massage, especially since they have been referred by another medical professional while in the hospital. The massage therapist must take care not to apply heat to this patient, as this can encourage the spread of cancerous tissue. Direct massage of the treatment area (which includes the chest for breast cancer patients) is contraindicated.*

---

295.

When working with a soccer player, a massage therapist identifies trigger points in the gastrocnemius. What is the appropriate sequence of treatment for this?

1. Compression of the point
2. Stretching of the gastrocnemius
3. Massage of the gastrocnemius
4. Heat application

1. Stretching of the gastrocnemius
2. Compression of the point
3. Massage of the gastrocnemius
4. Heat application

1. Massage of the gastrocnemius
2. Heat application
3. Compression of the point
4. Stretching of the gastrocnemius

1. Compression of the point
2. Heat application
3. Stretching of the gastrocnemius
4. Massage of the gastrocnemius

*Correct answer:*

1. *Compression of the point*
2. *Stretching of the gastrocnemius*
3. *Massage of the gastrocnemius*
4. *Heat application*

*Trigger points are areas of hypertonicity in tissue that are usually facilitated by nervous system activity. They are typically small and localized. Treatment should follow this sequence: compression, stretching of the area, massage of the area to improve blood flow, and application of heat for relaxation. Also, the therapist should locate and release secondary trigger points in the area of referred pain.*

*While heat application might be helpful at the beginning of a session, it is most beneficial after the point has been released to further induce relaxation. Stretching would not be appropriate first because the trigger point is too hypertonic and would not respond well to stretch. Massage of the area first is not contraindicated; however, release of the trigger point followed by massage would be most effective.*

**296.**

A massage therapist is performing friction massage over the IT band. What is occurring at the tissue level?

**Tissue repair is stimulated by a local inflammatory response.**

Connective tissue is reorganized by stimulation of the Golgi tendon organ.

Tissue repair is stimulated by proprioceptor stimulation.

Connective tissue is reorganized by the release of norepinephrine.

---

*Correct answer: Tissue repair is stimulated by a local inflammatory response.*

*Friction is typically applied transversely to the targeted tissue (such as the IT band) and can be applied deeply or superficially. It creates shear force, which stimulates a local inflammatory response. As a result of this inflammatory response, histamine and prostaglandins (among other inflammatory mediators) are released and help to induce repair of the tissues.*

*While tissue repair occurs as mentioned above, this is not a result of the proprioceptor stimulation. Connective tissue is also reorganized as a result of this technique, but it has nothing to do with the Golgi tendon organ (which senses tension within a muscle). Norepinephrine is likely not released during this process as it is a product of the sympathetic nervous system and increases the strength of muscular contractions.*

---

**297.**

A client has been recently diagnosed with pancreatic cancer. His doctor has said he is not likely to survive longer than two months. The client is unable to get out of bed and has been placed in hospice care. Massage in this setting can provide all the following benefits **except**:

**Stimulate nociceptors to reduce pain levels**

Change sensory perception and subsequently reduce pain levels

Stress reduction

Provide relief for caregivers

---

*Correct answer: Stimulate nociceptors to reduce pain levels*

*Massage for the terminally ill client has a wide variety of benefits. It can absolutely reduce pain levels; however, this does not occur by stimulating nociceptors. The stimulation of nociceptors would increase pain rather than reduce it.*

*Massage can change sensory perception simply by the change in position or small movements since this patient cannot get out of bed. It can also reduce stress levels and provide some respite for caregivers, if even for a short time, since the massage therapist is actively providing care for the client. In this setting, it is important that the massage therapist continues with sessions until the client passes if that is what the client desires.*

---

298.

Tapotement is one of the basic Swedish massage strokes that is **best** described by which of the following?

**Percussion strokes**

Static touch

Long gliding strokes

Kneading strokes

---

*Correct answer: Percussion strokes*

*The tapotement stroke is best described as a percussion stroke. It can be a light or heavy compressive force. It is a stimulating manipulation that involves nerve responses.*

*Holding is the use of static touch to establish initial contact with the client. Effleurage is best described as a long gliding stroke. Kneading, or petrissage, is a deeper technique.*

---

299.

"Recovery massage" most often refers to:

**Massage performed on athletes who have no injuries, following a strenuous workout or competition**

Massage performed on injured athletes, following a strenuous workout or competition

Massage performed on anyone with an acute injury

Massage performed on an athlete at any time

---

*Correct answer: Massage performed on athletes who have no injuries, following a strenuous workout or competition*

*"Recovery massage" most often refers to massage performed on athletes who have no injuries, following a strenuous workout or competition. This type of massage helps athletes recover from recent physical stress. It supports the body's return to homeostasis.*

---

**300.**

Based on assessment, a massage therapist concludes that a client has an overly sensitive vestibular system. Which massage therapy intervention should be avoided?

**Rocking**

Gliding

Stretching

Kneading

---

*Correct answer: Rocking*

*The vestibular system receives information about the body's orientation in space and is responsible for balance. Vertigo, for example, is a disorder of the vestibular system. Clients with overly sensitive vestibular systems are vulnerable to motion sickness.*

*Rocking, particularly of the trunk and head, can stimulate the vestibular system and may result in symptoms of motion sickness.*

*Gliding, stretching, and kneading are all appropriate techniques for the therapist to use with this client.*

---

**301.**

A client is receiving regular massages as part of complementary medicine. In this scenario, what is the **most likely** purpose of massage?

**To help the healing process**

Only to reduce symptoms of discomfort

To improve circulation

For direct muscle stimulation

---

*Correct answer: To help the healing process*

*Complementary medicine refers to situations in which clients receive care from multiple practitioners. For example, a client might seek out massage therapy to complement treatment by their primary care physician. In these situations, massage is done to help the client's healing process.*

*In palliative care, massage is only done to reduce symptoms of pain and discomfort. Therapeutic massage may be done to improve circulation or to directly stimulate muscles, but these are not **always** the goals of complementary medicine.*

---

**302.**

Which massage techniques **most** strongly affect the vestibular apparatus and cerebellum?

**Oscillation**

Effleurage

Kneading

Deep friction

---

*Correct answer: Oscillation*

*Massage application that produces rhythmic oscillation, including rocking, strongly affect the vestibular apparatus; therefore, the cerebellum. Rocking stimulates inner ear balance mechanisms and movement at the neck and head that affects equilibrium. While these techniques may have a beneficial impact on muscle tone, they should not be performed on clients who suffer from vertigo.*

*Effleurage has a great impact on superficial tissue such as the skin and superficial fascia. Kneading primarily effects the muscle bellies, tendons, and Golgi tendon organs. Deep friction has an effect on deeper muscles, deeper fascia, and scar tissue.*

---

**303.**

A client of a massage therapist has recently been sent to palliative care. The client's family contacts the therapist in hope of scheduling a massage. What are the primary benefits this type of massage would provide?

**Ensure comfort and reduce pain or suffering**

Improve blood flow to any areas that are painful and stimulate proprioceptors

Improve mobility in any restricted joints and stimulate the Golgi tendon organ

Ensure pain reduction and improve lymphatic and venous flow to reduce swelling

---

*Correct answer: Ensure comfort and reduce pain or suffering*

*A person is placed in palliative care to minimize suffering after treatment for a potentially terminal condition has failed. A massage in this realm should aim to be comforting, relaxing, and aid in pain reduction. The therapist should reduce the amount of pressure used, but ensure it is comfortable for the client.*

*While massage can improve joint and soft tissue mobility, stimulate proprioceptors, and improve blood and lymphatic flow, these are not the goals of a massage in the palliative care system. Attention should be focused on what feels good and is comforting to the client.*

---

**304.**

Which massage technique is used to make initial contact with the client?

**Holding**

Compression

Stroking

Effleurage

---

*Correct answer: Holding*

*Holding, or resting position, is a static massage technique used to make initial contact with the client. When the therapist simply places their hands against the client's skin, they establish trust and mutual respect.*

*Compression is used to apply pressure to a single area of the body at a time. Effleurage, also known as stroking, is a gliding technique.*

---

**305.**

The massage therapist is working in a hospital setting and uses tapotement/percussion over the chest cavity to assist in managing pleural secretions of a client. Where on the body should this technique **not** be used?

**In the kidney region**

In the area over the left lower lobe of the lung

In the upper back

In the pectoral region

---

*Correct answer: In the kidney region*

*Tapotement (percussion) is a technique that uses the hand to provide springy blows to the body at a quick rate. It can be done as light or heavy tapotement. Heavy tapotement is often done over the pleural cavity to help manage pleural secretions, such as in clients with pulmonary conditions.*

*It is important that percussion is never done over the kidney region or anywhere there is pain or discomfort in order to avoid causing injury.*

*The other options all describe regions where this technique may be performed to manage pleural secretions.*

---

**306.**

What is the **best** definition of hydrotherapy?

**The use of water to apply extreme temperatures during massage, either to the client's body or to an intermediary object**

The use of immersion baths as a therapeutic technique

The use of heat during massage

The use of cold during massage

---

*Correct answer: The use of water to apply extreme temperatures during massage, either to the client's body or to an intermediary object*

*Hydrotherapy is the use of water to apply extreme temperatures during massage, either to the client's body or to an intermediary object. In ice massage, for example, water is applied directly to the client's body. Alternatively, the therapist could apply heat packs which have been heated by hot water in a hydrocollator. The hot water doesn't touch the client, but some still consider this to be hydrotherapy. The temperatures used in hydrotherapy must not be so extreme as to cause injury, but should produce a noticeable effect in the muscles and surrounding tissues.*

*Immersion baths, heat, and cold are all specific types of hydrotherapy.*

---

**307.**

To have the greatest effect on connective tissue, a massage therapist should:

**Lightly drag and pull the skin**

Apply deep pressure with the fingers, thumbs, and elbows

Place heated stones on the body

Apply essential oils to the body to restore and heal

---

*Correct answer: Lightly drag and pull the skin*

*A connective tissue massage is performed by lightly dragging and pulling the skin. This mechanical manipulation of connective tissue can break up adhesions and stimulate healing.*

*A deep tissue massage is performed by applying deep pressure with the fingers, thumbs, and elbows.*

*A hot stone massage is performed by placing heated stones on the body.*

*Aromatherapy is performed by applying essential oils to the body to restore and heal.*

---

**308.**

A massage therapist is using an instrument to perform scraping on a client with Achilles tendonitis. What is the intention of this technique?

**To stimulate a small local inflammatory process**

To stimulate the nociceptors

To improve arterial blood flow

To reduce muscle tone

---

*Correct answer: Stimulate a small local inflammatory process*

*Scraping methods increase the drag along the skin and create an inflammatory process. This is done to jump-start the healing process in dysfunctional tissue (in this case, the Achilles tendon). When done in small therapeutic doses, this can be effective in normalizing tissue.*

*Nociceptors are pain receptors within joints. While scraping may be painful and may stimulate these receptors, the main intention is not to create pain. To improve arterial flow, compression should be applied systematically to the major arteries; scraping does not do this. Reducing muscle tone can be accomplished any number of ways including compression, kneading, and rocking; however, scraping is not intended to achieve this.*

---

**309.**

Which of the following structures is the **most** vulnerable to a tension injury?

**Biceps brachii**

Humerus

Cartilage

Femur

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*Correct answer: Biceps brachii*

*The biceps brachii are considered soft tissue and are therefore are very vulnerable to tension injuries. Tension injuries occur when the two ends of the tissue are pulled apart, as in a strain. Tension injuries are the most common type of injury to soft tissues. Sprains, tendonitis, and nerve traction injuries are also considered types of traction injuries.*

*Bone is incredibly difficult to injure by traction since it is so strong (humerus, femur). Cartilage is also difficult to injure with traction since it is typically so closely oriented with bone.*

---

**310.**

When trying to promote venous return, the massage therapist should apply strokes to the extremities, moving:

**Toward the heart**

Away from the heart

In a circular motion

Laterally

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*Correct answer: Toward the heart*

*Stroking over the veins toward the heart passively moves blood within the veins. This approach is especially effective in the extremities. The therapist applies short strokes over the veins at sufficient pressure to push the blood within the superficial veins.*

*In a patient with poor circulation, it can be ineffective or even dangerous to apply strokes away from the heart. This may cause blood to pool in the extremities.*

*Applying strokes in a circular motion or laterally would not have a strong impact on venous return.*

---

311.

Which of the following **best** defines "cryotherapy"?

Ice therapy

Heat therapy

Hydrotherapy

Massage therapy

---

*Correct answer: Ice therapy*

*Cryotherapy is another term for ice therapy. Ice therapy is used on contusions, sprains, fractures, and strains. There are many types of applications including ice packs, ice immersion, ice massage, cold whirlpool, chemical cold packs, and cold gel packs.*

*Heat therapy is the application of heat by using hot stones, heated towels, or similar implements. Hydrotherapy, or water therapy, can use either hot or cold applications. Cryotherapy can be used during the course of a massage therapist's practice, but cryotherapy is not a necessary component of all types of massage therapy.*

---

312.

What is the primary **benefit** of massage for the circulatory system?

**Massage can increase circulation.**

Massage can inhibit circulation.

Massage can dislodge blood clots.

Massage has no impact on circulation.

---

*Correct answer: Massage can increase circulation.*

*The increase of circulation is massage's primary benefit to the circulatory system. This is accomplished in two ways. Mechanically, massage strokes can mimic healthy blood flow patterns, stimulating the movement of blood through the arterial and venous systems. Chemically, massage also stimulates the release of vasodilators.*

*Massage does not inhibit circulation. While massage can dislodge blood clots, this is not a benefit. Therapists should take great care to avoid dislodging blood clots. One way to do this is to avoid massaging the legs of clients who are at risk of developing clots.*

---

**313.**

To assist with muscle energy techniques, a massage therapist may advise the client to take any or all of the following actions **except**:

**Exerting their full muscle strength in resistance to the massage therapist**

Looking in a specific direction

Inhaling

Exhaling

---

*Correct answer: Exerting their full muscle strength in resistance to the massage therapist.*

*To assist with muscle energy techniques, a massage therapist may advise the client to take any or all of the following actions **except** exerting their full muscle strength in resistance to the massage therapist. Eye positioning and respiration both have a known impact on the contraction and relaxation of various muscle groups, and so any of these actions could potentially assist with muscle energy techniques.*

---

**314.**

During a session, a massage therapist places her client into a supine position and supports their left leg at the posterior ankle and posterior knee. She lifts both joints, bending the knee and applying pressure as she slowly pushes it toward the client's chest. This is an example of:

**Passive stretching**

Proprioceptive neuromuscular facilitation

Active stretching

Reciprocal inhibition stretching

*Correct answer: Passive stretching*

*Passive stretching occurs when a second person (such as a massage therapist) applies force to stretch the tissue. In this example of passive stretching, the therapist is stretching the client's hamstrings.*

*Active stretching occurs when a person stretches their own body. Reciprocal inhibition stretching is when the antagonistic muscle is being contracted against the muscle that is being stretched. Proprioceptive neuromuscular facilitation is an assisted stretching technique in which a muscle is stretched into resistance three to four times, facilitating the nervous system.*

---

**315.**

Which of the following can be light, moderate, deep, or variable?

**Compressive force**

Drag

Trigger points

Holding

---

*Correct answer: Compressive force*

*Compressive force (or depth of pressure) can be light, moderate, deep, or variable. The massage therapist may choose which level of pressure to use based on the treatment goals.*

*Drag is the amount of pull or stretch that is placed on the tissue. Because drag refers to force applied in a transverse direction, depth is not an accurate measure of its intensity.*

*Trigger points may occur deeply or superficially, but they are not described as being light, moderate, or variable.*

*Holding techniques are static; they can be light, moderate, or deep, but not variable.*

---

**316.**

Which of the following is **not** a benefit that a massage provides to the integumentary system?

**Promote the release of endorphins**

Increase the blood flow to the skin

Facilitate sebaceous secretions

Maintain healthy skin

---

*Correct answer: Promote the release of endorphins*

*Massage promotes the release of endorphins, which has a positive impact on the **nervous** system, not the integumentary system.*

*The benefits of a massage for the integumentary system include the increase of blood flow to the skin, the facilitation of sebaceous secretions, and the ability to maintain healthy skin.*

---

**317.**

During hot stone massage, what temperature should the stones be prior to application?

**100–110 degrees F**

110–120 degrees F

65–92 degrees F

90–100 degrees F

---

*Correct answer: 100–110 degrees F*

*When performing hot stone massage, the stones should be cooled to a temperature of 100–110 degrees F prior to application. The stones must also be sanitized prior to the massage. Any temperature below 100 degrees F may not have the desired warming effect on the muscle tissue. Any temperature above 110 degrees may cause discomfort or result in a burn. It is important to note that the temperature of the water used to heat the stones is not necessarily the same as that of the stones themselves.*

---

**318.**

A client states he has pain in his upper trapezius region. Upon assessment, the massage therapist discovers a large trigger point in the upper trapezius. Stimulation of this trigger point creates radiating pain along the client's upper arm. Why would the client experience radiating pain with stimulation of this trigger point?

**It is near a motor nerve point.**

The deltoid, biceps, and triceps are likely involved as well.

The spinal nerve is activated.

This client likely has a herniated cervical disc.

---

*Correct answer: It is near a motor nerve point*

*Trigger points are areas of hypertonic soft tissue and, if they are located near motor points, they can create referred pain. Referred pain is typically distal to the location of the trigger point. Motor points are groups of small, sensitive muscle fibers that can cause the contraction of an entire muscle. Stimulation of the trigger point over or near a motor point will cause this type of referred pain.*

*Since the pain is reproduced with treatment/stimulation of the trigger point, it is likely that the cause of the pain is the trigger point. This referral pattern is common with the upper trapezius, so it is unlikely that this pattern is a result of the pathology of the deltoid, biceps, and triceps. The spinal nerves are nerves that exit through the vertebra, and while stimulation of these can cause referred pain, it is not as a result of palpation of a trigger point. While a herniated cervical disc can cause this type of pain, it is not likely since activation of the trigger point caused the referred pain.*

---

319.

A massage benefits which system by promoting the release of endorphins?

**Nervous system**

Respiratory system

Lymphatic system

Integumentary system

---

*Correct answer: Nervous system*

*A massage benefits the nervous system by promoting the release of endorphins. Endorphins are mood lifters that support satiety and modulate pain. Massage increases the available endorphin levels. A massage also benefits the nervous system by relieving pain and promoting homeostasis in the parasympathetic and sympathetic systems.*

*Optimizing nervous system function has a positive impact on all other systems of the body. However, the release of endorphins does not **directly** affect the respiratory, lymphatic, or integumentary systems.*

---

**320.**

A massage therapist is working with a client with generalized anxiety disorder, but no specific musculoskeletal injuries. After each session, the client always states she feels much better overall. What is the **most** likely explanation for this?

**Massage causes a release of serotonin, dopamine, and endorphins.**

Massage causes a localized inflammatory reaction.

Massage causes a release of vitamin K.

Massage causes an inhibition of serotonin, dopamine, and endorphins.

---

*Correct answer: Massage causes a release of serotonin, dopamine, and endorphins.*

*One of the major benefits of regular massage in clients with mental health conditions is its ability to reduce stress levels. This occurs as a result of the release of these chemicals in the brain, all of which work to improve mood. After these chemicals are released during a massage, the reduction in stress and improvement of mood are likely.*

*While certain massage techniques can cause a local inflammatory reaction, this is likely not the reason the client states she feels so much better. She does not have any musculoskeletal injuries, so the initiation of a local inflammatory response would likely not improve her symptoms. It is unlikely that a massage would cause the release of vitamin K; this vitamin is involved in the clotting cascade to form a blood clot after a cut or to stop internal bleeding.*

---

**321.**

Which of the following would be **most** appropriate areas to apply shaking?

**Hamstrings**

Tibialis anterior

Lumbar extensors

Cervical suboccipitals

---

*Correct answer: Hamstrings*

*Shaking should be used on large muscle groups and the appendicular synovial joints. The hamstrings are a large muscle group and can be grasped and manipulated effectively for shaking. This technique can help reduce muscle tone, warming the body and preparing muscles for deeper massage techniques. Other areas that are appropriate for shaking are the shoulder area, upper trapezius, biceps/triceps, quadriceps, and gastrocnemius.*

*The lumbar extensors and cervical suboccipitals cannot be easily isolated, and therefore cannot receive shaking techniques appropriately. While the extensors may be large, they would be difficult to grasp for this technique. Although the tibialis anterior may be able to be palpated easily, it also cannot be grasped for this technique and so would not be an appropriate area for shaking.*

---

**322.**

Which of the following is **not** a psychological effect that a massage has on a client?

**Increased flexibility**

Increased productivity

Reduced fatigue and anxiety

Deep relaxation

---

*Correct answer: Increased flexibility*

*The increased flexibility and mobility is a physiological effect of a massage, not a psychological effect.*

*The psychological effects of a massage include the reduction of stress from medical conditions, the reduction of pain from chronic illnesses, the reduction of fatigue and anxiety, the promotion of one's feeling of well-being, the promotion of deep relaxation, and the enhancement of productivity.*

---

**323.**

A massage therapist has spent several years working for a chiropractor who primarily treats otherwise healthy clients who have recently sustained acute injuries. The therapist gets a new job in a hospice, where they will provide palliative massage. Of the following options, which changes will the therapist **most** likely need to make to their massage techniques?

**The therapist will need to learn to work on clients who are positioned in a bed or a chair instead of on a massage table.**

The therapist will need to employ lymphatic drainage techniques in every massage.

The therapist will need to learn how to operate complex medical machinery.

The therapist will need to learn how to provide grief counseling.

---

*Correct answer: The therapist will need to learn to work on clients who are positioned in a bed or a chair instead of on a massage table.*

*Palliative care is offered to clients in the late stages of a terminal illness. The primary goal of palliative massage is to reduce discomfort. Seriously ill clients undergoing palliative care may not have the strength to move from their hospital bed to a massage table. Some of them may be able to move to a chair but would be uncomfortable lying on the flat surface of a massage table. A therapist will have to modify their technique to accommodate this type of positioning.*

*Lymphatic drainage may be appropriate for some palliative care patients, but not all of them. Operating medical machinery and providing grief counseling are outside the scope of practice for a massage therapist.*

---

**324.**

When applying an ice pack to a knee, what occurs physiologically?

**A local decrease in function followed by a state of hyperactivity of the tissue**

A global decrease in function

A local decrease in function that continues even after the ice is removed

An immediate local increase in function followed by a decrease in tissue activity

---

*Correct answer: A local decrease in function followed by a state of hyperactivity of the tissue*

*When a cold modality is applied (ice, ice bath, cold stones, etc.), the initial response is a slowing down of activity in the area. The secondary effect occurs after some time has passed, normally after the application has been removed. This secondary reaction involves an increase in activity of the area where the cold modality was applied. This secondary response results in increased metabolism and greater healing ability. In this case, a local decrease in function occurs because the ice is only applied to the knee.*

*A global decrease in function does not occur because the ice is only applied to the knee (as opposed to a whole-body ice bath). The typical response to ice is not an immediate increase in function; this is a secondary effect.*

---

**325.**

For which of the following conditions is the use of hot immersion baths **contraindicated**?

**Multiple sclerosis**

Osteoarthritis

Raynaud disease

Venous insufficiency

---

*Correct answer: Multiple sclerosis*

*Multiple sclerosis is a neurological condition that involves demyelination of the central nervous system. Individuals with this condition have a reduced tolerance to high temperatures. Exposure to high temperatures can exacerbate their symptoms. The application of heat, including immersion baths and the use of saunas, is contraindicated for these clients.*

*While Raynaud disease is a circulatory disorder, the main issue is with cold exposure, not heat. Venous insufficiency involves difficulty returning venous blood to the large vessels and the heart; heat is not contraindicated for people with this condition. There is no such contraindication for individuals with osteoarthritis.*

---

**326.**

When treating a client with a strain of the flexors of the wrist, which type of stone application would be **most** appropriate?

**Cold stones**

Hot stones

Alternating hot and cold stones

Stone application is not appropriate.

---

*Correct answer: Cold stones*

*The application of cold stones decreases inflammation and pain. Because of this, it is **most** appropriate to use cold hydrotherapy to treat an acute injury such as a strain.*

*When treating the inflammatory process caused by an acute injury, the use of heat alone may exacerbate symptoms. Although alternating hot and cold can be helpful in some cases, cold stones alone would be most appropriate in this case.*

---

**327.**

What is the amount of stretch or pull on a tissue?

**Drag**

Rhythm

Direction

Compressive force

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*Correct answer: Drag*

*Drag is the amount of stretch or pull on a tissue. Many structural and functional tissue changes depend on the amount of drag applied by a massage therapist. Connective tissue, in particular, is greatly affected by drag.*

*Rhythm is the regularity of application of a technique.*

*Direction can move outward from the center of the body (centrifugal or proximal) or inward from the extremities toward the center of the body (centripetal or distal).*

*Compressive force is the depth of pressure applied, which can be light, moderate, deep, or variable.*

---

**328.**

When working with a client with painful shoulder movement, a massage therapist performs passive range of motion of the shoulder joint. This results in greater ease of movement and reduced pain levels. What is the mechanism for this?

**Input to joint sensory receptors reduces the sensitivity of these receptors, resulting in reduced spasm.**

Input to joint sensory receptors increases the sensitivity of these receptors, resulting in muscle contraction.

Reduced input to muscle spindles results in an increased likelihood of muscle contraction.

Passive range of motion allows connective tissues to glide past each other more easily.

---

*Correct answer: Input to joint sensory receptors reduces the sensitivity of these receptors, resulting in reduced spasm.*

*When moving a joint through its available range with support, a new set of signals/input is received by the nervous system. This allows a painful joint to become less sensitive to movement. When a joint is in pain, often the surrounding muscles will spasm to prevent further movement or injury. By reducing the sensitivity of joint receptors, the protective muscle spasms will reduce.*

*Supportive input (as in passive range of motion) to a painful joint would result in decreased, not increased, sensitivity of the joint receptors. If anything, passive range of motion may increase input to muscle spindles since some muscles are being stretched. Passive range of motion also has little effect on the glide of connective tissues; frictioning is a more effective technique when the goal is to improve glide.*

---

**329.**

How does massage benefit the urinary system?

**It aids with the elimination of surplus fluids and toxins from the body.**

It stimulates the release of endorphins.

It provides a calming effect.

It increases body awareness.

---

*Correct answer: It aids with the elimination of surplus fluids and toxins from the body.*

*Massage benefits the urinary system because it aids with the elimination of surplus fluids and toxins from the body. The urinary system's function is to regulate blood pressure and electrolyte balance by eliminating the body's excess water and toxins.*

*A massage benefits the nervous system by stimulating the release of endorphins, providing a calming effect, and increasing the body's awareness through touch.*

---

**330.**

A massage therapist applies compression to the gastrocnemius muscle belly. This technique typically reaches to the level of:

**Subcutaneous tissue**

The epidermis

The dermis

The viscera

---

*Correct answer: Subcutaneous tissue*

*Compression is applied down towards the tissue and typically reaches the subcutaneous level. The beneficial effects of this technique come from the compression of the subcutaneous tissue on deeper structures, which causes them to spread out (tissue displacement). Compression is best for stimulating nerves and skeletal muscle.*

*While compression must also affect the epidermis and dermis (both of which are superficial to the subcutaneous level), it reaches and targets a deeper level of tissue.*

*Compression should not be performed directly over the abdomen, and therefore will not have a direct impact on the viscera.*

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# Client Assessment, Reassessment & Treatment Planning

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Client Assessment, Reassessment & Treatment Planning

**331.**

Five months after right sentinel lymph node removal (in the axilla) and radiation therapy for breast cancer, a client has persistent swelling in her right arm. She has seen her physician and has been cleared for massage therapy. What drag level should be applied when working with this client's right arm?

**Level 2**

Level 1

Level 0

Level 3

---

*Correct answer: Level 2*

*Clients who have had lymph node removal and radiation therapy are at high risk for developing lymphedema in the affected limb. Lymphedema is the buildup of lymphatic fluid, leading to swelling. For this condition, a gentle technique like lymphatic drainage massage is appropriate. Level 2 drag is a moderate level of drag that is commonly used for lymphatic drainage and relaxation. It provides enough stretch to encourage the movement of lymph without causing damage to the tissues, making it ideal for managing lymphedema.*

*Level 1 drag is too light to effectively stimulate lymphatic flow, so it is typically reserved for general relaxation or circulation enhancement without addressing specific conditions like lymphedema.*

*Level 0 drag is the gentlest level and is often used with fragile clients, such as those with osteoporosis or bleeding disorders, but it would not be effective for lymphatic drainage.*

*Level 3 drag is much stronger and is used for myofascial release or breaking down adhesions, which would be too intense for lymphedema and could potentially cause harm.*

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**332.**

A new client comes to the clinic with reports of pain in the mid-portion of the calf and also in the arch of the foot. He states the pain has started gradually over the course of several weeks. Based on the information given, what is the **most** likely source of this client's pain?

**A trigger point in the gastrocnemius**

A trigger point in the soleus

A trigger point in the peroneus longus

A trigger point in the abductor hallucis

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*Correct answer: A trigger point in gastrocnemius*

*The gastrocnemius is located on the posterior aspect of the calf. It is a large muscle in which trigger points commonly occur. Trigger points can create pain in areas far away from the muscle/trigger point itself. Trigger points in the gastrocnemius refer pain to the mid-calf and the arch of the foot.*

*A trigger point in the soleus would produce pain in the mid-portion and inferior portions of the calf, but not in the arch of the foot. In the peroneus longus, a trigger point would produce pain along the lateral calf, while a trigger point in the abductor hallucis would produce pain along the first metatarsal.*

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**333.**

A client comes to a massage therapy clinic after falling on her wrist three days ago. Her physician has diagnosed her with a wrist sprain and approved massage therapy. Upon assessment, the wrist appears visibly swollen, is painful, slightly warm to the touch, and an impression is left on the tissue with palpation.

What is the **most** appropriate treatment for this client?

**Lymphatic drainage for the area, light passive range of motion, full body massage**

Venous drainage for the area, stretching of the wrist into flexion and extension

Lymphatic drainage for the area, contract-relax techniques for all ranges of wrist range of motion

This client is not yet a candidate for treatment.

---

*Correct answer: Lymphatic drainage for the area, light passive range of motion, full body massage*

*This injury is still in the acute stage of tissue healing. Swelling, heat, and pain are all very common symptoms of a recent wrist sprain. The presence of pitting edema further confirms swelling in the area; lymphatic drainage is an effective treatment for this condition. Light passive range of motion to reduce pain levels and full body massage to promote healing are both appropriate in this stage of healing.*

*Even though some heat is noticed in the area, it is still appropriate to treat this client since she has been cleared by her physician and the joint does not demonstrate any visible redness. Venous drainage would be most appropriate for congestion rather than swelling. Stretching and contract-relax techniques are appropriate for the late subacute and chronic phases of healing, not the acute stage.*

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**334.**

A client visits a massage therapy clinic 20 days after a fall on his bicycle. He saw his doctor immediately afterward and has been cleared of serious pathology. He has been having some shoulder pain as a result of the fall and has a large cut over his shoulder that is closed; a scar has begun to form at the site of the injury.

What is the **best** treatment strategy for this client?

**Light mobilization of the scar in the direction of the fibers, active and passive range of motion of the shoulder from 20 degrees of flexion to 90 degrees**

Cross-friction mobilization of the scar, stretching of the shoulder into flexion and abduction

Cross-friction mobilization of the scar and resisted range of motion of the shoulder into 180 degrees of flexion

Friction mobilization of the scar away from the injury site, passive range of motion of the shoulder only in the range of 20 to 90 degrees of flexion

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*Correct answer: Light mobilization of the scar in the direction of the fibers, active and passive range of motion of the shoulder from 20 degrees of flexion to 90 degrees*

*This client is in the subacute phase of healing since his accident occurred 20 days ago. The subacute phase occurs between 14 and 21 days after the injury, and the healing tissue is fragile. Collagen formation and granulation tissue appear in this phase. Clinically, the massage therapist should focus sessions on promoting a mobile scar, cautious soft tissue mobilization of the scar toward the injury, active and passive range of motion in mid-ranges, and full-body massage to support healing. Light mobilization of the scar in the direction of the fibers promotes a mobile scar while still protecting the healing tissue. Active and passive range of motion of the shoulder from 20 to 90 degrees of flexion is limited to mid-range in order to support controlled motion.*

*Cross friction of the scar or mobilization in a direction away from the injury should be avoided at this phase since the scar tissue is not strong enough to tolerate it yet. Stretching of the shoulder should be avoided since, in this phase, the shoulder should be treated in mid-ranges; stretching implies end-range movement. Resisted range of motion of the shoulder should be implemented in the chronic phase of healing, not the subacute phase.*

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**335.**

When assessing a client for range of motion, the massage therapist notices the client has five degrees of hip extension. What would be an appropriate intervention to improve this?

**Contract and relax the psoas, then contract the gluteus maximus while moving the client into hip extension**

Contract and relax the gluteus maximus, then contract the psoas while moving the client into hip extension

Contract and relax the psoas, then contract the gluteus maximus while moving the client into hip flexion

Contract and relax the gluteus maximus, then contract the psoas while moving the client into hip flexion

---

*Correct answer: Contract and relax the psoas, then contract the gluteus maximus while moving the client into hip extension*

*Given the available information, it is likely that a shortened psoas is the cause of this client's decreased hip extension. One way for the therapist to improve the length of the psoas is by using the contract-relax-antagonist-contract muscle energy technique. This is performed by first having the client contract the targeted muscle (the psoas), then relax, followed by contraction of the antagonist (the gluteus maximus) while stretching the target tissue.*

*In order to improve the length of the psoas, the client must be moved into hip extension at the end of this technique, not hip flexion. The target tissue, in this case, is the psoas, so this must be contracted first, not the gluteus maximus.*

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**336.**

When does the massage therapist collect objective data that is needed to develop an appropriate care plan?

**During the physical assessment**

During the discussion of the client's health history

After the goals are written

When the physician provides medical history

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*Correct answer: During the physical assessment*

*The massage therapist collects objective data needed to create the treatment plan during the physical assessment. The objective data may include information such as range of motion, posture, muscle testing, girth measurements, respiratory rate, etc.*

*The discussion of the client's health history is a way to collect subjective information. The massage therapist uses the objective data to help and write the client goals.*

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**337.**

When you are visually assess a client's gait, what are you looking for?

**If their walking pattern is smooth and balanced**

If their body is symmetrical

If their spine has proper curvature

If their muscles are restricting their movements

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*Correct answer: Whether their walking pattern is smooth and balanced*

*When you visually assess a client's gait, you are looking to see if their walking pattern is smooth and balanced. You should look for two main factors when assessing gait:*

- 1. Identify areas that move too much*
- 2. Identify areas that do not move enough*

*If you are assessing a client's posture, you are looking to see if their body is symmetrical.*

*If you are assessing a client's basic body structure, you are looking to see if their spine has proper curvature.*

*If you are assessing a client's restrictive range of motion, you are looking to see if their muscles are restricting their movements.*

---

**338.**

During a session, a client reports she has been having new pain in her right shoulder. She denies any injury or specific event that caused this. When asked to describe the pain, she states it is a "vague" pain and cannot pinpoint a specific spot. She uses her entire hand and moves over her entire shoulder and pectoral region when asked to describe where the pain is. She also states that sometimes it is hard to tell where the pain is.

What is the **most** likely underlying cause of the client's pain?

**Visceral pain stemming from the liver**

Somatic pain from the deltoid

Somatic pain from a trigger point in the upper trapezius

Visceral pain stemming from the heart

*Correct answer: Visceral pain stemming from the liver*

*Visceral pain is a result of organ dysfunction. This pain often presents as referred pain, located far away from the actual site of the organ. It is vague, poorly localized, and no injury is associated with its onset. The client using her entire hand over the shoulder area, and her statement that it is difficult to identify the location of the pain tells the therapist that the pain may be of visceral origin. The liver and gall bladder will refer pain to the right shoulder. In this scenario, it would be appropriate to also refer the client to a physician for further diagnosis.*

*Somatic pain comes from the musculoskeletal system and is usually specific and easily localized. Therefore, pain stemming from the deltoid would likely present directly over the deltoid. A trigger point in the upper trapezius may refer pain to the side of the head, but this would be a more specific pain. Visceral pain from the heart would most likely present in the left shoulder and arm, rather than the right upper extremity.*

---

**339.**

A therapist's client has suffered an injury. Which of the following is **not** considered a stage of healing?

**Intermediate**

Subacute

Acute

Remodeling

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*Correct answer: Intermediate*

*The stages of an injury may be classified as follows:*

- 1. Acute (Inflammatory)*
- 2. Subacute (Repair)*
- 3. Chronic (Maturation and Remodeling)*

*"Intermediate" phase is not a commonly-used term.*

---

**340.**

A massage therapist is performing an assessment with a new client. All the following should be done **except**:

**Goal setting**

Observation

Muscle tests

Palpation

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*Correct answer: Goal setting*

*The assessment is the gathering of information and facts. This is a vital part of any session, but is especially important in the initial session in order to establish the client's needs. While goal setting is an essential part of the plan of care, it should not be done until the assessment is complete. The assessment will give the massage therapist the information needed to set goals, but if they are set before the assessment is complete, they may not be accurate or appropriate for that particular client.*

*The assessment should include taking the client's history as well as palpation, observation, and muscle tests.*

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**341.**

Eleven months after a shoulder replacement, a client still has limitations in range of motion. After further assessment, the massage therapist notes restrictions in the mobility of the surgical scar. What is the **most** appropriate action to take?

**Employ cross friction massage to the scar with pressure level 2–3**

Employ cross friction massage to the scar with pressure level 4–6

Avoid the scarred area; use range-of-motion techniques

Avoid the scarred area; address trigger points elsewhere

---

*Correct answer: Employ cross friction massage to the scar with pressure level 2–3*

*This scar tissue is in the maturation and remodeling phase of healing. The tissue can and should be massaged to encourage proper collagen formation and pliability. Since the therapist noted restrictions in the scar, using cross friction massage with pressure level 2–3 is most appropriate.*

*Using cross friction massage with pressure level 4–6 would be too aggressive; this level of pressure is usually used with adhesions on muscle layers. Since the scar is eleven months old, it is appropriate to address the scar. If it were still in the inflammatory stage of healing, it would not be appropriate to treat it. Since restrictions have been identified in the scar, it would be most appropriate to address them rather than treat trigger points elsewhere.*

---

**342.**

An older client comes to you after a month-long stay in the hospital due to a fall. She sustained a concussion when she fell, and contracted pneumonia while in the hospital. The pneumonia has mostly cleared, but she does have a pressure ulcer on her sacrum. She has been having back pain and would like treatment to be focused on her low back. What is the **best** course of action?

**Agree to treatment after getting clearance directly from her physician; avoid treatment of the sacral area**

Agree to treatment; use lighter techniques over the sacral area

Instruct the client to return home and wait for the ulcer to heal

Agree to treatment; avoid direct treatment of the sacral area

---

*Correct answer: Agree to treatment after getting clearance directly from her physician; avoid treatment to the sacral area*

*Given this client's complex recent medical history, it is best to contact the physician prior to treatment. While treated pneumonia is not a contraindication to treatment, when combined with low back pain, the massage therapist should work under medical supervision. A pressure ulcer is not a general contraindication, so the client can still be treated. However, the general area should be avoided, as this is condition entails extremely sensitive tissue and weakened skin.*

*This client is generally acceptable for treatment as long as the physician is aware of her condition and consents to massage. Techniques should not be applied over the area of the pressure ulcer, no matter how light they are.*

---

**343.**

If a client has been drinking alcohol, you can smell it with your:

**Olfactory sense**

Auditory sense

Energetic sense

Intuitive sense

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*Correct answer: Olfactory sense*

*If a client has been drinking alcohol, you can smell it with your olfactory sense. Your olfactory sense allows you to notice a client's abnormal odors, which may be positive or negative, such as alcohol, cigarette smoke, or a new perfume.*

*Your auditory sense allows you to hear. Your energetic sense allows you to notice and feel energy. Your intuitive sense is your gut feeling telling you that something is or is not quite right.*

---

**344.**

When assessing areas of pain, it is important for a massage therapist to differentiate between joint and soft tissue dysfunction. Which is an indication of a joint dysfunction?

**Pain with joint compression and with passive range of motion**

Pain with joint traction and active range of motion

Pain without joint movement

Pain only with deep palpation

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*Correct answer: Pain with joint compression and with passive range of motion*

*To determine whether an individual has soft tissue dysfunction or joint dysfunction, assessment is required. Pain with joint traction is usually soft tissue dysfunction. Pain with joint compression is usually joint dysfunction. In addition, if active range of motion causes pain and passive range of motion does not, then it is likely soft tissue related. If both active and passive range cause pain it is likely a joint dysfunction. Clients with suspected joint dysfunction require referral to a physician, as treatment of the joints is outside a massage therapist's scope of practice.*

---

**345.**

During an initial appointment with a new client, a massage therapist performs a gait assessment. This assessment is **least** likely to reveal which of the following?

**Trigger points in the sternocleidomastoid**

Torn meniscus in the knee

Contracture of the rectus femoris

Trigger points in the piriformis

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*Correct answer: Trigger points in the sternocleidomastoid*

*Of the available options, a gait assessment is **least** likely to reveal trigger points in the sternocleidomastoid. In some cases, the therapist may be able to observe neck pain during a gait assessment, but this is not the most accurate way to test for pathology of the cervical muscles.*

*A torn meniscus in the knee, contracture of the rectus femoris, or trigger points in the piriformis would probably be readily apparent, since all of these structures are directly involved in the act of walking.*

---

**346.**

A therapist is having difficulty palpating the supraspinatus. What would be the **most** helpful?

**Resist the client's movement into shoulder abduction**

Press more firmly to reach the muscle belly

The supraspinatus is located too deep and cannot be palpated

Resist the client's movement into shoulder medial rotation

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*Correct answer: Resist the client's movement into shoulder abduction*

*A muscle can be palpated much more easily while it is contracting against resistance. The supraspinatus is involved in shoulder abduction, so resisted shoulder abduction would make the muscle more discernable.*

*Resisting the client into shoulder medial rotation would make the medial rotators of the shoulder more discernable, most notably the subscapularis, not the supraspinatus. Sometimes, pressing more firmly is indicated, but the massage therapist should focus on palpating with accuracy, not simply pressing harder. Also, the supraspinatus is a superficial muscle, especially as it nears the shoulder, so pressing more firmly would not be the most advantageous.*

---

**347.**

When observing a client walk, a massage therapist notices the client is unable to achieve the proper knee position for initial contact (heel strike). Upon further assessment, the therapist notes decreased activity and mobility of the hamstrings. What is the **most** likely cause of this gait pattern?

**Shortened hamstrings**

Faulty hamstring firing patterns

Decreased quadriceps mobility

Faulty hip flexor firing patterns

*Correct answer: Shortened hamstrings*

*Normal knee position at initial contact (heel strike) in the gait cycle is 0 degrees, meaning the knee is in full extension. Causes for this can be variable. However, given the observation of decreased hamstring activity, the most likely cause of this is inadequate hamstring length. Since the hamstrings are lengthened in full knee extension, shortened hamstrings will interfere with knee extension.*

*Faulty hamstring firing patterns would not necessarily contribute to this pattern, but faulty quadriceps firing patterns might. Decreased mobility of the quadriceps would contribute to decreased ability to flex the knee, not extend it. The hip flexors are largely inactive at initial contact.*

---

**348.**

A client has been seeing the same massage therapist for several months to receive treatment for trigger points. He has a heart attack and is placed on anticoagulants. When his doctor clears him for massage, he returns to the massage clinic. He tells the therapist that he would like to continue with treatment for trigger points. How should the therapist proceed?

**Attempt to address the trigger points with non-compressive techniques and light pressure.**

Address the trigger points with traditional trigger point release and heavy pressure.

Inform the client that due to his recent heart attack, trigger points can no longer be addressed.

Attempt to address the trigger points with myofascial release techniques and heavy pressure.

---

*Correct answer: Attempt to address the trigger points with non-compressive techniques and light pressure.*

*Anticoagulants are medications used to prevent the clotting of blood and are commonly used in clients who have had a heart attack to prevent blood clots from forming in the heart. Because he is taking anticoagulants, this client should only receive massage that utilizes light pressure, with levels of only 1 to 2. This lowers the risks of subdermal bleeding and similar tissue damage.*

*Addressing the trigger points traditionally with pressure level 4 to 6 or with heavy myofascial release would be much too aggressive and place the client at risk of injury. This client is still appropriate for massage; however, he should be informed that the trigger points will need to be addressed differently than they were before.*

---

**349.**

In order to properly utilize the data gathered during the assessment, what must the massage therapist do?

**Employ clinical reasoning to develop an appropriate care plan with quantifiable goals**

Input the objective data into a national database to compare standardized norms

Confer with a physician to determine if there are any areas of contraindication for massage

Follow a standardized routine of relaxation massage

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*Correct answer: Employ clinical reasoning to develop an appropriate care plan with quantifiable goals*

*In order to properly utilize the data gathered during the assessment, the massage therapist must employ clinical reasoning to develop an appropriate care plan with quantifiable goals. Each care plan should be unique and tailored to the needs of the specific client. The assessment information guides the massage professional in creating quantifiable outcome goals. As the treatment progresses, the massage therapist can reassess the objective data to determine what progress has been made.*

*There is no professionally recognized national database the therapist can use for a comparison of norms.*

*The therapist may confer with a physician in certain cases, but this is not always required.*

*While relaxation massage may be a component of the care plan for some clients, it is not always indicated.*

---

**350.**

When working with a client, a massage therapist notes hypomobility in the elbow. The therapist then decides that stretching the elbow is the best course of action to improve mobility. How should this be performed?

**Begin the stretch at the first point of restriction and move further into restriction**

Begin the stretch before any restriction is felt and move until the first sign of restriction

Begin the stretch at maximum restriction

Begin the stretch at the first sign of pain, then move into restriction

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*Correct answer: Begin the stretch at the first point of restriction and move further into restriction*

*Stretching a hypomobile joint is advisable as long as it is pain-free. The most effective way to perform this technique is by beginning the stretch at the exact location of the restriction and then moving into further restriction. By focusing the stretch on the restricted tissue, the therapist is able to elongate the involved muscle(s) and increase the flexibility of the joint.*

*It is very important to end the stretch at maximum restriction, rather than starting there, as this can cause pain and injury. Pain should be completely avoided when stretching a hypomobile joint. If the stretch is begun before resistance, it only occurs within the available range of motion and does not challenge flexibility.*

---

**351.**

Which of the following is **not** a component of a typical gait pattern?

**Foot flat stepping**

Knee flexion with initiation of swing

Knee extension at heel strike

Hip flexion to initiate swing

---

*Correct answer: Foot flat stepping*

*Foot flat stepping indicates that the client is not achieving appropriate heel strike at initiation of stance. Foot flat stepping can indicate a variety of conditions, such as poor balance, poor dorsiflexion strength, pain, and weakness.*

*Normal gait includes knee flexion with the initiation of swing, knee extension at the heel strike, and hip flexion to initiate the leg swing.*

---

**352.**

There are a number of protocols that govern the process of an intake assessment. Which of the following statements is **false**?

**The massage therapist must refer to the primary care physician before assessing a client.**

Assessment is the process of identifying the structures that need to be addressed.

The massage therapist bases treatment goals and treatment plans on assessment data.

The assessment helps identify conditions in which a particular treatment may be contraindicated.

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*Correct answer: The massage therapist must refer to the primary care physician before assessing a client.*

*An assessment identifies the structures that need to be addressed, establishes clear treatment goals, provides a baseline of objective measurements, and identifies any conditions that may have contraindications. The massage therapist utilizes this information to plan the course of treatment and allow for optimal, specific outcomes.*

*The massage therapist does not need to refer to the primary care physician before an assessment. However, if contraindications are determined, then the massage therapist would refer to the primary care physician after the intake.*

---

**353.**

A client comes to a massage therapist with the primary complaint of stiffness and tightness in the shoulders and neck. This pain has been present for years. Sessions have included manual stretching, compression, and kneading. After six visits, the client states her symptoms improve during each session, but the pain returns within an hour after treatment.

What could the therapist do to improve this **most** effectively?

**Contract-relax of the upper trapezius, progressive relaxation program**

Refer to another health care provider for a different approach

Percussion and friction mobilization of the upper trapezius

Effleurage and circulation massage

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*Correct answer: Contract-relax of the upper trapezius, progressive relaxation program*

*Reports of stiffness or tightness in the neck are commonly a result of posture, which is a direct result of the client's habits on a daily basis. To make a more meaningful change, it would be more effective to utilize contraction, stretching, and muscle release. One effective technique to achieve this is contract-relax. The therapist might also perform progressive relaxation (asking the client to contract a specific muscle followed by total relaxation of that muscle).*

*Since the client does improve with techniques, it would still be appropriate to continue treating her, but a different technique or approach should be employed. Percussion would stimulate the muscle rather than relax it, and friction mobilization would start a small inflammatory response and likely not result in muscle relaxation or relief of tightness. Effleurage may affect the tension in a muscle, but circulation massage would place more focus on improved circulation to the area. While this is not a poor choice, the use of contract-relax techniques would be the **most** effective.*

---

**354.**

A client is a stroke survivor and comes to a massage therapist to reduce pain levels in his neck and shoulder. The client's strength in his biceps brachii is rated at 3/5. What is the **most** difficult type of movement that this client is **still** able to perform?

**Elbow flexion while in a sitting position (against gravity) without anything in his hand**

Elbow flexion while standing (against gravity) with a 1-pound weight in his hand

Elbow flexion while in standing (against gravity) with a 5-pound weight in his hand

Elbow flexion while in a side-lying position (not against gravity) with a 5-pound weight in his hand

---

*Correct answer: Elbow flexion in a sitting position (against gravity) without anything in his hand*

*The strength rating is based on the Medical Research Council grading scale. On this scale, muscle strength is graded between 0 and 5, with 0 being no muscle contraction whatsoever, and 5 being completely normal strength. In this case, the client is able to move the elbow against gravity without any extra resistance (nothing in his hand). Since the question indicated this had to be the most challenging movement the client could perform, this would place the client at a grade 3/5.*

*Being able to move the elbow against gravity with moderate or heavy resistance (1- or 5-pound weight) indicates a strength score of 4 or 5. While this client could perform side-lying elbow flexion possibly with a 5-pound weight, this is not the most challenging option.*

---

**355.**

A massage therapist has been working with a client on a regular basis for the past four weeks, and the client has recently stopped progressing. The client presents with low back and hip pain. The focus during the sessions has been decreasing muscle tone in the paraspinals and improving muscle length of the hamstrings and hip flexors.

To further reduce pain, what would be the **most** appropriate treatment to attempt next?

**Apply deeper pressure to reach the hip joint capsule and associated tendons and ligaments**

Begin including circulation massage to the area

Begin including kneading to the quadriceps and hamstrings

Add in stretching of the quadriceps

---

*Correct answer: Apply deeper pressure to reach the hip joint capsule and associated tendons and ligaments*

*Once a client stops progressing, a technique should be altered, or a new area may need to be explored because the current treatment has become ineffective. Often, massage therapists can forget that the most common source of musculoskeletal pain is actually the joint capsule and the periosteum. All the techniques currently being employed address only the muscle. Therefore, increasing the pressure to reach the hip joint capsule may help to improve symptoms, especially if the joint capsule is one of the underlying causes of the symptoms.*

*Techniques to improve circulation may aid in relieving symptoms, but applying more pressure and addressing the joint capsule should be the next step since the capsule is likely a major source of pain. Kneading of the quadriceps and hamstrings would essentially accomplish the same thing the therapist has already been doing, so this would not be a progression. Stretching of the quadriceps may help to reduce pain levels but again, this is directed at the muscle instead of the joint capsule, and the muscle has already been addressed.*

---

**356.**

A client expresses her desire to remain modest and that she does not feel comfortable disrobing for a massage intervention. What is the **most** appropriate solution?

**Instruct the client to wear loose-fitting shorts and a shirt for the session.**

Provide the client with a written handout describing the benefits of massage as applied directly to the skin.

Provide a demonstration of draping on a colleague.

Refuse treatment.

---

*Correct answer: Instruct the client to wear loose-fitting shorts and a shirt for the session.*

*The client's comfort is an extremely high priority during the massage. The client must give informed consent to every aspect of massage, both prior to and during each session. If the client prefers not to disrobe, it is the therapist's responsibility to offer appropriate accommodations. By instructing this client to wear loose-fitting clothing, the therapist respects the client's boundaries and further develops client-therapist trust.*

*It is unethical to attempt to convince the client to disrobe, either by giving them a handout or by providing a demonstration of draping. Refusing treatment is unnecessary, as there are many techniques that will be effective when performed through clothing.*

---

**357.**

What is the purpose of palliative massage?

**Reduce suffering and provide comfort**

Provide therapeutic change

Increase muscle strength

Promote circulation

---

*Correct answer: Reduce suffering and provide comfort*

*The purpose of palliative massage is to reduce suffering and provide comfort. It is often performed on patients with end-stage disease and intense chronic pain. This is an especially common treatment for cancer patients.*

*The goals for therapeutic massage, not palliative massage, include healing and therapeutic change.*

*Exercise, not massage, increases muscle strength.*

---

**358.**

Condition management is a very common treatment goal for a massage therapist. Which is an example of a condition that would require condition management by a massage therapist?

**Fibromyalgia**

Open wound

Ankle fracture

Influenza

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*Correct answer: Fibromyalgia*

*Condition management is a treatment goal for chronic conditions. The symptoms of chronic conditions should be managed, without the expectation that they will disappear entirely. Instead, the therapist should work to stabilize and slow the progress of the condition. Fibromyalgia, diabetes, depression, migraines, and chronic pain are all examples of conditions that would benefit from condition management. The other options are acute conditions.*

---

**359.**

A therapist is performing the initial postural assessment of a new client, who reports severe mid-back and lumbar pain. The therapist observes the client from the front and sides and notices no asymmetry of bony landmarks. What should the therapist do **next**?

**Observe the client from the back.**

Refer the client to their physician for further assessment.

Palpate the client's left and right ASIS to check for dysfunction.

Begin the massage, but stop if the client's pain increases even slightly.

---

*Correct answer: Observe the client from the back.*

*During a postural assessment, the therapist should observe the client from the front, both sides, and back. In this example, it is possible that the client has scoliosis, which is a lateral curve of the spine. The therapist may or may not be able to see signs of this pathology without observing the spine from the back.*

*It is inappropriate to refer the client to their physician before completing the assessment. While palpating the ASIS can give the therapist more information, this is not the best **next** step. The therapist should not begin the massage before performing a thorough physical assessment.*

---

**360.**

A massage therapist is working with a client who has been diagnosed with chronic renal failure. While stretching the hamstrings, the therapist notices an indentation in the calf from the therapist's hand that lasts for about 10 seconds. What would be the **most** appropriate technique to use to assist with this?

**Lymphatic drainage**

Circulatory massage

Myofascial release

Trigger point release

*Correct answer: Lymphatic drainage*

*This client likely has lymphedema as a result of chronic renal failure. It is important to note that clients with a diagnosis of chronic renal failure should only be treated under close supervision of a physician. In order to improve lymphatic flow and reduce this type of edema, lymphatic massage would be the most appropriate. Lymphatic massage is typically performed with strokes moving toward drainage points. Pressure should only be applied just below the skin since this is where the interstitial fluid lies.*

*Circulatory massage is indicated to improve blood flow, most often in the extremities. While myofascial release and trigger point release may be appropriate in other areas of the body, these techniques will not assist in lymphatic drainage.*

---

**361.**

A client with a visual impairment books an appointment for massage. They ask to be guided through the treatment room to the table. Which of the following behaviors is appropriate response?

**Stand in front of them and slightly to the left; allow them to touch your elbow and walk through the room as usual.**

Stand directly in front of them and have them put one hand on your back, so they can follow you directly.

Stand behind them with your hands on their shoulders to guide them forward.

Stand directly beside them and grasp their elbow to guide them through the room.

---

*Correct answer: Stand in front of them and slightly to the left; allow them to touch your elbow and walk through the room as usual.*

*When a person with a visual impairment asks to be guided through a room, the socially acceptable response is for the guide to stand in front of them and slightly to the left, so they can touch the elbow of their guide. This allows them to maintain agency while still receiving the information they need.*

*It is inappropriate for the therapist to stand directly in front of the client, as this impairs the client's movement through the room. It is disrespectful for the therapist to directly guide the client's body, no matter where they stand, because this denies the client's agency.*

---

**362.**

What does assessment of the dorsalis pedis pulse provide assessment information for?

**Cardiovascular system**

Nervous system

Respiratory system

Lymphatic system

---

*Correct answer: Cardiovascular system*

*Assessment of the dorsalis pedis pulse provides assessment information for the cardiovascular system. The cardiovascular system is responsible for arterial circulation, which is what is assessed when palpating the dorsalis pedis pulse. The dorsalis pedis pulse gives a good indication of the integrity of the circulation to the feet. In people with peripheral vascular disease or diabetes, this pulse can be weakened or impaired.*

---

**363.**

A massage therapist performs an intake assessment with a new client. In her notes, she writes, "Goals are to increase shoulder flexion by 10 degrees and for the client to sleep through the night without pain." Are either of these quantifiable goals?

**Yes, both are quantifiable goals**

Yes, increasing shoulder flexion is a quantifiable goal

Yes, sleeping through the night is a quantifiable goal

No, neither is quantifiable

---

*Correct answer: Yes, both are quantifiable goals*

*Both the increase of shoulder flexion by 10 degrees and the client being able to sleep through the night without pain are quantifiable goals. It is ideal for goals to be mathematically measurable (like shoulder flexion), but not every client's needs are so straightforward. A massage therapist should include as much measurable data as possible, while also taking each client's unique needs into account.*

---

**364.**

After an initial assessment with a client, a massage therapist develops a treatment plan (section P of their SOAP notes). It includes the following: "Pt. will reduce pain levels so he can return to running. Normalize tone in the quadriceps and improve knee mobility. Estimate client return to running in 5 visits with the use of tapotement, dynamic stretching, and kneading."

What is missing from this plan of care?

**Frequency and duration of visits**

Goals

Objective progress measurements

Visits needed to achieve goals

---

*Correct answer: Frequency and duration of visits*

*This plan of care does not mention how frequently the client will see the therapist, or how long each session will be. A proper plan of care outlines goals, frequency/duration, number of appointments needed to reach goals, methods to be used, and objective progress measurements (only included after the client has been seen more than once).*

*This plan of care includes goals and the number of visits needed to achieve goals. While it does not include objective progress measurements, as mentioned above, this is not necessary at the initial visit and this client has just begun treatment.*

---

**365.**

When assessing the pain level of a pediatric client, what scale would be **most** appropriate to use?

**Wong-Baker Faces Pain Scale**

Descriptive pain intensity scale

Numeric pain intensity scale

With a pediatric client, use of the pain scale is unnecessary. Perform only a physical assessment.

---

*Correct answer: Wong-Baker Faces Pain Scale*

*When assessing pediatric clients, it can often be difficult to ascertain what level of pain they are experiencing because their language has not developed to adult levels. The Wong-Baker Faces Pain scale was developed to solve this exact issue. It depicts faces in various levels of distress, ranging from a big smile to a tearful frown. The client can point to which face best describes their pain. Children often have an easier time using this scale than choosing a number from 0 to 10.*

*The descriptive intensity scale includes words such as "mild" and "severe." The numeric intensity scale ranges from 0 to 10, with 0 representing no pain and 10 representing the worst pain the client can imagine. These are both useful tools in asking adults to describe their experiences. Young children may not have an intuitive understanding of the descriptors and numbers in these scales, and so the use of the Wong-Baker Faces scale can prove more useful.*

*No matter the client's age, it is important to ask them to describe their pain, in addition to performing a physical assessment. This not only gives the therapist more information about their condition, but also builds trust between client and therapist.*

---

**366.**

Two days after an ankle sprain, a client began seeing a massage therapist and has continued with this treatment every week for four weeks. The client thought he was making progress when he first started treatment and no longer has any swelling in the ankle, but feels he has plateaued in the past two weeks. The sessions have focused on pain reduction, passive movement, and general massage.

What is the **most** likely reason the client is not progressing?

**The therapist is still using techniques for acute injury and has not progressed to treating subacute symptoms.**

The therapist has not addressed lymphatic drainage.

The therapist is still using techniques for subacute injury and has not progressed to treating chronic symptoms.

The therapist has not addressed scar tissue strength.

---

*Correct answer: The therapist has not progressed treatment from the acute stage of healing.*

*When this client first began treatment, the therapist should have focused on pain management and passive range of motion to progress through the acute phase of healing. However, once the client demonstrated improvement, and more time had passed since the original injury, the treatment plan should have changed to address the subacute phase of healing. This phase would include controlled mobilization of the soft tissue surrounding the ankle and active and passive range of motion. The treatment must change along with the client.*

*While lymphatic drainage techniques may have been appropriate in the acute phase, now that there is no further swelling in the ankle, this is not likely a cause of the plateau. Scar tissue strength should only be addressed in the chronic phase of healing (three to 12 months) since the tissues in the subacute phase would not be strong enough to tolerate this. The therapist would not need to progress into the chronic phase of healing yet since it has not been three months since the initial injury. The problem occurred because the therapist had not progressed from the acute phase to the subacute phase.*

---

**367.**

Earlier this year, a client broke her wrist and was placed in a cast. Her arm and hand were immobilized for 10 weeks. She now has decreased range of motion at the wrist. What is the **most** likely cause?

**Hypomobility due to contracture**

Hypomobility due to nerve damage

Hypermobility due to increased muscle tension

Hypermobility due to pain

---

*Correct answer: Hypomobility due to contracture*

*With prolonged immobilization, connective tissues undergo changes. Most commonly, these tissues shorten to the position in which the joint was held immobile, which results in joint contracture.*

*Hypomobility means restricted mobility. Hypermobility means excessive mobility.*

---

**368.**

What does the "P" in SOAP notes represent?

**Plan**

Procedure

Promotion

Progress

*Correct answer: Plan**SOAP stands for Subjective, Objective, Assessment, Plan.*

- The **subjective** (S) section is to record any information that the client informs the massage therapist of (i.e., "the client had an accident six days ago and now has pain in his left lower hip").
  - The **objective** (O) section is for the massage therapist to record any observed objective information and objective findings (i.e., "pain is present at 10 degrees of leg extension").
  - The **assessment** (A) section is to record the massage therapist's assessment of the patient's condition, as well as the patient's ongoing progress (i.e., "the client presents with splinting of the left gluteus medius and quadratus lumborum (QL). After a 1-hour session, the client's ROM increased to 15 degrees before the onset of pain").
  - The **plan** (P) section is to record the massage therapist's strategy for relieving the problem and suggestions for future sessions (i.e., "released 50% of splinting in gluteus medius with work on insertion points. Applied stretching techniques to quadratus lumborum (QL).").
-

**369.**

Which is the **most** accurate definition of clinical reasoning?

**The process of collecting and analyzing data and developing appropriate treatment plans based on desired outcomes.**

The process of explaining the validity of a particular method of treatment.

Targeted objectives that should be achieved as a result of massage application.

Placing a client in the position that best enhances the benefits of massage.

---

*Correct answer: The process of collecting and analyzing data and developing appropriate treatment plans based on desired outcomes.*

*Clinical reasoning is critical to the success of massage therapy, helping to create individualized client care. It is the process of collecting and analyzing data and developing appropriate treatment plans based on desired outcomes relative to the data.*

*Justification is the process of explaining the validity of a particular method of treatment. Outcome goals are the targeted objectives that should be achieved as a result of massage application. Positioning is placing the client in a position that best enhances the benefits of a massage.*

---

**370.**

A massage therapist is assessing the soft tissue of a client's calf. After she presses one finger into the tissue, the indentation of her finger lasts for more than a minute. What does this indicate?

**3+ pitting edema**

1+ pitting edema

2+ pitting edema

Normal swelling after a soft tissue injury

---

*Correct answer: 3+ pitting edema*

*Pitting edema can result from an excess amount of interstitial fluid, poor lymphatic drainage, kidney malfunction, heart failure, and/or liver failure. This type of edema is assessed by pressing the thumb into the tissue for 15 to 20 seconds. Then the tissue is observed to see how long the indentation remains after the thumb is removed. In this case, it lasts for more than a minute, which indicates 3+ pitting edema.*

*1+ pitting edema is seen with a slight indentation from the thumb, but goes away almost immediately once the thumb is removed. 2+ pitting edema results in a deeper indentation than 1+ edema and disappears after 10 to 15 seconds. Pitting edema is not a normal response after a soft tissue injury and is likely a result of organ failure or malfunction.*

---

**371.**

Which of the following is **not** part of a normal gait sequence?

**The ipsilateral arm moves forward during the leg swing**

Following the heel strike, the weight rolls to the outside of the arch

The foot easily clears the floor during the leg swing

Achieving heel strike at initiation of stance phase

---

*Correct answer: The ipsilateral arm moves forward during the leg swing*

*During a normal gait sequence, the **contralateral** (opposite) arm swings forward during the leg swing. If the client swings both the right (or left) arm and leg simultaneously, this may indicate musculoskeletal dysfunction of some kind.*

*In a normal gait sequence, the foot will easily clear the floor during the leg swing. After this, the heel strike initiates the stance phase as the weight rolls to the outside of the arch.*

---

**372.**

During the massage intervention, the therapist notices a change in temperature over the skin of the lower legs in comparison to the rest of the body. Which type of assessment is being performed?

**Palpation**

Observation

Postural

Gait

---

*Correct answer: Palpation*

*Palpation is an assessment technique that uses touch to collect data. It differentiates between tissue textures within the same tissue types. Palpation is a way to compare tissues to each other and check for the presence of localized heat and cold.*

*Observation is the visual assessment of a client. Postural assessment notes the way the client holds their body when at rest. Gait assessment notes the client's pattern of movement while walking.*

---

**373.**

A therapist arrives at the clinic at 9 a.m. and begins preparing for a session scheduled at 10 a.m. She is especially interested in reviewing the client's past symptoms, and his own description of his pain. Where in her notes should this information be recorded?

**Subjective**

Objective

Assessment

Plan

*Correct answer: Subjective*

*The subjective section contains information about what the client told the healthcare provider, i.e., "My shoulder hurts here and it feels like an ache." Current and previous complaints and the nature of pain will be in the subjective section of the note.*

*The objective portion includes tests and measures (palpation, range of motion, posture assessment, etc.). The assessment is the amalgamation of the information from the subjective and objective portions into an opinion of what the nature of the client's problem is and their response to interventions. The plan is the proposal for future interventions to address or eliminate the client's problem.*

---

**374.**

A massage therapist has been working with a client who plays tennis who has chronic tightness in the cervicothoracic region and low back pain. Which of the following is an appropriate short-term goal?

**Reduce pain levels by the end of the session**

Eliminate all pain in one month

Reduce symptoms, so the client can eventually return to playing tennis

Eliminate tightness of the upper traps, so the client can sit for long periods without symptoms

---

*Correct answer: Reduce pain levels by the end of the session*

*Short-term goals should be focused on session to session, and even within the session. Therefore, an appropriate short-term goal is to reduce the pain level during the current session. Short-term goals help to break down the recovery process so long-term goals can be achieved in smaller, manageable pieces.*

*Eliminating all pain in one month is a long-term goal. Reducing symptoms, so the client can sit and/or return to playing tennis, are both long-term goals because they focus on the bigger picture and a return to function. Again, the short-term goals break down the bigger goals into smaller pieces.*

---

**375.**

It is important for a massage therapist to review a client's medications. Vasodilators, beta-blockers, and anticoagulants are examples of:

**Cardiovascular medications**

Gastrointestinal medications

Hormone medications

Respiratory medications

---

*Correct answer: cardiovascular medications*

*Vasodilators, beta-blockers, and anticoagulants are all forms of cardiovascular medications. Vasodilators cause blood vessels to dilate (widen). Beta-blockers block nerve stimulation of the heart and blood vessels. Anticoagulants prevent blood clotting.*

*Gastrointestinal medications include GERD drugs and anti-ulcer drugs.*

*Hormone medications include antidiabetic drugs and thyroid drugs.*

*Respiratory medications include expectorants, decongestants, and antihistamines.*

---

**376.**

If you notice that a client's alignment is faulty, with deviations in the frontal plane, what are you visually assessing?

**The client's posture**

The client's walking pattern

The client's basic balance

The client's restrictive range of motion

---

*Correct answer: The client's posture*

*If you notice that a client's alignment is faulty, with deviations in the frontal plane, you are visually assessing the client's posture.*

*If you notice that the client's gait is smooth and balanced, you are visually assessing the client's walking pattern. If you notice that the client is unable to reach beyond his base of support, you are assessing his balance. If you notice that the client has a difficult time raising his arm and shoulder, you are visually assessing the client's restrictive range of motion.*

---

**377.**

When assessing a client for fluid imbalance, what is the **first** step the massage therapist should take?

**Ask the client if the tissue feels stiff, fat, or distended**

Ask the client for their history regarding injury or swelling to the area

Observe the tissue for changes in color

Palpate for heat over the area

---

*Correct answer: Ask the client if the tissue feels stiff, fat, or distended*

*When assessing for fluid imbalance, the therapist should ask about the client's subjective experience before performing a physical assessment. The first step is to ask how the tissue feels. The answer to this question can direct the therapist to a specific area of the body. If the answer is no, then the therapist can palpate to ensure that no swelling is present.*

*Observation and palpation should only occur after talking with the client about how the tissue feels and their history.*

---

**378.**

Of the following options, which is **not** true of an intake procedure?

**It is performed at the beginning of every session.**

It occurs once, before beginning the first session with a new client.

It includes a thorough health history of the client.

It is a component of record keeping.

---

*Correct answer: It is performed at the beginning of every session.*

*An intake procedure occurs once, before beginning the first session with a new client. It is **not** performed at the beginning of every session. Instead, each session should begin with a brief reassessment of the client's condition.*

*Intake procedures are an important component of record keeping. They should include a thorough health history of the client.*

---

**379.**

What can palpating bony landmarks give the massage therapist valuable information about?

**Skeletal symmetry and muscle attachments**

Trigger points

Whether the client suffers from arthritis

The client's gait

---

*Correct answer: Skeletal symmetry and muscle attachments*

*Palpating bony landmarks can give the massage therapist valuable information about skeletal symmetry and muscle attachments. Palpation can reveal the shape and structure of the client's skeleton. Because bony landmarks almost always serve as the attachment points for several muscles, the therapist will be able to feel the bony landmark and the tendons simultaneously.*

*Palpating the muscles will give the therapist information about trigger points.*

*Performing a verbal intake assessment will inform the therapist of any preexisting conditions, including arthritis.*

*A gait assessment will give the therapist information about the client's gait.*

---

**380.**

For which of the following conditions is massage therapy **best** indicated?

**Lymphedema**

Kidney disease

Congestive heart failure

Liver failure

---

*Correct answer: Lymphedema*

*Massage therapy is indicated for lymphedema, so long as the practitioner has appropriate training in this type of massage and condition. Depending on the severity of the condition, medical supervision may be needed.*

*For individuals with kidney disease, congestive heart failure, liver failure, and systemic infection, extreme caution and medical supervision are required. In most cases, massage is contraindicated for these clients.*

---

**381.**

During which phase of tissue healing is it **most** appropriate to focus on development of strong scar tissue, restoring firing patterns, and reducing compensatory patterns?

**Chronic**

Acute

Early subacute

Late subacute

---

*Correct answer: Chronic*

*The chronic phase of tissue healing focuses on the remodeling of tissue and occurs 3 to 12 months after an injury. The healing tissue is no longer fragile, and collagen is laid down along lines of stress. Therefore, developing scar tissue along appropriate lines of stress to improve mobility will be beneficial in this phase as well as improving firing patterns and reducing compensatory ones.*

*The acute phase should focus on managing pain and improving sleep, while the subacute phases should focus on managing edema, pain, scar mobility, and compensation patterns. It is not until the chronic phase that the focus shifts to developing strength in scar tissue.*

---

**382.**

The massage therapist is performing muscle energy techniques on a client with normal muscle strength. What amount of strength (exerted by the client) is required during the contraction for the muscle energy method to work?

**No greater than 25% of muscle strength**

No greater than 50% muscle strength

Full muscle strength

No greater than 75% muscle strength

---

*Correct answer: No greater than 25% muscle strength*

*The amount of strength required during the contraction for the muscle energy method to work is generally no greater than 25% (for individuals with normal strength). There is an exception is when the therapist's goal is to strengthen weakened muscles; this usually requires a stronger contraction by the client.*

---

**383.**

When a therapist assesses a client's dynamic balance, what are they checking?

**If the client is stable when moving outside their base of support**

If the client has difficulty moving their joints through a full range of motion

If the client walks in a smooth and continuous pattern

If the client is stable without moving outside their base of support

---

*Correct answer: If the client is stable when moving outside their base of support*

*When a therapist assesses a client's dynamic balance, they are checking to see if the client is stable when moving outside their base of support. Dynamic balance is a client's ability to maintain equilibrium when all the applied forces that act on a moving body occur simultaneously. For example, dynamic balance would include activities such as stepping forward while reaching outside the base of support.*

*When assessing a client's static balance, the therapist would assess the stability without any movement outside the base of support. For example, static balance occurs when a client stands still with their feet together.*

*To assess restrictive range of motion, look to see whether the client has difficulty moving their joints through a full healthy ROM.*

*When assessing a client's gait, the therapist observes whether the client walks in a smooth and continuous pattern.*

---

**384.**

A therapist is working with a client who is currently undergoing radiation and chemotherapy for breast cancer in an inpatient palliative care setting. Of the following, which massage techniques are appropriate?

**Slow, rhythmic strokes and light pressure**

Rhythmic strokes, compression to reduce tone, and stretching to end range

Slow strokes with an emphasis on connective tissue pliability

Muscle stimulation and heavy tapotement

---

*Correct answer: Slow, rhythmic strokes and light pressure*

*When working with a patient in palliative care, massage should focus primarily on comfort. Palliative care is a setting that focuses on patient comfort and can occur as the patient is still undergoing treatment for their primary condition. The client should be in a comfortable position and massage should promote pain relief and relaxation.*

*While compression may be appropriate (if it is light), stretching to end range is not. The goal is to comfort the patient rather than to improve the range of motion. While improved connective tissue pliability may be an unintended outcome, it should also not be the goal, since many of the techniques that accomplish this are painful. Muscle relaxation, not stimulation, is a goal of palliative massage. Tapotement stimulates the muscles, which is inappropriate in this situation.*

---

**385.**

A client with severe osteoarthritis books a session with a massage therapist. The client requests hydrotherapy to alleviate the symptoms of this condition. The client is generally in poor health, and the therapist carefully reviews their health history to see if they have any additional conditions which might make hydrotherapy inadvisable. Of the following options, which one is **not** a contraindication to hydrotherapy?

**Hyperthyroidism**

Kidney failure

Nephritis

Open pressure ulcer

*Correct answer: Hyperthyroidism*

*Being aware of the contraindications for hydrotherapy is essential. Clients with hyperthyroidism would have no adverse effects on their condition as a result of the use of water with treatment. Hyperthyroidism is an overactive thyroid condition. These clients are acceptable candidates for hydrotherapy.*

*Clients with any kind of kidney disease (kidney failure, nephritis) should not undergo hydrotherapy. Nephritis is an inflammation of the kidneys; "neph-" means kidney and "-itis" means inflammation. An open pressure ulcer is an open wound, and clients with this skin condition should never be exposed to water in the affected area.*

---

**386.**

During the intake assessment, a massage therapist tests the client's ROM. The client complains of pain when he reaches 90 degrees of forward shoulder flexion.

In which section of the SOAP notes should this information be recorded?

O

S

A

P

Correct answer: O

*This example describes objective, measurable data recorded by the therapist during an intake.*

*SOAP stands for Subjective, Objective, Assessment, Plan:*

- The **subjective** (S) section is to record any information that the client informs the massage therapist of (i.e., "The client had an accident six days ago and now has pain in his left lower hip").
  - The **objective** (O) section is for the massage therapist to record any observed objective information and objective findings (i.e., "Pain is present at 10 degrees of leg extension").
  - The **assessment** (A) section is to record the massage therapist's assessment of the patient's condition, as well as the patient's ongoing progress (i.e., "The client presents with splinting of the left gluteus medius and quadratus lumborum (QL). After a 1-hour session, the client's ROM increased to 15 degrees before the onset of pain").
  - The **plan** (P) section is to record the massage therapist's strategy for relieving the problem and suggestions for future sessions (i.e., "Released 50% of splinting in gluteus medius with work on insertion points. Applied stretching techniques to quadratus lumborum (QL).").
-

**387.**

A therapist is working with a baseball player. The client has previously stated that his goal is to stay mobile in his shoulder so that he can keep pitching. The therapist has been stretching the shoulder into 195 degrees of flexion. However, the client feels he has not been progressing.

What should the therapist consider next?

**Immediately stop stretching into flexion since he is already hypermobile**

Continue to stretch into flexion but consider stretching into other directions as well

Immediately stop stretching into flexion, but add in contract-relax techniques to improve shoulder flexion

Continue to stretch into flexion but also add in contract-relax techniques into shoulder flexion

---

*Correct answer: Immediately stop stretching into flexion since he is already hypermobile*

*The normal available range of motion at the shoulder is 180 degrees. While a baseball player's shoulder might be more mobile, it is not appropriate to continue to stretch this already hypermobile joint, even if the client requests it. This is dangerous and could lead to an even more hypermobile joint which puts it at risk of subluxation or dislocation. A better path would be to assess muscle activity and employ techniques to improve muscle activity based on exam findings, or to treat hypertonic/tight muscles around the shoulder.*

*The shoulder should absolutely not continue to be further stretched. A contract-relax technique designed to improve shoulder flexion would also not be appropriate because it is further mobilizing an already hypermobile joint. If other directions of shoulder movement (medial/lateral rotation, abduction, or extension) are found to be restricted, then it would be appropriate to stretch into those directions, but not flexion.*

---

**388.**

A massage therapist wrote the following as part of a client note: "Client rptd minimal reduction in p! post sess. Will cont with tx as previously outlined." How could this be improved?

**Reduce the number of abbreviations used**

Remove the plan section

Add a goal section

Remove the section on client response to treatment

---

*Correct answer: Reduce the number of abbreviations used*

*Notes should be completed only with universally accepted abbreviations. It is best for the therapist to use as few abbreviations as possible, in order to avoid misunderstandings. These two sentences contain several abbreviations, several of which are not universally accepted.*

*The plan section is important since it outlines the future plan, and the goal section is also necessary; however, since this was not the entire note, adding a goal section is not the most appropriate answer. Client response to treatment is very important in a note and can guide future treatment.*

---

**389.**

Which of the following is **not** an assessment you would conduct visually?

**Palpation**

Breathing

Gait

Posture

---

*Correct answer: Palpation*

*The therapist should assess certain attributes (such as temperature, texture, pulses, tension, pain levels, and the presence of adhesion) through palpation, or touch.*

*Palpation is using skillful touch to assess a region of the client's body. You would use your visual senses to assess a client's gait, posture, body structure, range of motion, eyes, breathing, pathological conditions, emotional condition, and physical condition.*

---

**390.**

Which of the following patient situations would benefit **most** from palliative care from a massage therapist?

**48-year-old woman with terminal pancreatic cancer**

25-year-old pregnant woman in the second trimester

50-year-old basketball player with knee pain

35-year-old woman with fibromyalgia

---

*Correct answer: 48-year-old woman with terminal pancreatic cancer*

*Palliative intervention is most appropriate for comfort measures to reduce pain and suffering and is often utilized at end of life stages. The 48-year-old woman with terminal cancer would be a perfect candidate for this kind of care.*

*The other examples listed would all be candidates for therapeutic massage. Palliative care is used as a way to ease suffering at the end of life, not to treat non-terminal conditions.*

---

**391.**

If you notice that a client is unable to fully bend his right knee in order to lower himself into a chair, what are you visually assessing?

**The client's restricted range of motion**

The client's gait

The client's posture

The client's balance

---

*Correct answer: The client's restricted range of motion*

*If you notice that a client has a difficult time bending his knees in order to lower himself into a chair, you are visually assessing the client's restricted range of motion.*

*If you notice that a client does not have a smooth and continuous walking pattern, you are visually assessing the client's gait. If you notice that the client's body is not symmetrical, you are visually assessing the client's posture. If you notice that the patient displays poor balance and reaches for support, you would be analyzing his balance.*

---

**392.**

During the first session with a client with low back pain, the client states he cannot tolerate laying on his stomach any more after 10 minutes in this position. What action should the massage therapist take **next**?

**Place a pillow under the client's hips and under the feet and wait for symptom response before having him change positions.**

Have the client transition to supine with a bolster under the knees.

Have the client transition to side-lying with a pillow between the knees and one under the arm and wait for symptom response.

Refer the client to a physician for further evaluation.

---

*Correct answer: Place a pillow under the client's hips and under the feet and wait for symptom response before having him change positions.*

*Lying prone on a treatment table can cause excessive lumbar extension and an anterior pelvic tilt. This can cause lumbar pain if not addressed, especially in a client with low back pain. Therefore, the first step should be to place a pillow under the hips to reduce lumbar extension and under the feet to reduce lumbar tension. If and when this accommodation is insufficient, the massage therapist should have the client change positions.*

*While the other positions may be good alternatives, the therapist will be able to perform far more effective work to the lumbar spine while the client lies prone. Therefore, the therapist should attempt to maintain the relative position as long as possible, while providing accommodations (pillows and/or bolsters) to make it tolerable. Laying supine would be a difficult position in which to work on the tissues of the lumbar spine. This client is still appropriate for massage; however, if the pain is rated 10/10, comes on suddenly, and never changes, he should be referred out.*

---

**393.**

A newly graduated massage therapist decides to specialize in spa massage. She enrolls in a wellness training course in order to prepare for this career track. Of the following, which subject is **least** likely to be covered in this course?

Religion

Diet

Behavior patterns

Lifestyle

---

*Correct answer: Religion*

*Wellness training is all-encompassing to include most aspects of life to develop of balance between body, mind, and spirit. An extensive understanding of religion is not necessarily required, although an understanding of how the spirit can affect wellness is important.*

*Understanding diet, exercise, lifestyle, and behavior patterns are crucial for wellness training since all of these factors contribute to the health of a person.*

---

**394.**

A runner comes to the clinic with reports of knee pain that has been present for several days; she denies any specific injury or accident. After further assessment, the massage therapist notes the suprapatellar region is swollen and warm to the touch, and deeper palpation reveals dense tissue. Pressure is applied to the painful area for 10 seconds (enough to cause discomfort), after which the discomfort diminished.

What would be the **most** appropriate action to take?

**Apply massage to the area with caution, recommend the client also see a doctor or physical therapist for further assessment.**

Avoid application of massage to the area, continue with regular treatment to the rest of the body.

Continue with massage to the area using compression and kneading.

Immediately refer the client to a physician for further evaluation.

---

*Correct answer: Apply massage to the area with caution, recommend the client also see a doctor or physical therapist for further assessment.*

*This client is exhibiting some signs of acute soft tissue inflammation (swelling, heat, denser tissue); however, the signs are not a red flag. Since the tissue became less painful after compression to the area, the client may not have acute soft tissue irritation. Since not all signs of acute irritation are present, it would be acceptable to continue with the massage with caution. Since the symptoms have been present for several days, and some signs of inflammation are present, it is best also to have the client visit another medical professional. It is important to remember most clients will not present with black and white symptoms, and the steps forward will not always be clear. When in doubt, trust your instinct.*

*It would not be appropriate to continue without caution secondary to the present symptoms; however, it is not necessary to completely stop the massage. Aggressive techniques such as compression and kneading are likewise contraindicated. Since the tissue is not extremely tender to the touch, there was no accident, and the pain improved with prolonged compression, it is acceptable to continue with caution rather than avoid the area.*

---

**395.**

A client has been seeing a massage therapist for the past several years, mostly for general massage to help with relaxation. Over the past several weeks, the client has stated she feels "tired all the time" but attributes this to a busy schedule at work. The therapist notices a rash on her arm and back, but the client states this is from a flu shot she recently received. The next week, the client cancels her appointment because she "caught a stomach bug."

What is the **best** step for the massage therapist to take?

**Call the client and advise her to call her physician for further assessment.**

Call the client and have her come in for help to reduce her symptoms.

Call the client and have her go to the ER or urgent care for further assessment.

Treat the client as normal once she returns for a session.

---

*Correct answer: Call the client and advise her to call her physician for further assessment.*

*While none of these signs/symptoms are red flags on their own, when put together, they present a more worrisome picture. Fatigue, an unexplained rash (on her back), and sudden onset of nausea/vomiting are reasons a client should be referred to another health care professional. Even though some can be explained, the fact that they are all occurring at the same time is more problematic. It is better to have the client assessed and nothing found than to continue to treat and later discover health problems.*

*These symptoms do not necessarily constitute a reason for an ER visit since they have had a gradual onset. If, however, the client had a fever along with sudden new pain, then the ER might be appropriate. It would not be the best idea to proceed with the next session as usual since there may be another pathologic process that requires evaluation.*

---

**396.**

Massage is indicated during the subacute phase of healing, which occurs:

**14–21 days after injury**

Immediately after the injury

3–7 days after injury

More than 21 days after injury

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*Correct answer: 14–21 days after injury*

*Massage is indicated during the subacute phase of healing, which occurs 14–21 days after injury.*

*Massage is indicated during the acute phase of healing, but not immediately after injury; the therapist should wait three days before beginning treatment.*

*It is also indicated during the chronic phase of healing, which normally begins 14–21 days after injury.*

*Any pain experienced after 21 days is considered chronic pain, and can often still be treated with massage.*

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**397.**

Cancer patients use massage as:

**Complementary care**

Primary care

Direct therapeutic care

Invasive treatment

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*Correct answer: Complementary care*

*Cancer patients use massage as complementary care in order to enhance the healing process. Palliative care is used for pain relief and relaxation for clients with terminal diseases; these clients often (but not always) have diagnoses of cancer.*

*Direct therapeutic care is used for direct muscle relaxation or stimulation. Invasive treatment does not include massage application, as massage is a non-invasive therapy. Primary care would involve care from the medical team of physicians and oncologists.*

---

**398.**

While assessing a client's gait pattern, you notice that he drags his right toe during the swing phase. What may be a contributing factor?

**Weakness in the ankle dorsiflexor muscles**

Weakness in the ankle plantar flexor muscles

Pain in the hip

Poor balance

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*Correct answer: Weakness in the ankle dorsiflexor muscles*

*Dragging of the toe (often called foot drop) occurs when there is weakness or lost innervation to the ankle dorsiflexor muscles. Typically, the anterior tibialis is negatively affected in some way, causing inability to fully clear the foot during swing. This often occurs after a stroke or other paralysis.*

*Weakness in the ankle plantar flexor muscles is more likely to impact the placement of the foot back onto the ground than the swing phase of gait. Pain in the hip is likely to result in unequal weight distribution. Poor balance may change the character of the client's gait, but would not likely cause the client to drag the toes.*

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**399.**

A massage therapist is performing skin rolling over a client's quadriceps. As the therapist gets close to the knee, he is unable to lift the tissue to continue the technique. What should the therapist do **next**?

**Change to a gliding and compression technique**

Continue with attempted skin rolling until the tissue lifts

Skip this area and move to other areas in which the tissue will lift

Change to a friction technique

---

*Correct answer: Change to a gliding and compression technique*

*Skin rolling is a technique for assessment as well as treatment. As a form of treatment, it used to soften restricted areas. It is necessary to be able to lift the skin and superficial tissues up for this technique; otherwise, it is not effective. The inability of the tissue to lift can be caused by edema, scarring, thickened connective tissue, or a heavy fat layer. Skin rolling over these areas can be painful, and the technique should be changed to a gliding and compressive one to soften the tissue in a gentler way.*

*Skin rolling as a treatment in this area will not be very effective, and the tissue will not soften with continued application of this technique. Skipping this area is not advisable because if the tissue will not lift, there is likely tissue dysfunction that needs to be addressed. A friction technique will create a local inflammatory response and may soften the tissues slightly; however, a gliding and compressive technique is a superior choice.*

---

**400.**

One week ago, a client was diagnosed with a quadriceps strain after running a marathon. Which technique should the massage therapist use to **most** effectively aid in the healing process?

**Gliding techniques**

Circulatory massage

Friction massage

Contract-relax techniques

---

*Correct answer: Gliding techniques*

*A strain is a tear in a muscle and can occur to varying degrees based on the grade of strain (grade 3 being a complete tear). Therefore, techniques to bring the two ends of the tear closer together will help to heal the tissue faster. Gliding techniques can achieve this, and the technique should be applied with pressure moving towards the epicenter (most painful area), not away.*

*While circulatory massage can help with tissue healing, approximating (bringing the ends together) tissue would be more effective in a strain since the injury occurred as a result of the separation of two parts of the muscle. Friction massage may reduce pain perception, but will not aid in healing in this instance. Contract-relax techniques would not be appropriate this soon after a strain since this would tense (lengthen) the muscle and hinder healing.*

---

**401.**

When working with a 14-month-old child, the massage therapist notices the child's respiration rate increases from 21 breaths per minute to 35 breaths per minute. Her facial expression also changes to a frown with a clenched jaw. The child's mother is also present, and she says not to worry or change anything because the child does this frequently.

What are the **best** next steps for the massage therapist?

**Reduce the current pressure; move to a different area of the body.**

Completely stop the massage; attempt again in one week.

Continue with the same technique to the same area.

Completely stop the massage; refer the client to a physician.

---

*Correct answer: Reduce the current pressure; move to a different area of the body.*

*When working with infants and children, it is incredibly important to avoid pain caused by massage and to know the signs of pain (since often the child cannot verbally express pain). Signs of pain are an increased respiration rate or pulse, flinching, or change in facial expression. The therapist should always be observing the client's body language for these signs. If they do occur, it is most appropriate to reduce the pressure and move to a different area to eliminate the pain, regardless of what the parent says. Always trust your own clinical reasoning skills.*

*It is not appropriate to continue the massage in the same way, despite what the mother says, since the child is showing signs of pain. It is not necessary at this point to completely stop the massage; however, if pressure is reduced and a new body area addressed, and these signs continue to show for a prolonged period, then the massage should be stopped.*

---

**402.**

When attempting to assess the subscapularis via palpation, what would be **most** helpful to the therapist?

**Gently resisting as the client moves the arm into medial rotation**

Gently resisting as the client moves the arm into lateral rotation

Gently resisting as the client moves the elbow into flexion

Gently resisting as the client moves the arm into abduction

---

*Correct answer: Gently resisting as the client moves the arm into medial rotation*

*To easily palpate a muscle, it is often helpful to gently contract the muscle, as this will cause the muscle to "pop up." The subscapularis is a medial rotator of the shoulder, so to contract the muscle, the client should move the arm into medial rotation, with the therapist gently resisting.*

*Moving the arm into lateral rotation will contract the infraspinatus and teres major, moving into abduction will contract the supraspinatus and likely the deltoid, and flexing the elbow will contract the biceps. None of these directions would be helpful when attempting to palpate the subscapularis.*

---

**403.**

A client with osteoarthritis of the knee has hypertonic quadriceps. The massage therapist has also noticed the client can only move the knee to 100 degrees of flexion with reports of an intense stretch felt in the quadriceps during this movement. What treatment would be the **most** effective for this client?

**Contract-relax techniques for the quadriceps, shaking of the quadriceps**

Contract-relax techniques for the hamstrings, shaking of the quadriceps

Contract-relax techniques for the quadriceps, shaking of the hamstrings

Contract-relax techniques for the quadriceps, percussion to the quadriceps

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*Correct answer: Contract-relax techniques for the quadriceps, shaking of the quadriceps*

*Appropriate techniques to address the joint degeneration that occurs in osteoarthritis include lengthening short/tight muscles, reducing tone in hypertonic muscles, and addressing adhesions surrounding the joint. 100 degrees of knee flexion is considered a hypomobile joint, and shortened quadriceps can contribute to this. Therefore, contract-relax directed at the quadriceps will help to improve muscle length, while shaking will help to reduce tone.*

*Since shortened or hypertonic hamstrings were not mentioned with this client, activating them would not be the most appropriate intervention. In addition, percussive techniques help to stimulate muscles rather than to reduce tone.*

---

**404.**

When palpating the levator scapulae, which direction should the therapist strum the fingers to better locate the muscle?

**Medially and slightly inferior followed by laterally and slightly superior**

Superior to inferior

Dorsal to ventral

Anteriorly and slightly medial followed by posteriorly and slightly lateral

*Correct answer: Medially and slightly inferior followed by laterally and slightly superior*

*In order to most effectively palpate a muscle, it should be strummed in a direction perpendicular to the muscle belly. The levator scapula connects to the superior tip of the scapula and travels medially and superiorly to the transverse processes of the upper cervical vertebrae. Therefore, to palpate perpendicularly to the muscle fibers, the fingers should move medially and slightly inferior followed by laterally and slightly superior, or vice versa.*

*Palpating superior to inferior may allow the fingers to locate the levator scapula, but not effectively secondary to its orientation. It is inefficient to palpate this muscle dorsal to ventral/anterior to posterior since the muscle fibers do not move in this direction. To do this, the therapist would have to palpate deep enough to locate the anterior portion of the muscle, which would be difficult to do.*

---

405.

Which of the following is not an example of objective data that would be recorded in the objective section of a SOAP note?

Review home exercise program during next session

Shoulder active range of motion to 120 degrees flexion

Girth measurement over R ankle

Visible swelling and redness of L knee joint

*Correct answer: Review home exercise program during next session*

*Objective, measurable data should be placed in the "O" section of a SOAP note. Range of motion, girth measurements and the observation of inflammation are all objective pieces of information.*

*Planning to review home exercise during the next session would fall under the "P" section, for Plan.*

*SOAP stands for Subjective, Objective, Assessment, Plan.*

- The **subjective** (S) section is to record any information that the client informs the massage therapist of (i.e., "the client had an accident six days ago and now has pain in his left lower hip").
  - The **objective** (O) section is for the massage therapist to record any observed objective information and objective findings (i.e., "pain is present at 10 degrees of leg extension").
  - The **assessment** (A) section is to record the massage therapist's assessment of the patient's condition, as well as the patient's ongoing progress (i.e., "the client presents with splinting of the left gluteus medius and quadratus lumborum (QL). After a 1-hour session, the client's ROM increased to 15 degrees before the onset of pain").
  - The **plan** (P) section is to record the massage therapist's strategy for relieving the problem and suggestions for future sessions (i.e., "released 50% of splinting in gluteus medius with work on insertion points. Applied stretching techniques to quadratus lumborum (QL).").
-

**406.**

Which of the following is **not** true of a wellness program?

**It strictly follows a set of pre-defined, universal steps.**

Nutrition is an important component of wellness.

It should be uniquely tailored to every client's needs.

It is usually designed to reduce physical and emotional stress.

---

*Correct answer: It strictly follows a set of pre-defined, universal steps.*

*A wellness program need not strictly adhere to a pre-defined set of steps. Even if a client follows a program exactly planned, there is no universal solution that works for everyone. Instead, a wellness program should be tailored to each client's unique needs and goals.*

*Nutrition is indeed an important component of a wellness program. These programs are almost always designed to reduce physical and emotional stress to the client.*

---

**407.**

A client has been seeing a massage therapist for one month and has little change in her symptoms. The massage therapist decides to change the treatment plan to better address the client's problem.

In what part of the treatment note would this be found?

**Revision**

Evaluation

Intervention

Plan

*Correct answer: Revision*

*The example describes a change in the treatment plan based on new data collected after at least one session.*

*SOAPIER stands for Subjective, Objective, Assessment, Plan, Intervention, Evaluation, Revision.*

- The **subjective** (S) section is to record any information that the client informs the massage therapist of (i.e., "the client had an accident six days ago and now has pain in his left lower hip").
- The **objective** (O) section is for the massage therapist to record any observed objective information and objective findings (i.e., "pain is present at 10 degrees of leg extension").
- The **assessment** (A) section is to record the massage therapist's assessment of the patient's condition, as well as the patient's ongoing progress (i.e., "the client presents with splinting of the left gluteus medius and quadratus lumborum (QL). After a 1-hour session, the client's ROM increased to 15 degrees before the onset of pain").
- The **plan** (P) section is to record the massage therapist's strategy for relieving the problem and suggestions for future sessions (i.e., "released 50% of splinting in gluteus medius with work on insertion points. Applied stretching techniques to quadratus lumborum (QL).").
- The **intervention** (I) section describes which measures are being taken to achieve a particular outcome. Make sure to document the client's understanding and acceptance of the initial plan in this part of the notes.
- The **evaluation** (E) section provides an analysis of the effectiveness of the interventions described in the intervention (I) section.

- The **revision (R)** section documents any changes from the original treatment plan. This section may change over time, as the therapist and client adjust their expectations and goals.
-

**408.**

A client comes to the clinic for the first time. She is a 45-year-old single mother who is also working on her bachelor's degree at night. She has systemic lupus erythematosus. She tells you she just feels so overwhelmed all the time and wants a way to relax and de-stress. She denies any specific pain. What type of massage would be **most** appropriate for her?

**General constitutional application**

Mechanical lymphatic drainage

Circulation massage application

Trigger point release

---

*Correct answer: General constitutional application*

*This client is coming to the massage therapist with a systemic illness and no specific injuries. The most beneficial type of massage will aid in stress management, help her sleep, and help her body to cope and heal to the best of its ability with systemic lupus erythematosus. This type of massage is based on reflexes within the body.*

*Trigger point release may be helpful if trigger points are found, but given the information provided, general constitutional application would be most appropriate. Mechanical lymphatic drainage can help to control edema and aid in the flow of lymph fluid in the body. Since there is no mention of swelling, edema, or lymphedema, this is not an appropriate technique for this client. Circulation massage is not the most effective technique in this scenario because there is no mention of specific circulatory issues.*

---

**409.**

Which of the following is the **most** correct way to write a goal?

**Client will reduce pain levels with walking to 2/10 in 4 weeks.**

Pain levels reduced moderately in 4 weeks.

Client will reduce pain levels while walking in 4 weeks.

Client will improve pain levels to 2/10.

---

*Correct answer: Client will reduce pain levels while walking to 2/10 in 4 weeks.*

*Goals must be quantifiable, meaning there must be a way for both the therapist and client to know when they have been achieved. Therefore, a time component is important as well as a quantifiable measure (pain level). This goal contains both elements.*

*"Moderately" reducing pain levels or just "reducing" pain levels is not measurable, so there is no way to know if this goal has been achieved. Additionally, "improving" pain levels is not an accurate use of clinical terminology.*

---

**410.**

When assessing a client's posture, what landmarks should be used to assess neck and head position?

**Tip of the nose, middle of the chin, sternal notch**

Occiput, spinous process of C2, tips of scapulae

Eyes, mouth, chin

Eyes, nose, sternal notch

*Correct answer: Tip of the nose, middle of the chin, sternal notch*

*When assessing posture, it is important to note whether the client's positioning is symmetrical. The therapist can observe various bony landmarks to determine this. In a client with postural symmetry of the head and neck, the tip of their nose will be directly above the middle of the chin, and the middle of the chin will be in line with the sternal notch. Deviations from this may suggest anterior head posture, cervical hyperlordosis, muscle imbalances in the cervicothoracic region, or a number of other concerns.*

*While the occiput is useful in determining alignment when compared to the rest of the spine, it is not often helpful to observe it in relation to the tips of the scapulae. The eyes and mouth are not as useful in assessing posture because they are often naturally asymmetrical.*

---

411.

A massage therapist is working with a client who had a knee replacement 10 months ago. The client is still limited in knee flexion and feels his quads are "tight." What is the **best** treatment approach for this client?

**Cross-friction mobilization of the scar, progressive stretching into knee flexion, kneading of the quadriceps**

Mobilization of the scar toward the knee, active range of motion in mid-ranges

Lymphatic drainage, passive range of motion in mid-ranges

This client is not appropriate for treatment secondary to his post-operative status

---

*Correct answer: Cross-friction mobilization of the scar, progressive stretching into knee flexion, kneading of the quadriceps*

*This client's condition is chronic because his surgery was 10 months ago. In this phase, treatment should focus on normalization of scar mobility and strength, reducing adhesions, and restoring tissue pliability. Shortened quadriceps are likely a large contributing factor in reduced knee flexion. Therefore, cross-friction mobilization of the scar will improve scar mobility and strength. Progressive stretching will help to improve soft tissue mobility and pliability, and kneading will help to reduce muscle tension to improve the mobility of the quadriceps.*

*This client is appropriate for treatment since he had surgery 10 months ago. Mobilization of the scar toward the knee and active range of motion in mid-ranges is not aggressive enough for this phase of tissue healing and would be more appropriate in the subacute phase. Lymphatic drainage and passive range of motion in mid-ranges are most appropriate in the acute phase and therefore are not aggressive enough for this client.*

---

412.

What is the **best** way to correct a mistake in a hand-written note?

**Cross it out with ink, date and initial next to the correction**

Use white-out and write over it so no blank spaces are present

Notes should always be written in pencil, so they can be erased and rewritten

Scribble it out with ink so it is no longer legible, date and initial next to the correction

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*Correct answer: Cross it out with ink, date and initial next to the correction*

*Mistakes are inevitable, especially in written documentation. When this does occur, it is important that the original information still be legible. A simple line through the mistake is sufficient. To ensure no other corrections to medical records are being made by unauthorized personnel, it is also important to initial and date the correction.*

*Medical records should always be kept in ink, and white-out should never be used. The mistake should also not be scribbled out entirely. It is important to keep a permanent record of all notes, including corrected mistakes, in case these mistakes were erroneously used to guide a treatment plan. These guidelines ensure the best possible care for the client, and may also protect the therapist from a lawsuit.*

---

**413.**

When attempting to palpate a muscle, how should the therapist move their fingers?

**Perpendicular to the muscle fiber**

Longitudinally along the muscle fiber

Inferior to the muscle fiber

Superior to the muscle fiber

---

*Correct answer: Perpendicular to the muscle fiber*

*To most effectively palpate, the muscle should be strummed perpendicular to its fiber direction. This is the easiest and most effective way for the therapist to locate the muscle.*

*While moving longitudinally along the muscle fiber is advantageous during treatment, it is not the most effective way to locate a muscle.*

*Palpating inferior or superior to the muscle fiber does not always make sense depending on the fiber direction, and this would typically not place the palpating finger on the targeted muscle.*

---

**414.**

A football player sustained a sprain of his MCL and joint capsule several days ago. He has stiffness, swelling, and pain in his knee. What would be the **most** effective treatment?

**Passive range of motion without pain, gentle compression/decompression**

Active range of motion with mild pain, stretching

Passive range of motion with mild pain, manual pressure to the joint capsule

Passive range of motion without pain, friction massage

---

*Correct answer: Passive range of motion without pain, gentle compression/decompression*

*This injury can be classified as acute since it occurred only days ago and is still inflamed (swollen and painful). The most effective techniques for an acutely injured joint capsule are gentle, pain-free techniques. These include rhythmic compression/decompression and pain-free passive range of motion to stimulate synovial fluid release within the joint and reduce pain levels.*

*The range of motion done with this client must be pain-free since it is still in the acute phase of injury. Stretching would not be appropriate since the injury occurred so recently. Friction massage is not appropriate in this phase and would be most effective to use with a hypermobile joint to ultimately stimulate collagen formation.*

---

**415.**

A massage therapist has been working with a client for the past six weeks. The client has recently started a new job and the therapist notices the client has become more irritable during sessions, needs to urinate frequently during the massage, and has stated he has not felt like eating very much lately. He denies any specific reason for any of this and has seen his doctor several times and has not been diagnosed with any condition.

What might be a cause of this client's signs and symptoms?

**Excessive stress response resulting in sympathetic activation**

Reduced stress response resulting in sympathetic activation

Normal stress response resulting in parasympathetic activation

Excessive stress response resulting in parasympathetic activation

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*Correct answer: Excessive stress response resulting in sympathetic activation*

*A stress response is the body's reaction to a stressor which may be physiological or psychological. A stress response typically activates the body's sympathetic nervous system, activating "fight or flight" responses. Agitation, irritability, increased urination, and reduced appetite are all common stress responses (among many others).*

*Because these symptoms are occurring in response to a new job, this client is clearly experiencing increased stress. Stressful situations activate the sympathetic nervous system and inhibit the parasympathetic nervous system. The parasympathetic nervous system governs the "rest and digest" response; activation results in reduced stress levels.*

---

**416.**

After an initial assessment is completed with a client, the massage therapist asks if the client is agreeable to beginning general massage, to which he says, "Yes." Treatment is then begun immediately on the lower back, with trigger point release and kneading. Several days after the session, the client calls the clinic upset because his back pain is worse and he never agreed to trigger point release.

How could this situation have been avoided?

**By having the client sign an informed consent form and speaking with the client about possible side effects prior to the massage**

By reducing the rigor of the techniques initially and avoiding treating the lumbar region

By not performing trigger point release

This client should not have been treated at all

---

*Correct answer: By having the client sign an informed consent form and speaking with the client about possible side effects prior to the massage*

*It is extremely important to obtain informed consent in various ways prior to starting a session. The client should sign a form before the massage begins, and the therapist should obtain verbal consent both before and during the treatment itself. The treatment plan should also have been discussed in as much detail as necessary to ensure that the client knows what to expect.*

*While reducing the rigor of techniques initially might be a good idea, obtaining informed consent is even more important in this instance since the client was upset that he was never given the option to turn down trigger point release. The client still should have been treated as long as informed consent was obtained.*

---

**417.**

To assess the popliteus via palpation through reciprocal inhibition, what is the **best** method?

**Have the client dorsiflex the ankle actively**

Have the client plantarflex the ankle actively

Passively dorsiflex the ankle

Passively plantarflex the ankle

---

*Correct answer: Have the client dorsiflex the ankle actively*

*In this particular instance, the massage therapist must palpate the popliteus through the gastrocnemius, which crosses the knee joint. To achieve reciprocal inhibition of the gastrocnemius, the therapist should have the client actively contract its antagonist (anterior tibialis), resulting in active ankle dorsiflexion. This allows the gastrocnemius to relax so the popliteus can be more easily palpated.*

*Active plantar flexion will cause the gastrocnemius to contract, which will make it more difficult to palpate the popliteus. Passively dorsiflexing the ankle will stretch the gastrocnemius, making it more difficult to palpate the popliteus and failing to achieve reciprocal inhibition. Passive plantar flexion of the ankle may put the gastrocnemius into a slack position, but will still not achieve reciprocal inhibition.*

---

**418.**

A client presents to the clinic stating he has a new pain in both legs that he describes as a heaviness. Upon assessment, the massage therapist notes both calves are swollen, warm to the touch, and reddened. What is the therapist's **most** appropriate next step?

**Refer the client to his doctor for immediate assessment. Resume treatment if approved by the physician.**

Perform lymphatic drainage to reduce swelling and pain levels.

Perform techniques to improve venous return to reduce congestion.

Refuse treatment; this client is not a candidate for massage.

---

*Correct answer: Refer the client to his doctor for immediate assessment. Resume treatment if approved by the physician.*

*A new pain combined with swelling, redness, and heat over the area are all indications of possible infection or a deep vein thrombosis. Caution should always be used if a client presents this way after a long plane ride, as this is a further indication of deep vein thrombosis. To ensure the client receives the appropriate medical attention, it is best to refer him to a doctor for immediate assessment.*

*Performing any technique to the area is not advised since there is likely some type of infectious process occurring. Further, if a deep vein thrombosis is present, treatment runs the risk of dislodging it, which could be life-threatening. If cleared by a doctor, the therapist may provide massage under medical supervision. It is inappropriate to simply refuse treatment without referring the client to a doctor. In this case, he may ignore his symptoms, and future complications could occur (sepsis, pulmonary embolism, etc.).*

---

**419.**

There are a number of ways to classify various types of blood pressure. What is diastolic pressure?

**Pressure of blood against the walls of arteries when the ventricles relax**

Pressure of blood against the walls of arteries when the ventricles contract

Pressure of blood within the ventricle

Pressure of blood within the atrium

---

*Correct answer: Pressure of blood against the walls of arteries when the ventricles relax*

*Blood pressure is the amount of pressure exerted by the blood on the blood vessel walls. It is important for massage therapists to know how to read and understand blood pressure.*

- *Diastolic pressure is the pressure of blood against the walls of arteries when the ventricles relax.*
- *Systolic pressure is the pressure of blood against the walls of arteries when the ventricles contract.*

*A helpful hint to remember the difference between systolic pressure and diastolic pressure is: "S is for squeeze (contraction) and D is for downtime (relaxation)."*

---

**420.**

During a posture assessment, it is noted that a client postures in slight external rotation of the hips. What is the next step to take to address this in treatment?

**None, this is normal posture**

Release the external rotators

Release the quadratus lumborum (QL) bilaterally

Release the gemellus and obturator groups

---

*Correct answer: None, this is normal posture*

*When assessing posture, it is important to know what is considered normal as well as which landmarks to look for. Most people will stand with slight external rotation of the hips. If they stand with a significant external rotation, then this could be addressed as needed.*

*If the client was standing with excessive external rotation (> 20 degrees or so), then releasing the external rotators (which also includes the gemellus and obturator groups) would be appropriate since tightness there could create this posture. The quadratus lumborum (QL) would not create this posture but rather elevation of one side of the pelvis.*

---

**421.**

After five massage sessions with a focus on stretching, a client still presents with decreased range motion when they perform knee flexion. What technique might the therapist perform **next** to enhance the effects of stretching?

**Use contract-relax techniques for the quadriceps followed by stretching of the quadriceps**

Continue to stretch the quadriceps, then use contract-relax techniques for the quadriceps

Continue with the same plan and techniques since five sessions are not enough to notice a change

Use only contract-relax techniques for the quadriceps

---

*Correct answer: Use contract-relax techniques for the quadriceps followed by stretching of the quadriceps*

*If a client has not improved after five sessions, it is time for the therapist to use a new strategy. Stretching is most effective when used after contract-relax techniques of the restricted tissue. If the knee is limited in flexion, contract-relax of the quadriceps, followed by stretching this same muscle group, would be the most effective strategy.*

*To enhance the effects of stretching, contract-relax techniques should be used before stretching, not after. This technique is also most effective when used in combination with stretching. Five sessions is enough time to see a noticeable change, so a change in techniques or focus is necessary.*

---

**422.**

When defining the goals of massage, a therapist should include quantifiable goals. By definition, quantifiable goals:

**Are measured in terms of objective criteria**

Are recommended by the supervising physician

Show clinical reasoning

Are informed by the client's present condition

---

*Correct answer: Are measured in terms of objective criteria*

*When defining the goals of massage, a therapist should include quantifiable goals. By definition, quantifiable goals are measured in terms of objective criteria. For example, the goal might be to increase the ROM of the client's shoulder by 10 degrees.*

*It is often appropriate to set quantifiable goals even if the therapist is not working under a physician's supervision. These goals should show clinical reasoning and be informed by the client's condition. However, neither of these is the definition of a quantifiable goal.*

---

**423.**

When applied appropriately, what effect will deep transverse friction have?

**Break up soft tissue adhesions and scars**

Reduce circulation

Create uncontrolled inflammation

Promote healing in acute injury

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*Correct answer: Break up soft tissue adhesions and scars*

*When applied appropriately, deep transverse friction will break up soft tissue adhesions and scars. This technique consists of small, deep movements performed in a local area. It creates shear force to tissue and prevents and breaks up local adhesions in connective tissue, especially over scars.*

*Deep transverse friction creates controlled therapeutic inflammation. It should not be used over an acute injury. It increases circulation to the area.*

---

**424.**

An active 87-year-old golfer comes to the clinic for general tension reduction and relaxation. When working with this client, what should the massage therapist do?

**Use lighter pressure**

Use more pressure

Perform friction techniques

Avoid range of motion techniques

---

*Correct answer: Use lighter pressure*

*As the body ages, many changes take place. The most relevant, in this case, are that the skin becomes thinner and connective tissue becomes less pliable. In order to avoid any injury to the skin and for the client to get the most benefit from massage, the therapist should use light pressure.*

*Older adults can benefit from range of motion techniques. However, caution should be used with these techniques in arthritic or painful joints. Overall, range of motion is not contraindicated.*

*Friction techniques and deeper pressure are not advisable due to the thinner skin and decreased tissue pliability of older adults.*

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**425.**

What is the universal treatment for a strain or a sprain?

**RICE**

SOAP

MET

AIIS

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*Correct answer: RICE*

*The universal treatment for a strain or a sprain is RICE. A strain or a sprain is a muscle or tendon that has been torn or stretched and should be treated with rest (R), ice (I), compression (C), and elevation (E).*

*SOAP stands for **S**ubjective, **O**bjective, **A**ssessment, **P**lan, and refers to the way a massage therapist should take notes on a client's treatment. MET stands for **m**uscle energy technique, and refers to a style of muscle activation during massage. The AIIS is the anterior inferior iliac spine, and is a bony landmark found in the pelvic area.*

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**426.**

The massage therapist assigns his client various stretches, which he would like to review in the next massage session. In which section of the SOAP notes should this information be recorded?

**P****S****O****A**

*Correct answer: P*

*SOAP stands for Subjective, Objective, Assessment, Plan.*

- The **subjective** (S) section is to record any information that the client informs the massage therapist of (i.e., "the client had an accident six days ago and now has pain in his left lower hip").
  - The **objective** (O) section is for the massage therapist to record any observed objective information and objective findings (i.e., "pain is present at 10 degrees of leg extension").
  - The **assessment** (A) section is to record the massage therapist's assessment of the patient's condition, as well as the patient's ongoing progress (i.e., "the client presents with splinting of the left gluteus medius and quadratus lumborum (QL). After a 1-hour session, the client's ROM increased to 15 degrees before the onset of pain").
  - The **plan** (P) section is to record the massage therapist's strategy for relieving the problem and suggestions for future sessions (i.e., "released 50% of splinting in gluteus medius with work on insertion points. Applied stretching techniques to quadratus lumborum (QL).").
-

**427.**

During a session, a massage therapist explains that he is about to do tapotement. He explains what this technique is and what to expect, as well as any risks associated with it. The client nods her head and says, "Sure, go ahead."

What is this interaction an example of?

**Informed consent**

History taking

Subjective reporting

Objective measures

---

*Correct answer: informed consent*

*During a session, a massage therapist explains that he is about to do tapotement. He explains what this technique is and what to expect, as well as any risks associated with it. The client nods her head and says, "Sure, go ahead." This interaction is an example of informed consent.*

*Informed consent is the process in which the therapist explains the options for client care, and the client both understands and agrees to a certain technique. It is absolutely necessary to obtain informed consent prior to performing any kind of massage. It is also advisable to continue to obtain various forms of informed consent throughout the session. In this case, explaining the technique and associated risks/benefits, then receiving a verbal confirmation from the client, constitutes an informed consent process.*

*Subjective reporting occurs when the client tells the massage therapist his or her reasons for coming to the clinic, health history, symptoms, previous treatment, etc.*

*History taking occurs when the therapist asks the client about the client's health history and symptom history.*

*Objective measures are quantifiable measures such as strength testing and range of motion. While informed consent must be obtained before a session, the above processes are not considered informed consent.*

---

**428.**

When performing an assessment of a new client, the massage therapist takes the client's vital signs and assesses range of motion. In what portion of a note should this information be documented?

**Objective**

Subjective

Assessment

Plan

*Correct answer: Objective*

*The SOAP note is a common form of medical documentation. This example describes objective, measurable data collected by the therapist during the intake.*

*SOAP stands for Subjective, Objective, Assessment, Plan.*

- The **subjective** (S) section is to record any information that the client informs the massage therapist of (i.e., "the client had an accident six days ago and now has pain in his left lower hip").
  - The **objective** (O) section is for the massage therapist to record any observed objective information and objective findings (i.e., "pain is present at 10 degrees of leg extension").
  - The **assessment** (A) section is to record the massage therapist's assessment of the patient's condition, as well as the patient's ongoing progress (i.e., "the client presents with splinting of the left gluteus medius and quadratus lumborum (QL). After a 1-hour session, the client's ROM increased to 15 degrees before the onset of pain").
  - The **plan** (P) section is to record the massage therapist's strategy for relieving the problem and suggestions for future sessions (i.e., "released 50% of splinting in gluteus medius with work on insertion points. Applied stretching techniques to quadratus lumborum (QL).").
-

**429.**

When working with a client with adhesive capsulitis (frozen shoulder), which techniques are **most** beneficial?

**Pressure to the joint capsule, stretching, massage strokes in every direction**

Active movement, skin rolling, massage strokes distal to proximal

Passive movement, decompression of the joint, massage strokes proximal to distal

Pressure to the joint capsule, active movement, massage strokes distal to proximal

---

*Correct answer: Pressure to the joint capsule, stretching, massage strokes in every direction*

*Adhesive capsulitis occurs when the glenohumeral joint capsule becomes irritated and, as the name implies, can adhere to itself and other tissues. Therefore, when working with a fibrotic joint, active movement, passive movement, and stretching are useful in reducing adhesions. Pressure should also be applied directly to the capsule, and massage strokes should be performed in all directions to aid in the reorganization of collagen.*

*Active movement, passive movement, and pressure to the joint capsule can all help improve mobility; the direction of massage strokes should not necessarily be only proximal to distal or vice versa. Since a fibrotic joint capsule will have collagen that is disorganized, strokes applied in many different directions can help to lay down new collagen in a more functional way.*

---

**430.**

A massage therapist is using the ASIS as a landmark to palpate a muscle. Of the following options, which is the muscle is he **most** likely assessing?

**Sartorius**

Rectus femoris

Psoas

Vastus intermedius

---

*Correct answer: Sartorius*

*The sartorius originates at the ASIS (anterior superior iliac spine) and inserts on the medial aspect of the tibia. It can be very helpful to begin palpation at attachment sites, especially those like the ASIS, since it is quite an obvious landmark.*

*None of the remaining options (rectus femoris, psoas, vastus intermedius) connect to the ASIS.*

---

**431.**

When palpating the vastus lateralis, the massage therapist notices the muscle is very distinct and has a ribbed feeling. Given only this information, what would be the **most** appropriate intervention for this muscle?

**No treatment is necessary, as this is how healthy skeletal muscle will feel**

Tapotement

Trigger point release

Myofascial release

---

*Correct answer: No treatment is necessary, as this is how healthy skeletal muscle will feel*

*Normal, healthy skeletal muscle will be easily discernable and have a ribbed feeling. It should not be stringy or crunchy. It is important to palpate through all layers of muscle to see whether adhesions are present. If a muscle is found to be normal upon palpation, no treatment techniques are immediately necessary.*

*Because the skeletal muscle has not been found to be dysfunctional on palpation, at this point, no treatment is necessary. Dysfunction may be found later if the muscle has been inhibited or shortened, but palpation does not give this information. Therefore, none of these techniques would be appropriate.*

---

**432.**

Which of the following should be **avoided** when working with an 11-month-old child?

**Light touch**

Use of lubricant

Light compressive techniques

Kneading

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*Correct answer: Light touch*

*When working with the pediatric population, it is important to avoid light touch because the nervous system is still developing and this could cause a tickle response, thus negating the intention of the massage. This is especially true of the infant population as light touch stimulation in specific areas can cause various developmental reflexes.*

*The techniques used should be rhythmic, gentle, and use slow gliding/gentle kneading. Light compressive techniques can be applied but should be used with caution. Scent-free lubricant should also be used to reduce friction on the skin.*

---

**433.**

What does PRICE stand for, and during what phase of an injury is it an appropriate treatment?

**Protection, Rest, Ice, Compression, Elevation; acute**

Protection, Rest, Ice, Compression, Elevation; chronic

Protection, Relaxation, Ice, Compression, Elevation; acute

Pain, Redness, Immobility, Contusion, Edema; subacute

---

*Correct answer: Protection, Rest, Ice, Compression, Elevation; acute*

*PRICE stands for Protection, Rest, Ice, Compression, Elevation and is an appropriate treatment during the acute phase of an injury.*

*This acronym refers to a treatment protocol, not a list of symptoms.*

*It is best used during the acute phase of healing, and is not effective during the subacute or chronic phases.*

---

**434.**

When working with a client with migraines, what should be the overall goal of treatment?

**Manage the symptoms, increase daily function as able**

Completely stop the recurrence of migraines

Address the underlying myofascial restrictions to stop all future migraines

No change can be made with treatment for clients with this condition.

---

*Correct answer: Manage the symptoms, increase daily function as able*

*Unfortunately, there is no known cure for migraines. Once someone starts experiencing them, migraines can be a lifelong condition. In these cases, the goal of treatment should be to "contain and cope." Since there is no solution, symptoms should be managed to reduce pain levels and improve coping for the client, so they can do as many daily activities as possible. Other conditions in this category are diabetes, depression, arthritis, fibromyalgia, chronic pain syndrome, and irritable bowel syndrome.*

*While some myofascial restrictions may contribute to headaches or migraines, the goal should not be to completely stop the migraines because this is not a realistic outcome. The goal should be to develop coping strategies and control symptoms as best you can. While there is no cure, massage can still be beneficial and help with symptoms, so treatment should still proceed.*

---

**435.**

Which of the following includes a therapist taking the client's history and completing a physical assessment?

**Intake assessment**

Care plan

Pain questionnaire

Functional assessment

---

*Correct answer: Intake assessment*

*As part of the intake assessment, a therapist takes the client's history and completes a physical assessment. Massage therapists should complete a thorough assessment when beginning work with each new client in order to best determine an appropriate massage treatment plan. This information must always be confidential. In addition, the assessment should direct the massage therapist into critical thinking that would create a beneficial treatment plan with meaningful outcomes.*

*A care plan describes the intended course of treatment.*

*A pain questionnaire and functional assessment are both components of the intake assessment.*

---

**436.**

Of the following, which is the **least** common response to stress?

Increased productivity

Fatigue

Tension and extreme alertness

Insomnia

---

*Correct answer: Increased productivity*

*Increased productivity is not a common response to ongoing stress. Typically, stress interferes with concentration and decreases a person's productivity. Of course, every individual is different, and so this is not **universally** true.*

*Common stress responses include irritability, dry mouth, impulsive behavior, emotional instability, weakness, fatigue, tension, nervous tics, intermittent anxiety, grinding teeth, insomnia, sweating, frequent urination, indigestion, pain in the neck and low back, and neurotic behavior.*

---

**437.**

Upon assessing fluid dynamics within tissue, the massage therapist notes the tissue is very stiff and dense, but it is not hot to the touch, and there is no indentation left once the palpating hand is removed.

What is likely occurring in the tissue?

**Congestion**

Edema

Inflammation

Varicose Veins

*Correct answer: Congestion*

*Congestion occurs when blood pools in capillaries and veins of the affected tissue. This tissue will feel dense and stiff, but will not present as pitting edema. Once the palpating hand is removed, no indentation will be present because the higher fluid volumes are present in the capillaries and veins rather than in the interstitial fluid. Venous return techniques are indicated for congested tissue.*

*With edema, the swollen tissue will pit with pressure even after the palpating hand is removed. This indicates that there is increased interstitial fluid in the area. Infected tissue, while it may be swollen or show signs of congestion, will also be red, hot, and painful; this is an indication for referral.*

*Inflammation is defined by the presence of heat, redness, swelling, and pain. If the tissue is both swollen and inflamed, the therapist should refer the client out. Massage is contraindicated until the client consults with a doctor, determines the cause, and approves massage as a course of treatment.*

*Varicose veins present as visible and sometimes raised veins, normally at the back of the lower leg. Deep pressure is contraindicated in the location of the vein.*

---

**438.**

If a client is lying on his side, where should you place a pillow in order to take pressure off of his pelvic and hip joints?

**Between his legs**

Under his ankles

Under his abdomen

Under his neck

---

*Correct answer: Between his legs*

*If a client is lying on his side, you should place a pillow between his legs in order to take pressure off of his pelvic and hip joints. A pillow might also be placed under his head and arms for comfort. The client should always be draped, only exposing the region of the body upon which the massage therapist is directly working.*

---

**439.**

Which of the following is **not** a factor that influences posture?

**Blood type**

Heredity

Disease

Habit

---

*Correct answer: Blood type*

*There are three factors that influence posture: heredity, disease, and habit. Habit is the easiest to correct with client education. Habitual patterns can include occupational, recreational, and sleep-related habits.*

---

**440.**

After a client sprains her wrist, she comes to a massage therapist to reduce pain levels. The therapist notices her hands are slightly cold and asks the client why. The client states that when it is cold outside, sometimes her hands change colors and go numb, but this has been happening for "years and years." She requests ice for her wrist to help with pain and the massage therapist declines to provide it. Why?

**The client may have Raynaud's disease.**

A sprained wrist would not benefit from ice.

This was not in the plan of care.

The client may have lymphedema.

---

*Correct answer: The client may have Raynaud's disease.*

*Raynaud's disease is classified as a circulatory disorder and most typically occurs when the external temperature is low (when it is cold outside). Typically, the hands will be cold and change colors between red, blue, and white. Ice is absolutely contraindicated in this situation since ice is a vasoconstrictor and will further limit blood flow to the hands.*

*A sprained wrist would likely benefit from cold application, but that is not appropriate in this situation. This is not lymphedema since it occurred as a result of an injury and has not been swollen for a long period of time.*

---

**441.**

When passively moving a client's joint for assessment and/or treatment, what is the correct hand placement for the massage therapist?

**One hand placed close to the joint, acting as a stabilizer. The other hand placed at the distal end of the bone, performing the movement.**

One hand placed close to the joint to be moved, providing the movement. The other hand placed at the distal end of the bone, acting as the stabilizer.

Both hands placed close to the joint, creating movement at both ends.

Both hands placed away from the joint at the distal end of the bone, providing movement.

---

*Correct answer: One hand placed close to the joint, acting as a stabilizer. The other hand placed at the distal end of the bone, performing the movement.*

*Hand placement by the massage therapist is important to ensure proper assessment as well as patient safety and comfort. When performing passive range of motion, one hand should be used as a stabilizer and positioned close to the joint. The other hand should provide the movement, and be positioned at the distal end of the bone.*

---

**442.**

A massage therapist notes the following findings after an initial session: 150 degrees shoulder flexion passively on the right, increased rounding of the mid-back, pelvis tucked under the spine, pain rated at 5/10. What is the **most** appropriate way to document these findings?

**Client rated pain at 5/10. Increased thoracic kyphosis. Postures in posterior pelvic tilt. Passive range of motion of right shoulder 150 degrees.**

Pain rated 5. Rounded mid-back and tucked pelvis. 150 degrees shoulder flexion.

P! rtd 5/10. Thor kyphosis, PPT present. Shldr flex 150 deg on R.

The client first rated pain as moderate. Client has thoracic kyphosis as well as a tucked pelvis. 150 of shoulder motion was available.

---

*Correct answer: Client rated pain at 5/10. Increased thoracic kyphosis. Postures in posterior pelvic tilt. Passive range of motion of right shoulder 150 degrees.*

*When documenting a client's progress, it is important to be as clear as possible. The therapist should use precise medical terms as much as possible. It is also important to document range of motion with the side assessed, what type of motion (passive, active), and how many degrees. Pain scales should be reported as "x/10" so the reader knows what scale is being used.*

*Abbreviations should only be used if they are universally accepted and "rtd," "thor," and "PPT" are not universally accepted. The pain level should also be reported as the client describes it, rather than converting a 5/10 rating to "moderate" in the notes. Again, it is important to use medical terminology rather than "rounded back" and "tucked pelvis."*

---

**443.**

A client reports she has been having pain along the posterior/medial aspect of the scapula that radiates to the mid-arm on the same side. She also has been having pain in her thumb and first finger. What is the **most** likely cause of this?

**A trigger point in the scalenes**

A trigger point in the infraspinatus

A trigger point in the upper trapezius

A trigger point in the posterior cervical musculature

---

*Correct answer: A trigger point in the scalenes*

*The scalenes are located in the lateral aspect of the neck. A trigger point in these muscles can radiate pain along the muscle itself, and also produce pain along the mid-arm region and thumb and first finger.*

*A trigger point in the infraspinatus would refer pain to the lateral shoulder and mildly to the thumb and third finger. A trigger point in the upper trapezius refers pain to the head. A trigger point in the posterior cervical musculature refers pain to the base of the neck and medial scapula.*

---

**444.**

After three massage therapy sessions, the therapist notes that the client's forward lumbar flexion motions increase pain and tingling sensations while lumbar extension decreases symptoms. The therapist determines that the patient may have vertebral joint or intervertebral disc involvement.

In which section of the SOAP notes should this information be recorded?

A

S

O

P

Correct answer: A

*This example is that of an assessment.*

*SOAP stands for Subjective, Objective, Assessment, Plan.*

- The **subjective** (S) section is to record any information that the client informs the massage therapist of (i.e., "the client had an accident six days ago and now has pain in his left lower hip").
  - The **objective** (O) section is for the massage therapist to record any observed objective information and objective findings (i.e., "pain is present at 10 degrees of leg extension").
  - The **assessment** (A) section is to record the massage therapist's assessment of the patient's condition, as well as the patient's ongoing progress (i.e., "the client presents with splinting of the left gluteus medius and quadratus lumborum (QL). After a 1-hour session, the client's ROM increased to 15 degrees before the onset of pain").
  - The **plan** (P) section is to record the massage therapist's strategy for relieving the problem and suggestions for future sessions (i.e., "released 50% of splinting in gluteus medius with work on insertion points. Applied stretching techniques to quadratus lumborum (QL).").
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**445.**

When asked about pain levels using the numeric pain intensity scale, a client rates his current pain as 3. How else could this be classified?

**Mild to moderate pain**

Moderate to severe pain

Severe pain

No pain

---

*Correct answer: Mild to moderate pain*

*The numeric pain intensity scale is a scale from 0 to 10 that is used to rate pain levels. Zero is described as no pain at all, while 10 is described as the worst pain imaginable. The best way to ask clients to rate their pain on this scale would be, "On a scale from 0 to 10, with 0 being no pain at all, and 10 being the worst pain you could possibly imagine, where would you rate your current pain?" Pain on a scale of 0 to 3 is considered mild. Pain on a scale of 4 to 6 is considered moderate. Pain on a scale of 6 to 10 is considered severe.*

---

**446.**

A massage therapist has ten years of experience working almost exclusively with the geriatric population. A client appears on his schedule who is a semi-pro baseball player with neck and shoulder pain. What is the **most** appropriate action for the therapist?

**Refer the client to a massage therapist who specializes in sports massage**

Refer the client to a physician secondary to the presence of shoulder pain

Treat the client using techniques he normally uses with geriatric clients

Treat the client with aggressive techniques

---

*Correct answer: Refer the client to a massage therapist who specializes in sports massage*

*Athletes can be the most challenging population to treat, as their injuries often result from repetitive movements required by their specific sport. In order to effectively work with an athlete, the massage therapist should have a passing familiarity with the physical activities involved in their specific sport and knowledge of their training regimen. Since this therapist has worked almost exclusively with geriatric clients, it is best to refer the client to someone with a greater understanding of their needs.*

*This client does not need a physician referral since he does not present with symptoms of a serious or contraindicated condition. The athlete may or may not benefit from the use of aggressive techniques. He absolutely needs a massage with a different approach than that which would be appropriate for a geriatric client.*

---

**447.**

A massage therapist notices a client stands with excessive lumbar lordosis and thoracic kyphosis. Which muscles would be **most** appropriate to massage and stretch in this client?

**Hip flexors, pectorals**

Rhomboids, hamstrings

Upper trapezius, rectus abdominus

Latissimus dorsi, deep hip external rotators

---

*Correct answer: Hip flexors, pectorals*

*With this kind of posture, it is likely the client has short, tight hip flexors and pectorals. Tight hip flexors pull the pelvis into an anterior tilt, which produces lumbar lordosis. Tight pectorals pull the shoulders forward and create thoracic kyphosis. Therefore, stretching and massaging these areas will allow the pelvis and shoulders to move into a more neutral position.*

*While the rhomboids, hamstrings, upper traps, rectus abdominus, latissimus dorsi, and deep hip external rotators may feel taut and tender, they are most likely lengthened and weak as a result of this posture. These muscles would benefit from exercises to strengthen them. The hip flexors and pecs feel tight in this posture because they are actually overly stretched, and so have to work twice as hard to maintain an upright posture.*

---

**448.**

Of the following options, which is **not** assessed during palpation of the skin?

**The presence of trigger points**

Temperature

Mobility of superficial connective tissue

The presence of moles

---

*Correct answer: The presence of trigger points*

*The palpation of the skin will not provide information about the presence of trigger points. In order to assess whether trigger points are present, the therapist should palpate deeper muscle tissue.*

*It is possible to assess the client's temperature, the glide of the skin over superficial connective tissue, and the presence of moles when palpating the skin.*

---

**449.**

When assessing a client's gait pattern, the therapist notes that the client achieves approximately 10 degrees of hip extension in terminal stance. What is an appropriate treatment for this?

**Contraction then relaxation of the psoas followed by movement into hip extension and gluteus maximus contraction**

Compression of the gluteals

Contraction then relaxation of the gluteals followed by movement into hip extension and psoas contraction

Friction mobilization of the gluteals

---

*Correct answer: Contraction then relaxation of the psoas followed by movement into hip extension and gluteus maximus contraction*

*During the normal gait cycle, the hip should achieve 20 degrees of extension in terminal stance. A likely cause of reduced hip extension is a shortened psoas. Given only this information, techniques to improve hip extension and psoas length would be most appropriate. Contract-relax-antagonist-contract would be appropriate to improve hip extension. This would be performed with contraction of the target tissue (the psoas), followed by relaxation of the target tissue, then contraction of the antagonist (the gluteals) along with movement into hip extension.*

*Contract-relax-antagonist-contract would not be performed with the gluteals as the target tissue to improve hip extension. Friction mobilization and compression are techniques to improve soft tissue mobility, blood flow, and to reduce tone. These would not be employed to the gluteals when attempting to improve hip extension.*

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**450.**

A massage therapist has been working with a 67-year-old woman for the past four weeks. The therapist has performed trigger point release, compressive techniques, and contract-relax muscle energy techniques focused on of the cervicothoracic region to improve mobility. During regular conversation with the client, it was recently discovered that she was diagnosed with osteoporosis several years ago.

How could this situation have been avoided by the massage therapist?

**By taking a thorough health history**

By having the client sign an informed consent form

By avoiding all compressive and trigger point release techniques on this client

By reading the client's x-rays

---

*Correct answer: By taking a thorough health history*

*It is absolutely essential that a massage therapist take a thorough health history before providing treatment. A diagnosis of osteoporosis should not have gone unnoticed for four weeks since the therapist should have asked specifically during the first visit about common conditions that are contraindications for some massage techniques. An older woman should always be asked if she has been diagnosed with osteoporosis since it is common in this population. Compressive techniques and deep pressure should be avoided. This is also a dangerous condition to ignore since aggressive massage techniques could result in bone fractures.*

*It is not necessary to avoid compressive and trigger point release techniques simply due to a client's age. However, these techniques are contraindicated for a client with osteoporosis and could have been avoided if the massage therapist knew of this condition. An x-ray would not provide sufficient information for the massage therapist to discover evidence of osteoporosis; furthermore, it is not within a massage therapist's scope of practice. While clients should always sign informed consent forms, this would not have alerted the therapist to the client's underlying conditions.*

---

**451.**

A massage therapist is working in a nursing facility, where he performs massage on Tuesdays and Thursdays. On Monday, a client requested massage. On Tuesday, at the beginning of his shift, the massage therapist arrives in the client's room. At this time, the client states he no longer wants massage. What should the massage therapist do?

**Leave the client's room and inform the supervisor of the client's refusal.**

Insist the client undergo massage since it is part of the plan of care.

Perform massage but reduce pressure and avoid painful areas.

Leave the client's room and attempt again later that day.

---

*Correct answer: Leave the client's room and inform the supervisor of the client's refusal.*

*When in the hospital/inpatient setting, massage is elective, meaning it is based on what the client wants and is not absolutely necessary. While it can help to manage chronic pain and improve mood, not every person in this setting will want massage. Therefore, it is best to not insist on the massage, but rather, respect the client's wishes and then inform supervising personnel as there may be a specific reason for the referral that the supervisor should know about. Informed consent requires the client to understand the goals of massage and participate voluntarily. If a client changes their mind at any point prior to or even during the massage, the therapist's only ethical course of action is to stop immediately.*

*The massage therapist should not push clients in the inpatient setting to receive massage, but rather should respect their wishes, even if they had previously requested the massage. It is also important to inform the supervisor/supervising personnel that the client refused massage rather than simply leaving the room and trying again later. This is especially important if the client has developed new symptoms that make massage less appealing to them.*

---

**452.**

A massage therapist has been working with a client for two weeks. At the end of their second session, the client tells the massage therapist he does not want to continue because the treatments are not what he thought they would be and he is not improving. Upon reflecting on what has gone wrong, the massage therapist recalls that on the day of the initial session, he was very rushed because he was running behind and the client arrived late.

What did the therapist likely **not** do that led to this outcome?

**Ask the client about his goals and expectations**

Take a thorough health history

Ask the client about his pain levels

Assess range of motion

*Correct answer: Ask the client about his goals and expectations*

*The first step in the initial session with a new client should be asking about his goals and expectations. It is incredibly important to ask this question because this sets the tone for the entire treatment plan and ensures both the therapist and client are on the same page. Once this is established, then informed consent is obtained, and further history taking can occur. This first step should never be skipped, even if the therapist is rushed.*

*The therapist may have skipped taking a thorough history and, while this can affect outcomes, it is likely not the most important missed step that led to the client discontinuing treatment. Asking about pain levels and assessing range of motion are important objective measures and always assist in treatment, but did not likely lead to this outcome. The most likely reason this client chose to stop the sessions was because of his expectations.*

---

**453.**

Why is it important to trust your first impression when palpating?

**The sensory receptors in the hand adjust to stimulus quickly.**

The second time, palpating is often done with more pressure.

The hands can fatigue quickly with palpation.

The client typically cannot tolerate palpation for a longer period of time.

---

*Correct answer: The sensory receptors in the hand adjust to stimulus quickly.*

*The hand is a highly innervated area, and the brain dedicates a large sensory area to it. Therefore, the hand is a very effective palpation tool, but the sensory receptors can adjust very quickly. This is why we stop noticing gloves or clothing after a while; the sensory receptors have adjusted to them. Therefore, if you palpate once, then again, and again, the sensation will be different, and the information your hand receives becomes less and less accurate. Trust the first impression.*

*The second time an area is palpated is not always necessarily done with more pressure; pressure is changed based on the structures the therapist is trying to palpate (deeper for deeper tissue). The hands do not necessarily fatigue with palpation, and this is not a reason to rush palpation. While some areas may be sensitive for clients, palpation should be generally tolerable.*

---

**454.**

A client informs the massage therapist that he fell off of a horse six days ago, and he now has pain in his left "lower hip." In which section of the SOAP notes should the massage therapist record this information?

S

O

A

P

*Correct answer: S*

*This example is that of a subjective report, given by the client to the massage therapist.*

*SOAP stands for Subjective, Objective, Assessment, Plan.*

- The **subjective** (S) section is to record any information that the client informs the massage therapist of (i.e., "the client had an accident six days ago and now has pain in his left lower hip").
  - The **objective** (O) section is for the massage therapist to record any observed objective information and objective findings (i.e., "pain is present at 10 degrees of leg extension").
  - The **assessment** (A) section is to record the massage therapist's assessment of the patient's condition, as well as the patient's ongoing progress (i.e., "the client presents with splinting of the left gluteus medius and quadratus lumborum (QL). After a 1-hour session, the client's ROM increased to 15 degrees before the onset of pain").
  - The **plan** (P) section is to record the massage therapist's strategy for relieving the problem and suggestions for future sessions (i.e., "released 50% of splinting in gluteus medius with work on insertion points. Applied stretching techniques to quadratus lumborum (QL).").
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# Ethics, Boundaries, Laws, Regulations

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Ethics, Boundaries, Laws, Regulations

**455.**

To practice as a physician's assistant (PA), one must complete a 2-year post-graduate physician's assistant program, pass a national exam, and obtain a credential to practice. What type of credential is this?

**License**

Government certification

Voluntary verification

Master's degree

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*Correct answer: License*

*Obtaining a license follows the process outlined in the question. In many regions of the United States, licensure is required for massage therapists. This is done to protect the public from any potential harm done by licensed professionals.*

*Government certification is not quite as strict as licensure and is voluntary. It does still require specific education. Voluntary verification is even less stringent than government certification and does not necessarily require a specific education. A Master's degree is a two- or three-year degree obtained after an undergraduate degree.*

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**456.**

What occurs when the therapist personalizes the professional relationship and is unable to separate the professional relationship from personal feelings and expectations for the client?

**Countertransference**

Transference

Contraindications

Therapeutic relationship

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*Correct answer: Countertransference*

*Countertransference is when the massage therapist personalizes their professional relationship with the client. The feelings could be positive or negative, but are too personal for a therapeutic relationship.*

*Transference occurs when the client personalizes their professional relationship with the massage therapist. Contraindications are conditions that render a particular treatment undesirable or harmful. A therapeutic relationship is created by the interpersonal structure with respect for professional boundaries between professionals and their clients.*

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**457.**

A massage therapist has just begun working in a new clinic. It quickly becomes apparent that one of his colleagues is known for dating many of his clients. As he works at the clinic longer, he also learns that this coworker also often dates several current clients at once. Other coworkers state this has been a pattern for the past eight years. What is the **best** course of action for the new massage therapist?

**File a report with the state board**

File a police report

Confront the colleague about his behavior

Accuse the employee of sexual misconduct at the next staff meeting

*Correct answer: File a report with the state board*

*It is absolutely unethical for a massage therapist to engage in sexual contact with clients. The offending therapist cannot be given the benefit of the doubt, since he has demonstrated this pattern of behavior for nearly a decade. This is not an isolated incident. Therefore, it is unlikely that a conversation between the therapist and a colleague will cause him to stop. The massage therapist who notices this misconduct must take action because therapists are obligated to hold each other to high ethical standards.*

*Confronting the colleague would probably not be productive, for the reasons stated above. Publicly calling out the employee would be both inappropriate and ineffective. Filing a police report should not be the first step, especially since the therapist does not appear to be violent.*

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**458.**

Which is **not** a component of the four basic principles that constitute the code of ethics for massage professionals?

**Respect for economy**

Respect for the dignity of people

Responsible caring

Integrity in relationships

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*Correct answer: Respect for economy*

*The four basic principles that constitute the code of ethics for massage professionals include:*

- 1. **Respect for the dignity of people:** massage therapists will maintain respect for the interests, dignity, rights, and needs of all clients, staff, and colleagues.*
  - 2. **Responsible caring:** Competent, quality client care will be provided at the highest standard possible.*
  - 3. **Integrity in relationships:** At all times, the professional will behave with integrity, honesty, and diligence in practice and duties.*
  - 4. **Responsibility to society:** Massage professionals are responsible and accountable to society and shall conduct themselves in a manner that maintains high ethical standards.*
-

459.

Which of the following principles of guiding ethical behavior describes the concept that the benefit of treatment must outweigh the burden of treatment?

Proportionality

Veracity

Client autonomy

Beneficence

*Correct answer: Proportionality*

*Every massage therapist must follow eight principles that guide ethical professional behavior:*

1. **Respect:** Esteem and regard for clients, colleagues, and oneself.
  2. **Client autonomy and self-determination:** The client's freedom to decide for themselves, and their right to have sufficient information to give informed consent.
  3. **Veracity:** The right to objective truth.
  4. **Proportionality:** The principle that the benefit must outweigh the burden of treatment.
  5. **Nonmaleficence:** The principle that massage therapists will do no harm and prevent harm from happening.
  6. **Beneficence:** The principle that treatment should contribute to the client's well-being.
  7. **Confidentiality:** Respect for the privacy of information.
  8. **Justice:** Equality.
-

**460.**

A massage therapy practitioner is setting up a new wellness clinic and is working to do so in a manner that maintains HIPAA regulations for compliance. What is an example of a strategy that may lead to a breach in patient privacy?

**Set up a mobile documentation station in the client lobby**

Provide password-protected computers and tablets

Keep internet connections encrypted and firewall protected

Keep paper files in a locked cabinet

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*Correct answer: Set up a mobile documentation station in the client lobby*

*The Health Insurance Portability and Accountability Act (or HIPAA) protects the privacy and security of patient information, patients' rights, and regulation of administrative requirements.*

*A mobile documentation station in the lobby of a wellness clinic could lead to a breach in patient privacy due to the public setting of the lobby. Documentation should be done in a private area, away from the view of other clients or clinic visitors. The other options are all good practice for maintaining patient privacy.*

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**461.**

Within what range is gratuity acceptable for a massage therapist?

**10-20%**

50-60%

70-80%

30-40%

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*Correct answer: 10–20%*

*Gratuity (tip) is acceptable if it is within the range given to other service providers, which is generally 10-20%. The massage therapist must exercise caution in accepting excessive gifts or gifts in which something else is expected in return (i.e., referrals).*

*The ranges in the other answer choices are generally considered too high for service providers and should not be expected.*

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**462.**

Which of the following is not an example of a common ethical dilemma in the health care profession?

**Client has a friend with neck pain and suggests they book a session with the massage therapist**

Client offers the massage therapist tickets to an event

Client tips the massage therapist more than 100% of the cost of the massage

Client is consistently late to sessions

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*Correct answer: Client has a friend with neck pain and suggests they book a session with the massage therapist*

*It is ethical for massage therapists to accept referrals from current and former clients. As long as the therapist only provides services within their scope of practice, this is an excellent way to grow one's business.*

*Accepting gifts from the client may be an example of transference or countertransference; this becomes a dilemma when the therapist and client maintain a dual relationship.*

*If the client offers to tip more than the cost of the session, they may or may not be making an implied request for unethical services.*

*If a client is consistently late to sessions, the massage therapist must decide how to handle the situation in a way that respects that client, the clients they have booked for the rest of the day, and the value of their own work.*

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**463.**

What term describes the knowledge base and parameters of practice for a profession?

**Scope of practice**

Consent

Continuing education

Direct access

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*Correct answer: Scope of practice*

*The scope of practice is the knowledge base and practice parameters of a profession. A massage therapist must understand the scope of practice for their profession and for other professionals. A massage therapist must not fall into a situation that would be misunderstood as practicing medicine.*

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**464.**

When working with a particularly challenging client, a massage therapist finds, after the first few sessions, little progress has been made. The client's condition is one that the therapist has some experience with. What is the **best** course of action for the massage therapist?

**Speak with coworkers for assistance.**

Continue treating the client in the same way, and hope they will improve over time.

Refer the client to another massage therapist.

Refer the client to another health care provider.

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*Correct answer: Speak with coworkers for assistance*

*A good massage therapist should be comfortable asking for help when they need it. When dealing with an especially challenging client, the first step is to seek professional advice from colleagues. This can be done without sharing any identifying information about the client, and therefore respecting HIPAA regulations.*

*Continuing treatment in the same way is unlikely to have different results. It may take some time to notice a difference, but it is still best for a therapist to seek out advice from more experienced colleagues. Referring the client to another massage therapist is not appropriate yet; however, if one emerges that is especially experienced with a type of technique for a specific condition, then this may be appropriate. Referral to another provider is not needed yet. If the client continues to show no improvement with changes to treatment, then this may become necessary.*

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**465.**

The massage therapist code of ethics is based on all of the following principles, **except**:

**Responsibility to insurance**

Responsible caring

Integrity in relationships

Responsibility to society

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*Correct answer: Responsibility to insurance*

*All massage therapists must follow a code of ethics based on four principles. The responsibility to insurance is not one of these. If they accept payment through their clients' insurance providers, they may take on certain responsibilities. However, many massage therapists perform perfectly ethical work without accepting this kind of payment.*

*All therapists have a responsibility to society to maintain high ethical standards. They must also maintain integrity in relationships with all professionals and clients they come into contact with, and they must exercise responsible caring to provide quality care to all clients.*

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**466.**

After having a conversation with a client about her health history and current concerns, with whom should the massage therapist discuss this information?

**No one without the informed consent of the client**

No one

Only the referring provider

Coworkers

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*Correct answer: No one without the informed consent of the client*

*This information is considered protected health information and should not be shared with anyone without the consent of the client.*

*It is appropriate to share this information with other providers involved in this client's care, but only with the client's knowledge and consent. If coworkers are directly involved with the client's care, it may be appropriate to share information with them. For example, if a massage therapist is working under a doctor's supervision, the two professionals might communicate about the client's symptoms. This is only done in very specific circumstances.*

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**467.**

Based on the massage standards of practice, what should the therapist avoid with respect to client education?

**Exaggeration**

Excessive information

Current research

The therapist's clinical experience

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*Correct answer: Exaggeration*

*Based on massage standards of practice, a massage therapist should not make false claims or exaggerate the potential benefits of certain techniques or massage in general. The client should always be accurately informed about the benefits/risks of treatment.*

*Excessive information is an arbitrary term, and the amount of education each client requires varies significantly. Therefore, what may be too much information for one client will not be enough for another. Both current research and the therapist's clinical experience should contribute to decision-making, and the client should be educated with regard to this process.*

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**468.**

A 20-year-old woman comes to a massage therapist with reports of neck and right upper arm pain. When treating this client, which of the following is within the scope of practice for a massage therapist?

**Instructing her in self-myofascial release techniques for at-home use**

Diagnosing her with a herniated disc

Instructing her to take ibuprofen to reduce pain

Realign her shoulder using chiropractic techniques

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*Correct answer: Instructing her in self-myofascial release techniques for at-home use*

*A massage therapist's scope of practice includes any skilled technique designed to positively influence soft and connective tissue. Teaching a client how to properly perform self-care is fully within this realm.*

*It is illegal for massage therapists with no other medical credentials to diagnose conditions, prescribe or recommend medications, or adjust a client's skeletal structure. Each of these requires special training, and is in the scope of practice of other healthcare providers. By acting outside their scope of practice, massage therapists risk causing harm to themselves and their clients, legal action, and loss of licensure.*

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**469.**

Which of the following would be the **most** beneficial to implement in a clinic in order for massage therapists to improve their clinical skills?

**Self-written assessment of current strengths and weaknesses**

Monthly performance reviews

Productivity bonuses

High client volume

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*Correct answer: Self-written assessment of current strengths and weaknesses*

*Regular self-reflection is an important part of any career. It is beneficial for massage therapists to take the time to reflect on their work, considering their strengths and growth areas. This may inform which continuing education the therapist chooses to take, thus improving their clinical skills.*

*Monthly performance reviews may or may not facilitate the improvement of a therapist's skills. Often, this practice simply promotes rule-following instead of inspiring the therapist to seek further education. Productivity bonuses encourage a therapist to see more clients, increasing client volume and revenue, but this does not incentivize clinical improvement. On the contrary, it may contribute to therapist burnout.*

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**470.**

When working with clients, a massage therapist frequently speaks about the ineffectiveness of another massage therapist's treatment. This second therapist works at a different clinic. What principle for ethical behavior did the first massage therapist violate?

**Respect**

Veracity

Beneficence

Nonmaleficence

*Correct answer: Respect*

*This therapist is showing blatant disrespect for another therapist. All massage therapists must show respect for clients, coworkers, and other professionals they come in contact with. Even if the second therapist has not been as effective in treatment, this should not be discussed with clients. Every massage therapist must follow eight principles that guide ethical professional behavior:*

1. **Respect:** Esteem and regard for clients, colleagues, and oneself.
  2. **Client autonomy and self-determination:** The client's freedom to decide for themselves, and their right to have sufficient information to give informed consent.
  3. **Veracity:** The right to objective truth.
  4. **Proportionality:** The principle that the benefit must outweigh the burden of treatment.
  5. **Nonmaleficence:** The principle that massage therapists will do no harm and prevent harm from happening.
  6. **Beneficence:** The principle that treatment should contribute to the client's well-being.
  7. **Confidentiality:** Respect for the privacy of information.
  8. **Justice:** Equality.
-

471.

When taking a client's history during the first session, what are the **best** types of questions for the therapist to ask?

**Only those pertinent to the current issue**

Those involving the client's home life

Only those relating to the client's history of substance use

As many questions as they possibly can; the more information they have, the more effectively they can treat the client

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*Correct answer: Only those pertinent to the current issue*

*During a client intake session, it is best to only ask pertinent questions. This shows respect for the client and avoids overstepping professional boundaries. Questions pertaining to the current issue, their health history, and other conditions that may have an impact on the massage are the most appropriate.*

*It is generally not appropriate, especially at the first session, to ask about substance use or the client's home life. If it becomes apparent that these two topics are impacting the client's health and progress in massage, then they may become relevant during later sessions. While it is important for the therapist to get a clear picture of the client's health history, it is disrespectful of the client's time for the therapist to bombard them with endless questions.*

---

**472.**

A massage therapist underwent abdominal surgery several weeks ago and has recently been cleared to return to work. He was given narcotics to reduce pain levels, which have been helping with pain. The therapist was supposed to take one pill every six hours, but recently he has been taking one pill every two hours. What is a potential issue with this scenario?

**Treating the client under the influence of narcotics**

Treating the client after abdominal surgery

The therapist should not work while taking any kind of medication, even if taking it as prescribed

The surgery should have been reported to the state board

*Correct answer: Treating the client under the influence of narcotics*

*This massage therapist is under the influence of drugs (narcotics). These can have a dangerous effect on the clinical reasoning abilities of the massage therapist. This is a clear violation of the standards of practice.*

*If the therapist has been cleared by his doctor to return to work, the fact that he had surgery should not be an issue. Surgeries do not need to be reported to the state board. It is appropriate for the therapist to work while taking medication, as long as they take it as prescribed.*

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**473.**

Jennifer is a massage therapist who works at a massage therapy clinic. Several front desk colleagues have informed Jennifer that one of her male clients has been asking personal questions about her, including her marital status. This makes Jennifer very uncomfortable, but since he has not said anything to her directly, she tries to ignore it and continue working with him. After a few sessions, she feels she has not been providing the same level of care to this client as she has to her other clients. What is the **best** action for Jennifer to take?

**Refer the client to another massage therapist in the clinic**

Refer the client to a mental health professional

Continue to treat the client, regardless of the level of care

Take a month off work to avoid burnout

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*Correct answer: Refer the client to another massage therapist in the clinic*

*Because Jennifer feels she cannot provide quality care, the ethical course of action is for her to refer the client out. It would be unacceptable to knowingly provide sub-par care. By referring the client to another massage therapist in the clinic, she can ensure a smooth transition from one therapist to another.*

*Referring the client to a mental health professional is not necessary. Continuing to treat the client while she knows she is providing sub-par care would be unethical. Jennifer may someday need time off to avoid burnout, but in this example, it appears that the problem will be resolved when she stops seeing this particular client.*

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**474.**

A massage may bring about an emotional response in clients. If the client has an emotional response to the massage, which is **not** an appropriate response by the massage therapist?

**Speed up the rate of massage to distract the client**

Stay connected with the client but distanced from the experience

Ask the client if he/she would like to continue the massage

Slow the massage pace to give the client time to process their emotions

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*Correct answer: Speed up the rate of massage to distract the client*

*If the client experiences an emotional response during the massage, it is important to stay connected to the client but distant from the experience, as that belongs to the client. The therapist should ask the client if he or she wants to continue and then slow the speed of the massage technique to allow the client to refocus.*

*Speeding the massage may make the client more uneasy and is not the appropriate response.*

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**475.**

A massage therapist is employed by a chiropractor. A client comes to their practice seeking to alleviate pain after a car accident. The chiropractor creates a treatment plan that includes regular massages and spinal adjustments.

What term best describes the situation?

**Supervision**

Transference

Peer support

Dual role

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*Correct answer: Supervision*

*Supervision involves a person who oversees others and their professional behavior. In this example, the chiropractor supervises the massage therapist's work.*

*A dual role is when one professional has expertise in multiple areas, and offers a client more than one kind of treatment.*

*Transference is the personalization of the professional relationship by the client.*

*Peer support is the interaction of professionals with similar skills and experience to encourage and maintain appropriate professional practice.*

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**476.**

Which of the following is not a reason behind the established NCTMB (National Certification Board for Therapeutic Massage and Bodywork) code of ethics?

**To foster inequitable treatment for clients**

To work only with the informed consent of each client

To foster honesty within the business

To ensure that services are within their scope of the practice

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*Correct answer: To foster inequitable treatment for clients*

*The NCTMB's code of ethics was established to foster equitable treatment for clients. One of the four basic principles laid out in this code is for massage therapists to respect their client's dignity.*

*The NCTMB's code of ethics was put into place to protect and serve the public by ensuring privacy for the clients, practicing honest business procedures, working within the scope of practice, and treating clients equally.*

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477.

Which of the following is **not** one of the four basic principles that constitute the code of ethics for massage professionals?

**Respect for the environment**

Respect for the dignity of people

Responsible caring

Responsibility to society

*Correct answer: Respect for the environment*

*The four basic principles that constitute the code of ethics for massage professionals include:*

- 1. **Respect for the dignity of people:** Massage therapists will maintain respect for the interests, dignity, rights, and needs of all clients, staff, and colleagues.*
  - 2. **Responsible caring:** Competent, quality client care will be provided at the highest standard possible.*
  - 3. **Integrity in relationships:** At all times, the professional will behave with integrity, honesty, and diligence in practice and duties.*
  - 4. **Responsibility to society:** Massage professionals are responsible and accountable to society and shall conduct themselves in a manner that maintains high ethical standards.*
-

**478.**

A massage therapist is interested in receiving a specialization for sports specific massage. This massage therapist would need to pursue which type of credentialing?

**Professional certification**

Licensing

Exemption

Informed consent

*Correct answer: Professional certification*

*Professional certification is voluntary and not required in order to practice. It is self-regulated by the profession and does not include governmental oversight. Massage therapists are recognized for advanced knowledge and skills.*

*Most states require massage therapists to be licensed in order to practice. This is intended to protect the health, safety, and welfare of the public. Licensing requires a state or provincial board of examiners and requires specific educational background or examination. It protects the usage of the title of massage therapist.*

*Exemption means that the professional is not required to comply with existing regulation. It excuses practitioners who meet specific educational requirements or experience from meeting current regulation requirements.*

*Informed consent is information used to educate the client regarding their choices and agreement for care. The massage therapist must receive informed consent from the client prior to massage therapy intervention.*

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**479.**

A massage therapist has recently begun a new advertising campaign for their business. It emphasizes that they can cure arthritis.

What is a potential issue with this type of advertising?

**Potential to be mistaken for a medical cure for a disorder**

Potential to bring in more clients with arthritis

Massage therapists should not promote themselves

Potential to be considered medical malpractice

---

*Correct answer: Potential to be mistaken for a medical cure for a disorder*

*Medical treatment is outside a massage therapist's scope of practice. A therapist should not claim the ability to cure a medical condition, as this makes them vulnerable to malpractice lawsuits. In this case, the claim that the therapist can "cure" is false advertising, as arthritis is a condition that can be managed but not cured.*

*Medical malpractice occurs when harm comes to a client as a result of incompetent care. It is perfectly acceptable for a massage therapist to promote themselves using an ad campaign, provided that campaign is implemented ethically. If the therapist is indeed qualified to treat arthritis, their connecting with more patients who have this condition is not a concern.*

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**480.**

Which of the following should a therapist engage in to remain compliant with the standards of practice?

**Periodic peer reviews**

Multiple specialty certifications

Take on a management role in the clinic

Take on leadership positions within the state board

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*Correct answer: Periodic peer reviews*

*According to the standards of practice for massage therapy, professionals in this field should engage in periodic peer reviews. This process helps identify potential problem areas so that the therapist can continue to improve.*

*While multiple specialty certifications, management roles, and leadership positions may help a therapist's career, they are not required in the standards of practice.*

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**481.**

The ability of a massage therapist to receive, interpret, and respond to client emotions while maintaining self-awareness effectively is called:

**Emotional intelligence**

Psychological intelligence

Social awareness

Emotional comprehension

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*Correct answer: Emotional intelligence*

*The ability to fully take into account and respond to a client's emotional state appropriately is called emotional intelligence. It incorporates self-awareness and awareness of others and it allows for a beneficial client-therapist relationship. Since massage is a client-centered practice, emotional intelligence is an extremely important quality for a therapist to have.*

*Psychological intelligence, social awareness, and emotional comprehension may all sound similar; however, the proper term is emotional intelligence. These other terms are not widely used.*

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**482.**

All of the following would improve professional excellence **except**:

**Offer marketing services to physicians in exchange for referrals**

Take a course in medical massage

Undergo self-reflection after each client interaction

Read current research articles pertinent to clinical practice

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*Correct answer: Offer marketing services to physicians in exchange for referrals*

*Marketing may be beneficial for growth as a business/service provider, but it is not part of striving for professional excellence. Increasing your number of clients may indeed help you gain experience. However, being busy does not necessarily improve your clinical skills; if you have too many clients, you may burn out. As your practice grows, it's important to balance your need for financial success with your own physical and emotional boundaries.*

*Continuing to improve clinical skills and critical thinking are imperative for professional excellence. This can be achieved with continued training and coursework (medical massage course), staying current on research, and regularly reflecting on your own work.*

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483.

Which of the following principles that guide professional ethical behavior describes a client's right to objective truth?

Veracity

Beneficence

Proportionality

Respect

*Correct answer: Veracity*

*Every massage therapist must follow eight principles that guide ethical professional behavior:*

1. **Respect:** Esteem and regard for clients, colleagues, and oneself.
  2. **Client autonomy and self-determination:** The client's freedom to decide for themselves, and their right to have sufficient information to give informed consent.
  3. **Veracity:** The right to objective truth.
  4. **Proportionality:** The principle that the benefit must outweigh the burden of treatment.
  5. **Nonmaleficence:** The principle that massage therapists will do no harm and prevent harm from happening.
  6. **Beneficence:** The principle that treatment should contribute to the client's well-being.
  7. **Confidentiality:** Respect for the privacy of information.
  8. **Justice:** Equality.
-

**484.**

A massage therapist who was not born in America has a supervisor who speaks very loudly and slowly only to her and does not delegate as much responsibility to her when compared to her peers for no defined reason. This supervisor is violating which ethical principle the **most**?

**Respect for the dignity of people**

Responsible caring

Responsibility to society

Integrity in relationships

*Correct answer: Respect for the dignity of people*

*This supervisor is likely treating this particular massage therapist differently because of her national origin. Massage therapists must demonstrate respect for all people, including employees, bosses, coworkers, and clients. This supervisor demonstrates a lack of respect by treating this therapist differently with no basis other than her national origin.*

*The four basic principles that constitute the code of ethics for massage professionals include:*

- 1. **Respect for the dignity of people:** Massage therapists will maintain respect for the interests, dignity, rights, and needs of all clients, staff, and colleagues.*
  - 2. **Responsible caring:** Competent, quality client care will be provided at the highest standard possible.*
  - 3. **Integrity in relationships:** At all times, the professional will behave with integrity, honesty, and diligence in practice and duties.*
  - 4. **Responsibility to society:** Massage professionals are responsible and accountable to society and shall conduct themselves in a manner that maintains high ethical standards.*
-

**485.**

A client becomes aroused during a massage. They tell the therapist this is happening, and then reach out and touch the therapist's thigh. In this situation, the therapist should:

**Tell the client to stop, leave the room, and inform a supervisor.**

Ignore this behavior and continue the massage.

Immediately pull out their phone and call the police before leaving the room.

If the attraction is mutual, the therapist should discontinue the professional relationship and ask the client out on a date.

---

*Correct answer: Tell the client to stop, leave the room, and inform a supervisor.*

*It is not unusual for short-lived feelings of sexual arousal to occur during a massage. It is absolutely inappropriate, unethical, and illegal for either the client or therapist to act on these feelings.*

*Ignoring this kind of behavior is ineffective; if the therapist does nothing, the client may or may not realize what they're doing is inappropriate. The therapist should set clear boundaries with the client before calling in the legal authorities. In some situations, police assistance is necessary; in others, it results in a lengthy process with no positive outcome. It is unethical for the therapist to pursue a sexual or romantic relationship with any of their clients, regardless of whether they find the client attractive.*

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**486.**

Which of the following is **not** an expected quality of a professional massage therapist?

**A focus on performing funded clinical research**

A willingness to learn new skills and techniques

An aptitude for working with their hands

A favorable professional image

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*Correct answer: A focus on performing funded clinical research*

*While it is important for massage therapists to stay up to date in their field by following clinical research, not all therapists are expected to perform this research themselves. Ideally, they should maintain an awareness of current massage-related research and continue to improve their clinical skills as new information becomes available.*

*A professional massage therapist is expected to demonstrate a willingness to learn new skills, an aptitude for working with their hands, and a favorable professional image.*

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**487.**

Before arriving at work, a massage therapist receives the following text from the receptionist at her clinic: "Your 8:15 canceled." Is this an appropriate text?

**Yes; no personal information about the client is present.**

No; anyone could obtain access to the schedule and identify this client.

No; the receptionist should have used the client's name to avoid confusion.

Yes; confidential information about clients can safely be shared via text.

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*Correct answer: Yes; no personal information about the client is present.*

*It is sometimes necessary to discuss practical details about work by phone or text. When this occurs, none of the client's identifying information should be included. This safeguards the client's confidentiality. In this scenario, anyone seeing the text over the therapist's shoulder would simply see a time with no client name. This is perfectly acceptable.*

*The client's schedule should not be accessible to anyone other than the employees of the clinic, so simply mentioning the time of the massage should not reveal the client's identity.*

*While caution must be used when communicating via text, no person other than colleagues should have access to the clinic's schedule so this client's personal information will be protected. It is a breach of confidentiality to include any identifying information about a client in a text. This includes using a specific client's name.*

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**488.**

The massage therapist works in a spa/wellness clinic with a team of five other massage professionals. The massage therapist believes that a colleague is unethically billing for services that were not provided. Which of the following responses is **most** appropriate?

**Bring the concern up to the clinic supervisor to handle privately with the employee**

Tell the colleague's clients to switch massage therapists due to the unethical billing

Bring the allegation up in the next team meeting so it is out in the open and can be discussed and handled appropriately

Report this to the American Massage Therapy Association

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*Correct answer: Bring the concern up to the clinic supervisor to handle privately with the employee*

*It is unprofessional to ignore unethical behavior by colleagues. Supporting ethical practice promotes professional integrity as a whole massage therapy community. However, reporting a colleague for unethical behavior without proof is not appropriate. The best response of those listed would be to voice the concern with the clinic supervisor in private. This way, the supervisor can investigate if there is truth to the claim and the colleague is not singled out.*

*It would not be appropriate to tarnish the reputation of the massage therapist with their clients nor with the clinical team in a meeting setting. Additionally, there is no proof of this infraction, so it would not be appropriate to report it to a professional organization.*

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**489.**

Which of the following **best** describes how you should handle a phone call that is requesting sexual services?

**Decline and explain the services that you provide**

Talk about the call in front of other clients

Scream at the caller

Decline and invite the caller to book an appointment for a Swedish massage

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*Correct answer: Decline and explain the services that you provide*

*When confronted with obscene calls or questions, it is important for you to always remain professional and explain the services that you provide.*

*As long as you are physically safe, it's best to avoid extreme tactics such as screaming at a caller. Remember that you represent all massage therapists in all your professional interactions. Respectfully explaining the problem is a better way to discourage them calling another therapist with the same request. You should avoid talking about business issues in front of your clientele; this is unprofessional. Once a client or potential client has expressed sexual intentions, it's inappropriate for you to work with them in a professional capacity.*

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**490.**

A massage therapist has been very busy with client care lately. A rare and exciting opportunity arose for his company to market at a large event. The day of this event happens to fall on a Saturday, which is normally one of his days off. The therapist's manager makes it clear that this event is optional, but the therapist knows it is an important marketing opportunity.

What is the **best** course of action for the therapist to take?

**Go to the event for the benefit of everyone in the company.**

Go to the event but leave early.

Do not go to the event because there is no obligation to do so.

Do not go to the event because it is his day off.

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*Correct answer: Go to the event for the benefit of everyone in the company.*

*Part of being a good employee is extending oneself, even if it is occasionally inconvenient, to benefit other employees in the long-term. By attending this event, more clients are likely to come to the clinic, helping the company as a whole. Even though it is his day off, occasionally participating in these activities is ideal.*

*Assuming this event is a rare occurrence, going to the event and leaving early is not ideal. This can show a lack of commitment on the employee's part. If the therapist's manager expects him to attend events every Saturday, however, it may become important to set boundaries. There is certainly no obligation for the employee to go since it is on his day off, but it is a mark of a good employee to go above and beyond what is expected.*

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**491.**

Charles and Debbie are both massage therapists, but they do not work together. Charles has recently learned that for the past ten years, Debbie has regularly recommended that her clients take certain medications to reduce their physical pain. What is the **most** appropriate action for Charles to take?

**Report Debbie to the state board**

Call law enforcement

Have a conversation with Debbie and explain that medication prescription is out of the scope of practice

Do nothing; no adverse events have occurred as a result of this so far

*Correct answer: Report Debbie to the state board*

*Prescribing medication violates the scope of practice for massage therapists. Debbie clearly has been treating clients out of the scope of practice for years. This indicates that she cannot claim ignorance when confronted, and has been knowingly violating the scope of practice repeatedly. Since this has been going on for 10 years and Charles just found out about it, it is most appropriate for him to report Debbie to the state board and let the board investigate further.*

*Simply talking with Debbie is not likely to change anything since she has been doing this for such a long time. She is a danger to the public since she has not been trained or educated in prescribing medications; this could result in serious harm. Calling law enforcement is not necessary; typically reporting the therapist to the board should be the first step. Doing nothing would be unethical, since there is an obligation to report misconduct by other massage therapists. Even if no harm has come to Debbie's clients so far, there is always a risk of adverse effects occurring in the future.*

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**492.**

To communicate most effectively with another person, all of the following must be taken into account **except**:

**Financial background**

Tone of voice

Body language

Words used

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*Correct answer: Financial background*

*A person's financial background, especially as it relates to massage-related communication, should not be in the forefront of the client's or therapist's mind. Professional communication should remain independent of a person's financial background.*

*When working to communicate in the best and most effective way, the person's body language, tone, and actual words used should all be taken into account to interpret what is actually being said.*

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**493.**

A new wellness center is trying to promote itself in the community by using social media advertising. They post research-based articles, speaking events and tag their massage clients to their social media page when they visit. What is unethical regarding this form of promotion?

**This breaks client privacy and confidentiality by linking a client to their social media webpage when they visit**

It is inappropriate to share research articles on social media as part of advertising unless it was written by an employee of the clinic

Social media is not an appropriate means to promote massage therapy services

There is nothing unethical about this activity

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*Correct answer: This breaks client privacy and confidentiality by linking a client to their social media webpage when they visit*

*Ethical behavior needs to be maintained with the use of all forms of social media and internet presence. The clinic should never link or tag their clients on social media when they visit as it breaks patient confidentiality and privacy.*

*Social media is a growing form of advertising and promotion of many types of businesses and is appropriate to promote massage therapy services. It is essential that ethical behavior is maintained. Information available to the public through the internet affects the whole massage profession. It is appropriate to share research articles on social media as part of advertising and sharing knowledge.*

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**494.**

All of the following are appropriate to disclose to a client **except**:

**Current financial problems**

Having a sprained wrist

Having a paper cut on the index finger

Having the flu

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*Correct answer: Current financial problems*

*Information should only be disclosed with clients if it will impact their care. The massage professional should be able to compartmentalize their personal problems enough that current financial troubles do not interfere with client care. Therefore, this is not necessary to disclose.*

*A sprained wrist or a paper cut could potentially impact the client's care. An infectious disease such as the flu would make it necessary for the therapist to take time off work, and may result in rescheduling an appointment. It would be appropriate to disclose any of these issues to the client. Without adequate information about the therapist's ability to perform massage, it is impossible for a client to give informed consent to treatment.*

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**495.**

What is a supervisor typically involved with as it relates to client care?

**Development of a treatment plan**

Implementation of a treatment plan

Response to treatment

Taking of subjective history

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*Correct answer: Development of a treatment plan*

*A supervisor is someone that oversees a massage therapist or similar health care professionals. They can be from a different discipline or simply be another massage therapist with more experience/expertise. Supervisors often take an active part in the development of a treatment plan as well as scheduling, discipline, and teaching.*

*The actual implementation of a treatment plan (massage itself), response to treatment, and the taking of subjective history are the massage therapist's responsibilities. The supervisor is rarely if ever involved in these processes.*

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**496.**

If they intend to work professionally, a massage therapist must have:

**Professional liability insurance**

Life insurance

Health insurance

A master's degree

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*Correct answer: Professional liability insurance*

*Professional liability insurance (also called malpractice insurance) is useful if a client decides to file a lawsuit or press charges against a massage therapist because of treatment. This can happen to even the best of therapists. Insurance protects the massage therapist if this does occur and is vital to have while employed as a massage therapist.*

*Life insurance and health insurance are not directly related to client care and there is no law as it relates to massage therapy that requires a therapist to be covered by these kinds of insurance.*

*A master's degree is not required to practice as a massage therapist.*

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**497.**

A long-time client has recently begun expressing strong political opinions. They have become more and more frequent, and they do not agree with the massage therapist's beliefs. Over time, the therapist becomes more and more uncomfortable while working with this client, to the point that he feels he is not providing unbiased care. What is the **first** course of action for the therapist?

**Have an honest and respectful discussion with the client about the need to not discuss these topics during a session because it is affecting his care.**

Refer the client to another massage therapist whose political opinions align with the client's.

Have an open discussion about his political views and try to change his mind.

Continue to treat him but seek support from coworkers by sharing all the details of the client's beliefs with them.

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*Correct answer: Have an honest and respectful discussion with the client about the need to not discuss these topics during a session because it is affecting his care.*

*It is unprofessional for the therapist to allow their personal beliefs to compromise a client's care. If the therapist is uncomfortable with a client but continues working with them, the therapists' care might be considered discriminatory. Touch tells the truth. Even if the therapist thinks she is able to compartmentalize her feelings, the client's experience may still be effected.*

*While referring the client to a different therapist may become appropriate, it should not be the first step in this process. It is inappropriate for the therapist to share confidential details—including any information discussed during the massage—with colleagues absent the client's informed consent. Openly engaging in a political conversation with the client will only serve to increase friction between client and therapist.*

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