

# NBCAAM Equine Massage Study Guide

*The purpose of this study guide is to provide some guidance as to which areas need to be studied prior to sitting for the National Exam in Equine Massage. We encourage you to begin your studies by referring to your class curriculum from the school from which you received your certification. At the end of this study guide we offer some additional resources that you may want to consider for more information.*

## **I. Anatomy and Physiology**

**A. Systems biology** – be able to understand how the following systems work and the physiological benefits of massage therapy:

1. Muscular System
  - Relieves muscular tension
  - Reduces soreness and fatigue
  - Reduces trigger point formation
  - Manually separates muscle fibers
  - Improves performance (balance and posture)
  - Increases range of motion
  - Tones weak muscles
  - Improves muscular nutrition
2. Skeletal System
  - Increases mineral retention
  - Promotes fracture healing
3. Digestive System
  - Promotes evacuation of the colon
  - Relieves colic and intestinal gas
  - Stimulates digestion
4. Nervous System
  - Promotes relaxation
  - Decreases pain
    - relieves local and referred pain caused by hypersensitive trigger points
    - stimulates the release of endorphins
    - pressure of a massage interferes with pain information entering the spinal cord by stimulating pressure receptors
    - interrupts the pain cycle by relieving muscular spasms, increasing circulation, and promoting rapid disposal of waste products
  - Activates sensory receptors

#### 5. Cardiovascular System

- Dilates blood vessels
- Improves blood circulation
- Stimulates release of acetylcholine and histamine for sustained vasodilation
- Replenishes nutritive materials
- Reduces ischemia
- Decreases blood pressure and reduces heart rate

#### 6. Integumentary

- Increases skin temperature
- Improves skin condition
- Reduces superficial keloid formation

#### 7. Respiratory System

- Reduces respiration rate
- Strengthens the respiratory muscles
- Decrease of asthma (COPD/Heaves) attacks
- Increases fluid discharge from the lungs
- Improves pulmonary functions
  - *Increase* in the total amount of air that can be forcibly inspired and expired from the lungs in one breath

#### 8. Urinary System

- Increases urine output
- Promotes the excretion of metabolic wastes

#### 9. Endocrine System

- Increases dopamine and serotonin levels. Linked to decreased stress levels and reduced depression.
- Reduces cortisol level. Reduces cortisol level by activating the relaxation response. Elevated levels of cortisol not only represent heightened stress but also inhibited immune function.
- Reduces norepinephrine level. Reduces norepinephrine, which is linked to the relaxation response.

#### 10. Lymphatic System

- Promotes lymph circulation
- Increases lymphocyte count
- Increases the number and function (or cytotoxicity) of natural killer cells

### **B. External anatomy** – know the surface features of the horse as well as bony landmarks.

1. **External Points:** poll, forehead, facial crest, nostril, lips, jaw, throatlatch, crest, neck, jugular groove, withers, shoulder, point of

shoulder, chest, arm, elbow, forearm, carpus, metacarpus, fetlock (ankle), pastern, coronet, hoof, thorax (barrel), girth, abdomen (belly), flank, back, loin, croup, point of hip (tuber coxae), tailhead, buttock, point of buttock, thigh, stifle, leg (gaskin), tarsus (hock), metatarsus.

**C. Skeletal structure and function** – know the different parts of the skeletal structure as well as the function and physiology of bone

1. **Axial skeleton:** skull, mandible, hyoid bone, cervical vertebrae, thoracic vertebrae, lumbar vertebrae, sacral vertebrae, coccygeal (caudal) vertebrae, ribs, costal cartilage, sternum.
2. **Appendicular skeleton – Forelimb:** scapular cartilage, scapula, humerus, radius, ulna, carpal bones (7 or 8), metacarpal bones (3), proximal sesamoid bones (2), proximal phalanx (P1), middle phalanx (P2), distal sesamoid bone (navicular bone), distal phalanx (P3).
3. **Appendicular skeleton – Hindlimb:** ilium, pubis, ischium (these first three fused to form hip bone – os coxae), femur, patella, tibia, fibula, tarsal bones (7), metatarsal bones (3), proximal sesamoid bones (2), proximal phalanx (P1), middle phalanx (P2), distal sesamoid bone (navicular bone), distal phalanx (P3).
4. **Function of the skeleton**
  - a. structural frame for the body
  - b. lever system for moving the muscles
  - c. protects internal organs
  - d. stores minerals, particularly calcium
  - e. production site for blood cells within the marrow

**D. Muscular structure and function**

1. **Muscle function** – movement, produces heat, helps with posture and joint stability, transports fluids such as blood, lymph, water, etc. transports nutrients, involved with involuntary processes such as digestion, heartbeat.
2. **Muscle characteristics** – can be made to move by the nervous system, can shorten and lengthen by relaxation then return to original length. Healthy muscle has the ability to stretch to 1 ½ times its resting length.
3. **Types of muscle tissue** – cardiac (makes up the heart), smooth (found in walls of arteries, gastrointestinal tract, bladder, male and female reproductive tracts, respiratory tract) and skeletal (moves the body).

4. **Muscle anatomy** – muscle belly, muscle fascicles, fascial membranes, muscle fibers, tendinous attachments, muscle spindle fibers, Golgi tendon organs.
5. **Terminology** - agonist, antagonist, fixator, synergist, eccentric and concentric contraction, isotonic and isometric contraction,
6. **Muscle Kinesiology** - actions of the muscles
7. **Specific Muscles** – know the major muscles and their origins and insertions (proximal and distal attachments).

#### **E. Connective tissue structure and function**

1. Components
  - Matrix - cells, fibers and ground substance
  - Fiber types - collagen, elastic and reticular
2. Cartilage
  - Hyaline, elastic and fibrous
3. Properties of fascia
  - Thixotropic
  - Piezoelectric

#### **F. Neurological structure and function**

1. Sensory - afferent
2. Integrative - brain
3. Motor - efferent
4. CNS (Central Nervous System)
  - Brain and spinal cord
5. PNS (Peripheral Nervous System)
  - SNS (Somatic Nervous System)
  - ANS (Autonomic Nervous System)
    1. Sympathetic (SNS) - stress related, fight or flight
    2. Parasympathetic (PNS) - rest and digest
6. Neurons - structure and function
  - Axons
  - Dendrites
  - Schwann cells - myelination
  - Synapse and synaptic cleft/space
7. Meninges, CSF (cerebral spinal fluid)
8. Parts of the brain
9. Cranial nerves and spinal nerves
10. Types of receptors

### **G. Sample questions:**

1. Which of the following is *not* part of the digestive system
  - a. esophagus
  - b. stomach
  - c. spleen
  - d. large intestine
  
2. Which structure carries oxygen-rich blood from the heart to the tissues?
  - a. Jugular vein
  - b. Lymphatic vessel
  - c. Right thoracic duct
  - d. Carotid artery

Answers: 1. C, 2. D

## **II. Massage Theory and Application**

### **A. History of Massage**

Jack Meagher (pronounced “Mar”), called the “Father of Sports Massage”, developed both human and equine massage. He discovered his techniques used with professional athletes also helped the performance of a horse. He worked with both NFL athletes and US Equestrian Olympic teams.

### **Brief History of Massage**

Massage therapists take pride in the historical background of their profession. Massage is the oldest form of healing known to man.

The first known documentation of massage was in 2700 B.C. by the Chinese. The first *detailed* records of massage, preserved by the British Museum, date back to the year 300 B.C. and contain descriptions of movements that are identical to those practiced at the present time. There is mention of massage in the early writings of the Greeks, Romans, Egyptians, and Turks, as well as the Persians, all having practiced a primitive form of massage.

Hippocrates, the “Father of Modern Medicine”, learned massage from Herodicus in 1800 B.C.

Records of application of massage by the Japanese, dating back to 1000 B.C. are still in existence; indeed massage is recognized in Japan today as one of the foremost forms of healing.

### Swedish Massage

The massage that we recognize today known as Swedish massage, was first devised by Per Henrik Ling of Sweden. The first institution for the scientific study and application of massage was established in Stockholm in 1813.

### Massage in the United States

Massage was first used in this country by Dr. Weir Mitchell of Philadelphia in 1877. Sr. A. Lovett of Boston used massage to assist in relieving the results of paralysis after the polio epidemic of 1916.

Although massage has been used in the US since the 1800's, it was not until the world wars that its true beneficial effects were recognized. Beginning with WWI, many hospitals started to use massage for various injuries. Finally, after WWII, it became recognized to the point where practically all hospitals today use massage in their Physical Therapy departments.

In 1937, Gertrude Beard, a physiotherapist at Northwestern University, had a profound influence on massage techniques in America. The history of massage is interesting and vital. In 1943 the American Massage Therapy Association (AMTA) is formed in Chicago, IL and is still going today.

Jack Meagher, a Physical Therapist and Massage Therapist who popularized the art of Sports Massage in the US, started working with horses in 1975. Jack is credited with formally bringing massage to the animal world in the US.

### **B. Physiological Effects of Massage**

1. Increases circulation of blood and other body fluids
2. Releases endorphins (natural pain killers)
3. Increases the excretion of toxins
4. Relaxes muscle spasms/relieves tension
5. Alleviates stiffness and restores mobility to injured tissues
6. Prevents injuries and loss of mobility in potential trouble spots
7. Increases range of motion
8. Enhances muscle tone
9. Increases flow of nutrients to muscles
10. Reduces inflammation and swelling
11. Lowers blood pressure
12. Improves animal's disposition
13. Increases athletic performance
14. Increases endurance
15. Maintains overall physical condition

### C. Massage techniques

1. **Compression** The desired effect is to spread the muscle fibers and increase circulation.
2. **Direct Pressure** is a form of compression that involves the use of your thumbs, finger pads, or elbows. The desired effect is to relieve hypertonia and increase circulation to a specific point (such as a trigger point or stress point).
3. **Effleurage** is a wide based gliding stroke. The desired effect is to prepare tight muscles for deeper work, relieve fatigue, and soothe and sedate when used as a finishing stroke. Effleurage is used to release fascial restrictions. Palpation stroke.
4. **Petrissage** strokes are where the skin and muscles are raised from their ordinary position then squeezed, rolled or pinched with firm pressure usually in a semi-circular direction. Terms such as kneading, rolling, pressing, squeezing, twisting and picking-up, wringing, skin rolling apply to petrissage. The desired effect is freeing adhesions, stimulating nerve endings, removing accumulation of fluids and waste, releases spasms and improves circulation.
5. **Friction** is a stroke that is meant to affect the deeper layers of tissue. Friction techniques work by compressing tissue against bone. The desired effect is freeing adhesions, breaking up deposits of waste, and stimulating tendons and ligaments.
6. **Tapotement or percussion** is executed with cupped hands, fingers or the edge of the hand with short, alternating taps. The desired effect is to relieve muscle atrophy by increasing contraction of muscle and to temporarily decrease nerve sensation so deeper techniques can be applied to an area. Variations are called tapping, cupping, hacking or slapping.
7. **Vibration Movement** is good for use with deeper muscles and joints. The desired effect is to loosen tissue and joints.

### D. Pre and Post Event Massage techniques

Pre Event Massage – used to enhance the horse’s warm up. Goal is to fill the muscles with well oxygenated, nutrient filled blood.

1. Looking to stimulate circulation, nerves, muscle activity
2. Strokes to consider; tapotement, effleurage, rubbing, rapid strokes, petrissage, compression. Avoid deep friction.
3. Stretching

Post Event Massage – used to reduce trauma that has occurred during event. Objective is to flush the toxins that are released during heavy muscle activity, speed recovery and thus reduce the risk of future injury.

1. Looking to soothe, help with recovery, move fluids, eliminate waste, calm nervous system, and stimulate lymphatic system.
2. Strokes to consider; passive touch, effleurage, compression, Avoid deep friction.
3. Gentle stretching

### **E. Proper Stretching techniques**

Stretching reduces muscle tension, preventing muscle pulls and ligament injuries.

1. Make sure muscles are warm before stretching – the ideal time is after a warm-up workout or after massage.
2. Stretch extremities slowly to full range of motion, being careful to not overstretch
3. Stretch safely – release stretches gently, guiding legs all the way back to the ground

### **F. Documentation/Record Keeping**

It's important to maintain good records of treatments. It helps with future massages (for reference and comparison). It helps with discussion of problems with vets and other health professionals. It also shows professionalism to clients.

The record of each massage session should include:

1. Dates of each treatment
2. Info on horse
3. Owner info
4. Location information
5. History and Background info on Horse
6. Personality traits of horse
7. Medications/supplements used
8. Current training/disciplines
9. Major complaint info
10. Space to note areas treated and findings
11. Recommendations Post Massage/General Comments

Record maintenance - owner/animal information is confidential

1. Information cannot be shared without owner consent
2. Records should be properly maintained

SOAP notes - Commonly used charting method

1. **Subjective** information - Subjective information is the information given to you by the client.
2. **Objective** information - Objective information is a report of what you observed and what you found during your treatment. This can include gait and postural analysis, as well as reactions to palpations and strokes, atrophy, and muscle tension.

3. **Assessment** information - Assessment information is what you did and how the horse/tissue responded. You can use information about the techniques/strokes that worked best or the horse responded to best. You can also include another postural or gait analysis - how did the horse move/stand after the session.
4. **Plan** is your suggestions for what would benefit the horse based on today's session. Include recommendations for veterinary/chiropractic follow up, homework for owner, and next appointment schedule.

### **III. Massage Assessment Techniques**

**A. Palpation** – how to palpate, purpose of palpation

**B. Gait Analysis** - how to perform a gait analysis

1. Observing the motion of the horses head, assessing movement to accentuate lameness, stance phase, swing phase,
2. Beats of natural gaits (walk, trot, canter, gallop, back, pace).
3. Moving in straight line, moving on a circle

**C. Conformation Analysis**

1. Standing square on level surface
2. Compare left to right

**D. Observation**

1. Horse in its natural environment

### **IV. Pathology**

**Pathology is the study of disease. The term pathogen comes from the Greek word “pathos” meaning disease.** An organism capable of producing disease in an animal is referred to as a **pathogen**. **Pathological** is a termed used for a diseased condition. An understanding of **pathological conditions** is necessary in order for a massage practitioner to be able to make accurate decisions regarding an appropriate massage plan.

**A. Recognition of Disease Patterns/ Clinical Signs**

Basic understanding of common diseases, conditions and how pathogens are transmitted.

1. **Zoonoses** are pathogenic conditions that may be transmitted between animals and other species, including humans.
2. **Pathogens** are microorganisms such as viruses, bacteria, protozoa and fungi that cause disease in humans and other species.

3. Pathogens transmission is grouped into two general types of contact, **direct** and **indirect**, within there are several mechanisms.

**Example: Direct Transmission:** Directly transmitted agents generally don't have to survive in the environment for successful transmission to occur. Direct transmission occurs from horse to horse contact.

**Indirect Transmission:** Airborne (ex. coughing), Vehicle (Fomite - ex. - buckets, brushes, bits, or Human - ex. - hands, clothes, boots) Transmission and Vector Transmission (mechanical and biological - ex. ticks, biting insects, birds).

- **Communicable diseases** and contraindications and preventions are in necessary the massage industry
  - **How to prevent the spread of zoonotic diseases**

**Example: Washing your hands** between massage sessions is an important measure in preventing the spread of zoonotic agents. Other methods may include - changing clothes, cleaning/disinfecting the bottoms of shoes, boots.

- **Pathogen transmission** and the routes by which an infectious agent exits its host, such as by feces, urine, saliva, expired air, blood, semen or urogenital secretions.
- **Pathogens and Transmission Routes**

**Examples: Direct Contact/Indirect Contact:** Ringworm is a fungus that can be spread by direct or indirect contact.

**Direct Contact: Papilloma** can be transmitted from one horse to another; although it affects the skin it is transmitted **virally** and is commonly know as warts

**Feco-Oral route: Salmonellosis** (which is zoonotic) is a bacterial disease characterized by debilitating intestinal problems and life-threatening diarrhea it is feco-orally spread between animals by manure that contaminates feed or water.

- **Systemic pathogens** Some pathogenic organisms use the cells that line the digestive tract in order to gain entry to the bloodstream. From there, an infection can become systemic.

## **B. Specific Conditions**

1. **Massage therapy** is contraindicated in pathogenic conditions involving fever and systemic infection.

- **Inflammatory Response** The **introduction of a pathogen** into a living system will generally launch an inflammatory response.

**Example: The following are all signs of the Inflammatory Response - broad and encompassing . Once phagocytosis happens: (CRTD)**

- **Calor** (warmth) - heat destroys many bacteria; heat given off by increased flow of blood.
  - **Rubor** (redness) - RBC leaking into blood tissues; increased circulation and vasodilation of injured tissues.
  - **Dolor** (pain) - exert pressure against pain receptors (nerve endings)
  - **Tumor** (swelling) - excess accumulation of fluids
- **How the Body Defends Against Pathogens**
    - **The lymphatic system- the primary and secondary organs.**

### **C. Contraindications**

Recognize situations that are contraindications to massage. Do not massage if:

1. Horse is in shock – shock lowers blood pressure; massage lowers even more
2. Horse has fever – fever is body's way to fight infection; massage could elevate fever.
3. Horse has cancer – massage could spread the condition – get approval from veterinarian first
4. Horse has open wounds – do not massage these areas
5. Horse has torn muscles, tendon, ligaments –can massage only after veterinary approval due to increased risk of inducing bleeding
6. Horse has skin problems like ringworm – massage could cause it to spread
8. Acute stages of diseases (ie: equine influenza or herpes)

### **D. Considerations**

1. NSAIDS - Non-Steroidal Anti-Inflammatory Drugs
  - NSAIDS are used for pain management and to decrease inflammation, they can also interfere with blood clotting. If the horse is medicated it may have decreased sensation and reaction to pain. Too much pressure may cause bruising or bleeding in the tissues.
2. Steroids
  - May be used for a wide variety of reasons. Have immune suppressive properties and anti-inflammatory properties. Medical advisement is indicated depending on underlying condition and duration of use. Long term use may cause weakening of bone and cartilage.
3. Muscle Relaxants
  - Given for relief of spasms and may alter muscle tone, pain levels. Be cautious with pressure.

## **V. Kinesiology/Biomechanics**

The study of the principles of biomechanics (the branch of physiology that studies the mechanics and anatomy in **relation to movement**) as it relates to health and disease. Biomechanics is a core part of kinesiology. Kinesiology is the study of the anatomical and mechanical basis of movement. This includes the study of anatomy, muscle physiology, and mechanics in an effort to arrive at a more complete picture of movement.

A kinesiological approach applies scientific and evidence based mechanical principles to movement and is not to be confused with Applied Kinesiology which is an alternative medicine technique.

### **A. Directional terms:**

1. Near side (left side)
2. Off side (right side)
3. Dorsal – towards the back (dorsum)
4. Ventral - towards the belly (venter)
5. Cranial – towards the head (cranium – skull case)
6. Caudal – towards the tail (cauda)
7. Rostral – closer to the nose (rostrum)
8. Proximal – on the limb, closer to the body
9. Distal – on the limb, further from the body
10. Axial – towards the axis
11. Abaxial – away from the axis

### **B. Joint Movements**

1. Flexion
2. Extension
3. Abduction
4. Adduction
5. Lateral Rotation
6. Medial Rotation

### **C. Joint Types**

1. Types of Joints
  - a. Fibrous – sutures, syndesmosis
  - b. Cartilaginous – symphysis, intervertebral discs
  - c. Synovial
2. Structures associated with joints
  - a. Articular/hyaline cartilage
  - b. Synovial Membrane
  - c. Synovial fluid - hyaluronic acid
  - d. Joint Capsule
  - e. Ligaments

2. Categories of Joints:
  - a. Hinge joints
  - b. Gliding joint
  - c. Ball and socket joint
  - d. Pivot joint

#### **D. Definition of Gaits**

1. Walk – four beat gait
2. Trot – two beat diagonal gait
3. Pace - two beat lateral gait
3. Canter – three beat gait
4. Gallop – four beat gait

#### **E. Gait Analysis**

1. Watching for rhythm, impulsion, balance, stride length, tracking, interference
2. Moving on a straight line
3. Moving in a circle

#### **F. Postural Analysis**

1. Observations from side, front and rear
2. Comparing left to right

#### **G. Sample Questions**

Muscles are divided into 3 major groups according to their cellular structure. These are

- a. striped, skeletal, and visceral
- b. smooth, unstriped, and visceral
- c. skeletal, smooth and cardiac
- d. striped, skeletal and heart

Answer: C

### **VI. Behavior, Handling and Safety**

#### **A. Pre-massage**

1. Approach horse in a respectful manner and with good intentions – let him check you out to gain trust and acceptance
2. Make sure location of massage is safe for both you and the horse (reduce distractions, always keep one hand on the horse at all times)
3. Observe animal's movements – watch him walk and turn
4. Get info from owner/trainer about horse's history and current condition
5. Notice condition of horse's skin and hair

6. Start slowly with overall hands-on evaluation, using light pressure
7. Observe any reactions to your touch
8. Note changes in texture and temperature of tissue

**Post-Massage:**

1. Conclude massage with a soothing effect
2. Walk horse for 5-10 minutes to prevent “after massage stiffness”
3. Make any notations on record document and discuss with trainer/owner

**B. Species Behavior (Prey Animals and Social Structure)**

1. Evolution
2. Warmblood, Hotblood, Coldblood
3. Prey animals
4. Herd Animals - herd dynamics
5. Communicate with body language
  - Signs of alertness
  - Signs of threats
  - Signs of relaxation, enjoyment

**C. Proper Handling and Restraint**

1. Approach based on above
2. Determine restraint method
  - Crossties
  - Straight tie - quick release knot
  - Held by person
3. Considerations of where to work
  - In aisle way
  - In stall
  - Make sure area is free of obstacles

**D. Body Mechanics / Personal Safety**

1. Lunge position, coming from your center
2. Proper and appropriate pressure
3. Body position allows for escape
4. Handler on the same side you are working

**E. Emergency First Aid for Animals**

1. Ensure your own safety
2. Procedures for puncture wounds
3. Emergency bandaging
4. When to call the veterinarian

**VII. Professional Practice and Ethics**

**A. Scope of Practice / Liability**

1. Massage therapy is not a substitute for quality veterinary care
2. Massage therapists do not diagnose disease or illnesses
3. Always refer clients to appropriate health professionals when required
4. Establish boundaries/limitations to protect yourself and your clients:
  - Personal safety boundaries
  - Commitment boundaries (don't over commit)
  - Boundaries of treatment by client (ie: verbal abuse)

**B. Code of Ethics** – a set of guiding moral principles that governs one's course of behavior and actions

1. Follow all policies, regulations, codes and requirements established by NCBAAM.
2. Conduct business with honesty and integrity
3. Commit to highest quality of care/services
4. Represent your educational and professional experience qualifications honestly
5. Accurately inform clients of the scope and limitations of your services
6. Acknowledge the contraindications and limitations of massage – refer to other health professionals when required
7. Maintain and improve professional knowledge through continued education and training
8. Protect confidentiality of all client information

**C. Setting up a Practice / Marketing**

1. Determine a business plan and mission statement
2. Mission Statement - a short written statement of purpose for your business
3. Develop Marketing/Advertising support materials
4. Investigate need insurance - liability, health
5. Licenses and Permits, Varies by county/state
6. Tax Advisors – consider working with tax advisors who are familiar with both small business and massage practices for best advice

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