



# Clinical Skills List for Equine Veterinary Graduates

For use in internship programs and as guidelines in mentorship of recent graduates in their formative years of practice. **This comprehensive list is meant to serve as a general guide to aspiring equine veterinarians**, as all skills are unlikely to be accomplished in a single year/program and may vary depending on the emphasis of a program or segment of practice. Some of these skills will require many years to master and may be less applicable in some categories for an individual based on practice caseload.

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## MEDICAL KNOWLEDGE

- Gather a complete history from the person responsible for the horse
- Develop and understand a process for creating a problem list, diagnosing, and treating horses of various signalments
- Understand and convey accurate prognosis for common conditions
- Interpret CBC/Chemistry/Fibrinogen/SAA/lactate values and apply it to a clinical case
- Interpret results of abdominal fluid, synovial fluid, and arterial/venous blood gas analyses in the context of a clinical case
- Understand basic classes of antibiotics and how to appropriately apply them to treat a variety of infections; exercise appropriate antimicrobial stewardship with these selections
- Be familiar with common therapeutic medications in equine medicine and how to incorporate them into a medical plan for a patient
- Understand the limitations of field medicine and when it is appropriate to refer to a hospital setting
- Know how to perform a literature search to identify and fill knowledge gaps
- Know how to critically read and apply scientific papers to practice
- Know how to present a case to a colleague completely and succinctly

## PREVENTIVE MEDICINE

- Understand and communicate core and risk-based vaccine and evidence based deworming protocols
- Determine fecal egg shedding status and recommend appropriate treatment to reduce pasture contamination
- Understand the FECRT (Fecal Egg Count Reduction Test)
- Understand and apply the basics of equine nutrition and body condition scoring to provide counsel to owners with dietary questions for healthy and diseased horses
- Understand and communicate information on routine dentals

## DENTISTRY

- Know the dental formula and tooth eruption timeline
- Estimate age based on dentition
- Perform a thorough dental examination and characterize common dental pathologies
- Perform occlusal equilibration
- Recognize clinical and radiographic signs of Equine Odontoclastic Tooth Resorption and Hypercementosis (EOTRH)
- Perform extraction of wolf teeth, persistent deciduous teeth and mobile teeth
- Obtain diagnostic radiographs of the incisor teeth, cheek teeth, and sinuses

## BASIC EXAMINATIONS & SKILLS

- Perform complete and efficient physical exams on adult equids utilizing knowledge of normal vital parameters
- Visually estimate weight and know how to use a weight tape
- Recognize and characterize heart rate and rhythm abnormalities, and murmurs
- Perform venipuncture from jugular, cephalic and lateral thoracic veins and facial sinus
- Administer intravenous, intramuscular, and subcutaneous medications
- Perform a regional limb perfusion of the forelimb and hindlimb, demonstrating appropriate tourniquet placement and knowledge of common medications utilized
- Place and secure an intravenous jugular catheter
- Pull a shoe efficiently without compromise of hoof wall integrity

## COLIC

- Evaluate and manage an acute colic case
- Implement an appropriate sedation and analgesia plan
- Palpate per rectum and be able to recognize normal versus abnormal findings
- Perform nasogastric intubation, determine reflux status, and administer enteral medications if appropriate
- Secure and manage a nasogastric tube for short- or long-term intervals
- Perform a FLASH (Fast Localized Abdominal Sonography in the Horse) exam and interpret results
- Develop a fluid therapy plan
- Perform an abdominocentesis and understand when this is indicated and how to interpret the results of the fluid analysis
- Perform a cecal trocarization and understand when this is indicated
- Be able to categorize lesions into differential list: strangulating vs. non-strangulating vs. inflammatory and by anatomic location of large vs. small intestine vs. other based on clinical picture
- Understand diagnostic and treatment options for recurrent colic
- Understand importance of gastroscopy in the appropriate diagnosis and treatment of Equine Gastric Ulcer Syndrome (EGUS)

## IMAGING

- Acquire and interpret diagnostic radiographs of the equine skeleton
  - Appropriately interpret hoof measurements and make farrier recommendations
  - Perform diagnostic ultrasound of the metacarpus/tarsus and diagnose injuries of the flexor tendon apparatus/suspensory ligament
  - Perform and interpret thoracic ultrasonography of normal and diseased patients
  - Understand the diagnostic value of advanced imaging modalities (MRI, CT, nuclear scintigraphy, PET, contrast radiography) and when to refer cases
  - Acquire and interpret a full set of radiographs for horses to be sold at public auction or pre-purchase examination settings. Know necessary views, proper positioning, and the most common lesions of the young growing horse
- \*Note - some imaging skills are categorized elsewhere when most appropriate\**

## SURGERY

- Understand and employ basic surgical principles: gentle tissue handling, hemostasis, preservation of blood supply, asepsis, minimizing tissue tension, accurate tissue apposition, and obliteration of dead space
- Be familiar with a variety of suture types, suture patterns, and tension-relieving principles and techniques
- Know the basic principles of wound healing and wound management
- Appropriately select and place a drain for soft tissue wounds
- Be able to apply a variety of bandages; basic wound dressing, half limb, full limb, foot bandage, face bandage, tie-over bandage, sweat, standing wraps
- Perform a castration
- Repair a variety of skin lacerations including eyelid lacerations
- Perform a sinus trephination and lavage
- Provide aftercare including suture/staple removal
- Identify common surgical instrumentation and demonstrate proficient use
- Become familiar with indications for a variety of general, abdominal, and orthopedic surgical procedures
- Apply a cast to the foot and to the distal limb
- Recognize and manage potential cast complications (cast sores, breakage, etc.)
- Manage postoperative complications in the colic patient

## ANESTHESIA

- Be familiar with a variety of local and systemic anesthetic agents
- Understand principles of local and regional anesthesia for the purposes of laceration repair, lameness isolation, and ophthalmic evaluation
- Sedate adults and neonates for short- and long-term standing procedures
- Implement an anesthetic plan for general anesthetic procedures in field and hospital settings
- Be familiar with emergency drug doses and their appropriate use
- Use clinical observation to complete a pain score assessment
- Design a multi-modal pain management plan
- Place a caudal epidural for anesthesia of the perineum
- Know the mechanisms of action and doses for common analgesics and induction medications
- Be familiar with the basic emergency and reversal medications
- Assess and communicate a patient's pre-anesthesia medical comorbidities
- Set up and pressure check a closed rebreathing system with a mechanical ventilator if available within the practice
- Understand the basics of mechanical ventilation
- Be able to perform endotracheal, nasotracheal, and transtracheal intubation in adults and neonates
- Anesthetize a healthy patient with injectable and/or inhalant anesthesia when available within practice
- Prepare a critical patient for an anesthetic event
- Correctly place leads, record, and interpret ECGs
- Place facial and distal limb arterial lines for direct arterial blood pressure monitoring
- Properly position an anesthetized patient to prevent post-operative complications and understand management of post-operative complications if they arise
- Understand and apply the cardiac output equation in an anesthetized patient
- Be familiar with the benefits and drawbacks of free recovery, head-and-tail rope recovery, and sling recovery
- Secure head and tail ropes for recovery when appropriate
- Be able to palpate and ultrasound per rectum ovaries, uterus and cervix of a mare in all stages of repro cycle; interpret findings and identify an estrous or diestrus mare; identify a pregnant mare
- Understand the components of a breeding soundness exam with full diagnostics including physical exam, reproductive ultrasonography, cervical exam with a vaginal speculum, uterine culture and cytology, and uterine biopsy
- Know medications available to manipulate the estrus cycle for breeding purposes, including dose and administration timing basics.
- Understand breeding schedules and differences in breeding with live cover, cooled-shipped and frozen semen
- Be familiar with management of donor and recipient mares for embryo transfer
- Be able to perform a complete ultrasound examination of the gravid uterus to evaluate twin status and fetal heartbeat
- Be familiar with fetal reduction techniques
- Determine fetal age based on ultrasonography at major landmarks during gestation
- Evaluate & identify the need for vulvoplasty (Caslick's); place a Caslick's; know how to remove a Caslick's for breeding or foaling
- Diagnose and manage a mare with placentitis
- Understand process for appropriate stallion collection in phantom and live mare settings.
- Demonstrate appropriate semen handling and evaluation of sperm motility and morphology
- Determine a proper insemination dose
- Be familiar with a variety of semen extenders and preparation of semen for cooled transport and frozen storage
- Infuse a uterus with either semen or antibiotics
- Know how to sedate a stallion for reproductive exams
- Identify and palpate normal testicles. Know anatomy and normal position in the scrotum.
- Identify a cryptorchid
- Know how to perform ultrasonography and measure testicles to calculate daily spermatid output
- Perform a post-foaling examination (mare)
- Perform a uterine lavage
- Evaluate and treat a mare with a retained placenta
- Know anatomical sites to swab for CEM in an imported mare
- Know anatomical sites to swab for CEM and regular stallion breeding cultures

## REPRODUCTION

- Instruct, and demonstrate to staff how to place proper restraint of a mare for reproductive evaluations

## INTERNAL MEDICINE

- Identify risk factors and discuss diagnostic and management plan for Equine Metabolic Syndrome (EMS)/Insulin Dysregulation (ID)
- Identify risk factors and discuss diagnostic and management plan for PPID (Pituitary Pars Intermedia Dysfunction)
- Establish a diagnostic and treatment plan for equine asthma
- Establish a diagnostic, treatment, and quarantine plan for infectious respiratory disease
- Establish a diagnostic, treatment, and quarantine plan for diarrhea
- Establish a diagnostic and treatment plan for chronic weight loss
- Establish a diagnostic and treatment plan reduced performance
- Perform an abdominal ultrasound and identify major abdominal organs
- Discuss testing for genetic diseases
- Perform additional diagnostics for a fever of unknown origin
- Perform a trans-tracheal wash (TTW) and a bronchoalveolar lavage (BAL) and understand when each is an appropriate diagnostic choice
- Place chest tube to drain pleural effusion
- Perform upper airway endoscopy including guttural pouch examination and lavage
- Perform a neurologic exam, provide basic neuroanatomical localization, and assign neurologic grade
- Safely manage the acutely neurologic horse
- Recognize, diagnose, and manage a variety of myopathies
- Perform skin scraping, skin surface cytology, and a variety of skin biopsy techniques
- Know the diagnostic techniques for an allergic horse
- Discuss a variety of treatment options for common skin tumors (cast sores, breakage, etc.)

## NEONATOLOGY

- Perform a healthy foal exam and describe appropriate umbilical care and monitoring
- Know the normal developmental markers of a neonate and when to intervene
- Perform a foal sepsis score and implement treatment or stabilization and referral accordingly
- Interpret foal IgG levels and know when treatment is indicated for failure of passive transfer
- Know the emergency resuscitation medications available for neonates and understand the fundamental principles of cardiopulmonary resuscitation (CPR)
- Know how to utilize oxygen therapy and mechanical ventilation when available
- Diagnose and manage a foal with fractured ribs
- Be familiar with therapies for neonatal encephalopathy
- Place a nasogastric feeding tube and calculate energy requirements
- Be familiar with acid-base and electrolyte disturbances and understand treatment options.
- Understand indication for and complications associated with partial or total parenteral nutrition of a sick neonate
- Develop a diagnostic and treatment plan for colic in neonates and foals
- Develop a diagnostic and treatment plan for neonatal diarrhea
- Diagnose and treat tendon contracture and laxity
- Diagnose angular limb deformity and know closure times of physal plates
- Diagnose and understand treatment options for septic arthritis
- Diagnose and manage umbilical infections and herniations; understand indications for surgical management
- Develop a vaccination and deworming program for the growing foal
- Manage an orphan foal and be familiar with foal grafting techniques

## LAMENESS & SPORT MEDICINE

- Obtain accurate and pertinent history for a horse presenting for lameness or performance issues
- Perform a lameness exam and assign a lameness grade
- Apply specific nerve blocks, know the structures they anesthetize and their limitations: palmar digital nerve block, abaxial nerve block, low 4-point nerve block, proximal metacarpal/tarsal region blocks
- Be familiar with approaches for intra-articular anesthesia and how they affect lameness diagnostics
- Understand and implement treatment plan for common causes of lameness such as navicular disease, osteoarthritis, and trauma
- Understand spectrum of lameness management options including nutrition, weight control, exercise limitations, pain control, and medical interventions
- Diagnose, treat, and manage laminitis including exploration of underlying etiology
- Understand the use of intra-articular injections and differentiate the range of products available from different pharmacologic classes with varying levels of evidence
- Understand the mechanism of action and application of orthobiologic products
- Understand indication, use, and side effects of bisphosphonate medications
- Understand drug withdrawal periods/detection times for performance horses, have knowledge of their implications on treatment options, and know where to find up-to-date information
- Participate in a complete pre-purchase examination and have familiarity with writing a pre-purchase report
- Be familiar with gait analysis technologies

## EMERGENCY & CRITICAL CARE

- Triage cases in order of most to least time-sensitive
- Demonstrate empathy and calm decision-making in high-intensity, high-pressure emergency situations
- Triage a colic case in the field and determine if referral is indicated
- Evaluate, treat, and manage a choke case
- Know how to identify and treat a “red bag” delivery
- Evaluate a dystocia, understand the importance of timely referral and timeline for foal viability and mare survival, and be able to communicate this to a client
- Discuss and implement biosecurity plans for an infectious disease outbreak
- Be able to utilize multiple euthanasia techniques
- Understand large animal rescue techniques and safely manage a team of lay people
- Perform arthrocentesis on commonly affected synovial structures
- Understand the basics of fracture stabilization, and be able to apply a bandage, Kimzey, PVC splints, or bivalve cast splints
- Evaluate and treat acute hemorrhage in the field and in cases of periparturient hemorrhage
- Diagnose and treat allergic reactions/anaphylaxis
- Know how to localize, lance and appropriately manage a hoof abscess
- Know the indications for blood transfusion
- Calculate and apply shock and maintenance fluid therapy in adults and foals
- Recognize the signs of endotoxemic shock in the equine patient
- Perform a tracheostomy and discuss management of a trach-tube
- Safely manage a down horse
- Medically treat an actively seizing horse

## HUSBANDRY TECHNIQUES

- Correctly restrain a foal and an adult horse
- Tie a quick release knot
- Apply a lip and neck twitch
- Safely pick up, clean, and examine the forelimbs and hindlimbs
- Demonstrate appropriate lunging techniques
- Advise handler on safe and appropriate positioning while veterinarian is performing procedures

## BUSINESS OF VETERINARY MEDICINE

- Maintain complete and concise records
- Develop accurate estimates and charge appropriately for work performed
- Understand basic financial management in practice
- Understand how gross production factors into salary
- Read an employment contract thoroughly and understand benefits
- Manage a team of coworkers and effectively utilize staff

## OPHTHALMOLOGY

- Perform a complete ophthalmic exam using local anesthetic techniques and determine appropriate initial treatment plan
- Perform auriculopalpebral and supraorbital nerve blocks, and understand technique and indication for retrobulbar blocks
- Perform a nasolacrimal duct flush
- Understand the difference in plan for a complicated versus superficial corneal ulcer
- Know the normal intraocular pressure and tear production values and associated tests
- Collect samples for culture and cytology from a corneal ulceration
- Place a subpalpebral lavage system
- Perform a simple corneal debridement
- Manage a case of equine recurrent uveitis
- Diagnose and treat a stromal abscess
- Recognize indications for enucleation
- Recognize common neoplasms of the eye and adnexa
- Perform transpalpebral ultrasonography of the eye
- Understand indications for and placement of temporary tarsorrhaphy

## REGULATORY

- Complete a Certificate of Veterinary Inspection (CVI) for domestic and international movement
- Complete Coggins paperwork
- Know who to contact when you suspect or diagnose a reportable disease
- Understand the differences between drugs approved by the FDA, compounded medications, veterinary medical devices, and supplements and the liability associated with use of each
- Understand and demonstrate proper record keeping, disposal, and use of DEA controlled drugs



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