

# Advanced Master's Degree Equine Anesthesia and Surgery





## Advanced Master's Degree Equine Anesthesia and Surgery

Course Modality: **Online**

Duration: **2 years**

Certificate: **TECH Technological University**

Official N° of hours: **3,000 h.**

Website: [www.techtute.com/in/veterinary-medicine/advanced-master-degree/advanced-master-degree-equine-anesthesia-surgery](http://www.techtute.com/in/veterinary-medicine/advanced-master-degree/advanced-master-degree-equine-anesthesia-surgery)

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# 01

# Introduction

Veterinary professionals who dedicate their daily work to treating large species, such as equines, must have extensive and specific knowledge in anesthesiology, clinical medicine and surgery. However, the training that exists in this field is often not within the reach of these professionals, who dedicate their time and effort to the care of animals. This proposal opens a new opportunity of distinction for clinical veterinarians specializing in equines who practice their daily work in the field on an ambulatory basis, covering their high demand for non-presential specialization.





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*Equine veterinarians are currently in demand by the owners of these animals. So don't think twice and increase your skills to improve their treatment"*

In the last 20 years, veterinary anesthesia in major species has experienced great progress thanks to the introduction of new techniques and drugs, as well as the development of specific anesthetic monitors and machines.

Additionally, the introduction of new surgical techniques has created the need to develop new anesthetic protocols, and there is a growing concern about the impact of anesthesia and analgesia on animal welfare and on the final outcome of surgical procedures.

The equine veterinary clinic also requires constant updating on the part of the veterinarian, as it encompasses numerous and complex specialties in continuous development. It is a highly competitive professional sector that quickly incorporates new scientific advances into the outpatient clinic, so the veterinarian deals with a labor market that demands a very high level of competence in all aspects.

The mobile veterinarians' daily work is very demanding in terms of the number of working hours, both because of the volume of hours involved in the mobile visits and because of the degree of personal dedication and the time required for the administrative management of their own company. For this reason, they often lack the free time they need to continue their training in person at accredited centers, and in many instances resort to consulting procedures and other information on the Internet. In the network, the professional expects to find reliable online training.

Taking into account the need for competent and quality online training, we present this Advanced Master's Degree in Equine Anesthesia and Surgery, which has revolutionized the world of veterinary specialization, both for its contents, as well as for its teaching staff and its innovative teaching methodology.

Furthermore, as it is a 100% online specialization, the student decides where and when to study. Without the restrictions of fixed timetables or having to attend classes, which facilitates the conciliation of family and professional life.

This **Advanced Master's Degree in Equine Anesthesia and Surgery** contains the most complete and up to date academic program on the market. The most important features include:

- ♦ The latest technology in online teaching software
- ♦ A highly visual teaching system, supported by graphic and schematic contents that are easy to assimilate and understand
- ♦ Practical cases presented by practising experts
- ♦ State-of-the-art interactive video systems
- ♦ Teaching supported by telepractice
- ♦ Continuous updating and recycling systems
- ♦ Autonomous learning: full compatibility with other occupations
- ♦ Practical exercises for self assessment and learning verification
- ♦ Support groups and educational synergies: questions to the expert, debate and knowledge forums
- ♦ Communication with the teacher and individual reflection work
- ♦ Content that is accessible from any fixed or portable device with an internet connection
- ♦ Supplementary documentation databases are permanently available, even after the course



*A high level scientific program, supported by advanced technological development and the teaching experience of the best professionals"*

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*A program created for professionals who aspire to excellence that will allow you to acquire new skills and strategies in a smooth and effective way"*

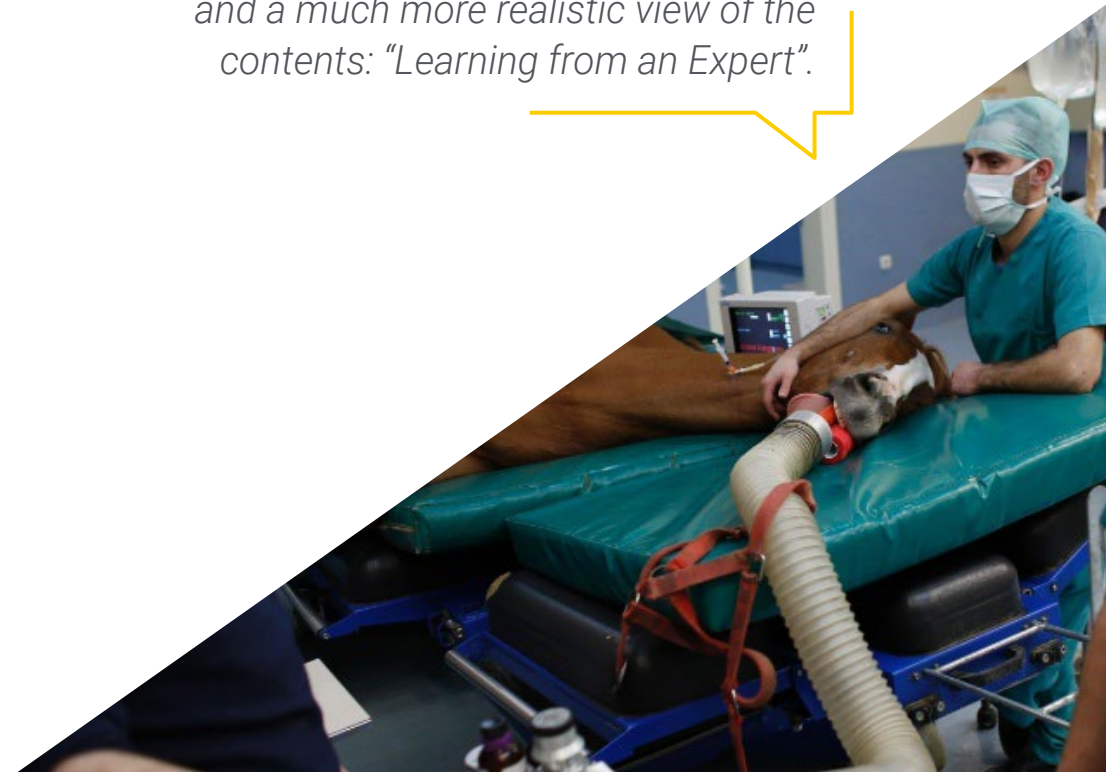
Our teaching staff is made up of working professionals. In this way, we ensure that we provide the up-to-date training we are aiming for. A multidisciplinary team of professionals trained and experienced in different environments, who will develop the theoretical knowledge efficiently, but, above all, will put at the service of the training the practical knowledge derived from their own experience.

This mastery of the subject is complemented by the effectiveness of the methodological design of this Advanced Master's Degree. Developed by a multidisciplinary team of *e-learning* experts, it integrates the latest advances in educational technology. In this way, you will be able to study with a range of comfortable and versatile multimedia tools that will give you the operability you need in this training.

The design of this program is based on Problem-Based Learning, an approach that sees learning as a highly practical process. To achieve this remotely, we will use telepractice. With the help of an innovative interactive video system and *Learning from an Expert*, you will be able to acquire the knowledge as if you were facing the scenario you are currently learning. A concept that will make it possible to integrate and fix learning in a realistic and permanent way.

*We give you the opportunity to take a deep and complete dive into the strategies and approaches in Equine Anesthesia and Surgery.*

*Our innovative telepractice concept will give you the opportunity to learn through an immersive experience, which will provide you with a faster integration and a much more realistic view of the contents: "Learning from an Expert".*





02

# Objectives

The objective is to train highly qualified professionals for work experience. An objective that is complemented, moreover, in a global manner, by promoting human development that lays the foundations for a better society. This objective is aimed at helping professionals reach a much higher level of expertise and control. A goal that you can take for granted, with a high intensity and high precision specialization.







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*If your goal is to improve in your profession, to acquire a qualification that will enable you to compete among the best, then look no further: Welcome to TECH”*



## General Objectives

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- ♦ Examine the anatomy and physiology of the cardiovascular system and the functioning of the respiratory system
- ♦ Establish the normal functioning of the digestive and renal systems
- ♦ Develop specialized knowledge about the functioning of the nervous system and its response to anesthesia
- ♦ Analyze the particularities of the different species (ruminants, swine, camelids and equids)
- ♦ Examine the requirements of a pre-anesthetic assessment and develop expertise in interpreting anesthetic risk
- ♦ Establish the pre-anesthetic preparation required for large species
- ♦ Analyze the pharmacological properties of injectable drugs
- ♦ Determine available sedative and tranquilizing drugs
- ♦ Delve into the available protocols for deep sedation
- ♦ Generate advanced knowledge of pharmacology and clinical maneuvers in the induction and intubation period in small and large ruminants, swine and camelids
- ♦ Provide safe options of current and new combinations of these agents for safe and effective induction of general anesthesia in the equine patient
- ♦ Detail the procedure of endotracheal intubation in the equine patient
- ♦ Examine the main physiological, anatomical and clinical needs related to the different types of decubitus and limb positioning of the equine patient
- ♦ Determine the components and operation of anesthetic machines, respiratory systems, oxygen delivery systems and artificial ventilation
- ♦ Generate specialized knowledge of pharmacology of halogenated inhalation anesthetics, injectable anesthetics, sedative adjuvants, as well as the most recent TIVA and PIVA techniques described for ruminants, swine and camelids and for the equine species
- ♦ Develop advanced knowledge on mechanical ventilation to recognize the need for it and the most effective and safe settings for ruminants, swine and camelids, as well as for equine species.
- ♦ Determine the pharmacology and clinical application of neuromuscular blocking agents
- ♦ Compile specialized knowledge on the anesthetic recovery phase in ruminants, swine, camelids and equine species
- ♦ Determine the vital importance of the correct use of the anesthetic record during general anesthesia
- ♦ Examine and gain an in-depth understanding of the vital signs that should be monitored during general anesthesia or sedation of the equine patient
- ♦ Establish the technical characteristics of the main monitoring equipment used in the equine patient
- ♦ Develop the main peculiarities of monitoring in ruminants, swine and camelids
- ♦ Analyze the pathophysiological principles governing pain processes
- ♦ Determine the characteristics and correct use of pain scales specific to the equine species
- ♦ Generate specialized knowledge of the pharmacology of the main families of analgesic agents
- ♦ Examine the pharmacological peculiarities of analgesic agents in ruminants, swine and camelids

- ♦ Examine the anatomy relevant to the loco-regional techniques to be performed
- ♦ Generate specialized knowledge on the clinical pharmacology of the local anesthetics to be used
- ♦ Determine the equipment necessary to perform the different loco-regional techniques
- ♦ Detail how to perform the different loco-regional techniques on large ruminants, small ruminants, swine and camelids
- ♦ Establish how to perform the different loco-regional techniques on horses
- ♦ Identify, prevent and resolve complications during the perianesthetic period in the horse
- ♦ Establish the appropriate clinical approach to cardiorespiratory resuscitation in the adult horse and neonatal foal
- ♦ Identify, prevent and resolve complications during the perianesthetic period in small and large ruminants, swine and camelids
- ♦ Establish the basis of body fluid and electrolyte physiology in the equine patient
- ♦ Determine the acid-base balance and interpret the most common alterations in the equine patient
- ♦ Examine the techniques and skills required for venous catheterization in the equine patient
- ♦ Establish the clinical and laboratory parameters important for monitoring fluid therapy in the equine patient
- ♦ Establish the physiological particularities related to fluid therapy in ruminants, swine and camelids
- ♦ Examine the main characteristics of crystalloid and colloid solutions frequently used in ruminants, swine and camelids
- ♦ Generate specialized knowledge related to the therapeutic applications of fluid therapy in ruminants, swine and camelids
- ♦ Analyze the types of fluids available to the equine patient
- ♦ Get to know the main characteristics of the most frequently performed procedures in the station under sedation
- ♦ Detail the most relevant characteristics related to the anesthetic management of the most frequent diagnostic and therapeutic procedures
- ♦ Generate specialized knowledge for the correct anesthetic management of animals destined for human consumption
- ♦ Master the legislation related to animals for human consumption as well as for experimentation
- ♦ Detail the main logistical, pharmacological and clinical requirements for the correct anesthetic management of wild animals
- ♦ Specify the most characteristic peculiarities of the anesthetic management of the most frequent diagnostic and therapeutic procedures in foals
- ♦ Perform euthanasia protocols that respect the physical and mental well-being of the horse
- ♦ Identify the different anatomical structures and pathologies of the digestive tract of the horse
- ♦ Develop and advance in the most frequent procedures to solve oral cavity pathologies
- ♦ Recognize the symptoms of digestive disorders
- ♦ Enable the clinician to correctly assess the systemic state of the animal and the consequent severity of the pathology
- ♦ Establish diagnostic protocols and generate optimized treatments and prognoses
- ♦ Establish optimal preventive medicine criteria and good management guidelines

- ♦ Establish an appropriate methodology for the examination of the horse with respiratory or cardiac problems.
- ♦ Identify all clinical signs associated with respiratory or cardiovascular disease in equines.
- ♦ Generate specialized knowledge of respiratory and cardiac auscultation.
- ♦ Establish the specific clinical approach to the horse with a respiratory or cardiovascular disorder.
- ♦ Specialize the clinician in the approach to the patient with advanced alterations in the hemogram, biochemistry or hematopoiesis disorders.
- ♦ Develop an innovative and up-to-date methodology for patients with immune-mediated disorders.
- ♦ Develop and expand knowledge of endotoxic shock in order to provide the patient with the latest treatments.
- ♦ Examine the physiology of food consumption and the physical distribution and transport of the food bolus through the small and large intestine, as well as the processes of nutrient absorption in the different digestive compartments.
- ♦ Determine the conversion of nutrients into energy available for the different organic functions of the horse
- ♦ Establish the different nutritional needs in the horse's diet, as well as its energy requirements according to sporting discipline, productive objective or maintenance as a domestic animal.
- ♦ Assess the cachectic horse: history and nutritional status, possible differentials, knowledge of metabolic consequences and requirements for subsequent dietary adjustment.
- ♦ Generate specialized knowledge on new developments in antibiotic therapy and antibiotic resistance.
- ♦ Examine prebiotics, probiotics, as well as the use of medicinal plants in response to the high market demand that exists today in this area of medicine.
- ♦ Update and develop in depth knowledge and new concepts in the diagnosis and treatment of lameness in the horse.
- ♦ Identify the applied anatomy and pathologies affecting the different structures of the locomotor system of the equine.
- ♦ Develop advanced screening and diagnostic methods available in the field clinic.
- ♦ Delve into both medical and surgical treatments applicable in the field clinic.
- ♦ Fundamental knowledge of wounds, tendon lacerations and musculoskeletal infections.
- ♦ Establish an appropriate methodology for its exploration, diagnosis and treatment.
- ♦ Generate specialized knowledge of the different materials and techniques used for the treatment of these pathologies.
- ♦ Propose therapeutic strategies in wound management alternative to the conventional ones.
- ♦ Provide an in-depth knowledge of the most common dermatological problems.
- ♦ Identify all clinical signs associated with each dermatological disease
- ♦ Establish the specific clinical approach for each pathology and determine the prognosis and the most appropriate treatment for each skin disease
- ♦ Identify the challenges and problems encountered by the veterinarian in the practice of equine clinical oncology.
- ♦ Establish the principles of diagnosis and treatment of cutaneous neoplasms affecting horses.
- ♦ Develop a detailed knowledge of the pathological processes affecting the endocrine system of the horse.
- ♦ Develop management strategies for the obese and insulin resistant horse.



- ♦ Establish an appropriate methodology for the identification and localization of neurological injuries in the horse.
- ♦ Identify alterations in consciousness and behavior and establish protocols for action.
- ♦ Define the approach to the ataxic horse and establish protocols for action.
- ♦ Examine diagnostic methods in equine neurology.
- ♦ Detail therapeutic protocols.
- ♦ Establish an appropriate methodology for ophthalmologic examination of the horse.
- ♦ Identify all clinical signs associated with ocular alterations in equines.
- ♦ Determine the specific clinical approach to the horse with an ocular disorder.
- ♦ Analyze the complementary methods available to diagnose the main ocular alterations in equines.
- ♦ Generate specialized knowledge on the main ocular pathologies in the horse.
- ♦ Establish the general and specific treatment for the main ocular pathologies in the horse
- ♦ Identify the pathologies of the urinary system of the horse.
- ♦ Establish diagnostic protocols to facilitate the recognition of patients with urinary pathology.
- ♦ Expand the alternatives of possible treatments according to pathological situations.
- ♦ Recognize the medical and surgical genital pathologies of the stallion and the broodmare, assess their extent and provide appropriate treatments for recovery and restoration of proper reproductive function.
- ♦ Develop surgical techniques for the resolution of pathologies of the reproductive system that can be performed in the field.
- ♦ Recognize representative clinical signs of disease in the newborn foal.
- ♦ Establish effective working protocols for the early detection of sick neonates.
- ♦ Develop treatment protocols for the different diseases of the neonate.
- ♦ Optimize the use of foal imaging in the field.
- ♦ Identify and decipher the particular characteristics of the pathologies of the locomotor system that appear during the development and growth of the foal from birth until the end of its pediatric period.
- ♦ Develop the main specific medical and surgical techniques for pathologies affecting the foal in the field.
- ♦ Develop sedation and ambulatory anesthesia procedures.
- ♦ Determine the necessary tools for the assessment of the critically ill patient, providing the knowledge that enables the student to perform hospital treatments, such as advanced pain management, correction of hydro-electrolyte balance and acid-base balance, intensive care in the neonate and intensive care in the adult.
- ♦ Deepen in the fundamental medicinal and pharmacological considerations for high level sport horses.
- ♦ Delve into equine toxicology.
- ♦ Develop the application of humane euthanasia protocols.



## Specific Objectives

### Module 1. Physiology Applied to Anesthesia in Major Species

- ♦ Examine the anatomical and physiological peculiarities of large and small ruminants that are relevant to the design of a safe anesthetic protocol in these species
- ♦ Examine equine cardiac anatomy, the basis of electrophysiological behavior of the heart, and the stress response produced by anesthesia in the equine patient
- ♦ Develop the anatomical and physiological peculiarities of swine and camelids that are relevant to the design of a safe anesthetic protocol for these species
- ♦ Determine the cardiac mechanical processes related to blood circulation
- ♦ Establish the hormonal and neuronal mechanisms involved in the control of the cardiovascular system
- ♦ Develop processes related to ventilation and gas exchange
- ♦ Analyze the clinical implications of respiratory alterations in anesthetized patients
- ♦ Determine the normal anatomy and physiology of the digestive system and the consequences of anesthesia on the digestive system
- ♦ Establish the excretion and hormonal processes related to the renal system
- ♦ Generate specialized knowledge on the anatomy and physiology of the nervous system
- ♦ Analyze the alterations produced by anesthetic drugs in the nervous system



**Module 2. Assessment, Preanesthetic Preparation and Sedation in Major Species**

- ♦ Determine the physical examination and common findings in the equine pre-anesthetic assessment
- ♦ Strengthen the basics of pre-anesthesia laboratory assessment
- ♦ Analyze, identify and interpret the patient's anesthetic risk
- ♦ Establish the necessary actions in the preparation of the patient for anesthesia
- ♦ Detail the pharmacological particularities of the main sedative drugs in ruminants, swine and camelids
- ♦ Develop expertise in pharmacokinetics and pharmacodynamics of drugs in horses
- ♦ Know the pharmacological properties and clinical implications of sedative and tranquilizing drugs
- ♦ Establish the most common station procedures and protocols in the equine patient

**Module 3. Induction of General Anesthesia in Major Species**

- ♦ Generate specialized knowledge on the pharmacology of dissociative agents and barbiturates given the side effects and the main contraindications for their administration
- ♦ Examine the pharmacology of propofol, alfaxalone and etomidate, given the side effects and major contraindications for their administration
- ♦ Develop advanced knowledge of the pharmacology of muscle relaxants such as benzodiazepines and guaifenesin
- ♦ Examine the anatomical, physiological and pharmacological considerations necessary to perform effective and safe induction of general anesthesia and endotracheal intubation in small and large ruminants, swine and camelids. Determine the physiological and anatomical considerations necessary to perform effective and safe tranquilizations for patients and personnel in the equine population
- ♦ Compile the clinical and anatomical knowledge necessary for the safe performance of endotracheal intubation in the equine patient
- ♦ Develop anatomical and physiological knowledge essential for the correct positioning of the equine patient in decubitus, in order to avoid the complications associated with decubitus.

#### **Module 4. General Anesthesia and Equipment in Major Species**

- ♦ Analyze the most frequent problems in the anesthetic machine and the circular circuit, in order to identify and solve them
- ♦ Gain knowledge and understand the operation of oxygen delivery systems and artificial ventilation during general anesthesia of large species
- ♦ Get to know the pharmacology of halogenated inhalation anesthetics, as well as their adverse effects in large animals
- ♦ Gain an in-depth knowledge of injectable sedative and hypnotic agents that can be used as adjuvants or general anesthetics, as well as the latest techniques described for equine PIVA and TIVA
- ♦ Detail the techniques of general anesthesia, both inhalable and injectable, described in large and small ruminants, swine and camelids
- ♦ Recognize the need for mechanical ventilation during anesthesia, know the positive and negative consequences of mechanical ventilation, and know the appropriate ventilatory parameters for its safe application
- ♦ Expand knowledge about specific particularities of mechanical ventilation in large and small ruminants, swine and camelids
- ♦ Detail the mechanism of action of neuromuscular blocking agents as well as their pharmacology
- ♦ Become familiar with the techniques for monitoring neuromuscular blockade and the agents used to reverse this blockade
- ♦ Recognize the importance of recovery from general anesthesia in equines
- ♦ Expand knowledge related to the techniques that can be used and the necessary preparation of the patient and the box
- ♦ Detail the specific particularities of anesthetic recovery in large and small ruminants, swine and camelids

#### **Module 5. Monitoring in Major Species**

- ♦ Detail the correct and regular use of the anesthetic record during general anesthesia
- ♦ Determine the importance and the most characteristic clinical signs of anesthetic depth monitoring in the equine patient
- ♦ Generate specialized knowledge on blood oxygenation monitoring and with the monitoring of proper ventilation
- ♦ Analyze the importance and main technical features related to the monitoring of cardiovascular and hemodynamic constants
- ♦ Develop the leading role of arterial blood gases in the clinical monitoring of the equine patient during general anesthesia
- ♦ Detail the peculiarities of monitoring other types of vital parameters, such as glucose, lactate, temperature or the degree of neuromuscular blockade
- ♦ Examine the main peculiarities of anesthetic monitoring in other species such as ruminants, swine and camelids



### Module 6. Analgesia in Major Species

- ♦ Examine the definition of pain, as well as the different types of pain in relation to their pathophysiology and evolution over time
- ♦ Determine the main physiological components associated with pain sensation
- ♦ Generate specialized knowledge related to the nociception pathway
- ♦ Determine the main pathophysiological consequences of untreated pain
- ♦ Analyze the knowledge of the use of pain scales in the equine patient
- ♦ Generate advanced knowledge of pharmacology of opioids, NSAIDs, alpha-2 agonist agents, ketamine, lidocaine and other adjuvant analgesic drugs
- ♦ Establish the main side effects of opioids, NSAIDs, alpha-2 agonist agents, ketamine, lidocaine and other adjuvant analgesic drugs
- ♦ Determine the main contraindications to the administration of opioids, NSAIDs, alpha-2 agonist agents, ketamine, lidocaine and other adjuvant analgesic drugs
- ♦ Examine the clinical uses of opioids, NSAIDs, alpha-2 agonist agents, ketamine, lidocaine, and other adjuvant analgesic drugs
- ♦ Establish the main pharmacological peculiarities of analgesic agents in ruminants, swine and camelids

### Module 7. Locoregional Anesthesia in Major Species

- ♦ Determine which drugs are to be administered
- ♦ Establish the equipment to be used
- ♦ Examine the anatomy of the head in relation to the nerve blocks performed
- ♦ Generate specialized knowledge on local head, forelimb and hind limb techniques
- ♦ Examine the anatomy of the forelimb and hind limb in relation to nerve blocks
- ♦ Develop the anatomy of the abdomen in relation to the nerve blocks performed
- ♦ Generate advanced knowledge on local abdominal techniques
- ♦ Examine the anatomy of the vertebral canal
- ♦ Develop the epidural technique
- ♦ Determine the main loco-regional techniques in other large animal species

## Module 8. Anesthetic Complications and Cardiopulmonary Resuscitation

- ♦ Get to know the published studies on pre-anesthetic mortality and morbidity in horses
- ♦ Get to know the risk factors and causes involved in preanesthetic mortality
- ♦ Identify, anticipate and resolve complications that occur in the premedication phase
- ♦ Identify, anticipate and resolve complications that occur in the induction phase
- ♦ Identify, anticipate and resolve complications that occur in the maintenance phase
- ♦ Identify, anticipate and resolve complications that occur in the recovery and postoperative phase
- ♦ Early recognition of life-threatening cardiorespiratory emergencies in horses
- ♦ Develop effective cardiorespiratory resuscitation protocols
- ♦ Be aware of the complications related to improper positioning of the ruminant, swine or camelid patient
- ♦ Recognize the main cardiovascular complications in ruminants, swine and camelids
- ♦ Identify and know the main arrhythmias in ruminants, swine and camelids
- ♦ Recognize the main respiratory complications in ruminants, swine and camelids
- ♦ Gain knowledge about the complications related to endotracheal intubation in swine
- ♦ Recognize the complications related to the digestive tract of ruminants
- ♦ Study the complications associated with the gastrointestinal system in camelids
- ♦ Recognize complications associated with intravenous catheter placement in ruminants, swine and camelids
- ♦ Broaden knowledge of the pathophysiology of malignant hyperthermia
- ♦ Identify the complications that can occur during anesthetic recovery in ruminants, swine and camelids



## Module 9. Fluid Therapy in Major Species

- ◆ Detail the physiology and movement of body water
- ◆ Delve into the physiology and alterations of the most important electrolytes
- ◆ Determine the acid-base balance and its regulation
- ◆ Interpret pH alterations
- ◆ Reinforce the important factors for catheter and catheterization site selection
- ◆ Detail the most frequent complications of venous catheterization
- ◆ Analyze the most frequent crystalloid fluids
- ◆ Detail the properties of blood derivatives and know their complications
- ◆ Delve into the physiological particularities of ruminants, swine and camelids in relation to fluid therapy
- ◆ Establish the properties of the isotonic, hypotonic and hypertonic crystalloid solutions most frequently used in ruminants, swine and camelids
- ◆ Delve into the study of the use of colloids in ruminants, swine and camelids
- ◆ Clinical fluid therapy applied to the perioperative period, as well as to electrolyte and glucose imbalances in ruminants, swine and camelids

## Module 10. Cases and Special Clinical Situations in Major Species

- ◆ Generate specialized knowledge on the most frequent surgical and imaging procedures
- ◆ Establish the most appropriate protocols according to the procedure to be performed
- ◆ Detail the main differences in the anesthesia of foals compared to adults
- ◆ Be aware of the risk factors and complications in colic anesthesia in order to adapt the anesthetic protocol
- ◆ Detail the physiological aspects to be taken into account during anesthesia in geriatric horses
- ◆ Gain in depth knowledge of the anesthetic management of the main diagnostic and therapeutic procedures in large and small ruminants

- ◆ Detail the anesthetic management of ruminant adnexal organs such as horns, hooves or tails
- ◆ Master the characteristics of anesthesia in swine transplantation models, as well as for laparoscopy in experimental swine
- ◆ Establish basic characteristics of field anesthesia in pigs and castration of piglets
- ◆ Determine the basic principles of field anesthesia in camelids
- ◆ Define the main behavioral, physiological and anatomical characteristics of donkeys and mules
- ◆ Delve into the pharmacology of anesthetic and analgesic agents in donkeys and mules
- ◆ Master the legislation applicable to the anesthesia of animals intended for human consumption
- ◆ Master the veterinary prescription drug cascade
- ◆ Establish waiting times and maximum residue limits applicable to species for human consumption
- ◆ Master the legislation applicable to experimental animals
- ◆ Detail the particularities of anesthesia for ruminants and experimental swine
- ◆ Broaden knowledge of the logistics and pharmacological methods most appropriate for the capture and handling of wild species
- ◆ Master sedation and field anesthesia protocols in wild ruminants
- ◆ Determine protocols for sedation and field anesthesia in wild swine
- ◆ Detailed protocols for sedation and field anesthesia in wild camelids
- ◆ Expand knowledge related to monitoring alternatives in these non-domestic species
- ◆ Determine analgesic techniques that can be applied in these non-domestic species
- ◆ Examine the main physical and chemical methods of euthanasia

### Module 11. Digestive System

- ♦ Define correct methods of anamnesis, evaluation and assessment of the patient with digestive pathology.
- ♦ Develop and advance in the most frequent procedures to solve oral cavity pathologies.
- ♦ Establish anesthetic blocking protocols for oral surgery and dental extractions.
- ♦ Recognize and resolve mandibular and maxillary pathologies.
- ♦ Properly develop general examination procedures such as rectal palpation, nasogastric probing, abdominocentesis, interpretation of analytical tests and diagnostic imaging in field conditions, and establish the appropriate treatments and issue the correct prognosis in the horse with abdominal pain.
- ♦ Develop and advance in depth in the diseases affecting the digestive tract from the stomach to the rectum, assessing the stage of the pathologies that appear.
- ♦ Develop and advance in depth on liver and biliary tract diseases in the horse and their possible treatments.
- ♦ Develop and advance in depth in infectious and parasitic diseases of the digestive tract, as well as their various treatments.
- ♦ Broaden knowledge, establish and develop the correct decision criteria to treat abdominal syndrome in the horse in the field, or in case of requiring surgical treatment, to be able to correctly inform the owner and advise on the referral of cases to the hospital in case they need surgery.

### Module 12. Cardiorespiratory and Vascular System

- ♦ Specify the necessary information in the clinical examination of the horse with respiratory or cardiac pathology.
- ♦ Accurately recognize the normal respiratory and cardiac sounds found in horses.
- ♦ Identify respiratory pathologies in order to classify them and decide on possible diagnostic tests if needed
- ♦ Establish the knowledge required when performing diagnostic procedures for the respiratory patient such as laboratory tests, cytology, BAL diagnostic imaging
- ♦ Propose a work methodology for patients with upper respiratory tract pathologies
- ♦ Propose a work methodology for patients with inflammatory lower respiratory tract pathologies.
- ♦ Identify the surgical pathologies of the upper respiratory tract and develop the technical procedures that can be performed in the field, both in scheduled and emergency conditions.
- ♦ Propose a work methodology for patients with infectious respiratory pathologies.
- ♦ Differentiate between physiological murmurs and pathological murmurs
- ♦ Establish differential diagnoses of abnormal rhythms based on irregularity and heart rate
- ♦ Propose a work methodology for the patient with cardiac murmur
- ♦ Propose a work methodology for patients with arrhythmias.



### Module 13. Hematopoietic System, Immunology and Nutrition

- ♦ Delve into the study of blood components, as well as to attend in detail to the serological biochemical markers, all of them analytical parameters that the clinical specialist must know in depth, in order to be able to relate possible alterations in this sense to pathological situations of any kind.
- ♦ Develop advanced knowledge on possible alterations related to hematopoiesis, as well as alternatives in terms of leading-edge treatments.
- ♦ Achieve a high degree of knowledge of the pathophysiological mechanisms of immune-mediated disorders in order to select the latest diagnostic tests and appropriate treatment
- ♦ Delve into the pathophysiological mechanisms of endotoxemia and the development of endotoxic shock, in order to prevent secondary complications associated with this process and to apply the most up to date treatments.
- ♦ Understand the processes of digestion and absorption of nutrients in the different anatomical compartments of the horse's digestive tract.
- ♦ Provide the basic knowledge on nutrients necessary for the development of feeding programs.
- ♦ Estimate a horse's weight and determine its body condition.
- ♦ Easy calculation of daily fodder and grain or compound feed requirements
- ♦ Differentiate and know how to apply the terms gross, digestible and net energy.
- ♦ Delve deeper into the knowledge of antibiotic treatment alternatives, as well as the development of antibiotic resistance, in order to train the clinician in decision making in situations where there is an important restriction of antibiotic use, either by the patient's category or by the appearance of bacterial resistance.
- ♦ Update on prebiotics, probiotics, as well as the use of medicinal plants and their relevance as important tools in preventive medicine, as well as in the treatment of specific pathologies

### Module 14. Locomotor System

- ♦ Identify in depth the pathologies affecting the musculoskeletal system of the horse by types of pathologies of the different anatomical regions.
- ♦ Master in depth the correct approach to the clinical case that may be presented; Obtain and control the tools for the correct exploration of the animal and a correct interpretation of the data obtained.
- ♦ Develop optimized work schemes and diagnostic protocols.
- ♦ Advanced diagnosis of joint, tendon, bone and muscle pathologies in horses.
- ♦ Master in depth the neural anesthetic blocks, their technique, main advantages and possible disadvantages
- ♦ Develop proximal blocks and other advanced anesthetic desensitization techniques
- ♦ Master and develop in depth imaging techniques and other complementary diagnostic methods in the field.
- ♦ Receive training in the latest published therapeutic measures and the latest advances in research in the treatment of locomotor pathologies.
- ♦ Master and develop advanced medical and surgical techniques that can be performed in the field.

### Module 15. Surgical Pathologies of the Skin and Related Structures

- ◆ Specify the different types of wounds that can occur in the equine clinic
- ◆ Identify and differentiate between acute and chronic pathologies
- ◆ Assess the degree of contamination and/or infection, if any
- ◆ Recognize damaged adjacent structures, assessing whether they are septic or not
- ◆ Develop knowledge of the different phases of skin healing.
- ◆ Determine the techniques of tissue management, hemostasis, suturing, reconstruction and skin grafting.
- ◆ Set guidelines for the choice of the different types, materials and patterns of suture and needle and drainage models available to the clinician in the field.
- ◆ Establish the different types and materials of bandages, both for wound treatment and immobilization
- ◆ Select the appropriate dressing or bandage for each clinical situation.
- ◆ Apply the different therapeutic guidelines and reparation procedures and other first aid techniques for acute and fresh wounds.
- ◆ Apply the different therapeutic guidelines and repair procedures for complicated, chronic and infected wounds, contemplating the possibility of the application of alternative procedures and technologies.
- ◆ Indicate the tests to be performed on a patient with a musculoskeletal injury or infection to determine the significance of the injury.
- ◆ Perform correct diagnosis and treatment of synovial and bone infections and perform joint lavage procedures and regional and intraosseous perfusion of antibiotics in the field.
- ◆ Specify the use of the different tenorrhaphy techniques in order to treat damage and lacerations of tendon and/or ligament structures.
- ◆ Present the different causes of exuberant granulation and its treatment.
- ◆ Apply the different therapeutic guidelines in burns and abrasions of different types.





### Module 16. Medical Pathologies of the Skin. Endocrine System

- ◆ Identify the main pathologies affecting the skin
- ◆ Examine the origin of the problem and establish the prognosis of dermatitis
- ◆ Recognize the clinical and laboratory signs of the main dermatological diseases
- ◆ Identify the symptoms of bacterial and viral skin diseases and propose therapeutic options.
- ◆ Determine the symptoms of skin diseases of fungal and parasitic origin and propose therapeutic options.
- ◆ Establish the symptoms of allergic and immune-mediated skin diseases and propose therapeutic options.
- ◆ Examine the symptoms of other skin diseases, as well as their prognosis and treatment options
- ◆ Identify and develop the clinical presentation, diagnosis and management of the main types of neoplasms affecting horses.
- ◆ Generate advanced knowledge on the pathology, diagnosis and management of sarcoids, squamous cell carcinomas, melanocytic tumors, mastocytomas and lymphomas.
- ◆ Examine recent developments in the therapy of cutaneous neoplasms in horses.
- ◆ Develop advanced knowledge on the pathology, diagnosis and management of equine metabolic syndrome and dysfunction of the intermediate pituitary gland in horses.
- ◆ Identify the processes that occur with alterations in thyroid hormone concentrations.
- ◆ Determine the most common causes of alterations in calcium, phosphorus and magnesium levels in the horse

### **Module 17. Nervous System and Ophthalmology**

- ♦ Identify all clinical signs associated with neurological disease.
- ♦ Define the key points of the neurological assessment.
- ♦ Establish differential diagnoses based on the main neurological pathologies of the horse.
- ♦ Present and analyze the diagnostic tools available for the different processes.
- ♦ Propose specific measures for the management of the neurological patient.
- ♦ Update neurological patient treatments both in the field and at the hospital setting.
- ♦ Define parameters that help us to establish a prognosis for the patient.
- ♦ Deepen in the use of diagnostic tools in ophthalmology, such as direct and indirect ophthalmoscopy, fundus assessment and electroretinography.
- ♦ Accurately recognize clinical signs of eye pain in horses.
- ♦ Establish differential diagnoses of ocular clinical signs.
- ♦ Propose a working methodology for the patient with corneal ulcers and/or infectious keratitis.
- ♦ Propose a working methodology for the patient with stromal abscess and immune-mediated keratitis
- ♦ Establish a working methodology for the patient with equine recurrent uveitis and for the patient with cataracts.
- ♦ Propose a working methodology for patients with glaucoma and for horses with ocular neoplasia

### **Module 18. Reproductive and Urinary System**

- ♦ Increase knowledge of pathologies affecting the urinary system.
- ♦ Recognize and establish protocols for the management of patients with acute renal failure and chronic renal failure.
- ♦ Establish work protocols for patients with post-renal urinary pathology
- ♦ Develop the predisposing factors that may condition the appearance of this type of pathologies, as well as to increase knowledge on the relevance of prevention
- ♦ Develop treatment alternatives available to the ambulatory veterinary clinician.
- ♦ Delve into the pathology of the testicles, adnexal glands and penis, as well as their respective treatments
- ♦ Improve the productive management of the sub-fertile stallion and mare.
- ♦ Identify and evaluate possible anomalies in the horse's ejaculate, applying the necessary procedures to guarantee its quality.
- ♦ Identify, treat and prevent parasitic and infectious pathologies of the equine reproductive system.
- ♦ Develop the pathologies of the female during the mating period and their possible treatments.
- ♦ Develop the pathologies that affect the female during the gestation period and their possible treatments.
- ♦ Develop the pathologies that affect the female during the pre- and post-partum period and their possible treatments
- ♦ Attend to the needs and demands of euthyroid delivery and placental assessment.
- ♦ Develop the procedures involved in the care of dystocic labor and the performance of fetotomy.
- ♦ Develop procedures that include the resolution of possible injuries associated with labor and delivery, such as correction of rectovestibular fistulas, reconstruction of external lacerations and repair of the perineal body.



## Module 19. Foal Medicine and Surgery

- ♦ Identify the neonatal patient with abnormal behaviors indicative of disease.
- ♦ Establish lines of action for neonatal patients with sepsis, based on severity
- ♦ Determine work protocols for patients with symptoms of neonatal asphyxia syndrome.
- ♦ Recognize the patient with cardio-respiratory symptomatology, being able to issue prognoses that determine their viability.
- ♦ Develop field stabilization protocols for patients with bladder rupture or persistent urachus
- ♦ Identify the difference in diagnostic test results between neonates and adults.
- ♦ Determine the use of diagnostic imaging methods that can be used in the field to diagnose pathologies in the foal, both in the neonatal and pediatric period; Use these methods accurately to diagnose and assess the different pathologies that may occur in these stages.
- ♦ Develop the techniques of examination, diagnosis and parenteral and local treatment by joint lavage of septic arthritis in the neonate.
- ♦ Develop techniques that can be performed in the field to solve surgical pathologies of the growing foal, such as umbilical hernia correction.
- ♦ Compile knowledge of angular and flexural deformities of the foal
- ♦ Develop their different treatments and establish the specificities of their treatment according to the age of the patient and the anatomical region affected
- ♦ Detail the medical treatments and application of resins, splints and orthopedic hardware used in the treatment of angular and flexural deformities.
- ♦ Specify the techniques for delaying and stimulating bone growth used in the surgical treatment of angular deformities
- ♦ Determine the desmotomy and tenotomy techniques used in the treatment of flexural deformities.
- ♦ Establish an appropriate methodology for the identification, treatment and prognostication of osteochondral injuries and subchondral bone cysts.

## Module 20. Advanced Therapeutic Protocols and Toxicology

- ♦ Analyze the new alternatives in terms of drugs used in sedation and anesthesia for outpatient use, as well as to delve into the most established protocols in order to optimize this type of procedures
- ♦ Train the clinician in effective and dynamic decision making when dealing with a patient with a serious systemic condition, in order to ensure diagnoses and treatments that ensure patient stabilization despite non-hospital conditions.
- ♦ Specialize the clinician in the correction of hydro-electrolyte and acid-base imbalances to ensure the reversal of hemodynamic alterations.
- ♦ Ensure advanced knowledge of equine pain management with the latest medications.
- ♦ Examine the characteristics and special considerations to be taken into account when applying pharmacological treatments in the sport horse, with special emphasis on avoiding problems in case of possible positive results in control tests for biological substances in competitions.
- ♦ Generate advanced knowledge on equine toxicology, ensuring training for the recognition of toxic symptoms, as well as the identification of plants and agents harmful to equines
- ♦ Analyze euthanasia procedures in depth
- ♦ Be able to act correctly with their patients in these last moments of their life trajectory, applying euthanasia in the most humane way possible in case of last necessity

# 03 Skills

Once all the contents have been studied and the objectives of the Advanced Master's Degree in Equine Anesthesia and Surgery have been achieved, the professional will have superior competence and performance in this area. A very complete approach, in a high level specialization that makes the difference.





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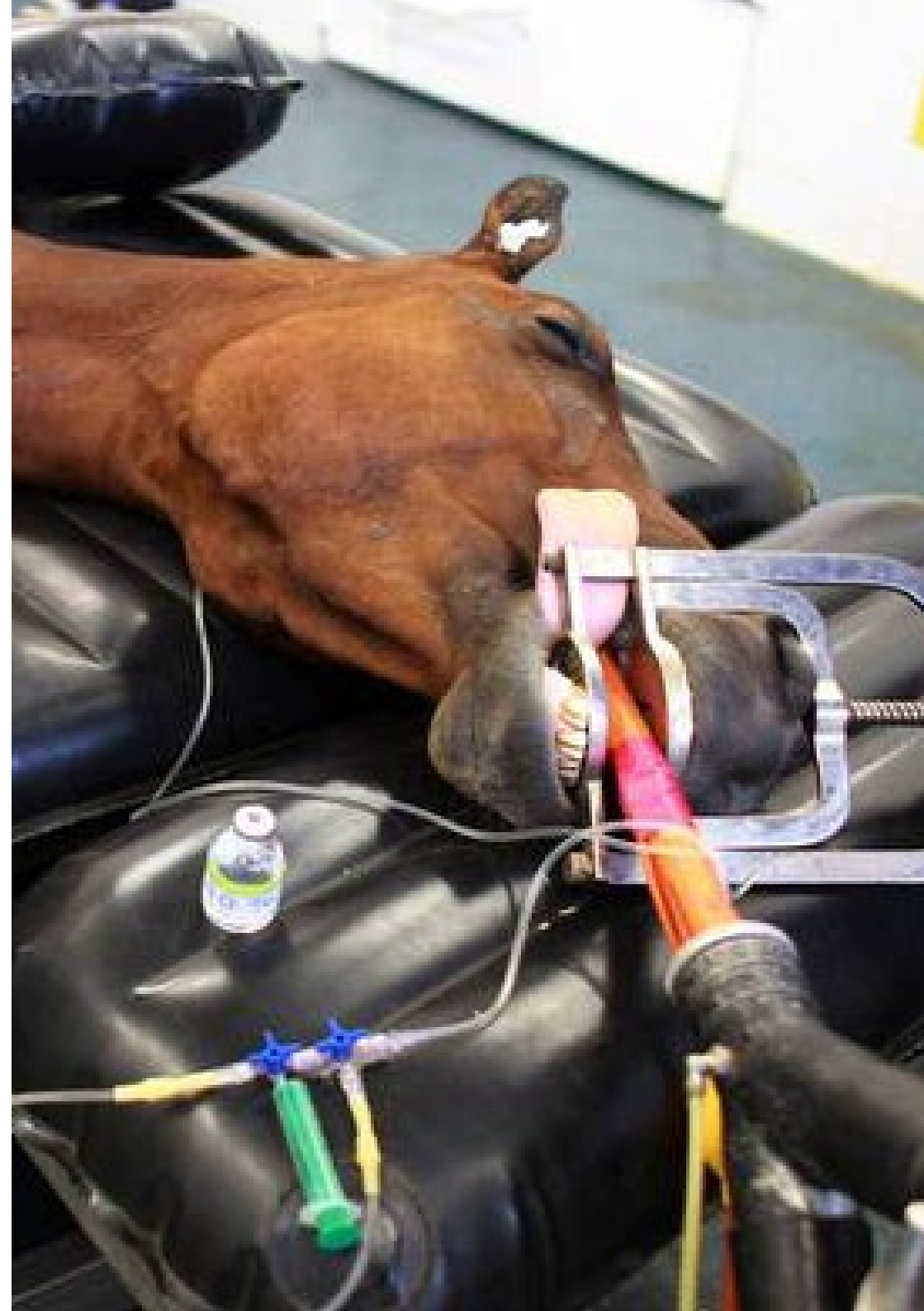
*Achieving excellence in any profession requires effort and perseverance. But, above all, the support of professionals, who will give you the boost you need, with the necessary means and assistance. At TECH, we offer you everything you need”*



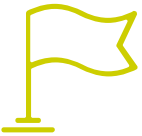
## General Skills

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- ♦ Acquire the necessary knowledge to be able to carry out a previous anesthetic approach
- ♦ Elaborate a specific anesthesia plan for each case
- ♦ Understand and know how to effectively use the necessary tools
- ♦ Understand and know how to implement existing protocols
- ♦ Understand and know how to develop the preoperative management
- ♦ Understand and know how to develop the operative management
- ♦ Understand and know how to develop postoperative management
- ♦ Master all aspects of anesthetic care in the individual patient
- ♦ Be able to create concrete plans in various specific situations: diseases, intolerances, critical states, etc
- ♦ Recognize equine diseases
- ♦ Master the action protocols in each case
- ♦ Master equine examination protocols
- ♦ Be competent in acting in the places to which they travel
- ♦ Competently perform the tasks of the equine ambulatory clinic
- ♦ Issue appropriate diagnoses







## Specific Skills

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- ◆ Know how to diagnose equine colic
- ◆ Handle the most complicated and the mildest cases
- ◆ Make quick decisions in case of urgency
- ◆ Decide when hospital referral is appropriate
- ◆ Perform adequate nutritional management
- ◆ Determine group conditions and their intervention
- ◆ Diagnose equine respiratory diseases
- ◆ Recognize upper respiratory tract disease
- ◆ Recognize lower respiratory tract diseases
- ◆ Educate the owner on prevention and early detection measures.
- ◆ Prescribe suitable treatments
- ◆ Recognize heart disease in equines
- ◆ Assess the clinical impact of a murmur or arrhythmia
- ◆ Know the alterations of the cardiovascular system
- ◆ Know the alterations of respiratory pathologies
- ◆ Master diagnostic techniques and protocols
- ◆ Be highly competent in the diagnosis of diseases related to the hematopoietic and immune system
- ◆ Prescribe and interpret laboratorial studies of blood components
- ◆ Recognize and address endotoxic shock
- ◆ Stabilize the patient quickly and effectively, especially in life-threatening situations
- ◆ Proper feeding and teaching the owner how to do it
- ◆ Perform advanced nutritional counseling in special cases
- ◆ Know the latest advances in equine antibiotic therapy
- ◆ Know which medicinal plants are useful in equine treatment.
- ◆ Diagnose diseases of the locomotor system
- ◆ Master equine anatomy
- ◆ Use medical advances in the locomotor area in equines
- ◆ Learn about the equine integumentary system at an advanced level
- ◆ Use available therapeutic options for the treatment of wounds and musculoskeletal injuries
- ◆ Achieve wound healing
- ◆ Intervene in joint and tendon injuries
- ◆ Surgical approach to lesions in this field
- ◆ Perform perioperative management
- ◆ Diagnose and intervene early in musculoskeletal infections
- ◆ Use larvatherapy and skin grafts in appropriate cases
- ◆ Recognize cutaneous neoplasms
- ◆ Early diagnosis of the same
- ◆ Detect, diagnose and treat endocrine diseases

- ◆ Recognize equine metabolic syndrome
- ◆ Recognize Cushing's syndrome in equines
- ◆ Know the geographic locations where these syndromes are most prevalent
- ◆ Recognize the most affected breeds
- ◆ Prescribe appropriate diagnostic tests
- ◆ Use conventional and advanced techniques in the approach
- ◆ Recognize equine neurological diseases
- ◆ Distinguish the etiological conditions that causes them
- ◆ Know the etiological agents that cause them
- ◆ Early detection and management of equine ocular conditions
- ◆ Diagnose and treat corneal ulcers
- ◆ Diagnose and treat uveitis
- ◆ Diagnose and treat stromal abscesses
- ◆ Diagnose and treat immune-mediated keratitis
- ◆ Diagnose and treat retinal detachment
- ◆ Diagnose and treat cataracts
- ◆ Diagnose and treat glaucoma
- ◆ Prescribe appropriate diagnostic tests for each case
- ◆ Attend equine labor and delivery
- ◆ Intervene in disorders of the reproductive system of equine males
- ◆ Intervene in disorders of the reproductive system of equine females
- ◆ Address surgical pathologies





- ◆ Perform traditional and avant-garde techniques
- ◆ Detect, diagnose and intervene in alterations of the urinary system
- ◆ Guideline and interpret diagnostic tests
- ◆ Detect and intervene in pathologies during pregnancy and labor in equines
- ◆ Perform early detection of labor and foal problems
- ◆ Handle portable diagnostic equipment in radiology and ultrasound of labor and foal
- ◆ Detect and intervene in osteochondrosis in foals
- ◆ Use up-to-date and advanced methods and protocols.
- ◆ Master all aspects of sedation and anesthesia
- ◆ Induce, maintain and reverse anesthesia
- ◆ Perform the care and protocols of a hospital intensive care unit
- ◆ Get to know the pharmacological management of the sport horse, anti-doping
- ◆ Address toxicological problems
- ◆ Know all aspects of euthanasia procedures

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*Our objective is very simple: to offer you quality specialized training, with the best teaching methods currently, so that you can reach new heights of excellence in your profession"*



# 04

# Course Management

For our program to be of the highest quality, we are proud to work with a teaching staff of the highest level, chosen for their proven track record in the field of education. Professionals from different areas and fields of expertise that make up a complete, multidisciplinary team. A unique opportunity to learn from the best.







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*Our professors bring their vast experience and their teaching skills to offer you a stimulating and creative specialized training program”*

## Management



### Dr. Salazar Nussio, Verónica

- D. in Medicine from the Complutense University of Madrid (Spain) in 2005
- Degree in Veterinary Medicine from the Complutense University of Madrid (Spain) in 2001
- Diplomate of the American College of Veterinary Anesthesia and Analgesia (ACVAA) in 2010
- Diplomate recognized by the European College of Veterinary Anesthesia and Analgesia (EVCAA) in 2018
- Her professional career has been mainly academic as a professor of veterinary anesthesia and analgesia in several Universities and Reference Centers in several countries such as the United States, Spain and the United Kingdom. In these centers she has performed clinical activity in large and small animals, as well as teaching and research activities
- In 2019 she becomes a RECOVER Certified Instructor in Basic and Advanced Life Support, a title awarded by the American College of Emergency and Critical Care. Since that same year, she has also been a RECOVER certified Rescuer in Basic and Advanced Life Support



### Dr. Varela del Arco, Marta

- Clinical Veterinarian in Equine Medicine, Surgery and Sports Medicine
- Head of the Large Animals Area of the Complutense Veterinary Clinic Hospital of Madrid (UCM)
- Associate Professor, Department of Animal Medicine and Surgery, Complutense University of Madrid (UCM)
- Head of Large Animal Unit at Complutense Clinical Veterinary Hospital of Madrid
- Assistant Professor in the Department of Animal Medicine and Surgery at UCM in 2007, she has been an Associate Professor in that Department from 2015 to the present
- She teaches in different undergraduate and graduate courses, university specialization programs and Professional Master's Degrees
- She actively participates as director of final projects in the Veterinary Degree and as a member of the tribunal of different doctoral theses

## Co-Direction



### Dr. De la Cuesta Torrado, María

- Veterinarian with clinical specialty in Equine Internal Medicine
- Associate Professor, Department of Equine Medicine and Surgery, Cardenal Herrera CEU University of Valencia since 2012
- Member of the Organizing Committee of the "12th European College of Equine Internal Medicine Congress 2019 (ECEIM)"
- Member of the Board of Directors of Spanish Society of Ozone Therapy
- Member of the Equine Clinicians Commission of the Official College of Veterinarians of Valencia
- Member of the Spanish Association of Equine Veterinarians (AVEE)
- Member of the scientific committee and coordinator of courses and congresses in the area of ozone therapy, supported by continuing education credits (CEC) granted by the National Health System

## Professors

### Dr. Salazar, Verónica

- PhD in Medicine from the Complutense University of Madrid (Spain) in 2005, LV, MSc, PhD, DipACVAA, DipECVAA
- Degree in Veterinary Medicine from the Complutense University of Madrid (Spain) in 2001
- Diplomate of the American College of Veterinary Anesthesia and Analgesia (ACVAA) in 2010
- Diplomate recognized by the European College of Veterinary Anesthesia and Analgesia (EVCAA) in 2018

### Dr. Arenillas, Mario

- Degree in Veterinary Medicine from the Complutense University of Madrid in 2004
- She obtained the Diploma of Advanced Studies in 2011 and defended her thesis for the achievement of the Doctorate in Veterinary Medicine in 2020
- Associate Professor in the Clinical Rotation of the subject "Anesthesiology" in the Veterinary Degree of the Faculty of Veterinary Medicine of the Complutense University of Madrid (UCM) since March 2020
- Collaborator in practical teaching in the Department of Animal Medicine and Surgery, Faculty of Veterinary Medicine, UCM Course 2019/20
- His professional career is focused on Veterinary Anesthesiology in Major Species. He received his specialization during three years of residency at the European College of Veterinary Anaesthesia and Analgesia at UCM.

#### Dr. Benito, Javier

- ◆ Degree in Veterinary Medicine from the Complutense University of Madrid (UCM) in 2004
- ◆ He completed a specialized training program through a European residency program (ECLAM) in Laboratory Animal Medicine at the Autonomous University of Barcelona (UAB) from 2006 to 2009. During this period, he also completed a Postgraduate Master (MSc) in Laboratory Animal Science and Welfare.
- ◆ He then moved to the United States, where he did a fellowship from 2009 to 2012 as a Postdoctoral Research Associate at the Comparative Pain Research Laboratory (CPRL) at North Carolina State University (NCSSU). His professional career as a veterinarian is currently focused on the area of anesthesia and clinical analgesia. He is currently working with small animals, large animals, both horses and ruminants, and with exotic species and zoo animals. He is currently the coordinator in charge of the Anesthesia Service at the Clinical Veterinary Hospital for the area of small animals.

#### ◆ Dr. Montefiori, Filippo

- ◆ Degree in Veterinary Medicine from the University of Parma (Italy) in 2006.
- ◆ Professor in Small and Large Animal Anesthesia and Analgesia at the Veterinary School of the University of Edinburgh (UK) from June 2015 to June 2016.
- ◆ Collaborator in practical teaching at the Faculty of Veterinary Medicine of the Complutense University of Madrid from September 2016 to August 2018.
- ◆ Honorary collaborator at the Faculty of Veterinary Medicine of the Complutense University of Madrid from September 2018 to the present.
- ◆ Since July 2016 he has been working as a Veterinary Anesthesiologist in the outpatient service Anesthesia and Veterinary Surgery in Madrid, he is a collaborator of the Faculty of Veterinary Medicine of the Complutense University of Madrid and speaker of a postgraduate course in small animal anesthesia in this same faculty.

#### Dr. Rioja, Eva

- ◆ PhD in Veterinary Medicine from the Complutense University of Madrid (Spain) in 2004.
- ◆ PhD in Veterinary Science from the University of Guelph (Canada) in 2009.
- ◆ Degree in Veterinary Medicine from the Complutense University of Madrid (Spain) in 2000.
- ◆ Diplomate of the American College of Veterinary Anesthesia and Analgesia (ACVAA) in 2009.
- ◆ Diplomate recognized by the European College of Veterinary Anesthesia and Analgesia (EVCAA) in 2020.
- ◆ Her professional career has been mainly academic as a professor of veterinary anesthesia and analgesia in several universities in various countries such as Canada, South Africa and the United Kingdom. In these universities she has performed clinical activity in large and small animals, as well as teaching and research activities.
- ◆ As part of her current work at Optivet, she performs equine anesthesia at the Sussex Equine Hospital for ophthalmological surgeries performed by Optivet referrals. She also performs theoretical and practical sessions of anesthesia and analgesia with the interns of this same equine hospital.

#### Dr. Santiago, Isabel

- ◆ PhD in Veterinary Medicine, Complutense University of Madrid.
- ◆ Degree in Veterinary Medicine from the Complutense University of Madrid in 1999 After obtaining a Bachelor's Degree Diploma (1999) and a Diploma of Advanced Studies (2003), she completed her PhD at the same university in 2016.
- ◆ Professor at Lusofona University of Lisbon (Portugal) in the Department of Medical Clinical Pathology II from 2019 to present.
- ◆ Her professional career is focused on equine clinical practice and research, currently as a contract veterinarian in the large animal area of the Complutense Veterinary Clinic Hospital of the Complutense University of Madrid.
- ◆ Head of Equine Internal Medicine and member of the Anesthesia Service at the Complutense Veterinary Clinic Hospital of the Complutense University of Madrid.



**Dr. Troya, Lucas**

- ◆ Degree in Veterinary Medicine from the Complutense University of Madrid
- ◆ Postgraduate Diploma in Equine Clinic from the Autonomous University of Barcelona
- ◆ Master's Degree in Equine Hospital Clinic at the Complutense University of Madrid
- ◆ Associate Professor, Department of Animal Medicine and Surgery, Autonomous University of Barcelona, teaching equine internal medicine since 2018.
- ◆ Professor at the Institute of Applied Studies (IDEA-Madrid) during 2017-2018, in the Equestrian Veterinary Technical Assistant and Equestrian Veterinary Assistant courses.
- ◆ Service of Internal Medicine and Anesthesia, Equine Unit, Veterinary Clinical Hospital UAB
- ◆ Associate Professor, Department of Animal Medicine and Surgery, Autonomous University of Barcelona
- ◆ Training stays in various Spanish and European centers
- ◆ Member of the Spanish Association of Equine Veterinarians (AVEE).

**Dr. Viscasillas, Jaime**

- ◆ Degree in Veterinary Medicine from the University of Zaragoza (Spain) in 1998.
- ◆ Master's Degree in Veterinary Anesthesia from the Complutense University of Madrid in 2003.
- ◆ Diplomate of the European College of Veterinary Anesthesia and Analgesia (ECVAA) in 2016.
- ◆ Professor in veterinary anesthesia at the Faculty of Veterinary Medicine at CEU- Cardenal Herrera University from 2019 to present.
- ◆ He teaches in different graduate and postgraduate courses, university specialization programs and masters, both national and international.
- ◆ Conferences in national and international courses
- ◆ Supervisor of residents of the European College of Veterinary Anesthesia and Analgesia and of residents of other European specialty colleges under their anesthesia rotations.
- ◆ Professor at the Royal Veterinary College from 2009 to 2019.

**Dr. Aguirre Pascasio, Carla**

- ♦ Degree in Veterinary Medicine from Santiago de Compostela University (1995-2000)
- ♦ D. in Veterinary Medicine from the University of Murcia (2009). After obtaining the Diploma of Advanced Studies (2005), she concluded her doctorate at the same university with the thesis "Doppler in digital ultrasound in horses with laminitis", obtaining a grade of Outstanding Cum Laude.
- ♦ Certified in Internal Medicine by the Royal Veterinary College of London, University of Liverpool, 2012 (CertAVP EM - Equine Medicine).
- ♦ Certified in Soft Tissue Surgery by the Royal Veterinary College of London, University of Liverpool, 2015 (CertAVP ESST - Equine Surgery Soft Tissue).
- ♦ Spanish Certificate in Equine Clinic, 2019 (CertEspCEq by the Veterinary Council of Spain)
- ♦ Postgraduate degree in Equine Physiotherapy (2001-2002 University of Barcelona)
- ♦ Master's Degree in Business and Administration (MBA) (2010 ENAE Business School, Murcia)
- ♦ Residency in the European College of Internal Medicine Board Eligible in the ECEIM (European College of Equine Internal Medicine)
- ♦ Professional stays in Equine Hospitals in England, USA and Europe (Liphook Equine Hospital-UK; Rood and Riddle-USA; Hagyard-USA, Blue Ridge-USA; Alamo Pintado-USA; San Luis Rey-USA; University of Liverpool-UK; University of Ghent-Belgium; University of Edinburgh-UK; University of London-UK).
- ♦ Consecutive scholarships and internship at Murcia University Veterinary Clinical Hospital (2002-2007).
- ♦ Fellowship at Casal do Rio Equine Hospital (2002)

**Dr. Alonso de Diego, María**

- ♦ Equine Internal Medicine Service at Clinical Veterinary Hospital of the Alfonso X El Sabio University
- ♦ Associate Professor of the Faculty of Veterinary Medicine of the Alfonso X El Sabio University.
- ♦ Spanish Certificate in Equine Clinic
- ♦ Member of the Association of Equine Veterinary Specialists
- ♦ Member of the Spanish Society of Ozone Therapy
- ♦ Residency at the UCM Veterinary Clinical Hospital
- ♦ Mobile equine clinic veterinarian hired by self-employed veterinarians
- ♦ Freelance equine ambulatory clinic veterinarian in Madrid
- ♦ Training stays in several hospitals in Kentucky (U.S) in the area of Equine Internal Medicine

**Dr. Carriches Romero, Lucía**

- ♦ Degree in Veterinary Medicine from the Alfonso X el Sabio University (2008)
- ♦ Rotating and Advanced Internships for Equine Specialization at the Hospital Clínico Veterinario Complutense (2016-2019)
- ♦ Collaborating Professor in Practical Teaching, Department of Animal Medicine and Surgery, Complutense University of Madrid (UCM) (2020)
- ♦ Outpatient veterinary clinic specializing in equine medicine, surgery, emergencies and reproduction.
- ♦ Hired external collaborator veterinarian at the Complutense Veterinary Clinical Hospital, Complutense University of Madrid (UCM) (2020)
- ♦ Various stays in foreign centers
- ♦ Attendance and publication of posters in national and international congresses.

**Dr. Barba Recreo, Marta**

- ♦ Head of the Equine Internal Medicine Service, Clinical Veterinary Hospital, CEU Cardenal Herrera University, Valencia.
- ♦ Degree in Veterinary Medicine from the University of Zaragoza in 2009
- ♦ D. in Biomedical Sciences, Auburn University, Alabama, USA, in 2016.
- ♦ Diplomate of the American College of Internal Medicine, Large Animal in 2015.
- ♦ 2010 - 2011: Rotating internship in Equine Medicine and Surgery at the University of Lyon, VetAgro-Sup, France.
- ♦ 2012 - 2015: Residency in Equine Internal Medicine, JT Vaughan Large Animal Teaching Hospital, Auburn University, Alabama, U.S.
- ♦ Assistant Professor, Department of Animal Medicine and Surgery, Faculty of Veterinary Medicine, CEU Cardenal Herrera University, Valencia.
- ♦ 2016: Professor and veterinary specialist in Equine Internal Medicine and research associate, Weipers Centre Equine Hospital, University of Glasgow, Scotland, United Kingdom.
- ♦ 2016-Present: lecturer, researcher and clinical veterinarian in the Equine Internal Medicine service, Faculty of Veterinary Medicine, CEU Cardenal Herrera University, Valencia.
- ♦ 2011 - 2012: Mobile equine veterinary clinic, Gres-Hippo, St. Vincent de Mercuze, France.

**Dr. Benito, Irene**

- ♦ Degree in Veterinary Medicine (2011) University of Extremadura (UEX), Faculty of Veterinary Medicine, Cáceres.
- ♦ Completion of an internship in Equine Medicine and Surgery at the Clinical Veterinary Hospital of the UAB (Autonomous University of Barcelona) during the year 2013-2014.
- ♦ (2012) Professional internship through the Quercus Scholarship (Leonardo Da Vinci Program) for graduates of the University of Extremadura, lasting half a year, at Hippiatrica Equine Medical Center, Lisbon (Portugal), under the coordination of Dr Manuel Torrealba (clinical director).
- ♦ Completion of the Erasmus Practical Scholarship to work abroad in the Equine Hospital of the University of Bristol, Referral Equine Hospital (directed by Prof. Alistair Barr) in Langford, (North Somerset), United Kingdom, under the supervision and coordination of Mr Henry Tremaine (2011).
- ♦ Online training course in 2014 and 2015 on administrative activities in customer relations and administrative management given by La Glorieta Academy (Denia).
- ♦ Attendance to the courses of Ozone Therapy in equines coordinated by María de la Cuesta in 2014 and 2015 and organized by the SEOT (Spanish Society of Ozone Therapy) in Valencia.
- ♦ Attendance at training and refresher courses and seminars given by Spanish universities.

#### **D. Cervera Saiz, Álvaro**

- ♦ Graduate in Veterinary Medicine from the Catholic University of Valencia "San Vicente Mártir" 2013-2018.
- ♦ Attendance to specific courses and conferences in the equine area of the HUMEKO group.
- ♦ Attendance at training and refresher courses and seminars given by Spanish universities.
- ♦ Collaboration as an internship teacher during the internship at CEU Cardenal Herrera University.
- ♦ Clinical equine veterinarian in ambulatory service in the company "MC Veterinaria Equina" since February 2020, in Valencia and directed by María de la Cuesta.
- ♦ Stays in reference hospitals in the United Kingdom, under the supervision of specialists in equine medicine and surgery such as Luis Rubio, Fernando Malalana and Marco Marcatili.
- ♦ Internship in Equine Medicine and Surgery at the Clinical Veterinary Hospital of the CEU Cardenal Herrera University during the year 2018-2019.
- ♦ Scholarship holder from 2013 to 2018 at the laboratories of the Faculty of Veterinary and Experimental Sciences of the Catholic University of Valencia "San Vicente Martir".
- ♦ Numerous stays in reference hospitals in Spain during his university career.

#### **Dr. Domínguez, Mónica**

- ♦ Clinical equine veterinarian specializing in internal medicine and reproduction
- ♦ Clinical Veterinary of the Reproduction Service of the Complutense Clinical Veterinary Hospital (HCVC).
- ♦ Currently pursuing a PhD at the Department of Animal Medicine and Surgery (UCM).
- ♦ Degree in Veterinary Medicine from the Complutense University of Madrid, 2008.
- ♦ Official Professional Master's Degree in Veterinary Sciences (UCM) (2010)
- ♦ In 2019 he obtained the Spanish Certificate in Clinical Equine (CertEspCEq).
- ♦ Associate Professor, Department of Animal Medicine and Surgery, Complutense University of Madrid (UCM)

- ♦ Collaborating Professor in Practical Teaching, Department of Animal Medicine and Surgery, Complutense University of Madrid (UCM) (2016 a 2018)
- ♦ Associate Professor, Department of Animal Medicine and Surgery, Complutense University of Madrid (UCM) (2019 to present).
- ♦ Teaching experience in Veterinary Technical Assistant (VTA) training in private academies (IDEA, Madrid) and other courses in the COVECA center (Equine Reproduction Center, Toledo)

#### **Dr. Forés Jackson, Paloma**

- ♦ Vice-Dean of Students and Professional Orientation (Faculty of Veterinary Medicine, Complutense University of Madrid)
- ♦ Member of the Equine Medicine Service of the Complutense Clinical Veterinary Hospital (HCVC).
- ♦ Graduated in Veterinary Medicine from the Complutense University of Madrid in 1986.
- ♦ D. in Veterinary Medicine by Madrid Complutense University in 1993.
- ♦ Full Professor of the Department of Animal Medicine and Surgery at UCM
- ♦ He started in 1987 as an Assistant in the Department of Animal Pathology II of the Faculty of Veterinary Medicine of the UCM.
- ♦ In 1992 he worked as Associate Professor and in 1996 he obtained a tenured position in the Department of Animal Medicine and Surgery.
- ♦ Stay in College of Veterinary Medicine, Department of Large Animal Sciences, Gainesville University, Florida (1994)
- ♦ He teaches in different graduate and postgraduate courses, university specialization programs and Master's Degrees and coordinates different subjects. He has participated in and organized national and international courses



**Dr. Gómez Lucas, Raquel**

- ◆ Degree in Veterinary Medicine from the Complutense University Madrid
- ◆ Doctor of Veterinary Medicine
- ◆ Graduate of the American College of Veterinary Sports Medicine and Rehabilitation (ACVSMR)
- ◆ Professor of the Veterinary Degree at the Alfonso X el Sabio University, teaching Equine Diagnostic Imaging, Internal Medicine and Applied Anatomy
- ◆ Professor of the Postgraduate Master's Degree of Equine Medicine and Surgery Internship at the Alfonso X el Sabio University
- ◆ Head of the Postgraduate Master's Degree in Sports Medicine and Equine Surgery at the Alfonso X el Sabio University
- ◆ Head of the Sports Medicine and Diagnostic Imaging Service of the Large Animal Area of the Clinical Veterinary Hospital of the Alfonso X el Sabio University since 2005.

**Dr. Goyoaga Elizalde, Jaime**

- ◆ Head of the Equine Surgery Service of the Complutense Clinical Veterinary Hospital (UCM)
- ◆ Graduated in Veterinary Medicine in 1986
- ◆ At the University of Bern, Germany (veterinary clinic "Dr Cronau") and the United States (University of Georgia).
- ◆ Professor in the Master's Degree in Animal Medicine, Health and Improvement Diagnostic Imaging, Córdoba
- ◆ Professor in Expert in Bases of Physiotherapy and Animal Rehabilitation UCM
- ◆ Co-director and Professor of the Master's Degree "Equine Medicine and Surgery" Improve International
- ◆ Associate Professor since 1989 in the Department of Animal Medicine and Surgery, Faculty of Veterinary Medicine, Complutense University of Madrid.
- ◆ Teaching since 1989, including Medical and Nutritional Pathology, Special Surgery of Large Animals, Equine Pathology and Clinic, Hospitalization, Emergency and Intensive Care in Equine Clinic, Radiology and Diagnostic Imaging, among others

**Dr. Iglesias García, Manuel**

- ◆ Clinical veterinarian and surgeon at the Veterinary Hospital of the Extremadura Hospital (University of Extremadura)
- ◆ Degree in Veterinary Medicine from the Alfonso X el Sabio University (UAX)
- ◆ Master's Degree in Equine Surgery and obtaining the title of "General Practitioner in Equine Surgery" by the "European School of Veterinary Postgraduate Studies" (2013)
- ◆ Master's Degree in Equine Surgery at the Veterinary Hospital of Alfonso X el Sabio University (2013-2016)
- ◆ Doctorate Degree from Alfonso X el Sabio University (2017)
- ◆ In 2019 he obtained the Spanish Certificate in Clinical Equine (CertEspCEq)
- ◆ He actively participates as director of final projects in the Veterinary Degree.
- ◆ Collaboration in the teaching of veterinary interns and undergraduate students during the Master's Degree in Equine Surgery
- ◆ Professor of the Master's Degree in Large Animal Boarding at Extremadura University for the last 3 years

**Dr. León Marín, Rosa**

- ◆ Clinical veterinarian specialized in Equine Dentistry
- ◆ Degree in Veterinary Medicine, Complutense University of Madrid, September 1994
- ◆ PhD in Veterinary Medicine from the Complutense University of Madrid with the qualification of "Outstanding cum Laude unanimously" (2011) for the thesis "Possible role of proinflammatory mediators in equine dental eruption"
- ◆ External tutor of the subject "Internships", tutoring second cycle students of the Faculty of Veterinary Medicine of the Complutense University of Madrid, the Alfonso X el Sabio University of Madrid and the CEU Cardenal Herrera University of Valencia.
- ◆ Courses of "Sport Technician in Riding" of the Madrid Equestrian Federation, courses for the training of professionals in the handling of racehorses
- ◆ Professor in postgraduate courses in Veterinary Rehabilitation at the IACES Equine Clinic, Expert in Therapeutic Riding and Expert in Bases of Physiotherapy and Animal Rehabilitation at the Faculty of Veterinary Medicine of the Complutense University of Madrid.

**Dr. López Sanromán, Javier**

- ♦ Clinical veterinarian member of the Equine Surgery Service of the Complutense Clinical Veterinary Hospital (UCM)
- ♦ Professor of the Department of Animal Medicine and Surgery of the Complutense University of Madrid (UCM) and deputy director of the Department.
- ♦ Assistant Professor of University School (LRU) From January 8, 1992 to October 9, 1994  
Assistant Professor of University (First period) (LRU) From October 10, 1994 to October 9, 1996  
Assistant Professor of University (Second period) (LRU) From October 10, 1996 to October 9, 1999  
Full-time Associate Professor (Type 2) From October 10, 1999 to June 29, 2000  
Full Professor of University From June 30, 2000 to date
- ♦ He has taught at other national universities (University of Las Palmas de Gran Canaria, Córdoba and Extremadura) and abroad (University of Trás-os-Montes e Alto Douro in Vila Real, Portugal; National Veterinary School of Lyon, France; National University of Litoral, Argentina).
- ♦ He teaches on different graduate and postgraduate courses, university specialization programs and master's degree, both national and international, and coordinates different subjects and international courses.
- ♦ He actively participates as director of master's degrees, doctoral theses and final projects in the Veterinary Degree.
- ♦ Reviewer of scientific articles in several journals indexed in the Journal Citation Report (JCR).
- ♦ In addition, he is deputy director of the Department of Animal Medicine and Surgery at UCM.
- ♦ Finally, she has three six-year research awards (CNEAI).

**Dr. Manso Díaz, Gabriel**

- ♦ Clinical veterinarian, member of the Diagnostic Imaging Service at Complutense Veterinary Clinical Hospital (HCVC).
- ♦ Degree in Veterinary Medicine from the Complutense University of Madrid (UCM), obtaining the Extraordinary National Award.
- ♦ D. from the UCM in 2015 with which he obtained the European Mention and the Extraordinary Doctorate Award
- ♦ Master's Degree in Veterinary Science Research 2011
- ♦ Assistant Professor of the Department of Animal Medicine and Surgery, University Complutense of Madrid (UCM)
- ♦ From 2011 to the present, he has been a Collaborator in Practical Teaching in the Department of Animal Medicine and Surgery (UCM).
- ♦ From 2019 to the present, he is Assistant Professor Doctor of the Department of Animal Medicine and Surgery at UCM.
- ♦ Regular speaker at courses, workshops and congresses in the field of Equine Diagnostic Imaging.
- ♦ Large Animal Diagnostic Imaging Resident (ECVDI) Equine Referral Hospital, Royal Veterinary College from 2016 to present.
- ♦ From 2011 to 2015 he has enjoyed a University Teacher Training Scholarship (Dept. of Animal Medicine and Surgery, Complutense University of Madrid).
- ♦ Assistant Professor Doctor of the Department of Animal Medicine and Surgery at the University Complutense of Madrid (UCM) from 2019 to present.

**Dr. Marín Baldo, Alexandra**

- ◆ Degree in Veterinary Medicine from the University of Murcia
- ◆ Diploma of Advanced Studies in Animal Medicine and Reproduction University of Murcia 2005
- ◆ Professor, Faculty of Veterinary Medicine, Alfonso X El Sabio University (2008-2020)
- ◆ Teaching of the theoretical and practical teaching related to the equine species of the subjects: Parasitic diseases, propaedeutics and supervised practice
- ◆ Practical teaching related to the equine species in the subject of Medical Pathology.
- ◆ Clinical Propedeutics course coordination
- ◆ Equine Hospitalization Service of the Clinical Veterinary Hospital of the University Alfonso X El Sabio
- ◆ Training stays in several hospitals in Spain in the area of large animals
- ◆ Fellowship in the Department of Equine Surgery and Large Animals Veterinary Hospital at Murcia University
- ◆ Head of the large animal hospitalization service at the Clinical Veterinary Hospital of Alfonso X el Sabio University
- ◆ Publications in the field of Equine Internal Medicine

**Dr. Martín Cuervo, María**

- ◆ PhD in Veterinary Medicine by the Extremadura University
- ◆ Degree in Veterinary Medicine from the University of Córdoba
- ◆ Master's Degree in Veterinary Science from the University of Extremadura.
- ◆ Graduate of the European College of Equine Internal Medicine (ECEIM)
- ◆ Associate Professor in the Department of Animal Medicine and Surgery at the University of Extremadura, teaching equine internal medicine, since 2016
- ◆ Professor of advanced courses at the UEx: "Theoretical-practical course on clinical analysis in veterinary medicine Methodology and interpretation (2010, 2011, 2012 and 2013)"
- ◆ Professor of the Master's Degree-Internship in Medicine and Surgery of Horses at the University of Extremadura (2012-present)
- ◆ Professor of the International Master's Degree in "Equine Reproduction" at Extremadura University (2013, 2014 and 2015)
- ◆ Professor of the Master's Degree in Equine Therapy at Extremadura University (2015)
- ◆ Head of the Internal Medicine Service of the Veterinary Clinic Hospital of the University of Extremadura
- ◆ Associate Professor of the Department of Animal Medicine and Surgery, Extremadura University
- ◆ Professor of the Master's Degree in Companion Animal Medicine and Surgery (Equids) at Extremadura University.

**Dr. Muñoz Morán, Juan Alberto**

- ♦ Degree in Veterinary Medicine from the Complutense University of Madrid
- ♦ PhD in Veterinary Science
- ♦ Graduate of the European College of Veterinary Surgeons.
- ♦ Graduated in experimental animals, category C, University of Lyon (France).
- ♦ Master's Degree in Veterinary Medicine Sciences from the Alfonso X El Sabio University, Madrid
- ♦ Residency in large animal surgery at the Veterinary University of Lyon.
- ♦ Internship in equine surgery at London Equine Hospital, Ontario.
- ♦ Internship in equine medicine and surgery at Lyon Veterinary University
- ♦ Professor of large animal surgery at the Veterinary University of Pretoria, South Africa.
- ♦ Head of the Equine Surgery residency program at the Veterinary University of Pretoria, South Africa.
- ♦ Head of the large animal surgery service and graduate professor at Alfonso X el Sabio University, Madrid. Head of the Postgraduate Master's Degree in Sports Medicine and Equine Surgery at Alfonso X el Sabio University.
- ♦ Head of the Postgraduate Master's Degree in Equine Surgery at Alfonso X el Sabio University
- ♦ Member of the Examination Committee of the European College of Veterinary Surgeons.
- ♦ Editor of the journal of equine veterinary medicine and surgery "Equinus".
- ♦ Equine surgery clinician at the Montreal Veterinary University.
- ♦ Equine surgery clinician at the Veterinary University of Lyon.
- ♦ Co-author of CD-ROM on Thoracic Extremity Anatomy of the Horse
- ♦ Partner Surgeon at the Veterinary Clinic of "Grand Renaud", Saint Saturnin, France
- ♦ Surgeon at the Equine Hospital of Aznalcóllar, Seville.

**Dr. Rodríguez Hurtado, Isabel**

- ♦ Specialist in Internal Medicine of Horses
- ♦ Veterinary Degree - Madrid Complutense University.
- ♦ Doctorate in Veterinary Medicine in 2012.
- ♦ Graduate of the American College of Veterinary Internal Medicine (ACVIM) in 2007.
- ♦ Internship and Residency in Equine Internal Medicine at Auburn University (U.S)
- ♦ Master's Degree in Biomedical Sciences.
- ♦ Master's Degree in Research Methodology in Health Sciences
- ♦ Professor and Coordinator of the subject "Medical Pathology" and "Nutrition" of the Veterinary Degree (University Alfonso X el Sabio - UAX, Madrid).
- ♦ Professor of the Postgraduate Master's Degree in Equine Internal Medicine at the Alfonso X el Sabio University.
- ♦ Head of the Internal Medicine Service of Horses (UAX)
- ♦ Head of the Large Animals Area of the Clinical Veterinary Hospital (UAX)

**Ms. Roquet Carne, Imma**

- ♦ Clinical veterinarian specialist in Equine Surgery
- ♦ Graduate of the American College of Veterinary Surgery in 2014
- ♦ Degree in Veterinary Medicine from the Autonomous University of Barcelona (UAB) in 2005.
- ♦ Internship in Equine Medicine and Surgery at Spurlock Equine Hospital (Virginia, U.S).
- ♦ Rotating Equine Internship at Kansas State University (U.S)
- ♦ Residency Program in Large Animal Surgery (ACVS) at the Western College of Veterinary Medicine (Canada).
- ♦ Equine surgeon in several clinics in Europe (Belgium, Sweden, Portugal) and in Spain (Faculty of Veterinary Medicine of Cáceres) until 2016.
- ♦ Member of the ACVS and AVEEC associations.
- ♦ Regular attendee and speaker at national and international courses and congresses.



**Dr. Santiago Llorente, Isabel**

- ♦ Her professional career is focused on equine clinical practice and research
- ♦ Head of the Internal Equine Medicine Service of the Complutense Clinical Veterinary Hospital (HCVC UCM).
- ♦ PhD in Veterinary Medicine from the UCM (2016), obtaining the specialty CertEspCEq.
- ♦ Degree in Veterinary Medicine from the Complutense University of Madrid, 1999.
- ♦ Rotating Internship at UCM.
- ♦ Teacher training in various graduate and postgraduate courses and several university specialization programs and Master's Degrees.
- ♦ Professor at the Lusófona University of Lisbon (Portugal) in the Department of Medical Clinical Pathology II from 2019 to present.
- ♦ Private practice in the areas of equine internal medicine, reproduction and lameness diagnosis.
- ♦ From 2005 to the present: Hired veterinarian in the Large Animal Area at the Hospital Clínico Veterinario Complutense (HCVC UCM), performing her main professional duties in the fields of equine anesthesia, equine internal medicine and hospitalization and intensive care.
- ♦ Founding partner of "Compluvet SL.", company responsible for the assistance and anti-doping control in horse races in Spain since 2010 to date.

**Dr. Villalba Orero, María**

- ♦ Clinical veterinarian, member of the Anesthesia and Internal Medicine Services for Equines of the Complutense Clinical Veterinary Hospital (UCM) and of the Equine Anesthesia Service of the Virgen de Las Nieves Clinical Veterinary Hospital (Madrid).
- ♦ Degree in Veterinary Medicine from the Complutense University Madrid
- ♦ Doctor of Veterinary Medicine, Complutense University of Madrid.
- ♦ European Certificate in Veterinary Cardiology (ESVPS)
- ♦ Master's Degree in Veterinary Science from the Complutense University of Madrid.
- ♦ Master's Degree in Veterinary Cardiology
- ♦ Speaker at national equine cardiology congresses and courses
- ♦ Member of the Veterinary Cardiovascular Society (VCS), the European and Spanish Society of Cardiology (ESC and SEC) and the Spanish Association of Equine Veterinarians (AVEE).
- ♦ Associate Professor in the Department of Animal Medicine and Surgery at the Complutense University of Madrid, teaching in equine internal medicine, especially in the area of cardiology, since 2017.
- ♦ Professor of Physiopathology at Alfonso X El Sabio University (2014-2017).
- ♦ Professor of the Master's Degree in Equine Hospital Medicine at the Complutense University of Madrid (2004-2016).
- ♦ Professor of the Master's Degree in Equine Medicine and Surgery at the Complutense University of Madrid (2004-2016).
- ♦ Collaborating professor in practical teaching at the Complutense University of Madrid (2009-2009).
- ♦ Postdoctoral researcher at the National Center for Cardiovascular Research.

# 05

# Structure and Content

The contents of this Advanced Master's Degree have been developed by the different experts of this course, with a clear purpose: to ensure that our students acquire each and every one of the necessary skills to become true experts in this field.

Throughout the syllabus, the professional will cover the two areas of interest of this Advanced Master's Degree; anesthesiology and large animal surgery. Both areas will be developed independently, but in a coordinated manner, covering all possible paradigms of intervention in which the professional may find themselves.



“*Through a very well organized program, you will be able to access the most advanced knowledge of the moment in Equine Anesthesia and Surgery”*

## Module 1. Physiology Applied to Anesthesia in Major Species

- 1.1. Physiology Applied to Anesthesia
  - 1.1.1. Introduction
  - 1.1.2. History of Anesthesia in Major Species
- 1.2. Cardiovascular System Physiology in the Horse
  - 1.2.1. Cardiac Anatomy
  - 1.2.2. Cardiac Electrophysiology
  - 1.2.3. Cardiac Mechanical Function
  - 1.2.4. Vascular System
- 1.3. Respiratory System Physiology in the Horse I
  - 1.3.1. Anatomy of the Respiratory System
  - 1.3.2. Pulmonary Ventilation
- 1.4. Respiratory System Physiology in the Horse II
  - 1.4.1. Pulmonary Circulation
  - 1.4.2. Gas Exchange
  - 1.4.3. Breathing Control
- 1.5. Digestive System in the Horse
  - 1.5.1. Anatomy of the Digestive System
  - 1.5.2. Nervous and Hormonal Control of the Digestive Function
- 1.6. Renal System in the Horse
  - 1.6.1. Anatomy of the Renal System
  - 1.6.2. Formation of the Urine
  - 1.6.3. Effects of Anesthetics on the Renal Function
- 1.7. Nervous System in the Horse
  - 1.7.1. Anatomy of the Central Nervous System
  - 1.7.2. Anatomy of the Peripheral Nervous System
  - 1.7.3. Neuronal Function
  - 1.7.4. Assessment of Neurological Function During Anesthesia
- 1.8. Autonomic Nervous System and Anesthesia-Related Stress
  - 1.8.1. Autonomic Nervous System
  - 1.8.2. Stress Response Associated with Anesthesia

- 1.9. Anatomy and Physiology of Small and Large Ruminants
  - 1.9.1. Applied Anatomy of Large Ruminants
  - 1.9.2. Applied Physiology of Large Ruminants
  - 1.9.3. Applied Anatomy of Small Ruminants
  - 1.9.4. Applied Physiology of Small Ruminants
- 1.10. Anatomy and Physiology of Swine and Camelids
  - 1.10.1. Applied Anatomy of Swine
  - 1.10.2. Applied Physiology of Swine
  - 1.10.3. Applied Anatomy of Camelids
  - 1.10.4. Applied Physiology of Camelids

## Module 2. Assessment, Preanesthetic Preparation and Sedation in Major Species

- 2.1. Physical Examination and Blood Test
- 2.2. Anesthetic Risk and Preanesthetic Preparation in the Equine Patient
- 2.3. Pharmacology of Injectable Drugs in Horses
  - 2.3.1. Important Pharmacokinetic Concepts
  - 2.3.2. Important Pharmacodynamics Concepts
  - 2.3.3. Physiological and Pathological Factors that Modify Pharmacological Properties
  - 2.3.4. Pharmacological Interactions
  - 2.3.5. Routes of Administration
- 2.4. Phenothiazines
  - 2.4.1. Mechanism of Action
  - 2.4.2. Pharmacology
  - 2.4.3. Clinical Use and Antagonism
  - 2.4.4. Complications and Adverse Effects
- 2.5. Benzodiazepines
  - 2.5.1. Mechanism of Action
  - 2.5.2. Pharmacology
  - 2.5.3. Clinical Use and Antagonism
  - 2.5.4. Complications and Adverse Effects



- 2.6. Adrenergic Alpha-2 Receptor Agonists
  - 2.6.1. Mechanism of Action
  - 2.6.2. Pharmacology
  - 2.6.3. Clinical Use and Antagonism
  - 2.6.4. Complications and Adverse Effects
- 2.7. Opioids
  - 2.7.1. Mechanism of Action
  - 2.7.2. Pharmacology
  - 2.7.3. Clinical Use and Antagonism
  - 2.7.4. Complications and Adverse Effects
- 2.8. Sedation for On-Station Procedures
  - 2.8.1. Types of Procedures
  - 2.8.2. Clinical Objectives
  - 2.8.3. Methods of Administration
  - 2.8.4. Combinations Described
- 2.9. Assessment and Anesthetic Preparation in Ruminants, Swine and Camelids
- 2.10. Pharmacological Peculiarities of Ruminant, Swine and Camelid Patients
  - 2.10.1. Small Ruminants
  - 2.10.2. Large Ruminants
  - 2.10.3. Swine
  - 2.10.4. Camelids

### Module 3. Induction of General Anesthesia in Major Species

- 3.1. Dissociative Anesthetics (Ketamine)
  - 3.1.1. Pharmacology
  - 3.1.2. Side Effects:
  - 3.1.3. Contraindications
  - 3.1.4. Dosages and Protocols
- 3.2. Barbiturates (Thiopental)
  - 3.2.1. Pharmacology
  - 3.2.2. Side Effects:
  - 3.2.3. Contraindications
  - 3.2.4. Dosages and Protocols
- 3.3. Propofol, Alfaxalone, Etomidate
  - 3.3.1. Pharmacology
  - 3.3.2. Side Effects:
  - 3.3.3. Contraindications
  - 3.3.4. Dosages and Protocols
- 3.4. Benzodiazepines and Guaifenesin
  - 3.4.1. Pharmacology
  - 3.4.2. Side Effects:
  - 3.4.3. Contraindications
  - 3.4.4. Dosages and Protocols
- 3.5. Main Knock-Down Techniques in the Equine Patient
- 3.6. Endotracheal Intubation, Nasotracheal Intubation and Tracheostomy in the Equine Patient
- 3.7. Physiological Consequences of Different Decubitus, Padding and Limb Positioning in the Equine Patient
- 3.8. Peculiarities of the Induction Period in Large and Small Ruminants
  - 3.8.1. Pharmacology of Induction Agents
  - 3.8.2. Knock-Down Techniques
  - 3.8.3. Intubation Techniques
- 3.9. Peculiarities of the Induction Period in Swine and Camelids
  - 3.9.1. Pharmacology of Induction Agents
  - 3.9.2. Knock-Down Techniques
  - 3.9.3. Intubation Techniques
- 3.10. Positioning of the Ruminant, Swine and Camelid Patient After Induction

## Module 4. General Anesthesia and Equipment in Major Species

- 4.1. Anesthetic Equipment (I)
  - 4.1.1. Anesthetic Machine
  - 4.1.2. Circular Circuit
- 4.2. Anesthetic Equipment (II)
  - 4.2.1. Mechanical Ventilator
  - 4.2.2. Demand Valve
- 4.3. General Aspects of Inhalation Anesthesia
  - 4.3.1. Pharmacokinetics of Inhalation Agents (Absorption, Distribution, Metabolism, Elimination, Physical and Chemical Characteristics)
  - 4.3.2. Pharmacodynamics of Inhalation Agents (CNS Effects, Cardiovascular and Respiratory Effects, Other Effects)
  - 4.3.3. Halogenated Inhalation Agents
    - 4.3.3.1. Isoflurane
    - 4.3.3.2. Sevoflurane
- 4.4. Partial and Total Intravenous Anesthesia (PIVA and TIVA)
  - 4.4.1. Injectable Agents Used and Techniques
- 4.5. Neuromuscular Blocking Agents
  - 4.5.1. Mechanism of Action
  - 4.5.2. Pharmacokinetics and Pharmacodynamics
  - 4.5.3. Monitoring
  - 4.5.4. Pharmacology of Reversing Agents
- 4.6. General Anesthesia in Other Species (Small and Large Ruminants, Swine and Camelids)
- 4.7. Mechanical Ventilation
  - 4.7.1. Respiratory Mechanism
  - 4.7.2. Consequences of MV
  - 4.7.3. Ventilatory Parameters
- 4.8. Mechanical Ventilation in Other Species (Small and Large Ruminants, Swine and Camelids)
- 4.9. Anesthetic Recovery
  - 4.9.1. Recovery Techniques
  - 4.9.2. Patient Preparation
  - 4.9.3. Box Preparation
- 4.10. Anesthetic Recovery (Small and Large Ruminants, Swine and Camelids)

## Module 5. Monitoring in Major Species

- 5.1. The Anesthetic Record
- 5.2. Anesthetic Depth Monitoring
- 5.3. Cardiovascular and Hemodynamic Status Monitoring (I)
  - 5.3.1. Clinical Monitoring
  - 5.3.2. Electrocardiogram
- 5.4. Cardiovascular and Hemodynamic Status Monitoring (II)
  - 5.4.1. Indirect Arterial Pressure
    - 5.4.1.1. Oscillometry
    - 5.4.1.2. Doppler
  - 5.4.2. Direct Arterial Pressure
- 5.5. Monitoring of Oxygenation Status (I)
  - 5.5.1. Clinical Monitoring
  - 5.5.2. Arterial Blood Gas (PaO<sub>2</sub>)
- 5.6. Monitoring of Oxygenation Status (II)
  - 5.6.1. Pulse Oximetry
- 5.7. Monitoring of Ventilation Status (I)
  - 5.7.1. Clinical Monitoring
  - 5.7.2. Arterial Blood Gas (PaCO<sub>2</sub>)
- 5.8. Monitoring of Ventilation Status (II)
  - 5.8.1. Capnography
- 5.9. Other Monitoring Types
  - 5.9.1. Temperature
  - 5.9.2. Glucose
  - 5.9.3. Lactate
  - 5.9.4. Ions
  - 5.9.5. Neurostimulation
  - 5.9.6. Others
- 5.10. Monitoring in Other Species (Small and Large Ruminants, Swine and Camelids)
  - 5.10.1. Particularities of Monitoring in Small Ruminants
  - 5.10.2. Particularities of Monitoring in Large Ruminants
  - 5.10.3. Particularities of Swine Monitoring
  - 5.10.4. Particularities of Camelids Monitoring



## Module 6. Analgesia in Major Species

- 6.1. Definition of Pain and Pathophysiology of Pain
  - 6.1.1. Definition of Pain
  - 6.1.2. Types of Pain
  - 6.1.3. Pathophysiology of Pain
    - 6.1.3.1. Nociceptors
    - 6.1.3.2. Axons
    - 6.1.3.3. Neurotransmitters
    - 6.1.3.4. Nociception Pathway
- 6.2. Multimodal and Preventive Analgesia
  - 6.2.1. Clinical Analgesia
  - 6.2.2. Multimodal Analgesia
  - 6.2.3. Preventive Analgesia
- 6.3. Consequences of Untreated Pain
- 6.4. Pain Detection Systems
  - 6.4.1. Physiological Signs
  - 6.4.2. Equine Pain Scales
  - 6.4.3. Pain Scales in Other Species
- 6.5. Opioids
  - 6.5.1. Pharmacology
  - 6.5.2. Side Effects:
  - 6.5.3. Contraindications
  - 6.5.4. Clinical Use
- 6.6. NSAIDs
  - 6.6.1. Pharmacology
  - 6.6.2. Side Effects:
  - 6.6.3. Contraindications
  - 6.6.4. Clinical Use
- 6.7.  $\alpha_2$  Agonists Agents
  - 6.7.1. Pharmacology
  - 6.7.2. Side Effects:
  - 6.7.3. Contraindications
  - 6.7.4. Clinical Use

- 6.8. Ketamine and Lidocaine
  - 6.8.1. Ketamine
    - 6.8.1.1. Pharmacology
    - 6.8.1.2. Side Effects:
    - 6.8.1.3. Contraindications
    - 6.8.1.4. Clinical Use
  - 6.8.2. Lidocaine
    - 6.8.2.1. Pharmacology
    - 6.8.2.2. Side Effects:
    - 6.8.2.3. Contraindications
    - 6.8.2.4. Clinical Use
- 6.9. Other: Gabapentin, Amantadine, Amitriptyline, Tramadol, Paracetamol
  - 6.9.1. Gabapentin
    - 6.9.1.1. Pharmacology
    - 6.9.1.2. Side Effects:
    - 6.9.1.3. Contraindications
    - 6.9.1.4. Clinical Use
  - 6.9.2. Amantadine
    - 6.9.2.1. Pharmacology
    - 6.9.2.2. Side Effects:
    - 6.9.2.3. Contraindications
    - 6.9.2.4. Clinical Use
  - 6.9.3. Amitriptyline
    - 6.9.3.1. Pharmacology
    - 6.9.3.2. Side Effects:
    - 6.9.3.3. Contraindications
    - 6.9.3.4. Clinical Use
  - 6.9.4. Tramadol
    - 6.9.4.1. Pharmacology
    - 6.9.4.2. Side Effects:
    - 6.9.4.3. Contraindications
    - 6.9.4.4. Clinical Use
  - 6.9.5. Paracetamol
    - 6.9.5.1. Pharmacology
    - 6.9.5.2. Side Effects:
    - 6.9.5.3. Contraindications
    - 6.9.5.4. Clinical Use
- 6.10. Pharmacology of Analgesics in Other Species (Small and Large Ruminants, Swine and Camelids)
  - 6.10.1. Pharmacological Peculiarities of Analgesics in Small Ruminants
  - 6.10.2. Pharmacological Peculiarities of Analgesics in Large Ruminants
  - 6.10.3. Pharmacological Peculiarities of Analgesics in Swine
  - 6.10.4. Pharmacological Peculiarities of Analgesics in Camelids

## Module 7. Locoregional Anesthesia in Major Species

- 7.1. Pharmacology of Local Anesthetics
  - 7.1.1. Mechanism of Action
  - 7.1.2. Clinical Differences
  - 7.1.3. Complications
  - 7.1.4. Adjuvants
- 7.2. Instruments and Equipment
  - 7.2.1. Needles
  - 7.2.2. Neurostimulation
  - 7.2.3. Ultrasound
- 7.3. Locoregional Head Blocks (I)
  - 7.3.1. Maxillary Nerve Block
  - 7.3.2. Infraorbital Nerve Block
  - 7.3.3. Mandibular Nerve Block
  - 7.3.4. Mental Nerve Block
- 7.4. Locoregional Head Blocks (II)
  - 7.4.1. Retrobulbar/Peribulbar Block
  - 7.4.2. Eyelid Block
  - 7.4.3. Auriculopalpebral Block
  - 7.4.4. Ear Block
  - 7.4.5. Cervical Block



- 7.5. Locoregional Forelimb Block
  - 7.5.1. Surgical Blocks
- 7.6. Locoregional Hind Limb Blocks
  - 7.6.1. Surgical Blocks
- 7.7. Locoregional Laparotomy Blocks
  - 7.7.1. Lumbar Paravertebral Block
  - 7.7.2. Inverted "L" Block and Infiltration
  - 7.7.3. Transverse Abdominal Plane Block
- 7.8. Epidural Anesthesia
  - 7.8.1. Realization of a Single Technique
  - 7.8.2. Epidural Catheter Placement
  - 7.8.3. Drugs Used
- 7.9. Locoregional Large Ruminant Anesthesia
  - 7.9.1. Most Common Techniques
- 7.10. Locoregional Small Ruminants, Swine and Camelids Anesthesia
  - 7.10.1. Most Common Techniques

## Module 8. Anesthetic Complications and Cardiopulmonary Resuscitation

- 8.1. Morbidity and Mortality
  - 8.1.1. Mortality
    - 8.1.1.1. General Considerations
    - 8.1.1.2. Mortality Studies
      - 8.1.1.2.1. Comparative Mortality
    - 8.1.1.3. Risk factors
      - 8.1.1.3.1. Related to the Horse
      - 8.1.1.3.2. Related to the Surgical Procedure
      - 8.1.1.3.3. Related to Anesthesia
    - 8.1.1.4. Anesthesia-Related Causes of Death
      - 8.1.1.4.1. Cardiovascular
      - 8.1.1.4.2. Respiratory
      - 8.1.1.4.3. Others
  - 8.1.2. Morbidity
- 8.2. Complications in Premedication and Induction I
  - 8.2.1. Intra-Arterial and Perivascular Injection
  - 8.2.2. Anaphylactic Reactions
  - 8.2.3. Drug-Induced Priapism
  - 8.2.4. Incomplete or Inadequate Sedation/Induction
- 8.3. Complications in Premedication and Induction II
  - 8.3.1. Hypoventilation
  - 8.3.2. Inability to Intubate/Laryngeal Trauma
  - 8.3.3. Hypotension
- 8.4. Complications in Maintenance I
  - 8.4.1. Hypoxemia
  - 8.4.2. Hypercapnia
  - 8.4.3. Inadequate Anesthetic Plane and Alternating Planes
  - 8.4.4. Malignant Hyperthermia
- 8.5. Complications in Maintenance II
  - 8.5.1. Hypotension
  - 8.5.2. Hypertension
  - 8.5.3. Bleeding
  - 8.5.4. Alterations in Heart Rate and Rhythm
- 8.6. Complications in Recovery I
  - 8.6.1. Hypoxemia/Hypercapnia
  - 8.6.2. Nasal Edema
  - 8.6.3. Airway Obstruction
  - 8.6.4. Pulmonary Edema
  - 8.6.5. Fractures and Soft Tissue Damage
  - 8.6.6. Neuropathologies
  - 8.6.7. Myopathies
- 8.7. Complications in Recovery II
  - 8.7.1. Myelopathies
  - 8.7.2. Hyperkalemic Periodic Paralysis
  - 8.7.3. Delay/Excitation in Recovery
  - 8.7.4. Immediate Postoperative Complications
  - 8.7.5. Human Error

- 8.8. Cardiopulmonary Resuscitation (CPR) I
  - 8.8.1. Causes of Cardiopulmonary Emergencies
  - 8.8.2. Diagnosis of Cardiopulmonary Emergencies
  - 8.8.3. Cardiac Massage
  - 8.8.4. CPR Maneuver
    - 8.8.4.1. Foal CPR Maneuver
    - 8.8.4.2. Adult CPR Maneuver
- 8.9. Complications in Small and Large Ruminants
  - 8.9.1. Complications Associated with Poor Patient Positioning
  - 8.9.2. Cardiovascular Complications
  - 8.9.3. Tympanism, Regurgitation, Salivation
  - 8.9.4. Respiratory Complications
  - 8.9.5. Hypothermia
  - 8.9.6. Other Complications
- 8.10. Complications in Ruminants, Swine and Camelids
  - 8.10.1. Complications Related to Improper Positioning of Ruminants, Swine and Camelids
  - 8.10.2. Cardiovascular Complications in Ruminants, Swine and Camelids
  - 8.10.3. Respiratory Complications in Ruminants, Swine and Camelids
  - 8.10.4. Digestive Complications in Ruminants and Camelids
    - 8.10.4.1. Complications in Anesthetic Recovery in Ruminants, Swine and Camelids
    - 8.10.4.2. Complications Related to Intravenous Catheterization in Ruminants, Swine and Camelids
    - 8.10.4.3. Complications Related to Endotracheal Intubation in Swine
    - 8.10.4.4. Malignant Hyperthermia in Swine Patients



**Module 9. Fluid Therapy in Major Species**

- 9.1. Physiology of Water and Body Electrolytes:
  - 9.1.1. Physiological Body Spaces
  - 9.1.2. Fluid Equilibrium
  - 9.1.3. Sodium Physiology and Alterations
  - 9.1.4. Potassium Physiology and Alterations
  - 9.1.5. Calcium Physiology and Alterations
  - 9.1.6. Chlorine Physiology and Alterations
  - 9.1.7. Magnesium Physiology and Alterations
- 9.2. Acid-Base Equilibrium I
  - 9.2.1. Regulation of Acid-Base Homeostasis
  - 9.2.2. Consequences of Acid-Base Disorders
  - 9.2.3. Interpretation of Acid-Base Status
    - 9.2.3.1. Traditional Method
    - 9.2.3.2. New Approaches
- 9.3. Acid-Base Equilibrium II
  - 9.3.1. Metabolic Acidosis
  - 9.3.2. Respiratory Acidosis
  - 9.3.3. Metabolic Alkalosis
  - 9.3.4. Respiratory Alkalosis
  - 9.3.5. Mixed Disorders
- 9.4. Catheterization in the Equine Patient
  - 9.4.1. Selection of Catheter
  - 9.4.2. Catheterization Placement Points
  - 9.4.3. Catheter Placement and Maintenance
- 9.5. Catheterization Complications
  - 9.5.1. Thrombophlebitis
  - 9.5.2. Catheter Rupture
  - 9.5.3. Perivascular Injection
  - 9.5.4. Venous Air Embolism
  - 9.5.5. Exsanguination
- 9.6. Clinical Examination of Water Status in the Equine Patient
  - 9.6.1. Physical Examination
  - 9.6.2. Laboratorial Parameters
  - 9.6.3. Hemodynamic Parameters
- 9.7. Types of Fluids I
  - 9.7.1. Replacement Fluids
  - 9.7.2. Maintenance Fluids
- 9.8. Types of Fluids II
  - 9.8.1. Colloids
- 9.9. Transfusion of Blood Products
  - 9.9.1. Plasma
  - 9.9.2. Erythrocyte Concentrate
  - 9.9.3. Whole Blood
  - 9.9.4. Complications
- 9.10. Fluid Therapy in Ruminants, Swine and Camelids
  - 9.10.1. Physiology Applied to Fluid Therapy in these Species
  - 9.10.2. Isotonic, Hypertonic and Hypotonic Solutions Available in These Species
  - 9.10.3. Colloid Solutions Available in These Species
  - 9.10.4. Fluid Therapy for the Perioperative Period in These Species
  - 9.10.5. Imbalances of Glycemia and Ions and their Correction Through Fluid Therapy in These Species

## Module 10. Special Cases and Clinical Situations in Major Species

- 10.1. Special Cases in Station in Equines
  - 10.1.1. Diagnostic Procedures (CT, MRI)
  - 10.1.2. Laryngeal Surgery
  - 10.1.3. Laparoscopy
  - 10.1.4. Dental Procedures
  - 10.1.5. Ophthalmological Procedures
  - 10.1.6. Perineal Surgeries
  - 10.1.7. Obstetric Maneuvers
- 10.2. Anesthesia in Special Cases in Equines (I)
  - 10.2.1. Geriatric Patient
  - 10.2.2. Patient with Acute Abdominal Syndrome
  - 10.2.3. Cesarean Section
- 10.3. Anesthesia in Special Cases in Equines (II)
  - 10.3.1. Elective Anesthetic Management in Foals
  - 10.3.2. Emergency Anesthetic Management of Foal Emergencies
- 10.4. Anesthesia in Special Cases in Equines (III)
  - 10.4.1. Anesthetic Management of Respiratory Surgery
  - 10.4.2. Anesthetic Management of Diagnostic and Therapeutic Procedures for Nervous System Pathologies
- 10.5. Anesthesia in Special Cases in Ruminants
  - 10.5.1. Anesthetic Considerations and Perioperative Management in Orthopedic Procedures in Ruminants
  - 10.5.2. Anesthetic Considerations and Perioperative Management in Wounds, Bruises and Abscesses in Ruminants
  - 10.5.3. Anesthetic Considerations and Perioperative Management in Ruminant Laparotomy
  - 10.5.4. Anesthetic Considerations and Perioperative Management in Obstetrics and Castration Procedures in Ruminants
  - 10.5.5. Anesthetic Considerations and Perioperative Management in Distal Limb, Hoof and Horn Procedures in Ruminants
  - 10.5.6. Anesthetic Considerations and Perioperative Management in Udder and Teat Procedures in Ruminants
  - 10.5.7. Anesthetic Considerations and Perioperative Management on Eyes and Adjacent Areas in Ruminants
  - 10.5.8. Anesthetic Considerations and Perioperative Management in Surgical Procedures for the Resolution of Umbilical Hernias in Ruminants
  - 10.5.9. Anesthetic Considerations and Perioperative Management in Perianal and Tail Procedures in Ruminants
- 10.6. Anesthesia and Analgesia in Donkeys and Mules
  - 10.6.1. Anatomical, Physiological and Behavioral Variations
  - 10.6.2. Reference Values Required for Anesthesia
  - 10.6.3. Variations in Responses to Common Drugs Used in Anesthesia
  - 10.6.4. Premedication and Sedation for Foot Procedures in Donkeys and Mules
  - 10.6.5. Induction and Maintenance of Anesthesia: Injectable and Inhalation Techniques
  - 10.6.6. Anesthetic Monitoring
  - 10.6.7. Recovery of Anesthesia
  - 10.6.8. Preoperative, Intraoperative and Postoperative Analgesia
  - 10.6.9. Local Anesthetic Techniques in Donkeys and Mules
- 10.7. Anesthesia in Special Cases in Swine and Camelids
  - 10.7.1. Intraoperative and Perioperative Anesthetic Management in Field Anesthesia in Swine
  - 10.7.2. Castration in Piglets. Analgesic and Anesthetic Considerations
  - 10.7.3. The Vietnamese Pig. Intraoperative and Perioperative Anesthetic Management and Most Frequent Complications
  - 10.7.4. Anesthetic Considerations and Perioperative Management of the Pig as a Model for Transplantation and Cardiovascular Models
  - 10.7.5. Anesthetic Considerations and Perioperative Management of the Pig as a Model for Laparoscopy
  - 10.7.6. Intraoperative and Perioperative Anesthetic Management in Field Anesthesia in Camelids
  - 10.7.7. Castration in Alpaca. Analgesic and Anesthetic Considerations



- 10.8. Anesthesia in Ruminants, Swine and Wild Camelids
  - 10.8.1. Considerations for Chemical Immobilization and Anesthesia in the Family Bovidae and Antilocapridae
  - 10.8.2. Considerations for Chemical Immobilization and Anesthesia in the Subfamily Capridae
  - 10.8.3. Considerations for Chemical Immobilization and Anesthesia in the Family Cervidae, Tragulidae and Mochidae
  - 10.8.4. Considerations for Chemical Immobilization and Anesthesia in the Family Suidae and Tayassuidae
  - 10.8.5. Considerations for Chemical Immobilization and Anesthesia in the Family Camelidae
- 10.9. Special Considerations: Animals for Consumption/Experimental Animals (Ruminants and Swine)
  - 10.9.1. Legislation Applicable to the Anesthesia of Animals Intended for Human Consumption
  - 10.9.2. Anesthetic and Analgesic Considerations in Animals Intended for Human Consumption
  - 10.9.3. Legislation Applicable to the Anesthesia of Animals for Experimental Purposes
  - 10.9.4. Anesthetic and Analgesic Considerations in Experimental Ruminants and Swine
- 10.10. Euthanasia
  - 10.10.1. General Considerations
    - 10.10.1.1. Geriatric Horse
  - 10.10.2. Mechanisms of Action for Hypothermia.
  - 10.10.3. Chemical Euthanasia Methods
  - 10.10.4. Physical Euthanasia Methods
  - 10.10.5. Euthanasia Protocol
  - 10.10.6. Confirmation of Death

## Module 11. Digestive System

- 11.1. Approach to Acute Abdominal Syndrome Evaluation. Treatment Decision
  - 11.1.1. Introduction
    - 11.1.1.1. Epidemiology of Colic and Predisposing Factors
    - 11.1.1.2. Categorization of Diseases Causing Colicky Conditions
  - 11.1.2. General Screening Methods
    - 11.1.2.1. Medical History
    - 11.1.2.2. Assessment of General Condition and Degree of Pain
    - 11.1.2.3. Measurement of Vital Signs, Degree of Dehydration, Degree of Tissue Perfusion and Mucous Membranes Status
    - 11.1.2.4. Auscultation, Palpation and Percussion of the Abdomen
    - 11.1.2.5. Rectal Examination
    - 11.1.2.6. Nasogastric Catheterization
  - 11.1.3. Advanced Diagnostic Methods
    - 11.1.3.1. Blood Biopathology in the Diagnosis of Colic
    - 11.1.3.2. Abdominocentesis
    - 11.1.3.3. Ultrasound, Radiology, Endoscopy
  - 11.1.4. Treatment Decision: Medical or Surgical? When to Refer?
- 11.2. Diagnostic Imaging of the Digestive System in the Field
  - 11.2.1. Introduction to Diagnostic Imaging in the Field
  - 11.2.2. Technical Basis
    - 11.2.2.1. Radiology
    - 11.2.2.2. Ultrasound
  - 11.2.3. Oral Pathology
  - 11.2.4. Esophageal Pathology
  - 11.2.5. Abdominal Pathology
    - 11.2.5.1. Digestive System
      - 11.2.5.1.1. Stomach.
      - 11.2.5.1.2. Small Intestine
      - 11.2.5.1.3. Large Intestine
    - 11.2.5.2. Peritoneal Cavity

- 11.3. Oral cavity Examination Exodontia
  - 11.3.1. Exploration of the Head
  - 11.3.2. Oral cavity Examination
  - 11.3.3. Regional Nerve Blocks for Surgery and Dental Extractions
    - 11.3.3.1. Maxillary Nerve
    - 11.3.3.2. Mandibular Nerve
    - 11.3.3.3. Infraorbital Nerve
    - 11.3.3.4. Mental Nerve
  - 11.3.4. Exodontia: Indications and Techniques
- 11.4. Malocclusions. Tumors. Maxillary and Mandibular Fractures Temporomandibular Joint Pathology
  - 11.4.1. Malocclusions. Filing
    - 11.4.1.1. Wear Alterations
  - 11.4.2. Tumors. Classification
  - 11.4.3. Maxillary and Mandibular Fractures Reparation
  - 11.4.4. Temporomandibular Joint Pathology
    - 11.4.4.1. Alterations and Clinical Signs
    - 11.4.4.2. Examination and Diagnosis
    - 11.4.4.3. Treatment and Prognosis
- 11.5. Diseases of the Esophagus and Stomach
  - 11.5.1. Oesophageal
    - 11.5.1.1. Esophageal Obstruction
    - 11.5.1.2. Oesophagitis
    - 11.5.1.3. Other Esophageal Alterations
  - 11.5.2. Stomach.
    - 11.5.2.1. Gastric Ulcers
    - 11.5.2.2. Gastric Impaction
    - 11.5.2.3. Squamous Cell Carcinoma
    - 11.5.2.4. Other Stomach Alterations
- 11.6. Small Intestine Diseases
  - 11.6.1. Simple Obstruction
  - 11.6.2. Proximal Enteritis
  - 11.6.3. Inflammatory Bowel Disease
  - 11.6.4. Intestinal Lymphoma
  - 11.6.5. Strangulating Alterations
  - 11.6.6. Small Intestinal Alterations
- 11.7. Large Intestinal Diseases
  - 11.7.1. Impactions
    - 11.7.1.1. Large Colon
    - 11.7.1.2. Cecum
    - 11.7.1.3. Minor Colon
  - 11.7.2. Large Colon Displacement
  - 11.7.3. Colitis
  - 11.7.4. Peritonitis
  - 11.7.5. Enterolithiasis
  - 11.7.6. Other Large Intestinal Alterations
- 11.8. Liver and Biliary Tract Diseases
  - 11.8.1. Approach to the Patient with Liver Disease
  - 11.8.2. Acute Liver Failure
  - 11.8.3. Cholangiohepatitis
  - 11.8.4. Chronic Hepatitis
  - 11.8.5. Neoplasms
  - 11.8.6. Other Liver and Biliary Tract Alterations



- 11.9. Infectious and Parasitic Diseases of the Digestive Tract
  - 11.9.1. Infectious Diseases of the Digestive Tract
    - 11.9.1.1. Salmonellosis
    - 11.9.1.2. Proliferative Enteropathy
    - 11.9.1.3. Clostridiosis
    - 11.9.1.4. Rotavirus
    - 11.9.1.5. Potomac Equine Fever
    - 11.9.1.6. Equine Coronavirus
  - 11.9.2. Parasitic Diseases of the Digestive Tract
    - 11.9.2.1. Gastrointestinal Myiasis
    - 11.9.2.2. Intestinal Protozoa
    - 11.9.2.3. Intestinal Cestodes
    - 11.9.2.4. Intestinal Nematodes
- 11.10. Treatment of Medical Colic in the Field
  - 11.10.1. Management of the Patient with Colicky Pain
  - 11.10.2. Pain Control in Colicky Patients
  - 11.10.3. Fluid Therapy and Cardiovascular Support
  - 11.10.4. Treatment for Endotoxemia

## Module 12. Cardio-Respiratory and Vascular System

- 12.1. Clinical Assessment of the Respiratory System and Diagnostic Methods
  - 12.1.1. Examination of the Respiratory System
  - 12.1.2. Respiratory Tract Sampling:
    - 12.1.2.1. Samples from Nasal Cavity, Pharynx and Guttural Pouches
    - 12.1.2.2. Tracheal Aspirate and Bronchoalveolar Lavage
    - 12.1.2.3. Thoracentesis
  - 12.1.3. Endoscopy
    - 12.1.3.1. Static and Dynamic Endoscopy of Upper Airways
    - 12.1.3.2. Sinuscopy
  - 12.1.4. Radiology
    - 12.1.4.1. Nasal Cavity, Sinuses and Guttural Pouches
    - 12.1.4.2. Larynx and Trachea
  - 12.1.5. Ultrasound.
    - 12.1.5.1. Ultrasound Techniques
    - 12.1.5.2. Pleural Effusion
    - 12.1.5.3. Atelectasis, Consolidation and Masses
    - 12.1.5.4. Pneumothorax
- 12.2. Diseases of the Upper Respiratory Tract I (Nose, Nasal Cavity and Paranasal Sinuses).
  - 12.2.1. Diseases and Pathologies Affecting the Rostral/Larynxes Area
    - 12.2.1.1. Clinical Introduction and Diagnosis
    - 12.2.1.2. Atheroma - Epidermal Inclusion Cyst
      - 12.2.1.2.1. Treatment
    - 12.2.1.3. Redundant Wing Fold
      - 12.2.1.3.1. Treatment
  - 12.2.2. Diseases and Pathologies Affecting the Nasal Cavity
    - 12.2.2.1. Diagnostic Techniques
    - 12.2.2.2. Nasal Septum Pathologies
    - 12.2.2.3. Ethmoidal Hematoma
  - 12.2.3. Diseases and Pathologies Affecting the Paranasal Sinuses
    - 12.2.3.1. Clinical Presentation and Diagnostic Techniques
    - 12.2.3.2. Sinusitis
      - 12.2.3.2.1. Primary Sinusitis
      - 12.2.3.2.2. Secondary Sinusitis
    - 12.2.3.3. Paranasal Sinus Cyst
    - 12.2.3.4. Paranasal Sinus Neoplasia
  - 12.2.4. Approaches to the Paranasal Sinus
    - 12.2.4.1. Trepanation Anatomical References and Technique
    - 12.2.4.2. Synocentesis
    - 12.2.4.3. Sinuscopy
    - 12.2.4.4. Flaps or Bone Flaps of the Paranasal Sinuses
    - 12.2.4.5. Associated Complications
- 12.3. Diseases of the Upper Tract II (Larynx and Pharynx)
  - 12.3.1. Diseases and Pathologies affecting the Pharynx - Nasopharynx
    - 12.3.1.1. Anatomical Pathologies
      - 12.3.1.1.1. Nasopharyngeal Scar Tissue
      - 12.3.1.1.2. Nasopharyngeal Masses
      - 12.3.1.1.3. Treatment
    - 12.3.1.2. Functional Pathologies
      - 12.3.1.2.1. Dorsal Displacement of the Soft Palate (DDSP)
        - 12.3.1.2.1.1. Intermittent DDSP
        - 12.3.1.2.1.2. Permanent DDSP
        - 12.3.1.2.1.3. Surgical and Non-Surgical Treatments
      - 12.3.1.2.2. Rostral Pharyngeal Collapse
      - 12.3.1.2.3. Dorsal/Lateral Nasopharyngeal Collapse
    - 12.3.1.3. Nasopharyngeal Pathologies in Foals
      - 12.3.1.3.1. Choanal Atresia
      - 12.3.1.3.2. Cleft Palate
      - 12.3.1.3.3. Nasopharyngeal Dysfunction



- 12.3.2. Diseases and Pathologies Affecting the Larynx
  - 12.3.2.1. Recurrent Laryngeal Neuropathy (Laryngeal Hemiplegia)
    - 12.3.2.1.1. Diagnosis
    - 12.3.2.1.2. Gradation
    - 12.3.2.1.3. Treatment and Associated Complications
  - 12.3.2.2. Vocal Cord Collapse
  - 12.3.2.3. Bilateral Laryngeal Paralysis
  - 12.3.2.4. Cricopharyngeal-Laryngeal Dysplasia (Fourth Branchial Arch Defects)
  - 12.3.2.5. Collapse of the Apex of the Corniculate Process
  - 12.3.2.6. Medial Deviation of the Aryepiglottic Folds
  - 12.3.2.7. Chondropathy of the Arytenoid Cartilage
  - 12.3.2.8. Pathologies in the Mucosa of the Arytenoid Cartilages
  - 12.3.2.9. Pathologies Affecting the Epiglottis
    - 12.3.2.9.1. Epiglottic Entrapment
    - 12.3.2.9.2. Acute Epiglottitis
    - 12.3.2.9.3. Subepiglottic Cyst
    - 12.3.2.9.4. Subepiglottic Granuloma
    - 12.3.2.9.5. Dorsal Epiglottic Abscess
    - 12.3.2.9.6. Hypoplasia, Flaccidity, Deformity of Epiglottis
    - 12.3.2.9.7. Epiglottic Retroversion
- 12.4. Diseases of Guttural Pouches and Trachea Tracheostomy
  - 12.4.1. Diseases and Pathologies Affecting the Guttural Pouches
    - 12.4.1.1. Tympanism
      - 12.4.1.1.1. Functional Nasopharyngeal Obstruction in Adults
    - 12.4.1.2. Empyema
    - 12.4.1.3. Mycosis
    - 12.4.1.4. Trauma - Ruptured Ventral Rectus Muscles
    - 12.4.1.5. Osteoarthropathy of the Temporohyoid Joint
    - 12.4.1.6. Other Pathologies
  - 12.4.2. Diseases and Pathologies Affecting the Trachea
    - 12.4.2.1. Trauma
    - 12.4.2.2. Tracheal Collapse.
    - 12.4.2.3. Tracheal Stenosis.
    - 12.4.2.4. Foreign Bodies.
    - 12.4.2.5. Intraluminal Masses
  - 12.4.3. Tracheal Surgeries
    - 12.4.3.1. Tracheostomy and Tracheostomy (Temporary)
    - 12.4.3.2. Permanent Tracheostomy
    - 12.4.3.3. Other Tracheal Surgeries
- 12.5. Inflammatory Diseases of the Lower Respiratory Tract
  - 12.5.1. Introduction: Functionality of the Lower Respiratory Tract
  - 12.5.2. Equine Asthma
    - 12.5.2.1. Etiology and Classification
    - 12.5.2.2. Epidemiology
    - 12.5.2.3. Classification
    - 12.5.2.4. Pathophysiology
    - 12.5.2.5. Clinical Signs
    - 12.5.2.6. Diagnostic Techniques
    - 12.5.2.7. Therapy Options
    - 12.5.2.8. Prognosis
    - 12.5.2.9. Prevention
  - 12.5.3. Exercise-Induced Pulmonary Hemorrhage
    - 12.5.3.1. Etiology
    - 12.5.3.2. Epidemiology
    - 12.5.3.3. Pathophysiology
    - 12.5.3.4. Clinical Signs
    - 12.5.3.5. Diagnostic Techniques
    - 12.5.3.6. Therapy Options
    - 12.5.3.7. Prognosis

- 12.6. Bacterial and Fungal Infectious Diseases of the Respiratory Tract
  - 12.6.1. Equine Strangles. Streptococcus Equi Infection
  - 12.6.2. Bacterial Pneumonia and Pleuropneumonia
  - 12.6.3. Fungal Pneumonia
- 12.7. Pneumonias of Mixed Origin Viral Infectious Diseases of the Respiratory Tract and Tumors
  - 12.7.1. Interstitial Pneumonia and Pulmonary Fibrosis
  - 12.7.2. Equine Herpesvirus I, IV and V
  - 12.7.3. Equine Influenza
  - 12.7.4. Tumours of the Respiratory System
- 12.8. Exploration of the Cardiovascular System, Electrocardiography and Echocardiography
  - 12.8.1. Anamnesis and Clinical Examination
  - 12.8.2. Basic Principles of Electrocardiography
  - 12.8.3. Electrocardiography Types
  - 12.8.4. Electrocardiogram Interpretation
  - 12.8.5. Basic Principles of Echocardiography
  - 12.8.6. Echocardiographic Planes
- 12.9. Structural Cardiac Alterations
  - 12.9.1. Congenital
    - 12.9.1.1. Ventricular Septal Defect
  - 12.9.2. Acquired
    - 12.9.2.1. Aortic Insufficiency
    - 12.9.2.2. Mitral Insufficiency
    - 12.9.2.3. Tricuspid Regurgitation
    - 12.9.2.4. Aorto-Cardiac Fistula
- 12.10. Arrhythmias
  - 12.10.1. Supraventricular Arrhythmias
  - 12.10.2. Ventricular Arrhythmias
  - 12.10.3. Conduction Disturbances

## Module 13. Hematopoietic System, Immunology and Nutrition

- 13.1. Analytical Interpretation: Blood Count and Serum Biochemistry
  - 13.1.1. General Considerations for the Interpretation of Analytical Reports
    - 13.1.1.1. Essential Patient Data
    - 13.1.1.2. Sample Collection and Handling
  - 13.1.2. Interpretation of Blood Count
    - 13.1.2.1. Red Blood Cells
    - 13.1.2.2. White Blood Cells
    - 13.1.2.3. Platelet Cells
    - 13.1.2.4. Smears
  - 13.1.3. Interpretation of Serum or Plasma Biochemistry
    - 13.1.3.1. Electrolytes
    - 13.1.3.2. Bilirubin
    - 13.1.3.3. Creatinine, Blood Urea Nitrogen (BUN), Urea and Symmetrical Dimethylarginine (SDMA)
    - 13.1.3.4. Proteins: Albumin and Globulins
    - 13.1.3.5. Acute-Phase Proteins: Fibrinogen, Serum Amyloid A
    - 13.1.3.6. Enzymes
    - 13.1.3.7. Glucose
    - 13.1.3.8. Bicarbonate
    - 13.1.3.9. Lactate
    - 13.1.3.10. Triglycerides and Bile Acids
- 13.2. Hematopoietic System Pathologies
  - 13.2.1. Hemolytic Anemia
    - 13.2.1.1. Immune-Mediated Hemolytic Anemia
    - 13.2.1.2. Equine Infectious Anemia
    - 13.2.1.3. Piroplasmiosis
    - 13.2.1.4. Other Causes
  - 13.2.2. Hemorrhagic Anemia
    - 13.2.2.1. Hemoperitoneum and Hemothorax
    - 13.2.2.2. Gastrointestinal Losses
    - 13.2.2.3. Losses From Other Origin

- 13.2.3. Non-Regenerative Anemias
  - 13.2.3.1. Iron Deficiency Anemia
  - 13.2.3.2. Anemia due to Chronic Inflammation/Infection
  - 13.2.3.3. Aplastic Anemia
- 13.2.4. Coagulation Alterations
  - 13.2.4.1. Platelet disorders:
    - 13.2.4.1.1. Thrombocytopenia
    - 13.2.4.1.2. Platelet Functional Alterations
  - 13.2.4.2. Alterations of Secondary Hemostasis
    - 13.2.4.2.1. Hereditary
    - 13.2.4.2.2. Acquired
  - 13.2.4.3. Thrombocytosis
  - 13.2.4.4. Lymphoproliferative disorders.
  - 13.2.4.5. Disseminated Intravascular Coagulation (DIC)
- 13.3. Endotoxic Shock
  - 13.3.1. Systemic Inflammation and Systemic Inflammatory Response Syndrome (SIRS)
  - 13.3.2. Causes of Endotoxemia in Horses
  - 13.3.3. Pathophysiological Mechanisms
  - 13.3.4. Endotoxic Shock
    - 13.3.4.1. Hemodynamic Changes
    - 13.3.4.2. Multiorgan Dysfunction
  - 13.3.5. Clinical Signs of Endotoxemia and Endotoxic Shock.
  - 13.3.6. Diagnosis
  - 13.3.7. Management
    - 13.3.7.1. Endotoxin Release Inhibitors
    - 13.3.7.2. Endotoxin Uptake and Inhibition
    - 13.3.7.3. Cell Activation Inhibition
    - 13.3.7.4. Inhibition of the Synthesis of Inflammatory Mediators
    - 13.3.7.5. Other specific therapies
    - 13.3.7.6. Support Treatments
- 13.4. Treatment of Hematopoietic Alterations Transfusion Therapy
  - 13.4.1. Indications for Transfusion of Whole Blood
  - 13.4.2. Indications for Plasma Transfusion
  - 13.4.3. Indications for Transfusion of Platelet Products
  - 13.4.4. Donor Selection and Compatibility Testing
  - 13.4.5. Technique for Whole Blood Collection and Processing of Plasma
  - 13.4.6. Administration of Blood Products
    - 13.4.6.1. Volume of Administration
    - 13.4.6.2. Administration Techniques
    - 13.4.6.3. Adverse Reaction Monitoring
- 13.5. Immune System Alterations Allergies.
  - 13.5.1. Hypersensitivity Types
  - 13.5.2. Pathologies Associated with Hypersensitivity
    - 13.5.2.1. Anaphylactic Reaction
    - 13.5.2.2. Hemorrhagic Purpura
  - 13.5.3. Autoimmunity
  - 13.5.4. Most Important Immunodeficiencies in Equines
    - 13.5.4.1. Diagnostic Tests
    - 13.5.4.2. Primary Immunodeficiencies
    - 13.5.4.3. Secondary Immunodeficiencies
  - 13.5.5. Immunomodulators:
    - 13.5.5.1. Immunostimulants
    - 13.5.5.2. Immunosuppressants
- 13.6. Nutrition Basic Principles I
  - 13.6.1. Physiology of Gastrointestinal Tract
    - 13.6.1.1. Oral cavity, Esophagus, Stomach
    - 13.6.1.2. Small Intestine
    - 13.6.1.3. Large Intestine
  - 13.6.2. Diet Components, Nutrients
    - 13.6.2.1. Water
    - 13.6.2.2. Proteins and Amino Acids
    - 13.6.2.3. Carbohydrates
    - 13.6.2.4. Fats and Fatty Acids
    - 13.6.2.5. Minerals and Vitamins
  - 13.6.3. Estimation of Horse Weight and Body Condition

- 13.7. Nutrition Basic Principles II
  - 13.7.1. Energy and Available Energy Sources
    - 13.7.1.1. Forage
    - 13.7.1.2. Starches
    - 13.7.1.3. Fats
  - 13.7.2. Metabolic Pathways of Energy Production
  - 13.7.3. Energy Needs of the Horse
    - 13.7.3.1. In Maintenance
    - 13.7.3.2. For Breeding and Growth
    - 13.7.3.3. For the Showhorse/Racehorse
- 13.8. Cachectic Horse Nutrition
  - 13.8.1. Metabolic Response
  - 13.8.2. Physical Examination and Clinical Signs
  - 13.8.3. Blood Analysis
  - 13.8.4. Differential Diagnoses
  - 13.8.5. Nutritional Requirements
- 13.9. Use of Probiotics, Prebiotics and Medicinal Plants
  - 13.9.1. Role of the Microbiota in the Large Intestine
  - 13.9.2. Probiotics, Prebiotics, and Symbiotics
  - 13.9.3. Medicinal Plants Use
- 13.10. Rational Use of Antibiotics. Bacterial Resistance
  - 13.10.1. Responsible Antibiotic Use
  - 13.10.2. New Antibiotic Therapies
  - 13.10.3. Resistance Mechanisms
  - 13.10.4. Main Multi-resistant Pathogens

## Module 14. Locomotor System

- 14.1. Examination and Diagnosis of Lameness
  - 14.1.1. Introduction
    - 14.1.1.1. Definition of Lameness
    - 14.1.1.2. Causes and Types of Lameness
    - 14.1.1.3. Symptoms of Lameness
  - 14.1.2. Static Examination of Lameness
    - 14.1.2.1. Medical History
    - 14.1.2.2. Approach to the Horse and General Examination
      - 14.1.2.2.1. Visual Examination: General Condition and Conformation
      - 14.1.2.2.2. Static Physical Examination, Palpation, Percussion and Flexion
  - 14.1.3. Dynamic Examination of Lameness
    - 14.1.3.1. Examination in Motion
    - 14.1.3.2. Flexion Test
    - 14.1.3.3. Assessment and Quantification of Lameness. Objective and Subjective Methods
    - 14.1.3.4. Introduction to Nerve Anesthetic Blocks
  - 14.1.4. Introduction to Complementary Diagnostic Methods
- 14.2. Anesthetic Nerve Blocks
  - 14.2.1. Diagnostic Loco-Regional Analgesia: Introduction
    - 14.2.1.1. General Considerations and Pre-Diagnostic Requirements
    - 14.2.1.2. Types of Blockages and Injection Techniques
    - 14.2.1.3. Drugs to be Used
    - 14.2.1.4. Election of Blockages
    - 14.2.1.5. Approach to the Patient
      - 14.2.1.5.1. Patient Management and Preparation
      - 14.2.1.5.2. Chemical Containment
    - 14.2.1.6. Evaluation of Results
      - 14.2.1.6.1. Subjective Assessment
      - 14.2.1.6.2. Objective Assessment
    - 14.2.1.7. Complications



- 14.2.2. Perineural Anesthetic Blocks
  - 14.2.2.1. Perineural Analgesia in the Forelimb
  - 14.2.2.2. Perineural Analgesia in the Hindlimb
- 14.2.3. Regional Anesthetic Blocks
- 14.2.4. Intrasynovial Anesthetic Blocks
  - 14.2.4.1. Intra-Articular Blocks
  - 14.2.4.2. Bursa and Tendon Sheath Blocks
- 14.3. Diagnostic Imaging of Lameness
  - 14.3.1. Introduction to Diagnostic Imaging in the Field
  - 14.3.2. Technical Basis
    - 14.3.2.1. Radiology
    - 14.3.2.2. Ultrasound
    - 14.3.2.3. Advanced Techniques
      - 14.3.2.3.1. Gammagraphy
      - 14.3.2.3.2. Magnetic Resonance
      - 14.3.2.3.3. Computerized Tomography
  - 14.3.3. Bone Pathology Diagnosis
  - 14.3.4. Joint Pathology Diagnosis
  - 14.3.5. Diagnosis of Tendon and Ligament Pathology
- 14.4. Pathologies of the Axial Skeleton Diagnosis and Treatment
  - 14.4.1. Introduction to Axial Skeletal Pathology
  - 14.4.2. Axial Skeleton Exploration
  - 14.4.3. Cervical Spine Diagnosis
  - 14.4.4. Diagnosis of the Thoracolumbar and Sacroiliac Spine
  - 14.4.5. Axial Skeleton Pathology Treatment
- 14.5. Degenerative Joint Disease (DJD) Traumatic Arthritis and Post-Traumatic Osteoarthritis Etiology, Diagnosis and Treatment
  - 14.5.1. Anatomy and Physiology of the Joints
  - 14.5.2. Definition of EDA
  - 14.5.3. Cartilage Lubrication and Repair
  - 14.5.4. DJD Manifestations
    - 14.5.4.1. Acute Injuries
    - 14.5.4.2. Chronic Fatigue Injuries
  - 14.5.5. DJD Diagnosis
    - 14.5.5.1. Clinical Examination
    - 14.5.5.2. Objective and Subjective Examination of Lameness
    - 14.5.5.3. Diagnostic Anesthesia
    - 14.5.5.4. Diagnostic Imaging
      - 14.5.5.4.1. Radiology
      - 14.5.5.4.2. Ultrasound
      - 14.5.5.4.3. Magnetic Resonance Imaging and Computed Axial Tomography
      - 14.5.5.4.3. New Technologies
  - 14.5.6. Treatment of DJD
    - 14.5.6.1. Nonsteroidal Anti-Inflammatories
    - 14.5.6.2. Steroid Anti-Inflammatories
    - 14.5.6.3. Hyaluronic Acid
    - 14.5.6.4. Glucosaminoglycans
    - 14.5.6.5. Pentosan
    - 14.5.6.6. Biological Therapies
      - 14.5.6.6.1. Autologous Conditioned Serum
      - 14.5.6.6.2 Platelet-rich Plasma
      - 14.5.6.6.3. Stem Cells
    - 14.5.6.8. Oral Supplements

- 14.6. Tendinitis, Desmitis and Adjacent Structures Pathologies
  - 14.6.1. Applied Anatomy and Tendon Damage Pathophysiology
  - 14.6.2. Alterations of Tendons, Ligaments and Associated Structures
    - 14.6.2.1. Soft Tissues of the Pastern
    - 14.6.2.2. Superficial Digital Flexor Tendon (SDFT)
    - 14.6.2.3. Deep Digital Flexor Tendon (DDFT)
    - 14.6.2.4. Inferior Accessory Ligament of the TFDSP
    - 14.6.2.5. Suspensory Ligament of the Fetlock (SL)
      - 14.6.2.5.1. Proximal part of the SL
      - 14.6.2.5.2. SL Body
      - 14.6.2.5.3. SL Branches
    - 14.6.2.6. Carpal Canal and Sheath
    - 14.6.2.7. Tarsal Sheath
    - 14.6.2.8. Plantar Fasciitis
    - 14.6.2.9. Bursitis
  - 14.6.3. Management of Tendon and Ligament Injuries
    - 14.6.3.1. Medical Therapy
    - 14.6.3.2. Regenerative Therapies
      - 14.6.3.2.1. Stem Cell and Bone Marrow Therapies
      - 14.6.3.2.2. Platelet Rich Plasma Therapy
    - 14.6.3.3. Shock Waves and Other Physical Therapies
    - 14.6.3.4. Surgical Therapies
    - 14.6.3.5. Rehabilitation and Return to Work Guidelines
- 14.7. Fractures. Bone Sequestration
  - 14.7.1. First Approach to Fractures, General Considerations Bone Sequestration
    - 14.7.1.1. Introduction
      - 14.7.1.1.1. First Aid for Fractures in Horses
      - 14.7.1.1.2. Case Selection, General Considerations
      - 14.7.1.1.3. Immobilization of Fractures According to Location
    - 14.7.1.2. Transport
      - 14.7.1.2.1. Transporting an Equine Patient for Fracture Treatment
    - 14.7.1.3. Prognosis
    - 14.7.1.4. Bone Sequestration
  - 14.7.2. Rehabilitation and Return to Work Guidelines
    - 14.7.2.1. In Fractures
    - 14.7.2.2. In Bone Sequestration
- 14.8. Laminitis
  - 14.8.1. Pathophysiology of Laminitis
  - 14.8.2. Clinical of Laminitis
  - 14.8.3. Diagnosis of Laminitis
    - 14.8.3.1. Physical Examination
    - 14.8.3.2. Diagnostic Imaging
    - 14.8.3.3. Endocrine and Metabolic Assessment
  - 14.8.4. Medical Treatment of Laminitis
    - 14.8.4.1. Anti-Inflammatories
    - 14.8.4.2. Vasoactive Drugs
    - 14.8.4.3. Analgesia:
    - 14.8.4.4. Hypothermia
    - 14.8.4.5. Sepsis.
    - 14.8.4.6. Pars Intermedia Pituitary Dysfunction (PPID) and Equine Metabolic Syndrome (EMS)
  - 14.8.5. Stabilization of the Third Phalanx
    - 14.8.5.1. Sole Support Techniques
    - 14.8.5.2. Therapeutic Horseshoeing
  - 14.8.6. Treatment of Laminitis
    - 14.8.6.1. Use of Casts
    - 14.8.6.2. Flexor Digitorum Superficialis Tenotomy
    - 14.8.6.3. Dorsal Wall Resection
    - 14.8.6.4. Complications
  - 14.8.7. Chronic Laminitis
  - 14.8.8. Laminitis Prevention



- 14.9. Orthopedic Field Surgery
  - 14.9.1. Fractures of Rudimentary Metacarpals/Metatarsals
    - 14.9.1.1. Clinical History, Symptomatology, Different Presentations
    - 14.9.1.2. Diagnostic Techniques
    - 14.9.1.3. Decision Making, Optimal Treatment
    - 14.9.1.4. Surgical Management
    - 14.9.1.5. Complications to Surgery
    - 14.9.1.6. Post-Operative Care
    - 14.9.1.7. Rehabilitation and Return to Work Guidelines
  - 14.9.2. Desmotomies
    - 14.9.2.1. Medical History
    - 14.9.2.2. Decision Making
    - 14.9.2.3. Surgical Management
    - 14.9.2.4. Complications to Desmotomies
    - 14.9.2.5. Post-Operative Care
    - 14.9.2.6. Rehabilitation and Return to Work Guidelines
  - 14.9.3. Neurectomies
    - 14.9.3.1. Indications
    - 14.9.3.2. Pre-Surgical Considerations and Implications
    - 14.9.3.3. Surgical Technique
    - 14.9.3.4. Complications
    - 14.9.3.5. Post-Operative Care
    - 14.9.3.7. Rehabilitation and Return to Work Guidelines

- 14.10. Myopathies in the Horse
  - 14.10.1. Genetic and Congenital Diseases
    - 14.10.1.1. Myotonia
    - 14.10.1.2. Myopathy due to Polysaccharide Storage
    - 14.10.1.3. Malignant Hyperthermia
    - 14.10.1.4. Hyperkaliaemic Periodic Paralysis
  - 14.10.2. Traumatic and Irritative Alterations
    - 14.10.2.1. Fibrotic Myopathy
    - 14.10.2.2. Bruises and Tears
    - 14.10.2.3. Intramuscular Irritant Injections
  - 14.10.3. Infectious Diseases.
    - 14.10.3.1. Abscesses.
    - 14.10.3.2. Clostridial Myositis
  - 14.10.4. Ischemic Diseases
    - 14.10.4.1. Post-Anesthetic Myositis
  - 14.10.5. Nutritional Diseases
    - 14.10.5.1. Malnutrition
    - 14.10.5.2. Vitamin E and Selenium Alterations
    - 14.10.5.3. Cachectic Atrophy
  - 14.10.6. Pathologies Associated with Exercise
    - 14.10.6.1. Acute Exertional Rhabdomyolysis
    - 14.10.6.2. Recurrent Exertional Rhabdomyolysis
    - 14.10.6.3. Hypokinetic Atrophy

## Module 15. Surgical Pathologies of the Skin and Related Structures

- 15.1. Exploration and Wound Types
  - 15.1.1. Anatomy
  - 15.1.2. Initial Assessment, Emergency Treatment
  - 15.1.3. Wound Classification
  - 15.1.4. Wound Healing Process
  - 15.1.5. Factors Influencing Wound Infection and Wound Healing
  - 15.1.6. Primary and Secondary Intention Wound Healing

- 15.2. Tissue Management, Hemostasis and Suture Techniques
  - 15.2.1. Incision and Tissue Dissection
  - 15.2.2. Hemostasis
    - 15.2.2.1. Mechanical Hemostasis
    - 15.2.2.2. Ligatures
    - 15.2.2.3. Tourniquet
    - 15.2.2.4. Electrocoagulation
    - 15.2.2.5. Chemical Hemostasis
  - 15.2.3. Tissue Management, Irrigation and Suctioning
  - 15.2.4. Suture Materials Used
    - 15.2.4.1. Instruments
    - 15.2.4.2. Suture Material Selection
    - 15.2.4.3. Needles
    - 15.2.4.4. Drainages
  - 15.2.5. Approaches to Wound Suturing
  - 15.2.6. Suture Patterns
- 15.3. Bandages
  - 15.3.1. Materials and Bandage Types
  - 15.3.2. Hoof Bandage
  - 15.3.3. Distal Extremity Bandage
  - 15.3.4. Full Limb Bandage
  - 15.3.5. Fiberglass Cast. Application and Peculiarities in Young Animals
- 15.4. Acute Wound Repair
  - 15.4.1. Wound Treatment Medication
  - 15.4.2. Debriding
  - 15.4.3. Emphysema Secondary to Wounds
  - 15.4.4. Negative Pressure Therapy
  - 15.4.5. Topical Treatment Types



- 15.5. Repair and Management of Chronic and/or Infected Wounds
  - 15.5.1. Particularities of Chronic and Infected Wounds
  - 15.5.2. Causes of Chronic Wounds
  - 15.5.3. Management of Severely Contaminated Wounds
  - 15.5.4. Laser Benefits
  - 15.5.5. Larvotherapy
  - 15.5.6. Cutaneous Fistulas Treatment
- 15.6. Hoof Wound Treatment Regional and Intraosseous Perfusion of Antibiotics
  - 15.6.1. Hoof Wounds
    - 15.6.1.1. Coronary Buckle Wounds
    - 15.6.1.2. Heel Wounds
    - 15.6.1.3. Puncture Wounds on the Palm
  - 15.6.2. Antibiotic Perfusion
    - 15.6.2.1. Regional Perfusion
    - 15.6.2.2. Intraosseous Perfusion
- 15.7. Management and Repair of Synovial Wounds and Joint Lavage
  - 15.7.1. Pathophysiology of Synovial Infection
  - 15.7.2. Epidemiology and Diagnosis of Synovial Wound Infections
  - 15.7.3. Synovial Wound Treatment Joint Lavage
  - 15.7.4. Synovial Wound Prognosis
- 15.8. Tendon Lacerations Management and Repair
  - 15.8.1. Introduction, Anatomy, Anatomical Implications
  - 15.8.2. Primary care, Examination of the Injury, Immobilization
  - 15.8.3. Case Selection: Surgical or Conservative Treatment
  - 15.8.4. Tendon Lacerations Surgical Repair
  - 15.8.5. Rehabilitation and Return to Work Guidelines after Tenorrhaphy
- 15.9. Reconstructive Surgery and Skin Grafting
  - 15.9.1. Principles of Basic and Reconstructive Surgery
    - 15.9.1.1. Skin Tension Lines
    - 15.9.1.2. Incision Orientation, Suture Patterns
    - 15.9.1.3. Tension Release Techniques and Plasties
  - 15.9.2. Closure of Skin Defects of Different Shapes
  - 15.9.3. Skin Grafts

- 15.10. Treatment of Exuberant Granulation Tissue Sarcoid Burns
  - 15.10.1. Causes of the Appearance of Exuberant Granulation Tissue
  - 15.10.2. Treatment of Exuberant Granulation Tissue
  - 15.10.3. Sarcoid Appearance in Wounds
    - 15.10.3.1. Wound Associated Sarcoid Type

## Module 16. Medical Pathologies of the Skin Endocrine System

- 16.1. Clinical Approach and Diagnostic Tests in Equine Dermatology
  - 16.1.1. Medical History
  - 16.1.2. Sampling and Main Diagnostic Methods
  - 16.1.3. Other Specific Diagnostic Techniques
- 16.2. Bacterial and Viral Skin Diseases
  - 16.2.1. Bacterial Diseases
  - 16.2.2. Viral Diseases
- 16.3. Fungal and Parasitic Skin Diseases
  - 16.3.1. Fungal Diseases
  - 16.3.2. Parasitic Diseases
- 16.4. Allergic, Immune-Mediated and Irritative Skin Diseases
  - 16.4.1. Hypersensitivity: Types
  - 16.4.2. Insect Sting Allergy
  - 16.4.3. Vasculitis and other Immune-Mediated Reactions
  - 16.4.4. Other Skin Tumors
- 16.5. Congenital Diseases and Syndromes in Equine Dermatology
  - 16.5.1. Hereditary Equine Regional Dermal Asthenia (HERDA), Epidermolysis Bullosa, and Other Congenital Diseases
  - 16.5.2. Miscellaneous
- 16.6. Cutaneous Neoplasms
  - 16.6.1. Sarcoids
  - 16.6.2. Melanocytic Tumors
  - 16.6.3. Squamous Cell Carcinomas
  - 16.6.4. Mastocytomas
  - 16.6.5. Lymphomas

- 16.7. Alternatives in the Medical Treatment of Neoplasms
  - 16.7.1. Electroporation and Electrochemotherapy
  - 16.7.2. Immunotherapy
  - 16.7.3. Radiotherapy
  - 16.7.4. Dynamic Phototherapy
  - 16.7.5. Cryotherapy
  - 16.7.6. Other Therapies
- 16.8. Endocrine System I
  - 16.8.1. Dysfunction of the Intermediate Portion of the Pituitary Gland
  - 16.8.2. Equine Metabolic Syndrome
  - 16.8.3. Endocrine Pancreas
  - 16.8.4. Adrenal Insufficiency
- 16.9. Endocrine System II
  - 16.9.1. Thyroid Gland
  - 16.9.2. Calcium Disorders
  - 16.9.3. Magnesium Disorders
  - 16.9.4. Phosphorus Disorders
- 16.10. Nutritional Management of the Obese Horse
  - 16.10.1. Body Condition Assessment
  - 16.10.2. Weight Reduction and Caloric Restriction
  - 16.10.3. Pharmacological Intervention
  - 16.10.4. Exercise
  - 16.10.5. Maintenance

## Module 17. Nervous System and Ophthalmology

- 17.1. Neuroanatomical Localization of Neurological Injuries in the Horse
  - 17.1.1. Neuroanatomical Peculiarities of the Horse
  - 17.1.2. Medical History
  - 17.1.3. Neurological Examination Protocol
    - 17.1.3.1. Head Assessment. Behavior, Consciousness, Positioning and Cranial Nerves
    - 17.1.3.2. Posture and Motor Function Assessment Gradation of Alterations
    - 17.1.3.3. Neck and Thoracic Limb Evaluation
    - 17.1.3.4. Evaluation of the Trunk and Pelvic Limb
    - 17.1.3.5. Evaluation of Tail and Anus
  - 17.1.4. Complementary Methods of Diagnostic
- 17.2. Disorders Affecting the Cerebral Cortex and Brainstem
  - 17.2.1. Consciousness State Regulation
  - 17.2.2. Cranial Trauma
    - 17.2.2.1. Etiopathogenesis
    - 17.2.2.2. Symptoms and Syndromes
    - 17.2.2.3. Diagnosis
    - 17.2.2.4. Treatment
    - 17.2.2.5. Prognosis
  - 17.2.3. Metabolic Encephalopathy
    - 17.2.3.1. Hepatic Encephalopathy
  - 17.2.4. Seizures and Epilepsy
    - 17.2.4.1. Types of Seizure Disorders
    - 17.2.4.2. Types of Epilepsy (ILAE Classification) (*International League Against Epilepsy*)
    - 17.2.4.3. Treatment
  - 17.2.5. Narcolepsy

- 17.3. Cerebellar or Vestibular Alterations
  - 17.3.1. Coordination and Balance
  - 17.3.2. Cerebellar Syndrome
    - 17.3.2.1. 7.3.2.1 Cerebellar Abiotrophy
  - 17.3.3. Vestibular Syndrome
    - 17.3.3.1. Peripheral Vestibular Syndrome
    - 17.3.3.2. Central Vestibular Syndrome
    - 17.3.3.3. Head Trauma and Vestibular Syndrome
    - 17.3.3.4. Osteoarthropathy Temporoiohidea
- 17.4. Spinal Alterations
  - 17.4.1. Cervical Stenotic Myelopathy
    - 17.4.1.1. Etiopathogenesis
    - 17.4.1.2. Symptomatology and Neurological Examination
    - 17.4.1.3. Diagnosis
    - 17.4.1.4. Radiology
    - 17.4.1.5. Myelography
    - 17.4.1.6. Magnetic Resonance Imaging, Computed Axial Tomography, Gammagraphy
    - 17.4.1.7. Treatment
  - 17.4.2. Equine Degenerative Myeloencephalopathy (EDM)
  - 17.4.3. Spinal Trauma
- 17.5. Bacterial, Fungal and Parasitic Infections of the Nervous System
  - 17.5.1. Bacterial Encephalitis or Encephalomyelitis
    - 17.5.1.1. Etiological Agents
    - 17.5.1.2. Symptomatology
    - 17.5.1.3. Diagnosis
    - 17.5.1.4. Treatment
  - 17.5.2. Fungal Encephalitis
  - 17.5.3. Equine Protozoal Encephalomyelitis (EPM)
    - 17.5.3.1. Etiopathogenesis
    - 17.5.3.2. Symptoms
    - 17.5.3.3. Diagnosis
    - 17.5.3.4. Treatment
  - 17.5.4. Meningoencefalomyelitis Verminosa
    - 17.5.4.1. Etiopathogenesis
    - 17.5.4.2. Symptoms
    - 17.5.4.3. Diagnosis and Treatment
- 17.6. Viral Infections of the Nervous System
  - 17.6.1. Equine Encephalomyelitis due to Herpesvirus Type -1 (EHV-1)
    - 17.6.1.1. Etiopathogenesis
    - 17.6.1.2. Clinical Picture
    - 17.6.1.3. Diagnosis
    - 17.6.1.4. Treatment
  - 17.6.2. West Nile Virus Encephalomyelitis
    - 17.6.2.1. Etiopathogenesis
    - 17.6.2.2. Clinical Picture
    - 17.6.2.3. Diagnosis
    - 17.6.2.4. Treatment
  - 17.6.3. Rabies
    - 17.6.3.1. Etiopathogenesis
    - 17.6.3.2. Clinical Picture
    - 17.6.3.3. Diagnosis
    - 17.6.3.4. Treatment
  - 17.6.4. Borna, Hendra and other Viral Encephalitis Viruses
- 17.7. Ocular Examination Ocular Nerve Blocks and Sub-palpebral Catheter Placement
  - 17.7.1. Anatomy and Physiology of the Eyeball
  - 17.7.2. Optic Nerve Blocks
  - 17.7.3. Ophthalmologic examination
  - 17.7.4. Basic Diagnostic Tests
  - 17.7.5. Advanced Diagnostic Tests
  - 17.7.6. Sub-Palpebral Catheter Placement

- 17.8. Palpebral Pathologies Ocular Perforations Entropion Correction
  - 17.8.1. Anatomy of Adnexal Tissues
  - 17.8.2. Eyelid Alterations
  - 17.8.3. Entropion Correction
  - 17.8.4. Ocular Perforations
- 17.9. Corneal Ulcers
  - 17.9.1. General Aspects and Classification of Corneal Ulcers
  - 17.9.2. Simple, Complex and Severe Ulcers
  - 17.9.3. Indolent Ulcer
  - 17.9.4. Infectious Keratitis
  - 17.9.5. Corneal Surgery
- 17.10. Uveitis and Ocular Medical Pathologies
  - 17.10.1. Immune-Mediated Keratitis
  - 17.10.2. Stromal Abscess
  - 17.10.3. Equine Recurrent Uveitis
  - 17.10.4. Crystalline Lens Alterations
  - 17.10.5. Posterior Segment Alterations and Glaucoma
  - 17.10.6. Neoplasms

## Module 18. Reproductive and Urinary System

- 18.1. Urinary System Assessment
  - 18.1.1. Hematological and Biochemical Parameters Related to the Renal System
  - 18.1.2. Urinalysis
  - 18.1.3. Diagnostic Methods in the Urinary System
    - 1.1.3.1.1. Ultrasound of the Urinary System.
    - 18.1.3.2. Endoscopy of the Urinary System
    - 18.1.3.3. Renal Biopsy.
    - 18.1.3.4. Water Deprivation Test
- 18.2. Urinary System Pathologies
  - 18.2.1. Acute Renal Failure
    - 18.2.1.1. Causes of Acute Renal Insufficiency
    - 18.2.1.2. Treatment of Acute Renal Insufficiency
  - 18.2.2. Chronic Renal Failure
    - 18.2.2.1. Causes of Chronic Renal Insufficiency
    - 18.2.2.2. Treatment of Chronic Renal Insufficiency
  - 18.2.3. Urinary Tract Infections
    - 18.2.3.1. Urethritis, Cystitis and Pyelonephritis and their Treatment
    - 18.2.3.2. Treatment of Urinary Tract Infections
  - 18.2.4. Obstructive Pathology of the Urinary Tract
    - 18.2.4.1. Obstructive Pathology Types
    - 18.2.4.2. Treatment
  - 18.2.5. Polyuria and Polydipsia
  - 18.2.6. Urinary Incontinence and Bladder Dysfunction
  - 18.2.7. Urinary Tract Tumors
- 18.3. Medical Pathologies of the Male Genitalia
  - 18.3.1. Introduction to the Medical Pathology of the Stallion
  - 18.3.2. Testicular Pathology in the Stallion
    - 18.3.2.1. Handling and Treatment of the Cryptorchid Stallion
    - 18.3.2.2. Testicular Inflammatory Disorders
    - 18.3.2.3. Management of Testicular Degeneration in the Stallion
    - 18.3.2.4. Hydrocele Management
    - 18.3.2.5. Testicular Neoplasms in the Stallion
    - 18.3.2.6. Testicular Torsion in the Stallion
  - 18.3.3. Penile Pathologies
    - 18.3.3.1. Penile Trauma Management
    - 18.3.3.2. Penile Tumor Developments
    - 18.3.3.3. Paraphimosis
    - 18.3.3.4. Priapism
  - 18.3.4. Pathology of Adnexal Glands
    - 18.3.4.1. Ultrasound and Assessment of Appendages Glands
    - 18.3.4.2. Vesiculitis, Management and Treatment
    - 18.3.4.3. Obstruction of Adnexal Glands





- 18.3.5. Ejaculate Alterations
  - 18.3.5.1. Seminal Assessment
  - 18.3.5.2. Factors Affecting Fertility
  - 18.3.5.3. Sub-fertile Semen Management
    - 18.3.5.3.1. Semen Centrifugation for Quality Improvement
    - 18.3.5.3.2. Seminal Plasma Substitution
    - 18.3.5.3.3. Semen Filtration to Improve Quality
    - 18.3.5.3.4. Low-Quality Semen Cooling Protocols
- 18.3.6. Alterations in Stallion Behavior and Mating Management
- 18.3.7. Advances in Assisted Reproduction in Stallions
  - 18.3.7.1. Seminal Freezing
  - 18.3.7.2. Epididymal Sperm Retrieval after Death or Castration
- 18.4. Male Field Surgical Procedures
  - 18.4.1. Castration
    - 18.4.1.1. Introduction and Considerations of Castration in Males
      - 18.4.1.1.1. Patient Selection
    - 18.4.1.2. Castration Surgical Techniques
      - 18.4.1.2.1. Open Castration
      - 18.4.1.2.2. Closed Castration
      - 18.4.1.2.3. Semi-Closed or Semi-Open Castration
    - 18.4.1.3. Variations in Surgical Technique
      - 18.4.1.3.1. Different Hemostasis Options
      - 18.4.1.3.2. Primary Skin Closure
    - 18.4.1.4. On-Station Castration Considerations
      - 18.4.1.4.1. Sedation
    - 18.4.1.5. Considerations for Castration under General Anesthetic
    - 18.4.1.6. Inguinal Cryptorchidism
      - 18.4.1.6.1. Presurgical Diagnosis
      - 18.4.1.6.2. Surgical Technique
  - 18.4.2. Penile Amputation
    - 18.4.2.1. Indications
    - 18.4.2.2. Procedure and Post-surgical Considerations

- 18.5. Medical and Surgical Pathologies of the Female Genitalia I
  - 18.5.1. Medical Pathologies I
    - 18.5.1.1. Ovarian Pathology
      - 18.5.1.1.1. Ovulation Disorders
      - 18.5.1.1.2. Ovarian Tumors
    - 18.5.1.2. Fallopian Tubes Disorders
    - 18.5.1.3. Medical Uterine Pathology
      - 18.5.1.3.1. Preparation and Procedure for Sample Collection
        - 18.5.1.3.1.1. Cytology
        - 18.5.1.3.1.2. Biopsy
      - 18.5.1.3.2. Types of Endometritis
      - 18.5.1.3.3. Management of the Mare with Uterine Fluid
      - 18.5.1.3.4. Management of Mares with Uterine Cysts
- 18.6. Medical and Surgical Genital Pathologies of the Mare II
  - 18.6.1. Medical Pathologies II
    - 18.6.1.1. Cervix Pathology
      - 18.6.1.1.1. Cervical Lacerations
      - 18.6.1.1.2. Cervical Adherences
    - 18.6.1.2. Medical Pathology of the Vagina
    - 18.6.1.3. Reproductive Management of the Geriatric Mare
    - 18.6.1.4. Update on Assisted Reproduction in the Mare
  - 18.6.2. Surgical Pathologies of the Mare
    - 18.6.2.1. Normal Vulvar Conformation of the Mare
      - 18.6.2.1.1. Vulvar Examination of the Mare
      - 18.6.2.1.2. Caslick Index
    - 18.6.2.2. Vulvoplasty
      - 18.6.2.2.1. Caslick Surgery Procedure
- 18.7. Pregnant Mare and Care at Foaling
  - 18.7.1. Mare Gestation
    - 18.7.1.1. Diagnosis of Pregnancy in the Mare
    - 18.7.1.2. Management of Early and Late Multiple Gestation New Techniques
    - 18.7.1.3. Embryo Sexing
  - 18.7.2. Complications During Gestation in the Mare
    - 18.7.2.1. Abortion
      - 18.7.2.1.1. Early Abortion
      - 18.7.2.1.2. Late Abortion
    - 18.7.2.2. Uterine Torsion
    - 18.7.2.3. Management and Treatment of Placentitis
    - 18.7.2.4. Management of Placental Abruption
  - 18.7.3. Nutritional Needs of the Pregnant Mare
  - 18.7.4. Ultrasound Evaluation of the Fetus
    - 18.7.4.1. Ultrasound Evaluation at Different Stages of Gestation
    - 18.7.4.2. Fetal Biometry
  - 18.7.5. Methods for Predicting Foaling in the Full-Term Mare
  - 18.7.6. Euthyroid Labor and Delivery
    - 18.7.6.1. Phases of Euthyroid Labor and Delivery
- 18.8. Complications of Labor and Delivery and Postpartum Care
  - 18.8.1. Dystocic Labor and Delivery
    - 18.8.1.1. Material Necessary for the Resolution of Dystocia
    - 18.8.1.2. Types of Dystocia and Management of Different Fetal Presentations
  - 18.8.2. Peripartum Surgical Emergencies
    - 18.8.2.1. Fetotomy
      - 18.8.2.1.1. The Fetus
      - 18.8.2.1.2. Preparation of the Mare for the Procedure
      - 18.8.2.1.3. Fetotomy in the Field vs in the Hospital
    - 18.8.2.2. Cesarean Section
    - 18.8.2.3. Hemorrhage of the Ankle Ligament
    - 18.8.2.4. Uterine Laceration
    - 18.8.2.5. Prepubic Tendon Rupture
    - 18.8.2.6. Rectovaginal Fistula

- 18.8.3. Postpartum Care
  - 18.8.3.1. Control of Uterine Involution and Establishment of the Postpartum Cycle
- 18.8.4. Complications in Postpartum
  - 18.8.4.1. Placenta Retention
  - 18.8.4.2. 8.8.4.2 Vaginal Lacerations
  - 18.8.4.3. 8.8.4.3 Uterine Bleeding
  - 18.8.4.4. Uterine Prolapse
  - 18.8.4.5. Rectal Prolapse
  - 18.8.4.6. 8.8.4.6 Vulvar Hematoma
  - 18.8.4.7. Uterine Horn Invagination
- 18.9. Repair of Tears and Lacerations during Labor and Delivery
  - 18.9.1. Management of Vulvar Tears and Lacerations during Labor and Delivery
  - 18.9.2. Classification of Perineal Lacerations
  - 18.9.3. Reconstruction of the Perineal Body
    - 18.9.3.1. Surgical Preparation of the Mare
    - 18.9.3.2. Vaginal Vestibule Sphincter Insufficiency
      - 18.9.3.2.1. Perineal Body Reconstruction, Vestibuloplasty
      - 18.9.3.2.2. Perineal Body Transverse Section, Perineoplasty
        - 18.9.3.2.2.1. Pouret's Surgery
    - 18.9.3.3. Post-Operative Care
    - 18.9.3.4. Complications of Perineal Surgery
  - 18.9.4. Surgical Management of Third-Degree Rectovaginal Tearing
  - 18.9.5. Surgical Management of Rectovaginal Fistulas

- 18.10. Infectious and Parasitic Diseases of the Reproductive System in Equines
  - 18.10.1. Introduction to Infectious and Parasitic Diseases of the Reproductive System in Equines
  - 18.10.2. Economic and Productive Significance of Infectious and Parasitic Diseases
  - 18.10.3. Infectious Diseases of the Reproductive Tract
    - 18.10.3.1. Mycoplasmas
    - 18.10.3.2. Contagious Equine Metritis Procedure of Sample Collection for the Determination of Contagious Equine Metritis
    - 18.10.3.3. Equine Viral Arteritis
    - 18.10.3.4. Equine Rhinopneumonitis
    - 18.10.3.5. Leptospirosis.
    - 18.10.3.6. Brucellosis
  - 18.10.4. Parasitic Diseases of the Reproductive Tract
    - 18.10.4.1. Habronemiasis
    - 18.10.4.2. Durina

## Module 19. Foal Medicine and Surgery

- 19.1. Neonatal Screening
  - 19.1.1. Normal Clinical Parameters in the Foal during the First Days of Life
  - 19.1.2. Onset of Organ Systems Functioning at Birth and During the First Months of Life
    - 19.1.2.1. 9.1.2.1 Gastric System
    - 19.1.2.2. Respiratory System
    - 19.1.2.3. Endocrine System
    - 19.1.2.4. Muscular and Neurological System
    - 19.1.2.5. 9.1.2.5 Ophthalmic System
- 19.2. Immature Foal Failure in the Passive Transfer of Immunity Isoerythrolysis Septicemia
  - 19.2.1. The Premature, Immature and Stunted Foal
  - 19.2.2. Cardiopulmonary Resuscitation
  - 19.2.3. Failure of Passive Transfer of Immunity
  - 19.2.4. Isoerythrolysis
  - 19.2.5. Neonatal Sepsis

- 19.3. Neonatal Respiratory, Cardiac, Neurological and Musculoskeletal Pathologies
  - 19.3.1. Neonatal Respiratory Pathologies
    - 19.3.1.1. Respiratory Bacterial Pathologies
    - 19.3.1.2. Viral Respiratory Pathologies
    - 19.3.1.3. Rib Fractures
  - 19.3.2. Neonatal Cardiac Pathologies
    - 19.3.2.1. Patent Ductus Arteriosus
    - 19.3.2.2. Foramen Ovale
    - 19.3.2.3. Tetralogy of Fallot
  - 19.3.3. Neonatal Neurological Pathologies
    - 19.3.3.1. Hypoxic Ischemic Encephalopathy
    - 19.3.3.2. Septic Encephalitis, Meningitis and Metabolic Encephalopathies
    - 19.3.3.3. Congenital Neurological Pathologies
  - 19.3.4. Neonatal Musculoskeletal Pathologies
    - 19.3.4.1. Vitamin E and Selenium Deficiency
- 19.4. Neonatal Gastrointestinal, Genitourinary and Endocrine Pathologies
  - 19.4.1. Neonatal Gastrointestinal Pathologies
    - 19.4.1.1. Bacterial and Viral Diarrhea
    - 19.4.1.2. Meconium Impaction
    - 19.4.1.3. Congenital Gastrointestinal Pathologies
    - 19.4.1.4. Gastric and Duodenal Ulcers
  - 19.4.2. Neonatal Genitourinary Pathologies
    - 19.4.2.1. Omphalophlebitis and Omphaloarteritis
    - 19.4.2.2. Patent Urachus
    - 19.4.2.3. Bladder Rupture
  - 19.4.3. Neonatal Endocrine Pathologies
    - 19.4.3.1. Thyroid Alterations
    - 19.4.3.2. Hypoglycemia, Hyperglycemia and Lack of Maturation of the Endocrine System
- 19.5. Identification and Stabilization of the Patient with Ruptured Bladder or Persistent Urachus
  - 19.5.1. Omphalophlebitis, Omphaloarteritis and Patent Urachus
  - 19.5.2. Bladder Rupture
  - 19.5.3. Diagnostic Assessment and Stabilization Treatments
  - 19.5.4. Medical Treatment and Surgical Options
- 19.6. Diagnostic Imaging of the Chest and Abdominal Cavity of the Foal
  - 19.6.1. Diagnostic Imaging the Chest
    - 19.6.1.1. Technical Basis
      - 19.6.1.1.1. Radiology
      - 19.6.1.1.2. Ultrasound
      - 19.6.1.1.3. Computerized Tomography
    - 19.6.1.2. Thoracic Pathology
  - 19.6.2. Diagnostic Imaging of the Abdomen
    - 19.6.2.1. Technical Basis
      - 19.6.2.1.1. Radiology
      - 19.6.2.1.2. Ultrasound
    - 19.6.2.2. Abdominal Pathology
- 19.7. Treatment of Septic Arthritis Umbilical Herniorrhaphy
  - 19.7.1. Pathophysiology and Diagnosis of Synovial Infections in the Foal
  - 19.7.2. Treatment of Septic Arthritis in the Foal
  - 19.7.3. Etiopathogenesis and Diagnosis of Umbilical Hernias
  - 19.7.4. Umbilical Herniorrhaphy: Surgical Techniques
- 19.8. Angular Deformities Treatment
  - 19.8.1. Etiopathogenesis
  - 19.8.2. Diagnosis
  - 19.8.3. Conservative Treatment
  - 19.8.4. Surgical Treatment.
- 19.9. Flexural Deformities Treatment
  - 19.9.1. Etiopathogenesis
  - 19.9.2. Diagnosis
  - 19.9.3. Conservative Treatment
  - 19.9.4. Surgical Management
- 19.10. Diagnosis of Developmental Diseases in the Foal Treatment of Physitis, Epiphysitis and Hoof Management Guidelines for Healthy Foals
  - 19.10.1. Etiopathogenesis, Diagnosis and Treatment of different forms of Physitis, Epiphysitis, Osteochondrosis and Subchondral Cysts
  - 19.10.2. Evaluation of Poise in the Healthy Foal
  - 19.10.3. Hoof Trimming Guideline in the Healthy Foal



**Module 20. Advanced Therapeutic Protocols and Toxicology**

- 20.1. Sedation and Total Intravenous Anesthesia
  - 20.1.1. Total Intravenous Anesthesia
    - 20.1.1.1. General Considerations
    - 20.1.1.2. Patient and Procedure Preparation
    - 20.1.1.3. Pharmacology
    - 20.1.1.4. Total Intravenous Anesthesia in Short-Term Procedures
    - 20.1.1.5. Total Intravenous Anesthesia in Procedures of Medium Duration
    - 20.1.1.6. Total Intravenous Anesthesia in Long-Term Procedures
  - 20.1.2. Sedation for On-Station Procedures
    - 20.1.2.1. General Considerations
    - 20.1.2.2. Patient Preparation/Procedure
    - 20.1.2.3. Technique: Bolus and Continuous Intravenous Infusions
    - 20.1.2.4. Pharmacology
    - 20.1.2.5. Drug Combinations
- 20.2. Pain Relief in Horses
  - 20.2.1. Detection of Pain in Hospitalized Patients and Multimodal Analgesia
  - 20.2.2. Types of NSAIDs
  - 20.2.3. Alpha-2-Agonists and Opioids
  - 20.2.4. Local Anesthetics
  - 20.2.5. Other Drugs Used for Pain Control in Equines
  - 20.2.6. Complementary Therapies: Acupuncture, Shockwaves, Chiropractic, Laser
- 20.3. Correction of the Hydro-Electrolytic Balance
  - 20.3.1. General Considerations on Fluid Therapy
    - 20.3.1.1. Objective and Key Concepts
    - 20.3.1.2. Organic Fluid Distribution
    - 20.3.1.3. Assessment of Patient Needs
  - 20.3.2. Types of Fluid
    - 20.3.2.1. Crystalloids
    - 20.3.2.2. Colloids
    - 20.3.2.3. Supplements
  - 20.3.3. Routes of Administration
    - 20.3.3.1. Intravenous
    - 20.3.3.2. Oral
  - 20.3.4. Practical Principles of Fluid Therapy Calculation
  - 20.3.5. Associated Complications
- 20.4. Specific Considerations of Acid-Base Equilibrium in Horses
  - 20.4.1. Specific Considerations of Acid-Base Equilibrium in Horses
    - 20.4.1.1. Assessment of the Patient's Acid-Base Status
    - 20.4.1.2. Role of Bicarbonate, Chloride and Anion Gap
  - 20.4.2. Metabolic Acidosis and Alkalosis
  - 20.4.3. Respiratory Acidosis and Alkalosis
  - 20.4.4. Compensatory Mechanisms
  - 20.4.5. Base Excess
- 20.5. Pharmacological Considerations in the Sport Horse
  - 20.5.1. Equestrian Sports Regulation
  - 20.5.2. Doping
    - 20.5.2.1. Definition
    - 20.5.2.2. Medication Control Objectives
    - 20.5.2.3. Sampling and Accredited Laboratories
    - 20.5.2.4. Classification of Substances
  - 20.5.3. Types of Doping
  - 20.5.4. Withdrawal Time
    - 20.5.4.1. Factors Affecting Withdrawal Time
      - 20.5.4.1.1. Detection Time
      - 20.5.4.1.2. Regulatory Policies
      - 20.5.4.1.3. Animal Disposal Rate
    - 20.5.4.2. Factors to Consider in Determining Withdrawal Time
      - 20.5.4.2.1. Dose Administered
      - 20.5.4.2.2. Formulation
      - 20.5.4.2.3. Route of Administration
      - 20.5.4.2.4. Individual Pharmacokinetics
      - 20.5.4.2.5. Sensitivity of Analytical Procedures
      - 20.5.4.2.6. Sample Behavior Matrix
      - 20.5.4.2.7. Environmental Persistence of Substances and Environmental Pollution



- 20.6. Intensive Care of the Neonatal Foal
  - 20.6.1. Types of Catheters, Infusion Sets, Nasogastric and Urinary Probes for the Maintenance of Intensive Care in the Foal
  - 20.6.2. Types of Fluids, Colloids, Plasmotherapy and Hemotherapy
  - 20.6.3. Total and Partial Parenteral Feeding
  - 20.6.4. Antibiotic Therapy, Analgesia and Other Important Medications
  - 20.6.5. Cardiopulmonary Resuscitation
- 20.7. Adult Intensive Care
  - 20.7.1. General Intensive Care Considerations
  - 20.7.2. Intensive Care Procedures and Techniques
    - 20.7.2.1. Vascular Access: Maintenance and Care
    - 20.7.2.2. Arterial and Venous Pressure Monitoring
  - 20.7.3. Cardiovascular Support
    - 20.7.3.1. Shock
    - 20.7.3.2. Supportive Drugs: Inotropes and Vasopressors
    - 20.7.3.3. Support Strategies
  - 20.7.4. Respiratory Support
    - 20.7.4.1. Management of Respiratory Distress
  - 20.7.5. Critically Ill Patient Nutrition
  - 20.7.6. Neurological Patient Care
    - 20.7.6.1. Medical and Supportive Management of the Neurological Horse
      - 20.7.6.1.1. Trauma
      - 20.7.6.1.2. Encephalopathies and Myeloencephalopathies
    - 20.7.6.2. Specific Management of the Recumbent Horse
- 20.8. Toxicology I
  - 20.8.1. Digestive System Toxicology
  - 20.8.2. Liver Toxicology
  - 20.8.3. Toxicology Affecting the Central Nervous System





- 20.9. Toxicology II
  - 20.9.1. Toxicology Producing Clinical Signs Related to the Cardiovascular and Hemolymphatic Systems.
  - 20.9.2. Toxicology Producing Clinical Signs related to the Skin, Musculoskeletal System and General Condition.
  - 20.9.3. Toxicology Producing Clinical Signs Related to the Urinary System.
  - 20.9.4. Toxicological Problems Causing Sudden Death.
- 20.10. Euthanasia Procedures
  - 20.10.1. General Considerations
    - 20.10.1.1. Geriatric Horse
  - 20.10.2. Mechanisms of action for Hypothermia.
  - 20.10.3. Chemical Euthanasia Methods
  - 20.10.4. Physical Euthanasia Methods
  - 20.10.5. Euthanasia Protocol
  - 20.10.6. Confirmation of Death



*A complete teaching program, structured into very well developed didactic units, oriented towards learning that is compatible with your personal and professional life"*

06

# Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning**.

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.







“

*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*



## At TECH we use the Case Method

What should a professional do in a given situation? Throughout the program you will be presented with multiple simulated clinical cases based on real patients, where you will have to investigate, establish hypotheses and, finally, resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

*With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.*



According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, in an attempt to recreate the actual conditions in a veterinarian's professional practice.

“

*Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method”*

The effectiveness of the method is justified by four fundamental achievements:

1. Veterinarians who follow this method not only manage to assimilate concepts, but also develop their mental capacity through exercises to evaluate real situations and knowledge application
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. The feeling that the effort invested is effective becomes a very important motivation for veterinarians, which translates into a greater interest in learning and an increase in the time dedicated to working on the course.



## Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.



*Veterinarians will learn through real cases and by resolving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.*



At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology more than 65,000 veterinarians have been trained with unprecedented success in all clinical specialties, regardless of the surgical load. Our teaching method is developed in a highly demanding environment, where the students have a high socio-economic profile and an average age of 43.5 years.

*Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.*

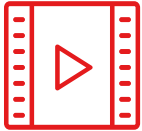
In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.





This program offers the best educational material, prepared with professionals in mind:



#### Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.



#### Latest Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current and procedures of veterinary techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many times as you like.



#### Interactive Summaries

The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

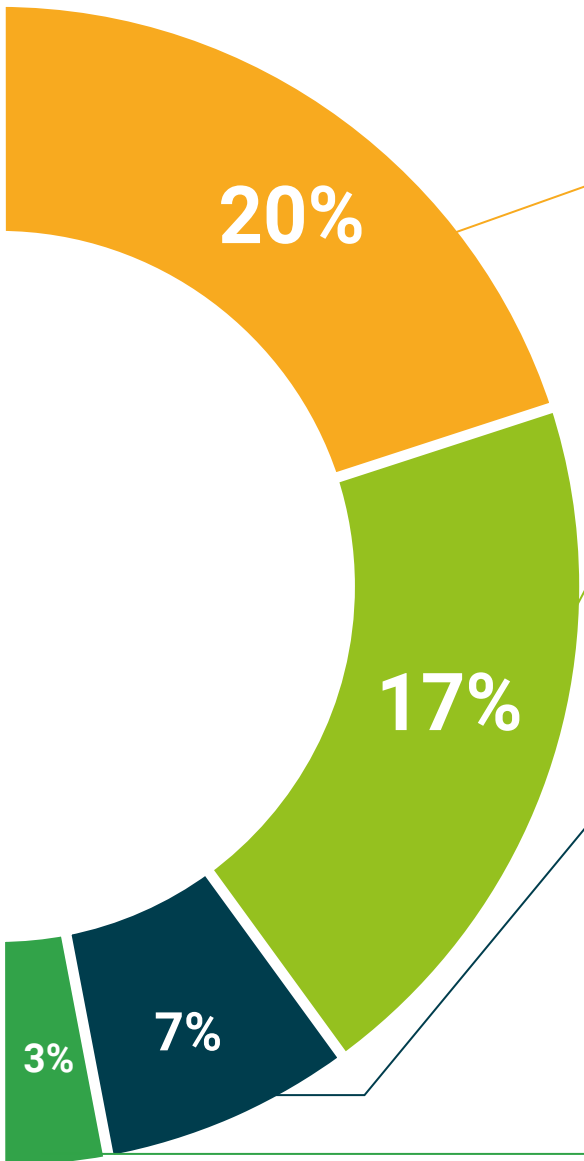
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





#### Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.



#### Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.



#### Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



#### Quick Action Guides

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help students progress in their learning.



# 07 Certificate

The Advanced Master's Degree in Anesthesia and Equine Surgery guarantees students, in addition to the most rigorous and up to date education, access to an Advanced Master's Degree certificate issued by TECH Technological University.



“

*Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork”*



This **Advanced Master's Degree in Equine Medicine and Surgery** contains the most complete and up to date scientific program on the market.

After the student has passed the assessments, they will receive their corresponding **Advanced Master's Degree** certificate issued by **TECH Technological University** via tracked delivery\*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the **Advanced Master's Degree**, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

**Title: Advanced Master's Degree in Equine Anesthesia and Surgery**

**Official N° of hours: 3,000 h.**



\*Apostille Convention. In the event that the student wishes to have their paper certificate issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

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education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present  
development languages  
classroom



Advanced Master's  
Degree  
Equine Anesthesia  
and Surgery

Course Modality: Online

Duration: 2 years

Certificate: TECH Technological University

Official N° of hours: 3,000 h.

# Advanced Master's Degree Equine Anesthesia and Surgery