# Advanced Master's Degree

## Medicine and Surgery of Birds and Exotic Animals

tech technological university

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## Medicine and Surgery of Birds and Exotic Animals

- Modality: **online**
- Duration: **2 years**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/in/veterinary-medicine/advanced-master-degree/advanced-master-degree-medicine-surgery-birds-exotic-animals**

# Index

01

# Introduction

New species have been introduced in homes around the world as pets, beyond the traditional dogs and cats. As a result, owners are in a constant search for veterinarians specializing in exotic animals, who are able to care for and cure the pathologies of their pets. This TECH program emphasizes medicine and surgery of birds and other exotic animals, with the aim of increasing the training of veterinary professionals who may face in their practice the management of this type of species.

*Birds and other exotic animals have a series of particularities that must be known in depth by veterinarians to successfully treat their pathologies"*

Birds and other exotic species, which are becoming more and more frequent as pets, are the great unknown in the routine practice of veterinarians. This may be due to the scarce specialization on them offered in universities during the veterinary careers or because of the few consultations they have to face in their daily practice. However, the increase of owners seeking professionals specialized in this type of animals forces them to increase their training in order to be able to perform successful interventions on these animals.

This Advanced Master's Degree in Medicine and Surgery of Birds and Exotic Animals is aimed at veterinary professionals seeking a high-level specialization and, to this end, the program covers all the exotic species that come to the clinic most frequently, mainly birds, mammals, reptiles and wildlife.

Thus, the program includes a very complete information on all those tests and treatments that veterinarians must apply with total safety to care for these species, from proper clinical management, diagnosis and treatment of the most common pathologies, to laboratory tests, anesthesia, the main surgical tools, soft tissue surgery and traumatology, or postoperative management, for example. In short, it covers the latest elements that every veterinarian dealing with exotic patients should know and use in their daily practice.

Throughout this Advanced Master's Degree, the student will be exposed to all the current approaches to the different challenges of his profession. A high-level step that will become a process of improvement, not only on a professional level, but also on a personal level. Additionally, at TECH we have a social commitment: to help highly qualified professionals to specialize and to develop their personal, social and professional skills throughout the course of their studies. To do this, we will not only take you through the theoretical knowledge we offer, but we will show you another way of studying and learning, more organic, simpler and more efficient. We will work to keep you motivated and to develop your passion for learning, helping you to think and develop critical thinking skills. And we will push you to think and develop critical thinking.

This Advanced Master's Degree is designed to give you access to the specific knowledge of this discipline in an intensive and practical way. A great value for any professional. In addition, as it is a 100% online program, the students themselves decide where and when to study. Without the restrictions of fixed timetables or having to move between classrooms, this course can be combined with work and family life.

This **Advanced Master's Degree in Medicine and Surgery of Birds and Exotic Animals** contains the most complete and up-to-date scientific 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 remote education
- Continuous updating and retraining systems
- Self-organised learning which makes the course completely compatible with other commitments
- Practical exercises for self-evaluation 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

*Don't miss the opportunity to study with us and update your knowledge in exotic animal medicine and surgery"*

*The specialization of veterinarians is essential to improve the health of exotic animals. Therefore, we propose a high level program with which you will be able to offer the maximum in your profession"*

*We give you the opportunity to take a deep and complete immersion in the most up-to-date strategies and approaches in avian and exotic animal medicine and surgery.*

*Specialize with the latest educational methodology, which will allow you to easily self-manage your study time.*

Our teaching staff is made up of active professionals with extensive experience. In this way, we fulfill the objective of updating your knowledge, thanks to the resources that our teachers offer you. A multidisciplinary team of professionals prepared and experienced in different environments, who will develop the theoretical knowledge in an efficient way, but, above all, will put at the service of your specialization the practical knowledge derived from their own experience.

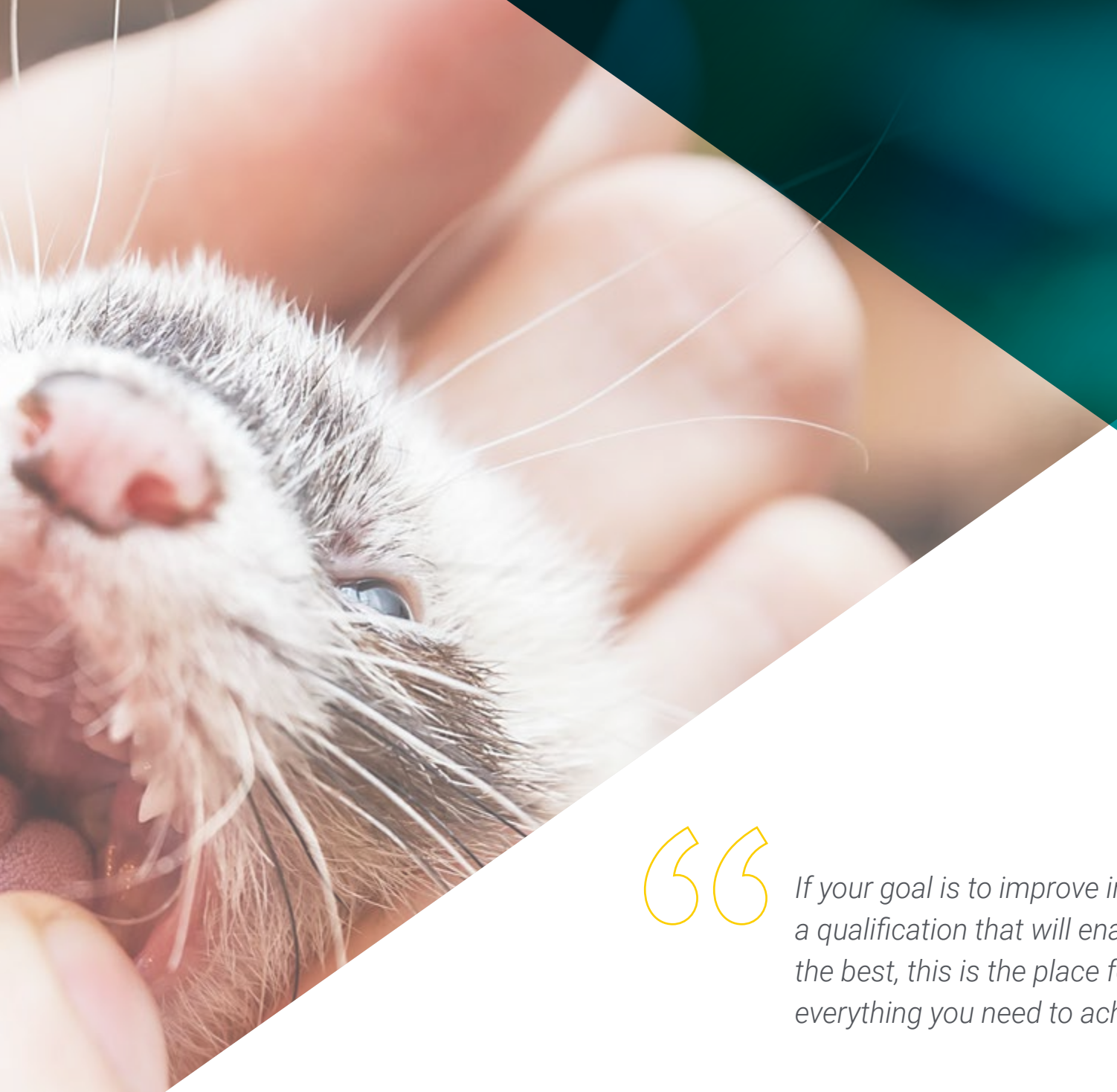
This mastery of the subject matter is complemented by the effectiveness of the methodological design of this Advanced Master's Degree. Developed by a multidisciplinary team of e-learning experts, it integrates the latest advances in educational technology. Thus, you will be able to study with a range of convenient and versatile multimedia tools that will give you the operability you need to improve your 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 learning. 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 actually dealing with the scenario you are learning about. A concept that will allow you to integrate and fix learning in a more realistic and permanent way.

02

# Objectives

Our objective is to offer a complete specialization to professionals seeking a high qualification for their 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 focused on helping professionals reach a much higher level of expertise and control. A goal that you can take for granted, with a high-intensity, high-precision training program.



*If your goal is to improve in your profession and acquire a qualification that will enable you to compete among the best, this is the place for you. At TECH you will find everything you need to achieve professional success"*

## General Objectives

- Identify the differences between birds and mammals
- Ascertain the most characteristic property in avian patients: The capacity for flight
- Analyze variations between species based on avian anatomy and physiology
- Specify key anatomical points to select diagnostic techniques
- Establish the necessary requirements for keeping birds in captivity
- Examine the key criteria for health, welfare and success in avian
- Determine nutritional guidelines and specific diets for birds
- Generate guidelines for all birds, including birds of prey and others less clinically studied species such as pigeons
- Compile the most commonly used diagnostic techniques: radiology, endoscopy and ultrasound
- Develop specialized knowledge in all laboratory diagnostic tests
- Establish the protocols to interrupt biochemical analysis and proteinograms
- Demonstrate the correct necropsy technique in avian patients
- Generate protocols for coprology in birds
- Examine radiology techniques in avian patients
- Anticipate diagnostic difficulties in ultrasound in avian patients
- Propose endoscopy as the diagnostic technique of choice
- Analyze the main infectious pathologies in birds: Viral, bacterial, mycoplasmic, fungal and parasitic
- Develop specialized knowledge of non-infectious pathologies: genetic, metabolic-endocrine, anatomical alterations, physical-chemical imbalances and nutritional deficiencies
- Define soft tissue pathologies



- Specify treatments and prevention strategies
- Develop specialized knowledge of diseases in birds according to cause, epizootiology and physiopathogenesis
- Determine the close relationship between humans and wild birds
- Identify the routes of disease transmission
- Analyze the most frequent questions that arise in field situations
- Generate specialized knowledge of anesthetic techniques commonly used in bird clinics
- Develop the most important aspects about the types of anesthesia and frequently asked questions by veterinarians
- Analyze management techniques for exploration and anesthetic drug administration
- Determine the most common emergency situations
- Analyze the different anatomical and physiological aspects of birds to apply them to anesthetic techniques
- Examine emergencies in situations of hemorrhage and more advanced surgical problems
- Establish emergency protocols, as in any animal that is injured or needs surgical assistance
- Reach the shock state protocol, which is very difficult to determine in avian patients
- Provide nutritional and fluid therapy requirements for pathology recoveries
- Analyze the relevant aspects of drug administration
- Gain in-depth knowledge of the most used antibiotics, taking into account the routes of administration and the possible and real guidelines that can be followed in each real situation

- Acquire knowledge of new medications for birds
- Develop specialized knowledge to properly treat fractures and determine prognosis
- Determine the proper praxis in resolving fractures in avian patients, using bandages and surgical methods of osteosynthesis, by means of external immobilizations, centromedullary interlocking, external fixators or locks
- Examine the most effective methods for treating each type of bird and potential fractures in terms of physical recovery and total recovery of the limb
- Analyze the different anatomical and physiological aspects of birds to apply them to the most effective treatments
- Identify the most important biological traits of these species in order to obtain a more generalized and reinforced base of knowledge
- Examine each species separately to highlight the main distinctions to keep in mind
- Establish the bases for attending to these species in practice
- Analyze their pathologies to identify them
- List of the most common diseases of exotic mammals
- Classify and examine the most common diseases according to their origin: bacterial, fungal, viral, parasitic, hereditary and other health problems
- Prevent the vast majority of common diseases and problems, establishing, as veterinary specialists, preventive medicine, vaccination and de-worming schedules applied to each species
- Make the veterinarian aware of the importance of providing information to the owner so that they carry out adequate hygiene practices with the animal, a healthy diet and exercise as well as rest, ensuring that the animal is free of stress, following the guidelines for examination and physical examination of the animal during the consultation
- Examine diseases from a practical and applicable point of view
- Check the health status of exotic mammals as a priority for the veterinary specialist
- Develop advanced knowledge on performing the most common operation in rabbits: castration, both in females and males, in addition to other basic interventions such as oral surgical techniques
- Develop specialized knowledge on biology, behavior, needs, feeding and care
- Determine appropriate veterinary advice on handling and diagnostic techniques
- Recognize the most common diseases in ferrets
- Explore diverse procedures and therapies, including anesthesia and surgical techniques
- Develop specialized knowledge about the species that regularly attend the exotic animal clinic
- Establish the basic needs, reasons for consultation and frequently asked questions by owners
- Analyze handling techniques for exploration and administration of treatment
- Examine the most common reptiles in captivity, and their anatomical differences between species
- Develop reptile handling techniques
- Establish the routes of drug administration and assess the degree of stress produced in each situation; punctual stress, maintained stress and environmental stress
- Determine the main pathologies of reptiles
- Examine the changes in behavior or other aspects of the animal following a pathology
- Establish treatments and cures for the most frequent pathologies
- Develop specialized knowledge on the most advanced surgical techniques, with updated anesthetic protocols

- Develop risk prevention for the public, zoonosis and animal escape
- Carry out management, nutrition, deworming, vaccination, reproductive management and hygiene plans
- Determine the main diseases, required diagnostics and therapeutics in the main animal species
- Analyze the principles of anesthesia, main techniques
- Identify pathologies, understanding that the result of an observation or test can never be considered of absolute diagnostic value without first having assessed and performed other diagnostic tests
- Take a much more cautious and prudent approach to fish pathologies
- Establish the necessary guidelines applied to each treatment

## Specific Objectives

### Module 1. Bird Taxonomy, Anatomy and Physiology

- Substantiate the taxonomic classification according to each order
- Examine the skeletal system, anatomical memory of each location
- Identify the common breeds of chickens and hens kept as pets
- Evaluate blood composition and the circulatory system
- Develop the basis of respiratory functioning to advance knowledge of anesthesia and emergency treatment
- Compile all current information on the anatomy and physiology of the digestive system
- Detail the forgotten areas of the sense organs and their fundamental implication in patient recovery
- Collect all the information on the lymphoid organs, especially the characteristic bursa of Fabricius and other glands of interest

### Module 2. Clinical Criteria for Avian Patients

- Propose the challenges of keeping poultry and other avian species
- Examine the difficulty of bird scouting
- Determine the requirements for keeping birds in captivity
- Analyze the most relevant clinical characteristics and their importance in physical examination to reach appropriate diagnoses and treatments
- Develop specialized knowledge on capture and adequate containment of avian patients
- Establish the main routes of drug administration
- Exhaustively analyze the nutritional requirements, types of nutrition and elaborate diets for each species kept in captivity



### Module 3. Laboratory Tests

- Analyze diagnostic evidence, information gathering methods, sample preparation for referral and transport purposes to anatomic pathology laboratories
- Examine hematology in birds with the different morphological changes they present
- Identify the results of biochemical analyses in birds
- Develop the latest cytological techniques
- Demonstrate the correct technique for sending samples to anatomic pathology services
- Examine the external and internal lesions that birds may present in the postmortem technique and their diagnostic interpretation
- Obtain the necessary samples from the postmortem examination for study by histopathology, microbiology and polymerase chain reaction (PCR)

### Module 4. Diagnostic Imaging Techniques

- Specify the sedation and anesthesia techniques necessary to perform diagnostic imaging techniques
- Study existing radiology equipment and diagnostic options in birds
- Develop management techniques for proper patient positioning, including the most commonly used projections in daily clinical practice
- Analyze the anatomical references in radiography, ultrasound and endoscopy to reach reliable diagnoses
- Justify why a specific type of ultrasound probe is used in avian patients
- Analyze the endoscopy techniques and applications in birds
- Achieve the maximum knowledge in other really important diagnostic techniques such as routine coprological analysis

### Module 5. Pathologies Related to Handling

- Identify symptoms to be able to detect them in time and act as soon as possible
- Examine the main pathologies derived caused by incorrect handling to avoid them and even prevent death
- Analyze the most frequent emergencies derived from incorrect handling, such as lead poisoning and capture myopathy
- Specify oral cavity disorders and their most appropriate treatments
- Completely and successfully deal with all the pathologies affecting the crop, the proventriculus and the ventriculus
- Delve deeper into all the most common pathologies affecting the distal part of the intestine
- Analyze liver disorders due to external causes, as well as the typical pathologies they present
- Develop specialized knowledge of the great avian unknown: The endocrine system, analyzing each of the endocrine glands in birds and their physiopathogenesis

### Module 6. Avian Patient Diseases

- Identify the cause of the disease through causal agents
- Develop specialized knowledge of the most common diseases in wild birds
- Make the best use of a list of problems, together with their differential diagnoses to properly design work plans
- Develop the most important viral diseases in wild bird pathologies, understanding that they are the most serious
- Diagnose diseases caused by bacteria, since they are mostly linked to respiratory infections, blood infections, intestinal infections or a combination of any of them
- Analyze parasitic diseases, their symptomatology and the most updated treatments

### Module 7. Anesthesia and Analgesia in Birds

- Determine the anatomical and physiological characteristics of birds to adequately perform anesthetic procedures
- Perform the anesthetic technique of choice: inhalation anesthesia
- Generate specialized knowledge on cardiorespiratory monitoring and temperature control during and after anesthetic procedures
- Examine injectable anesthesia in birds
- Perform the most up-to-date methods for local anesthesia and analgesia
- Implement the most frequent emergency anesthetics to deal with them successfully
- Determine the anesthetic particularities of each type of bird

### Module 8. Anesthesia and Soft Tissue Surgery

- Develop specialized knowledge in soft tissue surgery, starting from supplies in the operating room prior to any surgery
- Determine the special surgical supplies for avian patients
- Establish the main surgical problems of the skin and its appendages
- Perform all surgical techniques on male and female reproductive systems
- Evaluate all surgeries of the digestive and respiratory systems, following comprehensive and updated protocols
- Demonstrate the need for biopsies to reach a definitive diagnosis
- Emphasize the necessary guidelines for patient recovery

### Module 9. Pathologies and Medical Treatments

- Compile the most important nutritional treatments, understanding dehydration as one of the key factors for each treatment recovery
- Examine all the external treatments that birds need, recognizing that these are the fundamental aspects that we must understand to proceed with the rest of pathologies and treatments
- Attain the maximum knowledge of traumatic injury treatments
- Present the routes of administration of drugs and their advantages and disadvantages
- Develop the list of antibiotics, antifungals and antiparasitics most commonly used, including dosage and clarifications
- Propose the success in nebulization treatments
- Reach peak knowledge of eye drops and ophthalmologic treatments

### Module 10. Orthopedic and Ophthalmologic Surgery in Birds

- Develop specialized knowledge regarding the most frequent ocular pathologies and the most updated treatments
- Analyze the most frequent pathologies in obese birds in captivity: nails
- Address bone fracture emergencies situations and treatments
- Establish bone fixation methods in wings and shoulder girdles
- Analyze the osseous injuries in bird carpus and tarsus
- Determine how to conduct bone repairs of the femur and their surgical treatments
- Gain in-depth knowledge of postoperative care in repaired fractures

### Module 11. Relevant Aspects of Lagomorfs and Rodents

- Examine the different species and their taxonomic classification
- Determine how to handle each clinical situation
- Analyze the most frequent questions asked by animal owners in practice
- Establish a prevention protocol and guidelines for the correct maintenance of rabbits or rodents
- List the most common pathologies in lagomorphs and rodents
- Develop a list of problems, with their varying diagnoses to obtain an adequate work plan
- Finally achieve the definitive diagnosis and find the cause of the pathology

### Module 12. Advanced Criteria in Rabbits and Rodents

- Visualize the anatomy and physiological functioning of the oral cavity
- Examine dental malocclusion disease in lagomorphs
- Identify all diseases with zoonotic potential that we will encounter after handling or accidental ingestion
- Provide advanced knowledge related to the sedation of an exotic mammal, including up-to-date anesthetic protocols to perform surgical treatments
- Compile the ocular pathologies that may present, their causes and the currently available treatments
- Analyze the reason why not all medications currently available in the dog and cat clinic can be used and cite the most commonly used medications and their dosage
- Develop specialized knowledge of routine surgical techniques such as sterilization and when it should be performed, as well as more advanced surgical techniques such as cystotomy or enterotomy

### Module 13. Symptoms and Therapeutics for Ferrets

- Establish an adequate anatomo-physiological background, advanced knowledge of dentition, types of molt, skeletal system, digestive system, perineal glands and salivary glands
- Analyze the cardio-respiratory system and its pathologies
- Develop the best method of drug administration, access routes, routine radiographic projections and laboratory sampling to achieve a reliable and effective diagnosis
- List the various types of pathologies that are commonly encountered in daily clinical practice. Gastrointestinal and respiratory pathologies are very common, but so are neoplasms and skin problems
- Analyze the most frequent and serious endocrine pathology in sterilized ferrets: hyperadrenocorticism, going deeper into the subject with an anatomical review of the adrenal glands and paying attention to the non-specific symptoms they present in order to obtain the correct diagnosis
- Examine the most up-to-date treatments and make decisions about surgical or medical-only processes and the rationale for choosing each one
- Assess the monitoring of anesthetized patients and the levels of anesthesia that can be used
- Develop specialized knowledge to attend an emergency and cardio-respiratory resuscitation
- List the most common surgical techniques and those that are unique and exclusive to ferrets

### Module 14. New Pets

- Anatomically and taxonomically describe the differences between each species
- Design installations equipped to fulfil their needs, according to their habits, diet, furnishings, environmental enrichment and special characteristics
- Specify the necessary legal requirements to have invasive exotic pets
- Establish the most important zoonoses in order to protect the veterinary specialist and the owners
- Differentiate between the different techniques for drug administration and laboratory sampling
- Examine the most common pathologies of each species
- Describe the exclusive pathologies in each species

### Module 15. Relevant Aspects of Reptiles I

- Evaluate the types of facilities that exist and adapt them to each species and its needs. Access to water, the material used for the terrarium, and the crucial importance of temperature, humidity and light, which are the most important factors in fulfilling the basic needs of reptiles
- Identify the natural process of hibernation, taking into account relevant factors such as the types of hibernation, the species that hibernate and the problems that hibernation can cause during captivity
- Gain specialized knowledge on radiology in reptiles, a basic diagnostic technique to treat their diseases
- Explore other imaging techniques, such as ultrasound and endoscopy and cite the situations in which we should use these supportive techniques
- Identify all the information provided by a coprological analysis, a routine procedure in practices that should always be performed
- Study the biochemical parameters of reptiles
- Establish routine necropsy techniques to detect pathologies

### Module 16. Relevant Aspects of Reptiles II

- Determine the most frequent zoonoses, prevention and indications for owners
- Analyze the most important diseases in reptiles
- Treat the species with specific drugs and doses
- Understand the use of the concepts MEC (Minimum Energy Cost) and SMEC (Specific Minimum Energy Cost), understanding that there are differences in the dose depending on the physiological state
- Examine up-to-date anesthetic studies
- Analyze the anatomical and physiological features of each species in order to establish the appropriate anesthetic considerations
- Establish the basic and routine surgical techniques in clinical practice
- Analyze other important surgical issues
- Describe the pathologies presented by reptiles with more complex causes

### Module 17. Wild Animal Medicine and Surgery

- Establish the handling tasks of the veterinarian, together with his work team
- Develop specialized criteria to decide on the release of a wild species treated for a pathology
- Develop preventive medicine programs, such as vaccinations, coprologicals, and vermifugations
- Develop specialized knowledge to perform the mandatory clinical examination of any patient who is hospitalized or has just been admitted to a recovery center
- Interpret the laboratory tests performed on animals in order to treat their disease
- Establish guidelines for nutrition and nutritional diseases, infectious diseases, reproductive aspects and rescue work for primates, ursids and wild felines
- Analyze the most commonly used anesthesia techniques in zoo animals

### Module 18. Care and Pathologies in Fish

- Analyze, in each case, the 4 main contexts to carry out an adequate anamnesis:
- The general informative context: Identifies the type of customer and general typology
- The context of the particular system: Technology of the aquatic environment
- The context of the population: Assesses the number of fish, ages, species
- The individual context: When all the above points have been evaluated, we identify the affected fish, its organs and pathologies
- Analyze clinical management and establish guidelines for the correct collection of laboratory samples
- Establish the different pathologies of ornamental fish
- Describe the predisposing causes and establish differing diagnoses for each case
- Establish a definitive diagnosis and apply a medical or surgical treatment and follow-up of the case
- Assess the use of anesthetics and updated protocols
- Examine the most commonly used anti-parasitic treatments and external disinfectants
- Evaluate the degree of learning with the presentation of a clinical case

*A high-level program for professionals seeking academic excellence”*

03

# Skills

Once all the contents have been studied and the objectives of the Advanced Master's Degree in Medicine and Surgery of Birds and Exotic Animals have been achieved, the professionals will have superior competence and performance in this area. A very complete approach, in a high-level program, which makes the difference.

*Achieving excellence in any profession requires effort and perseverance. At TECH, we help you by providing you with all our educational resources in this field"*

## General Skills

- Specialize veterinary professionals in each of the specialized areas necessary to work as veterinary specialists, with new and updated Knowledge of ophthalmology, diagnostic imaging, pathology, anesthesia and monitoring, pediatric medicine, new laboratory techniques, soft tissue surgery and traumatology
- Carry out the clinical management, maintenance and feeding of different exotic species
- Diagnose, take samples, perform cutting-edge laboratory techniques, and implement medical and surgical treatments to achieve excellence in your daily practice

## Specific Skills

- Achieve advanced theoretical and practical knowledge applicable to daily clinical practice
- Discern the particularities of birds versus the treatment of other animals
- Determine variations between species based on avian anatomy and physiology
- Treat and handle sick birds
- Evaluate anatomical changes in birds to diagnose possible ailments
- Perform clinical management of a single patient or flock
- Perform clinical diagnosis, laboratory tests and applied treatments
- Perform radiology, anesthesiology and ophthalmology, soft tissue surgery and traumatology diagnoses and treatments in birds
- Employ complementary diagnostic techniques, many based on diagnostic imaging such as radiology, endoscopy and ultrasound
- Provide a suitable home for birds kept in captivity
- Carry out the taxonomic classification of the different exotic species arriving at veterinary or rehabilitation centers
- Be able to sedate rabbits and rodents, as well as other exotic species, in order to perform diagnostics and ocular treatments
- Gain in-depth knowledge about all the pathologies that affect ferrets and be able to treat them effectively
- Learn the specific regulations regarding the possession of exotic animals
- Identify the different species of exotic birds, with special emphasis on the nutrients and food required
- Perform diagnostic imaging techniques in reptiles
- Provide the necessary medicines to reptiles in each case
- Perform clinical examinations on specialized wild patients
- Establish diagnoses for fish pathologies and apply specific and necessary treatments in each case

*Our goal is very simple: to offer you a quality specialization program, with the best teaching system of the moment, so that you can achieve excellence in your profession"*

04

# Course Management

For our master's degree 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 comprehensive multidisciplinary team. A unique opportunity to learn from the best.

*Our teachers will put their experience and teaching skills at your disposal to offer you a stimulating and creative learning process"*

## Management

**Ms. Trigo García, María Soledad**

- Veterinarian in charge of the Internal Medicine and Exotic Animal Surgery Service at the Clinical Veterinary Hospital of the Alfonso X El Sabio University in Madrid
- Degree in Veterinary Medicine from the Alfonso X el Sabio University (2012)
- Postgraduate degree in General Practitioner Certificate Programme in Exotic Animals, Improve International
- Postgraduate degree in Food Safety from the Complutense University of Madrid
- Coordinator and Professor of the subject of Exotic Animal Symptoms and Therapeutics at the Faculty of Veterinary Medicine, Alfonso X El Sabio University, Madrid
- Lecturer in Food Science and Technology, Alfonso X El Sabio University
- Veterinary consultant at the José Peña Wildlife Center, and various veterinary clinics in Madrid
- Director of the Exotic Animal Service at the PRADO DE BOADILLA veterinarian center
- Tutor of the Final Degree Dissertations of the Exotic and Wild Animal Medicine and Surgery at the Alfonso X El Sabio University
- External expert evaluator and member of the tribunal of different Final Degree Dissertations



## Professors

### D. Ouro Núñez, Carlos

- Degree in Veterinary from the University of Santiago de Compostela (2007)
- Member of the G.M.C.A.E. (Group of Exotic Animal Medicine and Surgery) of A.V.E.P.A. (Association of Spanish Small Animal Veterinarians)
- Member of the A.A.V. (Association of Avian Veterinarians)
- Member of the A.E.M.V. (Association of Exotic Mammal Veterinarians)
- Member of the A.R.A.V (Association of Reptile and Amphibian Veterinarians)
- Professor and coordinator of the Master in Exotic Animal Medicine and Surgery", taught by Forvetex, from 2018 to the present
- Since 2014 he is the owner and administrator of the Madagascar exotic animal specialist clinic (Madrid), a center that in turn supports different veterinary centers and hospitals and breeders of non-conventional species
- Veterinarian specializing in exotic animals in different veterinary clinics and hospitals in Madrid since 2007

05

# Structure and Content

The contents of this program have been developed by different professors with a clear purpose: to ensure that our students acquire each and every one of the skills necessary to become true experts in this subject. The content of this Grand Master's Degree enables you to learn all aspects of the different disciplines involved in this field. A complete and well-structured program that will take you to the highest standards of quality and success.

*A unique syllabus that will be of great use in exotic animal care"*

## **Module 1.** Bird Taxonomy, Anatomy and Physiology

1.1. Taxonomic Classification of Psittaciformes
- 1.1.1. Taxonomic Classification
- 1.1.2. Worldwide Distribution
- 1.1.3. Anatomic Differences

1.2. Taxonomic Classification of Passerine Birds: Wild Birds
- 1.2.1. Taxonomic Classification
- 1.2.2. Worldwide Distribution
- 1.2.3. Anatomic Differences

1.3. Taxonomic Classification of Falconiformes and Other Orders
- 1.3.1. Taxonomic Classification
- 1.3.2. Worldwide Distribution
- 1.3.3. Anatomic Differences

1.4. The Skeletal System
- 1.4.1. Bone Ossification
- 1.4.2. The Skull
  - 1.4.2.1. The Premaxillary Area
  - 1.4.2.2. The Jaw
- 1.4.3. The Axillary Skeleton: The Epiaxial Hypoaxial Muscles
  - 1.4.3.1. Cervical Vertebrae
  - 1.4.3.2. Thoracic Vertebrae
  - 1.4.3.3. The Synsacrum: Special Anatomy
  - 1.4.3.4. Caudal Vertebrae
  - 1.4.3.5. Sternum
  - 1.4.3.6. Wings: Complete Anatomy and Flight Muscles
- 1.4.4. Pelvic Limbs
  - 1.4.4.1. Femur and Tibiotarsus
  - 1.4.4.2. Phalanges: Finger Placement in Different Species

1.5. The Circulatory System
- 1.5.1. Arterial Anatomy
- 1.5.2. Venous Return
- 1.5.3. The Renal Carrier System
- 1.5.4. Blood Composition: Nucleated Red Blood Cells

1.6. The Respiratory System
- 1.6.1. The Nasal Cavity
- 1.6.2. Larynx and Trachea
- 1.6.3. The Syrinx: The Phonatory Organ in Birds
- 1.6.4. The Lungs
  - 1.6.4.1. Gas Exchange
- 1.6.5. Air Sacs

1.7. The Digestive System
- 1.7.1. Beaks: Substitute for Lips and Teeth in Mammals
  - 1.7.1.1. Wax Localization
  - 1.7.1.2. Beak Functions
- 1.7.2. The Oropharynx
  - 1.7.2.1. Solid Food Intake
  - 1.7.2.2. Liquid Foods
- 1.7.3. The Esophagus
- 1.7.4. The Stomach
  - 1.7.4.1. Proventricles
  - 1.7.4.2. Ventricles
- 1.7.5. The Liver
- 1.7.6. The Pancreas
- 1.7.7. The Intestinal Package

1.8. The Urinary and Reproductive Systems
- 1.8.1. The Kidneys
- 1.8.2. The Ureters
- 1.8.3. Particularities in the Urinary System: The Salt Gland
- 1.8.4. Bird Sexing
- 1.8.5. Male Reproductive System
- 1.8.6. Female Reproductive System

1.9. The Nervous System
- 1.9.1. Sense Organs
- 1.9.2. Sight: Avian Eye Anatomy
- 1.9.3. Hearing
- 1.9.4. Smell and Taste
- 1.9.5. Touch: The Tegument



1.10. Anatomical and Physiological Particularities in Birds
- 1.10.1. The Thymus Gland
- 1.10.2. The Fabricious Bursa
- 1.10.3. The Spleen
- 1.10.4. The Pituitary Gland Pituitary Gland
- 1.10.5. Thyroid and Parathyroid Gland
- 1.10.6. Other Particularities

## **Module 2.** Clinical Criteria for Avian Patients

2.1. Bird Maintenance
- 2.1.1. Special Furniture: Types of Cages
- 2.1.2. Stress
- 2.1.3. Physical exercise
- 2.1.4. Bird Maintenance in Captivity
- 2.1.5. Ultraviolet Light
- 2.1.6. Feathers Coloring
- 2.1.7. Water Availability
- 2.1.8. Medication Added to the Water
- 2.1.9. Water Baths and Sprays

2.2. Capture: Proper Physical Examination
- 2.2.1. Physical Capture
  - 2.2.1.1. Capture Techniques
  - 2.2.1.2. Related Injuries
- 2.2.2. Chemical Capture
  - 2.2.2.1. Capture Techniques
  - 2.2.2.2. Drugs Used
- 2.2.3. Bird Containment

2.3. Clinical Management and Preventive Medicine
- 2.3.1. Complete and Orderly Physical Examination
- 2.3.2. Vaccination
- 2.3.3. Deworming
- 2.3.4. Sterilization

2.4. Sampling and Drug Administration
- 2.4.1. Intravenous Route
- 2.4.2. Intraosseous Route
- 2.4.3. Oral Posology
- 2.4.4. Intramuscular Route
- 2.4.5. Subcutaneous Route
- 2.4.6. Topical Route
- 2.4.7. Other Entry Routes in Avian Patients

2.5. Poultry as Patients
- 2.5.1. The Challenges of Keeping Hens as Pets
- 2.5.2. Hens as Patients
- 2.5.3. The Most Common Chicken and Hen Races

2.6. Nutritional Requirements Feeding
- 2.6.1. Feeding Guidelines
- 2.6.2. Nutritional Composition Feed
  - 2.6.2.1. Carbohydrates
  - 2.6.2.2. Proteins
  - 2.6.2.3. Fats
  - 2.6.2.4. Vitamins
    - 2.6.2.4.1. Liposoluble Vitamins
    - 2.6.2.4.2. Hydrosoluble Vitamins
    - 2.6.2.4.3. Antivitamins
  - 2.6.2.5. Minerals

2.7. Type of Nutrition in Psittacine Birds
- 2.7.1. Seed Mixture
- 2.7.2. Feed:
  - 2.7.2.1. Differences Between Granulated and Extruded
- 2.7.3. Fruits and Vegetables
- 2.7.4. Germinated Seeds
- 2.7.5. Cooked Legumes
- 2.7.6. Breeding Paste
  - 2.7.6.1. Desired Undesired Effects
- 2.7.7. Other Products
- 2.7.8. Calculating Energy Needs
  - 2.7.8.1. Basal Metabolic Rate (BMR)
  - 2.7.8.2. Maintenance Energy Requirements (MER)

2.8. Generalized Diet for the Most Common Psittacines in Clinics
- 2.8.1. Australian Parakeet (Melopsittacus Undulattus)
- 2.8.2. Nymph, Cocotilla or Carolina (Nymphicus Hollandicus)
- 2.8.3. Lovebird (Agapornis Spp.)
- 2.8.4. African Grey Parrot, Yaco (Psithacus Erithacus)

2.9. Generalized Diet for the Least Common Psittacines in Clinics
- 2.9.1. Amazon Parrot (Amazona Sp)
- 2.9.2. Macaw (Ara Sp)
- 2.9.3. Cockatoo (Cacatua Sp)
- 2.9.4. Ecleptus Parrot (Ecleptus Roratus)
- 2.9.5. Loris
- 2.9.6. Psittacine Diet Conversion

2.10. Other Dietary Aspects
- 2.10.1. Feeding in Passerine Birds
- 2.10.2. Diet in Other Birds
- 2.10.3. Diet in Hospitalized Patients

## **Module 3.** Laboratory Tests

3.1. Clinical and Diagnostic Techniques: General Principles Diagnostic Evidence
- 3.1.1. Accurate Diagnoses
- 3.1.2. Considerations for Sample Preparation
- 3.1.3. Sample Transport and Processing

3.2. Hematology: Essential Tool
- 3.2.1. Cell Morphology
  - 3.2.1.1. The Red Series in Blood
  - 3.2.1.2. The White Series in Blood
- 3.2.2. Morphological Changes in Blood Cells
  - 3.2.2.1. Degranulation
  - 3.2.2.2. Immaturity
  - 3.2.2.3. Toxicity
  - 3.2.2.4. Reactivity

3.2.3. Factors to Consider in Hematology
3.2.4. Hematology Protocols in Birds
3.2.4.1. Erythrocyte Count
3.2.4.2. Hemoglobin Estimation
3.2.4.3. Hematocrit Estimation
3.2.4.4. Leukocyte Count
3.2.4.5. Thrombocyte Count
3.2.4.6. Fibrinogen Estimation

3.3. Biochemical Analysis in Birds
3.3.1. Biochemical Reference Ranges
3.3.2. Most Used Profiles
3.3.2.1. Total Protein: Increase and Decrease
3.3.2.2. Glucose: Increase and Decrease
3.3.2.3. Uric Acid, Urea and Creatinine
3.3.2.4. Lactate Dehydrogenase (LDH)
3.3.2.5. Serum Glutamic-Oxaloacetic Transaminase (SGOT)
3.3.2.6. Bile Acids
3.3.2.7. Creatine-Phosphokinase (CPK): Muscle or Heart Failure
3.3.2.8. Calcium: Hypercalcemia Hypocalcemia
3.3.2.9. Phosphorus
3.3.2.10. Cholesterol
3.3.3. Age-Related Biochemical Changes
3.3.3.1. Proteinogram as a Diagnostic Tool
3.3.3.2. The Albumin
3.3.3.3. Alpha-1: Acute Disease Phase Indicator
3.3.3.4. Alpha-2: Acute Disease Phase Proteins
3.3.3.5. The Beta Fraction
3.3.3.6. The Gamma Fraction

3.4. Urinalysis: Suspected Nephropathy
3.4.1. Anatomo-physiological Recap of the Urinary System
3.4.2. Urine Collection Techniques in Birds
3.4.3. Urinalysis
3.4.4. Urinalysis Parameters

3.5. Fundamental Cytological Techniques: Cell Study
3.5.1. Skin and Plumage Scrapings
3.5.1.1. How to Perform Superficial Scrapings
3.5.1.2. How to Perform Deep Scrapings
3.5.2. Biopsy Collection
3.5.2.1. Different Application Techniques
3.5.2.2. Skin Biopsies
3.5.2.3. Skeletal Injury Biopsies
3.5.2.4. Small Biopsies Organs and Masses
3.5.2.5. Chronic Injury Biopsies
3.5.2.6. Biopsies of Small Lesions and Masses
3.5.3. Cytology: Functions
3.5.3.1. Sample Collection and Processing
3.5.3.2. Key Points Cytologic Interpretations

3.6. Advanced Cytologic Techniques
3.6.1. Aspiration
3.6.1.1. Complementary Tests
3.6.1.2. Aspiration Methods
3.6.2. Microbiological Swabs Collection
3.6.2.1. Upper Respiratory Routes
3.6.2.2. Lower Gastrointestinal Tract
3.6.3. Washing Technique
3.6.3.1. Crop Washing
3.6.3.2. Air Sac Washing

3.7. Preparing for a Necropsy
3.7.1. Fundamental Aspects
3.7.1.1. Necropsies
3.7.1.2. The Importance of Anamneses and Patient Medical Histories
3.7.2. Necessary Equipment: Instruments
3.7.3. Selecting Tissues in Necropsy Cases
3.7.4. Samples Preservation for Diagnostic Studies
3.7.5. Records: Injuries and Findings

3.8. External Patient Evaluation in Postmortem Examinations
- 3.8.1. Skin and Appendages: Evidence of Trauma
- 3.8.2. The Bone System
- 3.8.3. The Sensory System
- 3.8.4. The Muscular System. Initial Examination

3.9. Internal Patient Evaluation in Postmortem Examinations
- 3.9.1. The Cardiorespiratory and Cardiovascular Systems
- 3.9.2. Lymphoreticular System
- 3.9.3. The Liver
- 3.9.4. The Digestive system
- 3.9.5. Urinary System Assessment
- 3.9.6. Reproductive System Analysis
  - 3.9.6.1. Necropsy in Females
  - 3.9.6.2. Necropsy in Males
- 3.9.7. Necropsy Evaluation of the Nervous System
- 3.9.8. Examination Conclusion

3.10. Diagnostic Procedures for the Necropsy Technique
- 3.10.1. Histopathological Examination of Collected Samples
  - 3.10.1.1. Sample Collection
- 3.10.2. Microbiological Analysis
  - 3.10.2.1. Swabbing Technique
- 3.10.3. Polymerase Chain Reaction (PCR)
  - 3.10.3.1. Infectious Laryngotracheitis
  - 3.10.3.2. Infectious Bronchitis
  - 3.10.3.3. Poxvirus
  - 3.10.3.4. Mycoplasma Gallisepticum, Mycoplasma Synoviae
  - 3.10.3.5. Other diseases

## **Module 4.** Diagnostic Imaging Techniques

4.1. When to Anesthetize Birds for Diagnostic Techniques
- 4.1.1. Volatile Anesthesia
- 4.1.2. Injectable Anesthesia
- 4.1.3. Anesthesia in Special Conditions

4.2. Necessary Radiology Equipment
- 4.2.1. General Considerations
- 4.2.2. The X-Ray Unit
- 4.2.3. Screens, Chassis and Foils

4.3. Patients: Holding and Positioning
- 4.3.1. Laterolateral Projection
- 4.3.2. Ventrodorsal Projection
- 4.3.3. Craniocaudal Projection
- 4.3.4. Wing Projection
- 4.3.5. Caudoplantar Projection

4.4. Types of X-Rays: Contrast Radiography Studies
- 4.4.1. Conventional Radiography
- 4.4.2. Gastrointestinal Contrast Studies
- 4.4.3. Respiratory Contrast Studies
- 4.4.4. Urography
- 4.4.5. Myelography

4.5. Radiologic Interpretations
- 4.5.1. Anatomy Applied to Radiography
- 4.5.2. Abnormal Radiographic Findings the Respiratory System
- 4.5.3. Abnormal Radiographic Findings the Digestive System
- 4.5.4. Abnormal Radiographic Findings the Skeletal System

4.6. Fundamental Aspects of Avian Ultrasound
- 4.6.1. The Complete Ultrasound Diagnosis
  - 4.6.1.1. Lineal Convex, Microconvex and Phased Array Probes
  - 4.6.1.2. Ultrasound
- 4.6.2. Specific Diagnostic Objectives in Birds and Limitations
- 4.6.3. Necessary Technical Equipment for Ultrasound

4.7. Advanced Criteria for Avian Ultrasound
- 4.7.1. Patient Preparation for Ultrasound
- 4.7.2. Applied Anatomical Recap and Proper Patient Positioning
- 4.7.3. Ultrasound Interpretations

4.8. Endoscopy
- 4.8.1. Endoscopy
  - 4.8.1.1. Necessary Equipment for Endoscopy
  - 4.8.1.2. Rigid Endoscope
- 4.8.2. Patient Preparation and Positioning for Endoscopy
- 4.8.3. Clinical and Surgical Application of Avian Ultrasound

4.9. Avian Cardiology: Basic Fundamentals
- 4.9.1. Cardiac System Anatomy in Birds
- 4.9.2. Clinical Examination in Birds
- 4.9.3. Avian Electrocardiography

4.10. Veterinary Clinical Analysis in Birds
- 4.10.1. Serotyping Major Diseases
  - 4.10.1.1. Salmonella Spp
- 4.10.2. Coprological Analysis
  - 4.10.2.1. Parasitology
  - 4.10.2.2. Bacteriology
- 4.10.3. Serology of the Most Prominent Diseases in Avian Medicine
  - 4.10.3.1. Infectious Laryngotracheitis
  - 4.10.3.2. Infectious Bronchitis
  - 4.10.3.3. Newcastle Disease
  - 4.10.3.4. Mycoplasma Spp
  - 4.10.3.5. Influenza Aviar

## **Module 5.** Pathologies Related to Handling

5.1. Most Common Pathologies
- 5.1.1. Paresis by Capture: Cause of Mortality in Birds
  - 5.1.1.1. Affected Species and Characteristic Symptomatology
  - 5.1.1.2. Physiopathogenesis
  - 5.1.1.3. Differential Diagnosis
  - 5.1.1.4. Treatment and Prevention
- 5.1.2. Lead Poisoning
  - 5.1.2.1. Diagnosis
  - 5.1.2.2. Management Primary, Chelating and Supportive

5.2. Other Intoxications
- 5.2.1. Zinc Poisoning
- 5.2.2. Diagnosis
  - 5.2.2.1. Treatment
  - 5.2.2.2. Primary Treatment
  - 5.2.2.3. Chelating Treatment
  - 5.2.2.4. Supportive Treatment
- 5.2.3. Ammonium Chloride Poisoning in Falconiformes
  - 5.2.3.1. Clinical Signs
  - 5.2.3.2. Pathological Changes
  - 5.2.3.3. Physiological and Pathological Considerations
- 5.2.4. Copper Poisoning
  - 5.2.4.1. Diagnosis
  - 5.2.4.2. Treatment
    - 5.2.4.2.1. Chelating Treatment
    - 5.2.4.2.2. Supportive Treatment

5.3. Pathologies Derived from Poor Nutrition
- 5.3.1. Metabolic Osteopathies: Bone Injuries
- 5.3.2. Most Common Injuries Causes and Types
- 5.3.3. Symptomatology and Susceptible Species
- 5.3.4. Diagnoses and Treatments
- 5.3.5. Long Bone Deformities: Twisting and Bending
  - 5.3.5.1. Describing Pathology Type
  - 5.3.5.2. Clinical Signs in Birds
  - 5.3.5.3. Treatment and Prevention
- 5.3.6. Bone Alterations in the More Distal Bones: Deformation
  - 5.3.6.1. Slipped Tendon
  - 5.3.6.2. Angel Wing
  - 5.3.6.3. Curled Fingers
- 5.3.7. Starvation-Induced Cachexia
  - 5.3.7.1. Definition and Etiology. Symptoms
  - 5.3.7.2. Necropsy Findings
  - 5.3.7.3. Treatment and Prevention
- 5.3.8. Behavioral Osteodystrophy

5.4. Oral Cavity Disorders
- 5.4.1. Beak Pathologies
- 5.4.2. The Oral Cavity and Oropharynx: The Tongue and Salivary Glands
  - 5.4.2.1. Hypovitaminosis A
  - 5.4.2.2. Trauma
  - 5.4.2.3. Bleeding
  - 5.4.2.4. Neoplasms
  - 5.4.2.5. Halitosis
- 5.4.3. Infectious Diseases in Birds
  - 5.4.3.1. Mucosal Necrosis
  - 5.4.3.2. Fowl Pox
  - 5.4.3.3. Anatidae Herpesvirus (Duck Viral Enteritis or Duck Plague)
  - 5.4.3.4. Candidiasis (Candida Albicans Infection)

5.5. Esophagus and Gullet Pathologies
- 5.5.1. Esophagitis, Ingluvitis: Esophageal and/or Ingluvial Impaction
- 5.5.2. Esophagus and/or Crop Infestation by Capillaria Contorta and Other Capillaria spp
- 5.5.3. Candidiasis and Trichomoniasis
  - 5.5.3.1. Esophageal Ingluvial
- 5.5.4. Ingluvial Pathologies
  - 5.5.4.1. Calculations and Stasis
- 5.5.5. Crop Pathologies
  - 5.5.5.1. "Sour Crop Syndrome"
  - 5.5.5.2. Hanging Crop
  - 5.5.5.3. Content Regurgitation
- 5.5.6. Common Neoplasms

5.6. Proventriculus Pathologies
- 5.6.1. Proventricular Dilatation Disease in Psittaciformes
- 5.6.2. Proventricular and Gizzard Impaction
- 5.6.3. Candidiasis (Candida Albicans Infection)
- 5.6.4. Other Pathologies:
  - 5.6.4.1. Atony
  - 5.6.4.2. Hypertrophy of Unknown Etiology
  - 5.6.4.3. Proventriculitis
  - 5.6.4.4. Presence of Foreign Bodies

5.7. Gizzard or Ventricle Pathologies: Glandular Stomach
- 5.7.1. Proventricular Dilatation Disease
- 5.7.2. Gizzard Ulcerations
- 5.7.3. Stomach Nematode Infestation
- 5.7.4. Neoplasms
- 5.7.5. Other Pathologies:
  - 5.7.5.1. Muscular Atrophy and Traumatic Ventriculitis

5.8. Intestinal Pathologies
- 5.8.1. Malabsorption Syndrome
- 5.8.2. Non-Specific Enteropathies
  - 5.8.2.1. Diahrrea in Birds
- 5.8.3. Lower Intestinal Tract Alterations
  - 5.8.3.1. Colorectal Impactation
  - 5.8.3.2. Rectal Prolapse
    - 5.8.3.2.1. Intestinal Overexertion
- 5.8.4. Most Common Neoplasms
- 5.8.5. The Cloaca
  - 5.8.5.1. Chloacitis: "Gonorrheal Discharge"
  - 5.8.5.2. Prolapses
  - 5.8.5.3. Most Common Neoplasms

5.9. Pathologies of the Liver
- 5.9.1. Lipidosis
  - 5.9.1.1. Fatty Infiltration or Fatty Degeneration
- 5.9.2. Hemochromatosis
  - 5.9.2.1. Iron Storage in Avian Organisms
- 5.9.3. Visceral Gout
- 5.9.4. Amilodosis
- 5.9.5. Most Common Neoplasms
- 5.9.6. Other Pathologies:
  - 5.9.6.1. Toxic Hepatitis and Diabetes Mellitus

5.10. Endocrine Disorders
- 5.10.1. Thyroid Glands
- 5.10.2. Parathyroid Glands
- 5.10.3. Adrenal Glands

5.10.4. Ultimobranchial glands
5.10.4.1. Thoracic Localization
5.10.5. Pituitary. Avian Brains
5.10.6. Pancreas. Endocrine and Exocrine Function
5.10.6.1. Pancreatitis
5.10.6.2. Acute Pancreatic Necrosis
5.10.6.3. Most Common Neoplasms

## **Module 6.** Avian Patient Diseases

6.1. Viral Diseases
6.1.1. Viral Diseases
6.1.2. Newcastle Disease (Paramyxoviridae Family)
6.1.2.1. Etiology
6.1.2.2. Serotype Classification
6.1.2.3. Clinical and Physiopathogenesis Characteristics
6.1.2.4. Diagnostic and Treatment Techniques
6.1.3. Fowl Pox (Poxviridae Family Virus)
6.1.3.1. Serotypes Detected in Birds
6.1.3.2. Clinical Signs in Patients
6.1.3.3. Diagnosis and Treatment
6.2. Other Viral Infections of Clinical Interest
6.2.1. Influenza Virus in Birds (Orthomyxoviridae Family)
6.2.1.1. Disease Epizootiology
6.2.1.2. Clinical Signs in Birds
6.2.1.3. Diagnosis
6.2.1.4. Prevention and Control
6.2.2. Herpesvirus Infections
6.2.2.1. Etiology
6.2.2.2. Marek's Disease
6.2.2.2.1. Polyneuritis Paralysis
6.2.2.3. Duck Plague
6.2.2.3.1. Duck Viral Enteritis
6.2.2.4. Avian Infectious Laryngotracheitis
6.2.2.5. Herpes
6.2.3. Other Viral Diseases
6.3. Most Common Bacterial Diseases in Clinics
6.3.1. Pasteurellosis: Cholera
6.3.1.1. History: Etiological Agent and Disease Transmission
6.3.1.2. Susceptible Species and Symptoms
6.3.1.3. Diagnosis
6.3.1.4. Treatment Immunity
6.3.2. Chlamydiosis: Ornithosis-Psittacosis
6.3.2.1. Causes and Most Susceptible Species
6.3.2.2. Effective Diagnosis
6.3.2.3. Treatment and Prevention
6.3.3. Salmonellosis
6.3.3.1. Definition
6.3.3.2. Etiological Agent
6.3.3.3. Distribution
6.3.3.4. Susceptible Species
6.3.3.5. Transmission
6.3.3.6. Diagnosis
6.3.3.7. Treatment and Prevention
6.4. Less Common Bacterial Diseases in Clinics
6.4.1. Avian Tuberculosis: Mycobacterium Spp
6.4.1.1. Causes and Most Susceptible Species
6.4.1.2. Effective Diagnosis
6.4.1.3. Treatment and Prevention
6.4.2. Pseudotuberculosis (Yersiniosis)
6.4.2.1. Causes and Most Susceptible Species
6.4.2.2. Effective Diagnosis
6.4.2.3. Treatment and Prevention
6.4.3. Escherichia Coli Infections
6.4.3.1. Definition
6.4.3.2. Etiological Agent
6.4.3.3. Distribution
6.4.3.4. Susceptible Species
6.4.3.5. Transmission
6.4.3.6. Diagnosis
6.4.3.7. Treatment and Prevention

6.5. Other Bacterial Diseases in Avian Patients
- 6.5.1. Botulism
  - 6.5.1.1. History and Spread
  - 6.5.1.2. Transmission
    - 6.5.1.2.1. Clostridium Botulinum Bacilli
  - 6.5.1.3. Clinical Symptoms and Lesions
  - 6.5.1.4. Diagnosis and Treatment
- 6.5.2. The Red Disease: Erysipelothrix Rhusiopathiae
  - 6.5.2.1. Etiology and Causative Agent Transmission: Wild Birds
  - 6.5.2.2. Effective Detection
    - 6.5.2.2.1. Symptoms and Lesions
  - 6.5.2.3. Diagnosis and Treatment
- 6.5.3. Listeriosis: Listeria Monocytogenes
  - 6.5.3.1. History: Etiological Agent and Disease Transmission
  - 6.5.3.2. Symptoms Detected in Birds
  - 6.5.3.3. Effective Diagnosis and Treatment

6.6. Fungal Diseases
- 6.6.1. Aspergillosis
  - 6.6.1.1. Relevant Disease Characteristics
  - 6.6.1.2. Detected Clinical Signs in Patients
  - 6.6.1.3. Effective Diagnostic Techniques
  - 6.6.1.4. Treatment, Prevention and Prophylaxis
- 6.6.2. Candidiasis
  - 6.6.2.1. Candida Albicans Clinical Signs in Avian patients
  - 6.6.2.2. Laboratory Diagnostic Techniques
  - 6.6.2.3. Treatment and Pathology Control
- 6.6.3. Dermatophytosis, Ringworm
  - 6.6.3.1. Predisposing Factors and Types of Birds Affected
  - 6.6.3.2. Most Common Clinical Signs
  - 6.6.3.3. Diagnosis and Control

6.7. Ectoparasites
- 6.7.1. Diptera
  - 6.7.1.1. Flies and Mosquitos
- 6.7.2. Fleas (Siphonaptera)
- 6.7.3. Lice (Phthiraptera-Mallophaga)
- 6.7.4. Bedbugs (Hemiptera-Cimicidae)
  - 6.7.4.1. Hematophagous Ectoparasites
- 6.7.5. Mites (Acari)
  - 6.7.5.1. Most Common Ectoparasites
- 6.7.6. Ticks (Ixodide)
  - 6.7.6.1. Macroscopic Parasites
- 6.7.7. Beetles (Coleoptera)
  - 6.7.7.1. Disease Vectors

6.8. Performing Coprological Analysis in Birds
- 6.8.1. Most Prominent Coprological Techniques
- 6.8.2. Trematodes
  - 6.8.2.1. Staves
- 6.8.3. Cestodes
  - 6.8.3.1. Tapeworms
- 6.8.4. Nematodes
  - 6.8.4.1. Special Nematodes Locations and Pathologies

6.9. Protozoa: SingleCell Microorganisms
- 6.9.1. Coccidiosis in Anseriformes, Galliformes and Passeriformes
  - 6.9.1.1. Eimeria and Isospora Species
  - 6.9.1.2. Caryospora Species
  - 6.9.1.3. Other Coccidial Species in Birds
- 6.9.2. Trichomoniasis: Trichomonas Spp
- 6.9.3. Other Protozoa
  - 6.9.3.1. Giardia, Hexamita and Histomonas

6.10. Hemoparasites
- 6.10.1. Microfilariae
- 6.10.2. Plasmodium Species
- 6.10.3. Haemoproteus Species
- 6.10.4. Leucocytozoon Species
- 6.10.5. Trypanosomiasis
- 6.10.6. Hepatozoon Species
- 6.10.7. Babesia Species
  - 6.10.7.1. Avian Piroplasmas
- 6.10.8. Other Species

## **Module 7.** Anesthesia and Analgesia in Birds

7.1. Anatomical and Physiological Characteristics in Avian Anesthesia
- 7.1.1. Anatomical Characteristics: Air Sacs
- 7.1.2. Physiological Considerations
  - 7.1.2.1. Inspiration and Expiration
  - 7.1.2.2. Ventilation Triggers
  - 7.1.2.3. Hypoglycemia
- 7.1.3. Pharmacokinetic and Pharmacodynamic Characteristics Avian Patients

7.2. Administering Distant Anesthesia
- 7.2.1. Handler Safety
- 7.2.2. Cooperating Birds: Adequate Management
  - 7.2.2.1. Administering Anesthesia Routes and Techniques
- 7.2.3. Uncooperative Birds: Wild Birds
  - 7.2.3.1. Administering Anesthesia Techniques
  - 7.2.3.2. Darts
  - 7.2.3.3. Other Mechanisms
- 7.2.4. Stress Prior to Administering Anesthesia
  - 7.2.4.1. Activating the Sympathetic Nervous System
  - 7.2.4.2. Other Hormonal Changes
  - 7.2.4.3. How to Measure Stress
  - 7.2.4.4. Physiological Effects Caused by Capture

7.3. Anesthesia Inhalation in Birds: The Anesthesia of Choice
- 7.3.1. Anesthesia Equipment Technical Considerations
  - 7.3.1.1. Gases and Vapors
    - 7.3.1.1.1. Isoflorane, Sevoflorane and Other Anesthetic Gases
- 7.3.2. Endotracheal Intubation
- 7.3.3. Air Sac Intubation
  - 7.3.3.1. Exceptional Intubation

7.4. Monitoring during Anesthesia
- 7.4.1. Reflexes
- 7.4.2. Circulatory Volume
- 7.4.3. Pain
- 7.4.4. Cardiovascular Monitoring
  - 7.4.4.1. Cardiac Suscultation
  - 7.4.4.2. Capillary Refill Time
  - 7.4.4.3. Electrocardiogram
  - 7.4.4.4. Doppler Cardiac Monitoring or Echocardiography
  - 7.4.4.5. Other Monitoring Techniques
  - 7.4.4.6. Intravenous Fluid Therapy
    - 7.4.4.6.1. Crystalloids and Colloids
- 7.4.5. Respiratory Monitoring
  - 7.4.5.1. Respiratory Auscultation
  - 7.4.5.2. Pulse Oximetry
  - 7.4.5.3. Capnography
- 7.4.6. Temperature Monitoring: Hypothermia and Hyperthermia
  - 7.4.6.1. Body Temperature Loss during Surgery: Monitoring and Prevention
  - 7.4.6.2. The Consequences of Hypothermia
  - 7.4.6.3. Hyperthermia
    - 7.4.6.3.1. Prevention and Treatment

7.5. Injectable Anesthesia
- 7.5.1. Anesthetic Perfection
- 7.5.2. Dissociative Anesthetics
- 7.5.3. Opioids
- 7.5.4. Anesthesia in Field Conditions
- 7.5.5. hypothermia
  - 7.5.5.1. Important Aspects in Preventing and Reducing Heat Loss during Anesthesia

7.6. Local Anesthesia and Analgesia
- 7.6.1. Local Anesthesia
  - 7.6.1.1. Cardiovascular Monitoring
  - 7.6.1.2. Drugs Used
  - 7.6.1.3. Therapy Options
- 7.6.2. Analgesia
  - 7.6.2.1. Types of Pain: Analgesia
  - 7.6.2.2. Physiological Sensitivity in Birds

7.6.2.3. Analgesic Drugs
7.6.2.3.1. Acetylsalicylic Acid
7.6.2.3.2. Buprenorphine Hydrochloride
7.6.2.3.3. Butorphanol
7.6.2.3.4. Flunixin-Meglumine
7.6.2.3.5. Carprofen
7.6.2.3.6. Ketoprofen
7.6.2.3.7. Copper Indomethacin
7.6.2.3.8. Meloxicam
7.6.2.3.9. Other Analgesics

7.7. Anesthetic Emergencies
7.7.1. Respiratory Complications during Anesthesia
7.7.1.1. Respiratory Depression
7.7.1.2. Apnea and Respiratory Arrest
7.7.1.3. Airway Obstruction
7.7.1.4. Hyperventilation
7.7.1.5. Hypoxia
7.7.2. Specific Cardiovascular Complications during Anesthesia
7.7.2.1. Bradycardia
7.7.2.2. Tachycardia
7.7.2.3. Hypotension
7.7.2.4. Hypertension
7.7.2.5. Arrhythmias
7.7.2.6. Cardiac Arrest
7.7.3. Hemorrhaging in Avian Patients during Anesthesia

7.8. Anesthesia in Caged Birds: Psittaciformes and Passeriformes
7.8.1. Anatomical and Physiological Considerations
7.8.2. The Cardiovascular System
7.8.3. Thermoregulation
7.8.4. Respiratory Ventilation Systems
7.8.5. Preanesthetic Evaluation in Birds
7.8.6. Anesthetic Procedures
7.8.7. Types of Anesthetics Used
7.8.8. Local Anesthesia and Analgesia



7.9. Anesthesia in Aquatic and SemiAquatic Birds
- 7.9.1. Patients: Aquatic and SemiAquatic Birds
- 7.9.2. Physiological Constants Monitoring
- 7.9.3. Thermoregulation
- 7.9.4. Anesthetic Procedures
- 7.9.5. Types of Anesthetics Used
- 7.9.6. Local Anesthesia and Analgesia

7.10. Other Anesthetic Particularities
- 7.10.1. Anesthetic Particularities in Ratites
  - 7.10.1.1. Anatomical and Physiological Considerations
  - 7.10.1.2. Anesthetic Procedures
  - 7.10.1.3. Types of Anesthetics
  - 7.10.1.4. Local Anesthesia and Analgesia
- 7.10.2. Anesthesia in Galliforms
- 7.10.3. Anesthesia in Falconiformes
- 7.10.4. Euthanasia: Humane Act
  - 7.10.4.1. Special considerations

## **Module 8.** Anesthesia and Soft Tissue Surgery

8.1. Soft Tissue Surgery
- 8.1.1. Soft Tissue Surgeon in Birds
- 8.1.2. Patient Preparation
  - 8.1.2.1. Hypothermia
  - 8.1.2.2. Skin Preparation
- 8.1.3. Necessary Equipment
- 8.1.4. Sterile Cotton Balls
- 8.1.5. Bifocal Surgical Lenses
- 8.1.6. Microsurgery Tools
- 8.1.7. Suture Materials

8.2. Special Surgical Supplies in Bird Surgery
- 8.2.1. Hemoclips
- 8.2.2. Radiosurgery
- 8.2.3. Surgical Lasers
  - 8.2.3.1. Most Used Types and Equipment
- 8.2.4. Microsurgery

8.3. Skin and Appendage Surgery
- 8.3.1. Feather Cysts
  - 8.3.1.1. Plumafoliculoma
- 8.3.2. The Uropygian Gland
  - 8.3.2.1. Most Common Pathologies
- 8.3.3. Wounds and Soft Tissue Injury Treatment
- 8.3.4. Most Common Neoplasms
  - 8.3.4.1. Lipoma
  - 8.3.4.2. Xanthoma

8.4. Reproductive System Techniques
- 8.4.1. Prior Patient Preparation
- 8.4.2. Sterilization
- 8.4.3. Salpingohysterectomy: Female Sterilization
  - 8.4.3.1. Surgical Technique
- 8.4.4. Egg Obstruction in the Oviduct Dystocia in Birds
  - 8.4.4.1. Cesarean Section: Egg Obstruction in the Oviduct
  - 8.4.4.2. Uterine Torsion: Coeloma Inflammation
- 8.4.5. Orchidectomy
  - 8.4.5.1. Anatomical Location of the Testicles: Intracellular
  - 8.4.5.2. Technique
- 8.4.6. Testicular Endoscopic Biopsy

8.5. Gastrointestinal Tract Techniques I
- 8.5.1. The Tongue
  - 8.5.1.1. Most Common Pathologies
- 8.5.2. The Proximal Esophagus
  - 8.5.2.1. Esophageal Strictures: Causes and Treatments
  - 8.5.2.2. Esophageal Trauma: Causes and Treatments
- 8.5.3. Ingluviotomy
  - 8.5.3.1. Localization
  - 8.5.3.2. Indications. Foreign Bodies
- 8.5.4. Crop Burns
  - 8.5.4.1. Pathology Origin
  - 8.5.4.2. Adequate Surgical Technique
- 8.5.5. Others Surgical Techniques of Choice

8.6. Gastrointestinal Tract Techniques II
- 8.6.1. Crop or Esophagus Lacerations
  - 8.6.1.1. Traumatic Diet: Causes and Treatments
  - 8.6.1.2. External Trauma: Causes and Treatments
- 8.6.2. Ingluviostomy Tube Placement
  - 8.6.2.1. Feeding Tube Indications
- 8.6.3. Celiotomy: Opening the Coelomic Cavity
  - 8.6.3.1. Indications and Complications
  - 8.6.3.2. Left Lateral Celiotomy
- 8.6.4. Others Surgical Techniques of Choice

8.7. Gastrointestinal Tract Techniques III
- 8.7.1. Proventriculotomy: Proventriculus or Ventricle Access
  - 8.7.1.1. Indications
  - 8.7.1.2. Surgical Techniques of Choice
- 8.7.2. Yolk Saculectomy: Newborn Chicks
  - 8.7.2.1. Indications
  - 8.7.2.2. Surgical Techniques of Choice
- 8.7.3. Enterotomy
  - 8.7.3.1. Cases Where Enterotomy Is Necessary
  - 8.7.3.2. Type of Surgery to Applied
- 8.7.4. Enterectomy. Intestinal Anastomosis
  - 8.7.4.1. Clinical Situations
  - 8.7.4.2. Surgical Process
- 8.7.5. Ventral Midline Celiotomy
  - 8.7.5.1. Indication This Type of Surgical Access
  - 8.7.5.2. Approaches
- 8.7.6. Cloaca Disorders
  - 8.7.6.1. Prolapsed Organs through the Cloaca
  - 8.7.6.2. Cloacolito

8.8. Magnetic Biopsy Procedures
- 8.8.1. Hepatic biopsy
  - 8.8.1.1. Indication This Type of Surgical Access
  - 8.8.1.2. Approach

8.8.2. Pancreatic Biopsy
8.8.2.1. Pancreatic Alterations
8.8.2.2. Surgical Indications
8.8.3. Renal Biopsy
8.8.3.1. Indications
8.8.3.2. Necessary Technical Resources
8.8.3.3. Technique and Approach
8.9. Respiratory Surgical Techniques
8.9.1. Respiratory Surgery
8.9.1.1. Necessary Anatomy Recap
8.9.2. Tracheotomy
8.9.2.1. Indications
8.9.2.1.1. Presence of Aspergillomas and Foreign Bodies
8.9.2.2. Surgical Technique
8.9.3. Tracheotomy
8.9.3.1. Indications. Severe Tracheal Stenosis
8.9.3.2. Surgical Technique
8.9.4. Pulmonary Biopsy
8.9.4.1. Indications. Severe Tracheal Stenosis
8.9.4.2. Surgical Technique
8.9.5. Muting in Birds
8.9.5.1. Ethical Considerations
8.10. Postoperative Care
8.10.1. Stressful situtions
8.10.2. Thermal Recovery and Maintenance
8.10.3. Hospitalization and Swift Recovery
8.10.4. Self-Trauma Prevention
8.10.5. Postoperative Analgesia
8.10.6. Adequate Fluid Therapy
8.10.7. Nutritional Supplements

## **Module 9.** Pathologies and Medical Treatments

9.1. Nutritional Treatments
9.1.1. Fluid Therapy: Clinical Application
9.1.1.1. Types of Fluid Therapy
9.1.1.2. Advantages and Disadvantages
9.1.2. Feeding Tube and Nutritional Support
9.1.2.1. Nutritional Needs
9.1.2.2. Enteric Nutrition Formulas
9.2. External Treatment
9.2.1. Claw/Nail and Beak Trimming
9.2.2. Feather Repair
9.2.2.1. Materials Instruments Used in Grafting
9.2.2.2. Bent Feather Repair
9.2.2.3. Partial Feather Substitution
9.2.2.4. Total Feather Substitution
9.2.3. Wing Trimming and Cutting
9.2.4. Wound Treatment Management Objectives
9.3.4.1. Bandage Care
9.3.4.2. Dressing Removal
9.3. Trauma Treatments
9.3.1. Bandages and Dressings
9.3.1.1. Bandage and Dressing Functions
9.3.1.1.1. Protection
9.3.1.1.2. Pressure
9.3.1.1.3. Support
9.3.1.1.4. Absorption, Moist Environment, Holding in Place
9.3.1.1.5. Comfort
9.3.1.1.6. Other Ideal Dressing Characteristics
9.3.1.2. Selection Process
9.3.1.3. Injury Evaluation

9.3.2. Types of Bandages Most Used in Orthopedic Surgery
9.3.2.1. EightShaped Bandage
9.3.2.2. EightShaped Bandage to the Body
9.3.2.3. Wing Bandage with Two Circular Bandages around the Body
9.3.2.4. Robert Jones Bandage
9.3.2.5. Ball Bandage
9.3.3. Protective Leg Casts
9.3.4. External Splints
9.3.5. Elizabethan Collars
9.4. Administering Drugs in Birds
9.4.1. Relevant Aspects in Drug Administration
9.4.2. Use Routes
9.4.3. Advantages and Disadvantages
9.4.4. Metabolic Drug Adjustment
9.5. Most Used Antibiotics in Avian Patients
9.5.1. Amikacin
9.5.1.1. Species Indicated and Dosage
9.5.2. Ceftazidime
9.5.2.1. Species Indicated and Dosage
9.5.3. Doxycycline
9.5.3.1. Species Indicated and Effective Dosage
9.5.4. Enrofloxacin and Marbofloxacin
9.5.4.1. Quinolones and Current Uses
9.5.5. Metronidazole
9.5.5.1. Species Indicated and Effective Dosage
9.5.6. Trimethoprim / Sulfamethoxazole
9.5.6.1. Adequate Dosage
9.5.7. Other Antibiotics Used
9.6. Most Used Antifungal Drungs in Avian Patients
9.6.1. Amphotericin B
9.6.1.1. Target Species and Dosage
9.6.2. Fluconazole
9.6.2.1. Dosage
9.6.3. Itraconazole
9.6.3.1. Dosage
9.6.4. Ketoconazole: Fungistatic
9.6.4.1. Dosage
9.6.5. Nystatin: Antifungal Macrolide
9.6.5.1. Target Species and Dosage
9.6.6. Other Antifungal Drugs of Clinical Interest
9.7. Most Used Antiparasitics in Avian Patients
9.7.1. Ivermectin
9.7.1.1. Target Species and Dosage
9.7.2. Albendazole
9.7.2.1. Target Species and Dosage
9.7.3. Fenbendazole
9.7.3.1. Target Species and Dosage
9.7.4. Levamisole
9.7.4.1. Species Type and Dosage
9.7.5. Selamectin
9.7.5.1. Species Type and Dosage
9.7.6. Toltrazuril
9.7.6.1. Dosage and Target Species
9.7.7. Other Antiparasitics of Clinical Interest
9.8. Other Drugs Used in Birds
9.8.1. Most Used Antivirals in Avian Patients
9.8.1.1. Aciclovir
9.8.1.1.1. Posology, Target Species and Dosage
9.8.1.2. Other Antivirals of Clinical Interest
9.8.2. Hormones Used in Birds
9.8.2.1. Adrenocorticotropic Hormone: ACTH
9.8.2.1.1. Bird Type and Dosage
9.8.2.2. Cabergoline
9.8.2.2.1. Effective Dosage
9.8.2.3. Oxytocin
9.8.2.3.1. Effective Dosage
9.8.2.4. Other Hormones of Clinical Interest

9.9. Medications Used for Nebulization
- 9.9.1. Nebulizer Use
- 9.9.2. F10 Use
- 9.9.3. Gentamicin
- 9.9.4. Amikacin
  - 9.9.4.1. Dosage and Use
- 9.9.5. Amphotericin B
  - 9.9.5.1. Dosage and Use
- 9.9.6. Clotrimazole
  - 9.9.6.1. Dosage and Use
- 9.9.7. Others Medications Used for Nebulization

9.10. Ophthalmological Drops Used in Birds
- 9.10.1. Ciprofloxacin
- 9.10.2. Chloramphenicol
- 9.10.3. Tobramycin
- 9.10.4. Diclofenac
- 9.10.5. Prednisone

## **Module 10.** Orthopedic and Ophthalmologic Surgery in Birds

10.1. Avian Ophthalmology: Eye and Eyelid Lesions
- 10.1.1. Anatomy Recap
- 10.1.2. Differences Between Species
- 10.1.3. Eyeball Pathophysiology
- 10.1.4. Most Used Treatments

10.2. Pododermatitis: Nails
- 10.2.1. Pathology Characteristics
- 10.2.2. Most Affected Bird Species
- 10.2.3. Current Treatments
  - 10.2.3.1. Medical Treatment
  - 10.2.3.2. Surgical treatment
    - 10.2.3.2.1. Necrotic Debridement
- 10.2.4. Prevention
- 10.2.5. Treatment

10.3. Fractures. Bone Definition Loss
- 10.3.1. Bird Skeletons
- 10.3.2. Necessary Surgical Supplies and Preliminary Technical Considerations
- 10.3.3. Physical Examination and Preoperative Management of Avian Patients
- 10.3.4. Types of Bone Fractures and Dislocations

10.4. Fracture Correction: Fracture Treatment Objectives
- 10.4.1. Osteosynthesis Techniques in Birds
  - 10.4.1.1. Advantages
  - 10.4.1.2. Inconveniences
- 10.4.2. Internal Fastening
  - 10.4.2.1. Medullary Nailing (Intramedullary or Centromedullary)
  - 10.4.2.2. Banding
- 10.4.3. External Fastening: Bone Scaffolds
  - 10.4.3.1. The Kirschnner-Ehmer Splint

10.5. Fastening Methods Humerus, Clavicle and Coracoid Fractures
- 10.5.1. Shoulder Girdle and Forelimb Anatomy
- 10.5.2. Humerus Fractures
- 10.5.3. Fastening Method for Distal and Subcondylar Humerus Fractures
  - 10.5.3.1. Crossed Needles

10.6. Fastening Methods for Diaphyseal Forelimb Fractures
- 10.6.1. Relevant Aspects
- 10.6.2. Needles Placement in Different Fasteners
- 10.6.3. Proximal Ulnar Diaphysis Fractures, with Intact or Fractured Radius
- 10.6.4. Diaphyseal and Distal Ulnar Fractures, with Intact or Fractured Radius
- 10.6.5. Special Forelimb Cases
  - 10.6.5.1. Proximally or Distally Fractured Radius
  - 10.6.5.2. Intact Ulna
- 10.6.6. Elbow Dislocations

10.7. Fastening Methods the Carpus and Tarsus
- 10.7.1. Fastening the Carpal Joint
  - 10.7.1.1. Relevant Aspects
  - 10.7.1.2. Specific Treatment Recommendations

10.7.2. Fastening Tibiotarsus Fractures
10.7.2.1. Relevant Aspects
10.7.2.2. Tibiotarsus Fractures and Surgical Stabilization
10.7.3. Fastening Choices for Tarsometatarsal Fractures
10.8. Fastening Methods and Orthopedic Femur Pathologies
10.8.1. Relevant Aspects
10.8.2. Femur Fractures
10.8.2.1. Surgical Stabilization
10.8.3. Knee Dislocation
10.8.3.1. Choice Treatment
10.9. Less Common Bone Injuries
10.9.1. Neck Dislocation and Fracture
10.9.1.1. Symptoms, Diagnosis and Treatment
10.9.2. Keel Injuries
10.9.2.1. Pathology
10.9.2.2. Treatment
10.9.3. Wing Tip Injuries
10.9.3.1. Wing Wounds and Ulcers
10.9.3.1.1. Types of Wounds and Treatment
10.9.3.2. Bursitis
10.9.3.2.1. Symptoms and Treatment
10.9.3.3. Edema and Dry Gangrene Syndrome: Avascular Necrosis
10.9.3.3.1. Localization
10.9.3.3.2. Symptoms and Treatment
10.10. Postoperative Patient Care for Repaired Fractures
10.10.1. Physical Therapy for Wing Fracture Treatment
10.10.2. Patagium Treatment
10.10.3. Physical Rehabilitation and Physiotherapy in Birds

## **Module 11.** Relevant Aspects of Lagomorfs and Rodents

11.1. Taxonomic Classification: Is a Lagomorf a Rodent?
11.1.1. Lagomorphs
11.1.2. Hystricomorph Rodents
11.1.3. Myomorph Rodents
11.1.4. Visible Differences Between the Different Species
11.2. Technical Requirements: The Importance of Adapting the Facilities to Each Species
11.2.1. Types of Accommodation
11.2.2. Absorbent Hygienic Bedding
11.2.3. Accommodation During the Hospitalization of the Patients
11.3. Nutritional Aspects: Nutritional Specifications in the Diets
11.3.1. Specific Feeding Patterns in Lagomorphs and Hystricomorph Rodents
11.3.2. Nutritional Programs for Myomorph Rodents
11.3.3. Nutritional Care in Special Situations
11.4. Anatomic Reminder: Different Species, Different Anatomies
11.4.1. The Domestic Rabbit
11.4.2. Hystricomorph Rodents
11.4.3. Myomorph Rodents
11.5. Clinical Handling and Preventive Medicine: The Key Factor for Excellence in the Eyes of the Owner
11.5.1. Handling
11.5.1.1. Handling Techniques for Examination in the Practice
11.5.2. Physical Examination
11.5.2.1. Sexing: Sexual Dimorphism:
11.5.3. Preventive Medicine
11.5.3.1. Current Legislation and Animal Identification System
11.5.3.2. Vaccination Protocol
11.5.3.3. Deworming Guidelines
11.5.3.4. Information on Sterilization

11.6. Sampling for Diagnosis and Pathways for Drug Administration
- 11.6.1. Venipuncture
- 11.6.2. Medication administration
- 11.6.3. Urine Collection
- 11.6.4. Radiographic Images Necessary to Reach the Correct Diagnosis and How to Perform Them

11.7. Diagnostic Techniques:
- 11.7.1. Sample Analysis: Key Factor for a Reliable Diagnosis
  - 11.7.1.1. Urine Sample. Interpretation of Results
  - 11.7.1.2. Blood Sample. Different Results
- 11.7.2. The X-Ray as a Basic Tool
  - 11.7.2.1. Radiographic Interpretation and Diagnostic Imaging
- 11.7.3. Ultrasound to Diagnose Specific Pathologies
  - 11.7.3.1. Main Approaches
- 11.7.4. Other Diagnostic Techniques

11.8. Skin and Gastrointestinal Pathologies: Listing the Most Frequent Pathologies
- 11.8.1. External Parasites
- 11.8.2. Fungal Infections
- 11.8.3. Bacterial Infections
- 11.8.4. Viral Infections
- 11.8.5. Dermal Neoplasms:
- 11.8.6. Other Dermal Alterations
- 11.8.7. Dental Problems
- 11.8.8. Mucocele
- 11.8.9. Foreign Bodies and Impaction
- 11.8.10. Internal Parasites:
- 11.8.11. Bacterial Enteritis
- 11.8.12. Ileum

11.9. Respiratory and Genitourinary Disorders
- 11.9.1. Respiratory Diseases of Rabbits and Rodents
- 11.9.2. Cystitis and Urolithiasis
- 11.9.3. Dystocia
- 11.9.4. Hyperestrogenism
- 11.9.5. Mammary Tumors
- 11.9.6. Gestational Toxemia,
- 11.9.7. Ovarian Cysts
- 11.9.8. Paraphimosis
- 11.9.9. Pyometra and Hemometra

11.10. Other Less Frequent Pathologies of Interest, But of Equal Importance
- 11.10.1. Musculoskeletal Alterations
  - 11.10.1.1. Vitamin C Deficit
  - 11.10.1.2. Fractures and Dislocation of the Rachis in Rabbits
- 11.10.2. Neurological Alterations:
  - 11.10.2.1. Vestibular Syndrome in Rabbits
  - 11.10.2.2. Epilepsy in Gerbils
- 11.10.3. Other Pathologies:
  - 11.10.3.1. Viral Hemorrhagic Disease
  - 11.10.3.2. Myxomatosis
  - 11.10.3.3. Lymphomas

## **Module 12.** Advanced Criteria in Rabbits and Rodents

12.1. Anatomo-Physiological Reminder of the Oral Cavity
- 12.1.1. Anatomy of the Oral Cavity
  - 12.1.1.1. Dental Formula
  - 12.1.1.2. Types of Dentition
  - 12.1.1.3. Types of Mastication
- 12.1.2. Origin of Dental Pathologies
  - 12.1.2.1. Genetic Origin
  - 12.1.2.2. Traumatic Origin
  - 12.1.2.3. Systemic Origin
  - 12.1.2.4. Dietary Origin

12.1.3. Types of Oral Pathologies
12.1.3.1. Malocclusion of Incisors
12.1.3.2. Malocclusion of Premolars and Molars
12.2. Oral Pathologies
12.2.1. Symptoms Associated With Dental Pathologies. Early Diagnosis
12.2.1.1. Symptoms According to Location
12.2.1.2. Presumptive Diagnosis and Work Plan
12.2.1.3. Complementary Diagnostic Tests
12.2.1.4. Firm Diagnosis
12.2.2. Prevention, Treatment and Prognosis of Patients With Oral Pathologies
12.2.2.1. Medical Treatment
12.2.2.2. Surgical Treatment: New Advances in the Treatment of Oral Abscesses
12.3. Fundamental Zoonoses in Lagomorphs and Rodents
12.3.1. Basic Features of Prevention and Protection of the Veterinary Professional
12.3.2. Diseases of Bacterial Origin
12.3.2.1. Francisella Tularensis
12.3.2.2. Pasteurellosis
12.3.2.3. Salmonellosis
12.3.2.4. Bordetella Sp
12.3.2.5. Brucellosis
12.3.2.6. Yersinia Pestis
12.3.2.7. Q fever
12.3.3. Parasitic Diseases
12.3.3.1. Internal Parasites:
12.3.3.2. External Parasites
12.4. Advanced Zoonoses in Lagomorphs and Rodents
12.4.1. Diseases Caused by Protozoos
12.4.1.1. Encephalytozoonosis
12.4.1.2. Toxoplasmosis
12.4.1.3. Giardiasis
12.4.2. Viral Diseases
12.4.2.1. Herpesvirus
12.4.3. Diseases of Fungal Origin
12.4.3.1. Dermatophytosis
12.4.3.2. Microsporum sp
12.4.3.3. Trichophyton Mentagrophytes
12.5. Most Commonly Used Anesthesia Techniques in Rodent and Lagomorph Clinics
12.5.1. Basic Concepts
12.5.2. Anaesthesia -Analgesia Epidural
12.5.3. Sedation and General Anaesthesia
12.6. Updated Anesthesia Techniques
12.6.1. Anatomical Review of the Facial Nerves
12.6.2. Local Anesthesia and Cranial Nerve Block
12.6.3. Jaw Nerve Blockade
12.6.4. Infraorbital Nerve Block
12.6.5. Palatine Nerve Block
12.6.6. Mandibular Nerve Block
12.6.7. Mental Nerve Block
12.6.8. Anesthesia in the Emergency Department: Cardiopulmonary Resuscitation
12.7. Ophthalmology in Lagomorphs and Rodents
12.7.1. Common Ocular Infections
12.7.2. Corneal Ulcers. Diagnosis and Treatment
12.7.3. Protrusion of the Nictitating Membrane
12.7.4. Pseudoterigion
12.7.5. Naso-lacrimal Duct Catheterization in Rabbits
12.8. Updated Medical Treatments
12.8.1. Relevant Aspects
12.8.2. Safe Drugs and Suitable Dosage
12.8.3. Common Drugs in Other Species, But Banned For Lagomorphs and Rodents
12.9. Basic Surgical Techniques
12.9.1. Pre-Surgery Factors
12.9.2. Surgery Factors
12.9.3. Post-Surgical Factors
12.9.4. Lagomorph and Rodent Sterilization Techniques

12.10. Advanced Surgical Techniques
- 12.10.1. Cystotomy in Rabbits and Guinea Pigs
- 12.10.2. Urethrotomy and Perineal Urethrostomy in Rabbits
- 12.10.3. Gastrotomy in Lagomorphs and Rodents
- 12.10.4. Enterotomy and Enterectomy in Lagomorphs and Rodents

## **Module 13.** Symptoms and Therapeutics for Ferrets

13.1. Introduction to the Ferret Symptoms. Reinforced Basis to Move Towards a Diagnosis
- 13.1.1. Anatomy
  - 13.1.1.1. Taxonomic Classification
  - 13.1.1.2. Anatomophysiological Peculiarities
  - 13.1.1.3. Noticeable Differences With Other Domestic Carnivores
  - 13.1.1.4. Sexual Dimorphism:
  - 13.1.1.5. Physiological Parameters
- 13.1.2. Maintenance and Nutritional Requirements of Ferrets
  - 13.1.2.1. Interior and Exterior Accommodation
  - 13.1.2.2. Specific Facilities
  - 13.1.2.3. Absorbent Hygienic Bedding
  - 13.1.2.4. Hospitalization Maintenance Requirements
    - 13.1.2.4.1. Nutritional Classification
    - 13.1.2.4.2. Feeding Guidelines
    - 13.1.2.4.3. Nutritional Requirements in Special Physiological Situations

13.2. Clinical Handling and Preventive Medicine: The Importance of the First Visit to the Veterinarian Center
- 13.2.1. Receiving the Patient and Clinical History
- 13.2.2. Physical Examination: Systematic Physical Examination Protocol
- 13.2.3. Clinical Handling and Veterinary Actions. Physical Containment of the Ferret for Examination, Diagnostic Techniques and How to Apply Treatments
  - 13.2.3.1. No Contact With the Patient
  - 13.2.3.2. Light Containment
  - 13.2.3.3. Light Immobilization
  - 13.2.3.4. Full Immobilization
- 13.2.4. Sexing: Sexual Dimorphism:
- 13.2.5. Preventive Medicine
  - 13.2.5.1. Current Legislation and Animal Identification System
  - 13.2.5.2. Vaccination Protocol
  - 13.2.5.3. Deworming Guidelines
  - 13.2.5.4. Information on Sterilization

13.3. Pathways for Administering Drugs and Diagnostic Techniques
- 13.3.1. Venipuncture
  - 13.3.1.1. Access to the Cephalic Vein
  - 13.3.1.2. Vena Cava: Location and Common Use
  - 13.3.1.3. Lateral Saphenous Vein
- 13.3.2. Medication administration
  - 13.3.2.1. Oral Posology
  - 13.3.2.2. Subcutaneous Route
  - 13.3.2.3. Intramuscular Route
  - 13.3.2.4. Intravenous Route
  - 13.3.2.5. Intracardiac Route
  - 13.3.2.6. The Importance of Nebulizations
- 13.3.3. Urine Collection
- 13.3.4. Radiographic Images Necessary to Reach the Correct Diagnosis and How to Perform Them
  - 13.3.4.1. Handling Techniques for Performing X-Rays Without Sedation
  - 13.3.4.2. The X-Ray as a Basic Tool
- 13.3.5. Laboratory Samples: Interpretation and Results
  - 13.3.5.1. Urine Sample. Interpretation of Results
  - 13.3.5.2. Blood Sample. Different Results
- 13.3.6. Ultrasound to Diagnose Specific Pathologies
  - 13.3.6.1. Main Ultrasound Approaches

13.4. Skin Diseases. Update on Dermatological Cases in Ferrets
- 13.4.1. Alopecia: Very Common in Clinical Practice
  - 13.4.1.1. Non-Specific Symptoms That Should Not Be Forgotten
- 13.4.2. Ectoparasites. Symptoms and Treatment Discussion
  - 13.4.2.1. Ear Mites
  - 13.4.2.2. Fleas. Ctenocephalides Felis and C. Canis
  - 13.4.2.3. Ticks

13.4.3. Dermal Neoplasms: Very Common in Ferrets
13.4.3.1. Carcinomas
13.4.3.2. Sebaceous Adenomas
13.4.3.3. Epitheliomas
13.4.3.4. Cystadenomas
13.4.3.5. Epitheliotropic Cutaneous Lymphomas
13.5. Problems of the Oral Cavity: Pathologies Similar to Those of Other Domestic Carnivores
13.5.1. Dental Malocclusion: Congenital Causes
13.5.2. Double Dentition: Supranumerary Incisors
13.5.3. Dental Fractures: The Most Common Dental Pathology
13.5.4. Periodontal Disease: Ferrets of Medium - Advanced Age. Geriatrics
13.5.5. Tooth Abscesses
13.5.5.1. Advanced Periodontal Disease
13.5.5.2. Malpractice
13.5.6. Alterations in Dental Coloring. There are Two Classifications
13.5.6.1. Dental Stains
13.5.6.1.1. Intrinsic Staining of the Teeth
13.5.6.1.2. Extrinsic Staining
13.5.6.2. Dental Coloring
13.6. Gastrointestinal Pathologies. The Importance of Diagnostic Tools
13.6.1. Gastritis
13.6.1.1. Gastric Ulcers
13.6.1.2. Causes. Diagnosis and Treatment
13.6.2. Diarrheic Processes: Most Common Symptoms in Ferrets
13.6.3. Presence of Internal Parasites
13.6.3.1. Leonine Toxascaris
13.6.3.2. Toxacara Cati
13.6.3.3. Ancylostoma Sp
13.6.3.4. Dipylidium Caninum
13.6.3.5. Giardia Sp
13.6.3.6. Coccidiosis
13.6.4. Inflammatory Bowel Disease
13.6.4.1. Lymphoplasmacytic
13.6.4.2. Eosinophilic



13.6.5. Epizootic Catarrhal Enteritis (Coronavirus)
13.6.5.1. Frequency, Clinical Picture and Diagnosis
13.6.6. Infectious Peritonitis (Systemic Coronavirus)
13.6.6.1. High Frequency
13.6.6.2. Symptoms and Diagnosis
13.6.6.3. Prognosis of the Disease
13.7. Respiratory Pathologies:
13.7.1. Human Influenza: Orthomyxovirus
13.7.1.1. Transmission
13.7.1.2. Clinical Picture
13.7.1.3. Diagnosis
13.7.1.4. Treatment
13.7.2. Distemper Virus: Paramyxovirus
13.7.2.1. Progression of the Disease
13.7.2.2. Diagnosis
13.7.2.3. Prevention: The Best Tool Currently Available
13.8. Endocrine Pathologies. The Main Issue With Ferrets
13.8.1. Hyperadrenocorticism in Ferrets
13.8.1.1. Definition and General Concepts
13.8.1.2. Adrenal Gland Anatomy. Localization
13.8.1.3. Endocrinological Functioning of the Adrenal Glands
13.8.1.3.1. Reminder of Hormonal Functioning
13.8.1.4. Typical and Non-Specific Symptoms
13.8.1.4.1. Alopecia
13.8.1.4.2. General Malaise: Anorexia
13.8.1.4.3. Genital Inflammation
13.8.1.4.4. Other Symptoms
13.8.1.5. Establishing a Diagnosis
13.8.1.5.1. Differential Diagnosis and Work Plan
13.8.1.5.2. Complementary Tests: The Importance of Ultrasound
13.8.1.5.2.1. Studies on the Measurement of Adrenal Glands
13.8.1.5.3. Other Complementary Tests
13.8.1.6. Management Patient Stabilization
13.8.1.6.1. Surgical: Left or Bilateral, Total or Partial Adrenalectomy

13.8.1.6.2. Medical:
13.8.1.6.2.1. Deslorelin Implant
13.8.1.6.2.2. Agonists of the Gonadotropin-Releasing Hormone (GnRH)
13.8.1.6.2.3. Other Medical Treatments Used
13.8.2. Hyperestrogenism
13.8.2.1. Symptoms, Diagnosis and Treatment
13.9. Other Important Pathologies
13.9.1. Urinary Pathologies
13.9.1.1. Renal Cysts
13.9.1.1.1. Clinical Findings
13.9.1.1.2. Treatment
13.9.1.2. Bladder Uroliths
13.9.1.2.1. Frequency (F)
13.9.1.2.2. Types of Calculi and Recommended Treatment
13.9.2. The Cardiac Patient
13.9.2.1. The Most Common Symptoms
13.9.2.2. The Diagnostic Tools: X-rays, Electrocardiograms, Ultrasound Scans
13.9.2.3. Common Treatments and Case Monitoring
13.9.3. Aleutian Disease
13.9.3.1. Causes
13.9.3.2. Characteristic Symptomatology
13.9.3.3. Early Diagnosis
13.9.4. Neoplasms
13.9.4.1. Insulinoma: Very Common Pathology in MiddleAged Ferrets
13.9.4.1.1. Causes. Symptoms
13.9.4.1.2. Diagnostic Plan
13.9.4.1.3. Effective Treatment
13.9.4.2. Lymphoma
13.9.4.2.1. Causes
13.9.4.2.2. Diagnostic Plan
13.10. Surgical Techniques in Ferrets
13.10.1. Most Commonly Used Anesthesia and Analgesia in Ferrets
13.10.1.1. Analgesia
13.10.1.2. Sedation
13.10.1.3. General Anesthesia
13.10.1.4. Anesthesia in the Emergency Department: Cardiopulmonary Resuscitation
13.10.2. Basic Surgical Techniques
13.10.2.1. Pre-Surgical, Surgical and Post-Surgical Factors
13.10.2.2. Lagomorph and Rodent Sterilization Techniques
13.10.3. Advanced Surgical Techniques
13.10.3.1. Adrenalectomy in Ferrets
13.10.3.1.1. Surgical Technique: Bilateral, Unilateral, Total or Partial Decisions Prior
13.10.3.2. Saculectomy: Anal Sacs Located in the Perianal Space
13.10.3.2.1. The Most Common Approaches Currently Used
13.10.3.2.2. When It Goes Wrong: Complications
13.10.3.3. Cystotomy
13.10.3.3.1. Indications: Neoplasms and Urinary Obstructions
13.10.3.3.2. Surgical Technique
13.10.3.4. Urethrotomy and Urethrostomy in Ferrets
13.10.3.4.1. Anatomic Reminder: Os Penis (Penis Bone)
13.10.3.4.2. Indications: Neoplasms, Distal Urethral Strictures and Urinary Obstructions
13.10.3.4.3. Surgical Technique
13.10.3.5. Gastrotomy, Enterotomy and Enterectomy in Ferrets
13.10.3.5.1. Indications: Gastrointestinal Obstructions, Foreign Bodies, Neoplasms and Biopsies
13.10.3.5.2. Surgical Technique

## **Module 14.** New Pets

14.1. Taxonomic Classification: Noticeable Differences Between Species
- 14.1.1. Squirrels, Prairie Dogs and Richardson's Squirrels: Small Rodents of Worldwide Distribution
  - 14.1.1.1. Common or Red Squirrel (Sciurus Vulgaris)
  - 14.1.1.2. Grey Squirrel (Sciurus Carolinensis)
  - 14.1.1.3. Siberian Chipmunk (Eutamias Sibiricus)
  - 14.1.1.4. Eastern Chipmunk (Tamias Striatus)
  - 14.1.1.5. Prairie Dog (Cynomys Spp)
  - 14.1.1.6. Richardson's Squirrels (Urocitellus / Spermophilus Rochardsonii)
- 14.1.2. Hedgehogs: The Most Common Species
  - 14.1.2.1. African White-Bellied, 4-Toed or Pygmy Hedgehog (Atelerix Albiventris)
  - 14.1.2.2. Egyptian Hedgehog (Hemiechinus Auritus)
  - 14.1.2.3. European Hedgehog (Erinaceus Europaeus)
  - 14.1.2.4. Moorish Hedgehod (Erinaceus Algirus)
- 14.1.3. Pet Pigs
  - 14.1.3.1. Vietnamese Pig (Sus Scrofa Domestica)
  - 14.1.3.2. Kune Pig (Sus Scrofa Domestica)

14.2. Maintenance in Captivity: Specific Facilities. Furniture and Special Features
- 14.2.1. Sciuromorphs. Thermal Factor
  - 14.2.1.1. Body and Environmental Temperature in Each Species
- 14.2.2. Hedgehogs: Nocturnal, Territorial and Solitary Animals
  - 14.2.2.1. Body and Environmental Temperature
  - 14.2.2.2. Behavior in the Wild and in Captivity
  - 14.2.2.3. The "Self-Anointing". A Characteristic Behavior of the Species
- 14.2.3. Pet Pigs: Dwarf Pigs
  - 14.2.3.1. Body and Environmental Temperature
  - 14.2.3.2. Interior and Exterior Facilities
  - 14.2.3.3. Environmental Enrichment: Techniques for Preventing Destructive Behavior
  - 14.2.3.4. Behavior in the Wild: Extrapolation to Captivity

14.3. Nutritional Aspects: Nutritional Specifications in the Diets. Different Nutritional program for Each Species
- 14.3.1. Sciuromorphs
  - 14.3.1.1. Classification According to their Habits
    - 14.3.1.1.1. Arboreal
    - 14.3.1.1.2. Mixed
    - 14.3.1.1.3. Land
  - 14.3.1.2. General Dental Distribution
  - 14.3.1.3. Changes in Feeding for Hibernation
  - 14.3.1.4. Nutritional Deficiencies
- 14.3.2. Hedgehogs: Very Different Nutrition in Captivity Than in the Wild
- 14.3.3. Pet Pigs: They Are Omnivores

14.4. Anatomic Reminder: Different Species, Different Anatomies
- 14.4.1. Sciuromorphs
  - 14.4.1.1. Oral Cavity. Types of Dentition
  - 14.4.1.2. Sexual Dimorphism: Only Clear in Adult Specimens
  - 14.4.1.3. Special Criteria for Reproduction: One Litter Per Year
  - 14.4.1.4. Differences Between Species
- 14.4.2. Hedgehogs: They Are Polygamous
  - 14.4.2.1. Sexual Dimorphism:
  - 14.4.2.2. Special Criteria for Reproduction
  - 14.4.2.3. Anatomic Considerations
- 14.4.3. Pet Pigs:
  - 14.4.3.1. Special Criteria for Reproduction
  - 14.4.3.2. Anatomy Recap

14.5. Clinical Handling and Preventive Medicine: The Key Factor for Excellence in the Eyes of the Owner. Key Questions:
- 14.5.1. Sciuromorphs
  - 14.5.1.1. Handling Techniques for Examination in the Practice
- 14.5.2. Hedgehogs:
- 14.5.3. Pet Pigs

14.5.4. Preventive Medicine
14.5.4.1. Current Legislation and Animal Identification System
14.5.4.2. Vaccination Protocol
14.5.4.3. Deworming Guidelines
14.5.4.4. Information on Sterilization
14.6. Sampling for Diagnosis and Pathways for Drug Administration
14.6.1. Sciuromorphs
14.6.2. Hedgehogs
14.6.3. Pet Pigs
14.7. The Most Important Zoonoses: Protection as a Key Factor in the Veterinarians Practice
14.7.1. Sciuromorphs
14.7.1.1. Animals Born in Captivity
14.7.1.2. Captured Animals That Live in Captivity
14.7.2. Hedgehogs
14.7.2.1. Demodex Spp
14.7.2.2. Notoedrees Cati
14.7.3. Pigs:
14.7.3.1. Hydatidosis
14.8. Most Common Pathologies in Sciuromorphs
14.8.1. Update on Dermatology in Squirrels, Prairie Dogs and Richardson's Squirrels
14.8.1.1. Alopecia
14.8.1.2. Scabies: Sarcoptes Scabiei and Notoedres Cati
14.8.1.3. Dermatophytosis
14.8.2. Pathologies of the Oral Cavity: Most Frequent Dentistry Problems
14.8.2.1. Most Frequent Causes
14.8.2.2. Treatment
14.8.2.3. The Pseudo-Odontoma: The Most Common Dental Problem in Prairie Dogs
14.8.2.3.1. Predisposing Causes: Repeated Trauma
14.8.2.3.2. Symptoms: The Reason for Coming to the Practice
14.8.2.3.3. Effective Diagnosis
14.8.2.3.4. Definitive Treatment
14.9. The Most Common Pathologies in Hedgehogs
14.9.1. Scabies: Loss of Spikes That Scares the Owner
14.9.1.1. Caparinia Tripilis
14.9.1.2. Symptoms and Treatment
14.9.2. Dermatophytosis
14.9.2.1. Trichophyton Mentagrophytes and Microsporum Spp
14.9.2.2. Symptoms and Treatment
14.9.3. Respiratory Pathologies: Pneumonias
14.9.3.1. Bordetella Bronchiseptica
14.9.3.2. Multicide Pasteurella
14.9.3.3. Mycoplasma Spp
14.9.4. Nerve Pathologies: Whobbly Hedgehog Syndrom
14.9.4.1. Definition
14.9.4.2. Symptoms
14.10. The Most Common Pathologies in Dwarf Pigs
14.10.1. Dermal Pathologies: A Common Issue in the Practice
14.10.2. Parasitosis
14.10.2.1. Sarcoptes Scabiei
14.10.2.2. Haematopinus Suis
14.10.3. Botulism: Similar Symptoms to Other Dermal Lesions
14.10.3.1. Erysipelothrix Rusopathiae
14.10.4. Nail Overgrowth
14.10.4.1. Specific Anatomy of the Nails
14.10.5. Obesity: A Common Issue with Pigs in Captivity
14.10.6. Swine Pleuropneumonia: Low Incidence but High Mortality
14.10.6.1. Actinobacilus Pleuroneumoniae

## **Module 15.** Relevant Aspects of Reptiles I

15.1. Introduction
- 15.1.1. Taxonomic Classification
- 15.1.2. The Most Common Species of Reptiles in Captivity
- 15.1.3. Other Reptiles Kept in Captivity

15.2. Anatomy:
- 15.2.1. Common Aspects in Reptiles
  - 15.2.1.1. Skeletal System
  - 15.2.1.2. Circulatory System
  - 15.2.1.3. Digestive System
- 15.2.2. Particular Anatomy of Turtles
- 15.2.3. Anatomy of Lizards
- 15.2.4. Anatomy of Snakes

15.3. Maintenance: Suitable Facilities for Each Species
- 15.3.1. Special Furniture: Types of Terrariums and Their Dimensions
- 15.3.2. Water: Calculation of Daily Water Requirements
- 15.3.3. The Material of the Terrarium
- 15.3.4. The Importance of temperature: POTZ (Preferred Optimum Temperature Zone)
- 15.3.5. The Importance of Humidity
- 15.3.6. Controlling Light: Effects on Their Organism
  - 15.3.6.1. Types of Radiation
  - 15.3.6.2. Existing Materials on the Market
- 15.3.7. Living Together
  - 15.3.7.1. Interspecific
  - 15.3.7.2. Intraspecific

15.4. Hibernation or Diapause
- 15.4.1. Relevant Concepts
- 15.4.2. Types of Hibernation
- 15.4.3. Species that Hibernate
- 15.4.4. Problems Derived from Hibernation

15.5. Nutritional Requirements: Nutrition
- 15.5.1. Classification Depending on the Type of Diet
- 15.5.2. Factors to be Assessed in Each Physiological State
- 15.5.3. Diet for Herbivore Species
- 15.5.4. Diet for Insectivore Species
- 15.5.5. Diet for Carnivore Species

15.6. Clinical Management
- 15.6.1. Reptile Transportation
  - 15.6.1.1. How to go to the clinic
  - 15.6.1.2. Long-Haul Transportation
  - 15.6.1.3. Legislation
- 15.6.2. Containing the Reptile for its Examination
- 15.6.3. Caudal Autotomy
- 15.6.4. Physical Examination
- 15.6.5. Sexing Techniques
  - 15.6.5.1. Turtles
  - 15.6.5.2. Lizards
  - 15.6.5.3. Ophidians
- 15.6.6. Handing During Hospitalization

15.7. Sampling and Drug Administration
- 15.7.1. Oral Posology
  - 15.7.1.1. Suitable Techniques
  - 15.7.1.2. Administering Food During Hospitalization
- 15.7.2. Subcutaneous Route
- 15.7.3. Intramuscular Route
- 15.7.4. Intravenous Route Intravenous Catheterization
  - 15.7.4.1. Chelonids
  - 15.7.4.2. Lizards
  - 15.7.4.3. Ophidians
- 15.7.5. Intraosseous Route: Intraosseous Catheterization
- 15.7.6. Intracellular Route: Similar to the Intraperitoneal Route in Mammals

15.8. The X-Ray as a Basic Diagnostic Technique
- 15.8.1. Radiological Technique: Machinery and Optimum Radiographic Contrast
- 15.8.2. Handling During X-Rays and Radiographic Visualization
  - 15.8.2.1. Chelonids
  - 15.8.2.2. Lizards
  - 15.8.2.3. Snakes

15.9. Other Diagnostic Imaging Techniques Used: Ultrasound and Endoscopy
- 15.9.1. Ultrasound in Reptiles: Complement to X-Rays
- 15.9.2. Endoscopy: With Several Uses

15.10. Other Diagnostic Techniques
- 15.10.1. Biopsies: Highly Valuable Information
- 15.10.2. Clinical Biochemistry
- 15.10.3. Cytological Techniques
- 15.10.4. Coprology in Reptiles
- 15.10.5. Microbiology: Detecting Viruses, Bacteria and Parasites
- 15.10.6. Necropsy: Post-Mortem Examination

## **Module 16.** Relevant Aspects of Reptiles II

16.1. The Most Important Zoonoses
- 16.1.1. Prevention and Protection
- 16.1.2. Risk of Zoonosis from Handling
- 16.1.3. Risk of Zoonosis from Ingesting

16.2. Dermal Diseases:
- 16.2.1. Lesions: Trauma and Aggressions
- 16.2.2. Dysecdysis: Alteration of Skin Shedding
- 16.2.3. Thermal Burns Caused by a Lack of Information Provided to the Owner
- 16.2.4. Pyramiding: Deformation of the Shell
- 16.2.5. Otic Abscesses: Habitual in Chelonians
- 16.2.6. Ectoparasites
- 16.2.7. Hypovitaminosis A: Multifactorial Cause

16.3. Digestive Alterations
- 16.3.1. Estomatitis: Very Common in Reptiles
- 16.3.2. Intestinal Obstruction: Causes
- 16.3.3. Hepatic Lipidosis: Obesity in Reptiles
- 16.3.4. Internal Parasites: Different Species

16.4. Other Pathologies
- 16.4.1. Rhinitis: Dyspnea and Emergencies
- 16.4.2. Pneumonia: The Deficient Mucociliary System of Their Lungs
- 16.4.3. Renal Insufficiency: Very Common in Reptiles
- 16.4.4. Gout: Multifactorial Cause

16.5. What Dose of a Drug to Use?
- 16.5.1. Minimum Energy Cost
- 16.5.2. MEC (Metabolic Energy Constant) and SMEC (Specific Minimum Energy Cost) Dose Values
- 16.5.3. Dose Examples

16.6. Common Treatments
- 16.6.1. Antibiotics
- 16.6.2. Disinfectants
- 16.6.3. Nutritional Treatments
- 16.6.4. Antimycotics
- 16.6.5. Antiparasitics II
- 16.6.6. Harmful Treatments

16.7. The Success of Anesthesia
- 16.7.1. Anesthetic Evaluation
- 16.7.2. Pre-Medication
- 16.7.3. Induction With Anesthetic Gas
  - 16.7.3.1. Types of Gases
  - 16.7.3.2. Anesthetic Circuitry
- 16.7.4. Anesthetic Recovery

16.8. Techniques and Applications of Basic Surgery
- 16.8.1. Esophagotomy
- 16.8.2. Intracellular access in Saurians and Ophidians: Celiotomy
- 16.8.3. Cloacal Replacement
- 16.8.4. Tympanic Removal Due to Abscesses

16.9. Advanced Surgical Techniques:
- 16.9.1. Cloacal or Penile Prolapse
- 16.9.2. Egg Retention
- 16.9.3. Hepatic biopsy
- 16.9.4. Renal Biopsy

16.10. Common Orthopedic Surgeries
- 16.10.1. Metabollic Bone Disease: SNHP (Secondary Nutritional Hyperparathyroidism)
- 16.10.2. Tail Amputation
- 16.10.3. Limb Amputation and Fractures
- 16.10.4. Shell Fractures

## **Module 17.** Wild Animal Medicine and Surgery

17.1. Triage and Emergency Care of Wildlife
- 17.1.1. Legislation, Organization and Function of Animal Centers
- 17.1.2. The Philosophy and Ethics of Wild Life
- 17.1.3. Answering Questions About Treatment and Release into the Wild
- 17.1.4. The Relationship With the Wildlife Rehabilitator
- 17.1.5. Emergency Treatment of Wildlife
- 17.1.6. Animal Identification Techniques: Indispensable for Population Control

17.2. Selection and Emergency Treatment in Wild Patients
- 17.2.1. Trauma
- 17.2.2. Oil Spills
- 17.2.3. Intoxications
- 17.2.4. Infectious Diseases
- 17.2.5. Geriatric Animals
- 17.2.6. Natural Disasters
- 17.2.7. Rehabilitation and Release of Wild Patients

17.3. Real Situations of Wildlife Anesthesia and Immobilization
- 17.3.1. Ideal Situation
- 17.3.2. Real Situation
- 17.3.3. Pre-Anesthetic Considerations
- 17.3.4. Public Safety

17.4. The Anesthetic Procedure in Relation to Wildlife
- 17.4.1. The Immobilization Process
- 17.4.2. Non-Injectable Anesthetics
- 17.4.3. Non-Injectable Anesthetics
- 17.4.4. Anesthetic Recovery: Capture Myopathy

17.5. Bacterial Diseases of Wildlife I
- 17.5.1. Leptospirosis: Leptospira spp
- 17.5.2. Brucellosis: Undulant Fever
- 17.5.3. The Bubonic plague: Yersinia Pestis

17.6. Bacterial Diseases of Wildlife II
- 17.6.1. Psittacosis: Ornithosis and Chlamydiosis
- 17.6.2. Salmonellosis: Salmonella Spp
- 17.6.3. Tetanus: Clostridium Tetanii
- 17.6.4. Tularemia: Rabbit Fever

17.7. Other Important Diseases in Wildlife III
- 17.7.1. Aspergillosis: Aspergillus Fumigatus
- 17.7.2. Histoplasmosis: Histoplasma Capsulatum
- 17.7.3. Rabies: Rhabdovirus
- 17.7.4. Helminth Diseases: Parasites

17.8. Ursid Medicine
- 17.8.1. Taxonomy: Ursidae Family
- 17.8.2. Most Common Species of Bears
- 17.8.3. Eye Anesthesia: Required Drugs
- 17.8.4. Most Common Infectious Diseases
- 17.8.5. Biometrics
- 17.8.6. Diagnostic Techniques
- 17.8.7. Vaccination: Vaccine Types and Protocols

17.9. Wild Feline Medicine
- 17.9.1. Taxonomy: Felidae Family
- 17.9.2. Most Common Species of Wild Felines
- 17.9.3. Anesthesia in Wild Felines: Common Drugs
- 17.9.4. Most Common Infectious Diseases
- 17.9.5. Other Important Diseases
- 17.9.6. Biometrics
- 17.9.7. Diagnostic Techniques

17.10. Medicine in Primates
- 17.10.1. Taxonomic Classification: Primates of the New World and the Old World
- 17.10.2. The Most Common Species of Primates
- 17.10.3. Anesthesia in Primates: Common Drugs
- 17.10.4. Most Common Infectious Diseases

## **Module 18.** Care and Pathologies in Fish

18.1. Veterinary Clinical Activity in Fish: Basis for Clinical Diagnosis
- 18.1.1. Profile of the Clinic: The Global Picture
- 18.1.2. The Different Aquatic Environments
  - 18.1.2.1. Natural Aquatic Environment and Ornamental Fish Keeping Facilities
  - 18.1.2.2. The Role of Technology in Water Maintenance
- 18.1.3. Chemical Properties of the Water
  - 18.1.3.1. Chemical Criteria
  - 18.1.3.2. Biological Criteria

18.2. Anatomic Reminder: Guidelines to Achieve Cross-Species Identification
- 18.2.1. Taxonomic Classification
- 18.2.2. Most Common Species of Fish
  - 18.2.2.1. Ornamental Fish
  - 18.2.2.2. Fish for Consumption
  - 18.2.2.3. Laboratory Fish

18.3. Clinical Handling: Guidelines for Their Appropriate Handling
- 18.3.1. Appropriate Anamnesis
- 18.3.2. Correct Physical Evaluation
- 18.3.3. Basic Handling Techniques
- 18.3.4. Specialized Methods in Clinical Techniques
  - 18.3.4.1. Taking Samples for Complementary Tests

18.4. Clinical Guidelines: The Definitive Diagnosis
- 18.4.1. Identifying Clinical Problems
- 18.4.2. Postmortem Diagnostic Techniques: The Major Finding
  - 18.4.2.1. Necropsy Technique
- 18.4.3. Interpreting Clinical Findings
- 18.4.4. Zoonosis: The Importance of Knowledge for Our Protection
- 18.4.5. Biosafety
- 18.4.6. Patient Protection
- 18.4.7. Food Safety
- 18.4.8. Environmental Safety

18.5. Pathologies Diagnosed with Simple Water Analysis Kits: Improper Handling of the Acuatic Environment
- 18.5.1. Low Concentration of Oxygen
- 18.5.2. Adequate Temperature Control
  - 18.5.2.1. Thermal Gradients
- 18.5.3. Toxicity Due to Ammonia Concentration
- 18.5.4. Toxicity Due to Nitrite Concentration
- 18.5.5. Controlling the pH of the Water
- 18.5.6. Appropriate Use and Measurement of the Water pH
- 18.5.7. Concentration of Solutes in Water
  - 18.5.7.1. Hard Water
  - 18.5.7.2. Inadequate Salinity

18.6. Pathologies Derived from an Improper Maintenance: The Fish as an Individual Patient
- 18.6.1. Nutritional Deficiency
- 18.6.2. Presence of Inappropriate Toxic Substances: Poisons
- 18.6.3. Pathologies Due to the Presence of Algae
- 18.6.4. Trauma
- 18.6.5. Genetic Alterations

18.7. Pathologies Caused by Microorganisms:
- 18.7.1. Viral:
- 18.7.2. Bacterial
- 18.7.3. Parasitic

18.8. Pathologies that Require Complementary Diagnostic Tests
- 18.8.1. Incorrect Concentration of Gas
- 18.8.2. Trematode Infections
- 18.8.3. Nematode Infections
- 18.8.4. Cestode Infections
- 18.8.5. Ceratomyxa Shasta Infection
- 18.8.6. Microsporidiosis
- 18.8.7. Coccidiosis
- 18.8.8. Processes of Renal Destruction

18.9. Treatment Administration: General Concepts and the Most Used Methods
- 18.9.1. Guide of Treatments Used
- 18.9.2. Medicine Administration Routes
- 18.9.3. Choosing the Right Dosage

18.10. Most Commonly Used Anesthesia Techniques: Administering Anesthesia
- 18.10.1. Patient Response to Aesthesia
- 18.10.2. Euthanasia
- 18.10.3. Toxicity and Residues Generated by the Environment

*A comprehensive specialized program that will take you through the necessary education to compete with the best in your profession"*

06

# Methodology

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

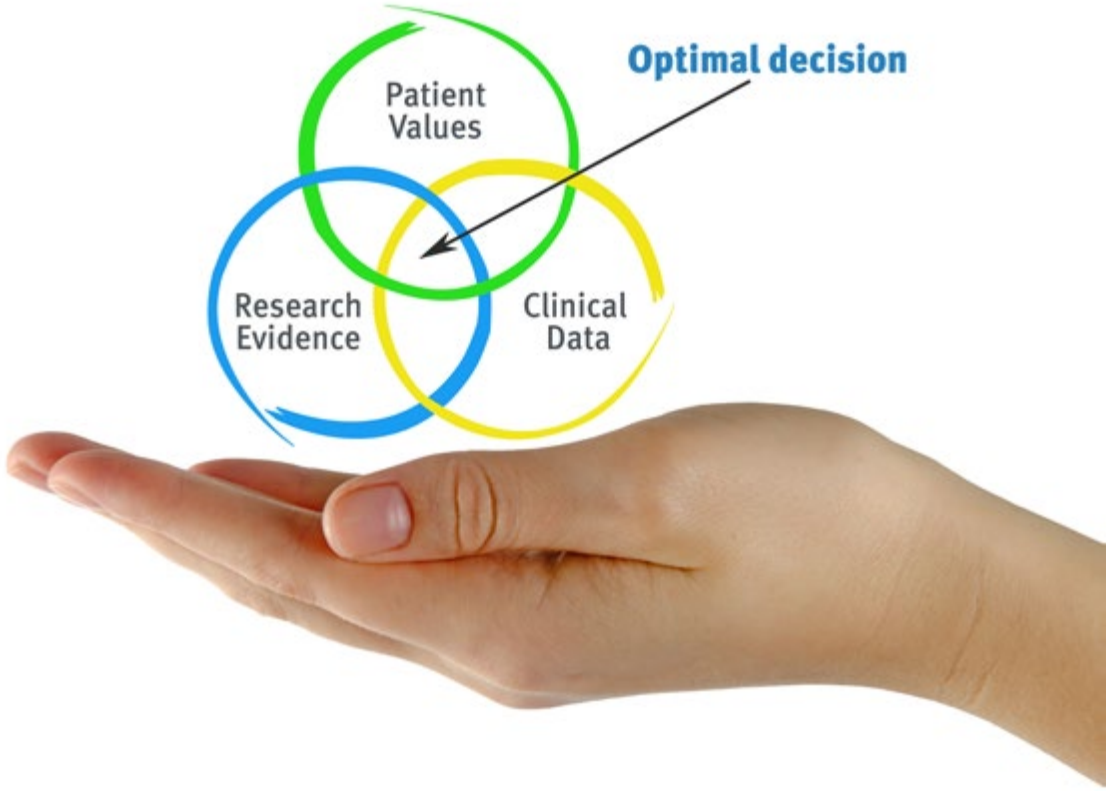
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

*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:**

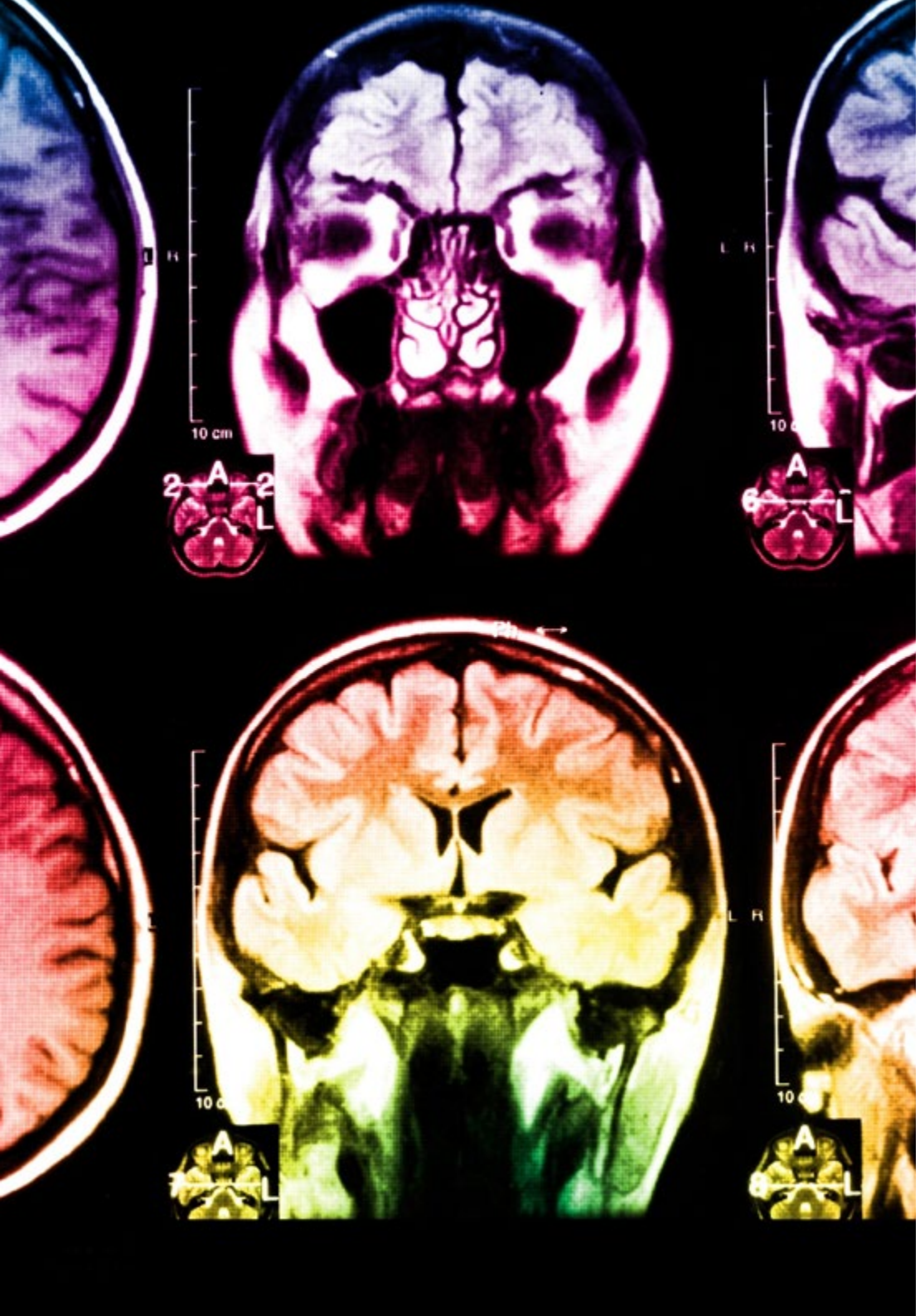
1. Veterinarians who follow this method not only manage to assimilate concepts, but also develop their mental capacity through exercises to evaluate real situations and knowledge application
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real 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.

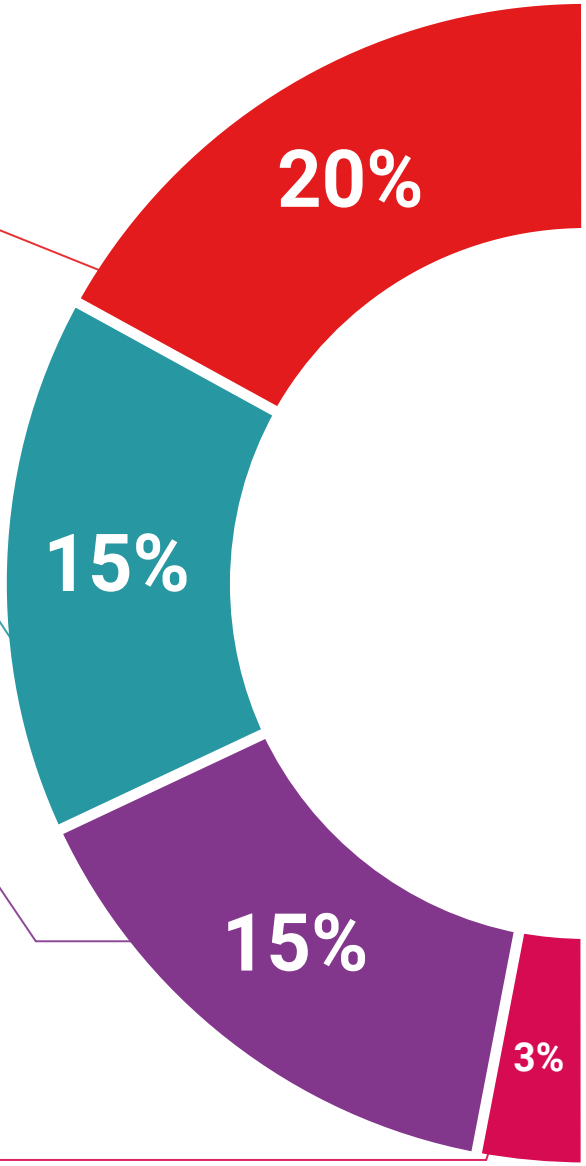
### Interactive Summaries

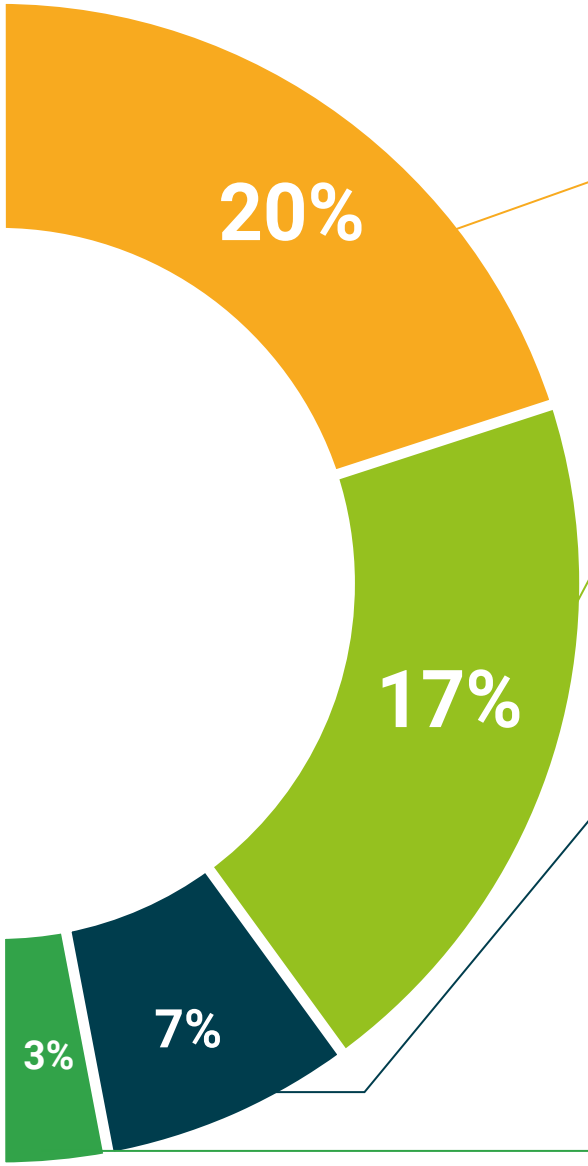
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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 Medicine and Surgery of Birds and Exotic Animals guarantees students, in addition to the most rigorous and up-to-date education, access to an Advanced Master's Degree's 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 Medicine and Surgery of Birds and Exotic Animals** 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** 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 Medicine and Surgery of Birds and Exotic Animals**

Official N° of Hours: **3,000 h.**


tech technological university

Awards the following

CERTIFICATE

to

Mr./Ms. _____, with identification number _____.

For having successfully passed and accredited the following program

ADVANCED MASTER'S DEGREE

in

Medicine and Surgery of Birds and Exotic Animals

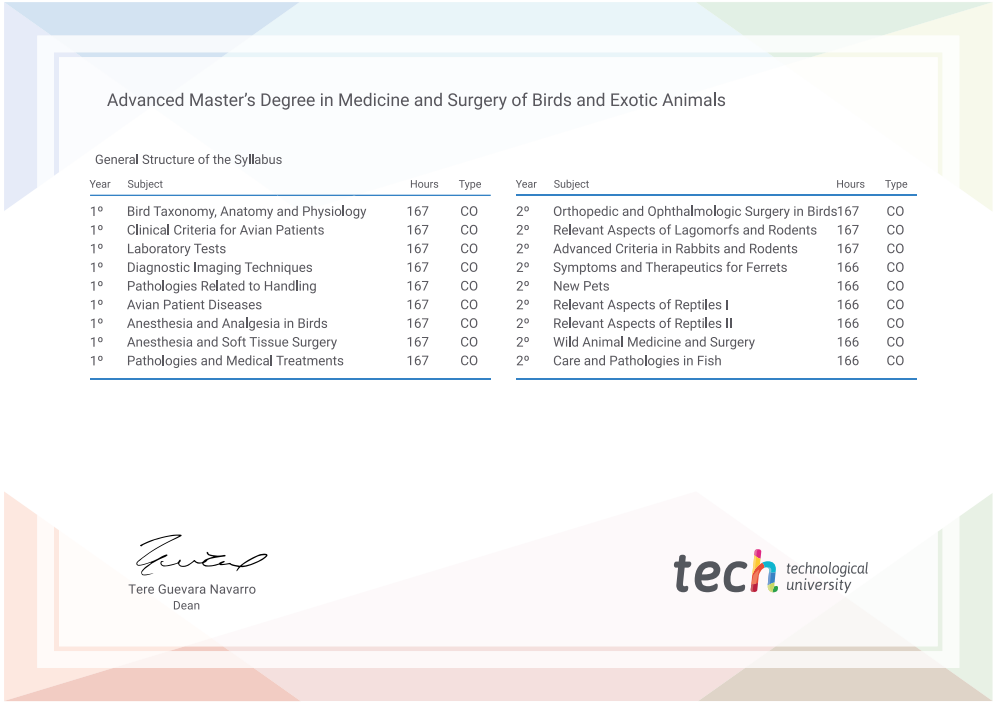
This is a qualification awarded by this University, equivalent to 3,000 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
Dean

Unique TECH Code: AFWORD23S techtitute.com/certificates


Advanced Master's Degree in Medicine and Surgery of Birds and Exotic Animals

General Structure of the Syllabus

| Year | Subject | Hours | Type |
|---|---|---|---|
| 1º | Bird Taxonomy, Anatomy and Physiology | 167 | CO |
| 1º | Clinical Criteria for Avian Patients | 167 | CO |
| 1º | Laboratory Tests | 167 | CO |
| 1º | Diagnostic Imaging Techniques | 167 | CO |
| 1º | Pathologies Related to Handling | 167 | CO |
| 1º | Avian Patient Diseases | 167 | CO |
| 1º | Anesthesia and Analgesia in Birds | 167 | CO |
| 1º | Anesthesia and Soft Tissue Surgery | 167 | CO |
| 1º | Pathologies and Medical Treatments | 167 | CO |
| 2º | Orthopedic and Ophthalmologic Surgery in Birds | 167 | CO |
| 2º | Relevant Aspects of Lagomorfs and Rodents | 167 | CO |
| 2º | Advanced Criteria in Rabbits and Rodents | 167 | CO |
| 2º | Symptoms and Therapeutics for Ferrets | 166 | CO |
| 2º | New Pets | 166 | CO |
| 2º | Relevant Aspects of Reptiles I | 166 | CO |
| 2º | Relevant Aspects of Reptiles II | 166 | CO |
| 2º | Wild Animal Medicine and Surgery | 166 | CO |
| 2º | Care and Pathologies in Fish | 166 | CO |

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*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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# Advanced Master's Degree
## Medicine and Surgery of Birds and Exotic Animals

- Modality: **online**
- Duration: **2 years**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

# Advanced Master's Degree

## Medicine and Surgery of Birds and Exotic Animals

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