AVTCP Exotic Companion Animal Knowledge Lists

This list is both a guide for applicants to prepare for studying as well as to supply a list of acceptable species for case logs and reports. Any questions regarding species outside of this list, particularly for reptiles, amphibian, and fish which could encompass companion species not listed here, should be emailed to the ECA Member at Large Kathryn Torres: kgtorres@san.rr.com. Please note that crocodilian and venomous species will not be accepted.

Species List

Please note that logs, reports, and skills must be from exotic companion animals compiled from this list, not wildlife or zoo cases. For example, if writing about a case involving a falconiform, it must belong to a falconer who keeps them for sport/companionship and not to be released.

- **Pet Birds**
  - Psittacines (eg: parrots, lories)
  - Passerines (eg: canaries, finches)
  - Columbiformes (eg: doves, pigeons)
  - Ramphastidae (eg: toucan, toucanettes)
  - Falconiformes (eg: falcons, hawks, kestrels)
  - Galliformes (eg: chicken, quail)
  - Anseriformes (eg: ducks, geese)

- **Pet Mammals:**
  - Rabbits
  - Guinea Pigs
  - Chinchillas
  - Prairie Dogs
  - Sugar Gliders
  - Hedgehogs (African & European)
  - Skunks
  - Ferrets
  - Hamsters
  - Gerbils
  - Rats
  - Mice
  - Degus
  - Pot-bellied and miniature pigs

- **Pet Reptiles:**
  - Iguanas
  - Bearded Dragons
  - Chinese Water Dragons
Anatomy and Physiology

For each species on the “Species List”, the following topics should be mastered. These parameters are meant to be for captive avian and exotic pets, which is very different from zoo exhibits and the differences should be clearly understood.

- Physiologic values (where applicable)
- Life span
- Average body weight
- Body temperature
- Heart rate
- Respiratory rate
- Sexual maturity
- Type of estrous cycle
- Ovulation
- Gestation period
- Litter size
- Incubation period
- Normal weight at birth
- Eyes and ears open
- Weaning age

• Integument
  - Fur
  - Feathers
  - Glands
  - Skin and dermal layers
  - Scales
  - Chromatophores
  - Osteoderms
  - Femoral pores

• Senses
  - Vision
    - Pupillary light response
    - Visual spectrum
    - Eye shape
    - Eye lids
    - Lens
    - Avascular retinas
    - Tapetum
    - Spectacle
    - Nasolacrimal duct system
    - Parietal eye

  - Hearing
    - Acoustical ability
    - Pinna
    - Ear canal
    - Tympanic membrane
    - Operculum
    - Sound frequency ranges
- Smell
  - Olfactory sense developed in which species
- Touch

- Metabolism
  - POTZ—preferred optimal temperature zone
  - Ecto-thermal
  - Behavioral thermoregulation
  - Hibernation, brumation
  - Osmoregulation

- Gastrointestinal System
  - Herbivores
  - Carnivores
  - Omnivores
  - GI transit time
  - Dental formulas for the variety of species
    - Incisors
    - Canine teeth
    - Deciduous teeth
    - Permanent teeth
    - Premolars
    - Molars
    - Diphyodont dentition
    - Peg teeth
  - Tongue
  - Salivary glands
  - Beak
    - Rhamphotheca
    - Rhinotheca
  - Oropharynx
  - Choanal slit
  - Palatal ostium
  - Diastema mastication
  - Esophagus
  - Crop
  - Stomach
  - Pylorus
    - Ability to vomit
  - Liver—number of lobes
  - Intestines
  - Gallbladder (which species have one)
- Pancreas
- Spleen
- Splenopancreas
- Adrenal glands
- Hind gut fermenters
- Cecum
- Colon
- Chloaca
  - Coprodeum
  - Urodeum
  - Proctodeum
- Vent

- Respiratory System
  - Nares
  - Cere
  - Obligate nasal breathers
  - Operculum
  - Infraorbital sinus
  - Larynx
  - Glottis
  - Trachea
    - Bifurcation
    - Complete cartilaginous tracheal rings
    - Bronchi- pirmay, secondary, tertiary
  - Syrinx
  - Lungs
    - number of lobes
    - number of lungs
  - Diaphragm
  - Air sacs
  - Vascularity
  - Gaseous exchange
  - Breathing cycles
  - Glottis

- Cardiovascular System
  - Heart—number of chambers and location according to species
  - Hepatic and renal portal systems
  - Cardiac shunting
  - Venous circulation
  - Arterial circulation
  - Lymphatic system
    - Lymph nodes
• Nervous System
  o Circadian Pacemaker
  o Brain
  o Spinal cord
  o Cranial nerves
  o Peripheral nerves
  o Autonomic nervous system
  o Parasympathetic nervous system
  o Vasovagal reflex
  o Melatonin
  o Wulst
  o Pineal gland

• Musculoskeletal system
  o Pneumatic bones
  o Medullary bones
  o Skull
    ▪ Avian
    ▪ Mammal
    ▪ Anapsid
  o Vertebral Column
  o Vertebræ number
    ▪ Number variation between species
  o Occipital condyle
  o Synsacral
  o Coccygeal
  o Pygostyle
  o Tail autotomy and regeneration
  o Shell—modifications between species
  o Carapace
  o Plaстрon
  o Scutes
  o Muscles and bones of the thoracic or pectoral girdles
  o Muscles and bones of the wings
    ▪ Flight muscles
  o Muscles and bones of the pelvic girdle
  o Muscles and bones of the legs
  o Epaxial musculature
  o Forms of locomotion
  o Digits
    ▪ Anisodactyl
    ▪ Zygodactyl.
    ▪ Claws

• Reproductive Systems
- Sex chromosomes
- Sex determination
- Anogenital distance
- Sexual dimorphism
  - Testes
  - Hemipenes
  - Prostate
  - Penis vs. Phallus
  - Os penis
  - Colors
- Female Reproductive System
  - Ovulation
  - Ovary
  - Oviduct
  - Fertilization
  - Egg formation
  - Oviparous
  - Viviparous
  - Egg anatomy
  - Incubation
  - Gestation
  - Postovulatory follicle
  - Uterus
  - Cervix
  - Ossification of pelvic symphysis
  - Mammary glands
  - Egg anatomy
- Copulation techniques
- Seasonal variances in habits

- Urinary System
  - Kidneys
  - Osmoregulation
  - Urates
  - Renal Portal System
  - Salt Gland
  - Uricotelic
  - Bladder
  - Urine consistency and color
  - Urates

- Endocrine System
  - Pituitary gland
- Growth hormones
- Thyroid
- Parathyroid
- Thymus
- Adrenal glands
- Corticosterone
- Nasal salt glands
- Pancreas
- Insulin
- Glucoregulation
- Glucose
- Glycogen
- Somatostatin

- Circulatory System
  - Heart
  - Purkinje fibers
  - Aorta
  - Cerebral arterial Circle of Willis
  - Hepatic and renal portal systems
  - Arteriovenous networks
  - Blood
  - Extrinsic and intrinsic pathways
  - Bursa of Fabricius

- Lymphatic and immune system
  - Thymus
  - Spleen
  - Specific immunity
    - Avian B cells
    - IgG
    - IgE
    - IgA
    - IgM

**Anesthesia**

Candidate must have a complete understanding of the theoretical and technical use, application, and relevance of these anesthetic issues for each individual species on the “species list”.

- Anesthetic equipment
  - ETCO₂
- Doppler
- EKG
- Indirect blood pressure
- Direct blood pressure
- Blood gas analysis
- $\text{SPO}_2$
- Ventilation options
- Core body temperature measurement
- Respiratory monitoring
- IV/IO infusion options
- Proper thermal support
- Analgesics
- Pre-anesthetic agents
- Induction agents
  - Inhalents
  - Injectables
- Administration sites
- CRI options
- Normal physiologic reference ranges
  - Heart Rate
  - Respiratory Rate
  - Core body temperature
- Anesthetic techniques
  - Intubation
  - Induction
  - IV/IO/air sac catheter placement sites and sizes
- Intra-operative fluid therapy options
- Blood transfusions
  - Blood typing
  - Rates and administration methods
  - Recognize blood transfusion reactions
- Troubleshooting anesthetic reactions
- Emergency interventions and CPR (see Knowledge list)
- Post-anesthetic complications

**Diseases and Conditions**

Candidates are expected to recognize which of these diseases are species specific, and how certain diseases can and do manifest differently between varying species.
Candidates must have a complete knowledge of each of these diseases for every species on the “species list” including:

- Causes
- Symptoms
- Modes of transmission
- Proper testing
- Treatment options
- Prognosis

Abscesses
Antibiotic toxicities
Adrenal disease
Alleutian's disease
Amyloidosis
Anaphylaxis
Anemia
Atrial thrombosis
Aural Abscess
Autoimmune diseases
Avian Borna Virus
Barbering
Behavioral Disorders
  - Feather Destructive
  - Skin mutilation
  - Screaming/Biting
Biliary cysts/adenocarcinoma
Blood parasites
Cardiac Disease
Cecal impaction
Cheek pouch impaction
Cherry eye
Chlamydiosis
Chordoma
Clostridium piliforme (Tyzzer’s disease)
Crop diseases
  - Stasis
  - Infection (bacterial/fungal)
  - Impaction
  - Burn
Cryptorchidism
Cryptosporidiosis
Cystitis
Dental disease
- Malocclusion
- Abscess
- Gingivitis
- Gingival hyperplasia

Dermatitis
Dermatophytosis
Dirofilariasis
Distemper virus
Diabetes Mellitus/Insipidus
Dystocia
Dysec dysis
ECE (Epizootic catarrhal enteritis)
Edema (Dropsy)
Egg binding/dystocia
Egg peritonitis
Encephalitozoon cuniculi
Endometrial hyperplasia
Eosinophilic enteritis
Estrogen toxicity
Estrus associated aplastic anemia
Fatty liver disease
Fecal impactions
Fibroma
Foreign body
  - Crop
  - Proventricular/Ventricular
  - Gastro-Intestinal
  - Tracheal
Fungal infections
  - Aspergillosis
  - Candida
  - Ornithogaster
  - Others
Fur slip
Gastro-Intestinal obstruction or torsion
Gastrointestinal stasis/Ilius
Granulomatosis
Helicobacter pylori
Hemipene impaction/infection
Hepatic lipidosis
Herpes Virus
  - Pacheco’s Disease
  - Papillomavirus/Papillomatosis
  - Marek’s Disease
Hydronephrosis
Hypercalciuria
Hypersplenism
Hyper/hypothermia
Hypocalcemia
Hypovitaminosis A
Illius
Inflammatory bowel disease
Influenza
Inhalent Toxins
  o PTFE
  o Air fresheners
  o Incense
  o Gas
Insulinoma
Intussusception
Iron Storage Disease
Lawsonia intracellularis infection
Limb constriction- foreign object
Liver disease
  o Infectious
  o Nutritional
  o Neoplastic
  o Hepatic Lipidosis
Lymphoma
Lymphadenitis
Lymphocytic choriomeningitis virus
Mammary neoplasia
Mast cell tumor
Megaesophagus
Mucoid enteritis
Mycobacterium
Neoplasia varieties
Nutritional secondary hyperparathyroidism (Metabolic Bone Disease)
Obesity
Ophthalmologic disease
Osteoarthritis
Osteomyelitis
Otitis
Ovarian cysts
Paramyxovirus
Parasitism
  o Skin
  o Gastro-Intestinal
  o Ears
  o Tracheal/air-sacs
  o Myiasis
Parvovirus
Pasteurellosis
Penal hair ring
Pheochromocytoma
Pneumonia
Pododermatitis
Polymyositis
Polyoma Virus
Porphyrinuria/pigmented urine
Pre-ovulatory egg binding
Pregnancy toxemia
Proliferative colitis
Prostate disease
Proventricular Dilatation Disease (PDD)
Prolapse
  o  Cloaca
  o  Vent
  o  Intestinal
  o  Hemipene/penis
  o  Oviduct/uterus
  o  Bladder
Psittacine Beak and Feather Disease (PBFD)
Pseudopregnancy
Pulmonary mycoses
Pyometra/metritis
Rabies
Renal disease
  •  Infectious
  •  Nutritional
  •  Neoplastic
  •  Gout
Respiratory diseases of the small rodent
  •  Murine Respiratory Mycoplasmosis (MRM)
  •  Cilia-associated Respiratory (CAR) Bacillus
  •  Streptococcus pneumoniae
  •  Corynebacterium kutscheri Pseudotuberculosis)
  •  Pasteurella pneumotropica
  •  Sendai Virus
  •  Pneumonia Virus of Mice (PVM)
  •  Rat Respiratory Virus (RRV)
  •  Pneumonia carinii
Rotavirus
Rupture of the eye
Scurvy
Salmonellosis
Self-mutilation
Sepsis
Sinusitis/air sacculitis/pneumonia
Splay-Leg
Spondylosis
Stomatitis
Testicular/ovarian neoplasia
Thymoma
Toxicosis
  • Lead
  • Zinc
  • Copper
  • Plant
Tracheal mites
Trauma
  • Dermal wounds/burns
  • Orthopedic
  • Soft tissue
  • Occular
  • Crushing/shell wounds
  • Prey bites
Treponema
Trichobezoars
Uric acid impaction
Urolythiasis
Uropygial gland disease
  • Impaction
  • Infection
  • Neoplasia
Vaccine reaction
Xanthomatosis

**Emergency and Critical Care**

Candidates must demonstrate a complete knowledge of all of these categories and parameters for each species on the “species list”. They must be able to recognize and understand how each situation differs among species and how to troubleshoot between them.

- Triage the emergency patient
  - Common emergency presentations and causes
  - Follow proper steps once emergency has been determined
- Perform complete physical exam
Proper capture and restraint techniques
  o Physiologic normal reference ranges
  o Auscult heart and lungs
  o Hydration status
  o When to perform exam in steps to minimize stress-related deaths

- Recognize the need to receive supplemental oxygen and methods of administration
- Temperatures and humidity requirements
- Fluid therapy regimens
  o Shock fluid therapy rates
  o Maintenance fluid therapy rates
  o Correcting hydration deficits
- Types of fluids used and when to use them
- Catheter placement sites
  o Intravenous sites
  o Intraosseous sites
  o Urinary catheters
- Equipment for fluid therapy delivery
- Analgesics
  o NSAIDS
  o Opioids
  o Local/topical
- Injection routes
- Tube/syringe feeding
  o Equipment/supplies
  o Calculate metabolic caloric requirements
  o Common hand feeding formulas
- Venipuncture
  o Use of lab supplies and packaging supplies
  o Venipuncture sites
  o Blood volume limitations
- Radiology
  o Film types and quality
  o Proper positioning
  o When to sedate
  o Use of positioning board
- Critical care wound management
  o Hemostasis
  o Bandaging techniques
  o Splinting
- Blood transfusion medicine
  o Blood typing
  o Rates and administration methods
  o Recognize blood transfusion reactions
- CPR
  o Common emergency drugs used and routes
Intubation techniques in the emergency patient
  - Prep and assist with air sac cannulation

- Equipment knowledge and set up
  - Doppler placement and indirect blood pressure measurement
  - ECG placement
  - Ambu-bag/ventilator
  - Oxygen tanks/cages/Incubators/nebulizers
  - Pulse Oximeters

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**Hematology**

Candidates must have a complete understanding of each of these topics for each individual species on the “species list”.

- Venipuncture
  - Correct site/restraint
  - How much total blood can be pulled safely

- Packed Cell Volume
  - Normal Values
  - Serum color/quality

- Slide Preparation
  - Correct method of making a smear
  - Staining technique

- Lab supplies
  - Microtainers
  - Special swabs
  - Knowledge of which tests require what sort of sample (i.e., plasma vs. serum vs. whole blood)

- Machines and lab devices
  - Proper microscope use and maintenance
  - Centrifuges
  - Hemocytometers
  - Refractometers
  - In-house chemistry/hematology analyzers pros and cons

- Manual count
  - Hemocytometer
  - Solutions used

- Cell Identification
  - Erythrocytes
  - Leukocytes
    - Granulocytes/Heterophils
    - Agranulocytes
  - Thrombocytes/Platelets
- Estimated White Cell Count
  o Equation
  o Normal ranges
- Differential Count
  o Normal ranges/ratios
- Regeneration
  o Reticulocytes-Calculate mean
  o Grading with Plus System/percentage mean
  o Poikilocytosis/Anisocytosis/Polychromasia
- Toxic/Reactive Changes
  o Identify changes to cells
  o Grading changes
- Hemoparasites
  o Identify
  o Knowledge of different species

**Behavior**

Candidates are expected to master all of these parameters for each species specified on the “Species list”.

- Normal reproductive behaviors
  o Cycles
  o Oviparous, Viviparous, Ovoviviparous
  o Mating/courtship rituals
  o Sexual maturity
  o Gestation
  o Common physical displays

- Abnormal reproductive behavior
  o How to recognize dystocia
  o Irregular displays

- Age related behaviors
  o Common baby bird behaviors (eg: begging, regurgitating, rolling, sleeping, learning/practicing to fly)
  o Differences between age related blindness/lack of vision and acute blindness
  o Difference between normal age-related decrease in activity level vs. illness

- Signs of illness: Differentiate between normal behaviors and illness such as:
  o Vomiting vs. Regurgitating
  o Periods of inappetence
  o Brood patch feather removal/molting vs. feather destructive behavior
Mouth gaping vs. respiratory distress
Resting vs. lethargy
Egg laying vs. dystocia
Limping vs. playing/displaying

Physical displays/body language for each species
- Territorial displays
- Affection displays
- Aggressive/menacing displays
- Feeding/nurturing displays
- Mating/sexual

Seasonal changes and associated behavior changes
- Hibernation/brumation/estivation
- Molting/Shedding
- Appetite variance
- Dietary requirements based on seasons
- Reproductive habits

Candidates should be prepared to advise pet owners of all species on a variety of topics and how to deal with these issues in their captive pets:
- Biting
- Excessive screaming
- Boredom
- Fighting with cage mates
- Feather mutilation
- Skin mutilation
- Enrichment options
- Foraging options
- Basic training techniques:
  - How to medicate
  - How to restrain
  - How to teach birds to step up on a hand
  - How to safely get pets into appropriate transport carriers

**Husbandry**

For each species of pet, the following topics should be mastered. These parameters are meant to be for captive avian and exotic pets, which is very different from zoo exhibits and the differences should be clear in these recommendations.

- Nutrition
  - Herbivore, omnivore, carnivore, insectivore, frugivore
  - Ideal diets as per native habitat
- Proper commercially available diets
- Dangerous/toxic foods
- Supplements
- Gut loading
- Proper food presentation
- Frequency and quantity of feeding

- Enclosures
  - Type (cage vs. aquarium vs. free roam)
  - Natural habitat (Arboreal vs. ground dwelling vs. swamp vs. forest vs. desert vs. rain forest vs. arid)
  - Substrate
  - Important furniture
  - Feeding devices
  - Enrichment devices

- Lighting/sleep cycles
  - Proper spectrum requirements
  - How to provide appropriately for pets in captivity
  - Diurnal vs. Nocturnal vs. Crepuscular
  - Indoor vs. outdoor options

- Temperature/Humidity
  - POTZ for all species
  - Proper gradients
  - How to provide appropriately for pets in captivity
  - What is normal for these species in their natural environments and how best to recreate that for pets in captivity

- Bathing
  - Frequency and techniques (spraying vs. misting vs. fogging vs. soaking, etc.)
  - Which species require alternative “bathing” options (dust or soil baths)

- Hibernation
  - Which species naturally hibernate
  - When, as a pet in captivity, is hibernation appropriate
  - How to safely create an environment for these species to hibernate
  - Brumation vs. hibernation

- Longevity
  - Average life expectancy for captive pet species

- Grooming Needs
  - Which species may need grooming (nails/claws, feathers, beaks, etc)
  - What techniques are commonly used
What are signs of illness vs. normal captive overgrowth (ie: overgrown beak of a turtle due to nutritional deficiency vs. improper cage furniture and substrate)

**Surgical Procedures**

Candidate must have a complete understanding of each of these procedures including which species may require specific procedures, how to prep for procedures, how to assist during the procedure, what instruments/tools/equipment will be required and how to properly use them, and possible pre and post surgical/procedural complications. Candidate must also be able to determine what each procedure is for and under what circumstances the procedure may or may not be indicated.

- Abscess management
- Abscess removal
- Adrenal tumor removal
- Amputation
  - Extremity
  - Penis
  - Hemipene
- Anastamosis
- Aural abscess removal
- Beak repair/reconstruction
- Biopsy
  - Dermal
  - Visceral
- Bite wound repair
- Caesarian
- Cloacalpexy
- Computed tomography
- Cryosurgery
- Cutaneous parasite removal
- Cystotomy
- Cystectomy
- Dental surgery
- Dental scaling
- Dental trimming
- Descenting
- Egg removal
- Endoscopy
  - Coelomic
  - Tracheal/Upper airway
- Cloacal
- Gastro-intestinal
- Nasal
- Intubation
- Enterotomy
- Enudeation
- Esophageal tube placement
- Exploratory abdominal
- Exploratory coeliotomy
- Gastrotomy
- Laser surgery
- Mammary tumor removal
- Orchiectomy
  - Scrotal
  - Pre-scrotal
  - Abdominal
- Orthopedic surgeries
  - Pinning
  - Plating
  - Splinting
  - Bandaging/external coaptation
  - Luxation reduction
  - Plastron/Carapace traumatic injuries
- Ovariohysterectomy
- Pancreatic tumor removal
- Prolapse repair
  - Hemipene
  - Penis
  - Oviduct
  - Colon
  - Cloaca
  - Bladder
- Radio surgery
- Salpingectomy
- Salpingotomy
- Salpingohysterectomy
- Soft tissue mass removal
- Thymoma removal
- Tracheal intubation
- Urethrotomy