Question

What are the genotypes of male and female birds?

- Male ZZ, Female WW
- Female ZZ, Male ZW
- Male ZZ, Female ZW
- Female ZZ, Male WW

Explanation - The correct answer is Male ZZ, Female ZW. Females are the heterogametic sex in birds while males are the homogametic sex. This is in contrast to mammals where males are heterogametic (XY) and females are homogametic (XX).

Question

A turtle is presented to you for diarrhea. You diagnose a nematode infection on fecal smear. Which of the following is not a treatment option for the turtle?

- Ivermectin
- Fenbendazole
- Levamisole
- Mebendazole
- Thiabendazole

Explanation - The correct answer is ivermectin. Ivermectin is highly toxic in turtles and causes paresis, paralysis, and death at low doses. Ivermectin is not recommended in turtles despite its efficacy in treating nematode infections.

Question

A proliferative honeycomb beak (as seen in the image below) along with scaly crusty lesions on the legs and feet of a bird can be a sign of _____.

- Chlamydophila psittaci
- Cnemidocoptes pilae
- Mycobacterium avium

- Avian pox

Explanation - The correct answer is Cnemidocoptes pilae. Cnemidocoptes pilae, is also known as "scaly face" or "scaly leg." This mite can be treated with topical or oral ivermectin. It is more common in birds that are immunocompromised, and beak deformity may be permanent even after the mite is cleared.

Avian pox can cause skin lesions, diptheric membranes, or septicemia. Mycobacterium avium causes granulomatous disease throughout the liver and GI tract. Chlamydophila psittaci is the causative agent of psittacosis, and causes lethargy, respiratory, and GI signs.

***Knemidocoptes* sp.**
The "Scaly-leg" mite of chickens

Compare with *Sarcoptes* sp. and *Notoedres* sp. Note the absence of scales and spines on dorsal surface. The tarsal segments have claw-like structures and tactile hairs instead of suckers borne on stalks.

Question

You have confirmed the diagnosis of Chlamydophila psittaci in a group of birds. What is your treatment of choice?

- Acyclovir
- Doxycycline
- Itraconazole
- Nystatin

Explanation - The correct answer is doxycycline. Nystatin is used to treat candidiasis. Acyclovir is an anti-viral agent and would be ineffective in this situation. Itraconzaole is used to treat avian apergillosis. VetPrep Note: Other antibiotics such as enrofloxacin and azithromycin are showing promise in the treatment of Chlamydophila but the classic treatment has been doxycycline. This may change to one of the other drugs in the future but public health officials may request the use of doxycycline in an outbreak situation because of its long time use and success.

Question

Which of the following is true about mammary tumors in mice?

- Mammary tumors are rare in mice
- The tumors are well-circumscribed and easily removed
- Mammary tumors on mice can be found on their dorsum
- The prognosis for surgical removal of mammary tumors in mice is good

Explanation - The correct answer is mammary tumors on mice can be found on their dorsum. Mammary tumors of mice are common and can be found at nearly any subcutaneous region of the body due to the extensive nature of a mouse's mammary tissue. The tumors are anaplastic and invasive in nature, so surgical excision does not have a good prognosis. The tumors are associated with an RNA retrovirus.

NB: Mice tend to develop mammary adenocarcinomas (Malignant invasive tumors) while rats mostly develop mammary adenomas (Benign tumors)

Question

A newly acquired Cockatiel with an unknown history presents for increased respiratory effort. Which of the following is the least likely differential diagnosis for this bird?

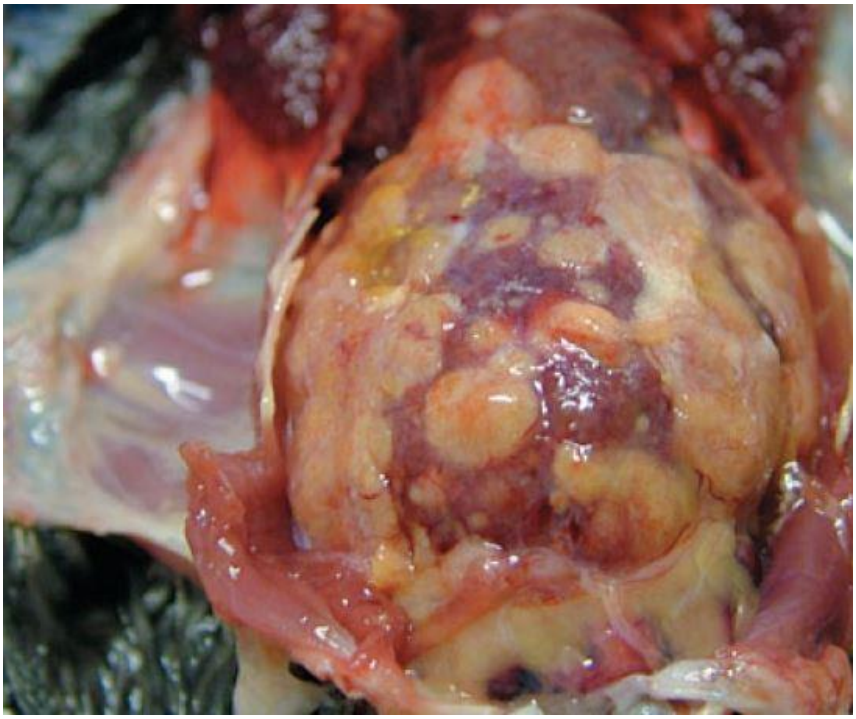
- Mycoplasma infection
- Chlamydiosis
- Polyoma virus infection
- Bordetella infection

Explanation - The correct answer is Polyoma virus infection. The avian Polyoma virus causes delayed feathering, diarrhea, gastrointestinal stasis, ascites, and death. Respiratory difficulty is not a classic clinical sign for Polyoma virus. Mycoplasma infection, chlamydiosis, and Bordetella infection are all respiratory infections in birds that can cause head shaking, sneezing, and rhinitis.

NB: Polyoma virus kills only young parrots (less than 120 days) but adults do well.

Question

You are presented with a dead 5-year old parrot from a local breeder with a history of chronic weight loss. It was received two months ago from another breeder following shipment across the country. A necropsy is performed and the most notable finding is an enlarged liver with diffuse 1mm white nodules (see image). Histopathology reveals granulomatous inflammation and acid-fast bacilli in the lesions. What is the most likely diagnosis?



- Salmonella

- Mycobacterium
- Clostridium
- Polyomavirus

Explanation - Acid-fast stain (also known as Ziehl-Neelsen) is a special bacteriological stain used to identify acid-fast organisms, mainly Mycobacteria. Birds are susceptible to Mycobacterium avium, the causative organism of avian tuberculosis (or avian TB) and is the diagnosis in this case. Nocardia is also a bacterium that stains acid-fast positive but clinical disease is much less common in avian species. Clostridium and Salmonella are not acid-fast bacteria, and polyomavirus is a virus.

Question

An owner presents with his sulphur crested cockatoo and his main complaints are "powder loss" and an irregular beak (see image). What disease should you test for?

- Pacheco virus
- Psittacine beak and feather virus
- Parrot fever
- Papillomatosis

Explanation - The correct answer is psittacine beak and feather virus. Powder loss in cockatoos is a common finding with this disease that you should be aware of. The beak and nails will also be affected. On physical exam, you can also expect feather dystrophy.

Pacheco's virus does not cause the same clinical signs. Usually you will observe anorexia, depression, and it may cause death. With papillomatosis you will expect to find papillomatous lesions, which are not described in the question. Parrot fever is another name for Chlamydophila psittaci, which has non-specific clinical signs such as lethargy, respiratory signs, diarrhea, and decreased activity.

Question

A 2-year old male tortoise presents for nasal discharge, dyspnea, and open mouth breathing. You suspect a respiratory infection. Which of the following is not a treatment option for the tortoise?

- Vitamin B1 supplementation
- Vitamin A supplementation
- Nebulization
- Antibiotic therapy
- Adjustment of environmental temperature to the top of the normal range

Explanation - The correct answer is vitamin B1 supplementation. The occurrence of respiratory infections in reptiles is increased with poor husbandry, inappropriate environmental temperatures, concurrent disease, and malnutrition. Aeromonas and Pseudomonas spp are often isolated from secretions. Treatment includes nebulization, antibiotics, and increasing the environmental temperature to the upper end of normal to stimulate the immune system and loosen respiratory secretions. Hypovitaminosis A is often an underlying condition in turtles with respiratory infections, so vitamin A supplementation is recommended as well.

Question

Feces from a normal adult psittacine bird contains approximately ----------.

- 2/3 gram negative rods, 1/3 gram positive rods
- 2/3 gram positive cocci, 1/3 gram positive rods
- 2/3 gram positive rods, 1/3 gram positive cocci
- 2/3 gram negative rods, 1/3 gram positive cocci
- 2/3 gram positive cocci, 1/3 gram negative rods

Explanation - The correct answer is 2/3 gram positive cocci, 1/3 gram positive rods. Examples of abnormal psittacine fecal smears include an absence of cocci, decreased numbers of gram positive rods, many filamentous gram positive bacteria, or populations of gram negative rods, budding yeast, or white blood cells.

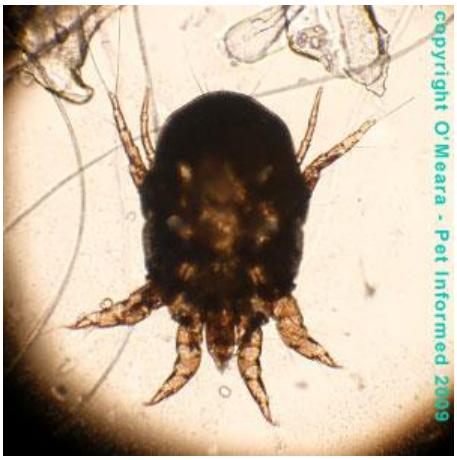
Question

Which of these products would be safe and effective against Psoroptes cuniculi in a rabbit?

- Fipronil

- Enrofloxacin
- Lufenuron
- Ivermectin/selamectin

Explanation - The correct answer is ivermectin/selemectin. Psoroptes is the ear mite of rabbits and is treated with ivermectin. Fipronil (trade name Frontline) is a product against fleas and ticks and is very toxic to rabbits.



Question

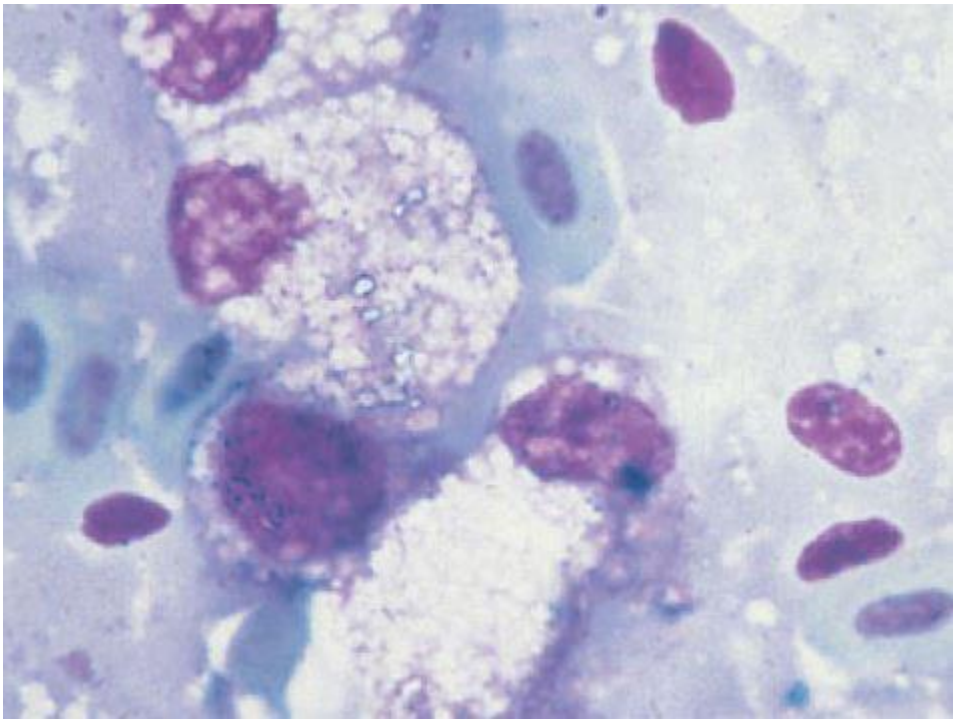
You are presented with two young wild cockatoos that have immature, clubbed feathers and a malformed beak (see image). You suspect this is Psittacine Beak and Feather Disease (PBFD). Which test would you run to confirm your diagnosis?

- A serologic test for antibody to herpesvirus
- PCR probe of whole blood for polyomavirus DNA
- PCR probe of whole blood for circovirus DNA
- A gram stain of the diseased feather pulp

Explanation - The etiologic agent for PBFD is circovirus-1 and circovirus-2 so submitting a whole blood sample for DNA probe analysis is the best method to check for viremia.

Question

A green-winged macaw weighing 3 pounds presented with a complaint of feather loss on the distal end of the right wing. A feather cyst had been removed from this area three months earlier. Physical examination reveals a thickened, yellow, friable skin lesion on the dorsal aspect of the right metacarpus. You make a contact smear of the area and and cytology reveals macrophagic inflammation with multi-nucleated giant cells and cholesterol clefts as seen in the image below. What condition is this most compatible with?



- Avian poxvirus
- Cutaneous xanthomatosis
- Bacterial dermatitis
- Cutaneous lymphoma
- Cutaneous gout

Explanation - Cutaneous xanthomatosis is a unique condition of birds caused by excessive accumulation of lipids in the skin. It is a macrophagic inflammatory response, with multinucleated giant cells and cholesterol crystals observed cytologically. A xanthoma is a benign growth and is most prevalent in cockatiels, budgies and cockatoos. They are typically non-aggressive, but at times can become locally invasive causing irritation and self-mutilation of the site. The etiology is unknown but a high fat diet and inactivity may contribute.

Gout is a build-up of uric acid, and typically causes swollen painful joints. Bacterial dermatitis is usually associated with a heterophilic or mixed inflammation. Poxvirus lesions have clusters of squamous epithelial cells with eosinophilic cytoplasmic vacuoles. Cutaneous lymphoma yields highly cellular samples of immature lymphocytes.

xanthoma in a cockatiel Used by permission
© Photo by Jeannine Miesle

Question

A 4-month old bird presents to you for evaluation of the feathers. You note that there is achromatosis or a failure of pigmentation as seen in the images below. Which of the following should you tell the owner?

- Her bird has signs of toxicity and the toxic source should be identified and removed
- This is a normal appearance for a budgerigar of this age
- Her bird has an infectious disease that should be treated with appropriate antimicrobials
- Her bird has a nutritional disorder and requires supplementation
- Her bird has a genetic disorder and she should inform the breeder

Explanation - Achromatosis is caused by a variety of nutritional deficiencies in different species. In this case the cause is choline deficiency during growth. A lysine deficiency during growth causes achromatosis in dark breeds of chickens, turkeys and quail, but not in rock doves or cockatiels. Achromatosis is caused by a riboflavin deficiency in growing cockatiels.

In all these cases, birds moult and grow normal feathers sometime after the
phase of rapid growth is complete. The major significance of achromatosis is as a serious sign of an underlying nutritional deficiency.

The proper course of action is to supply the limiting nutrient and, if the bird is still growing, observe growing feathers for normal pigmentation.

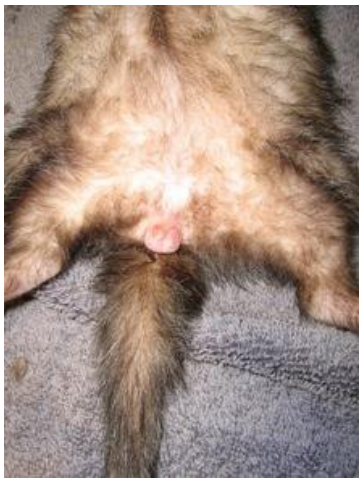
Question

A 4-year old male castrated ferret presents for stranguria. On physical exam there is alopecia over the base of the tail and the ferret is pruritic. What is the most likely diagnosis?

- Cutaneous lymphoma
- Adrenal disease
- Insulinoma
- Cystic calculi

- Dermatophytosis

Explanation - This ferret is exhibiting signs of prostatitis/paraprostatic cysts, secondary to adrenal disease. Common signs of adrenal disease include bilaterally symmetric alopecia, pruritus, vulvar enlargement in females, and prostatitis/cystitis in males. Cystic calculi occur uncommonly in ferrets but would not cause alopecia and pruritus. Dermatophytosis and cutaneous lymphoma could cause alopecia and pruritus but would not cause stranguria. Insulinoma is common in ferrets, but the clinical signs are related to hypoglycemia and would not include stranguria, alopecia or pruritus.



Question

A first-time rabbit owner brings in his one-year old doe for a routine physical examination. He wants his rabbit to live longer than him. Though you know this isn't possible, you know that to increase her chances of a longer life, you recommend an ovariohysterectomy. What is your primary concern?

- An increased risk for pyometra
- An increased risk for uterine adenocarcinoma
- An increased risk for mastitis

Explanation - The correct answer is an increased risk for uterine adenocarcinoma. Though all the other choices are potential concerns, uterine adenocarcinoma affects greater than 55% of intact females at 3 years of age and older.

Question

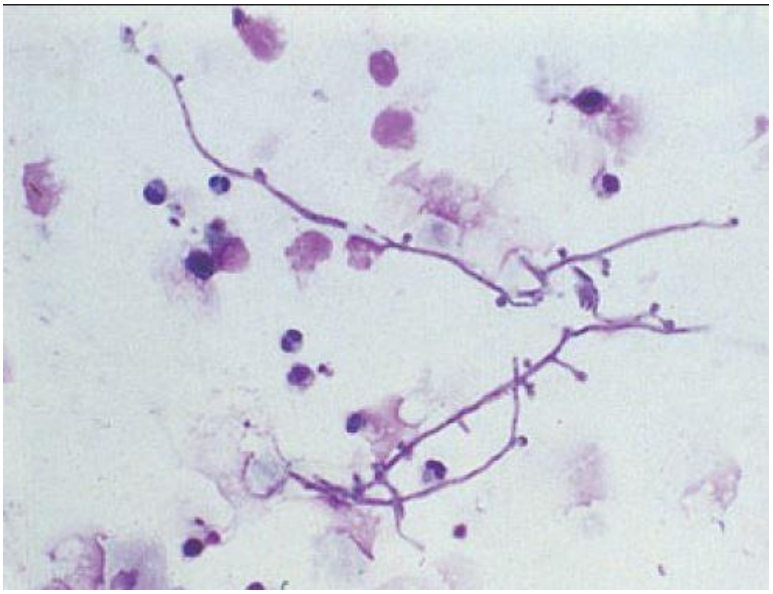
A recently purchased 5-week old male hamster is brought to your clinic for diarrhea. On examination, the hamster appears depressed and dehydrated (8%), and fecal staining of the tail is evident. What is the most appropriate therapy for this patient?

- Subcutaneously administer 50 ml/kg of an isotonic 2.5% dextrose and 0.45% sodium chloride solution and treat the hamster with enrofloxacin and trimethoprim-sulfa.
- Subcutaneously administer 20 ml/kg of an electrolyte solution and treat with fenbendazole.
- Force-feed a puree of vegetables and rodent pellets and start treatment with amoxicillin and tetracycline.
- Subcutaneously administer 10 ml/kg of an electrolyte and glucose solution and force-feed a puree of vegetables and rodent pellets. The condition will likely resolve with supportive care and appropriate husbandry.

Explanation - The symptoms describe a common condition in young (3-10 week old) hamsters called proliferative ileitis. It is caused by the bacteria, Lawsonia intracellularis. Treatment must be aggressive and should consist of correction of electrolyte imbalances and administration of a combination of antibiotics. Recommended antibiotics include tetracycline, enrofloxacin, and trimethoprim-sulfa. Symptomatic treatments with bismuth subsalicylate can be given for persistent diarrhea.

Question

An adult African grey parrot presents with a history of weight loss and periodic coughing. The complete blood count and blood biochemistry profile were unremarkable except for a slight anemia (PCV-32%). You perform a tracheal wash and evaluate cytology of a Wright's stained sample (shown below). What is the most appropriate treatment for the etiologic agent shown here?



- Fluconazole
- Metronidazole
- Ivermectin
- Praziquantel

Explanation - The sample shows septate branching hyphae indicating a mycotic infection of the upper respiratory tract. The characteristics of the hyphae are compatible with Aspergillus.

Fluconazole is the only antifungal drug listed here. The other drugs listed would not be effective against a fungal organism.

Question

What is the most common bacterial pathogen of fish worldwide? This organism is responsible for furunculosis of salmonids, goldfish ulcer disease, carp erythrodermatitis, and trout ulcer disease.

- Aeromonas salmonicida
- Salmonella salmincola
- Yersinia ruckeri
- Flexibacter columnaris

Explanation - The correct answer is Aeromonas salmonicida. Yersinia ruckeri is the causative agent of enteric redmouth disease which is a benign disease with low mortality. Flexibacter columnaris is the causative agent of Columnaris disease (aka peduncle disease, fin rot, black patch necrosis, cotton wool disease). Clinical signs include whitish plaques that may have a red peripheral zone which then become erosions/ulcers and lead to necrosis of the skin.

Question

A large 5 year old iguana presents on emergency for an acute onset of not doing right. On physical exam, there is episcleral injection, swelling of the pharyngeal region, and pain on palpation of the abdomen. What is the most likely diagnosis?

- Renal failure
- Gravid female
- Hypersensitivity reaction
- Foreign body ingestion

Explanation - The correct answer is renal failure. The clinical signs described are typical of an iguana in renal failure. Typically, these iguanas are large and on a high protein diet. The episcleral injection and pharyngeal edema is thought to be as a result of hypertension due to the renal failure and is not a hypersensitivity reaction. The abdomen is usually painful with large soft palpable kidneys.

Question

A client brings you a box turtle that he recently purchased and has been caring for. On exam, you see that the turtle's eyelids are markedly swollen due to palpebral edema and nasal discharge. Which of the following questions would be most helpful in determining the cause of the turtle's clinical signs?

- What is the turtle's diet?
- Are there other animals in the turtle's enclosure?
- What do you use for a light source and how many hours per day is it on?
- What is the temperature in the turtle's habitat?
- What area of the country did the turtle come from?

Explanation - The signs described are characteristic of Vitamin A deficiency (hypovitaminosis A). Vitamin A is a fat-soluble vitamin that acts as an antioxidant and helps growth and repair of tissues. It is important for proper function of the eyes, skin, and mucous membranes. Squamous metaplasia occurs in vitamin A deficiency and most commonly causes changes to the tear ducts. The cause of hypovitaminosis A is an inadequate diet; therefore, finding out about the turtle's diet would be the most helpful information.

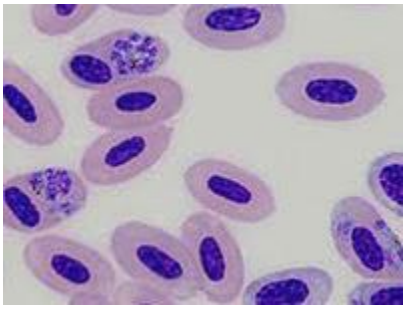
Turtles fed iceberg lettuce, an all meat diet, or a poor quality commercial diet are prone to developing a vitamin A deficiency. Vitamin A is present in high quantities in green leafy vegetables (especially dandelion greens), yellow and orange vegetables such as carrots and yellow squash, whole fish, and liver.

Question

A falconer presents his peregrine hybrid to you with the complaint of lethargy and weakness. You run a blood chemistry panel and CBC and these are the abnormalities: elevated AST, elevated CPK, low total protein and a low hematocrit at 22%. Some of the RBCs have a small, round to oval structure with a large vacuole forcing the nucleus to be displaced to one pole, resulting in a 'signet-ring' appearance. Your diagnosis is avian malaria and it is caused by which of following organisms?

- Dirofilaria

- Hemoproteus
- Plasmodium
- Bartonella



Explanation - The plasmodium trophozoite is a stage of the parasite that is seen as a large vacuole displacing the nucleus on microscopic examination of red blood cells in infected birds.

Question

A full spectrum source of ultraviolet light is required for reptiles for which of the following reasons?

- Proper absorption of vitamin D in the gut
- Proper absorption of calcium and magnesium in the gut
- Conversion of beta-carotene to vitamin A
- Conversion of inactive vitamin D to vitamin D3 in the skin
- Proper incorporation of iodine into thyroid hormone

Explanation - The correct answer is conversion of inactive vitamin D to vitamin D3 in the skin. Animals housed outside with access to direct sunlight usually have adequate amounts of vitamin D3. Vitamin D3 is required for proper calcium absorption and metabolism. Imbalances in calcium, phosphorus, and vitamin D3 can lead to nutritional secondary hyperparathyroidism, fibrous osteodystrophy, osteomalacia, cystic calculi, bone deformities, and rickets. Deficiencies in vitamin D3 can be corrected with parenteral administration of vitamin D3 every 4 weeks. Overdoses of vitamin D3 can lead to soft tissue mineralization.

Iguana with Metabolic Bone Disease - Note Left Arm

Question

An owner arrives with a new bearded dragon for his first physical exam. Before manipulating the lizard, you notice its limbs appear bowed. What should you talk to this owner about?

- Animal abuse
- Antibiotic therapy
- Euthanasia
- Proper nutrition

Explanation - The correct answer is proper nutrition. Bowing of the long bones is a key sign for metabolic bone disease, which results from hypocalcemia, decreased vitamin D or wrong Ca:P ratio (crickets high in P and low in Ca). Proper nutrition will halt the osteoclastic process which is occurring as an effort to maintain normal serum calcium levels.

NB: in MBD Ca will be less than 9 mg/dl.

Question

Which of the following is not a possible sequela of calcium, phosphorus, and vitamin D3 imbalance in a pet bird?

- Egg binding
- Osteoporosis
- Seizures
- Rickets
- Proventricular dilatation

Explanation - The correct answer is proventricular dilatation. Birds on all seed diets often have problems with calcium and phosphorus metabolism. Inadequacies in these minerals result in osteoporosis, acute hypocalcemia (weakness, tremors, seizures), rickets and splayleg in young birds, and egg binding. Excess vitamin D3 can cause mineralization in tissues, particularly the kidneys.

NB: Proventricular dilatation is a possible viral disease that affects mainly cockatoos and macaws and cause encephalitis, regurgitation, the bird to pass undigested food. No treatment.

Question

A budgerigar is showing signs of squamous metaplasia of the oral mucosa, conjunctiva, and upper airways. It has developed associated bacterial sinusitis (see image). In a pet bird, what are these clinical signs most suggestive of?

- Hypovitaminosis A
- Hypervitaminosis D
- Hypovitaminosis D
- Hypocalcemia
- Iodine deficiency

Explanation - The correct answer is hypovitaminosis A. The functions of vitamin A are related to epithelial maintenance, vision, and skeletal development. In birds, problems with the skeleton or vision are rarely seen with vitamin A deficiency. Vitamin A deficiency can manifest as squamous metaplasia of the oral mucous membranes or glands. Glands may be entirely converted to squamous epithelium with keratin material and can look like abscesses or pustules but are essentially keratin cysts. They should be differentiated from lesions of pox, Candida, and Trichomonas. Lesions of the conjunctiva, nasolacrimal duct, upper GI tract, and upper respiratory tract can occur. Presenting signs may include severe dyspnea or respiratory signs.

Question

Which of the following is not an intracellular parasite of birds?

- Leukocytozoon
- Plasmodium
- Dipetalonema
- Hemoproteus

Explanation - The correct answer is Dipetalonema. Dipetalonema reconditum is a microfilarial parasite found in the blood (not in the blood cells) of dogs. The infection is typically non-clinical. Hemoproteus and Plasmodium are intraerythrocytic parasites found in birds whereas Leukocytozoon is found in white bloods cells.

Question

A 3 year old king snake presents for retained spectacles after shedding. Which of the following should not be advised to the client?

- Use forceps to grasp the eyecaps and peel them off
- Consider searching for other underlying diseases
- Apply an ophthalmic ointment several times daily until the eyecaps soften and fall off
- Increasing humidity in the environment for several days

Explanation - The correct answer is use forceps to grasp the eyecaps to peel them off. Dysecdysis or incomplete shedding is often due to low humidity, lack of abrasive substrates to rub against, or other stresses such as ectoparasitism, nutritional deficiencies, or other systemic disease. Retained spectacles should never be forcibly removed because of the possibility of corneal damage. Increasing moisture in the environment by increasing humidity or by applying ophthalmic ointments to the eyecaps can often help.

> **Spectacle** - The embryologically-fused eyelids form a transparent covering of the eye called the spectacle (also known as the brille or eyecap). Between the spectacle and the cornea are tear-like secretions. The spectacle is shed during normal ecdysis but may be pathologically retained (for example if mites are present, with low humidity or if the eye is diseased). Retention of the spectacles has been associated with the development of corneal disease and panophthalmitis.


Question

A woman purchased two 4-month old budgerigars recently. She is concerned about their appearance which is shown in the photos below. Which of the following should you tell the owner?


- Her birds have signs of toxicity and the toxic source should be identified and removed
- Her birds have a genetic disorder and she should inform the breeder
- Her birds have an infectious disease that should be treated with appropriate antimicriobials
- Her birds have a nutritional disorder and require vitamin supplementation

Explanation - This is the striking appearance of a genetic condition in budgerigars known as "Chrysanthemum disease." They are colloquially referred to as "feather dusters." This is an autosomal recessive disorder that results in continuous growth of feathers all over the body. Initially, these birds stand out in the nest as the largest and best feathered of the group. But over the first days or weeks, the classic appearance becomes obvious. This frequently results in obscured eyesight, inability to fly, and difficulty preening. Conventionally, it has been stated that birds with this condition only live 3-6 months but with care taken to provide adequate nutrition and supportive care, they can live several years.

Question

On physical exam of a budgerigar with a history of voice change and regurgitation, you note a gross enlargement in the neck region that palpates like soft tissue. What is your most likely diagnosis?

- Neck trauma
- Thyroid carcinoma
- Crop stasis

- Iodine deficiency

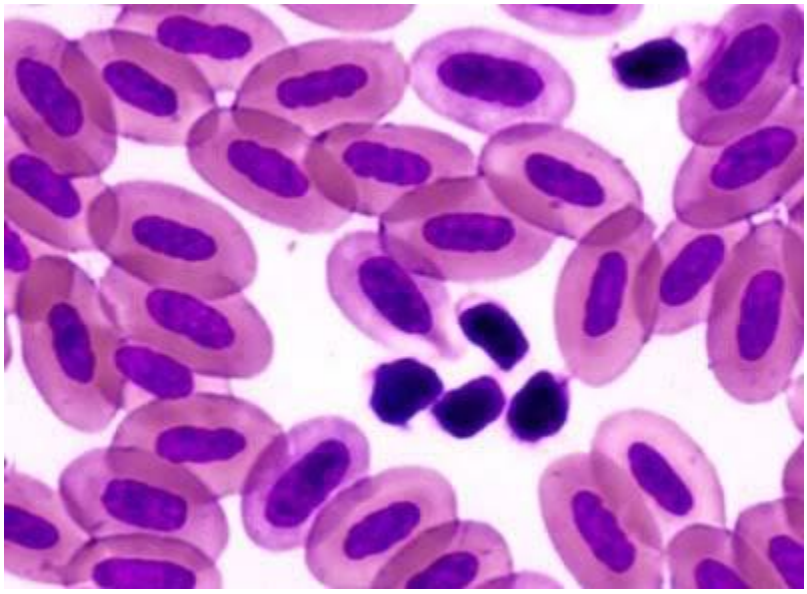
Explanation - The correct answer is iodine deficiency which results in goiter. The clinical signs along with physical exam findings are consistent with the diagnosis. Thyroid carcinoma is highly unlikely in birds. Neck trauma and crop stasis are good differentials but given that you are palpating a soft tissue mass, goiter is more likely.

Question

Which of these avian blood cells does NOT contain a nucleus?

- Red blood cell
- Heterophil
- Thrombocytes
- None of the above (all of the cells listed contain a nucleus)

Explanation - All blood cells are nucleated in avian species.



Avian platelets have nucleus photos

Question

Which of the following is not a unique adaptation of avian species?

- No diaphragm
- Pneumatized bones
- Incomplete tracheal rings
- Countercurrent air flow

Explanation - The correct answer is incomplete tracheal rings. Birds have complete tracheal rings. Additionally, they have pneumatized bones (femur and humerus), countercurrent air flow exchange at the level of the lungs, and no diaphragm.

Question

Most bladder stones in rabbits are primarily composed of _____?

- Calcium carbonate
- Phosphorus
- Urate
- Magnesium

Explanation - The correct answer is calcium carbonate, although there seem to be multiple causes of formation of cystic calculi. One major component is that rabbits will absorb calcium through their GI tract at a rate directly proportional to the amount of calcium in their diet regardless if they need it or not. Excess calcium is then excreted through the kidneys.

Question
You are working as a relief veterinarian at an exotic animal practice, and a toucan is brought in for evaluation due to a history of poor feathering and an overgrown beak. Blood work shows elevated liver enzymes and bile acids. What disease common for this species must you rule out?

- Hepatic lipidosis
- Hemochromatosis
- Hypocalcemia syndrome
- Cholangiohepatitis

Explanation - The correct answer is hemochromatosis. Given the clinical signs, blood work results, and species, it is very important to consider hemochromatosis, as both toucans and mynah birds seem susceptible.

Question

You visit a fish hatchery and need to perform anesthesia on a fish to remove a foreign body. Which of these agents is approved for use in fish and what additional rules apply to its use?

- Chloral hydrate - There is a 14 day withdrawal period before the fish can be consumed by humans
- Clove oil (Eugenol) - This can only be used in animals that will not be consumed by humans
- Halothane - must be used in a vacuum system to collect volatile gas
- Benzocaine hydrochloride - A mask and eye protection should always be worn when handling this agent
- Tricaine methanesulfonate (MS 222) - There is a 21 day withdrawal period before the fish can be consumed by humans

Explanation - Also known as Finquel, tricaine methanesulfonate (MS-222) is the only FDA approved agent for fish anesthesia. There is a mandatory 21 day withdrawal period before the fish can be used for consumption. The other agents listed have been used for fish anesthesia but are not FDA approved.

Question

Extension of an infection from the respiratory tract to the middle ear can occur when an infectious agent travels through the _____.

- Canal of Schlemm
- Mandibular foramen
- Cavernous sinus
- Semicircular canal
- Eustachian tube

Explanation - The correct answer is eustachian tube. This tube connects the pharynx and the inner ear. The semicircular canals are part of the inner ear. The canal of Schlemm is in the eye. The mandibular foramen is in the mandible, as the name implies. The cavernous sinus is a portion of the skull where the cranial nerves heading toward the eyes travel.

Question

An iguana is presenting for a change in behavior described as hyperactivity and irritability. The iguana has also recently stopped eating and seems to have an enlarged abdomen. What is the most likely diagnosis?

- Foreign body ingestion
- Neoplasia
- Volvulus
- Gravid female

Explanation - The correct answer is gravid female. The clinical signs described are typical for a gravid female. They are most likely to present from November to June. On physical exam you can typically feel the lumps in the abdomen which are the large eggs. Intervention in the form of an ovariohysterectomy is performed if attempts at inducing oviposition fail.

Question

Psittacine beak and feather disease, as seen in this lorikeet showing loss of distal primary feathers, mainly affects birds of which age group?

- 10-20 years of age
- Over 50 years of age
- 30-40 years of age
- Less than 3 years of age

Explanation - The correct answer is less than 3 years of age. The disease is caused by a circovirus and can affect any psittacine bird, but clinical illness is seen most commonly in those less than 3 years of age. Clinical signs include feather loss, abnormal pin and mature feathers, lack of powder down, and various beak abnormalities. The clinical signs are progressive, and birds may have their feathers, beak, or both affected. Diagnosis is based on appearance of birds and by blood tests using a viral DNA probe.

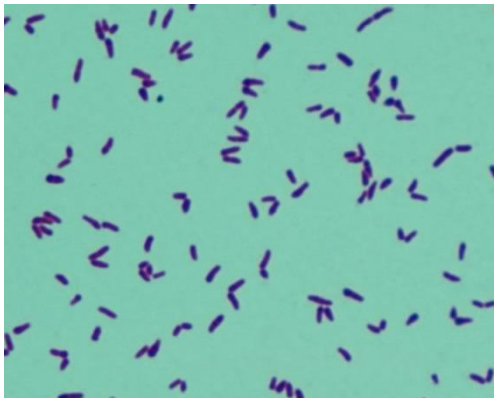
Question

Corynebacterium kutscheri causes which of the following in rats?

- Hepatic failure
- Abortion
- Renal failure
- Pseudotuberculosis
- Sialodacryoadenitis

Explanation - The correct answer is pseudotuberculosis. C. kutscheri is a gram positive rod that causes caseous purulent foci in the lungs of rats when stressed. The infection is usually subclinical. Clinical signs include dyspnea, oculonasal discharge, rough hair coat, and hunched posture. In mice, lesions in other organs occur as well. Diagnosis is based on impression smears of the lesions showing the characteristic "Chinese character" formation. Culture of the bacteria or

serology can diagnose the infection as well. C. kutscheri does not cause abortion, sialodacryoadenitis, hepatic or renal failure.



Question

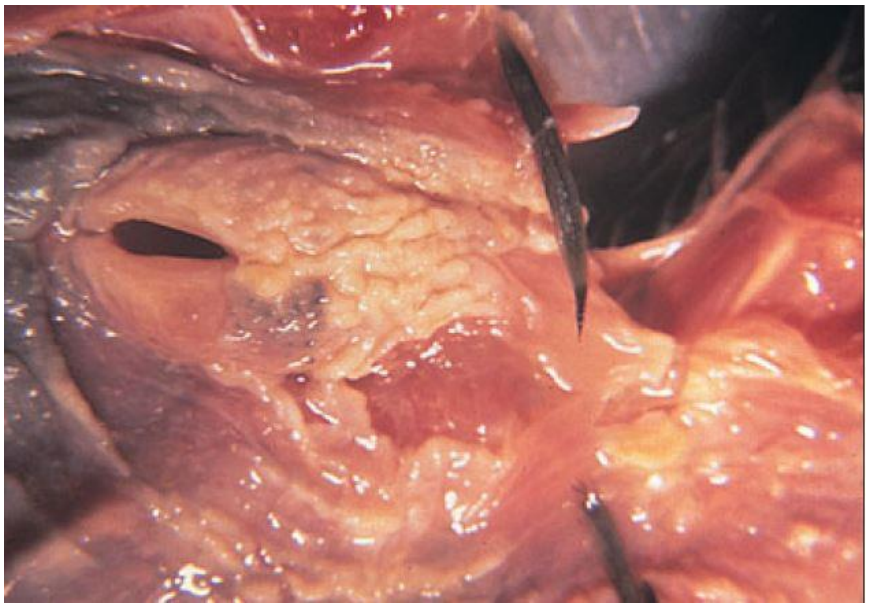
Which of the following is not a method to prevent ringtail in rats?

- Provide a wire-bottom cage for the rat
- Increase humidity in the environment
- Provide nesting material in the environment
- Keep environmental temperatures between 70-74 degrees Fahrenheit

Explanation - The correct answer is to provide a wire-bottom cage for the rat. Ringtail is an annular constriction of the tail found in weanling rats and rats kept in wire-bottom cages. The condition causes the tail to constrict, undergo dry gangrene, and fall off. Factors contributing to ringtail include increased environmental temperatures, low humidity, repeated blood draws from tail veins, and possibly drafts. The tail stumps usually heal with no complications.

Question

Which of the following is NOT a predisposing factor to candidiasis (as shown in the image below) in birds?



- Old age
- Vitamin A deficiency
- Prolonged antibiotic therapy
- Spoiled feed

Explanation - The correct answer is old age. Candidiasis is caused by the yeast Candida albicans. Young birds are most commonly affected. Infection involves the crop mucosa, and secondary bacterial infection is common. Affected birds will be unthrifty, underweight, and may vomit. Crop stasis and malabsorption syndrome may be associated clinical findings. Diagnosis is by culture and identification of the yeast. Treatment options are nystatin, itraconazole, fluconazole, and vitamin A supplementation.

Question

Which of the following drugs is toxic to tortoises and turtles but not necessarily other reptiles?

- Fluconazole
- Ampicillin
- Ivermectin
- Doxycycline

Explanation - The correct answer is ivermectin. Ivermectin is highly toxic in turtles and causes paresis, paralysis, and death at low doses due to an ability to cross the blood-brain barrier.

Question

A 23-year old male Blue Front Amazon parrot presents for lethargy and poor feather quality. The bird is fed a diet of sunflower seeds and peanuts. The bird is kept in a 2x3 foot iron cage lined with newspaper. On physical exam the bird is obese, the feathers are dull and contain many stress bars, and there are white plaques located on the oral mucosa. Complete blood count and chemistry results are within normal limits. What is the most likely diagnosis?

- Mycobacteriosis
- Candidiasis
- Hypovitaminosis A
- Psittacosis
- Trichomoniasis

Explanation - Hypovitaminosis A is seen most commonly in birds that are on poor quality diets, such as all seed diets or diets high in nuts. Amazon parrots appear to be more sensitive to this condition. Clinical signs are related to squamous metaplasia and include white plaques in the oral cavity, poor feather quality, respiratory distress and renal disease.

Trichomoniasis can cause white plaques but is more common in wild birds such as raptors and pigeons.

Candidiasis may cause white plaques in the mouth but is seen more commonly in young birds or birds that are immunosuppressed.

Psittacosis is the common name for Chlamydophila psittaci, a bacterial infection that causes respiratory and liver disease.

Mycobacteriosis is caused by the Mycobacterium avium complex and most commonly causes lesions in the GI tract or skin in birds.

Question

A baby bird is presented to you for severe respiratory distress. It is being hand-fed a commercial formula with oil added to it. The bird appears quite heavy for its age and is very dyspneic. What condition should you suspect?

- Hypocalcemia
- Hepatic lipidosis
- Xanthoma
- Hypovitaminosis A

Explanation - The correct answer is hepatic lipidosis. In pediatric birds, hepatomegaly is essentially normal, but lipidosis develops when they are fed a high-fat diet, often a formula supplemented with peanut butter or oil. They are typically heavy for their age and show severe respiratory distress. Initial treatment should be minimal and consist of cooling and oxygen therapy. Typical signs of vitamin A deficiency are squamous metaplasia of the mucous membranes and submandibular abscessation. A xanthoma is an accumulation of friable yellow fatty tissue.

Question

A boa constrictor presents to you for weight loss, vomiting, hemorrhagic diarrhea, and anorexia. The snake is housed with herbivorous turtles, which all seem to be healthy. What pathogen should you be suspicious of?

- Aspergillus spp
- Entamoeba spp
- Salmonella spp
- Plasmodium spp
- Citrobacter spp

Explanation - The correct answer is Entamoeba spp. Entamoeba invadens is a protozoal organism that causes severe gastrointestinal signs and death in snakes. Turtles act as carriers for the protozoa but are clinically unaffected. Diagnosis is based on identification of trophozoites or cysts in fecal smears or histologic sections. Metronidazole is the treatment of choice. Turtles and snakes should not be housed together.

Question

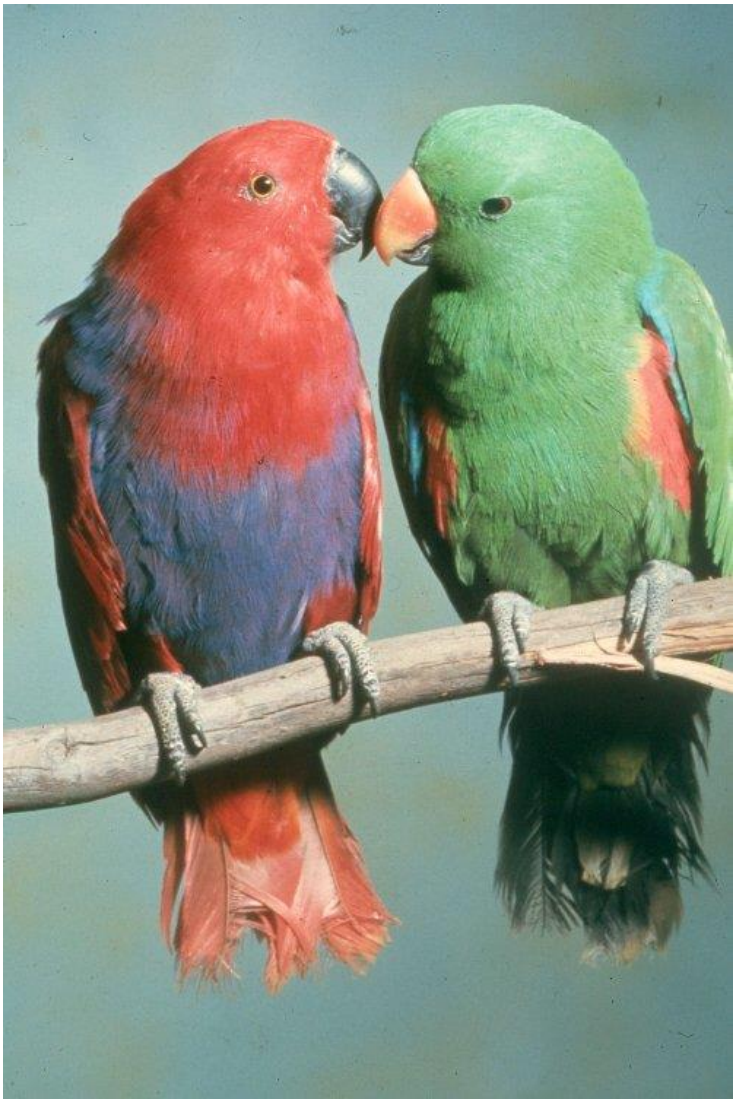
What is the treatment for proliferative bowel disease in ferrets?

- Anthelmintics
- Corticosteroids
- Antibiotics
- Nonsteroidal anti-inflammatory drugs

Explanation - The correct answer is antibiotics. Proliferative bowel disease in ferrets is caused by Lawsonia, an intracellular bacterium. The organism is very susceptible to chloramphenicol and has a variable susceptibility to other antibiotics.

Question

Which of the following is true regarding the Eclectus parrots shown in the image below?



- Both birds are females
- It is not possible to determine the gender of these birds based on the photograph
- Both birds are males
- The green bird on the right is male and the red bird on the left is female
- The green bird on the right is female and the red bird on the left is male

Explanation - While it is not possible to determine the gender of most birds based on their appearance, Eclectus parrots are sexually dimorphic. Male Eclectus parrots are green and females are red.

Question

A 6-year old Macaw presents to your emergency clinic with a broken blood feather. What is the best way to stop the hemorrhage?

- Apply gentle pressure to the bleeding area of the feather for 2-5 minutes
- Thermally cauterize the area
- Bandage the wing, incorporating the feather
- Pull the feather

Explanation - Blood feathers, also called "pin feathers," are new feathers that are starting to grow and need a large blood supply. They will bleed if broken. A blood feather starts out with a waxy keratin sheath and, when mature, the blood supply will recede, and the waxy sheath will be removed by the bird. Blood feathers can be broken or may accidentally be cut when the wings are trimmed.

Pulling the blood feather is the most appropriate treatment. The bleeding can be temporarily stopped with other means (thermal or chemical cautery), but the feather can easily be re-injured or the clot dislodged due to the slippery keratin of the feather.

Removing the feather is best done using a forceps or hemostat. The feather should be gripped close to the skin and pulled steadily and firmly in the direction the feather is growing. Pulling out a feather will cause pain, so be sure you hold the bird firmly, but carefully. If it is a wing feather, support and immobilize the wing to keep it steady during the procedure. Do not jerk on or twist the feather.

If bleeding occurs from the follicle after the feather has been removed, continue to apply pressure to the area for several minutes and monitor the bird for at least an hour.

Question

An adult budgerigar presents sitting on the floor of its cage. It has a history of polydipsia, weight loss, and progressive left leg lameness. What is your highest suspicion for what may be causing these signs?

- Lead toxicity
- Bumble foot
- Renal adenocarcinoma
- Teflon toxicity

Explanation - The correct answer is renal adenocarcinoma. A mass in the renal parenchyma of a bird will compress and compromise the function of the ischiatic nerve, causing a unilateral leg lameness. We would be unlikely to see unilateral lameness with lead toxicity. Bumblefoot could affect one foot, but would not cause polydipsia. Teflon toxicity causes acute death in birds.

Bumblefoot is a bacterial infection and inflammatory reaction on the feet of birds and rodents. This infection is much more likely to occur in captive animals than in those in the wild.

Question

Which of the following is a common isolate in infectious stomatitis in turtles?

- E. coli
- Salmonella spp
- Pasteurella spp
- Citrobacter spp
- Aeromonas spp

Explanation - The correct answer is Aeromonas spp. Infectious stomatitis occurs commonly in lizards, turtles, and snakes. Aeromonas and Pseudomonas spp are commonly isolated from the lesions. Clinical signs include petechiation and caseous material build up within the mouth. Treatment is aimed at debridement and antibiotics.

Question

This 3-year old female Budgerigar presents on emergency for a 3-day history of being fluffed at the bottom of the cage with a decreased appetite. The owners noticed red tissue protruding from the vent today. Her diet is seed only with a cuttle bone, and she is housed with a male. She has no previous medical history, but did lay a clutch of eggs last year. They appeared normal to the owner.

What is a common predisposing factor for this condition in seed-eating birds?

- Calcium excess
- Vitamin A deficiency
- Calcium deficiency
- Hypercholesterolemia

Explanation - With seeds as a primary diet, many reproductively active females do not maintain adequate calcium levels to be able to lay eggs normally. This leads to weakened contractions of the reproductive tract and an inability to pass eggs through the oviduct. Initial therapy should consist of fluid support and calcium prior to attempt to reduce the prolapse.

While vitamin A deficiency is often present in seed-eating birds, the clinical syndromes associated with this are more commonly squamous metaplasia affecting the oral mucosa, respiratory and renal systems.

Hypercholesterolemia is often associated with seed-diets, but does not generally result in egg-binding or prolapse, as reproductively active birds will normally have elevated levels of cholesterol for egg production.

Excessive amounts of oral calcium are generally not absorbed by the gastrointestinal tract and are excreted, making it difficult to over-supplement with oral calcium.

Question

A dwarf rabbit presents for a right sided head tilt and history of circling to the right. Which of the following is a likely diagnosis?

- Myxomavirus
- Bordetella bronchiseptica
- Treponema cuniculi
- Encephalitozoon cuniculi

Explanation - The correct answer is Encephalitozoon cuniculi. There is a high prevalence of E. cuniculi although it only infrequently causes disease. Head tilt and torticollis are the common clinical signs. Treponema cuniculi is the causative agent for rabbit syphilis. Bordetella bronchiseptica is part of the normal flora of the rabbit respiratory tract and does not generally cause clinical signs. Myxomavirus can be a common cause of pneumonia.

Question

Which of these is the primary means of heat dissipation for a rabbit?

- Through salivating
- Through panting
- Through the ears
- Through shivering
- Through sweating

Explanation - The correct answer is through the ears. Rabbits can only sweat through glands around their lips. They also are unable to dissipate heat efficiently via panting or salivation. Their ears are large, thin-skinned, highly vascularized structures with heat sensing organs and a counter-current heat exchange system. At high temperatures, the blood vessels dilate, increasing ear blood flow and dissipating heat. Because this is their primary means of dissipating heat, rabbits are unable to tolerate very hot ambient temperatures.

Question

A rat is presented for bleeding from its eyes. On physical exam, the rat is exophthalmic, squinting, and has a swollen face and neck. There is a red discharge from both eyes. What is your most likely diagnosis?

- Coronavirus infection
- Rotaviral infection
- Carcinoma at the thoracic inlet
- Head trauma

Explanation - The correct answer is coronavirus infection. Coronavirus in rats causes sialodacryoadenitis which causes inflammation and necrosis of the salivary and lacrimal glands, as well as the nasolacrimal duct. The disease is self-limiting and usually resolves within 2 weeks; however, corneal drying can lead to secondary lesions such as corneal ulcers. Transmission is by respiratory aerosol. The red discharge from the eyes is a porphyrin pigment secreted from the Harderian gland in times of stress for the rats.

Question

Which of the following would you expect to see on cytology of feces from a normal adult psittacine bird?

- 75% gram negative rods
- 25% gram negative rods
- 75% gram negative cocci
- 75% gram positive cocci

Explanation - The correct answer is 75% gram positive cocci. A normal fecal cytology of a psittacine contains 100-200 bacteria per high-power field, 60-80% gram-positive cocci, and 20-40% gram-positive rods. A few yeast or gram-negative bacteria per high-power field may be considered normal. An absence or decrease in the number of bacteria, the detection of

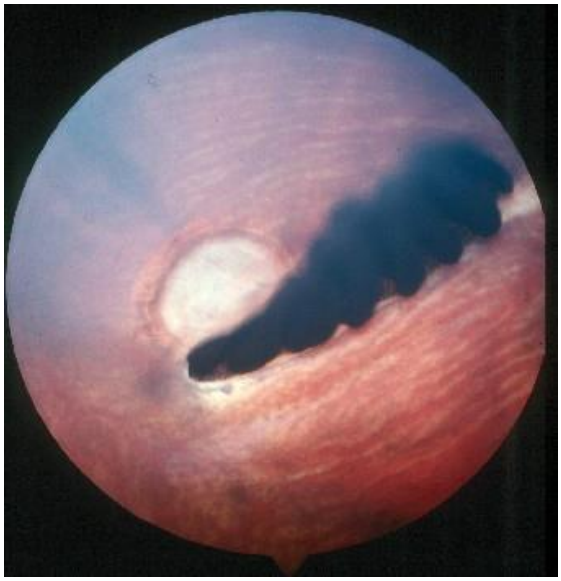
WBCs, a shift from a gram-positive to a gram-negative bacterial population, or the presence of a high number of budding yeast (more than 5 per high-power field) are considered abnormal and are a sign of infection or immunosuppression.

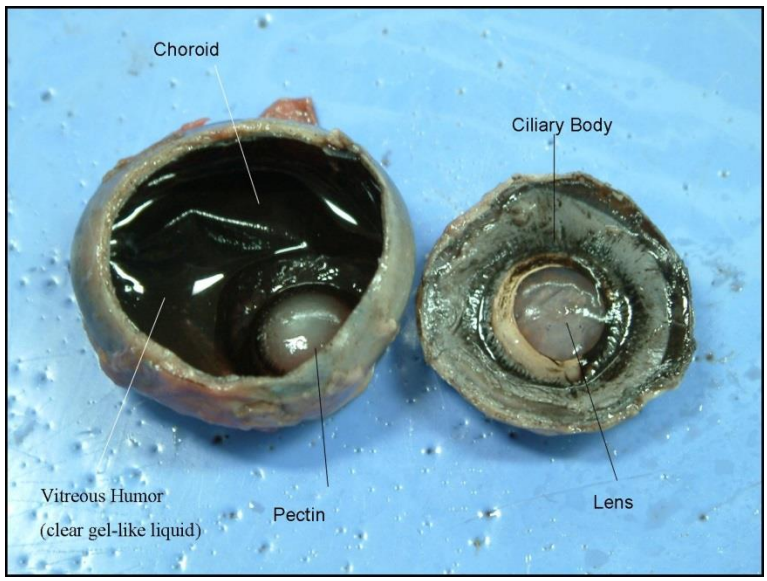
Question

You examine the eyes of a 45-year-old Amazon parrot as part of a pre-purchase examination for a valued client. On retinal examination, you notice a black, somewhat tubular structure extending from the retina into the vitreous. What would you recommend next?

- Treat the bird with ivermectin for suspected ocular nematodiasis
- Treat the bird with itraconazole for suspected ocular mycosis
- Discuss photoactive laser treatment for ocular melanoma
- Do nothing since this is a normal structure

Explanation - This normal anatomic structure is called the "pecten" and is present in all birds. It is a highly vascularized intraocular organ and is believed to nourish the retina and control the pH of the vitreous body.





Question

What is the most effective treatment for adrenal gland disease in ferrets?

- Trilostane
- Mitotane (Lysodren)
- Ketoconazole
- Prednisone
- Surgery (adrenalectomy)

Explanation - The correct answer is surgery (adrenalectomy). Adrenalectomy is the treatment of choice for adrenal disease in ferrets. If both adrenals are affected, you can perform a unilateral adrenalectomy and a subtotal adrenalectomy on the contralateral side. Mitotane is rarely successful in reducing clinical signs in these patients. The same is true for ketoconazole.

Trilostane, is a medicine used in dogs with hyperadrenocorticism. Unfortunately it increases 17-hydroxyprogesterone which is one of the hormones that is frequently elevated in ferrets with adrenal gland disease. It will likely raise this hormone in ferrets, too, and make the adrenal problem even worse.

Question

A female ferret of unknown age presented for acute onset of severe lethargy (see image). The owners obtained the pet 2 weeks ago from an elementary school class which had owned the ferret for 6 years. It is not known if the ferret was spayed. Physical exam reveals depression and thin body condition. Heart rate is 200 bpm. The spleen feels enlarged but no masses are palpable. Blood glucose measures "Lo" on a glucometer. Which of the following treatments are most useful long term for the likely condition?

- Meloxicam and amoxicillin
- Prednisone and diazoxide
- Insulin and potassium supplementation
- Adrenalectomy and trilostane
- Ovariohysterectomy and intravenous fluids

Explanation - This ferret's clinical signs and blood glucose are most consistent with insulinoma. Medical management consists of prednisone and diazoxide alone or in combination. Dietary management with a high protein and low carbohydrate diet is also important. Surgical removal of the tumor is also an option in otherwise healthy ferrets.

Question

Which of these antibiotics should be avoided in rabbits?

- Erythromycin
- Trimethoprim sulfa
- Metronidazole
- Enrofloxacin

- Chloramphenicol

Explanation - The correct answer is erythromycin. Antibiotics with a predominantly gram positive spectrum should be avoided in rabbits whenever possible as they will frequently result in serious alterations to intestinal microflora and predispose them to intestinal disease.

Question

You are primarily a food animal veterinarian, and your client asks you to perform a necropsy on his son's lizard. You cautiously agree to perform a necropsy and identify white chalky nodules in multiple joints. Additionally, there are multiple pinpoint white foci in the kidneys. Given these findings, you recall your reptile lectures and come to a conclusion as to what happened to this lizard. What is your diagnosis?

- Metabolic bone disease
- Aspergillosis
- Hypovitaminosis A
- Gout

Explanation - The correct answer is gout. The key to this question is to realize that there is probable uric acid deposition in the joints, which would be indicative of gout. Gout occurs when there is an inability to excrete uric acid or an overproduction of uric acid. Metabolic bone disease would cause osteopenia and fibrous osteodystrophy. Aspergillosis can cause white plaques, but you would not expect them to be chalky and in the joints. Hypovitaminosis A does not affect joints.

Question

Which of the following is not a clinical sign of hypovitaminosis A in box turtles?

- Posterior paresis
- Renal disease
- Palpebral edema
- Squamous metaplasia of epithelium
- Respiratory disease

Explanation - The correct answer is posterior paresis. Hypovitaminosis A most commonly affects box turtles that are fed imbalanced diets of fruit and insects that have little vitamin A. Clinical signs include edema of the eyelids, chronic respiratory disease, renal disease (due to the squamous metaplasia of renal tubules blocking collecting ducts), squamous metaplasia of epithelium, and secondary infections of the eyes, skin, and respiratory system. Treatment includes oral or parenteral vitamin A supplementation.

Question

What are clinical signs associated with Sendai virus infection in mice?

- Icterus and subcutaneous hemorrhages
- Dyspnea, chattering, and weight loss

- Vomiting, diarrhea, and weight loss
- Inflammation of salivary and nasolacrimal glands

Explanation - The correct answer is dyspnea, chattering, and weight loss. Sendai virus infection in mice causes respiratory disease, leading to pneumonia, weight loss, dyspnea, chattering, and mortality. The infection is usually subclinical in rats and hamsters. The disease is very contagious and difficult to control.

Question

A cockatiel presents with a large yellow-orange mass on the tip of its wing and also on its breast. You perform a fine needle aspirate and cytology reveals macrophagic inflammation with multi-nucleated giant cells and cholesterol clefts. What is your diagnosis?

- Triglyceroma
- Squamous cell carcinoma
- Xanthoma
- Feather cyst

Explanation - A xanthoma is a benign growth composed of lipids and cholesterol accumulations and is most prevalent in cockatiels, budgies and cockatoos. They are typically non-aggressive, but at times can become locally invasive causing irritation and self-mutilation of the site. The etiology is unknown but a high fat diet and inactivity may contribute.

Question

A 3 1/2 year old castrated male ferret presents for episodes of lethargy. He has also been intermittently dragging the pelvic limbs. Which of these choices is a likely cause of these signs in this ferret?

- Diabetes mellitus
- Renal carcinoma
- Insulinoma
- Adrenal tumor

Explanation - The correct answer is insulinoma. This condition is common in ferrets and would cause bouts of lethargy. Intermittent pelvic limb weakness is another manifestation of systemic weakness secondary to hypoglycemia. Renal carcinoma is not common in ferrets. Adrenal tumors and diabetes mellitus usually are accompanied by different clinical signs.

Question

An owner presents with a hamster with a history of bilaterally asymmetric, intermittent, swollen cheeks. What is your most likely diagnosis?

- Metastatic carcinoma
- Lymphoma
- Sialocele
- Food stuff in cheek pouches

Explanation - The correct answer is food stuff in cheek pouches. This presentation is very common.

Question

An adult ferret presents for acute onset of ataxia, salivation, and lethargy. Which of these diagnostic tests would you perform first?

- Blood glucose
- Radiographs
- Ionized calcium
- Sex steroid levels

Explanation - The correct answer is blood glucose. The first rule out for a ferret with these signs is hypoglycemia. If hypoglycemia is confirmed, an insulin level should be submitted as a diagnostic test for insulinoma.

Question

A 2-year old rabbit presents for scratching its ears. On physical exam you observe crusts and excoriations in its ears. Microscopic exam of the crusts reveals numerous mites. You prescribe ivermectin to treat which parasite in this rabbit?

- Encephalitozoon cuniculi
- Otodectes cynotis
- Psoroptes cuniculi
- Treponema paraluis cuniculi
- Cheyletiella parasitovorax

Explanation - Psoroptes cuniculi, the rabbit ear mite, causes severe crusting and inflammation in the external ear canals. Treatment is ivermectin or selamectin. Encephalitozoon cuniculi is a microsporidian parasite of rabbits that causes neurologic and renal disease. Cheyletiella parasitovorax is the rabbit fur mite and causes white flakes that resemble dandruff. Otodectes cynotis is the ear mite of dogs and cats. Treponema paraluis cuniculi is the causative agent of rabbit syphilis.

Question

A client brings in her rabbit, which acutely went down in the hind limbs after playing with the owner's daughter yesterday. On physical exam, the rabbit is dribbling urine and has no withdrawal in the hind legs. Forelimbs are normal. What do you suspect?

- Hansen's type II disc herniation
- Fibrocartilagenous embolism
- Vertebral luxation
- Vertebral fracture
- Hansen's type I disc herniation

Explanation - The correct answer is vertebral fracture. Fractures in the caudal lumbar region frequently occur when rabbits are not handled properly or are stimulated to jump around excessively. Fractures are much more common than luxations, disc extrusions, or emboli. The most common site of fracture is L7.

Question

You are using a Bain circuit to anesthetize a ferret. Which of the following measures is the most important thing to do to prevent re-breathing of carbon dioxide by the ferret?

- Make sure the soda-lime canister is fresh
- Make sure that the endotracheal tube extension is longer than the ferret
- Make sure the pop-off and one-way valves are opening correctly
- Maintain high flow rates of oxygen in the circuit

Explanation - A Bain circuit is a non-rebreathing system (in contrast to circle systems used more commonly in larger animals). Therefore, there is no carbon dioxide absorber such as soda lime. Instead, you must use sufficient oxygen flow rates to constantly flush the system (typically at least 100 ml/kg/min). The system is not dependent on valves as a circle system is. A long endotracheal tube will increase re-breathing and should not be used.

Question

Iodine deficiency in a budgerigar can lead to which of the following?

- Hepatic lipidosis
- Goiter
- Egg binding
- Squamous metaplasia of the mucous membranes

Explanation - The correct answer is goiter. Also known as thyroid hyperplasia, classic signs include stertor or wheezes due to pressure of the thyroid on the syrinx. Regurgitation can be seen and engorgement of the right jugular vein may occur in severe cases.

Question

Visceral gout, as seen in the image below in a parrot, is the result of crystallization of what?

- Uric acid
- Oxalic acid
- Urea
- Glycolic acid
- Ursodeoxycholic acid

Explanation - The correct answer is uric acid. Gout occurs when urate crystals form and deposit. Urea is soluble and does not crystallize. Ursodeoxycholic acid is the active ingredient of Actigall (ursodiol), which is used in biliary disorders of small animals. Glycolic acid is metabolized to oxalic acid, which may precipitate into calcium oxalate crystals in mammals.

Question

A geriatric Amazon parrot had a 1 cm diameter raised ulcerated mass on its left wing surgically removed at your clinic six months earlier. Histology found the mass to be an aggressive squamous cell carcinoma. The same bird returns due to severe weight loss, lethargy and a return of the mass. The owners wish to euthanize the bird. What is the most humane method to euthanize this parrot?

- Manually restrain the bird in a towel, intubate and provide intravenous ketamine
- Manually restrain the bird using gloves, intubate and administer inhalant carbon dioxide
- Manually restrain the bird in a towel and administer intravenous potassium chloride
- Administer isoflurane gas via facemask and when adequately anesthetized, administer intravenous pentobarbital

Explanation - Gas anesthesia via facemask is recommended before performing euthanasia to allow patient relaxation and easy access to the veins. Pentobarbital is a satisfactory euthanasia agent in birds.

Question

Septicemic cutaneous ulcerative disease (SCUD) in turtles is most commonly caused by which pathogen?

- Citrobacter freundii
- Aeromonas spp
- Beneckea chitinovora
- Pseudomonas spp

Explanation - The correct answer is Citrobacter freundii. SCUD in turtles causes pitted scutes that slough with underlying purulent exudate. Petechia on the skin and liver necrosis also commonly occur. Prevention is aimed at good husbandry, and chloramphenicol is the treatment of choice.

Question

You diagnose a colony of mice with lymphocytic choriomeningitis (LCM). What is your next step?

- Notify the federal authorities
- Treat aggressively with antibiotics
- Do nothing; the disease is self-limiting
- Euthanize the colony

Explanation - The correct answer is to euthanize the colony. LCM is caused by an RNA arenavirus. The disease is a zoonotic concern, so euthanasia is recommended for animals affected with the disease.

Question

How is cryptosporidiosis treated in reptiles?

- Fenbendazole
- Metronidazole
- There is no effective treatment
- Penicillin
- Sulfa antibiotics

Explanation - The correct answer is there is no effective treatment. Clinical signs of cryptosporidiosis in reptiles include regurgitation, weight loss, and debilitation. The organism causes thickening of the gastrointestinal mucosa and loss of motility. Diagnosis is made by acid-fast staining of fresh feces or regurgitated food. Since there is no effective treatment euthanasia is often recommended.

Question

A black mouse is presented for progressive, partial alopecia that started at the face and head and progressed to the trunk. The other mouse that it is housed with appears completely normal. The underlying skin is normal. What is the most likely cause for the alopecia?

- Pattern alopecia
- Barbering or chewing of the hair by its cagemate
- Mite infestation
- Ectromelia
- Dermatophytosis

Explanation - The correct answer is barbering or chewing of the hair by its cagemate. The key to this question is that the underlying skin is normal and the cagemate is normal. Barbering commonly occurs with pigmented mice and is a behavioral occurrence.

Dermatophytosis or a mite infestation would cause crusting and scaling of the underlying skin, and the cagemate would most likely be affected as well. Ectromelia virus is a member of the family Poxviridae, and causes mousepox. Clinical signs include skin lesions and generalized disease.

Question

Which of these animals' erythrocytes are normally nucleated?

- Goat
- Chicken
- Horse
- Cat

Explanation - The correct answer is chicken. Non-mammalian vertebrates (birds, reptiles, amphibians, and fish) have nucleated red blood cells (erythrocytes). The other answer choices are all mammals.

Question

This adult Caiman is housed singly in a 100-gallon aquarium with a bark substrate, soaking area and several large logs as cage furniture with a ceramic heat bulb as well as a complete UV light source. This animal is fed primarily a fish diet. The owner does not monitor the temperature gradient in the enclosure. What is the most likely cause of scars, like these, seen along the dorsum?

- Chemical exposure
- Burns
- Mites
- Prey wounds

Explanation - Owners will very often place heat-emitting bulbs over an enclosure in an attempt to increase the temperature. If it is too close, reptiles may stay in one place and suffer burns.

Chemical exposure generally only occurs if owners do not thoroughly rinse an enclosure after cleaning with a caustic agent. However, these are more commonly seen along the ventrum.

Prey wounds occur with some frequency in animals fed live prey (usually rats or mice) if the prey is not consumed quickly, or if the reptile is anorexic. However, this caiman is not fed animals that can inflict wounds if not consumed.

Question

A Toco toucan is presented to your clinic with nondescript signs of lethargy and weight loss. The owner of this valuable bird perused the internet and found that this species of bird is highly susceptible to hemochromatosis, or iron storage disease. You run a CBC and chemistry panel and both bile acids and AST are mildly elevated. Radiographs reveal an enlarged liver. What test would you recommend to confirm your tentative diagnosis of hemachromatosis?

- Liver biopsy

- Bone marrow biopsy for iron levels
- Blood iron levels
- Liver hemotropin levels

Explanation - Liver biopsy provides the most definitive diagnosis in birds since pathology is readily seen on microscopic examination of liver tissue. Hemochromatosis occurs when too much iron accumulates in the liver and other major organs of the body. The etiology of this disease remains unknown but owners and breeders receive conflicting information regarding the influence of captive dietary iron levels and genetics. Blood tests such as serum iron levels, plasma iron binding capacity unfortunately provide inconclusive results.

Question

Rotaviral infection in mice causes which of the following clinical signs?

- Inflammation of the salivary and nasolacrimal glands
- Diarrhea with obstipation
- Subcutaneous hemorrhages
- Liver failure

Explanation - The correct answer is diarrhea with obstipation. Rotaviral infection in mice affects young mice 1-3 weeks of age. Clinical signs include soft yellow feces that stain and dry around the anus, causing obstipation and death. Diagnosis is based on clinical signs. Electron microscopy can be used for virus identification. The only treatment is to clean and remove the impacted feces.

Question

Which of these is the most common cause of seizures in the adult ferret?

- Hypocalcemia
- Idiopathic epilepsy
- Intracranial neoplasia

- Hepatic encephalopathy
- Hypoglycemia

Explanation - The correct answer is hypoglycemia. Hypoglycemia secondary to insulinoma is the most common cause of seizures in the adult ferret. Keep in mind, a prolonged seizure can actually cause hypoglycemia, so the finding of low blood glucose in a seizuring ferret does not necessarily confirm a diagnosis of insulinoma. Idiopathic epilepsy has not been reported in ferrets. Hypocalcemia and hepatic encephalopathy can cause seizures, but are not as commonly reported as hypoglycemia.

Question

An 8-month old iguana presents for further evaluation of a lack of thriving. On physical exam, a pliable mandible and maxilla are palpated. What is your diagnosis?

- Coccidioidomycosis
- This is a normal finding
- Metabolic bone disease
- Osteomyelitis

Explanation - The correct answer is metabolic bone disease. Usually, you will see bowing of the long bones with rounding of the skull in addition to the clinical findings mentioned. The disease usually occurs as a result of secondary nutritional hyperparathyroidism. When there is inadequate calcium absorbed from the diet, the parathyroid glands become hyperactive, causing release of calcium stores in the bones, leading to fibrous and pliable bones. Adequate nutrition is key to preventing this disease.

Question

Which of the following is not transmitted from non-human primates to humans?

- Rubella (measles)
- Herpesvirus B
- Salmonella
- Tuberculosis

Explanation - The correct answer is Rubella (measles). Humans are responsible for infecting non-human primates with Rubella and death can occur in primates as a result.

Question

An adult macaw presents to you for a cloacal prolapse. The cloacal tissue appears pink but blanches when 5% acetic acid solution is applied, and small fleshy proliferations are seen. What is the likely cause of the prolapse?

- Proventricular dilatation disease (PDD)
- Egg binding
- Enteritis
- Cloacal papilloma

Explanation - The correct answer is cloacal papilloma. This is the most common gastrointestinal tumor of birds, and is seen most commonly in Amazons and macaws. A viral etiology is suspected but not proven. Treatment is surgical removal or chemical cautery. Egg binding can cause cloacal prolapse, but does not cause fleshy proliferations. Enteritis and PDD are unlikely to cause prolapse.

Question

Which of the following blood tests the most liver-specific in psittacines and other birds?

- Alanine aminotransferase (ALT) and glutamine gamma-transferase (GGT)
- Bile acids and aspartate aminotransferase (AST)
- Creatine phosphokinase (CPK) and alkaline phosphatase (ALP)
- There are no useful liver specific tests for avian species

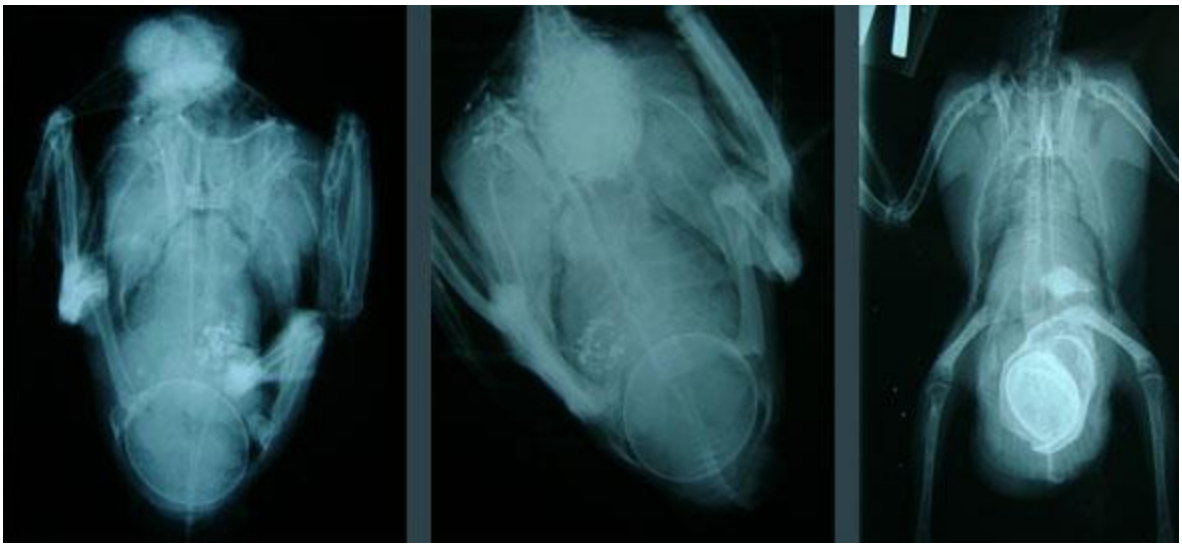
Explanation - Bile acids and AST are found to be most specific for liver disease in birds. AST is also found in muscle cells of birds and will be elevated along with CPK in muscle disorders, whereas bile acids would be normal.

Question

A parakeet presents to your clinic as a result of a recent onset of weakness, lethargy, and anorexia. On physical exam, you note the parakeet to be markedly obese. The parakeet also has cloacal straining and has a distended coelomic cavity (see image). How will you confirm your tentative diagnosis?

- Cloacal cultures
- Ultrasound
- Bloodwork
- Radiographs

Explanation - The correct answer is radiographs. Given the history and clinical signs your tentative diagnosis should be egg binding. Radiographs will help confirm this diagnosis although sometimes they are not necessary. Ultrasounding birds is unrewarding due to their air sacs which do not allow visualization of coelomic structures. Bloodwork and cloacal cultures will not confirm your tentative diagnosis in this case.



Question

A pet bird is fed an all seed diet and it develops squamous metaplasia with white plaques in the mouth and poor feather quality. What deficiency should you suspect?

- Molybdenum deficiency
- Hypovitaminosis A
- Hypomagnesemia
- Hypovitaminosis D

Explanation - The correct answer is hypovitaminosis A. An all seed diet is deficient in vitamin A. Clinical signs include a blunted choanal papilla, rhinitis, sinusitis, and loss of skin and feather quality. Other causes of white plaques in the mouth include Candidiasis, trichomoniasis, capillaria, pox virus, and papillomatosis in birds.

Question

Which of these syndromes is not caused by Pasteurella multocida in rabbits?

- Typhlitis
- Otitis media/interna
- Rhinitis/sinusitis
- Septicemia
- Abscesses

Explanation - The correct answer is typhlitis. Pasteurella is a common cause of infectious disease in rabbits and is the causative agent of "snuffles". The upper respiratory syndrome is the most common presentation for Pasteurella in rabbits, but it can affect many other systems and can cause enzootic pneumonia, otitis media/interna, conjunctivitis, meningitis, encephalitis, reproductive tract infections, abscesses, and septicemia. Typhlitis, or inflammation of the cecum, is not a condition caused by Pasteurella.

Question

A breeder presents with 3 turtles, and despite your advice not to administer ivermectin, he convinces your technician to administer ivermectin to the turtles. What can you tell the owner to expect?

- Neurologic signs
- Dermatologic signs
- Respiratory signs
- Ocular signs
- Gastrointestinal signs

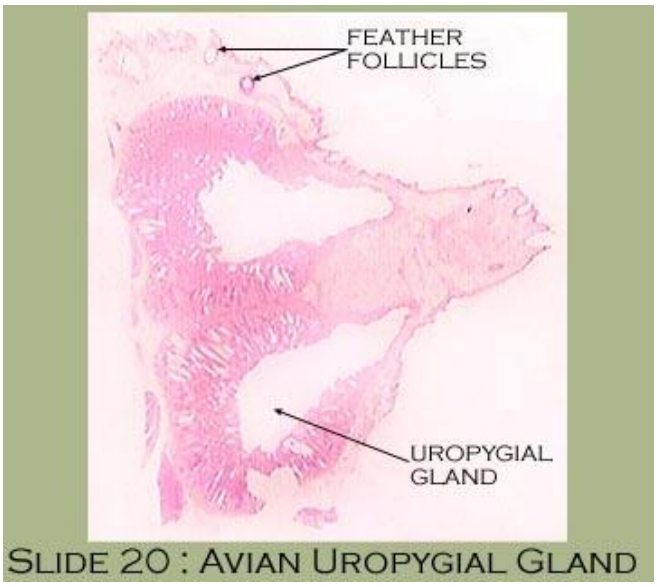
Explanation - The correct answer is neurologic signs. Ivermectin is highly toxic in turtles and causes paresis, paralysis, and death at low doses due to an ability to cross the blood-brain barrier.

Question

On a pre-purchase health examination of a seven year old green cheeked conure, you astutely notice a small, bilobed swelling at the base of the tail that has a few protruding short feathers. It feels greasy and the bird is sensitive to the touch. What do you recommend to the owner?

- Place the bird on antibiotics for a tail base infection
- Do nothing, this is a normal anatomic structure in this species
- Aspirate the contents to drain the suspected feather cyst
- Advise immediate surgical resection because it is mostly likely neoplastic in a bird this age

Explanation - The bilobed structure is known as the uropygial, or preen, gland. In many species of birds, when present, it provides a source of oil and nutrients for the bird's feathers. Interestingly, not all birds have a uropygial gland. Those without a preen gland include Amazon parrots and several macaw species such as Blue Hyacinth. Aspiration can damage the gland, and surgical resection will cause life-long problems for the bird.



Question

Clinical signs of transmissible murine colonic hyperplasia are seen in mice of which age group?

- Greater than 12 months of age

- 2-4 weeks of age
- Less than 2 weeks of age
- 6 to 12 months of age

Explanation - The correct answer is 2-4 weeks of age. The disease is caused by Citrobacter freundii strain 4280. It is a gram negative enteric bacterium. Clinical signs include anorexia, dehydration, and diarrhea. Histopathology shows thickening and inflammation of colonic mucosa. Adults show no clinical signs. The disease is highly contagious but self-limiting. Treatment includes neomycin or tetracyclines.

Question

An adult rabbit presents to you for chronic mucopurulent nasal discharge and sneezing. Which of these agents is likely responsible for the rabbit's clinical signs?

- Eimeria stediae
- Treponema cuniculi
- Pasteurella multocida
- Clostridium spiroforme

Explanation - The correct answer is Pasteurella multocida. This is a common cause of infectious disease in rabbits and is the causative agent of "snuffles". Of the choices listed, Pasteurella is the only respiratory pathogen. The upper respiratory syndrome is the most common presentation for Pasteurella in rabbits, but it can affect many other systems and can cause enzootic pneumonia, otitis media/interna, conjunctivitis, meningitis, encephalitis, reproductive tract infections, abscesses, and septicemia.

Question

Clostridium piliformis is the causative agent of what disease in mice?

- Pseudotuberculosis
- Mouse hepatitis
- Tyzzer's disease
- Transmissible murine colonic hyperplasia
- Sialodacryoadenitis

Explanation - The correct answer is Tyzzer's disease. Clostridium piliformis (aka Bacillus piliformis) is a gram negative rod that usually causes a subclinical infection, unless the mouse is stressed or immune suppressed. Clinical signs include diarrhea, kyphosis, poor haircoat, and death. Histopathologic lesions include focal areas of hepatic necrosis and inflammation of the terminal ileum. Diagnosis is based on serology or identification of the organism on histopathology.

Transmissible murine colonic hyperplasia is caused by Citrobacter freundii. Sialodacryoadenitis is caused by the sialodacryoadenitis virus (a corona virus), and only infects rats. Mouse hepatitis is caused by the mouse hepatitis virus (corona virus). Pseudotuberculosis is caused by Corynebacterium kutscheri.

Question

A deceased adult Red Tailed Hawk presents to you for necropsy after long standing respiratory disease. You find white plaques on the air sacs and caseous plugs in the distal trachea. What disease do you suspect?

- Trichomoniasis
- Candidiasis
- Internal papillomatosis
- Aspergillosis

Explanation - The correct answer is aspergillosis. This is caused by Aspergillus fumigatus. It is common among raptors, penguins, and waterfowl but not psittacines except under poor husbandry, stress, or immunodeficiency. Transmission is by inhalation of spores. There may be a history of respiratory signs (acute or chronic). Findings include fungal plaques on the air sacs and thickening of the air sacs. Antemortem diagnosis can be made by transtracheal wash with culture and cytology. Treatment is with antifungals such as amphotericin B or -azole antifungal agents.

Question

What antibiotic is contraindicated for use in guinea pigs?

- Enrofloxacin
- Chloramphenicol
- Trimethoprim-sulfa
- Streptomycin

Explanation - The correct answer is streptomycin. Guinea pigs are particularly sensitive to many antibiotics including penicillin, ampicillin, bacitracin, lincomycin, vancomycin, erythromycin, and clindamycin. Streptomycin can be directly toxic and result in death and therefore should never be used in this species.

In rodents, three of the antibiotics used most commonly are Enrofloxacin, Chloramphenicol and TMS. These antibiotics are the most commonly used because hamsters, guinea pigs, and other rodents are prone to developing enterotoxemia from many other antibiotics that disturb their normal intestinal microflora.

Question

A female cockatiel is presented to your clinic for lethargy and poor condition. A thorough history reveals that she has produced an egg every three days for the past 3-4 weeks. Which of the following drugs is used to help stop chronic egg laying in this bird?

- PGF2-alpha (Lutalyse)
- Leuprolide acetate (Lupron)

- Methylprednisolone (Depo-Medrol)
- Progesterone

Explanation - Leuprolide acetate is a gonadotropin releasing hormone (GNRH) analog and will shut down the production of reproductive hormones in birds, thus, will often stop ovulation in the laying hen. Female birds are capable of producing eggs (infertile) without the presence of a male, just as chickens do.

Question

A 4-year old female ferret presents with a history of an enlarged vulva and truncal alopecia. What is the most likely diagnosis?

- Adrenal tumor
- Sertoli cell tumor
- Insulinoma
- Hypothyroidism

Explanation - The correct answer is adrenal tumor. These tumors are very common in middle-aged ferrets and usually secrete estradiol. Common clinical signs are hair loss, enlarged vulva, pruritus, and behavior changes. Diagnosis is made by clinical signs, ultrasound, and measurement of serum estradiol levels. Treatment is adrenalectomy.

Question

The avian Polyoma virus primarily affects which of the following?

- Young psittacines
- Young passerines
- Old passerines
- Old psittacines

Explanation - The correct answer is young psittacines. The disease most prominently affects nestling psittacines and causes delayed feathering, diarrhea, gastrointestinal stasis, ascites, subcutaneous hemorrhages, and death. Some animals may develop melena, hematuria, and green urates. Necropsy findings include enlarged, pale, mottled liver and spleen, which may have white pinpoint foci, petechiations, and ecchymoses. Intranuclear inclusion bodies are sometimes found in tissue samples. A vaccine is now available for the virus.

Question

Which of the following statements is true about pinworm infections in mice?

- Infections always result in diarrhea
- There is no good treatment for pinworms in mice
- The worms inhabit the descending colon in mice
- Heavy parasite loads may lead to rectal prolapse

Explanation - The correct answer is heavy parasite loads may lead to rectal prolapse. Pinworms (Syphacia obvelata and Aspicularis tetraptera) in mice inhabit the cecum. Most infections are subclinical and treatment involves administration of piperazine sulfate. Ivermectin may be used as well.

Question

Which antibiotic must you not give reptiles in the caudal half of the body?

- Gentamicin
- Doxycycline
- Enrofloxacin
- Ampicillin

Explanation - The correct answer is gentamicin. It is important to remember that reptiles have a renal-portal system in which blood from the caudal half of the body passes through the kidneys before returning to the heart. Therefore, administration of a potentially nephrotoxic drug, as are all aminoglycosides, would be contraindicated in the caudal half.

Question

A well-known bird breeder calls to let you know she is bringing in a parrot on emergency with a "tear in the rhamphotheca and a lacerated choana". What anatomic structures should you be prepared to examine?

- The cervical vertebra and nostril openings
- The beak and the open slit located on the roof of the oral cavity
- The boney prominence on the most caudal portion of the sternum and opening to the trachea
- The distal portion of the scapula and the anal opening

Explanation - The boney beak, bill or rostrum of a bird is covered with a thin horny sheath of keratin that is technically known as the rhamphotheca. The choana is the passageway for air from the nasal respiratory system into the oral cavity and is a single slit-like structure on the roof of the mouth in birds.

Question

An African grey parrot died of sudden respiratory distress after the owner burnt her pancakes while cooking breakfast. Which of the following is the toxin that kills birds when nonstick cookware is overheated?

- Carbon monoxide
- Lead
- Polytetrafluoroethylene
- Chlorofluorocarbons

Explanation - The correct answer is polytetrafluoroethylene. Also referred to as Teflon toxicosis, this compound is released when non-stick cookware is overheated and is extremely toxic when inhaled by pet birds. Carbon monoxide is also an inhaled toxicant, but is not released by non-stick cookware. Lead is toxic when ingested.

Question

Red leg in frogs is a result of _____.

- Fungal infection
- Bacterial septicemia
- Courtship

- Environmental toxins

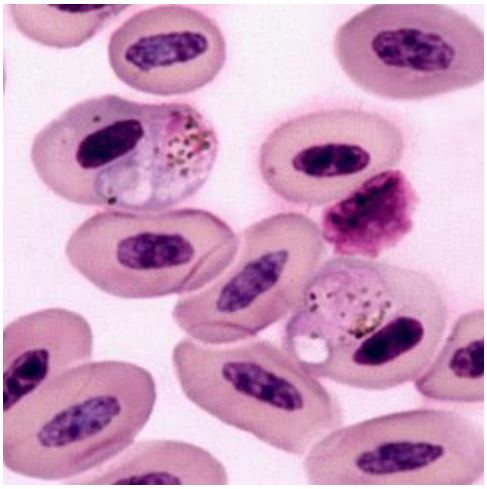
Explanation - The correct answer is bacterial septicemia. Aeromonas hydrophila is classically associated with red leg, but other organisms have been implicated as well. The condition occurs with poor husbandry, trauma, or immunocompromise.

Question

What is the mode of transmission of Plasmodium in birds?

- Mosquitoes
- Direct body contact
- Contact with feces
- Aerosol transmission
- Fomites

Explanation - The correct answer is mosquitoes. Plasmodium is an intraerythrocytic parasite of birds. The nucleus of erythrocytes is often displaced to the periphery of the red blood cell in certain stages of the parasite's life cycle. It most commonly affects passerines and is transmitted by mosquitoes. The gametocytes often contain a yellow-brown iron pigment. Many birds are asymptomatic, but the disease may cause hemolytic anemia.



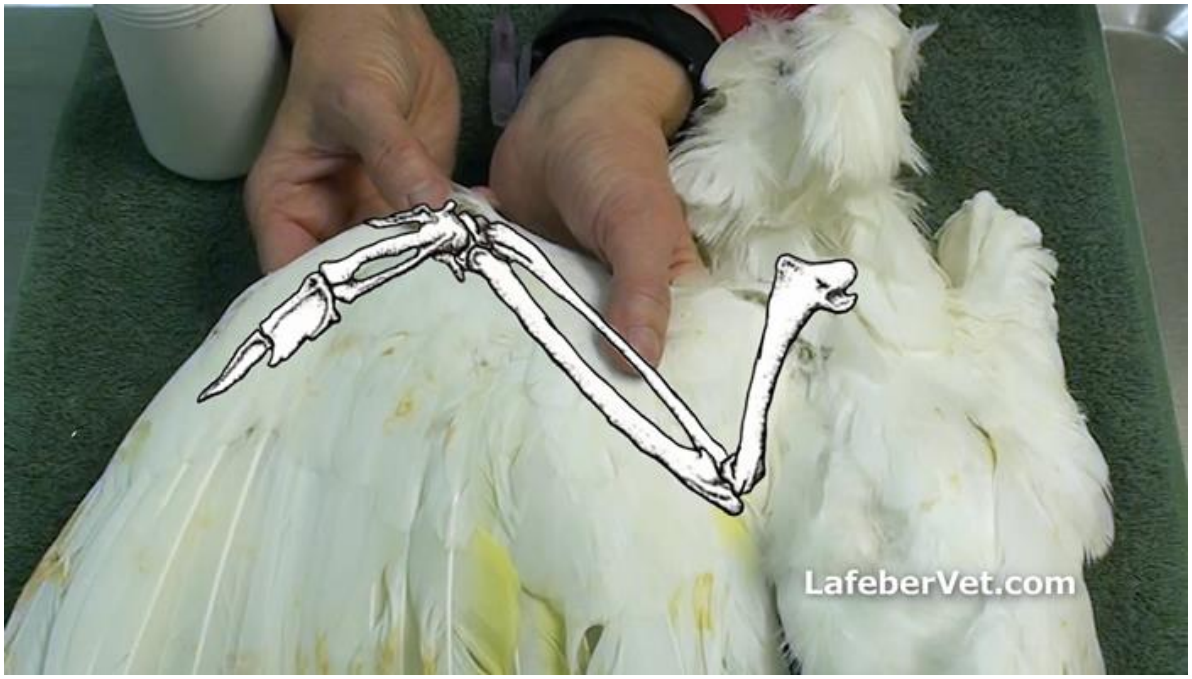
Question

When placing an intraosseous catheter in a bird, which of the following bones would be the most appropriate to use?

- Coracoid
- Femur

- Ulna
- Radius
- Humerus

Explanation - Intraosseous catheters can be placed in birds in either the ulna or the tibiotarsus. Birds have pneumatized bones, and these must be avoided with IO catheters, since administration of fluids into a pneumatic bone would drown the bird. The humerus and femur are both pneumatic. The coracoid is not accessible for placement of a catheter. The radius is not a pneumatic bone, but in the bird, the radius is the smaller of the two bones of the antebrachium and is generally too small to use for catheterization.



Question

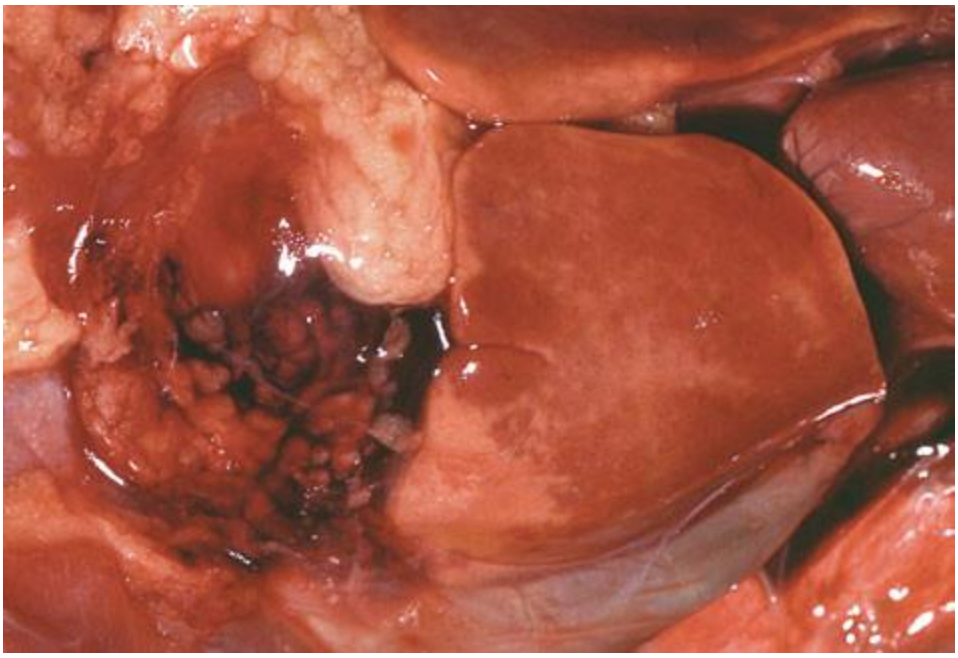
An adult chameleon was purchased by an owner one year ago and presents to your clinic with signs of anorexia, decreased activity, and lameness of its left rear leg. The majority of the new owner's chameleon's diet is cat food with occasional insects. The chameleon's enclosure is temperature-regulated and has multiple features on which to climb and hide. Given the history and clinical presentation, what must you rule out?

- Articular gout
- Salmonella
- Hepatic lipidosis
- Metabolic bone disease

Explanation - The correct answer is articular gout. The key to this question is to note the feeding of cat food. Cat food is too high in protein for reptiles. Reptiles have an inability to process large amounts of protein, thus uric acid may subsequently deposit in the joints. Furthermore, chameleons are primarily insectivorous so the diet is inappropriate. Therefore, this is the most reasonable answer for this presentation in a captive chameleon on a sub-optimal diet. Cat food would not be expected to cause metabolic bone disease or hepatic lipidosis.

Question

A 1-year-old macaw is presented to you for necropsy after recent arrival at a pet shop subsequent to quarantine. It had acutely become anorexic and depressed with ruffled plumage. At necropsy, you find necrotic foci in the liver (see image) and kidneys as well as splenomegaly. Histopathology shows Cowdry type-A intranuclear inclusion bodies in the liver and renal parenchyma. Which of these is a likely diagnosis?



- Avipoxvirus infection
- Marek's disease
- Newcastle disease
- Infectious coryza
- Pacheco's disease

Explanation - The correct answer is Pacheco's disease, caused by a herpes virus. The incubation for this disease can be longer than most quarantine periods. The clinical findings and necropsy results are consistent with this infection, and the finding of the inclusion bodies confirms the diagnosis.

Marek's disease is also caused by a herpesvirus, and is characterized by lethargy and unilateral leg paresis.

Avipoxvirus infection causes scabbing skin lesions or diptheric lesions in the respiratory tract.

Infectious coryza is a bacterial disease that causes nasal discharge and facial swelling.

Newcastle virus causes signs that can range from respiratory, GI, or neurologic signs.

Question

Why should rabbits and guinea pigs never be housed together?

- Risk of transmission of Bordetella from rabbits to guinea pigs
- Risk of transmission of Bordetella from guinea pigs to rabbits

- Risk of transmission of Pasteurella from rabbits to guinea pigs
- The guinea pigs will attack and kill the rabbits until there are none left
- Risk of transmission of Pasteurella from guinea pigs to rabbits

Explanation - The correct answer is risk of transmission of Bordetella from rabbits to guinea pigs. Bordetella is a normal inhabitant of the oropharynx of rabbits but is pathogenic to guinea pigs.

Question

In macaque monkeys, this relatively non-pathogenic disease can cause a fatal encephalitis if transmitted to humans.

- Herpes simiae
- Tuberculosis
- Hepatitis B
- Measles

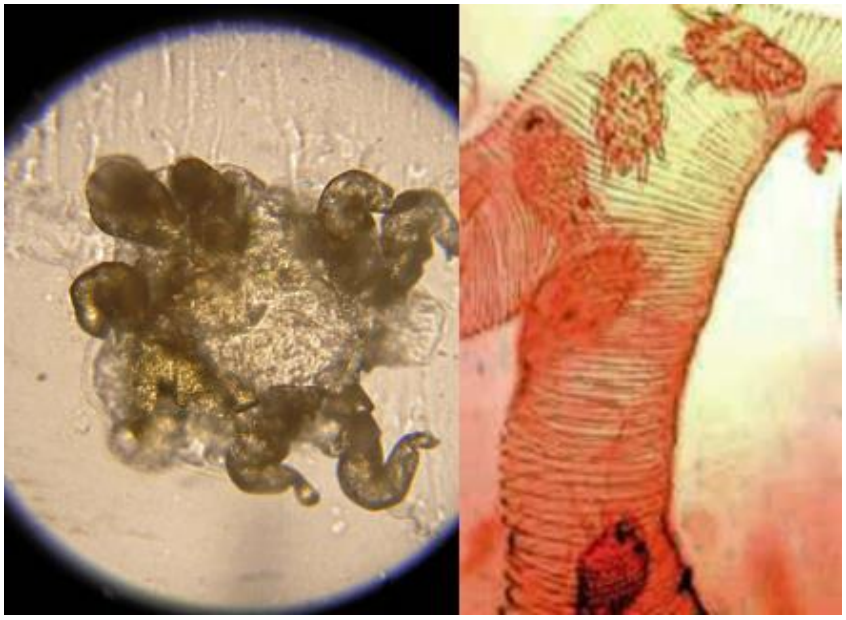
Explanation - The correct answer is Herpes simiae. This is a herpes B virus. Old world monkeys can transmit this disease by bite or scratch. Macaques are the most frequent carriers. In monkeys, the disease can cause mild cold sore like lesions in times of stress. This strain of herpes is potentially fatal to humans. Similarly, humans carry a strain of herpes (herpes simplex virus) which can cause fatal encephalitis in monkeys. Hepatitis B, tuberculosis, and measles are all zoonotic, but do not cause encephalitis.

Question

A multi-finch aviary is having an outbreak of ill birds. The owner brings one of the affected birds to you. It is dyspneic with pronounced expiratory noise. You suspect the bird has Sternostoma tracheacolum. A helpful test to aid in the diagnosis would be?

- Radiographs of nasal passages
- Aspergillus titer
- Tracheal transillumination
- Fungal culture of the trachea

Explanation - Sternostoma tracheacolum is also known as the air sac mite. It is contagious and often causes dyspnea and respiratory distress in certain finch species. It can sometimes be visualized within the trachea of these tiny birds by wetting the feathers of the neck and placing a small, bright light source across the trachea. The other answer choices would not help to diagnose this mite.



Question

What is the approximate daily water requirement for a rabbit?

- 60 ml/kg
- 120 ml/kg
- 30 ml/kg
- 240 ml/kg

Explanation - The correct answer is 120 ml/kg day. This is considerably higher than a dog or cat.

Question

An Amazon parrot presents to your clinic with the history of being polyuric and polydypsic (PU/PD), overweight, lethargic and recently inappetant. What is the most likely diagnosis?

- Adrenal tumor
- Diabetes mellitus
- Renal gout
- Viral pyelonephritis

Explanation - Birds with diabetes mellitus have clinical signs and blood results similar to other animals including hyperglycemia, glucosuria and increased thirst and urine production. This is not an uncommon disease in captive birds and is likely due to poor diet, lack of exercise, poor condition and obesity. Treatment options include insulin injections and oral medications such as glipizide.

Question

What is the maximum amount of blood that can be safely drawn from a healthy adult 100 gram Cockatiel?

- 5 ml
- 0.3 ml
- 0.03 ml
- 3 ml
- 1 ml

Explanation - It is safe to take up to 1% of a bird's weight in a blood draw (converting grams to ml).

In this case, the bird is 100 grams. 1% of 100 = 1

Question

What is the appropriate medication for the treatment of Psittacosis (Chlamydophila psittaci)?

- Metronidazole
- Enrofloxacin
- Rifampin
- Fenbendazole
- Doxycycline

Explanation - The only approved treatments for Chlamydophila are tetracyclines such as doxycycline and oxytetracycline. Generally the duration of treatment must be AT LEAST 45 DAYS. Enrofloxacin may decrease the number of organisms and bacterial shedding of Chlamydophila but it is not an approved treatment. Chlamydophila is a reportable disease in most locations. The other medications listed are not appropriate for treatment of Chlamydophila.

Question

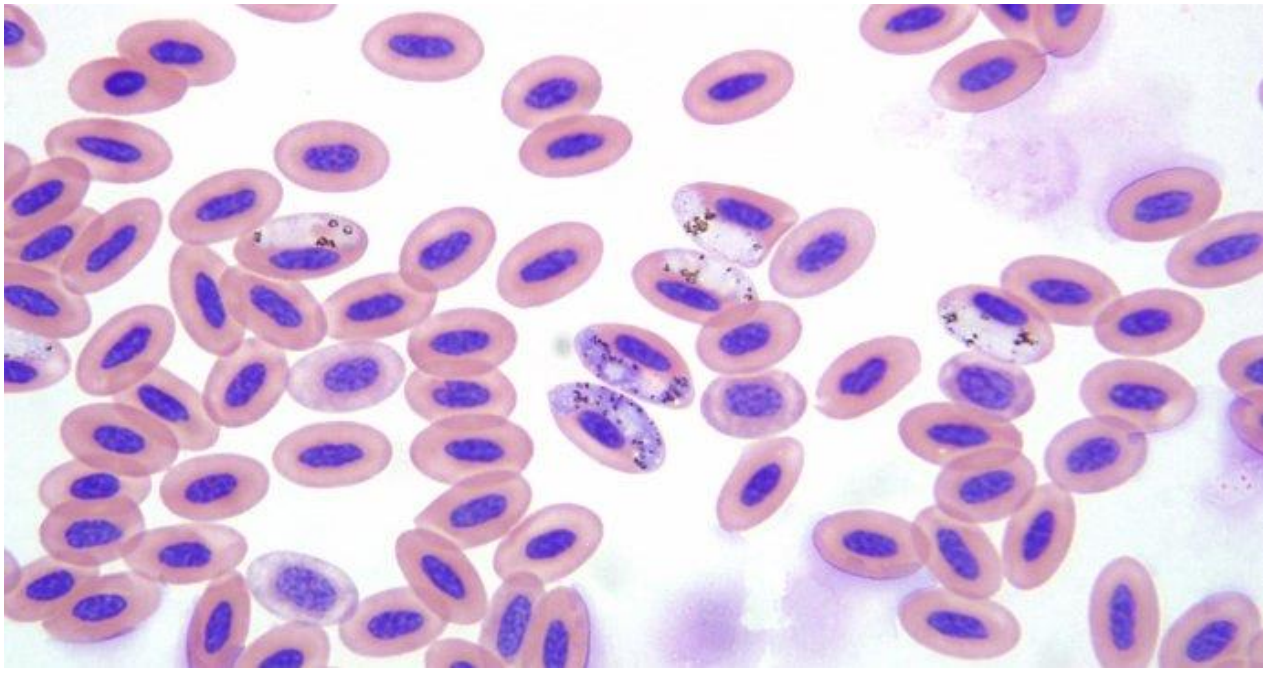
An adult cockatiel presents for shifting leg lameness and an inability to bend the toes. An aspirate from a swollen toe shows spindle-shaped crystals cytologically. What is your diagnosis?

- Visceral gout
- Septic polyarthritis
- Immune mediated polyarthritis
- Synovial gout

Explanation - The correct answer is synovial gout. This disease occurs when uric acid crystallizes in the synovium and causes lameness. The underlying pathophysiology is not completely understood, but renal disease is found in many affected birds; treatment generally consists of a low-protein diet, allopurinol, and addressing underlying renal disease. Visceral gout affects the surfaces of the visceral organs. Septic polyarthritis and immune-mediated polyarthritis would not show spindle-shaped crystals.

Question

A dove from a bird sanctuary is brought to your clinic because it has been displaying signs of weakness. You perform a blood smear and see the abnormality shown in the image below. What is your diagnosis?



- Haemoproteus
- Leucocytozoon
- Dipetolonema
- Babesia

Explanation - Diagnosis of Haemoproteus infection is made by microscopic examination of a peripheral blood smear. Haemoproteus gametocytes partially encircle the nucleus of erythrocytes forming a "halter-shaped" appearance. Haemoproteus gametocytes often occupy over one-half of the erythrocyte cytoplasm with little displacement of the host cell nucleus as seen here.

The haemoproteus life cycle involves a blood sucking insect for transmission (mosquitos, lice, and culicoides). The infection often does not cause clinical signs but may cause an enlarged gizzard, spleen, liver, or kidney. Treatment of choice is the antimalarial drug, chloroquine.

Question

Which of the following is a feature of avian anatomy or physiology?

- 18 air sacs
- Neutrophils are the predominant type of circulating white blood cell
- A 4-chambered heart
- Incomplete tracheal rings

Explanation - The correct answer is 4-chambered heart. Birds have heterophils instead of neutrophils, which essentially serve the same function as neutrophils. Remember, birds will always have complete tracheal rings, which makes them unique compared to most other species. As a general rule of thumb, birds have 9 air sacs.

Question

A 5-year old female intact New Zealand White rabbit presents for hematuria, anorexia, and weight loss. What is the most likely differential?

- Rabbit syphilis
- Porphyrinuria
- Uterine adenocarcinoma
- Pregnancy

Explanation - Uterine adenocarcinoma is the most common neoplasia of female rabbits, with up to 80% incidence among intact females of certain species. Because of this, all female rabbits that are not breeders should be spayed. The most common signs of uterine ACA are hematuria, anorexia, depression, dysuria, and milk production. Pregnancy would be unlikely to cause hematuria. Rabbits are induced ovulators and do not exhibit estrous. Hematuria must be distinguished from porphyrinuria, which is a normal red or orange pigment in the urine of some rabbits. However, porphyrinuria does not cause anorexia and weight loss. Rabbit syphilis is a sexually transmitted disease caused by Treponema paraluis cuniculi. It causes perineal lesions but does not cause hematuria.

Question

Which of the following foods is considered toxic to parrots?

- Habanero peppers
- Avocado
- Cheese
- Blueberries
- Chicken

Explanation - A toxin found in the Guatemalan type of avocado causes myocardial necrosis in parrots. Blueberries and peppers (even "hot" peppers) are not toxic to psittacines. Chicken and cheese are high in fats and are not appropriate to feed parrots, but there is no toxicity associated with them.

Question

Which of the following diseases is not commonly associated with beak abnormalities?

- Polyoma virus
- Psittacine beak and feather disease
- Cnemidocoptes infestation
- Liver failure

Explanation - The correct answer is Polyoma virus. The virus usually results in lethargy, anorexia, depression, and death. The death may be acute in nature, and it is likely that there will be no beak abnormalities. Whenever you observe beak abnormalities, you should rule out liver disease. Cnemidocoptes infestations lead to a honeycomb-like beak.

Question

The most appropriate site for tuberculosis testing in monkeys is _____.

- Subcutaneously in the abdomen
- Intradermally in the lip
- Intradermally in the eyelid
- Intradermally in the tail fold

Explanation - The correct answer is intradermally in the eyelid. This allows for easy reading at 24, 48, and 72 hours from a distance. Old world monkeys will usually acquire tuberculosis from man.

Question

Cilia-associated respiratory (CAR) bacillus infection in rats is associated with which other bacteria?

- Salmonella typhimurium
- Mycoplasma pulmonis
- Corynebacterium kutscheri
- Clostridium piliforme

Explanation - The correct answer is Mycoplasma pulmonis. CAR bacillus is a gram negative bacterium that causes severe bronchiectasis, pulmonary abscesses, and atelectasis. It is found with Mycoplasma pulmonis when respiratory signs are evident in rats. It is not known if CAR bacillus alone can cause respiratory signs. The disease is poorly understood, so control measures are aimed at improving husbandry.

C. kutscheri is a bacterial cause of pneumonia in rats, but does not have a synergistic relationship with viruses the way Mycoplasma does. S. typhimurium and C. piliforme do not cause respiratory signs.

Question

A pet ferret presents to you for a prolapsed rectum. Upon questioning the owner, you determine that the ferret has had chronic diarrhea and weight loss with green stool containing mucus. On physical exam, you palpate thickened intestine and enlarged mesenteric lymph nodes. What condition do you most strongly suspect?

- Eosinophilic gastritis
- Helicobacter mustelae gastritis
- Lymphosarcoma
- Proliferative bowel disease

Explanation - The correct answer is proliferative bowel disease. This is a fairly common condition of ferrets and causes the signs described. Ferrets do get lymphoma with some frequency but usually get mediastinal or multicentric lymphoma rather than gastrointestinal. Gastritis should not cause mucus in the stool, tenesmus, or rectal prolapse.

Question

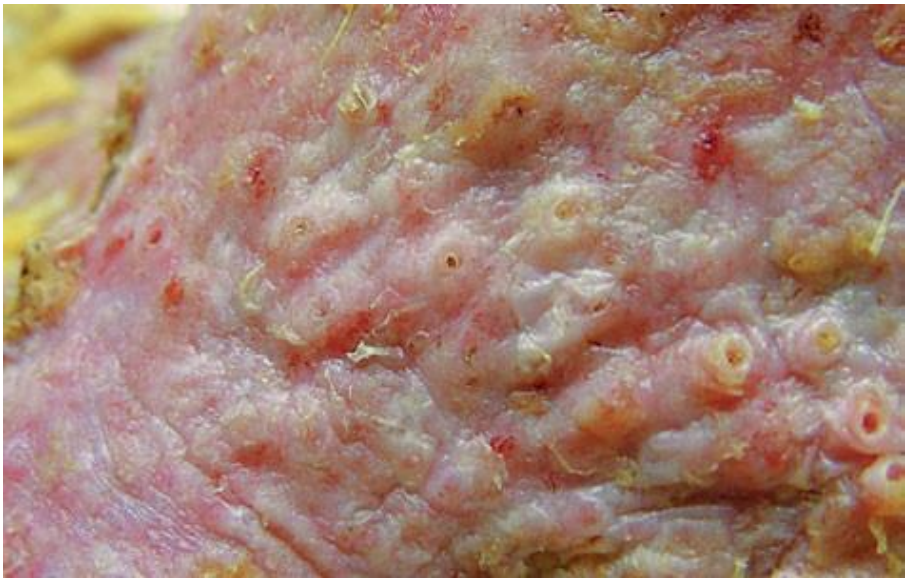
What is the primary mode of transmission of West Nile Virus (WNV) between birds?

- Via feces
- Via saliva
- Via placenta
- Via mosquitoes
- Via Cnemidocoptes mites

Explanation - Mosquito vectors are the primary mode of transmission for WNV between birds and other hosts (horses, humans). There are infrequent documented cases of the disease being spread by feces or saliva. No mites have been documented to transmit the disease. Birds do not have a placenta.

Question

A 7-year old cockatoo presents to you for evaluation of the skin. The owner reports the skin lesions seem to have started shortly after an incident when the bird was "mouthed" by the family dog but did not appear to be significantly injured at the time. On your examination, you note the skin lesions shown in the photo. You perform a biopsy and culture of the region which confirms Staphylococcal dermatitis. Which of the following antibiotics is useful against Staphylococcus when administered orally (including in water or food) in birds?



- Amoxicillin
- Terbinafine
- Metronidazole
- Oxytetracycline

Explanation - Amoxicillin is effective against Gram-positive bacteria, especially Staphylococcus. It is absorbed orally and can be administered in water to birds with susceptible bacterial infections.

Metronidazole is useful in birds against anaerobic infections such as Clostridium and some motile protozoa such as Trichomonas, Giardia and Cochlosoma.

Ketoconazole is an antifungal sometimes used for Candida infections. Terbinafine is an antifungal used to treat Aspergillus

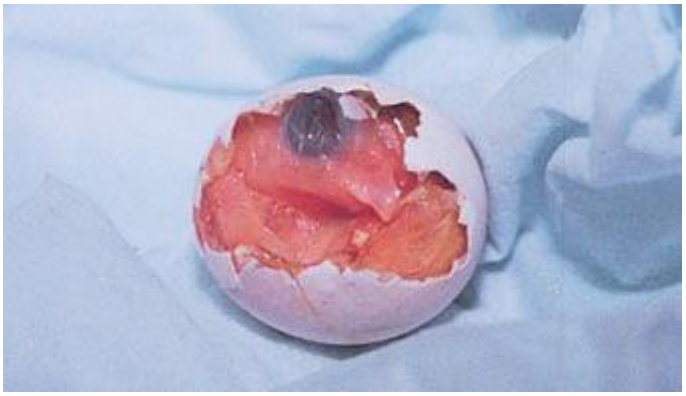
and dermatophytes.

Gentamicin is toxic to birds.

Oxytetracycline is poorly absorbed orally and is given intramuscularly although it can cause irritation/necrosis at injection sites.

Question

A breeding pair of blue and gold macaws (Ara ararauna) are laying eggs that are being taken for artificial incubation. As seen in the image below, several of the eggs have died near hatch (between 21-24 days of incubation). Egg necropsy, combined with microbiology, demonstrates a bacterial infection with Pseudomonas aeruginosa. Which of the following could be performed to try to salvage the remaining eggs in the incubator?



- Inject eggs with nystatin
- In-ovo vaccination with Pseudomonas bacterin
- Decrease incubation temperature
- Increase incubation temperature
- Inject eggs with piperacillin

Explanation - A normal, healthy egg should hatch sterile. Occasionally, eggs may be infected by low level bacterial contamination. Infection may occur as a result of ovarian, oviductal or cloacal infection. Contamination is by minute cracks or pin-holes in the shell at the time of handling or egg collection.

All eggs should be candled so that any non-viable eggs may be removed from the incubator prior to possible contamination of healthy eggs. The incubator should be sanitized.

Pseudomonas infection in eggs can be treated by injection of an appropriate antibiotic such as piperacillin. A small hole is drilled, using a sterile 27 gauge needle over the air cell, and the antibiotic is injected into the air cell. The hole is sealed with white, water-soluble glue (being careful not to cover additional areas of the shell as this would reduce water loss from the egg during incubation). Any chick that hatches should be cultured for bacteria immediately upon breaking open the shell, and antibiotic therapy should be commenced depending on the culture results. Nystatin should be given concurrently at 100,000 U per 400 g of body weight to prevent secondary infections with Candida spp.

Question

A 16-year old budgerigar presents with progressive unilateral paresis of the right leg (see image). There is normal flexion and extension of the hip joint with decreased flexion, extension, and sensation below the knee. The remainder of your skeletal and neurologic examination is unremarkable. Which of the following is most likely in this bird?

- Renal neoplasia
- Marek's disease
- Intervertebral disc disease
- Lead toxicosis
- Botulism

Explanation - The signalment and progressive unilateral paresis are most suspicious for renal neoplasia of budgerigars. Affected birds develop paresis due to pressure exerted on the sciatic nerve by a renal tumor. There is typically normal flexion and extension of the hip joint with decreased flexion, extension, and sensation below the knee as described here.

Disc disease is uncommon in birds. Lead toxicity can lead to peripheral neuropathy and paresis but typically there are more multifocal or other accompanying signs such as polyuria/polydipsia, gastrointestinal signs, wing droop, head tilt, or convulsions. Marek's disease typically affects younger animals. Botulism typically presents with flaccid paralysis of the legs, wings, and neck.

Question

Use of oral ampicillin in a rabbit is most likely to precipitate which of the following?

- Treponemiasis
- Aspergillosis
- Clostridial enterotoxemia
- Candidiasis
- Colibacillosis

Explanation - The correct answer is clostridial enterotoxemia. Because the rabbit GI tract is composed primarily of gram positive bacteria, use of oral antibiotics with a gram positive spectrum disrupt the normal balance of flora and allow for growth of clostridium difficile or clostridium spiroforme which can cause severe, sometimes fatal enterotoxemia.

Question

A client presents a lilac crowned Amazon parrot to your clinic on emergency with complaints of lethargy, respiratory symptoms and inappetance. During initial examination, the client informs you that, coincidentally, she has had a fever, chest tightness and sore throat for the past two days. You recommend that the client immediately go see a physician because you are worried that they may have contracted a disease from this bird. What zoonotic disease do you suspect may be the cause of the clinical signs in your client?

- Chlamydophila psittaci
- Bird scratch fever
- Polyomavirus
- Avian papillomatosis

Explanation - Chlamydophila psittaci is the highly contagious, causative bacterial organism of avian chlamydiosis and is a recognized zoonotic disease. This disease is also known as psittacosis or 'parrot fever' in man and you should advise your client to seek medical attention. Bird scratch fever does not exist. Polyomavirus and avian papillomatosis are not zoonotic diseases.

Question

An iguana presents to your clinic on an emergency basis because the owner noticed the iguana's tongue is very dark red in color. What is your next step?

- Evaluate the iguana for respiratory disease
- Screen the iguana for metabolic bone disease
- Begin aggressive broad spectrum antibiotic therapy
- Tell the owner this is normal for iguanas

Explanation - The correct answer is tell the owner this is normal for iguanas. It is of common occurrence that owners suddenly pay attention to their iguana's tongue and note that they are darkly pigmented. If the owner is not properly educated they will likely mistake it for a sign of disease or distress.

Question

A juvenile tortoise presents for difficulty eating due to an overgrown beak. You trim the mouth parts to make a more normal conformation. What do you tell the owner regarding management of the tortoise?

- The tortoise will require beak trimmings until it reaches its full size
- The condition usually does not recur after the first trimming
- The condition usually recurs from primary malocclusion and will likely need long term maintenance
- Calcium supplementation will prevent requiring future beak trimmings

Explanation - The correct answer is the condition usually recurs from primary malocclusion and will likely need long term maintenance. Abnormal beak growth in turtles is often associated with hypocalcemia causing distortion of the skull as the animal grows. Supplemental calcium is unlikely to affect the skull's formation once distortion has already occurred.

Question

A turtle presents with a history of lethargy, anorexia, and swelling of the ears. What is the treatment of choice?

- Corticosteroids
- No treatment, the condition is self-limiting
- Lance tympanic membranes to drain material and begin supplementation of vitamin A
- Euthanasia

Explanation - The correct answer is to lance the tympanic membranes and begin supplementing with vitamin A. Accumulations in the ear due to squamous metaplasia and secondary infection can result from vitamin A deficiency. The best thing to do is start systemic antibiotics, drain the ears, and provide appropriate nutrition.

Question

A 12-year-old female Scarlet Macaw from a large aviary presents for regurgitation, weight loss despite a good appetite, polyuria, and passage of undigested seeds in the feces. Which of the following is the most likely differential?

- Pacheco's disease (Herpes virus)
- Candidiasis
- Proventricular dilatation syndrome
- Hypovitaminosis A
- Capillaria

Explanation - Proventricular dilatation syndrome, also known as PDS, PDD or Macaw wasting disease, can affect many species of birds in addition to macaws. Clinical signs of regurgitation, weight loss despite a good appetite, polyuria, and passage of undigested seeds are characteristic, but may also include neurologic signs. The histopathologic lesion is a lymphoplasmacytic ganglioneuritis. Pacheco's disease causes acute liver necrosis and associated clinical signs, including sudden death. Hypovitaminosis A generally causes oral plaques and other types of squamous metaplasia. Capillaria is an intestinal parasite and may cause diarrhea or weight loss. Candidiasis is an overgrowth of yeast in the crop and may cause regurgitation but not the other signs.

Question

A one year old rescued iguana presents for further evaluation as a result of poor growth. Survey radiographs show osteopenia and evidence of remodeling suggestive of a previous fracture. What is the most likely diagnosis?

- Gout
- Primary hypoparathyroidism
- Metabolic bone disease
- Hypovitaminosis C

Explanation - The correct answer is metabolic bone disease. Other things to look for are a pliable mandible and maxilla. Usually, you will see bowing of the long bones with rounding of the skull. The disease usually occurs as a result of secondary nutritional hyperparathyroidism or hypovitaminosis D. Gout results from a primary overproduction of uric acid or an inability to excrete uric acid.

Question

Which of the following statements about rabbit teeth is correct?

- All of the rabbit's teeth are open-rooted but only the incisors are continuously growing
- Only the rabbit's canine teeth are open-rooted and continuously growing
- Only the rabbit's incisors are open-rooted and continuously growing
- All of the rabbit's teeth are open-rooted and continuously growing

Explanation - The correct answer is all of the rabbit's teeth are open-rooted and continuously growing. Rabbits do not have canine teeth but have a diastema between the incisors and premolars. Because their teeth continually grow, dental malocclusion necessitates teeth trimming since the teeth do not wear down and grow continuously.

Question

A 1-year old male guinea pig presents to you for anorexia. Physical examination reveals painful, swollen stifles, and loose incisors. The guinea pig is fed a diet of 100% Timothy hay. What is the most likely etiology?

- Metastatic Mineralization
- Dental abscess
- Trauma
- Hypovitaminosis C
- Rodenticide toxicity

Explanation - Guinea pigs lack the enzyme to convert glucose to ascorbic acid and therefore have a dietary requirement for vitamin C. Inadequate vitamin C in the diet leads to collagen defects, with painful, swollen stifles the most common clinical sign. Other signs include anorexia and loose teeth/dental malocclusion.

Trauma or rodenticide toxicity could cause swelling and pain in the stifles, but these are not likely to cause loosening of the teeth. Metastatic mineralization is generally an incidental finding in guinea pigs on necropsy. Dental abscesses are associated with malocclusion but would not affect the stifles.

Question

You are examining a rabbit on annual exam and note shedding, scaling, and dandruff along the dorsum. You collect a sample on clear tape for cytology and identify a mite. What mite of rabbits commonly causes the clinical signs described?

- Chorioptes
- Psoroptes cuniculi
- Cheyletiella
- Demodex

Explanation - The correct answer is Cheyletiella. This is the fur mite seen in rabbits. Psoroptes cuniculi is the ear mite of rabbits. Chorioptes is a mite that infests livestock. Cheyletiella can infest dogs, cats, and humans.

Question

A 6-year old Sun Conure presents for evaluation of a skin lesion. The owner reports that the bird is very sensitive on the wing near the lesion. On your exam, you note an oval swelling involving the feather follicle as seen in the image below. What is the best treatment for feather cysts?

- Lance and drain the feather cyst, flush with saline
- Treat with systemic antibiotics for 4-6 weeks
- Squeeze and express the material out of the feather cyst
- No treatment is necessary as feather cysts typically resolve spontaneously
- Surgical removal of the feather cyst and follicle

Explanation - Feather cysts are the avian equivalent of an ingrown hair. A growing feather is unable to protrude through the skin and curls within the follicle. Since feathers are much larger than hairs, cysts can be quite large and painful. They commonly are found in the primary feathers of the wing. The cysts contain keratinized feather material that can be expressed or excised but commonly recur. Treatment of choice is surgical removal of the involved feather follicle.

Question

An adult Amazon parrot presents to your clinic with a swollen, distended neck. It appears to be acting and breathing normally. On physical examination, you find that the skin of the neck is distended with air, the crop is empty, and the bird is non-painful. What is your diagnosis?

- Ruptured cervical air sac
- Pneumothorax
- Aerophagia
- Proventricular dilatation disease

Explanation - The cervical air sac is part of the extensive respiratory system in birds, including the parrot. The air sac system extends into the region of the neck. When this air sac is ruptured, usually from a traumatic incident, air escapes

from the air sacs and fill the subcutaneous space resulting in swelling of the neck. Aerophagia, PDD, and pneumothorax all would have accompanying clinical signs, and air dilation would not be evident in the coelomic cavity.

Question

Murine respiratory mycoplasmosis in rats is characterized by which of the following clinical signs?

- Nasal discharge and ataxia
- Nasal discharge and alopecia
- Coughing and vomiting
- Vomiting and diarrhea

Explanation - The correct answer is nasal discharge and ataxia. Murine respiratory mycoplasmosis in rats and mice is a common chronic disease characterized by inflammation of the respiratory tract and middle ear. Clinical signs include coughing, sneezing, dyspnea, nasal discharge, head tilt, incoordination, and circling. Mycoplasma pulmonis is the primary causative agent of the disease, but other bacteria have been associated with the disease as well. Diagnosis is by isolation of an organism or by antibody detection via serology. Treatment is with oxytetracycline in the drinking water.

Question

Which of the following is not a cause of metabolic bone disease in reptiles?

- Low calcium diet
- Lack of ultraviolet light
- Vitamin D deficiency
- High Ca:P ratio

Explanation - The correct answer is high Ca:P ratio. This ratio would indicate there is an adequate amount of calcium and would not predispose to metabolic bone disease. Whenever there is not enough calcium either as a result of decreased calcium in the diet or not enough vitamin D, calcium is resorbed by osteoclastic resorption in order to maintain serum levels. This leads to weak, pliable bones which are susceptible to fracture.

Question

The snake in the image below is being irradiated with a Strontium-90 probe. Strontium-90 radioactively decays and emits beta particles which allow delivery of very high doses of radiation to a small superficial area. All of the following are considered important principles of radiation protection for personnel (radiation workers) that should be followed EXCEPT for which of the following?

- Pregnant women should not handle a Strontium probe
- All personnel should stand as far away from the Strontium probe as is reasonably achievable
- Plexiglass shielding should be used to decrease radiation exposure to personnel
- All personnel should hold the Strontium probe for the minimum amount of time that is necessary

Explanation - Significant knowledge about Strontium is not necessary to answer this question correctly. The principle of ALARA (as low as is reasonably achievable) should always be followed when dealing with radiation, regardless of the type of radiation. This means than you should always take reasonable steps to keep radiation dose to personnel as low as you reasonably can. The 3 main ways to decrease radiation dose are to increase the distance of personnel from the radiation source, to decrease the time of exposure of personnel to radiation, and to use appropriate shielding to decrease radiation to personnel. The same principle holds true for pregnant women. There are acceptable exposure limits for pregnant women (the most commonly used is <0.5 milliSieverts per month during pregnancy). If steps are taken to keep exposure as low as reasonably achievable, pregnant woman would be able to handle the Strontium probe and keep the dose well below these limits.

Question

A fluffed cockatiel with a recent history of anorexia and dyspnea presents to your clinic. You place the bird in oxygen for approximately an hour and then perform a physical exam. On physical exam you note coelomic distention. Blood work shows a heterophilia, increased AST, CK, and fibrinogen. What is the most likely diagnosis?

- Aspergillosis
- Egg binding
- Gout
- Egg yolk peritonitis

Explanation - The correct answer is egg yolk peritonitis. Egg yolk peritonitis can be life-threatening. Clinical signs include anorexia, fluffed feathers, coelomic distention, and dyspnea. Blood work findings are consistent with egg yolk peritonitis. If gout was the diagnosis, we would expect to see painful joints. We would not expect to see coelomic distention with aspergillosis. With egg binding you would not expect to see hyperfibrinogenemia. Additionally, cloacal straining could potentially be present. Treatment for egg yolk peritonitis involves antibiotic therapy, surgery, and anti-inflammatories.

Question

An adult cockatiel presents for shifting leg lameness and an inability to bend the toes. An aspirate from a swollen toe shows spindle shaped crystals cytologically. Which of the following treatments is most appropriate?

- Systemic corticosteroid therapy
- Switching the bird to a high protein diet
- Systemic allopurinol therapy
- Systemic antibiotic therapy

Explanation - The correct answer is systemic allopurinol therapy. This question describes synovial gout or articular gout. The disease occurs when uric acid crystallizes in the synovium and causes lameness. Allopurinol is used to decrease uric acid formation. The underlying pathophysiology is not completely understood, but renal disease is found in many affected birds; treatment generally consists of a low-protein diet, allopurinol, and addressing underlying renal disease.

Visceral gout affects the surfaces of visceral organs. Septic polyarthritis and immune-mediated polyarthritis would not show spindle-shaped crystals.

Question

During routine surveillance of a rainbow trout hatchery, the younger fish are noted to be swimming in an erratic pattern. On closer evaluation, the fish seem to be deformed around the head and spine. One of these fish is sacrificed for necropsy, and diffuse necrosis of the cartilage and spores in the cartilage are observed. What is your diagnosis?

- Whirling disease
- Ich (Ichthyophthirius multifiliis)
- Gill rot
- Hole in the Head disease

Explanation - The correct answer is whirling disease. The causative agent is Myxobolus (aka Myxosoma) cerebralis which is a myxosporean parasite of salmonid fish. Rainbow trout are most commonly affected and the parasite can cause deformation of the head and spine resulting in the inability to swim properly. Skeletal deformation is not seen in the etiologies of the other potential answers. Ich results from a protozoan parasite that causes white spots on the gills and skin, along with erratic behavior. Hole in the Head disease is seen in tropical fish, especially cichlids, with pitting-like lesions of the head and lateral line. The etiologic agent of Hole in the Head is still controversial and likely includes multiple factors including poor water quality, improper nutrition, and heximita infection. Gill rot is a fungal disease caused by Branchiomyces spp. with clinical signs related to respiratory distress due to thrombosis and necrosis of the gills.

Question

An owner brings in his prize winning American Fuzzy Lop rabbit to your clinic in mid-July due to a swelling on its neck. The client maintains approximately 25 rabbits of various breeds in an outdoor, open-air, fenced-in enclosure. You examine the unusual swelling and notice a hole in the center that is oozing pus. The owner agrees to anesthesia and surgical exploration. During surgery you are surprised to find and remove the larval structure pictured below. Your diagnosis of the larva is which one of the following?

- Cuterebra the larval form of the botfly
- A warble of the genus Hypoderma bovis, common in outdoor housed rabbits
- The nasal bot larvae of white-tailed deer for which rabbits are the intermediate host
- A mature oocyte of the encysted form of sarcocystis

Explanation - The larva shown in the figure is classic for the cuterebra bot and rabbits housed in outdoor enclosures are susceptible to this type of lesion due to contact with flies and eggs deposited in their environment.

Adult, female, Cuterebra flies deposit eggs in and around caging, vegetation and animal burrows. Rabbits come in contact with the eggs as they pass through contaminated areas or by direct deposition of eggs on rabbit fur. Eggs hatch to a larval form in response to body heat and enter the body through the mouth or nares during grooming or, rarely, through open wounds. Within the rabbit, the larvae now migrate to subcutaneous locations around the head, body or neck. Here they develop and grow as a third instar larva and breathe through a breathing pore in the skin. This is the stage most clients will seek medical attention for their rabbits. If left unattended, in approximately 30 days the larva matures, exits the skin, falls to the ground, pupates and becomes an adult bot fly.

Question

An old budgerigar recently had a cere color change from blue to brown. What is your most likely diagnosis?

- Sertoli cell tumor
- Uterine carcinoma
- Leydig cell tumor
- Adrenal tumor

Explanation - The correct answer is Sertoli cell tumor. Sertoli cell tumors are often functional and secrete hormones that can cause this change.

Question

Which ORGANIZATION is responsible for regulating the food safety of salmon in the United States?

- EPA (Environmental Protection Agency)
- USDA (United States Department of Agriculture)
- FDA (Food and Drug Administration) [Correct answer]

- FAO (Food and Agricultural ORGANIZATION)

Explanation - The correct answer is FDA. The USDA is responsible for meat and poultry products including eggs. The FDA regulates other foods, food labels, use of veterinary drugs, and seafood. The EPA is responsible for pesticides and water standards. The FBI is responsible for food counter-terrorism. The FAO is a United Nations entity.

FYI, an exception to the rules above is from the 2008 Farm Bill which amends regulations such that catfish are subject to examination and inspection by USDA's FSIS when processed for use as human food.

Question

Which of the following is false of mammary neoplasias in rats?

- Most are benign tumors
- They are usually fibroadenomas
- They act similarly to mammary tumors in mice
- They can commonly occur in males and females

Explanation - The correct answer is they act similarly to mammary tumors in mice. Mammary neoplasias in rats are usually benign fibroadenomas that can occur almost anywhere on the body due to the extensive nature of the rat's mammary tissue. Surgical removal can help with the well-being of the rat. Mammary tumors in mice are often very anaplastic and invasive.

Question

An adult conure presents to you for progressive right sided lameness. On physical exam, you palpate an abdominal mass. What diagnostic test do you recommend?

- Serum biochemistry
- Urinalysis
- Abdominal radiograph
- Right leg radiographs
- Complete blood count

Explanation - The correct answer is abdominal radiograph. Based on the description, you should suspect a renal mass (carcinoma) causing progressive compression of the ischiatic nerve. A radiograph would be the best test of these choices to confirm that diagnosis. Radiographs of the right leg would rule out orthopedic disease, but would not show the primary mass. Urinalysis would most likely not show evidence of neoplastic cells.

Question

A 1-year old female guinea pig presents for respiratory distress and weight loss. The guinea pig is housed in a 4x6 foot enclosure lined with newspaper. The guinea pig SHARES a cage with a 2-year old female rabbit that appears healthy. What is the most likely etiology?

- Pasteurella multocida
- Bordetella bronchiseptica

- Teflon toxicity
- Sendai virus
- Mycoplasma pulmonis

Explanation - Many rabbits are inapparent carriers of Bordetella bronchiseptica. However, Bordetella causes primary respiratory disease in guinea pigs; therefore, guinea pigs and rabbits should not be housed together. Clinical signs of bordetella in guinea pigs include respiratory distress, WEIGHT LOSS, and sudden death.

Pasteurella multocida causes respiratory disease ("snuffles") in rabbits but not guinea pigs. Mycoplasma pulmonis and Sendai virus are part of a complex of ORGANISMS that cause respiratory disease in rats. Teflon toxicity causes respiratory disease in birds but has not been reported to affect guinea pigs.

Question

An adult budgerigar presents for regurgitation whenever he is taken out of the cage by the owner. There is no history of other clinical SIGNS, and the bird is unremarkable on physical examination. What disease process do you suspect?

- Normal courtship behavior
- Aspergillosis
- Pacheco virus
- Polyoma virus

Explanation - The correct answer is normal courtship behavior. Polyoma and Pacheco virus both result in lethargy, anorexia, and death. Regurgitation is not a common feature of these viruses and the bird would not be expected to only regurgitate when being removed from its cage if infected. Aspergillosis usually causes respiratory SIGNS, and regurgitation would be unexpected. Therefore, given those answer choices, clinical signs, and history, it is most likely that this is normal courtship behavior. Budgies will often court themselves when they see their reflection in a mirror and regurgitate then.

Question

A 3-year old iguana presents to the emergency clinic after sustaining trauma to the tail. What is the best treatment option?

- Bandaging the tail
- Benign neglect
- Antibiotics
- Tail removal

Explanation - The correct answer is tail removal. Once a tail has sustained sufficient trauma and lost circulation, the iguana will be much more comfortable if the tail is removed. You can do this by snapping the tail off at the point of least resistance. Let it heal as an open wound (with bandaging), as suturing closed can prevent regrowth of the tail.

Question

An owner of a canary of unknown age requests evaluation of abnormal plumage as shown in the photo. Which of the following is the most appropriate recommendation?

- Do nothing, this is a normal anatomic structure in this species
- Surgical removal of the feather follicles
- Treatment with fluconazole
- Supplementation with vitamin A
- Treatment with ivermectin

Explanation - These are feather cysts. Feather cysts are the avian equivalent of an ingrown hair. A growing feather is unable to protrude through the skin and curls within the follicle. Since feathers are much larger than hairs, cysts can be quite large and painful. They commonly are found in the primary feathers of the wing. The cysts contain keratinized feather material that can be expressed or excised but commonly recur. Treatment of choice is surgical removal of the involved feather follicle.

Question

This 2-year old FS Dwarf domestic rabbit presents on emergency for a 2-day history of lethargy and inappetance. On further questioning, the owners state that she has been grinding her teeth on occasion. Her normal diet consists of a pellet seed mix from the local pet store and occasional lettuce. On physical exam, she has absent gastrointestinal sounds on auscultation and is painful in her abdomen with no formed feces. She is otherwise normal. Based on the radiographs below, what is the most likely cause for her clinical SIGNS, and what husbandry changes would be recommended?

- Normal dental radiographs; no changes recommended.
- Premolar/molar/incisor malocclusion; increasing hay and leafy greens, reducing pellets/seeds
- Incisor malocclusion; adding wooden chews
- Mandibular abscessation; reducing the amount of seed in the diet

Explanation - There is evidence of malocclusion of her premolar and molars based on the uneven occlusal surface. There is also root elongation of the mandibular and maxillary premolars and molars. Additionally, the incisors have an improper occlusal angle. Most commonly, genetics and diet are significant contributors to dental malocclusion in rabbits. Dietary changes should include increasing the amount of leafy greens and hay as well as eliminating or significantly reducing pellets.

Question

Which of the following is required for chinchilla health?

- Dust baths
- A warm (90 degree) basking spot
- Vitamin C
- Monthly dental adjustments
- Cedar shavings

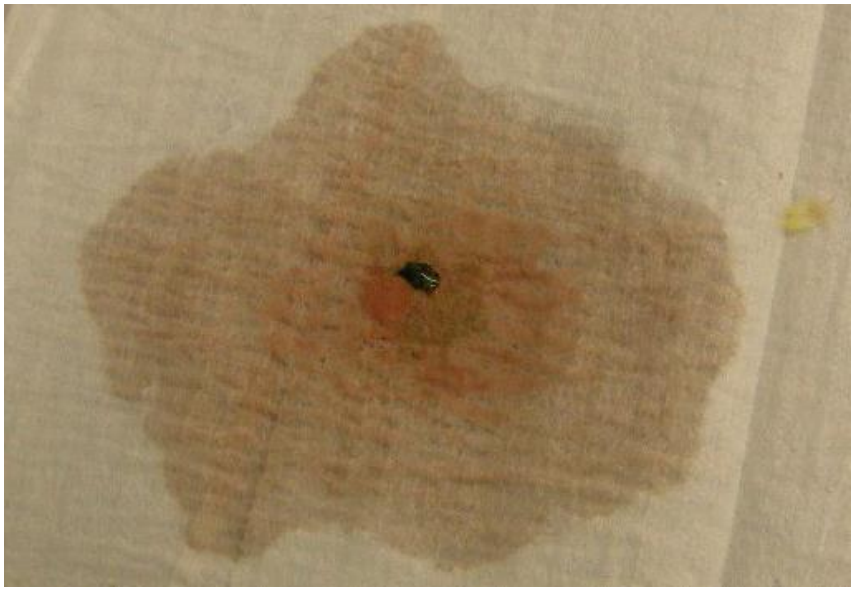
Explanation - Chinchillas require dust baths every 1-2 days in order to maintain coat health. The dust bath should not be left in the enclosure at all times since frequent bathing may cause conjunctivitis. Chinchillas are heat-intolerant, and the enclosure should not be kept at temperatures above 80 degrees Fahrenheit. Cedar shavings should be avoided as BEDDING, since they can cause respiratory irritation. Chinchillas do not require supplemental Vitamin C. Healthy chinchillas do not require dental adjustments, although dental disease is a common problem in chinchillas.

Question

A 26-year-old female Double-Yellow Head Amazon presents with a 1-day history of profuse polydipsia, polyuria, lethargy and anorexia. The owners noticed today that the droppings were bright red (see image) and brought the bird for evaluation. On physical exam, the bird is severely DEPRESSED, approximately 12-15% dehydrated based on eyelid turgor and basilic

vein refill. There are no other significant physical exam findings. The bird immediately drinks when placed in front of a water bowl. You are able to obtain a small amount of blood from the medial metatarsal vein. You run a PCV/TS on the blood sample. The PCV is 19% with total solids of 5.2gm/dl, and you note the plasma is red following centrifugation.

The bird has no previous medical history and is housed alone in a wrought-iron cage. She is indoor-only and is allowed supervised time out around the house. The owners noticed her chewing on the windowsill behind her cage. What is the most likely differential for a bird with this presentation and what should be your next diagnostic step?



- Liver disease; obtain bile acids
- Chlamydophila psittaci; obtain conjunctival/choanal/cloacal swab for PCR
- Heavy metal toxicosis; perform 1-view radiograph to confirm presence of metal in gastrointestinal tract
- Leukocytozoon infection; evaluate blood smear for presence of parasites

Explanation - These SIGNS (acute onset severe lethargy, polyuria, polydipsia, and hemolysis) are all consistent with heavy metal toxicosis; however, it is difficult to differentiate lead vs. zinc toxicosis without a heavy metal panel. Hemoglobinuria is sometimes seen in Amazon parrots with lead toxicosis. Positioned radiographs are not required to diagnose heavy metal toxicosis, and it is important not to stress ill birds to obtain positioned radiographs. The history of chewing on a windowsill or other household objects is common for birds with metal toxicosis, especially in older houses with lead-based paint.

Liver disease may present similarly; however, the urates are generally more green-yellow, and the feces may also have a greenish tinge. Some animals with metal toxicosis will present with bright green feces, so this remains an important differential. In this bird, the red-tinged urates help to differentiate this presentation from that of liver disease.

Chlamydophila psittaci is a common cause of hepatosplenomegaly in psittacines and may cause SIGNS similar to those listed for liver disease. The evidence of hemolysis in this patient is not consistent with avian chlamydiosis.

Leukocytozoon is a commonly found blood borne parasite found in birds of prey and may cause anemia in birds that are otherwise immunosuppressed. This is extremely uncommon in household psittacines.

Question

Which of the following clinical SIGNS would you expect in a rabbit with a gastric trichobezoar?

- WEIGHT LOSS
- Vomiting
- Diarrhea
- Pruritus

Explanation - The correct answer is WEIGHT LOSS. Trichobezoars (hair balls) get stuck in the stomach of rabbits and cause anorexia, weight loss, and scant stool production. Rabbits cannot vomit. Pruritus usually is not the predisposing factor to development of trichobezoars but rather, decreased gastrointestinal motility. Trichobezoars can be treated medically with supportive care and syringe feeding of a high-fiber food. Ideally, you want these to pass without surgery.

Question

Candida, hypovitaminosis A, and trichomoniasis result in what lesion in the mouth of a bird?

- Oronasal fistula
- Petechiation
- Gingival ulceration
- Red mucosal discoloration
- Raised plaques

Explanation - The correct answer is raised plaques. Hypovitaminosis A causes squamous metaplasia. Candidiasis causes thickening of crop mucosa. Trichomoniasis causes white caseous lesions in the oral mucosa.

Question

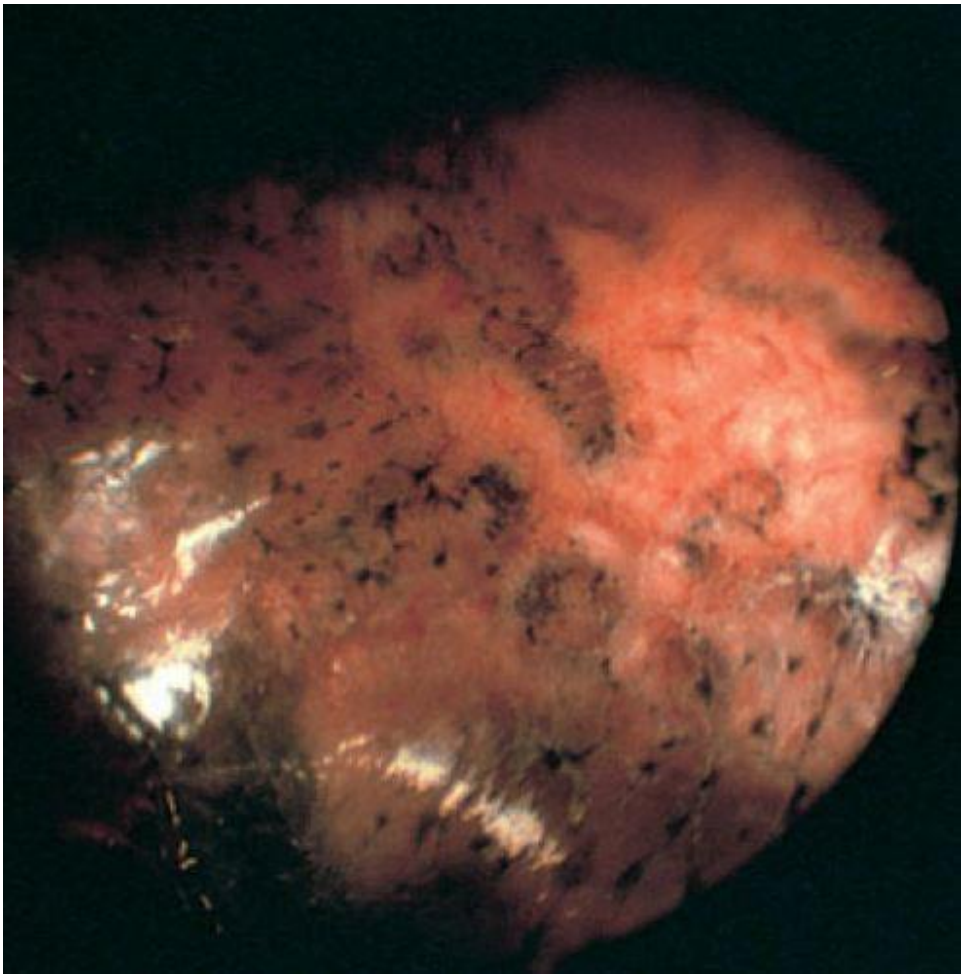
A Cockatiel hen, one of the owner's prize egg layers, was found on the bottom of its cage and brought to your clinic on emergency. You check your records and see that the bird has had one previous reproductive problem with metabolic exhaustion but has always laid the egg successfully. On physical exam, you note the cloaca to be pink and dilated and abdominal palpation reveals a firm, round mass in the caudal abdomen. Your tentative diagnosis is that the bird is egg bound. Which of the following is the best treatment option?

- Female Cockatiels are prone to adrenal tumors which prevents the normal release of prostaglandin during egg laying so immediate surgical removal of the egg should also include adrenalectomy
- Prepare the bird for immediate surgery to remove the egg and perform an ovariohysterectomy
- Provide the owner with a poor prognosis since unfortunately there is no viable treatment option for birds with this condition.
- Medical treatment including analgesics, subcutaneous fluids, calcium administration, placing the bird in a warm, moist environment and reassess in 24 hours

Explanation - This is the best answer because taking a debilitated bird to immediate surgery will be extremely risky. Since the bird is a proven layer, it is best to STABILIZE this dystocia patient for its metabolic needs during the first 24 hours while monitoring its response. In many cases, the egg will be produced with medical treatment alone - especially since she has laid eggs successfully in the past. If the bird does not produce the egg within 24 hours, then surgical and non-surgical options for removal can be discussed. Cockatiels are not prone to anti-prostaglandin producing adrenal tumors.

Question

A spectacled Amazon parrot presented for surgical sexing. During the laparoscopic procedure, black spots were observed on the lungs and air sacs as seen in the image below. No other SIGNS of inflammation were detected. Which of the following is the most appropriate treatment or management recommendation?



- Treat the parrot with metronidazole
- Treat the parrot with ivermectin
- Do not breed the parrot
- No treatment or management change is indicated
- Treat the parrot with fluconazole

Explanation - This appearance of black spots on the air sacs and lungs in a bird are known as anthracosis. This is considered a routine non-pathologic finding provided there are no other SIGNS of inflammation in those areas and no treatment or management change is needed in birds.

Question

Which of these recommendations should you give an owner inquiring about proper dietary recommendations for a ferret?

- The diet should be fed in 2 or 3 meals per day, rather than free-choice feeding
- The diet should contain complex rather than simple carbohydrates
- The diet should be low in protein (<25%)
- The diet should be high in plant materials
- The diet should be low in fiber and carbohydrates

Explanation - The correct answer is the diet should be low in carbohydrates and fiber. Ferrets are strict carnivores that depend on meat proteins and fats. They need a highly digestible diet due to their short GI transit time. They lack intestinal flora to break down complex carbohydrates and diets rich in carbohydrates will lead to protein or fat malnutrition. Ferrets also cannot tolerate large amounts of fiber. High levels of plant proteins are associated with urolithiasis. Ferrets should not be fasted for longer than 6 hours as they become irritable; additionally, if they develop insulinomas (which are not uncommon), periods without food can result in severe, fatal hypoglycemia. A high quality dry kitten food or commercial ferret diet is appropriate.

Question

A guinea pig presents to your emergency clinic for oral petechia and loose teeth. You also note a rough hair coat on physical exam. What nutritional disorder is common in guinea pigs and can lead to the SIGNS described?

- Hypovitaminosis A
- Hypovitaminosis D
- Hypovitaminosis C
- Hypocalcemia
- Hypervitaminosis A

Explanation - The correct answer is hypovitaminosis C. Guinea pigs are frequently deficient in vitamin C and can develop scurvy. Vitamin C is necessary for collagen synthesis, and deficiency leads to a rough hair coat, loose teeth, petechia, and lameness. It is treated with vitamin C injections, as multivitamins can lead to vitamin A and D toxicosis. Leafy green vegetables are good dietary sources of vitamin C.

Question

Submandibular keratin cysts ("abscesses") in pet birds may be attributable to which of the following?

- Psittacine beak and feather disease
- Vitamin A deficiency
- Gout
- Polyomavirus

Explanation - The correct answer is vitamin A deficiency. The classic SIGNS of vitamin A deficiency are submandibular abscesses and squamous metaplasia leading to infections in the choana and respiratory tract.

Question

What is the natural HOST of the causative agent of Tularemia, Francisella tularensis?

- Sheep
- Horse
- Rabbit
- Deer

Explanation - The correct answer is rabbit. Rabbits and rodents are the natural HOST of Francisella tularensis, although the disease can be seen in many animals including humans. Rabbits are the species most commonly associated with zoonotic spread to humans. Sheep are much more frequently infected than horses but are not the natural host.

Question

An avid bird breeder is concerned that one of his prized budgerigars is sick. You recommend trying tube feeding over the next few days. Which of the following is true regarding the bird esophagus?

- Lies ventral to the trachea
- Lies on the right side of the neck
- Made up of skeletal muscle
- Contains complete cartilage RINGS

Explanation - The correct answer is lies on the right side of the neck. This is important to know when tube feeding birds, since you want to be 100% certain not to inject your food material into the trachea. The trachea contains complete cartilage RINGS, not the esophagus.

Question

Which of these antibiotics is safest for use in guinea pigs?

- Ampicillin
- Bacitracin
- Streptomycin
- Enrofloxacin

Explanation - The correct answer is enrofloxacin. Guinea pigs are particularly sensitive to many antibiotics including penicillin, ampicillin, bacitracin, lincomycin, vancomycin, erythromycin, and clindamycin. Streptomycin can be directly toxic and result in death and should never be used in this species.
