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FEATURE ARTICLE

Common Respiratory Disorders in Caged Birds

Amy B. Worell, DVM, Dipl ABVP–Avian Specialist

Respiratory disorders are a common presentation in caged birds. The clinical signs can be quite varied; they include sneezing, tail bobbing, nasal discharge, open-mouth breathing, visible swelling of the sinus area, abnormal respiratory clicks or sounds, dyspnea at rest or with handling, insufflation of the air sacs, and matted or stained feathers near the nares. The three most common respiratory disorders encountered in caged bird medicine today are (1) infections caused by a variety of bacteria, (2) mycotic infections primarily due to *Aspergillosis* species, and (3) inflammations caused by the presence of *Sternostoma tracheacolum* or air sac mites.

Infections Caused by Bacteria

Many bacteria that inhabit the respiratory system of birds are subject to infection because of nutritional inadequacies and deficiencies. The most common specific deficiency involves a lack of vitamin A. In the psittacine family, the Amazon parrot (*Amazona* species) seems to be particularly susceptible to hypovitaminosis A when fed a seed diet. Visible changes include narrowing or occlusion of the choanal slit, abscessing of the oral and pharyngeal mucosa, blunting of choanal papillae, and visible white plaques near the choanal slit. These changes are often directly related to lack of vitamin A in the diet, a poor nutritional plane in general, and invasion of the abnormal tissue with microorganisms such as bacteria. Common bacterial respiratory pathogens include gram-negative organisms such as *Escherichia coli*, *Klebsiella pneumoniae*, and *Pseudomonas aeruginosa*, and the gram-positive organism *Staphylococcus aureus*. The incidence of respiratory infections caused by the various *Mycoplasma* species is unknown.

Mycotic Infections

The most common mycotic agent causing respiratory disorders in birds is the *Aspergillus* species. In a practice treating caged birds, the most frequently susceptible species include Amazon parrots, African grey parrots *(Psittacus erithacus)*, and macaws (*Ara* species). Other commonly presented species with a high susceptibility to aspergillosis include waterfowl and raptors. Affected birds may be asymptomatic, may have acute and severe dyspnea, or may simply have a marked weight loss. The disease is notoriously difficult to diagnose, and commonly used diagnostic aids include specific aspergillosis tests, general blood work that includes a CBC and serum chemistries, radiographs, and protein electrophoresis. Endoscopy of the body cavity and trachea can also be performed. Treatment can involve long-term use of antifungal medications such as itraconazole, nebulization with antifungal agents, surgical removal of lesions, and intravenous or intratracheal use of amphotericin B.

Presence of Air Sac Mites

Most commonly suspected and identified in canaries and finches, infections of the respiratory tract caused by air sac mites are frequently encountered. Although these mites are thought to primarily inhabit the air sacs of affected birds, they may be present anywhere in the respiratory system. Birds with a mite infection are often brought to the clinician exhibiting dyspnea, tail bobbing, weight loss, and a respiratory click. Treatment involves multiple applications of ivermectin. Infection with air sac mites is considered to be a treatable but recurring problem in these susceptible species.

Infections Caused by *Chlamydia psittaci*

Once a common cause of respiratory disease in caged birds, psittacosis, or *ornithosis*, is not frequently encountered. This may in part be

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Common Respiratory Disorders in Caged Birds

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due to the marked decrease in legally imported and illegally smuggled birds, the increased reliance on domestically bred birds for the needs of pet owners and aviculturists, and the improved management and care of avian species.

Respiratory signs can vary from extreme dyspnea to a mild serous rhinitis. Diagnosis may involve a number of tests to detect antibody or antigen reaction to the presence of the organism, as well as general supportive diagnostics including a protein electrophoresis and a CBC coupled with serum chemistries. Treatment involves a 30- to 45-day (or longer) treatment period with doxycyline or tetracycline.

Summary

Respiratory disorders in caged birds are an interesting and challenging aspect of veterinary medicine. Diagnostic tests are often nonspecific and nondiagnostic, and clinical impression and experience are extremely useful in the diagnosis and treatment of affected birds.

Suggested Reading

1. Ritchie BW, Harrison GJ, Harrison LR (eds): *Avian Medicine: Principles and Application.* Lake Worth, Fla, Wingers, 1994.
2. Altman RB, Clubb SL, Dorrestein GM, et al: *Avian Medicine and Surgery.* Philadelphia, WB Saunders, 1997.

ROUNDTABLE

Circling in Rodents

Q. In what species is this a problem?

Dr Suedmeyer: *Hamsters, rats, mice, and chinchillas.*

Dr Johnson-Delaney: *I have seen the symptom of circling in grey squirrels (usually adopted wild squirrels, rescued and reared from infancy or taken in because they were circling and falling), chinchillas, rats and mice.*

Q. Describe the signs.

Dr Suedmeyer: *Generally an involuntary consistent circling.*

Dr Johnson-Delaney: *The animal may or may not seem to have a head tilt to the side of the circling. It may seem almost rigid in a bent-body position. Even if you straighten the animal out, when you release it, it turns to the side and starts circling again. The animal may have nystagmus. There may also be a stumbling or ataxia associated with the circling. The animal, in the beginning, usually seems in good flesh and can eat and drink.*

Q. What are the causes?

Dr Suedmeyer: *In some instances, aging changes (senility) appear to be a possible cause, whereas* Listeria monocytogenes *is a common etiology.* Nosema cuniculi *(of the order Microsporidia) has been reported in the literature in mice, hamsters, and guinea pigs. Trauma can have clinical signs of circling, and unilateral blindness can lead an animal to circle on occasion. In some rodents, circling may also be due to a behavioral problem. Neoplasia of the central nervous system has been reported in the literature. Depending on the location, circling can be a component of the clinical signs.*

Dr Johnson-Delaney: *In squirrels,* Baylisascaris procyonis *larvae migrate to the brain and cause cerebral larvae migrans, a disease with clinical symptoms that include circling. In chinchillas housed outdoors, this is also an etiology. Other causes documented in chinchillas include thiamine deficiency and otitis interna (caused by various bacteria). In rats and mice,* Mycoplasma pulmonis *otitis interna is a cause of circling. I have seen otitis interna from various bacteria (streptococcus, staphylococcus, etc).*

Q. Describe your workup.

Dr Suedmeyer: *Evaluating the CBC and plasma chemistries can indicate an infectious disease process. In our experience, radiographs have seldom revealed a problem.*

Dr Johnson-Delaney: *History is important, particularly for squirrels and chinchillas. In our area, the raccoons are heavily infected with* Baylisascaris, *and the ova stay infective in the soil for years. Outdoor housing or exposure in urban areas is commonplace. Diet information is particularly helpful in diagnosing chinchillas; although thiamine deficiency is not common, there can be problems with formulated diets if the pre-mix was incorrectly made. Otic examination and neurologic assessment for cranial and peripheral nerves and reflexes are done. I transilluminate the head of small rodents in the examination room; frequently otitis interna can be seen as a density to the bullae, or other pathologies can be identified. Radiographs may also be useful. If there is otic exudate, I will take some for culture, Gram's stain, and cytology. A CBC and chemistry panel are useful to look at systemic infection or inflammation. Testing the creatine kinase level may be helpful to diagnose and encephalitis with tissue necrosis. Serology can be done in mice and rats for* M pulmonis, *but this isn't usually done for a pet rodent. A diagnosis of a* Baylisascaris *infection is usually made if everything else has been ruled out and if a history of exposure to the outdoors or to soil is established. Theoretically, this could be done with an MRI; however, this is not common practice—yet!*

Q. Discuss treatment and prognosis.

Dr Suedmeyer: Listeria *infections can be treated with oxytetracycline at 10 mg/kg given every 48 hours. I have not seen a case of* Nosema *infection, and I could find no recommendations on treatment or antemortem diagnosis.*

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WHAT'S YOUR DIAGNOSIS?

Hamster With a Distended Cheek Pouch

Cathy A. Johnson-Delaney, DVM

A 2-year-old golden hamster (Mesocricetus auratus) *was brought in to the clinic with the owner complaining that a foul smell was coming from the animal. On examination, the right cheek pouch was firmly distended. Through the mouth, the opening to the cheek pouch appeared to be distended with an irregular surface.*

Questions

1. What are your differentials?
2. How would you diagnose the condition?
3. How would you remove the lesion?
4. How does this pathology occur?

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Circling in Rodents

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Behavioral problems can occasionally be corrected by changing the environment. This can be accomplished by adding climbing structures and other environment-enrichment items. In simple cases of aging, treatment is palliative. I have used corticosteroids with marginal success.

Dr Johnson-Delaney: *There is no current treatment for* Baylisascaris *except supportive care. This usually includes a round of antibiotics (just as a precaution), nonsteroidal anti-inflammatory drugs, and, if the animal is having trouble eating or drinking, fluid and nutritional support. I usually give a vitamin B complex injection (including thiamine) or put the animal on additional B complex vitamins, and make sure the diet is complete. For the otitis interna, an additional analgesic such as butorphanol may be given early on; the course of antibiotics is usually based on the cultured organism. If* M pulmonis *is the underlying organism, tetracycline, doxycycline, or tylosin will control the symptoms but not eliminate the organism. The infection may reoccur (along with respiratory signs), when treatment is stopped.*

Q. Can this problem be prevented?

Dr Suedmeyer: *Certainly, traumatically induced lesions and some behavioral conditions can be prevented. Proper hygiene and husbandry can prevent most infectious causes.*

Dr Johnson-Delaney: *Prevention of* Baylisascaris *exposure involves keeping the rodent away from raccoon fecal–contaminated soil and habitat. As for thiamine deficiency in chinchillas, I like clients to buy small quantities of pelleted feed, and feed their pets treats of leafy vegetables to minimize the likelihood of a single nutrient deficiency if the pre-mix was incorrect. It is difficult to buy mice and rats in the pet trade that do not carry or have not been exposed to* M pulmonis*. Education of the owner for control of the symptoms and suppression of the organism when the signs do manifest is the way to prevent the infection progressing to otitis interna with neurologic symptoms.*

Hamster With a Distended Cheek Pouch

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Answers

1. The differential diagnoses include impaction, abscessation, and neoplasia.
2. Anesthesia is induced and maintained with isoflurane anesthesia, and a radiograph is taken to see the extent of the lesion and to see whether any other tissues were involved. Under anesthesia, the cheek pouch could be everted and the internal mucosal surface examined. Cytology could be done immediately to rule out abscessation or a neoplastic process rather than just food impaction.
3. In this case, the lesion was encased in mucosa. From aspiration, it appeared to be a granuloma with pieces of seed hull embedded in it. Surgical excision of the mass was done using an elliptical incision through the mucosa only. The mass peeled out easily. The remaining mucosa was sutured with absorbable synthetic suture. The surface was swabbed with chlorhexidine oral rinse, and the cheek pouch was returned to normal position. Postoperatively, baby aspirin (100 mg/kg PO q4h) was administered for 2 doses.

   A cut through the mass revealed mostly impacted food with some necrotic tissue. A sample from the margin containing mucosa was sent for histopathology. The diagnosis was secondary abscessation due to food impaction.
4. Cheek pouches in hamsters are immunologically protected sites that rarely develop spontaneous neoplasia. The sites are often used in research for tumor transplantation. Impaction is not uncommon in pet hamsters, particularly among those fed a seed-based diet. Because of their hoarding behavior and the possible lack of suitable cache spots, many pet hamsters fail to completely remove all food from the cheek pouches. With time, material can begin to rot, and this combined with mechanical irritation to the mucosa can cause an abscess to form. Complete excision is usually easily performed, and rarely are systemic antibiotics needed.

FROM THE LITERATURE

Nutrient Composition of Invertebrates

The nutritional requirements of insectivores have not been determined; however, knowing the chemical analysis of invertebrates fed to insectivores is essential for evaluating the nutritional adequacy based on domestic animal nutritional principles. The proximate analysis and selected vitamin and mineral content of mealworms *(Tenebrio molitor* and *Zophobas morio)*, crickets *(Acheta domesticus)*, waxworms *(Galleria mellonella)*, fruit flies *(Drosophila melanogaster)*, and earthworms *(Lumbricus terrestris)* have been determined, based on diets commonly fed to these invertebrates.

All species had a water content that was greater than 50% of their body weight. The total nitrogen content ranged from between 4% and 6% (earthworms) to between 10% and 11% (adult crickets) on a dry matter basis. The bound nitrogen ranged between 3% and 10% in all invertebrates tested. The neutral detergent fiber (used to measure chitin) had a dry matter content averaging between 12% and 19%, except in wild-caught earthworms, which had an average of 51%. Larval invertebrates had a higher fat content (greater than 30% on a dry matter basis) than adults.

Excluding pinhead crickets, the insects evaluated had a low calcium content (average, 0.1%) with an improper calcium-phosphorus ratio. The insects appeared to have sufficient concentrations of copper, iron, magnesium, phosphorus, and zinc based on the known requirements of domestic birds and mammals. Super mealworms and waxworms were deficient in manganese. Earthworms appeared to meet the dietary mineral requirements of domestic birds and mammals. The vitamin E content of invertebrates ranged from 12 IU/kg (mealworms) to 741 IU/kg (waxworms), whereas the vitamin A content was too low to meet the requirements for domestic carnivores on a dry matter basis.

Barker D, Fitzpatrick MP, Dierenfeld ES: Nutrient composition of selected whole invertebrates. *Zoo Biol* 17:123-134, 1998.

HOW I . . .

Treat Ear Mites in Rabbits

Shawn Messonnier, DVM

Ear mites are a common cause of otitis externa in rabbits. The mites typically produce a "honeycombed" appearance to dry, yellow crusts seen in the ears. The crusts are pathognomonic for this condition; ear cytology to check for yeasts or bacteria is, therefore, not necessary and is in fact almost impossible because the crusts are dry and difficult to remove.

In cases of these mites in rabbits, I perform a gentle ear flushing to try to gently remove as much of the crust as possible. Care is needed, because the entire crusted material cannot usually be removed without causing considerable pain and bleeding to the rabbit. After the gentle flushing, I administer Tresaderm (Merial) to the ears to provide comfort. The rabbit is treated with ivermectin, given subcutaneously at 200 µg/kg every 10 to 14 days for 2 treatments total. All rabbits and other pets in the environment should be treated as well.

Client Teaching Guide

Ferret CARE SHEET

Michael A. Dutton, DVM, Dipl ABVP–Companion Animal Practice

Adrenal Tumors in Ferrets

Adrenal tumors are very common in ferrets. Many researchers believe that this is because of the close relationship between the functions of the ferret's reproductive organs and the adrenal glands. Early neutering or spaying may result in a compensatory growth in the adrenal glands, which can lead to the development of a tumor. Other possible risk factors include diet and genetics. Ninety percent of ferrets with this kind of tumor have one only in the left adrenal gland. The other 10% have tumors in only the right gland or in both glands. There is no way to determine which gland is affected before surgery.

✔ **Diagnosis:** Diagnosis is made based on the results of a physical examination and a high degree of suspicion. Symptoms include:

- Hair loss on the tail, buttocks, and along the backbone.
- Swollen vulvas in spayed female ferrets.
- Male ferrets may become aggressive.
- Male ferrets may also have prostate enlargement that can lead to urinary tract infections or urinary obstruction (a life-threatening disease).

There is a blood test available to prove the diagnosis. However, in the most cases, this test is not necessary because more than 95% of ferrets with the classic symptoms have adrenal disease.

✔ **Concurrent Diseases:** Older ferrets are prone to have more than one disease at a time. The two more common concurrent diseases are insulinoma (a benign tumor of the pancreas) and a type of heart disease call cardiomyopathy. For this reason, we strongly recommend testing for these diseases before treating for adrenal disease.

✔ **Treatment:** The recommendation at the Weare Animal Hospital is to surgically explore and remove the affected adrenal glands of the ferret. Currently we use cryosurgery (freezing the tissue).

- *Uncomplicated Adrenal Gland Removal:* Ninety percent of ferrets have the left adrenal gland affected. This gland is relatively easy to isolate and remove. A small percentage of ferrets have a tumor in the right adrenal gland; reaching this gland is more surgically difficult.
- *Complicated Right Adrenal Gland Removal:* An even smaller percentage of ferrets have the right adrenal gland growing into the vena cava. The vena cava is the "main highway" for blood to return to the heart from the veins in the lower body. To remove the adrenal gland, we have to remove a short section of the vena cava. This can cause a variety of cardiovascular problems, most of which resolve in a few weeks. However, this variation of adrenal disease carries a higher mortality rate postoperatively than the other variations. Because of this mortality rate, we strive to dissect the adrenal gland away from the vena cava as opposed to resecting the vena cava. This dramatically improves the mortality rate (par with the uncomplicated variations). The time required for this meticulous dissection does make this the most expensive option.
- *Cost of Surgery:* The cost of surgery, not including the initial examination or any preanesthetic blood work, runs from $300 to $450. This is an estimate based on prior experience and may not apply to your pet's particular case and surgery.
- *Medical Treatment:* A medication called Lysodren (Bristol-Myers) can shrink the abnormal gland(s). It does not work in all cases and may cause severe vomiting in the pet. It is usually a lifelong medication. Because most ferrets are cured by surgery and require no further treatment, we reserve the use of Lysodren for cases that are bilateral in nature or for when the disease is recurrent. Another medication called Lupron (Tap Pharmaceuticals) can be used, especially for ferrets that are not candidates for surgery. Application needs to be repeated every 4 to 6 months for the duration of the ferret's life.

✔ **If the Symptoms Recur:** The most common cause of recurrence of the symptoms is that a tumor has developed in the remaining adrenal gland tissue. At this time, we are recommending surgical removal of the entire other adrenal gland. In the short term, this does not seem to be a problem, but no long-term studies have been done. Ferrets that have both adrenal glands removed require approximately 30 days of supplemental steroids. Occasionally, this medication may be lifelong.

CASE REPORT

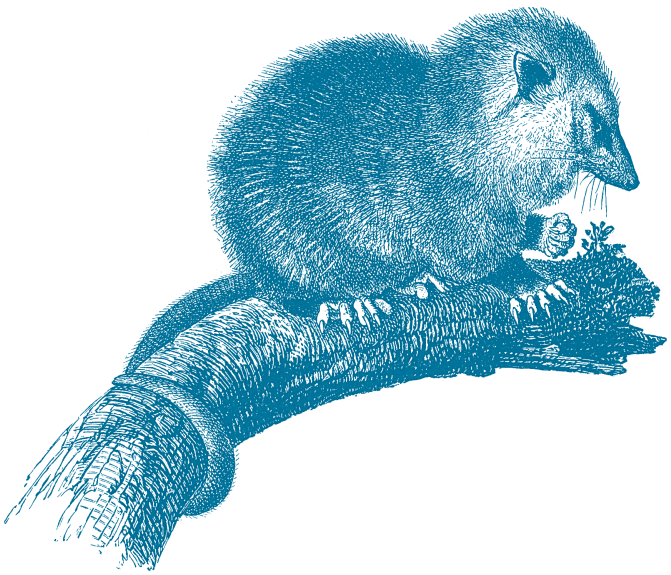
Prolapse in a Short-Tailed Opossum

Cathy A. Johnson-Delaney, DVM

A 5-year old female short-tailed opossum (*Monodelphis domestica*) was brought to the clinic with a large, cherry-red protrusion from the vent. The opossum was bright, alert, and well-hydrated. The body weight was 102 g. Upon examination, the opossum urinated (but was showing tenesmus), and no fecal material was passed. The prolapsed tissue was still moist with no erosions. Because of the tenesmus, the decision was made to anesthetize the animal before trying manual reduction.

The opossum was anesthetized with isoflurane administered in a small chamber, and then anesthesia was maintained with a nose cone. The animal was placed on a heating pad. Subcutaneous fluids (physiologic saline solution, warmed) were given. Dexamethasone at 0.5 mg/kg was administered intramuscularly. The rectal tissue was gently irrigated with 50% Dextrose (Phoenix Pharmaceuticals, St Joseph, MO). As the tissue began to shrink, an 8F red rubber catheter was used to manually begin replacing the tissue. The catheter was lubricated with sterile lubricating jelly, and continuous irrigation with warmed saline solution was used along with digital pressure to reduce the tissue and relax the prolapsed section of rectum and colon. The catheter was passed about 3 cm cranially with irrigation. With the catheter still in the rectum and colon, the urogenital slit and forked clitoris were located (under magnification) in the ventral wall of the cloaca. Sutures were placed across the cloaca, avoiding the urogenital slit but preventing re-prolapse. The placement was similar to placement in cases of cloacal prolapse. The catheter was gently withdrawn. Flunixin at 1 mg/kg was administered subcutaneously. The opossum recovered from surgery uneventfully. Anti-biotic therapy of amoxicillin (30 mg/kg PO q24h for 10 days) was initiated at the time of full recovery.

The animal defecated normally a few hours after the surgery, during the administration of the amoxicillin. Its appetite and activity were normal. Five days after the surgery, the sutures were removed with no recurrence of prolapse. Antibiotic therapy continued for the 10 days.



Thirty days later the opossum prolapsed again, although not as severely. The animal was again anesthetized and the procedure described above was repeated. This time, the animal was administered enrofloxacin (5 mg/kg IM) instead of amoxicillin. The enrofloxacin was continued orally for 14 days postoperatively. Flunixin was continued for 3 days at 12-hour intervals. The sutures were left in place for 14 days. The opossum had no trouble urinating and defecating through the reduced cloaca. There was no recurrence of prolapse.

Rectal prolapse is one of the leading causes of death in short-tailed opossums.[1] This problem is essentially one that occurs in female *M domestica* and has been associated with reproduction, lactation, and parturition. It has also been associated with persistent tenesmus caused by anorectal or urogenital disease, or with parasitic disease such as with pinworms in mice. Stool analyses done on this opossum repeatedly tested negative for endoparasites. The results of urinalyses performed subsequent to the replacement of the prolapses were within normal limits of a carnivorous animal's urinary parameters. Diets higher in fiber have been fed in some colonies where *M domestica* are bred in an attempt to decrease the incidence of rectal prolapse. This opossum received small amounts of vegetable or fruit matter nightly (eg, banana, apple, green beans) to increase the fiber in the diet. The opossum was primarily fed a commercial insectivore diet, crickets, mealworms, and cooked meats with additional calcium, with treats of half of a tablespoon of grape, cottage cheese, or a small piece of peach or papaya.

A contributing factor to the prolapses in this opossum may have been decreased muscle tone due to the animal's advanced age. The average age at death in the article by Hubbard et al[1] was 25.8 ± 4.9 months. Although the maximum life span is considered to be 5 years, few opossums reach that, usually succumbing to neoplasia, heart disease, or other maladies. Different geriatric conditions may develop in pet opossums than in laboratory opossums. Practitioners should take note of these conditions and document successful treatment.

Reference

1. Hubbard GB, Mahaney MC, Gleiser CA, et al: Spontaneous pathology of the gray short-tailed opossum *(Monodelphis domestica). Lab Anim Sci* 47:19-26, 1997.

Q&A

Editor's Note: We appreciate readers submitting questions for *Exotic Pet Practice.* There are times, however, when we don't have a backlog of questions waiting to be answered. In these instances, we'd like to share with you some questions that will help you review important information. For those of you studying for board examinations, these questions may be helpful. They are take from Pratt PW: *Review Questions and Answers for Veterinary Boards: Ancillary Topics,* ed 2. St Louis, Mosby, 1998.

A recently diagnosed HIV-positive patient has a pet African grey parrot (*Psittacus erithacus*). He is concerned about the zoonotic potential of keeping this pet. Regarding avian pathogens, the following have known zoonotic potential except:

A. *Giardia* species

B. Histoplasma

C. Influenza A virus

D. *Chlamydia* species

E. *Mycobacterium avium*

(A.) The species of Giardia *that infect birds is not know to infect people.*

UPCOMING MEETINGS

Atlantic Coast Veterinary Association, Trump Taj Mahal Resort Hotel, Atlantic City, NJ; October 9-12, 2000. For information, call (609) 671-2043.

Tufts Animal Expo to Debut Fall 2000, Hynes Convention Center and Back Bay Hilton, Boston, MA; October 10-13, 2000. For information, call (978) 371-2200.

Wild West Veterinary Conference, Reno Hilton & Casino, Reno, NV; October 18-22, 2000. For information, call (916) 334-5090.

Intensive Course in Veterinary Western Herbology, October 20-22, 2000. For information, call (414) 884-9549.

Readers: We welcome your questions, practice tips, and case reports. Please submit any materials to Susan Sibiski, 526 Cole Ln, Baltimore, MD 21220; ssibiski@home.com.

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