Cockatiel Disorders Seen in the U.S.A.

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The cockatiel, *Nymphicus hollandicus*, is a very popular pet. This species is by far the most common patient in the author's practice. Clinicians and pet owners agree what a fine companion animal the cockatiel represents. Behavior problems, common in some larger psittacids, are rare in these birds. Cockatiels entertain themselves quite readily and provide all the characteristics of a firm companion animal bond.

Cockatiels are pretty sturdy pets. We currently aim for a pet bid life span of greater than 20 years, however trauma, disease, and malnutrition can greatly shorten the average life of the pet cockatiel. This presentation reviews the most common issues seen by this author in the U.S.A.

Malnutrition

Aviculture and pet bird marketing has progressed greatly. While most large pet psittacines were wild caught imports 20 years ago, parrots are now sold as captive reared. The progressive producers and retailers market these parrots as weaned onto formulated diets. Unfortunately, this trend has not occurred with small psittacine species.

The first post-purchase exam/consultation includes educating the client that "cockatiel seed mix" is based on folklore and tradition is akin to lard (tallow) and potatoes or toast and butter as a total diet. This author also tells clients that cockatiels in the wild don't eat millet-based diets (but doesn't mention seeing "wild bird seed" in Queensland with the picture of a cockatiel on it..)

Vitamin A deficiency is not easy to recognize clinically due to lack of prominent oral papillae, but will contribute to a increasing number of disorders. Yeast infections (Candida, Malassezia) occur more often in malnourished cockatiels. Complications of pet cockatiel egg-laying can largely be prevented by proper diet. Hepatic lipidosis (histological diagnosis) typically correlates with a history of exclusive seed diet.

We are currently recommending 80-90% of calories fed in formulated diets (pellets), but are uncomfortable with 100% of this ration (see renal disease). The clinician must provide tools for the client to increase their success rate of diet conversion. Leadership by the client is an essential part of the equation. If such products are not available at a local retailer or

by mail order, the clinician should carry them for sale. Conversion instructions, as printed on the practice computer invoice are:

Seed diets are deficient in most major nutrients and contain excessive fat for the pet bird. Formulated Diets (extruded, pellets, crumbles etc) are designed in an attempt to provide a balanced diet to your bird

HOW TO CONVERT YOUR PET BIRD TO A FORMULATED DIET: Our target amount is 80% of the diet as fed. The key to conversion is initially limiting the seed quantity available to your bird to one-half of what the bird will eat per day. What is that amount? To find out:

1) Measure, in teaspoons or tablespoons quantity of seed mix you place in clean cage first thing in the morning. IMPORTANT: ALL SEED (including millet spray and seed trees) MUST BE INCLUDED IN YOUR MEASUREMENTS!!!

2) The next morning (24 hours later) measure, in teaspoons or tablespoons quantity of seed mix which is left uneaten.

3) Subtract remainder from the initial quantity to determine the actual amount of seed your bird eats in 24 hours.

4) Start feeding ONLY one half of the calculated amount of seed to your bird on a daily basis. Place an equal quantity of the new formulated diet (Harrison's, Roudybush, etc.) in the same bowl.

5) Gradually, over a number of days, decrease the seed percentage.

Worried your bird isn't eating enough? Solution: track your pet's weight. Buy a food or postal scale (or better yet a digital scale). Mark or record the initial weight. Then weigh your bird every morning. During conversion, we can easily accept a 5% weight loss. A 10% weight loss, except with obese birds, is excessive over a short time.

Most birds on formulated diets will tend to be a little leaner, due to a lower fat diet. They will, however, continue to have a regular dropping output, containing both green feces and white urates (kidney waste).

*******Important Note- the above conversion program is to be started ONLY with a bird that is not underweight and is not sick. If your bird is currently under our care with an illness- DO NOT START the conversion program- do ask us when to start it. You can, however, offer some of the new food as a side item.*

Some veterinary practices offer an in-hospital conversion service. We provide follow-up phone calls to inquire on the client's progress. We also caution against feeding too much other items, with a one to two teaspoons (5-10ml) of seed limit per week. The main reason to limit "people food" is that the typical indulged cockatiel (and other parrot) will focus on

more fats and carbohydrates. Typical North American fruits provide little real nutrition to cockatiels and contribute to Ca:P ratio imbalance. A small percentage of cockatiels become obese on free-choice formulated diets, requiring daily rationing.

Under nutrition (and mental health), regular unfiltered sunlight is recommended for pet cockatiels. This means safely transporting the bird outside in a secure, escape-proof, varmint-proof carrier or cage.

The current general care and feeding handout used at the Avian Medical Center of Sacramento can be viewed and printed (Adobe Acrobat) at:
http://home.surewest.net/avianlab/AMCCARE.pdf

Parasites

Ascarids are quite rare and occasionally present with a debilitated cockatiel sourced from a mass-market source or chain store. This author first reported a syndrome with giardiasis in 1986. Characterized by pruritus, screaming and feather-picking, the "cockatiel feather syndrome" is far less common than in the past. This may be due to routine Giardia screening and treatment by avian veterinarians. Eosinophilia originally reported with this syndrome is more accurately interpreted as associated with tissue damage (skin), rather than parasitism. Rapid clinical improvement usually occurs after specific Giardia therapy (metronidazole, ronidazole). Hexamita/Spironucleus, characterized by a cigar shape and more direct and rapid motility, occasionally occurs with variable enteric signs. This organism is more difficult to clear than Giardia. Trichomonas infection is quite rare in the "American" cockatiel. Cryptosporidium is occasionally diagnosed histologically but not typically a pet cockatiel clinical problem.

Feather lice are occasionally or rarely seen and classically treated with carbaryl powder. Feather mites and epidermal mites are quite rare in U.SA. cockatiels.

Chlamydophila Infections

Cockatiels can be inapparent carriers of *Chlamydophila (Chlamydia) psittaci*. Recently infected and clinically ill birds are best sampled with pharyngeal and ocular swab to assay for active shedding (by ELISA, direct FA, DNA probe, cell culture etc). This author does not routinely sample older cockatiels unless recent exposure is noted in the history. Focus of testing on new birds is towards those from mass market sources. While an infected cockatiels can originate from any place, higher infection rates are observed in mass-market sources, with more transport stress and less than ideal management. In spite of pre-sale "spiking" with tetracyclines these sourced cockatiels are frequently infected and sick in the author's experience. This is contrasted with cockatiels from well-managed producers and retailers, where infection is less frequently detected Illness due to *Chamydophila* during the post-purchase period, is rare. The hemogram remains a very valuable tool when assessing the acutely or chronically *Chlamydophila*-infected cockatiel. A variable relative basophilia and/or monocytosis is a common feature. Non-regenerative anemia is

uncommon when compared to larger psittacines. Leukocytosis is more common with acute infections.

Mycoplasma is placed under this category only because weak evidence supports the occurrence of mycoplasma infections. Most articles referring to psittacine mycoplasma reference or trace back to an article Gaskin (Proc AAZV 1979) where mycoplasma was suspected but not proven in quarantine station macaws and who responded to tylosin. Cytological and microbiological evidence of mycoplasma infections in cockatiels is uncommon. Pathological studies supporting mycoplasmosis in cockatiels are apparently rare. This author would suggest that "mycoplasma" infections, as described in textbooks, that respond to treatment are actually due to Chlamydophila (Chlamydia).

Bacteria and Fungi

Cockatiels are susceptible, as a compromised host, the usual suspects of opportunistic bacteria and fungi. These include coliforms (E coli, *Klebsiella* etc), *Pseudomonas*, *Staphylococcus*, *Candida*, *Aspergillus* and other molds. *Salmonella* occasionally shows up. Mycobacterial infections seem to be quite rare in relation to numbers of cockatiels treated as patients.

Spirochete infections (no scientific ID- Borrelia?) occur in some young cockatiels and are associated with pharyngitis and illness. As this organism can't be easily propagated, therapy is empirical with a wide variety of antibiotics usually effective. In the U.S.A., this condition will be missed if a pharyngeal gram stain is not done.

Bordatella avium presents as part of a "Lockjaw Syndrome" in neonates, characterized by inability to articulate the temporo-mandibular joint. Inflammation of associated connective tissue sometimes correlates with pure isolates of B. avium. Flock cure is difficult. Individual cure, along with supportive care, can occasionally resolve a case.

Yeast (*Candida*) infections appear to more common in cockatiels. Opinions vary on their clinical significance. The infection characterized by cheesy lesions is rare. While optimum conditions (chronic malnutrition and chronic spore exposure) can induce aspergillosis in cockatiels, this condition seems to be uncommon, if not underdiagnosed.

Megabacteria is a higher fungus in need of a name. Megabacteriosis in Amercian cockatiels is uncommon compared to budgerigars and lovebirds.

Viral Infections

Phalen reports that there is a high incidence of persistence avian polyomavirus infections (APV) in cockatiels, but that clinical illness is uncommon. In fact cockatiel illness that we can blame on APV is elusive. APV as a cause of death in pet cockatiels is quite rare. Some pathologists surmise (without confirmation yet) that some undifferentiated sarcomas in cockatiels may be APV-induced. APV post-purchase screening in pet cockatiels is not a routine procedure nor is vaccination.

Circovirus infections can occur in cockatiels but do not appear to be a common case of neonatal or fledging mortality, as contrasted to the lovebird. This author recalls a single case of feather dystrophy, diagnosed as circovirus by biopsy, in a middle-aged cockatiel. The bird had been treated elsewhere for giardiasis and died a few weeks after the histological diagnosis.

Psittacine herpesvirus (Pacheco's Disease) can and does occur in cockatiels, however incidence of sporadic and typically associated with large, closely-held collections. This author has never been involved in a case of peracutely fatal Pacheco's disease in a solo pet cockatiel. A DNA probe is now available in the U.S.A. to screen for Pacheco's carriers.
Several other viruses (PDD-associated disease, adenovirus, paramyxovirus, Newcastle's) have been reported in cockatiels.

Dermatopathies

An axillary/propatagial ulcerative dermatitis presents as a difficult to manage case in mature cockatiels. Biopsy does not provide information as to underlying etiologies, but usually shows a mixed inflammatory infiltrate associated with cocci, and or yeasts or occasionally gram-negative bacilli. Nutritional history does not seem to be an important factor. Treatment is directed towards topical (cleansing; topical drugs) and systemic antibiotics/antifungals.

In 1986, this author first reported "cockatiel feather syndrome," characterized by acute pruritus, screaming while picking and patchy feather loss. Original reports associated fecal positive Giardia cases with eosinophilia. Retrospectively, rather than a hematologic response to parasites, the (relative) eosinophilia is most likely associated with tissue damage. This condition is far less common in the U.S. compared to 15-20 years, presumably due to screening and therapy, resulting in a far lower infection rate.

White-faced mutations seem to be the current breed where Giardia is commonly found. A clinical observation by this author: positive infections often correlate with broken rectrices (see YFMCS under trauma).

Malassezia (Pityrosporum) dermal and superficial epidermal infections have long been recognized in a variety of parrot species, based on biopsy. The first cases that this author recalls were associated with circovirus infections. In cockatiels a pruritic skin condition is seen and correlates with positive surface skin cytology and response to topical (clotrimazole, miconazole) and systemic (ketoconazole) therapy. Pruritus is most common in the thoraco-abdominal area. A mild, non-effusive rhinitis or otitis associated with Malassezia is also seen in cockatiels. This author believes that malnutrition (Vitamin A deficiency) predisposes cockatiels to *Malassezia* infections.

Wing growths are not uncommon in cockatiels. Xanthomas (macrophages containing cholesterol crystals) are most common on mid to distal wings. Excision is difficult, amputation may be necessary. Presentation may be predicated by a ulcerative, bleeding and pruritic lesion. Palliative therapy includes repeated bandaging and dietary changes

from seed to formulated diet. Squamous cells carcinomas are increasingly common in the older cockatiel. Early surgical excision can be curative; radiation therapy has been helpful in cases where metastasis did not occur. While located deeper, fibrosarcomas can present as an extremity mass in middle-aged cockatiels.

Trauma and Toxicities

These two items are placed together because they are unfortunately common and mostly preventable through good stewardship of the pet cockatiel. This author's motto is "Cherish but Protect." We all tire of seeing these tragedies. The "Birds for Dummies" book by Brian Speer (www.dummies.com -e-book only outside of U.S.) provides much good information in this area.

Exercise is valuable of course, but free-flighted cockatiels in typical households can result in many types of serious trauma, including burns, head trauma, long bone fractures, carnivore attack and fly-aways. In California, loose pet cockatiels are well advised to find someone to save them, because they don't fare well, compared to larger species. Head trauma is just about the only time the clinician can justify a single dosage of systemic corticosteroids. Carnivore attack, particularly cats, can become a fatal sepsis in less than 18 hours. Initial parenteral antiobiotics, followed by outpatient orals are essential immediately.

Cockatiels used to be number two (to Amazons) in heavy metal toxicities in the author's practice, but white cockatoos have ascended to number one now. Stained glass art, non-jacketed bullets, curtain weights, costume jewelry, painted antiques represent a few sources of lead in the household. While zinc toxicosis hysteria has been over-emphasized in the U.S., resulting in over-treatment of clinically normal non-exposed cockatiels, real cases do occur in cockatiels. This usually involves elemental zinc or small metal pieces containing zinc that are ingested. Cockatiels allowed to "run amok" on the carpet can find such particles. This author prefers parenteral CA EDTA for therapy. Despite references supporting oral EDTA therapy, this is contrary to pharmacologic and toxicologic principles. DMSA, an oral chelator, may be toxic for cockatiels and is probably not effective for treatment of zinc toxicosis. Unfortunately we see many cockatiels in the U.S. being treated with this drug, without a solid diagnostic indication.

Toxicities other than heavy metal poisoning are uncommon in this author's experience. Non-stick cookware can be a problem if thoroughly charred, but proper usage of this product is safe. This author has been cooking on them for years with parrots present. Only negligent usage of non-stick cookware will be a problem and then you can have a house-full of dead birds.

Cockatiel trauma is almost a daily occurrence in the author's practice. Minor lacerations can be repaired with butorphanol parenterally and lidocaine (spray, gel, topical solution or injection) quite efficiently. Further pain relief is addressed with a suspension of carprofen orally @ 2mg/kg BID. Topical NSAIDs are useful also such as Ibruprofen gel (Ibugel-UK).

While some of our colleagues impress me tremendously with their internal fracture fixation of cockatiel long-bone fractures, I have been mostly pleased with coaptation splints (aided by a single Vitamin D3 injection and oral calcium if nutrition history suggests).

Some traumatic events "specific" to cockatiels are YFMCS (Young Foolish Male Cockatiel Syndrome-Fudge) aka Tail Base Laceration of Cockatiels (Rosskopf). The other is Earthquake Panic. YFMCS occurs particularly in young males with broken rectrices (see giardiasis). Add to that normal wing clip and silly young guys jumping off of high surfaces, landing wrong and severely lacerating their tail. One or two layer closure plus acrylic cement is necessary for repair. In addition, the patient must be restricted to being held or in a (low elevation) cage during healing and until tail feathers moult out or the little guy gets a little more sense.

Earthquake panic is legendary in the Los Angeles area, keeping veterinarians quite busy with severely self-battered cockatiels after a major quake. Soft-tissue and sometimes hard tissue trauma occurs, requiring analgesics, wound care and supportive measures. Some excitable cockatiels, even in non-earthquake areas, benefit from "night-lights," and padded cages.

Reproductive Tract Disease

Cockatiels are indeterminate egg layers, meaning at least in the U.S.A. we see house pet cockatiels laying eggs virtually any week of the year. Of course these are typically pet birds, without a mate nor a nourishing diet. I wouldn't write a life insurance policy on a 7 year old egg-laying cockatiel on a chronic seed diet.

We experience unwanted egg-laying in pet cockatiels year-round but a bit more in the North American spring and fall. The traditional millet and sunflower diet leads to poor nutrition for egg production. The high calorie diet tends to promote egg laying while being devoid in minerals and complete protein.

Photoperiod reduction seems to be of minimal help in reduction egg production in cockatiels, however we try to reduce the external stimuli (birds, people and objects). Most egg-binding cases present with a soft-shelled egg in the oviduct. While usage of the controversial Prosta 2 alpha (Lutalyze- Upjohn) can be quite successful in larger psittacines, it doesn't often help- nor does oxytocin. Nonetheless, therapy begins with a 1:100 dilution of the Lutalyze- 0.01 ml of the dilution is placed in DMSO gel and placed in the cloaca. Parenteral calcium is provided plus appropriate supportive care. If no parturition in 2-12 hours, extraction is attempted. Parenteral butorphanol plus parenteral or oral NSAID (carprofen, ketoprofen) is administered. Alternately, the patent is lightly anesthetized with isoflurane. Ovocentesis is first attempted with obvious soft-shelled eggs. Manual extraction proceeds with the egg coming out or assisted with forceps. The patient is discharged after a Vitamin D injection. Oral calcium and antibiotics are dispensed. In many cases, an initial injection is given to inhibit short-term egg-laying. Previously, this author used chorionic gonadotropin but this has given way to depo-leuprolide (Depot

Lupron; Depot-Lucrin – Tap/Abbott) @ 100 micrograms per kg. Note that some clinicians are using up to 700-800 micrograms/kg every 2 weeks for 3 injections. Additonal discharge instructions include guidance on dietary improvement and behavior management. A recheck exam and hemogram is recommended in 2-3 weeks.

Ascites can present in a female cockatiel with or without an egg-laying history. Typically, a previous (up to 2-3months) unrecognized egg-binding episode resulted in oviductal rupture and a "rotten egg" or parts in the abdomen. Abdominocentesis cytology will show a typical fatty background with a variable degree of cellularity from granulocytic to macrophagic. Bacterial visualization is uncommon but can include cocci and sometimes what turn out to be coliforms on culture.

Initial inpatient care involves partial mechanical fluid removal, followed by 12-24 hours of furosemide @ 1-2 mg/kg. Parenteral later-generation cephalosporins (ceftiofur, cefotaxime, ceftazidime) or piperacillin are started for 5-7 days. Radiographs are most useful after abdominal fluid reduction. Laparotomy, peritoneal cleanup and oviduct removal are then scheduled. Surgical hemoclips are useful for the salpingectemy procedure. Sometimes the surgeon will be surprise by reproductive tract neoplasia in high-producing hens. Some ovarian and oviductal cancers are suspected with cytodiagnosis; many are missed. Ultrasound might pick up such a neoplasm. Otherwise it is prudent to advise that cancer is one possible outcome discovered during the surgical procedure.

Yolk peritonitis can present with a much lesser degree of yolk material in the peritioneal cavity. Leukocyte counts exceeding 20,000 are common along with typical cytologic changes. If shell or excessive yolk material is not present in the peritoneum (partially assessed radiographically), medical therapy alone may resolve this. The same parenteral drugs above or quinolones or oral trim/sulfa are used up to several weeks, with periodic patient and total leukocyte assessment.

Pancreatic disease can be a complication of yolk peritionitis, resulting in a pseudo-diabetes. Plasma glucose may be 2-3 times normal, while the persistent avian "diabetes mellitus" not clearly associated with female physiology/pathology tends to show a plasma glucose of 4-6 times normal. Therapy is directed towards resolving the reproductive tract disease and switching patient to a primary formulated diet.

Respiratory Disease

The bacterial agents previously mentioned can cause upper or lower respiratory disease. Cytologic and chlamydophila sampling of naso-ocular discharge can be quite helpful. Chronic respiratory or cardiac disease, resulting in hypoxemia can show a marked polycythemia (PCV > 65-70%). Aspergillosis seems to be quite uncommon in the cockatiel.

The infamous aspirated millet seed can present as a truly acute syndrome, which provides another argument for not feeding millet at all. The main differential diagnosis is bacterial broncho-pneumonia and occasionally a fungal syringitis. A thoracic or abdominal air sac

tube is installed and then attached to isoflurane machine. A blunted tip feline tomcat cathether is useful for sampling. Insertion of the tube to the depth of the syrinx is followed by instillation of 0.2 ml sterile saline followed by aspiration for cytology and culture. Bacterial infections are quite obvious in their laboratory profile and rapid response to antibiotics. The aspirated millet, however shows minimal or normal cytology. The little devil can be quite difficult to remove- using the same tube- suction and flushing is the best effort.

Liver Disease

A tabulation of 103 cases of psittacine liver diseases (Fudge) by necropsy or biopsy yielded the following results:

Table 1- Histological Diagnoses of Psittacine Liver Disease

Bacterial cholangiohepatitis	7	Bacterial necrotizing hepatitis	18
Bile duct proliferation	3	Chlamydial cholangiohepatitis	5
Chlamydial hepatitis	9	Hepatic fibrosis	15
Hepatic lipidosis	14	Hemosiderosis/Hemochromatosis	4
Hepatocyte vacuolation	18	Herpesvirus	2
Lipofuschinosis	2	Neoplasia	6
		(Bile duct CA, lymphosarcoma, myeloproliferative, lymphohistiocytic)	
PDS associated	2	Polyomavirus	3
Protozoan hepatitis	2		

Other: tuberculosis, hepatic degeneration- aspergillosis, toxic, viral; fungal infarction

The underlined terms represent the more common findings in cockatiels. Many of these potentially fatal liver diseases probably have a long period of development. Inflammatory and degenerative changes together are common. Early detection is aided by plasma bile acid assays, because enzyme elevations are absent unless significant hepatocellular damage and leakage is occurring at sampling.

Liver biopsy, by laparotomy, endscopy, or ultrasound-guided methods will provide further therapy-specific information. Initial doxycycline appears to clinically help many of the cockatiel patients who have been demonstrated to have or are suspected of inflammatory liver disease. Nutritional improvement may be the single most important therapy and preventive measure.

Kidney Disease

Echols (Echols Proc AAV 1998, 1999) provides nice reviews of the current state of diagnosis and therapy of avian renal diseases. In the author's practice, aminoglycoside toxicity used to be seen as second opinions. Decline in the usage of gentamicin specifically and aminoglycosides in general has resulted in this problem just about disappearing. Renal

mineralization, associated with polyuria secondary to feeding 100% formulated diets remains a problem in some cockatiels. Glomerulopathies (associated with polyomavirus?) are also common and may respond to the FA/NSAID therapy outlined by Echols. Severe zinc toxicosis will present with marked polyuria. Overall, urinalysis is rarely helpful in diagnosis of renal disease. Uric acid assay is a poor measure of renal function.

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