

Daily Living with Avian Bornavirus and Proventricular Dilatation Disease, or Avian Ganglioneuritis

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What is PDD?

Proventricular Dilatation Disease (PDD) is a wasting disease affecting mostly cockatoos and macaws; however, any of our pet birds can be afflicted, and recently it is being found in African greys and other mid-sized birds in greater numbers—even in canaries and cockatiels. Stress is believed to be the trigger which sets in motion initial onset signs and relapses.

Introduction:

The following suggestions are helpful, not just for birds suffering from Avian Bornaviral Disease, but for any bird with gastrointestinal illness. The signs are usually similar among all gastrointestinal illnesses, so following this diet and adhering to the suggestions will aid in the bird's recovery. The Avian Bornavirus also produces Central Nervous System (CNS) signs, and many birds experience both the gastrointestinal (GI) and CNS signs.

I developed these guidelines during the five and a half years I cared for my triton cockatoo after she was diagnosed with Avian Bornaviral Disease in 2008. This information was gleaned from experimentation, along with guidance from my avian veterinarian. After the initial, acute attack and diagnosis, she survived another five years as a result of the medications given by her avian veterinarian and the utilization of these strategies. In 2009 and 2010, she suffered severe relapses during consecutive breeding seasons, and in 2013 she experienced an attack after which she declined quickly and expired. The medications had ceased to work; that is common with this disease.

Every bird is unique. What has worked for me may or may not work for you. You too will have to experiment. It is important to adhere strictly to whatever you find works for your bird. The most dangerous times for relapses are during breeding seasons since the bird's immune system is lower during that time. Be sure to be proactive about these times and discuss preemptive hormonal treatment with your avian veterinarian.

These birds do not have to be completely isolated from other birds; the disease is not that easily transferred from bird to bird. Keep him separated from others and pay strict attention to hygiene.

Do not allow these birds to breed!

The Diet

During a PDD onset episode or flare-up, or gastrointestinal illness, it is important to monitor the bird's food intake very carefully, both for the quality and quantity of food provided. The Avian Bornavirus will always be with the bird, and PDD/avian ganglioneuritis flares can occur at any time. Incorrect food choices may trigger an attack. Once regurgitation begins, it can be very difficult to control. Even birds showing only neurological signs need to have their diets watched very carefully since chances are very good that their gastrointestinal (GI) tracts have been affected, and the proventriculus and other internal organs have become enlarged. Even though these dietary suggestions are recommended for use during a flare, most ABV/PDD-affected birds will do significantly better if continued on this maintenance diet for the lifetime of the bird, with other foods offered only as tolerated. Consult your avian veterinarian for further advice.

General Dietary Recommendations

- **Use canola or corn oil instead of margarine for cooking.** Margarine may be reintroduced when the bird has improved.

- Carbohydrates are important to offer as they provide energy and are usually easily digestible.
- Monitor water/liquid intake to make sure the bird is staying hydrated, especially if it is regurgitating.
- Feed rice products rather than wheat, if possible; they are easier to digest.
- Offer small amounts of any bland food when the bird is stable and not regurgitating.

Foods to avoid:

- Avoid whole seeds and fruits with seeds since seeds are difficult to digest. Ground seeds and nuts are a good source of protein and energy as the bird improves.
- Avoid foods that are fried, high in fat and/or cholesterol, high in salt or sugar, have breeding on them, or are otherwise heavy.
- Avoid foods with liquid dairy products, including yogurt. (This goes for all birds due to their inability to digest lactobacillus). You may use rice, soy, or almond milk to cook with, such as when making mashed potatoes. Solid dairy such as cheese may be offered occasionally.
- Avoid strong, heavy, dark greens, such as kale, mustard greens, chards, etc.
- Avoid high-fiber foods such as corn and beans, and foods that are hard or crusty.
- Avoid hot and spicy foods.
- Avoid cooked cereals. They are heavy and slow to move through the digestive tract.
- Avoid meat. Beef, bacon, and pork take a long time to digest.
- NO NUTS DURING A FLARE. They are very hard to digest. Be careful offering nuts even after the flare has subsided. Many birds cannot tolerate them at all after becoming infected with Avian Ganglioneuritis (PDD).

Foods which may be offered:

Breads and Grains:

- Rice, plain or with a little canola or corn oil, later margarine.
- Thin rice or wheat pasta, such as spaghetti or noodles, cooked in a little broth or thin tomato sauce. For variety, you might try sprinkling a little breadcrumbs on them.
- Sugar-free dry cereals, such as Rice, Wheat, and Corn Chex®, Cheerios®, wheat, rice and corn flakes. All cereals may be dampened with a little rice milk or other non-dairy milk for easier digestion.
- Couscous is well-tolerated and nutritious. Be sure it isn't too moist; it will clump up in the crop.
- Toast, preferably using whole-grain breads. Toast lightly. A little jelly (not jam) may be used. Cut in very small cubes. Dipping it in applesauce makes it more easily digestible, affords energy, and adds flavor to the toast. Do not offer plain bread; it must be toasted or it will sit in the crop in a lump.
- Waffles and pancakes may be offered in very small amounts. Use jelly instead of syrup.

Fruits:

- Apples, peaches, melon, pears, banana, applesauce are all good, but no skins, pits or seeds from fruits, ever, for any bird. Cook fruits such as the apples, peaches and pears.

Dairy:

- Only solid dairy may be offered. Liquid dairy contains lactobacillus, which birds cannot digest.
- Finely shredded cheese; this is a good source of protein and energy.
- Hard-boiled or scrambled egg; use water, not milk to scramble eggs.

Seeds:

- Small amounts of *Lafeber's® Nutri-berries* and *Avi-cakes*, crumbled, when the bird shows improvement. *Lafeber®* also offers *Nutri-An Cakes for Recovery and Nutritional Support* for the larger birds. These are available through your avian veterinarian. These are an excellent source of essential Omega Fatty Acids.

Greens: Small pieces of lettuce such as Boston or leaf lettuce, and light-colored celery leaves.

Vegetables: fresh or frozen. Canned vegetables contain high levels of salt and have poor nutritional value.

- Peas, carrots, green beans (the bean only, not the pod), broccoli, cauliflower. All should be cooked, not raw.
- White potato, regular sweet potato, or golden sweet potato. Use the soft, inside part of the potato and not the stringy, more fibrous part near the peel. *Never give the peel to a bird.*

Meat:

- Boiled white meat of chicken or turkey (later baked, plain), shredded.

General Recommendations for feeding and medicating:

- ❖ Feed very small pieces in small amounts, about 1 ½ to 2 hours apart. Gently feel the crop to see if there is still food in it. Allow time for the food to be digested before offering more; there is a danger of bacterial or fungal growth if the food remains in the crop too long.
- ❖ Shred everything. This allows for easier transit through the digestive tract.
- ❖ Do not allow the bird to overeat. Crop stasis may result.
- ❖ Stay with a bland diet, and only reintroduce other foods back one at a time. If you introduce more than one at a time you won't know what caused the regurgitation.
- ❖ If the bird regurgitates a food, remove that food from the diet until he's improved.
- ❖ Try to keep the head up after a feeding. Lowering the head stimulates regurgitation.
- ❖ Know the difference between regurgitation and vomiting. Regurgitation comes from the crop and oozes out; vomiting comes from the proventriculus and is more forceful. If there is an odor to the vomitus, there could be a bacterial or fungal infection in the crop, and the bird will need to be seen by his avian veterinarian.
- ❖ Don't allow the bird to chew on towels or fabrics; many birds consume the fibers while chewing on them, and this stimulates regurgitation and can cause crop stasis and bacterial or fungal infection. Regurgitation can be stimulated by the chewing alone, even if the bird doesn't ingest any fibers.
- ❖ When the bird is feeling better, you may mix the medications in a *very small amount* of a food that will absorb it easily, such as scrambled eggs, hand-mashed sweet or white potato. Be sure it is a food that the bird likes well enough to eat the entire amount.
- ❖ Do not give medications all at the same time; spread them out throughout the day. This way you will know if one isn't well tolerated by the bird.

Suggestions for rest and activity during a relapse and recovery

- ✚ Keep active play times short; place them at least an hour after or before eating
- ✚ Give the bird plenty of time to calm down and relax before you offer food. Too much or too strenuous an activity will encourage regurgitation.
- ✚ Schedule activity times once or twice a day. Allow rest before feeding again.
- ✚ Do not feed the bird when it is excited, screaming or active. Wait until it is calm and relaxed.
- ✚ Don't force him to eat. If he's not hungry and eats anyway, you increase the chances that he'll regurgitate or food will accumulate in the crop, encouraging bacterial or fungal growth. .
- ✚ Allow the bird to rest after a feeding, even if it means returning him to the cage.
- ✚ Provide sufficient rest and sleep periods. Ill birds require more rest than well birds. They need at least 12 hours of sleep per night, and rest periods during the day. One longer rest period after lunch is helpful. Do not interrupt rest for activity time.
- ✚ Affected birds chill easily and shiver more than usual. If you bathe him, be sure to dry him thoroughly. The ambient air needs to be warm, so keep the house and cage area away from drafts and in a warm room. Do not overheat the bird, either, as the stress of overheating is also

detrimental. If the bird is in a cold room, use an electric heater several feet from the cage and turn it off at night.

- ✚ For bathing, use a spritzer bottle instead of placing him in the shower. Showering or heavy bathing will cause him to chill and add stress to his already stressed condition. Light spritzing with warm water will aid in preventing feather picking and encourage preening behavior.
- ✚ Birds require a great deal of attention and reassurance during the difficult times, especially if they have to be syringe-fed medications or nutritional supplements. Added love and attention will help you retain the bond between you and the bird.
- ✚ Stay calm and pleasant in front of the bird; if you exhibit worry or nervousness or any negative behaviors, it will affect the bird's mental state and ability to heal.
- ✚ Provide quiet, calming music in the background. This will help you and the bird stay calm and quiet, particularly in times of stress or relapse.
- ✚ Do not become angry, shout at, strike, or drop the bird, even if he bites. Calmly return him to the cage. Displaying strong emotion is negative reinforcement and will encourage the behavior to continue. Keep a stick, small perch, or toy handy to block bites.

Keep a journal

- ✚ Monitor droppings and urates daily, taking note of the color of the urates (they should be white) and quantity of urine. Monitor the color of the stool and consistency of the droppings. Also watch for undigested food or fiber content in the droppings. Mark these in your journal.
- ✚ Keep a daily chart. Record all medications and their dosage amounts, supplements given, activity levels, normal and unusual behaviors, activities preceding relapses, daily weight (taken at the same time each day), food and liquids consumed, and length and severity of symptoms. Record whether you had to syringe-feed critical care formula and medicines. Chart the medications and times each is given so you don't over- or under-medicate.
- ✚ Take dropping samples from overnight and different times of the day of your appointment to your avian veterinarian for visual inspection and Gram's stain analysis. Place wax paper on the floor of the cage to collect the droppings, and place them in separate plastic bags with a moist paper towel to prevent drying.
- ✚ Monitor any CNS signs such as seizures or unusual body movements.
- ✚ Discuss significant or consistent changes with the veterinarian as needed.

Work closely with an avian veterinarian experienced in managing PDD-affected birds. Proper medical management can minimize or even eliminate the clinical signs of disease in affected birds. Consider yourself partners with your practitioner in caring for your bird.

Physical, physiological, and psychological needs and behaviors

- ✚ **Self-mutilation:** Prior to and during a relapse, chewing may increase. Birds will chew or pull out their feathers or pick at the skin on their backs, legs, and tops of the wings.
- ✚ **Chewing:** Many birds become hyperactive and will chew obsessively on wood, and toys, even after the bird is stable. Provide chunks of "white wood" for the larger birds, available at places like Home Depot. Small birds enjoy balsa wood; available from Hobby Lobby in bulk.
- ✚ **Relapses:** These often occur during breeding season, mainly in early spring. Speak with your avian veterinarian about Lupron® hormone shots or Deslorelin® implants.
- ✚ **Chills:** The feet tend to be cold, and the bird may shiver quite a bit. Add an additional heat source not too close to the cage. Small birds may need to be placed in a large bin with a heating pad on the bottom and towels covering it. Be sure to hold your hand on the towels to make sure it is not too warm. Protect the cord by wrapping it in a towel. Place the food and

water in small dishes on the towels, and put a few toys in the bin. Cover it with framed screening that will not rust, or some other open barrier that will prevent the bird from escaping but still allow light and air to enter. At night, the bin can be partially covered with a towel.

- ✚ **Hypersensitivity:** The bird may experience a strong startle reflex. Hyperesthesia (strong reaction to sensory stimuli, such as light and sound), hyperalgesia (increase in sensitivity to pain), and allodynia (sensitivity to touch) are all difficulties these birds experience. Being aware of these changes will help you prevent being bitten when you handle the bird. Handle carefully; don't jostle or bounce him around.
- ✚ **Stimulation:** Affected birds require a quiet surrounding. Turn down or turn off the ringer on the phones during rest times. Soothing, quiet music is very helpful.
- ✚ **Exercise:** The bird still requires exercise, except when it is very ill. Once he is holding his food down, allow him to walk around the floor, play simple floor games, such as chasing a ball, and even take short flights. Take him outside on warm—not hot—days on your hand or in a carrier. Discourage “diving” in the large birds. If any of these activities results in regurgitation, stop the activity and return the bird to its cage.
- ✚ **Negative behaviors:** These may increase, both during and after a flare. Set behavioral boundaries for the bird; feeling sorry for him does not help him or you. This disease changes the physiology and mentation of the birds, and he may bite, scream, or attack for seemingly no reason at all. This may be difficult to tolerate, especially if he had not done so before. He is in discomfort. Calmly return him to his cage.
- ✚ **Central Nervous System signs:** Some birds also experience CNS signs with PDD and may suffer seizures or abnormal physical movements. They may need a more confined area without perches, such as in the above-mentioned bin, so they don't fall and harm themselves. For larger birds, remove all but one perch, place it low in the cage, and pad the floor of the cage with towels (unless the bird chews on them). Place their food dishes on the bottom of the cage or attach them to the bars on the side of the cage. Make the area smaller by placing a barrier between the bottom of the cage and the upper part of the cage to prevent his hanging onto the side of the cage all the time, thus expending much-needed energy. Monitor food intake carefully; even birds showing only neurological signs possess some digestive tract impairment.

Recommended Formulary

- *Celebrex*® (Celecoxib, Pfizer), an oral Cox-2 inhibitor, for GI tract signs, pain, inflammation, and peripheral neuritis in nerves of the digestive tract. Please note: Oral meloxicam is not as effective as celecoxib.
- *Robenacoxib*®—an injectable Cox-2 inhibitor, for pain and inflammation
- *Gabapentin*®: for self-mutilation, seizures, neurological/neurogenic pain
- *Cisapride*®: GI prokinetic agent for improving transit in birds with GI tract involvement, particularly early in the course of therapy.
- *Leuprolide acetate* injections and *Deslorelin* implants: for managing hormonal increases which occur with the onset of breeding activity.
- *Metoclopramide* (*Reglan*®) GI prokinetic agent, for decreasing nausea, regurgitation or vomiting, improving motility, and easing digestive discomfort,
- *Silymarin* (milk thistle): a natural substance that protects the liver; it is available through your avian veterinarian or health food store. I use: <http://www.iherb.com/Nature-s-Answer-Milk-Thistle-Alcohol-Free-2-000-mg-1-fl-oz-30-ml/5159>.

Syringe-feeding Medications and Supplements

If the bird is unable to keep anything down, you will need to administer the medications and Emerald with an oral syringe to ensure absorption. Small birds will accept a small syringe more easily than a large one. Use a .5 cc syringe for cockatiels and 1 cc for cockatoos. You may need a larger syringe for macaws.

- ❖ Administer without food so the medication will not be lost with regurgitation. Do this about ½ hour before feeding. Hold the bird securely in your hand or wrapped in a towel, stabilize his head, and drip the medication or supplement into the side of the mouth, a few drops at a time. This may require a second person's assistance, particularly with a large bird.
- ❖ Many birds who are too ill to eat or who are regurgitating will need to receive **Lafeber's® Emerald Omnivore Critical Care** nutritional diet by syringe in order to survive. It should be given during a flare, or any time the weight is dropping. It is a semi-elemental formula and easily absorbed. It is hydrolyzed, so it requires almost no digestion and is absorbed quickly into the bloodstream. It is available through your veterinarian. Preparations instructions:
 - Prepare a small amount of the thin mixture, about ½ tsp. Emerald to 1 tsp. water. Shake well. Syringe-feed this directly into the side of the beak. This should be given often throughout the day—if the flare is severe, every hour or two. If the bird regurgitates it, cut back on the amount given. Make up the liquid fresh before use and fresh each day. The dry powder will keep longer if stored in the freezer.

Suggested routine:

- 8 a.m.: Breakfast: a soft food, such as little scrambled egg, with medications
- 9:15-9:30: slice of banana or small piece of baked goods, any easily digestible food
- 10:00-10:30: Activity time.
- 11:00-11:30: Lunch: a few strands of thin pasta (cut up) or noodles with a small amount of canola oil or thin tomato sauce; peas; when improved, other vegetables. Add medications.
- 12:00 to 2:00 or so: afternoon rest period away from house activity. Turning of the ringer on the phone helps, as does turning on soothing music
- 2:30: Food: hand-mashed white or sweet potatoes with medications. Provide rest after eating.
- 3:30: Activity time.
- 4:00: Food: rice or noodles with a small amount of broth or margarine
- 5:30: Food: a small amount of pasta, toast or noodles; if not regurgitating, white meat of chicken. When feeling better, medium-cooked roast beef. Avoid overcooked, dry meats. Add a little tomato sauce or serve plain. Break up all meat into very small pieces and feed very small amounts. 6:00-6:30:
 - Activity time
- 7:00: small amount of scrambled egg or baked goods or toast with jelly. Administer medication.
- 7:30: bedtime

Conclusion

In the past, Avian Bornaviral Disease (PDD) had been considered a fatal disease, but now, new treatment and management options offer added hope for affected birds. PDD is a very manageable, chronic disease. New treatment protocols utilizing COX-2 inhibitors, along with proper nutritional management and attention to supportive care, will help minimize or eliminate disease signs, thus extending the quality and longevity of life in affected birds.

The author is indebted to Dr. Robert Dahlhausen for his advice and recommendations. Other papers on this topic are available from the author. The author may be contacted at jmiesle@zoomtown.com.