

Husbandry and Medical Management of the Nursery

by Robert F. Stonebreaker, D.V.M.
Escondido, California
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Many of the common disease problems encountered in the nursery are related to improper husbandry. The conditions under which baby birds are kept have a profound influence on their health. Disease prevention is the most economically sound base on which to build a successful nursery management program.

An important aspect in the management of the avian nursery is the veterinarian's relationship with the aviculturist. Through the combined efforts of the avian veterinarian and the aviculturist, specific individual husbandry techniques and preventive measures can be developed.

There are a myriad of problems known and suspected to be related to inadequate management practices in an avian nursery. We now have a better understanding about the etiology of pediatric diseases to prevent many of these problems. This paper will define the majority of these problems as seen in psittacines with an emphasis on preventive medicine.

Diets and Feeding Techniques

There are as many formulas as there are people that handfeed babies. Although specific nutritional requirements are not known, many different diets have proven successful for a variety of species. Several of these have been published over the years. There are now several prepared formulas commercially available. Whatever diet is chosen, it is very important not to radically change the ingredients. Every time a new dietary ingredient is added, nutri-

ent ratios change, which can lead to problems such as crop stasis or stunting.

Water content, consistency and temperature of the diet are also important. The diet's proportion of solids-to-liquids and viscosity will affect crop emptying time. Very young birds should receive a more diluted formula. As the birds develop, the formula should be about the consistency of cream of wheat. Because a large number of gram-negative bacteria may be found in tap water, it is best to use Lactated Ringers, Pedalyte™, or bacteriostatic water (bottled or filtered) as the formula dilutant. The temperature of the formula is critical to its acceptance. The optimum temperature for feedings is 100° - 105° F. Birds may be reluctant to feed or may develop hyperthermia and crop stasis with food that is less than 100° F. Food hotter than 105° F may cause the crop to burn. Mild burns may heal without treatment or surgery. Fistulas with subsequent leakage of formula will require surgical repair. The handfeeding formulas should be prepared fresh for each feeding. Baby formulas that have been mixed and stored improperly commonly grow contaminants of gram-negative bacteria and yeasts. For convenience, one may mix and freeze single portions in ice cube trays. Whichever method is used, strict hygiene is of utmost importance.

Handfeeding can be accomplished by using a variety of utensils. Spoons, syringes, plastic bottles and feeding tubes have all been used successfully. A separate feeding utensil should be used for each bird. Spoons are slow and can

be messy, pipettes and squeeze bottles are difficult to measure the amount fed, and feeding tubes, although quick, can be dangerous. Catheter-tipped syringes in a variety of sizes are the most popular feeding utensil. Syringes can be filled and kept in a hot water bath to maintain formula temperature. Between feedings all utensils should be thoroughly washed and soaked in disinfectant. Syringes and other feeding utensils should never be refilled after feeding a bird until it is cleaned, otherwise this can be a common way to transmit disease by contamination of the formula. All sick and suspected ill birds should be isolated and always fed last with utensils stored separately.

Housing and Bedding

There are many ways to house baby birds. The proper environment can affect the well-being of a chick. Psittacine chicks are altricial and as such require a heat source to regulate their body temperature until they become feathered. Most babies are traditionally raised in thermostatically controlled brooders. Some aviculturists use heating pads under plastic tubs, aquariums or cardboard boxes; however, heating pads are unstable and can be dangerous. The environmental temperature and humidity are critical factors. Birds younger than one week should be kept at 90° - 94° F. As a bird matures the temperature should be gradually decreased until the bird is fully feathered and then maintained at 75° - 80° F. The humidity should be greater than 50%, with an optimum of 55 - 75%.

Heat and cold stresses are a predisposing origin for disease in nurseries. Environmental temperatures too high may cause dehydration, hyperactivity, panting, poor growth rates or death. Too cold of environmental temperatures can result in crop stasis, inactivity, lack of feeding response, pale skin color, shivering or death. When the humidity is too high fungal infections are more prevalent. Humidity that is too low will often cause crop stasis, dehydration, dry flaky skin or constricted toes.

Hatchlings are placed in small plastic containers, one or more birds to a container. One bird per container is preferred to contain the spread of any disease, while two or more birds are placed together for psychological or social benefits. These containers should have solid sides and a flat-bottomed surface. Baskets with open sides should be avoided as toes, feet and leg injuries

may result, and bowls with rounded bottoms should be avoided as leg deformities may result when birds lean on the sides. The containers are changed daily and as the chick increases in size larger tubs are used.

The preferred bedding is paper or cloth toweling which is changed with every feeding. Toweling is safe, provides good footing and droppings can be easily monitored. Other substrates such as wood shavings, corn cobs, walnut shells and shredded newspaper are not recommended for fear that the babies will ingest it. They are growth medias for fungi and molds and obscure the monitoring of fecal matter. Some aviculturists place babies on small wire mesh. They may not look as cozy as those kept in containers on bedding, but overall the wire platform has many advantages. The chick doesn't come in contact with its fecal matter, thereby staying cleaner and healthier. This method has also proven helpful in preventing "constricted toe syndrome." Low environmental humidity and accumulation of fecal matter appears to be the primary predisposing factors of constricted toes.

When youngsters are well feathered and are wing flapping in anticipation of fledging, a wire top should be put on the container or they need to be placed in a holding cage to prevent escapes. These birds should be kept caged up or their wings trimmed. Otherwise they will take off and fly over to other cages where they can quickly become traumatized.

Housing different species in separate areas or individual rooms of the nursery is a good idea. Some species are more prone to certain diseases than others. Additionally, it is easier to control disease with smaller numbers.

Records

A successful nursery management program should always incorporate documentation. Good record keeping can prove invaluable in detecting problems. An individual record for each baby should be started as it enters into the nursery. Key points of value should include age, weight, time, volume fed and any comments. Additional points of value include identification, species, date of hatch and parentage.

Chicks should be weighed at regular intervals, preferably daily. The best time is before the first feeding in the morning, at which time the crop is empty. Inadequate weight gain or weight loss will be

one of the first indications of an impending problem. Additionally, any observations regarding the status of the chick, along with any treatment or laboratory information should be recorded.

These records are of the utmost importance to the aviculturist to assist with future breedings. From a veterinary standpoint, records are critical for complete evaluation of the pediatric patient. In order to provide adequate treatment for young birds, veterinarians should be familiar with normal developmental parameters of various species of birds.

Most aviculturists find the keeping of daily records to be a time-consuming task. Therefore, compliance with record keeping has become a significant problem. Without records, developmental review and management evaluation is virtually impossible.

Pest Control

The presence of mosquitos can be associated with poxvirus outbreaks. These can be controlled by screening vents and other port openings, avoiding free-standing water around nursery area, and use of fly traps.

Rodents can frequently inhabit nursery areas and act as carriers of disease such as E-coli, Klebsiella sp., Enterobac-

ter sp., Salmonella sp., and other bacterial agents. Field surveys from 10 nurseries have yielded E-coli as the most common bacterial isolate. Rodents are aggressive and can kill or seriously injure babies. They also cause an unpleasant smell. It is almost impossible to prevent the entry of mice and a continuous effort is necessary to keep their numbers down. Trapping is the safest way to eliminate rodents inside the nursery. Attempts should also be made to eliminate nesting places. Poisons are not suitable or recommended for use in a nursery environment.

Cats may be used for rodent control in the nursery but they, too, act as carriers of disease. Cats may also injure or kill chicks. Cats should be discouraged from visiting the nursery. The best means of control is to prevent access.

Bacterial Diseases

Bacterial infections are the most common diseases encountered in baby psittacine birds. Bacteria are opportunistic organisms occurring ubiquitously which can be primary or secondary invaders. Underlying environmental, nutritional, chlamydial, fungal, mycoplasmal, protozoal or viral diseases should always be considered as poten-

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tial complicating factors. It is important to note that bacteria are the easiest disease agents to diagnose and treat.

The normal microflora of psittacines consists primarily of gram positive bacteria. Gram-negative bacteria are commonly considered pathogens. The microflora balance between gram-positive and gram-negative bacteria is a complicated issue and poorly understood. If a problem of microflora imbalances is occurring in a nursery, it is important to identify the sources and take appropriate preventative management measures to clean up the environment. Gram-positive bacterial isolates such as *Enerococcus* sp., *Staphylococcus* sp. and *Streptococcus* sp. can be pathogens in young birds. This occurs primarily post-treatment with broad spectrum antibiotics, especially the quinolone antibiotics. The presence of gram-negative bacterial isolates does not alone warrant antibiotic treatment in all cases. Low to scant growths in an asymptomatic bird would probably not warrant treatment.

The same drugs used to treat adult birds are used for baby birds with some precautions. It is important to be aware of the potential of fungal overgrowth during antibiotic therapy in baby birds. Therefore, antifungal therapy should always accompany the use of antibiotics. Treatment should normally be based on the culture and sensitivity results. In a sick baby, antibiotic, antifungal and supportive therapy must be started right away. To wait for the sensitivity results may result in death.

Quinolone antibiotics must be used with extreme caution in baby birds. Many toxic effects that may be species specific have been seen. Of greatest concern is developmental arthropathies. Others include diarrhea, regurgitation, gastrointestinal bleeding, ingluvial ulcers, malgia, nyopathies, respiratory distress gout and overgrowth of beta-hemolytic gram positive bacteria.

Good husbandry and sanitary precautions go a long way in preventing gram-negative microflora imbalances.

Viral Diseases

Of all the infectious disease agents, viral diseases are the most feared and represent the greatest threat to the nursery. The potential economic and emotional losses can be devastating. With time, new viral diseases are becoming better understood. Currently the viral diseases of greatest importance in

young birds are Polymavirus (Papovavirus), Psittacine Beak and Feather Disease (Diminivirus), Psittacine Proventricular Dilatation Syndrome, Reovirus and Poxvirus.

Viral diseases remain a therapeutic challenge. There are no specific antiviral treatments available. Human antiviral drugs such as Acyclovir (Zovirax™ Burroughs Wellcome Co.) and Metisoprinol (Isoprinosine™, Newport Pharmaceuticals International, Inc.) have helped reduce mortality in some outbreaks. Nonspecific supportive care including antibiotics and antifungals for inhibition of secondary bacterial and fungal invaders, fluid therapy, blood transfusions, immunoglobulins and vitamins may help with some patients.

Disinfection remains as one of the most important management tools for the control of viral infections in the nursery. There are many disinfectants available, each varying in their spectrum of virucidal activity. Chlorhexidine (Nolvasan™, Fort Dodge) has been tested and shown to be ineffective against the majority of psittacine viruses. Air filters are probably one of the best deterrents to spreading airborne viruses by minimizing dust, dander, feathers and aerosolized particles.

Attempts at producing immunity through vaccination are being made. Only Pacheco's Disease Vaccine and Psittacine Pox Vaccine are currently available. The Pox Vaccine is not especially efficacious for all species of psittacines. The vaccine should be reserved for use in nurseries only where the Poxvirus is known to be present and causing problems. Other vaccines which are unavailable at this time but are under experimental study include Reovirus, Papovavirus and Psittacine Beak and Feather Disease.

Viral diseases are important sources of morbidity, mortality and economic losses in the nursery. Much more research is necessary in order to fully understand these various syndromes and to find the best means to control them.

Disinfection and Sanitation

Good hygiene is paramount in the nursery. Following specific practices within the nursery will avoid contamination from one baby to another and prevent the spread of diseases. Psittacine baby birds lack a fully competent immune system and are therefore more susceptible to disease than older birds. The most common sources of patho-

genic disease transmission are the food, water supply, other birds in the nursery and contamination by the handfeeder or nursery personnel.

The handfeeding formula should be prepared fresh for each feeding and fed promptly after heating. Commercially available formulas must be kept refrigerated or frozen to prevent spoilage. Gram-negative bacteria and yeasts are common contaminants of spoiled food. Left-over formula should never be reused. When evaluating stored food, if there is any doubt it is best to throw it out. The utensils used to prepare the formula and for handfeeding should be carefully cleaned and disinfected to prevent introducing bacterial contaminants. *E-coli*, *Enterobacter*, *Klebsiella* and *Pseudomonas* are the most common gram-negative organisms isolated from utensils. The water supply is another source for introducing bacterial contaminants. Use of tap water is highly discouraged. *Pseudomonas*, *E-coli* and other gram-negative bacteria are common water contaminants. Bottled water is safer; however, outbreaks of *pseudomonas* septicemia have been traced back to bottled water from local grocery stores. Bottled water dispensers can be significant transmitters of contaminants and should be avoided. Water filtration systems are the preferred method for water supply in the nursery. A bacteriostatic water filter such as Ambassador™ is highly recommended. Feeding utensils should be washed in soap and left soaking in a disinfectant between feedings. These utensils should be rinsed prior to use as some disinfectants can be a threat to the babies. Roccal-D™ and Wavicide™ have been shown to cause stunting of babies if residues remain on feeding utensils. Kennel-Sol™, a quaternary ammonium disinfectant has been shown to be a safe effective soak for utensils with good antibacterial, fungal and viral properties with no toxic effects from disinfectant residues.

New babies brought into the nursery are a great potential source of contamination. A routine health exam and medical workup should be performed on each baby as it is introduced into the nursery to maintain a disease-free nursery. Infected chicks can then be isolated and treated and the problem eliminated before spreading to other babies. To prevent baby-baby transmission, chicks should be kept in separate containers. A separate feeding utensil should be used for each bird and there should be no re-

introduction into a common food source. Hands can be disinfected between handling of each baby by applying a foam disinfectant (Alcare™, Calgon Vestal Labs). Frequent spraying with a disinfectant (Staphene Disinfectant Spray and Air Sanitizer™, Calgon Vestal Labs) may be necessary for clothing and hair. Foot baths with a phenol type disinfectant (1-Stroke Environ™, Ceva Labs) should be placed at every doorway, especially into the high risk areas of the nursery. Air filters will serve to control dust, feather dander and dried fecal matter that is airborne.

Different people should be used to take care of the nursery and the breeding flock. Since this is not possible for most aviculturists, different clothing should be used for servicing each area. The feeder should wash and disinfect thoroughly before feeding the babies.

Visitors (people and birds) to the nursery should be kept to a minimum. A "closed" nursery concept is essential to success. Infectious diseases are best controlled through strict traffic control.

Specific diseases are best controlled by different disinfectants. It is up to the veterinarian to educate and advise the aviculturist as to what the best disinfectant is for each individual task. Most successful nurseries will employ several types. Initial cleaning of dirt and other organic matter from surface will greatly assist disinfectants in their ability to kill.

For the aviculturist cleaning and sanitizing is an unfavorable task often overlooked by stress, feeding schedules, telephone calls and other time-consuming events. As the number of babies being handled increases, the convenience and ease of cleaning and disinfection decreases. It is critical to establish a sanitation protocol and adhere to it.

References and Suggested Reading

1. Clipsham R: Pediatric management and medicine, J Assoc Avian Vet 1(1): 10-13, 1989.
2. Clipsham R: Avicultural medical diagnostics and therapeutics, Proc of Avian Pediatric Seminar, Concord, 1991, pp 61-92.
3. Clubb SL: Psittacine pediatrics, Proc Assoc Avian Vet, Miama, 1986, pp 317-332.
4. Flammer K: Pediatric medicine. In Harrison GJ, Harrison LR (ed): Clinical Avian Medicine and Surgery, Philadelphia, WB Saunders Co., 1986, pp 634-650.
5. Gaskin J: Considerations in the diagnosis and control of psittacine viral infections, Proc Assoc Avian Vet, Oahu, Hawaii, 1987, pp 1-14.
6. Harrison GJ, Harrison LR (eds): Clinical Avian Medicine and Surgery, Philadelphia, WB Saunders Co., 1986, pp 85-100.
7. Joyner K: Avicultural pediatrics, Proc of Avian Pediatric Seminar, Union City, 1988, pp 83-92.



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