

Chapter 26

THERAPEUTICS INDIVIDUAL AND FLOCK TREATMENT REGIMENS

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Flock treatment regimens for poultry have been extensively researched and are often applicable when treating flocks of pet birds. In contrast, individual therapeutic regimens used in pet bird practice are largely extrapolated from poultry or mammalian research. Owing to the large number of species encountered by the avian practitioner and to the expense of pharmacokinetic studies, it is likely that empirical dosage regimens will continue to be in common usage. In Tables 26-1 to 26-5 some guidelines for therapy will be outlined for use in various situations. Most of these dosages are empirical but have been used successfully in a clinical situation.

Antibiotics are among the most important and highly utilized drugs in avian practice. Bacterial diseases and chlamydiosis are frequently encountered by the avian practitioner. In addition to diseases of primary bacterial etiology, the clinician is faced with secondary bacterial infections when dealing with viral, parasitic, and noninfectious diseases. Because the underlying cause of disease may be very difficult to diagnose, he is in many cases forced to treat for the treatable diseases, the secondary invaders. Interest in pharmacokinetics of antibiotics in birds has increased in recent years, and much new information is now available for treatment of the individual bird (see Chapter 25, Pharmacology of Antibiotics).

Ideally, any antibiotic therapeutic regimen should maintain tissue levels at the site of infection equal to or greater than the MIC (minimum inhibitory concentration) of the causative organism for a sufficient time to control the infection. There are, however, many inherent difficulties and variables involved in this approach to antibiotic therapy. First, we must know the pharmacokinetics of each drug in each

species; individual, sex, and age variations may also be important. The MIC of the organism being treated is usually not known and is relatively costly to determine. Excretion of many drugs is rapid in birds, and the maintenance of therapeutic blood levels may require frequent dosage and excessive handling. Further studies emphasizing tissue antibiotic levels are needed before accurate dosage regimens can be developed. Tissue levels are often higher and maintained longer than blood levels. Tissue penetration will vary according to the target organ involved and the amount of tissue destruction or vascular compromise.

Drug administration techniques also differ from those commonly used in mammals. For example, it is difficult if not impossible to pill a psittacine (although a pilling instrument is in use in Europe for canaries) (Fig. 26-1). Techniques differ when dealing with the individual tame pet bird, a large flock of imported birds, a breeding flock, and a hand-feeding baby bird.

Physical restraint is stressful to birds, especially wild birds, and must be minimized. All medications and diagnostic tools should be on hand prior to handling the bird. Drugs should be administered quickly and gently, keeping restraint time to a minimum. The value of frequent administration of drugs must be weighed against the stress of frequent handling.

Alteration of gut flora or gut sterilization is a frequent side effect of antibiotic therapy. Supplementation of *Lactobacillus* to restore normal flora after antibiotic therapy is commonly advocated but is controversial. Many natural products, such as some brands of yogurt, do not contain viable *Lactobacillus* cultures. Some researchers feel that species-specific lactobacilli may be required for gut colonization. Clinical improvement does often accompany the use of

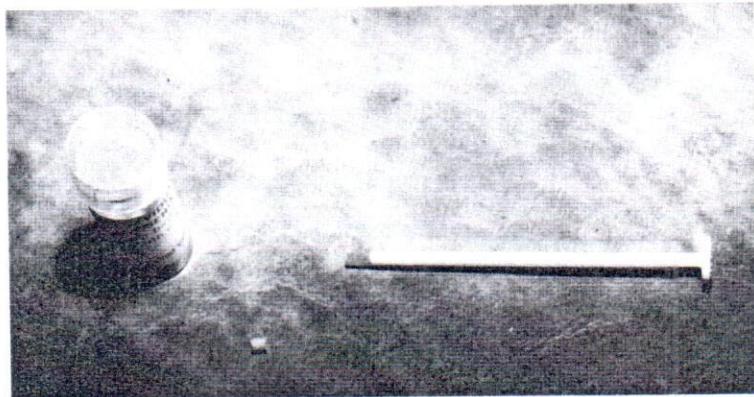


Figure 26-1. Pilling instrument used in Europe for administering drugs to canaries. (Courtesy Greg J. Harrison.)

Lactobacillus, possibly resulting from temporary alteration of the gut environment, allowing proliferation of normal strains.

Immunosuppression is another side effect of antibiotic therapy which must be considered. Several antibiotics suppress the immune response in man and animals by interference with protein or immunoglobulin synthesis, elimination of antigen, interference with phagocytosis, or indirect action on the properdin system (see Chapter 24, Relationships of Avian Immune Structure and Function to Infectious Diseases). Levamisole has been shown to restore the immune response of x-irradiated and antibiotic-treated turkeys to normal levels and may be a helpful adjunct to therapy.²³

Antibiotics are not the only chemicals valuable in the control of pathogens. Chlorhexidine, gentian violet, copper sulfate, chlorine bleach, and food preservatives have all been used with some success. Resistance to these chemical agents is uncommon.

ROUTES OF ADMINISTRATION

Parenteral Therapy

Parenteral therapy is the most exact and effective method of administering drugs to birds. Parenteral medications are most commonly administered intramuscularly (I.M.) in the pectoral or leg muscles. Repeated injections in the same site of the breast or the use of extremely irritating drugs I.M. may result in muscle necrosis or atrophy. Drugs administered in the posterior pectoral muscle or legs may pass through the renal portal system prior to entering the general circulation.

Parenteral therapy may be used to deliver high concentrations of antibiotics to the site of

a local problem. Air spaces may be effectively reached by intratracheal or air sac injection. Joints and sinuses are sites in which direct instillation of antibiotics may be helpful. Intravenous administration is highly effective for initial therapy in life-threatening diseases such as septicemia and chlamydiosis. Owing to the fragility of avian veins and the uncooperative nature of most birds, continuous intravenous (I.V.) administration is difficult if not detrimental to the avian patient, unless the bird is anesthetized. Subcutaneous injections are an alternative, but owing to minimal amounts of dermis, drugs may be poorly absorbed. Subcutaneous fluids or drug administration should be avoided in the cervical region because of the possibility of deposition into the cervicocephalic air sac system.

Oral Medications

The addition of medications to drinking water is controversial but is often the only practical means of drug administration. This is the least stressful means of providing medications, especially for those that are palatable. Theoretically the bird will frequently self-dose during the day. While therapeutic blood levels may not be achieved with many antibiotics, levels within the intestine may be sufficient to control enteric infections. Aminoglycosides are frequently used in pet birds owing to their bactericidal activity and high level of efficacy for gram-negative bacterial infections. Aminoglycosides are not absorbed following oral administration if gut mucosa is intact. This may be desirable in treating primary gut infections. Mild systemic bacterial infections often respond to low, sometimes erratic, blood levels produced by water medications.

One very valuable use of water-borne antibiotics in flocks is in the reduction of the spread of disease by water contamination. A large number of pathogens multiply initially in the oropharynx and are spread by oral contamination of water supplies. Fecal contamination of water supplies is likewise a common means of disease transmission in a flock. Antibiotics in the water supply will decrease the bacterial contamination of water supplies while combatting bacteria in their primary port of entry, the pharyngeal area and the intestinal tract.

Antibiotic water mixtures should be prepared fresh daily. For the single pet bird, a volume sufficient to change the solution in the drinking cup several times a day is mixed at one time and the unused portion stored in the refrigerator. Some soluble mixtures (e.g., tetracyclines) should not be stored at all. Other additives to the antibiotic water solution, such as vitamins, should be avoided.

There are many inherent disadvantages to the use of water medications. Ideally water consumption levels should be established and the dose calculated based on body weight. For obvious reasons this is impractical for flock use. Estimations may be based on average weight and consumption and multiplied for the number in the flock, but individual consumption will vary. Medications may be rejected because of flavor or taste. Zerophilic birds such as budgerigars, Zebra finches, and Australian parakeets may not consume any water with dissolved medications. Environmental temperature may affect water consumption. Anorectic birds may not consume adequate amounts of water; and slydipsic birds may increase water consumption. These factors can result in quite a variation in antibiotic dosage. Overdosage of drugs such as nitrofurazone or dimetridazole may result in toxicity. In breeding flocks the male bird may consume large amounts of water in order to feed the female in the nest, resulting in toxic drug levels in the male and inadequate levels in the female. Some drugs are poorly or erratically absorbed from the gut in birds. Some drugs may also interfere with absorption (for example, calcium binding with tetracycline). The presence of concurrent disease, parasitism, nutritional deficiencies may also alter drug absorption. Some drugs, most notably tetracyclines and vitamin A, quickly lose potency in water mixes. Some medications, especially those containing sugars or vitamins, may promote bacterial growth in water bowls. The increased chance of developing antibiotic-resistant bacterial strains with subtherapeutic

administration of antibiotics in drinking water must be considered.

The addition of medications to food stuffs is a more reliable way of medicating birds. The addition of drugs to a favorite food increases the chances of acceptance.

Oral suspensions, ground tablets, or the contents of capsules may be applied to fruits, peanut butter sandwiches, fresh corn, cooked sweet potatoes, monkey biscuits, or any other relished item. Toucans may be easily medicated by the injection of drugs into grapes. A practical method of adding drugs to a seed mixture is by coating a moist food which is then added to the mixture. Freshly cooked whole kernel corn is inexpensive and well-accepted by large and medium-size psittacine species. Canned or fresh corn can be used. Rice may also be readily accepted. Budgerigars, cockatiels, and Australian parakeets may be more reluctant to accept these preparations.

Pelleted feeds are an excellent means for delivering chlortetracycline while providing a balanced diet. Many other drugs can be used in this manner if they can withstand the heat required by the pelleting process. Unfortunately, some species are very reluctant to accept pellets.

Extensive use of pelleted feeds in quarantine stations has revealed some tendencies regarding acceptance among common species. Amazon parrots, *Pionus* parrots, African parrots, and most conures and cockatoos usually accept pellets readily. Pellets are mixed with corn or rice for the first two to three days, after which only pellets are offered. Cockatiels, lovebirds, and budgerigars will accept pellets but are more easily converted to tetracycline-impregnated millet or a combination of the two. Macaws tend to be stubborn and may refuse a diet of pellets alone. Addition of medicated corn, monkey biscuits, and peanuts will often solve the problem. Birds that are addicted to sunflower seeds are the most difficult to convert (see Chapter 3, Captive Behavior and its Modifications). In these birds tube feeding may be required until the medicated diet is accepted. Addition of sunflower seeds to the medicated diet will tempt the bird to try it, but seeds must be removed after a few days. Many birds will dig through a mix for seeds and will not eat adequate amounts of medicated feeds to maintain their weight.

Hand-feeding babies are easily medicated in their formulas. Most medications that are used in self-feeding birds can be used in hand-feeding babies. It must be kept in mind, however,

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Table 26-1. ANTIBIOTICS FOR USE IN BIRDS

Generic Name	Form	Route	Species	Dosage	Frequency and Duration	Notes
Amikacin (Amiglyde— Bristol)	Injectable (250 and 500 mg/ml)	I.M.	Most	15–20 mg/kg (0.015 mg/gm)	s.i.d. or b.i.d.	For gram-negative bacterial infections that are resistant to gentamicin, especially strains of <i>Pseudomonas</i> and <i>Klebsiella</i> . Available products are too concentrated for use in birds and should be diluted.
Amoxicillin (Amoxi Drops— Beecham Labs)	Suspension (50 mg/ kg)	Oral	Most	150–175 mg/kg	s.i.d. or b.i.d.	Most preparations are palatable and well accepted. Many require refrigeration and expire rapidly. Higher blood levels than with oral ampicillin.
Ampicillin	Oral suspension	Oral	Amazon parrots	150–200 mg/kg	b.i.d. or t.i.d.	Ampicillin is poorly absorbed, making oral route unreliable and rapidly excreted by the kidneys. Poor efficacy against many gram-negative pathogens of pet birds. See Chapter 25, Pharmacology of Antibiotics, for effect of probenecid.
Injectable (Polyflex—Bristol)	I.M.	Amazon parrots	100 mg/kg (0.1 mg/gm)	Every 4 hours	This dose is required for the maintenance of therapeutic blood levels in septicemia and other serious disorders. Drug of choice for initial therapy in "cat bite" <i>Pasteurella</i> septicemias.	
Capsule	Water	Chicken	1.65 gm/L		See Oral above.	
	Water	Pet birds	250 mg/8 oz			
	Feed	Most	250 mg/kg	5 to 10 days	Sprinkle on favorite food or add to mash or corn mix.	
Carbenicillin	Injectable (Geopen—Roerig)	I.V. or I.M.	Psittacines	100–200 mg/kg	b.i.d. or t.i.d.	Synergistic with aminoglycosides; excellent in combination with gentamicin, but they must not be mixed in the same syringe. Retains potency for only three days under refrigeration.

Intratracheal	Psittacines	100 mg/kg	s.i.d. or b.i.d.	For use in conjunction with I.M. gentamicin for <i>Pseudomonas</i> pneumonias. If used alone, more frequent dosage may be required.
Tablets (382 mg ground) (Geocillin—Roeng)	Water	Most	½–1 tablet/ 8 oz	5 to 10 days Ground tablets have a very objectionable taste and odor that may be masked with sugar, honey, or juice. Not water-soluble and will usually float or settle.
Feed	Psittacines	200 mg/kg	5 to 10 days	Apply to favorite food (cooked sweet potato works well) or mix in mash or hand-feeding formula.
Cefotaxime (Claforan—Hoechst-Rousseau)	Injectable	I.M.	Most	50–100 mg/kg t.i.d. Broad-spectrum drug with low toxicity. May be used in conjunction with aminoglycosides; however, nephrotoxicity may occur. Reconstituted vial good for 13 weeks in freezer.
Cephalexin (Keflex—Eli Lilly)	Suspension	Oral	Most	35–50 mg/kg q.i.d. Most preparations are well-accepted.
Cephalothin (Keflin—Eli Lilly)	Injectable	I.M.	Most	100 mg/kg q.i.d. Not absorbed from the intestines.
Chloramphenicol	Succinate—injectable (100 mg/kg)	I.M. I.V.	80 mg/kg 50 mg/kg	b.i.d. or t.i.d. t.i.d. or q.i.d. Lower dose for succinate form can be used if given I.V. Excretion of I.V. chloramphenicol succinate is extremely rapid but may be required in the initial treatment of bacterial septicemias.
Palmitate—oral suspension (30 mg/ml) (Chloromyctin palmitate—Parke-Davis)	Oral	Turkey Psittacines	50 mg/kg 0.1 ml/30 gm 1.0 ml/300 gm	q.i.d. b.i.d., t.i.d., or q.i.d. b.i.d., t.i.d., or q.i.d. Absorption is erratic, so it should not be used for initial therapy in life-threatening infections. Palatable and very useful for therapy in hand-feeding birds in which food passage has slowed owing to bacterial infection. If crop stasis occurs, parenteral antibiotics must be used.

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Table 26-1. ANTIOTIOTICS FOR USE IN BIRDS (Continued)

Generic Name	Form	Route	Species	Dosage	Frequency and Duration	Notes
	Capsules	Feed	Most	100–200 mg/kg	5 to 10 days	Coat corn and add to seed mix or apply to favorite food or mash. Drug of choice for flock treatment of <i>Salmonella</i> .
Chlortetracycline (CTC)*	Soybean meal base (100 gm/lb) (SF 66—Cyanamid)	Feed	Large psittacines	100 gm/20 lb mash	Only food source for 30 to 45 days	For treatment of chlamydia. Prepare mash by cooking rice, corn, and commercial chicken feed in water until soft. Cool completely and add CTC. Brown sugar may be added in equal volumes to CTC. Must be prepared fresh daily.
	Capsules or soluble powder (Aureomycin—Cyanamid)	Feed	Lories and lorikeets	500 mg/L of food and/or nectar (0.5%)	Only food source for 30 to 45 days	Mash may be prepared from overcooked rice with boiled beans, moist commercial chick starter ration, or soaked monkey rations. If nectar is fed, CTC should be added. For treatment of chlamydia, must be prepared fresh daily.
	Water	Most		250 mg/pint	Only source of water	Solution should be mixed fresh b.i.d. or t.i.d. Inadequate for long-term treatment of chlamydia. Some birds converted to pellets or mash.
Pelleted feeds (Zeigler Brothers, Lafeber Co., or Bird Life)	Feed	Large psittacines	1%	Only food source for 30 to 45 days	Excellent for treatment of medium and large psittacines for chlamydia. Some birds, especially macaws, are reluctant to accept pelleted feeds. Antifungal ingredients reduce fungal overgrowth. See Nystatin notes in Table 26-2.	
Impregnated millet seed (Keet Life—Hartz)	Feed	Small psittacines	0.5%	Only food source for 30 to 45 days	Excellent for budgerigars and cockatiels. May be inadequate for lovebirds. If constipation occurs greens should be offered.	

*Treatment may be ineffective. See Chapter 35, Chlamydia.

Doxycycline	Suspension (5 mg/ml) (Vibrantycin monohydrate—Pfizer)	Oral	Psittacines	8–12 mg/lb b.i.d.	Drug of choice for <i>Chlamydia</i> . Less fungal overgrowth and flora disturbance than CTC.
	Syrup (10 mg/ml) (Vibrantycin calcium syrup—Pfizer)	Oral	Psittacines	8–12 mg/lb b.i.d.	Sensitive to iron and calcium in diet. Suspension and injectable have short shelf life unfrozen.
Injectable (10 mg/ml) (Vibrantycin hyclate—Pfizer)	I.V.	Psittacines	10–20 mg/lb	Once or twice	For initial therapy in severe cases of chlamydiosis. Toxicity and muscle necrosis may occur if given I.M.
Injectable (20 mg/ml) (Vibravetöös—Pfizer, West Germany)	I.M.	Most Macaws, lovebirds	1 mg/10 gm 0.75 mg/gm	Once every 7 days for 4 weeks; next 2 injections after 6 days each; last injection after 5 days	Unavailable in the U.S. Vibrantycin hyclate cannot be substituted.
Capsules (generic)	Feed	Most	100 mg/kg	Only food source for 45 days	Custom-produced by request.
Erythromycin	Soluble powder	Water	Most	500 mg/gallon	For chronic respiratory disease, especially if <i>Mycoplasma</i> is suspected, air sacculitis, mild sinusitis, and mild enteric infections.
	Nebulize	Most	1 ml/10 ml saline	10 days on, 5 days off, 10 days on	For air sacculitis and chronic respiratory disease. Injectable solution should not be given I.M. owing to severe muscle irritation.
Suspension (40 mg/ml)	Oral	Psittacines	20–40 mg/lb b.i.d. 5 to 10 days	b.i.d. 5 to 10 days	Most psittacine gram-negative isolates are resistant. Good efficacy in some cases of sinusitis.
Gentamicin (Gentocin—Schering)	Injectable (50 mg/ml)	I.M.	Pheasants and cranes 5 mg/kg t.i.d. 5 to 10 days	t.i.d. 5 to 10 days	These dosages maintain therapeutic blood levels as

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Table 26-1. ANTIBIOTICS FOR USE IN BIRDS (Continued)

Generic Name <i>(Continued)</i>	Form	Route	Species	Dosage	Frequency and Duration	Notes
Gentamicin			Quail African Grey Parrot Blue and Gold Macaw	10 mg/kg 10 mg/kg b.i.d. 10 mg/kg	t.i.d. b.i.d.	required for septicemias and other serious illnesses.* In less serious infections, s.i.d. or b.i.d. dosage is clinically very effective because of the bactericidal effect of gentamicin. May produce a transient polyuria. Overdose may result in owluria.
			Most species	Probably similar to above	The above dosages do not exceed blood levels of 12 µg/ml, which is the mammalian nephrotoxic level. This dosage produces blood levels for 12 hours, but the mammalian nephrotoxic level is greatly exceeded initially. The avian nephrotoxic level has not been established. This dosage is clinically effective when used s.i.d. This dosage may be toxic in owls.	
Oral	Most			40 mg/kg	s.i.d., b.i.d., or t.i.d., 2 to 3 days	For sterilization of the gut or treatment of infections confined to the gut. Gentamicin is not absorbed across intact mucosa.
Water	Most			1-5 ml/gallon	3 days	For infections confined to the gut.
Nebulize	Most			1 ml/10 ml saline	15 min. t.i.d.	For sinusitis or air sacculitis.
Intratracheal	Most			5-10 mg/kg	s.i.d.	Useful in treating pneumonia in conjunction with carbenicillin or tylosin administered I.M.
Ophthalmic solution	Intranasal		Most	Several drops in each nostril	s.i.d., b.i.d., or t.i.d.	For sinusitis and pharyngitis
Powder (2 gm/30 gm)	Water	Most		½ tsp/2 gallons	3 days	For infections confined to the gut.

*Unpublished data.

Kanamycin (Kantrim—Bristol)	Injectable (50 mg/ml)	I.M.	Most	10–20 mg/kg	b.i.d.
		Water	Most, especially finches	1–5 cc/gallon	3 to 5 days
Lincomycin (Lincoein—Upjohn)	Suspension (50 mg/ml)	Oral	Budgerigar	1 drop	b.i.d. 7 to 14 days
			Amazon Parrots	0.5 ml/300 gm	b.i.d. 7 to 14 days
				1 ml/300 gm	s.i.d. 7 to 14 days
			Raptors	100 mg/kg	s.i.d. 7 to 14 days
Lincomycin and Spectinomycin (LS-50—Upjohn)	Soluble powder (16.7 gm lincomycin and 33.3 gm specti- nomycin/2.55 oz)	Water	Most	$\frac{1}{8}$ – $\frac{1}{4}$ level tsp/pint	10 to 14 days
					For chronic respiratory disease when <i>Mycoplasma</i> is sus- pected. Therapy may be ex- tended if necessary. May also be effective for mild enteric infections. Sugar may be added to improve acceptance.
Neomycin (Biosol-M—Upjohn)	Solution with meth- scopolamine bro- mide	Water	Most	1–8 drops/oz	1 to 3 days
Nitrofurazone	Soluble powder (9.3%)	Water	Most psittacines Lories, lorikeets, mynahs	1 tsp/gallon $\frac{1}{2}$ tsp/gallon	7 to 10 days
				Do not put in nectar	
					Excellent for the treatment of gram-negative especially <i>E. coli</i> enteric infections. Will slow the spread of salmonel- losis in a flock. Effective for many strains of coccidia in psittacines but not very effec- tive in mynahs and toucans. Toxic in overdose, resulting in neurologic signs and/or death. If neurologic signs are ob- served, discontinue use imme- diately. The lower dose is needed to prevent toxicity in lorries, lorikeets, and mynahs.

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Table 26-1. ANTIBIOTICS FOR USE IN BIRDS (Continued)

Generic Name	Form	Route	Species	Dosage	Frequency and Duration	Notes
Oxytetracycline long-acting (LA 200—Pfizer)	Injectable	I.M.	Most	200 mg/kg	s.i.d. for 3 to 5 days	Has worked well in treating chlamydiosis in breeding birds to control outbreak and while getting birds to eat form of CTC or doxycycline to finish treatment.*
Procaine penicillin G and benzathine penicillin	Injectable	I.M.	Turkey	100 mg/kg of each drug	s.i.d. or every two days	Provides therapeutic blood levels for one to two days. Care must be used in the treatment of small birds because of potential procaine overdose. Used extensively in poultry.
Streptomycin	Injectable	I.M.	Large birds	30 mg/kg	b.i.d. or t.i.d.	Should not be used in pet birds owing to potential toxicity. Used extensively in poultry.
Spectinomycin (Spectam-R—Abbott)	Water-soluble solution	Water	Most	20 cc/gallon	5 to 10 days	For gram-negative enteric infections. Good for flock treatment.
Sulfachlorpyridine (Vetasulid—Squibb)	Soluble powder (packets of 5 gm, bottles of 50 gm)	Water	Most	1/4 tsp/L	5 to 10 days as only water	Effective for many <i>E. coli</i> enteric infections.
Tetracycline	Soluble powder, 10 gm/6.4 oz (Polyotic-American Cyanamid)	Water	Most	1 tsp/gallon	5 to 10 days	Tetracycline rapidly loses potency in water and must be changed b.i.d. or t.i.d.
	Suspension	Oral or gavage	Most	200–250 mg/kg	s.i.d. or b.i.d.	For converting regimen to pelleted feeds. Administer by gavage until feeds are accepted. Inadequate for long-term therapy for chlamydiosis.
Ticarcillin (Ticar—Beecham)	Injectable	I.V. or I.M.	Most	200 mg/kg	b.i.d., t.i.d., or q.i.d.	More effective against <i>Pseudomonas</i> than carbenicillin. Non-toxic and synergistic with aminoglycosides. Stable for 72 hours after reconstitution.
Tobramycin (Nebcin—Lilly)	Injectable (80 mg/2 ml)	I.M.	Most	Dose as gentamicin	See Gentamicin	For strains of <i>Pseudomonas</i> resistant to gentamicin.



Tylosin	Injectable (50 mg/ml) (Tylyn 50—Elanco)	I.M.	Most	10–40 mg/kg	b.i.d. or t.i.d.	Good in initial therapy of upper respiratory infections and air sacculitis. Nontoxic.
Soluble powder with vitamins (250 gm/8.81 oz) (Tylyn plus vitamins—Elanco)		Most	2 tsp/gallon	10 days on, 5 days off, and 10 days on	s.i.d., b.i.d., or t.i.d.	May be poorly accepted because of bitter taste. Dosage may be divided between food and water. For treatment of chronic respiratory disease.
	Eye spray	Cockatiels and others	Mix with water 1:10	For flock or individual treatment of conjunctivitis. Allows frequent treatment without handling. May be used in conjunction with tylosin or preferably lincomycin and spectinomycin in the water for suspected mycoplasmosis.	s.i.d., b.i.d., or t.i.d.	
Nebulize (Tylyn 200—Elanco) and DMSO (Domoso—Diamond)	Nebulization	Quail and pigeons	1 gm tylosin/50 ml DMSO	Nebulize for one hour	Therapeutic tissue concentrations of tylosin are produced after one hour of nebulization and remain high for more than three hours. May be used as an adjunct to systemic therapy or alone.	
Trimethoprim and Sulfamethoxazole	Suspension (40 mg trimethoprim and 200 mg sulfamethoxazole/5 ml) (Bac-trim—Roche)	Oral	Psittacines	0.1 ml/30 gm 1.0 ml/lb	b.i.d. or t.i.d. for 5 to 7 days	For respiratory or enteric infections in hand-fed babies.
			Toucans and mynahs	1.0 ml/lb	s.i.d. for 5 days	For coccidiosis. May be added to feed.
Injectable (40 mg trimethoprim and 200 mg sulfamethoxazole/1 ml) (Tribrissen—Coopers)	I.M.	Psittacines	0.1 ml/lb	s.i.d. or b.i.d.	For respiratory and enteric infections.	



Table 26-2. ANTIFUNGALS FOR USE IN BIRDS

Generic Name	Form	Route	Species	Dosage	Frequency and Duration	Notes
Amphotericin B (Fungizone— Squibb)	Injectable	I.V.	Raptors and psittacines	1.5 mg/kg	t.i.d.	Use for three days in conjunction with or follow with flucytosine therapy. Potentially nephrotoxic and may cause bone marrow suppression. For aspergillosis.
Intratracheal	Raptors and psittacines	1 mg/kg		s.i.d., b.i.d., or t.i.d. for three days	Dilute with sterile water to increase volume for maximum distribution throughout lungs and air sacs. Use in conjunction with flucytosine.	
Nebulize	Raptors and psittacines	1 mg/ml saline		15 min b.i.d.		
Lotion, creme, or ointment (3%)	Topical	Psittacines		s.i.d.	Apply to oral lesions of candidiasis that are refractory to nystatin. Not absorbed from the gut.	
Chlorhexidine (Nolvasan—Fort Dodge; Virosan— Biocutic)	Solution (2%)	Water	Most	10–20 ml/gallon	7 to 14 days	To treat mild flock candidiasis and to slow spread of virus. Not absorbed from gut. Can be used over 30 days. Unpalatable to canaries and in scented form can cause death owing to lack of water consumption.
Flucytosine (5-fluorocytosine) (Ancobon—Roche)	Capsules (250 and 500 mg)	Cavage	Psittacines	250 mg/kg b.i.d.		This dosage can be used safely for extended periods of time for treatment of aspergillosis. Because of bone marrow toxicity, hematologic assessment is recommended during therapy.
Feed	Psittacines and mynahs			100–250 mg/lb	every six hours	For flock treatment of aspergillosis or severe

candidiasis, especially respiratory candidiasis. Apply to favorite food or mix with mash. Drug is expensive and difficult to obtain.

Gentian Violet (GV-11— Norencos)	Powder	Feed	Psittacines	0.5–1.0 gm/kg feed	7 to 45 days	For treatment of candidiasis or inhibition of <i>Candida</i> overgrowth during chlortetracycline therapy. To inhibit fungal overgrowth in feed.
Ketoconazole (Nizoral—Janssen)	Tablets (200 mg)	Gavage	Psittacines	5–10 mg/kg	b.i.d. for 14 days	For severe refractory candidiasis. For local effect in the crop, dissolve $\frac{1}{4}$ tablet (50 mg) in 0.2 ml 1 N hydrochloric acid and 0.8 ml water. Will turn pale pink when dissolved. Mixture is added to food for gavage.
		Water	Most	200 mg/L	7 to 14 days	Drug is not water-soluble and will float or sink. Dissolve in acid prior to adding to water.
		Feed	Most	10–20 mg/kg	7 to 14 days	Apply to favorite food or add to mash.
Nystatin	Suspension (100,000 units/ml) (Mycostatin— Squibb)	Oral	Most	1 ml/300 gm s.i.d., b.i.d., or t.i.d. for 7 to 14 days	For treatment of candidiasis, after antibiotic therapy or in conjunction with antibiotics. Hand-fed babies should always receive antifungal therapy when being treated with antibiotics. Acts on contact with lesions and is not absorbed from the gut. Should not be given by gavage if treating mouth lesions.	
	Feed premix in diatomaceous earth base (Myc-20—Squibb)	Feed	Most	1–2 tbs/5 lb feed	7 to 14 days	Do not use in conjunction with tetracycline, as calcium content may interfere with absorption.

Table 26-3. ANTHELMINTIC DOSAGES FOR BIRDS

Generic Name	Form	Route	Species	Dosage	Frequency and Duration	Notes
Amprolium (Amprol or Corid—Merck)	Solution (9.6%)	Water	Most	2 ml/gallon	5 days or longer	For treatment of coccidiosis. Some strains in mynahs and toucans may be resistant. Cages should be cleaned with live steam to prevent reinfection. Supplement B vitamins.
Chloroquine phosphate (Aralen phosphate— Winthrop)	Tablets (500 mg)	Oral	Penguin	Initial loading dose of 10 mg/kg followed by three doses of 5 mg/kg.	Initial dose followed by lower dose at 6, 18, and 24 hours	For initial therapy of avian malaria caused by <i>Plasmodium</i> species. Therapy should include simultaneous dosage with primaquine phosphate. Effective only against circulating forms.
Carbarel (Sativin—Southern Agricultural Insecticides, Inc.)	Dust (5%)	Dusting	Most	Cover bird with light dust or 1 tsp to a cockatiel nest box; 2 tbs to large macaw nest box	Once. Repeat as needed. Repeat when cleaning nest box yearly.	For treatment of ectoparasitism. Can be applied with vegetable hand duster. May be added to nest box litter for control of mites and ants. Nontoxic.
Crotamiton (Eurax— Westwood)	Creme	Topical	Most	Apply to affected areas	Weekly for four weeks	For treatment of <i>Knemidokoptes</i> and other cutaneous mite infestations.* Avoid application to feathered areas.
Dimetridazole (Emtryl—Jensen- Salsbury)	Soluble powder (182 gm/6.42 oz)	Water	Most Lory, mynah Pekin Robins	1 tsp/gallon $\frac{1}{2}$ tsp/gallon Lethal or toxic	5 days only 0	May be toxic if this dosage is exceeded. For treatment of trichomoniasis, giardiasis, histomoniasis and hexamitiasis. Do not treat birds when breeding. A male bird that is feeding the hen on the nest may consume enough of the drug to reach toxic levels. Extended therapy may result in toxicity or overgrowth of <i>Candida</i> . Also effective against some infections caused by anaerobic bacteria. Recurrence of clinical giardiasis after therapy may occur.

Gavage	Budgerigar	1.5 gm (1 level tsp)/pint water. Each bird is given 0.5 ml/30 gm.	Most	10–50 mg/kg	Once. Repeat in 10 days. s.i.d. for 3 days s.i.d. for 5 days	3 doses at 12-hour intervals For Ascaris. Not to be used during molt (may stunt feathers) or while nesting.	For birds that fail to drink adequate amounts of medicated water.
Fenbendazole (Panacur—Hoechst-Roussel)	Suspension	Oral	Most	500 mg/gallon	Once. Repeat in 10 days. s.i.d. for 3 days s.i.d. for 5 days	For giardiasis, trichomoniasis, and histomoniasis.	For microfilaria or flukes.
Ipronidazole (Ipropran—Roche)	Soluble powder (61 gm/2.65 oz)	Water	Most	200 µg/kg	Once. Repeat in 10 to 14 days.	Effective for intestinal nematodes, coccidia, <i>Oxyspiruria</i> , and gapeworms.	For Capillaria. Not effective against gizzard worms in finches.
Ivermectin (Ivomec—Merck)	Injectable (10 mg/ml)	I.M. or oral	Most	0.3 ml/gallon	Several weeks	Drug of choice for <i>Knemidokoptes</i> infestation. Bovine preparation should be diluted 1:4 with propylene glycol and dosed at 0.05 ml/lb. Budgerigar dose, 0.01 ml. Oral dose seems to work as well as I.M.	For immunostimulation in immune-suppressed birds.
Levamisole (Ripercol L—American Cyanamid)	Injectable (13.65%)	Water	Most	15 mg/kg	Once. Repeat in 10 days.	For treatment of individual birds or in species that fail to drink water (desert species may refuse water for several days).	For immunostimulation in immune-suppressed birds.
I.M. or subcutaneous	Most	4–8 mg/kg	1 to 3 days	10 to 14 days.	Once. Repeat in 10 to 14 days.	May be toxic, resulting in vomiting, ataxia, or death. Do not use in debilitated birds.	For immunostimulation in immune-suppressed birds.
		2 mg/kg	3 doses at 14-day intervals				

Table continued on following page

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*A more effective treatment is available—see Ivermectin.

Table 26-3. ANTHELMINTIC DOSAGES FOR BIRDS (Continued)

Mebendazole (Telmintic— Pitman-Moore)	Powder	Gavage or feed	Raptors and psittacines	25 mg/kg	b.i.d. for 5 days	Acute toxic hepatitis reported in raptors and some mammals. For <i>Capillaria</i> .
Niclosamide (Yomesan— Bayvet)	Tablets (5-lb dose=357 mg)	Gavage or food	Most	100 mg/lb	Once. Repeat in 10 to 14 days.	For treatment of tapeworms. Ground tablets are not water- soluble. Add to mash. Large waterfowl may be filled.
			Finches	500 mg/kg	Once a week for 4 weeks	
Piperazine	Suspension	Oral	Poultry	100–500 mg/kg	Once. Repeat in 10 to 14 days.	For ascariides in poultry. Not effective in psittacines.
Praziquantel (Droncit—Bayvet)	Tablets (23 mg)	Oral	Most	1/4 tablet/kg	Once. Repeat in 10 to 14 days.	For tapeworms. Add to feed or administer by gavage. Injectable form should be used with caution owing to potential toxicity. Injectable form toxic to finches.
Primaquine	Oral	Penguins	0.03 mg/kg	s.i.d. for 3 days	For therapy of avian malaria caused by <i>Plasmodium</i> sp. Therapy should include simultaneous dosage with chloroquine.	
Pyrantel pamoate (Nemex II—Pfizer)	Suspension (4.5 mg/ml)	Oral	Most	4.5 mg/kg	Once. Repeat in 10 to 14 days.	Nontoxic and palatable. For intestinal nematodes.

Pyrethrin	Spray	Topical	Most	Lightly mist feathers	Repeat as necessary	For external parasites, especially lice, which are resistant to carbaryl. When treating lice spray must be applied in axillary area with wing extended.
Quinacline (Atabrine—Winthrop)	Tablets	Gavage	Psittacines	5–10 mg/kg	s.i.d. for 7 days	Drug is hepatotoxic at high doses (50–150 mg/kg) in cockatoos. Treatment of <i>Haemoproteus</i> infection is not recommended.
Rotenone (Goodwinol—Goodwinol Products)	Creme	Topical	Most	Apply to affected areas	Weekly for four weeks	For treatment of <i>Knemidokoptes</i> (see Ivermectin for more effective treatment) and other cutaneous mite infestations. Avoid application to feathered areas. May be toxic if ingested.
Thiabendazole	Oral	Most	250–500 mg/kg	Once. Repeat in 10 to 14 days.	s.i.d. for 7 to 10 days	For ascarides. For <i>Syngamus trachea</i> .

Table 26-4. NUTRITIONAL SUPPLEMENTS FOR BIRDS

Generic Name	Form	Route	Species	Dosage	Frequency and Duration	Notes
Calcium	Syrup (Neo-calciumon—Sandoz) (115 mg calcium/5 ml)	Water	Most	1 ml/30 ml water	To effect	For calcium deficiency or supplementation during egg laying, growth, bone healing.
Injectable	I.M. (Calphosan—Carlton Corp) (50 mg Ca gluconate and 50 mg Ca lactate/10 ml)	I.M.	Most	0.5–1.0 ml/kg	Once; can be repeated weekly	For treatment of hypocalcemia or hypocalcemic tetany. For supplementation during egg laying, rapid growth, bone healing, and tetracycline therapy. Adjunct in treatment of egg binding and soft-shelled eggs. Used in Toucans when on tetracycline, as they are very susceptible to bone deformities.
Calcium gluconate	I.V.		Most	50–100 mg/kg	To effect; slow	For hypocalcemic tetany. May be diluted and given I.M. if a vein cannot be located.
Powder (Osteoform—Vet-A-Mix)	Feed	Feed	Most	½ tsp/kg feed	As needed	For vitamin A and vitamin D ₃ supplementation.
Cod liver oil	Feed Oral	Feed Oral	Most	10 ml/kg seed 1 to 2 drops	Daily	For iodine deficiency or goiter.
Iodine	Strong solution (Lugol's)	Water	Budgerigars	Preparation stock solution 2 ml/30 ml water; 1 drop stock solution added to 250 ml drinking water	2–3 times weekly	For preventive supplement in iodine-deficient areas. Store in brown bottle or keep in dark after mixed. Will stain.
Seawater mixture	1 liter seawater boiled 1 ml Lugol's solution (stock solution)	Water	Most	5 ml stock solution/250 ml drinking water	Daily	For trace mineral supplementation. Store in refrigerator.

Vitamin A (Aquasol A—USV Pharmaceutical)	Injectable I.M.	Psittacines	0.1 ml/100 gm	Twice weekly in first week; then weekly as needed.
Vitamins A, D ₃ , and E units vitamin A and 10,000 units vitamin D ₃ /ml (Injacom 100—Roche)	Injectable (100,000 units vitamin A and 10,000 units vitamin D ₃ /ml) (Injacom 100—Roche)	I.M. Most	0.1–0.2 ml/100 gm	Double dosage first treatment; then once weekly as needed.
Vitamins A, D, E, and B complex	Injectable with vitamin B complex (Injacom 100 + B—Roche)	I.M. Most	0.1 ml/300 gm	Indications as above. Toxicity or anaphylaxis may occur if recommended dosage is exceeded.
Vitamin B complex	Injectable	I.M. Most	Dose by thiamine content—1–3 mg/100 gm	Once a week Once every 7–10 days
Vitamin B complex with choline, inositol, and methionine (Methiscol—USV Pharmaceutical)	Capsules Feed	Most	1–2 gm/kg feed	For muscular weakness, debilitation, and anemia and to stimulate appetite. For supplemental therapy in neurologic disorders, liver, kidney, and intestinal disease, and following long-term antibiotic therapy. Overdose may result in anaphylaxis.
Vitamin B ₁ (thiamine)	Powder Food	Raptores, penguins, cranes	1–2 mg/kg	Lipotropic agent used to facilitate the transport of fats in treatment of liver disease or arteriosclerosis. For vitamin B complex supplementation as indicated above.
			Daily	Prophylactic use when feeding diet of fish containing thiaminase.

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Table 26-4. NUTRITIONAL SUPPLEMENTS FOR BIRDS (Continued)

Generic Name	Form	Route	Species	Dosage	Frequency and Duration	Notes
Vitamin B ₁₂	Injectable	I.M.	Most	250–500 µg/kg	Once a week	For anemia. May produce pink droppings.
Vitamin C	Injectable	I.M.	Most	20–40 mg/kg	s.i.d. to once a week	For supplementation in anorectic or debilitated birds, stress, viral diseases, and liver disease.
Vitamin E and selenium (Seletoc—Burns Biotec)	Injectable	I.M.	Storks, cranes, flamingos, cockatiels Most immature psittacines	0.06 mg/kg selenium (cockatiels—0.01 ml) (macaws—0.1 ml) (Eclectus—0.05 ml) (African grey—0.03 ml)	Prior to or at time of capture or stressful event. cockatiels—every 3–14 days)	For prevention or treatment of muscular weakness, capture myopathy. Also for paralysis in cockatiels. May assist in early therapy of neonatal leg dysfunction. Overdose may result in selenium toxicity.
Vitamin K ₁ (Veta-K—Professional Veterinary Laboratory) (Aquamephyton—Merck, Sharp & Dohme)	Injectable (10 mg/ml)	I.M.	Most	0.2–2.5 mg/kg	As needed; usually only needs 1–2 injections	For hemorrhagic disorders and to prevent such problems when Amprolium and sulfas are administered.
Vitamins—water soluble (Plex Sol C—Vet-A-Mix)	Powder—Vitamins A, D ₃ , C, E, etc.	Feed or water	Most	2 gm/kg feed 1 gm/L water	Daily	For vitamin supplementation. Double dose for therapy. Well accepted. Water breaks down vitamin A rapidly. Mix fresh s.i.d. or b.i.d.

Table 26-5. MISCELLANEOUS DRUG DOSAGES FOR BIRDS

Generic Name	Form	Route	Species	Dosage	Frequency and Duration	Notes
Allopurinol (Zyloprim— Burroughs Wellcome)	Tablets (100 mg)	Oral Water	Parakeet	1 crushed tablet in 10 ml water; give one drop or 20 drops in 30 ml drinking water.	4 times daily	For treatment of gout.
Aspirin	Tablets (5 grain)	Water	Most	1 tablet in 250 ml drinking water	Only source of water	Indicated for pain.
Atropine	1/20 gr/ml or 0.5 mg/ml	I.M. or subcutaneous	Most	0.1–0.2 mg/kg q.s.		Will not result in pupil dilation. For organophosphate poisoning.
Bromhexine hydrochloride	Injectable (3 mg/ml)	I.M.	Most	0.05 ml/100 gm b.i.d. or s.i.d.	Liquefy respiratory mucus	
Calcium EDTA (Calcium disodium versenate—Riker)	Injectable (200 mg/ml)	I.M.	Most	10 mg/350 gm t.i.d. until asymptomatic (5 to 10 days)		Chelating agent for use in lead toxicity. Initial therapy with injectable until patient is asymptomatic, followed by oral therapy. Therapy should not be discontinued until lead has been removed from the gizzard or tissues.
Dexamethasone	Injectable (2 mg/ml)	I.M. or I.V.	Most	2–4 mg/kg s.i.d., b.i.d., or t.i.d.		For shock, trauma, gram- negative endotoxemia. Use lower dose for anti- inflammatory. Use decreasing dosage schedule for long-term therapy.

Table continued on following page

Table 26-5. MISCELLANEOUS DRUG DOSAGES FOR BIRDS (Continued)

Generic Name	Form	Route	Species	Dosage	Frequency and Duration	Notes
Dextrose—50%	Injectable (50%)	I.V. in slow bolus	Most	1 gm/kg (2 ml/kg)	As needed	For hypoglycemia. May be diluted and given I.M. if vein cannot be located.
Dextrose—50%	Injectable (50%)	I.V. in slow bolus	Most	1 gm/kg (2 ml/kg)	As needed	For hypoglycemia. May be diluted and given I.M. if vein cannot be located
Diazepam (Valium—Roche)	Injectable (5 mg/ml)	I.M. or I.V.	Most	0.03 mg/30 gm 0.6 mg/kg	As needed	Anticonvulsant (see Chapter 45, Anesthesiology).
Diethylstilbestrol	0.25 mg/ml	I.M.		0.03–0.10 ml/300 gm		For reproductive problems in females and plumage problems in both sexes. Overdose may result in anemia.
Dimethylsulfoxide	Liquid or gel	Topical	All	0.1 cc/100 gm	b.i.d. until pain and/or swelling decrease	Used following trauma. Can be mixed with some liquid antibiotics. Produces garlic smell on breath.
Doxapram (Dopram—A.H. Robins)	Injectable (20 mg/ml)	I.M. or I.V.	Most	5–10 mg/kg (0.007 mg/gm)	Once	To stimulate respiration. To speed recovery from ketamine-xylazine anesthesia.
EDTA—TRIS lysozyme solution (Custom-prepared solution)*	Liquid	Topical Intratracheal Intranasal Lavage of wounds	All	As desired	b.i.d.	To increase susceptibility of <i>Pseudomonas</i> bacteria to antibiotics and to aid in liquefaction of caseous exudate. Keep refrigerated.
Ergonovine maleate	Injectable (0.2 mg/ml)	I.M.	Most	0.02 mg/300 gm	One dose maximum	To aid in egg expulsion. Use in conjunction with calcium and vitamin A injections. Dilute for use in small birds.
Ferric subsulfate	Liquid, powder	Topical	All	q.s.	As needed to stop hemorrhage	Apply with cotton-tip applicator using grinding motion.
Flunixin-meglumine (Banamine—Schering)	Injectable (50 mg/ml)	I.M.	Most	1.0–10 mg/kg	Can be repeated b.i.d.	Analgesic, anti-inflammatory, antipyretic. Helpful in shock and trauma. Nonsteroidal.
Furosemide (Lasix—Hoechst-Roussel)	Injectable (50 mg/ml)	I.M.		0.05 mg/300 gm		Diuretic. Lories are very sensitive and easily overdosed.

Iron dextran	Injectable mg/ml)	(100 I.M.	All	10 mg/kg	Repeat in 7–10 days if PCV fails to return to normal.	For iron deficiency anemia or following hemorrhage.
Kaolin and Pectin	Oral suspension	Oral	Most	2 ml/kg	b.i.d., t.i.d., or q.i.d.	Antidiarrheal.
Lactated Ringer's solution	I.V.; fluids in bag or bottle	All		Body wt. in gm × 0.10 = fluid deficit (def) (in ml) Maintenance = 50 ml/kg/day.	50 % def + maintenance in first 24 hrs; 2nd 50 % def + maintenance next 48 hours.	Replace fluids prior to gavaging nutrients. Some raptor studies indicate oral tubed fluids do as well as I.V. unless very critical.
				Adult— $\frac{1}{3}$ daily dose t.i.d.	Adult— $\frac{1}{3}$ daily dose t.i.d.	Weak, debilitated, or baby birds—1/10 to 1/5 every 1½ hours.
				Then go to maintenance.		
				Repeat S.P. & PCV to determine if adequately replaced.		
Lactulose (Cephulac— Merrell Dow)	Liquid	Oral	All	Cockatiel—0.03 cc b.i.d. to t.i.d. Amazon—0.10 cc b.i.d. to t.i.d.	To decrease toxins and/or CNS symptoms from liver damage, stimulate appetite, improve intestinal flora. Warning—reduce dosage if diarrhea develops.	
Levothyroxine (Synthroid—Flint)	Tablets (0.1 mg)	Water	Most	1 tablet/30 ml water Daily to 1 tablet/4 oz water	For respiratory clicking, vomiting in budgerigar. Thyroid replacement responsive problems: i.e., slow molt, obesity, lipoma. Overdose: bradycardia, hyperesthesia, weight loss, death. Stir water; offer 15 min and remove. Budgerigar—high dose; water drinkers—low dose.	
Medroxy- progesterone	Powder (Provera-pro- mone—Upjohn)	Feed	Pigeons	0.1 % of ration	Continual	To inhibit ovulation.
	Injectable (Depo-pro- vera—Upjohn)	I.M.	Most	0.025–1.0 ml (3 mg/100 gm)	Once ever 4–6 weeks	Antipruritic. To suppress ovulation. Repeat doses tend to cause obesity, polydipsia, polyuria, and lethargy.

Table continued on following page

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Table 26-5. MISCELLANEOUS DRUG DOSAGES FOR BIRDS (Continued)

Generic Name	Form	Route	Species	Dosage	Frequency and Duration	Notes
Mineral oil	Ointment	Oral	Most	1-3 drops/30 gm 5 ml/kg	Once. Repeat as necessary.	Use as laxative and to aid in the elimination of lead from the gizzard. Should be administered by tube or slowly in order to avoid aspiration.
Neomycin palmitate—hydrocortisone acetate—trypsin—chymotrypsin concentrate (Kymar ointment—Burns Biotec)	Ointment	Topical	All	As needed	As needed b.i.d.	Apply to debrided necrotic areas.
Oxytocin	Injectable	I.M.	Most	0.01-0.1 ml	Once	For egg expulsion. Should be administered in conjunction with injectable calcium and vitamin A.
Pancreatic enzymes: Lipase, protease, and amylase (Viokase V—A. H. Robins Co.)	Powder	Feed	Most	1/8 tsp/kg	Daily	For pancreatic insufficiency. Mix with moistened feed or administer by gavage. Incubate with food for 15 minutes prior to gavage. Used in birds that are polyphagic (going light), passing whole seeds, and slow in emptying crops.
Phosphated carbohydrate (Emetrol—Rorer)	Solution	Oral	Most	0.1 ml/30 gm	Repeat 5 times in one hour.	To control vomiting and aid crop emptying.
Prednisolone	Tablet (5 mg)	Oral	Most	0.2 mg/30 gm or 1 tablet in 2.5 ml water—2 drops orally	b.i.d.	Anti-inflammatory—use decreasing dosage schedule in long-term therapy.
	Injectable	I.M. or I.V.	Most	2 mg/kg		For shock, trauma, endotoxemia.
Prednisolone sodium succinate (Solu-Delta-Cortef—Upjohn)	Injectable (10 mg/ml)	I.V. I.M.	All	0.1-0.2 cc/100 gm	Repeat every 15 minutes to effect.	For shock—can decrease dosage by half in larger birds.

Sodium bicarbonate	1 mEq/ml	I.V., then subcutaneously	Most	1 mEq/kg for 15–30 minutes to maximum of 4 mEq/kg	
Stanazolol (Winstrol V-Winthrop)	Injectable (50 mg/ml)	I.M.	Most	0.5 to 1 ml/kg weekly	Once or twice weekly
Testosterone	Injectable (25 mg/ml)	I.M.	Most	0.1 ml/300 gm weekly as needed for anemia.	To increase male libido (be aware of suppression of negative feedback system), for anemia, debilitation, and feather problems.
				Canaries 2.5 mg/kg weekly for 6 weeks.	See Contraindications to tablets.
Tablet (10 mg)	Water	Canaries	1 ground tablet in 30 ml water (stock solution); 5 drops stock solution/30 ml drinking water	Daily	To return male canaries to song. If no response in two weeks, double dose. Contraindicated in hepatitis.

Table 26-6. SELECTED PHARMACEUTICAL HOUSES AND PRODUCTS FOR AVIAN USE

Abbott Laboratories , Veterinary Division, Abbott Park, North Chicago, IL 60064 Spectam-R—spectinomycin	Tylan 50 injection—tylosin Tylan 200—tylosin nebulize
American Cyanamid Co. , P.O. Box 400, Princeton, NJ 08540 Aureomycin—chlortetracycline soluble powder Polyotic—tetracycline soluble powder Ripercol-L injectable solution—levamisole Sodium sulfamethazine soluble powder—sodium sulfamethazine solution 12.5%	Evsco Pharmaceutical Corp. , 2285 East Landis Ave., Vineland, NJ 08360 Cardoxin—digoxin elixir
Anaquest , 2005 W. Beltline Highway, Madison, WI 53713 AErrane—isoflurane anesthesia	Flint Laboratories , Division of Travenol Laboratories, Inc., One Baxter Parkway, Deerfield, IL 60015 Synthroid—levothyroxine
Ayerst Laboratories , Veterinary Medical Division, 685 Third Ave, New York, NY 10017 Fluothane—halothane	Fort Dodge Laboratories , 800 Fifth Street N.W., Fort Dodge, IA 50501 Nolvasan solution—chlorhexidine Oxytocin injection
Bayvet , Division of Cutter Labs., Inc., Shawnee, KS 66201 Droncit—praziquantel Yomesan—niclosamide	Goodwinol Products Corp. , E. Northport, NY 11731 Goodwinol ointment—rotenone
Beecham Laboratories , 501 Fifth Street, Bristol, TN 37620 Amoxi Drops—amoxicillin Dexamethasone injection Ticar—ticarcillin	Hartz Mountain Products Corp. , Harrison, NJ 07029 Keet Life—chlortetracycline-impregnated millet
Bioceutic Laboratories, Inc. , P.O. Box 999, St Joseph, MO 64502 Piperazine solution Styptic powder Virosan solution—chlorhexidine	Haver-Lockhart Laboratories , Box 390, Shawnee, KS 66201 Ergonovine maleate solution Oxytocin injection Rompun 20 mg/ml injectable—xylazine Yomesan tablets—niclosamide
Bird Life , Box 745, Poway, CA 92064 Pelleted parrot diet containing 1 per cent chlortetracycline	Hoechst-Roussel Pharmaceuticals, Inc. , Rt. 202-206 North, Somerville, NJ 08876 Claforan—cefotaxime Lasix—furosemide Panacur—fenbendazole
Bristol Laboratories , Division of Bristol-Myers Co., P.O. Box 657, Syracuse, NY 13201 Amiglyde—amikacin Ketaset—ketamine Kantrim—kanamycin Polyflex—ampicillin	Janssen Pharmaceutica, Inc. , 40 Kingsbridge Road, Piscataway, NJ 08854 Nizoral—ketoconazole
Burns Biotec Laboratories , Division Chromalloy Pharmaceutical, Inc., 8530 K Street, Omaha, NE 68127 BVMO—liquid vitamins Kymar ointment—neomycin palmitate—hydrocortisone acetate—trypsin—chymotrypsin concentrate Seletoc—selenium and vitamin E injectable	Jensen-Salsbury Laboratories , Division of Richardson Merrell, Inc., 520 W. 21st Street, Kansas City, MO 64141 Dermahtycin—thyroid-stimulating hormone Emtryl—dimetridazole Hexanthelin—piperazine Oxytocin
Burroughs Wellcome Co. , 3030 Cornwallis Road, Research Triangle Park, NC 27709 Zyloprim—allopurinol	Lafeber Co. , RR 2, Odell, IL 60460 Avi-cake—food containing doxycycline (custom) Pelleted parrot diet containing chlortetracycline and other medications
Carlton Corporation , 83 North Summit Street, Tenafly, NJ 07670 Calphosan injection—calcium	Eli Lilly and Company , 307 E. McCarty St., Indianapolis, IN 46285 Keflex—cephalexin Keflin—cephalothin Nebcin—tobramycin
Coopers Animals Health , P.O. Box 167, Kansas City, MO 64141 Tribriksen injectable—trimethoprim-sulfamethoxazole	Med-Tech, Inc. , P.O. Box 338, Elwood, KS 66024 Dexasone—dexamethasone Chloramphenicol capsules Dihydrostreptomycin sulfate injection Ergonovine maleate injection Kaopect—kaolin and pectin Medichol—chloramphenicol oral solution Lipo B Super—vitamin B complex plus inositol and choline with thiamine 150 mg/ml Multi B Super—vitamin B complex with thiamine 100 mg/ml Sodium ascorbate injection Testosterone aqueous Triple sulfa solution Vitamin E injection
Diamond Laboratories , 2538 SE 43rd Street, Des Moines, IA 50303 Domoso-dimethylsulfoxide gel or liquid	
Elanco Products Company , P.O. Box 1750, Indianapolis, IN 46206 Tylan plus vitamins—tylosin powder	

Table 26-6. SELECTED PHARMACEUTICAL HOUSES AND PRODUCTS FOR AVIAN USE

Merck Sharp & Dohme AGVET , Division of Merck & Co., Inc., P.O. Box 2000, Rahway, NJ 07065	Roerig (A Division of Pfizer Pharmaceuticals), 235 E. 42nd St., New York, NY 10017 Geocillin—carbenicillin tablets Geopen—carbenicillin injectable
Amprol—amprolium	
Aquamephyton—Vitamin K ₁	
Corid—amprolium	
Ivomec—ivermectin	
Merrell Dow Pharmaceuticals Inc. , Subsidiary of the Dow Chemical Company, 2110 E. Galbraith Rd., Cincinnati, OH 45215	William H. Rorer, Inc. , 500 Virginia Dr., Fort Washington, PA 19034 Emetrol solution—phosphorated carbohydrate
Cephalac syrup—lactulose	
Norden Laboratories , 601 W. Cornhusker Highway, Lincoln, NE 68521	Rugby , Rockville Center, Long Island, NY 11570 Nystatin oral suspension (generic)
Furacin water mix—nitrofurazone	
Noremco , P.O. Box 1622, Springfield, MO 65805	Sandoz, Inc. , Route, 10, East Hanover, NJ 07936 Neocalglucon syrup—glubionate calcium
GV-11—gentian violet	
Parke-Davis , Division of Warner-Lambert Company, 201 Tabor Road, Morris Plains, NJ 07950	Schering Corporation , 2000 Galloping Hill Road, Kenilworth, NJ 07033 Azium solution—dexamethasone Banamine—flunixin meglumine Gentocin ophthalmic solution—gentamicin Gentocin soluble powder—gentamicin Gentocin solution—gentamicin
Chloromycetin palmitate—chloramphenicol suspension	
Vetalar—ketamine	
Chloromycetin sodium succinate	
Pfizer Laboratories , A Division of Pfizer, Inc., 235 E. 42nd St., New York, NY 10017	Southern Agricultural Insecticides, Inc. , P.O. Box 218, Palmetto, FL 33561 Sevin dust—carbaril
Dexamethazone	
LA 200—oxytetracycline, long-acting	
Liquamycin R—tetracycline	
Nemex II—pyrantel pamoate	E.R. Squibb & Sons Inc. , P.O. Box 4000, Princeton, NJ 08540 Fungizone—amphotericin B Mycostatin—nystatin oral suspension Myco-20—nystatin feed premix Vetasulid—sulfachlorpyridazine
Vibramycin—doxycycline	
Pfizer, West Geramny	
Vibravénös	
Pitman-Moore, Inc. , Washington Crossing, NJ 08560	The Upjohn Company , 7171 Portage Road, Kalamazoo, MI 49001 Biosol-M liquid—neomycin Depo-provera—medroxyprogesterone Kaopectate—kaolin and pectin Lincocin Aquadrops—lincomycin LS-50—lincomycin and spectinomycin Panmycin Aquadrops—tetracycline oral suspension Provera-promone—medroxyprogesterone Solu-Delta-Cortef—prednisolone sodium succinate Veterinary Depo-Medrol
Ergonil—ergonavine	
Metofane—methoxyflurane	
Telminthic powder—mebendazole	
Tylocine—tylosin	
Professional Veterinary Laboratory , 100 Nancy Drive, Belle Plaine, MN 56011	USV Pharmaceutical Corporation , 303 South Broadway, Tarrytown, NY 10591 Aquasol A—vitamin A injection Methiscol—vitamin B complex with choline, inositol, and methionine
Veta K ₁ —vitamin K injection	
Rachelle Laboratories , P.O. Box 2029, 700 Henry Ford Ave, Long Beach, CA 90801	Vet-A-Mix , 604 West Thomas Avenue, Shenandoah, IA, 51601 Osteoform—powdered mineral supplement Plex Sol C—powdered vitamin supplement
Chloramphenicol injection	
Chloramphenicol capsules	
Chlororachelle	
Mychel-Vet—chloramphenicol oral solution	
Riker Laboratories, Inc. , Subsidiary of 3M, 19901 Nordhoff Street, Northridge, CA 91324	Westwood Pharmaceuticals , 468 Dewitt St., Buffalo, NY 14213 Eurax—crotamiton
Calcium disodium versenate—calcium EDTA	
A.H. Robins Company , Pharmaceutical Division, 1407 Cummings Drive, Richmond, VA 23220	Winthrop Laboratories , 90 Park Ave, New York, NY 10016 Aralen phosphate—chloroquine Aralen with primaquine—chloroquine and primaquine Atabrine—quinacrine Winstrol V—stanazolol (Veterinary Products Division)
Dopram V injectable—doxapram	
Viokase V—whole pancreas powder	
Roche Laboratories , Division of Hoffman-La Roche Inc., Roche Park, Nutley, NJ 07110	Zeigler Brothers , P.O. Box 95, Gardners, PA 17324 Pelleted parrot diet containing chlortetracycline
Albon oral suspension—sulfadimethoxine	
Ancobon—flucytosine (5-fluorocytosine)	
Bactrim—trimethoprim + sulfamethoxazole	
Injacom 100—vitamins A, D ₃ , and E	
Injacom 100 + B complex—vitamins A, D ₃ , E, and B complex	
Ipropan—ipronidazole	
Valium—diazepam	

that hand-feeders and recently weaned young birds, in many cases, consume twice the volume of food consumed by adult birds, so that most medications added to the mash should be halved. Intestinal stasis is a common complication in most systemic disease processes observed in baby birds. In severe illnesses initial therapy should be parenteral.

Feed medication dosages in the tables are listed by bird weight rather than feed weight. A helpful rule of thumb is that a one-pound bird will consume (or waste) 1/5 to 1/4 pound of feed daily. Food consumption is higher in small birds.

Oral suspensions developed for pediatric use are particularly useful in avian medicine. Most are very palatable, and the concentrations are low enough for treatment of small birds. In larger birds or in cases in which a more concentrated solution is desired, they may be spiked with capsule contents.

Rapid administration of oral suspensions may result in exhalation of the drug through the nares, or in aspiration. Passage of drugs through the choana and nasal passages is usually not dangerous but probably very uncomfortable to the bird. This contributes to fear and stress during subsequent treatments. Oil-based medications, however, may cause foreign body pneumonia if they are aspirated. Oral preparations may be mixed with food and administered by gavage.

Topical Therapeutics

Judicious use of topical preparations of antibiotics and antifungal agents can be useful in treating skin diseases and wounds. Creams and ointments must be used sparingly on the skin to avoid pasting of the feathers and subsequent loss of insulation. Powdered spray preparations are much safer for topical treatment.

Intranasal application of ophthalmic solutions, especially gentamicin, is helpful in treating rhinitis. Instillation of oily topical preparations in the nares should be avoided, as aspiration may lead to foreign body pneumonia. Intranasal antibiotics are also helpful in the treatment of bacterial pharyngitis. Ophthalmic preparations are too dilute to provide systemic therapy.

Sprays prepared from water-soluble antibiotics are very useful for treating eye diseases, allowing frequent therapy without restraint. Skin diseases and wounds can also be treated in this way if they are accessible.

Nebulization Therapy

The reader is referred to Chapter 29, Aerosol Therapy, for information on medicating birds by nebulization techniques.

OUTPATIENT CARE

Depending upon the severity of the disease status of the avian patient, some clients may be willing to treat their birds at home. Client compliance is enhanced if treatment regimens are not stressful for the bird or owner. If the bird is not critically ill, owners can be instructed in injection techniques for home therapy. Oral administration of some medications by the owner may be adequate for some cases requiring long-term therapy.

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