

## MEDICATIONS

Medications are typically selected on the basis of blood work and culture results from urine or tissue samples that have confirmed the presence of specific microorganisms. Blood samples are compared with baseline data obtained from healthy animals to determine additional information. Due to the small size of insectivorous bats, however, it is not possible to obtain sufficient quantities of tissue samples for culturing or comparison with baseline data. The author cautions against the indiscriminate use of broad-spectrum antibiotics when access to culture and sensitivity results would permit the use of a more specific antibiotic. However, when access to culture and sensitivity results are not available, the use of broad-spectrum antibiotics has allowed bat care specialists to save animals with clinical signs formerly associated with high mortality.

Note: Except when indicated, medications should always be administered with food. The use of medications for bats is extra-label drug use and no claims can be made for the efficacy or safety of the dosages. Recommended dosages for many of the medications used to treat conditions in bats as described in this book are significantly higher than those used to treat other mammals. Nonetheless, careful observation and trial and error by the author for a period of almost 20 years have led to treatments that have proven successful for ameliorating a variety of clinical signs of disease in insectivorous bats.

<b>ANALGESICS</b>	<b>*Dose/g bw</b>	<b>DOSAGE</b>	<b>DURATION</b>	<b>WARNINGS</b>
<b>Cetacaine<sup>®</sup></b> Topical gel		Apply small amount onto mucus membranes where pain control is required.	Topical anesthesia occurs within 30 seconds and lasts 30 to 60 minute	<b>Do not use in the eyes.</b> Localized allergic reactions may occur after prolonged or repeated use.
<b>Metacam<sup>®</sup></b> Oral Suspension (Meloxicam, 1.5mg/ml) (NSAID)	0.002ml/g	0.02ml PO, BID	Unknown in insectivorous bats. Has been used for 14 continuous days without incident. Can be given with Tramadol for increased efficacy.	Do not use in conjunction with corticosteroids, ketoprofen, aspirin or any other NSAID drug as intestinal bleeding and gastrointestinal ulceration may result.
<b>Tramadol</b> 50ml	0.00375mg/g	Dissolve one tablet in 20mls distilled water. Administer 0.015mls, PO, TID.	Unknown in insectivorous bats. Has been used for 14 continuous days without incident. Can be given with Metacam <sup>®</sup> for increased efficacy.	Constipation and vomiting can occur. Bats suffering from diseases of the liver or kidneys should not receive Tramadol.
<b>Buprenex</b> Injectable (Buprenorphine 0.3mg/ml)	0.0001mg/g	0.02 PO, BID May be applied to the gums to be absorbed through mucous membrane.	Up to 5 days.	Vomiting, diarrhea, loss of appetite, sedation, tremor, hypoventilation, dyspnea and cyanosis can occur.
<b>ANESTHETICS</b>	<b>Dose/g bw</b>	<b>DOSAGE</b>	<b>DURATION</b>	<b>WARNINGS</b>
<b>Isoflurane</b> (Inhalant Anesthetic)	NA	See Anesthesia or Euthanasia.	See Anesthesia or Euthanasia.	Isoflurane is not significantly metabolized, therefore, toxic metabolites are not produced.
<b>Telazol<sup>®</sup>, Diazepam and Ketamine</b>		Do not use.		Serious adverse reactions leading to death.

ANTIBIOTICS	Dose/g bw	DOSAGE	DURATION	WARNINGS
<b>Sulfamethoxazole - trimethoprim</b> (SMZ-TMP) (200 mg/40mg per 5ml)	0.005ml/g	0.05ml PO, BID.	14 to 21 days.	Side effects can include vomiting, diarrhea, anemia and loss of appetite.
<b>Sulfamethoxazole - trimethoprim</b> (SMZ-TMP) (200 mg/40mg per 5ml) mixed with <b>Baytril</b> <sup>®</sup> (Enrofloxacin, 2.27%)	0.005ml/g	Mix 0.25ml Baytril <sup>®</sup> with 3.0ml SMZ-TMP. Administer 0.05ml PO, BID.	10 to 14 days.	Side effects can include vomiting, diarrhea, anemia and loss of appetite.
<b>Amoxicillin</b> (Oral Suspension, 50mg)	0.005ml/g	0.05ml PO, BID.	14 to 30 days.	Side effects can include anorexia, diarrhea, nausea and vomiting.
<b>Baytril</b> <sup>®</sup> Injectable Solution ( <b>Enrofloxacin 2.27%</b> )	SQ: 0.001- 0.002ml/g	0.01 to .02ml SQ, SID. Mix 0.02 to 0.04ml with 0.25ml electrolyte solution to lessen sting and aid in hydration.	7 to 10 days.	Do not administer by injection to bats that are easily stressed. Use the oral mixtures instead. Do not inject IM. High doses can cause sloughing at the injection site.
<b>Clavamox</b> <sup>®</sup> Drops (Amoxicillin trihydrate/Clavulanate potassium)	0.005ml/g	Reconstitute with 14ml water. Administer 0.05ml PO, BID.	14 to 30 days (Continue for 48 hours after bat is asymptomatic.)	Keep refrigerated. Discard after ten days. Do not use if mixture becomes discolored.
<b>Clavamox</b> <sup>®</sup> Drops ( <b>Amoxicillin trihydrate/Clavulanate potassium</b> ) mixed with <b>Baytril</b> <sup>®</sup> (Enrofloxacin, 2.27%)	0.005ml/g	Reconstitute Clavamox <sup>®</sup> with 14ml water. Add 0.05ml Baytril <sup>®</sup> to 1.0ml Clavamox <sup>®</sup> and administer 0.05ml PO, BID	14 to 21 days (Continue for 48 hours after bat is asymptomatic.)	Keep refrigerated. Discard after ten days. Do not use if mixture becomes discolored.
<b>Cephalexin</b> (250mg/5ml)	0.005ml/g	Mix 5ml (one tsp) water with 8gm (one tsp) Cephalexin and administer 0.05ml PO, BID	14 to 30 days.	Keep refrigerated.
<b>Cephalexin</b> (50mg/5ml) mixed with <b>Baytril</b> <sup>®</sup> ( <b>Enrofloxacin, 2.27%</b> )	0.005ml/g	Mix 0.25ml Baytril <sup>®</sup> with 3.0ml reconstituted Cephalexin (see above). Administer 0.05ml PO, BID.	10 to 14 days.	Keep refrigerated.
<b>Clindamycin</b> (Hydrachloride oral drops, 25mg/ml)	0.0002 ml/g to 0.0004 ml/g	Mix with an equal amount of apple juice. Administer 0.01ml PO, BID.	10 to 14 days	May cause vomiting and diarrhea.
<b>Doxycycline</b> (25mg/5ml)	0.005ml/g	Reconstitute according to bottle directions. Administer 0.05ml PO, BID	21 days.	Administer with food. May cause light sensitivity.
ANTIFUNGALS	Dose/g bw	DOSAGE	DURATION	WARNING
<b>Grifulvin V</b> <sup>®</sup> (Griseofulvin) 125mg/5ml)	0.005ml/g	0.05 ml PO, BID.	Six full weeks.	Anorexia and/or vomiting. Do not administer to pregnant bats, bats suspected of having liver disease, or bats sensitive to penicillin.
<b>Nolvasan</b> <sup>®</sup> Solution (Chlorhexidine diacetate)		Apply a 10% solution to fungal infections twice a day.	Until condition is cleared.	Do not use on or near the eyes, ears, nose or mouth as it can cause nerve irritation and serious problems.

<b>ANTI-GAS</b>	<b>Dose/g bw</b>	<b>DOSAGE</b>	<b>DURATION</b>	<b>WARNING</b>
<b>Simethicone</b>	0.003 to 0.005ml/g	0.03 to 0.05ml PO every 2 hours as needed.	24 to 48 hours.	
<b>ANTHELMINTICS</b>	<b>Dose/g bw</b>	<b>DOSAGE</b>	<b>DURATION</b>	<b>WARNING</b>
<b>Praziquantel</b> (5.68mg/ml solution)	0.03mg/g	Mix 0.02ml Praziquantel with 0.35 sterile water. Administer 0.10 ml SQ.	Dose once.	Discard unused mixture as it does not remain stable.
<b>Albon Suspension 5%</b> (Sulfadimethoxine 50mg/ml)	0.002ml/g	0.02ml PO, SID.	5 days. Continue for 48 hours after bat is asymptomatic.	
<b>Panacur Suspension</b> (Fenbendazole 100mg/ml)	0.005ml/g	0.05ml PO, SID.	One dose weekly for 3 weeks.	Do not administer with flukicides (i.e. Valbazen).
<b>Revolution®</b> (Selamectin)		0.005ml applied directly onto the skin of the tail membrane.	Dose once.	Do not use on sick, weak, or underweight bats.
<b>OPHTHALMICS</b>	<b>Dose/g bw</b>	<b>DOSAGE</b>	<b>DURATION</b>	<b>WARNING</b>
<b>Triple Antibiotic Ophthalmic Ointment</b> (Bacitracin-Neomycin-Polymyxin)		Apply a thin film over the cornea 3 or 4 times daily.	Administer until improvement is noted.	Itching, burning or inflammation may occur in animals sensitive to the product. Discontinue use in such cases.
<b>Tobramycin Ophthalmic Ointment</b> (0.3%)		Apply a thin film over the cornea 2 or 3 times daily.	Administer until improvement is noted.	Keratitis, erythema, localized ocular toxicity, lid itching and swelling.
<b>ANTIMICROBIALS</b>	<b>Dose/g bw</b>	<b>DOSAGE</b>	<b>DURATION</b>	<b>WARNING</b>
<b>Manuka honey</b> (Active UMF16+)	NA	Apply topically to the wound and surrounding tissue.	Until injury is healed. Do not clean hardened layers of honey from the wound as it acts as a protective layer.	Thoroughly drain abscesses before applying. Drain abscesses daily or as needed, then reapply.
<b>Vetericyn VF™</b> (Hydrogel)	NA	Apply topically to the wound and surrounding tissue.	Reapply twice daily until infection is cleared.	
<b>Novalsan® Solution</b> (chlorhexidine diacetate)	NA	Dilute with water to 10%. Flush affected areas twice a day.	One to two applications.	
<b>Chlor-a-Flush</b> (Lidocaine 0.5%, chlorhexidine 0.2% solution)	NA	Apply liberally to affected area.	Two to three times daily or as necessary, until healing is complete.	Can cause severe eye and mouth irritation. Avoid getting into eyes or mouth.
<b>OraVet</b> (Plaque prevention gel)	NA	Use a cotton swab to apply a thin layer of gel to the teeth.	Apply once weekly to control plaque and tartar.	
<b>CORTICOSTEROID</b>	<b>Dose/g bw</b>	<b>DOSAGE</b>	<b>DURATION</b>	<b>WARNING</b>
<b>Dexamethasone</b> (Injectable Solution 2mg/ml)	0.003ml/g	Mix 0.03ml dexamethasone with 0.25ml LRS and administer entire dose SQ, BID. Warm fluids before injecting.	2 to 7 days. When given for more than 3 days, taper dose by administering SID for two days, then SID every other day for 4 days.	May cause excessive thirst and urination. Do not use in conjunction with NSAIDs as gastric bleeding may result.
<b>DIURETIC</b>	<b>Dose/g bw</b>	<b>DOSAGE</b>	<b>DURATION</b>	<b>WARNING</b>
<b>Lasix®</b> (Furosemide)	0.0001 mg/g	0.01ml administered orally.	One to two doses only for bloat caused by hypoproteinaemia.	May cause appetite loss, diarrhea, thirst, nausea and vomiting.

SYMPATHOMIMETIC	Dose/g bw	DOSAGE	DURATION	WARNING
<b>Epinephrine</b> 1:1000 Sterile Solution	0.01ml/5g	Mix 0.1ml epinephrine with 9.0ml sterile water. Inject 0.01 SQ per every 5 grams of body weight.	Dramatic improvement should be seen within 5 to 10 minutes. Inject an additional dose if symptoms are not alleviated within 20 minutes.	An additional dose will be needed if symptoms return.
<b>ELECTROLYTES</b>	Dose/g bw	DOSAGE	DURATION	WARNING
<b>Electrolyte Solution</b> Parenteral fluids (Lactated Ringers, Normosol, Plasmalyte)	NA	See Dehydration and Fluid Replacement Therapy.	Until bat is fully hydrated.	Except when heat exhaustion/stroke is suspected, always warm fluids before a SQ injection. Excess fluids can accumulate in the head, neck, and wrists. In severe cases fluid can accumulate in the lungs.
NUTRICETICALS	Dose/g bw	DOSAGE	DURATION	WARNING
<b>Vital® HN</b> (Peptide and free amino acid based powder)	NA	Mix 1 part Vital® HN to 2 parts water. Administer up to 1.0ml.	24 hours, then switch to soft food diet.	Can result in diarrhea if used in excess. As soon as improvement is noted, switch to soft food.
<b>Calsorb® Gel</b> (170mg/ml Calcium supplement)	NA	For pups and adults: 0.02 to 0.04ml PO, SID.	1 to 2 doses only.	Is extremely bitter. Should be given with honey to help mask the taste.
<b>Denosyl Tablets</b> (S-Adenosylmethionine 90mg) or SAM e	0.005ml/g	Dissolve one 90mg Denosyl® tablet in 5.0ml water. Slip the brown coating off the tablet as soon as it has softened. Continue dissolving the tablet in the water. Administer 0.05ml PO, BID.	10 to 14 days.	Should be given on an empty stomach. Can be mixed with soft food.
<b>Milk Thistle</b> (Alcohol free liquid)	NA	Administer 0.05 to 1.0ml twice daily.	10 to 14 days.	Side effects are rare but can include itching and diarrhea.
<b>Pet-Tinic®</b> (Iron supplement)	0.005ml/g	0.05ml PO, BID.	Until improvement is observed.	
TRANQUILIZERS	Dose/g bw	DOSAGE	DURATION	WARNING
<b>ACE/TORBUGESIC</b> (Acepromazine 10mg/ml, butorphanol 2mg/ml)	0.008ml/g	0.05ml Acepromazine with 0.05ml Torbugesic® and 9.8ml LRS. Administer 0.08ml SQ. Re-dose in 20 minutes if needed.	Every 4 to 6 hours. Do not use for more than 24 hours.	Side effects include anorexia and drowsiness. Avoid using in bats with head trauma or nervous system dysfunction.
<b>RABIES VACCINE</b>	Dose/g bw	DOSAGE	DURATION	WARNING
<b>Three year vaccine</b>	<b>Adults:</b> 0.01ml/g	<b>0.05ml SQ for pups weighing up to 3.9 g.</b>  <b>0.1ml SQ for pups and adult bats weighing 4g and over.</b>	<b>One dose.</b>	<b>Bats that are already incubating rabies infection may present with clinical signs of infection within two weeks of being vaccinated, and should be humanely euthanized.</b>