INFORMATION-AT-A-GLANCE

CONSIDERING DRUGS FOR TRANSDERMAL THERAPY

QUICK REFERENCE CHART FOR CATS

UNTIL SCIENTIFIC STUDIES OR CLINICAL EXPERIENCE INDICATE OTHERWISE, THESE DOSES ARE SUGGESTED AS THE MAXIMUM STARTING DOSE FOR DRUGS LISTED. THESE SUGGESTED DOSES ARE NO GUARANTEE OF SAFETY OR EFFICACY IN ANY GIVEN PATIENT AND FUTURE SCIENTIFIC STUDIES MAY COMPLETELY INVALIDATE THESE RECOMMENDATIONS.

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DRUG	PHARMACOKINETIC CONSIDERATIONS	ORAL DOSE (CATS)	INJECTABLE DOSE (CATS)	RECOMMENDED INITIAL TD DOSE (CATS)	TARGET FOR EFFICACY	MONITORING FOR TOXICITY
Aminophylline	100% bioavailability for non-SR orals; injectable doses equal to oral doses; transdermal forms have been used successfully in human neonates.	4 mg/kg q 8 – 12 h	4 mg/kg q 8 – 12 h	4 mg/kg q 8 – 12 h	Serum theophylline blood levels in therapeutic range. (These values are not firmly established for veterinary patients, but human range is 10 – 12 mcg/ml); evidence of controlled asthma.	Tachycardias, arrhythmias, seizures, hyperthermia.
Amitriptyline	48% oral bioavailability (humans); extensive first pass hepatic extraction; accumulation after multiple doses; active metabolites must be conjugated with glucuronic acid to inactivate (cats cannot do this).	5 – 10 mg per cat q 24 h	None published	1.25 mg/cat q 24 h; behaviorists who have utilized TD amitriptyline in cats advise careful monitoring to avoid accumulation.	Cessation of undesirable behavior; cessation of cystitis; onset of action as early as 3 – 5 days.	Dry mouth; gastric distress; constipation, ataxia, tachycardia, weakness, sedation, urinary retention.
Amlodipine	Oral bioavailability 75% in humans, undetermined in cats; slowly but extensively metabolized to inactive compounds in the liver.	0.625 mg per cat q 24 h	None published	0.5 mg per cat q 24 h	Reduction in blood pressure.	Hypotension, headache is reported most commonly in humans although this may be difficult to recognize in veterinary patients.
Amoxicillin Clavulanate	Not recommended due to doses > 50 mg and possibility of induction of bacterial resistance.	62.5 mg per cat q 24 h	None published	Not recommended	Not recommended	Not recommended
Atenolol	50% oral bioavailability; minimal (<50%) metabolism	6.25 mg per cat	None published	3.25 mg per cat q 24 h	Reduction in pulse to 140 – 200 bpm.	Hypotension, bradycardia, bronchospasm, cardiac failure, hypoglycemia.
Azithromycin	Not recommended due to doses > 50 mg and possibility of induction of bacterial resistance.	7 – 15 mg/kg q 12 h 5 – 7 days, then every 5 days	None published	Not recommended	Eradication of bacterial infection.	Head tilt (otic toxicity), elevated hepatic enzymes
Buprenorphine	Injectable form available; high degree of first pass extraction with gut wall and liver metabolism; conjugation with glucuronide.	0.01 – 0.03 mg/kg up to q 8 h	0.005 – 0.015 mg/kg IM, IV	0.01 mg/kg q 8 h	Apparent analgesia; animal benefiting from pain management.	Respiratory depression.
Buspirone	Not recommended until further studies available. Extensive first pass extraction (95% of oral dose removed by hepatic extraction).	2.5 mg per cat q 12 h	None published	Not recommended	Cessation of undesirable behavior or phobia.	Sedation, nausea, anorexia, tachycardia
Butorphanol	Extensive first pass extraction (84% of oral dose removed by hepatic extraction).	1 mg per cat PO q 12 h	0.4 mg/kg SQ q 6 h	0.4 mg/kg q 6 h	Apparent analgesia; animal benefiting from pain management.	Overly sedated; respiratory depression.
Carboplatin	Cytotoxic agent; not recommended; tissue necrosis occurs at concentrations > 0.5 mg/ml.	Not recommended	Not recommended	Not recommended	Not recommended	Not recommended
Chloramphenicol	Not recommended. High toxicity to humans; bacterial resistance, large doses preclude transdermal dosing.	Not recommended	Not recommended	Not recommended	Not recommended	Not recommended
Cisapride	Oral bioavailability 35 – 40%; recommend extreme caution to caregiver who may be taking interacting drugs such as antihistamines and benzimidazole antibiotics.	5 mg per cat q 8 – 12 h	None published	2.5 mg per cat q 12 h	Resolution of ileus; evidence of colonic motility with no constipation or obstruction.	Diarrhea, abdominal pain and cramping, arrhythmias from drug interactions.
Clomipramine	Substantial first pass hepatic extraction; oral bioavailability 50%; cats are very sensitive to TCADs; may accumulate in cats.	2.5 mg per cat q 24 h	None published	1.25 mg per cat q 24 h	Cessation of undesirable behavior.	Excessive sedation; dry mouth; urinary retention.
Cyclophosphamide	Not recommended. Cytotoxic agent.	Not recommended	Not recommended	Not recommended	Not recommended	Not recommended

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Cyproheptadine	Good oral bioavailability, extensive hepatic metabolism and conjugation with glucuronide with metabolites excreted in urine, accumulates in renal failure.	2 mg per cat q 12 h	None published	2 mg per cat q 12 h, monitor for accumulation.	Evidence of appetite stimulation; relief of pruritis; cessation of undesirable behavior.	Excessive sedation, dry mouth, urinary retention.
Digoxin	Not recommended. Narrow thearpeutic index; cats are very sensitive to digoxin. Exposure potentially dangerous to caregiver.	0.007 – 0.015 mg/kg; q 24 – 28 h Do not use for HCM in cats	None published	Not recommended	Achievement of thearpeutic serum levels 0.9 -2.0 nanogram/ml for cats.	Cats are very sensitive. Bradycardia, worsening of arrhythmias, serum levels > 2.0 nanogram/ml.
Diltiazem	10% transdermal bioavailability in cats (compared to IV), extensive first pass hepatic extraction. (50 – 80% oral bioavailability in cats.)	7.5 mg per cat (non SR) q 8 h	0.25 mg/kg IV bolus up to 0.75 mg/kg	7.5 mg per cat q 12 h	Reduction in pulse rate to 140 – 200 range.	Bradycardia, vomiting, heart block.
Doxycycline	Known to irritate gastric and esophageal mucosa of cats; do not recommend rubbing this chemical into ears. Also a potent photosensitizer, do not recommend putting on ears that might be exposed to sunlight. Bacterial or rickettsial resistance to this drug from subtherapeutic concentrations would leave few other alternatives in treating tick-bourne disease.	5 mg/kg q 12 h	5 mg/kg IV q 24 h	Not recommended	Not recommended	Not recommended
Enalapril	Prodrug that is hepatically metabolized to active drug enalaprilat; 60% oral bioavailability.	0.25 – 0.5 mg/kg q 24 h	None published	0.25 mg/kg q 24 h	Improvement of clinical signs of heart failure.	GI distress, hypotension.
Enrofloxacin	Not recommended. Risk of reinal toxicity in cats; risk of inducing bacterial resistance; risk of hallucinations in caregiver. **Raw chemical is FDA targeted high priority drug for regulatory action.**	2.5 mg/kg q 12 h DO NOT EXCEED 5 mg/kg/day	2.5 mg/kg SQ q 12 h DO NOT EXCEED 5 mg/kg/day	Not recommended	Eradication of bacterial infection.	Pupillary dilation (early indicator of retinal toxicity); lameness (indicator of joint erosion in immature animals.) Seizures, behavior change (auditory and visual hallucinations commonly reported in humans.)
Fluoxetine	Not recommended. Extremely long terminal half life in cats (60 hr+); likely to accumulate.	1 – 5 mg per cat q 24 h, obtain baseline labwork, assess after 1 – 4 weeks	None published	Not recommended	Cessation of undesirable behavior.	Anxiety, irritability, sleep disturbances, anorexia, hepatotoxicity.
Furosemide	Not recommended. Very unstable at acid pH.	0.5 – 2.0 mg/kg per day	Up to 4.4 mg/kg IV or IM to effect.	Not recommended	Improvement in respiratory rate and/or character; resolution of effusion or edema.	Head tilt (ototoxicity); electrolyte imbalances; weakness, lethargy.
Glipizide	100% oral bioavailability in humans.	2.5 mg per cat q 12 h	None published	2.5 mg per cat q 12 h	Reduction in blood glucose < 200.	GI distress, hypoglycemia, icterus, increased ALT; hyperglycemia from therapeutic failure.
Insulin	Not recommended. Although, there are anecdotal reports of efficacy, none of these cases have sustained an effect nor documented blood glucose levels during treatment. Risk of lipodystrophy also potentially increased due to larger surface area exposed to insulin.	Not available	Variable	Not recommended	Achievement of blood glucose values.	Hypoglycemia (too much insulin delivered), hyperglycemia (thereapeutic failure).
Methimazole	Oral bioavailability 45 – 98%, hepatic metabolism; large interpatient variation; allow 1 – 3 weeks for assessment.	5 mg per cat q 8 – 12 h	None published	2.5 mg per cat q 12 h	Reduction in serum T4 levels; improvement in clinical symptoms.	Worsening of vomiting; dermal excoriations; leukopenias, hepatopathies, thrombocytopenia.
Metoclopramide	Large interpatient variation in oral bioavailability, may be as low as 30% in some patients, conjugation with glucuronide, may accumulate in cats.	0.2 – 0.4 mg/kg q 6 – 8 h	0.2 – 0.4 mg/kg SQ q 6 – 8 h	0.2 – 0.4 mg/kg q 8 h	Cessation of vomiting.	Frenzied behavior; disorientation, constipation.
Phenobarbital	Oral bioavailability 90%; conjugation with glucuronide; very polar; very low lipid solubility; t ½ 34 – 43 hrs in cats; may accumulate.	2 mg/kg q 12 h	2 – 5 mg/kg IV bolus for status epilepticus persisting after diazepam.	2 mg/kg q 12 h	Seizure free, serum plasma concentrations of 10 – 30 mcg/ml.	Ataxia, overly sedated, lethargy, bone marrow suppression, immune mediated reactions, hepatotoxicity in dogs (cats not as likely to experience hepatotoxicity).
Prednisolone	Not recommended. Risk of epidermal atrophy is great.	1 – 2 mg/kg q 12 – 24 h	1 – 3 mg/kg IV or IM (prednisolone sodium succinate)	Not recommended	Cessation of inflammatory signs.	Epidermal or cartilage atrophy; signs of hyperadrenocorticism with chronic use; signs of diabetes mellitus.