

College of Veterinary Medicine  
 Clinical Pharmacology - Clinical Endocrinology Laboratory Analysis

Test	Specimen	Tube	Storage	Effect of Interference	Reference Range	Cost
Acetaminophen	serum or plasma 0.5 mL	red-top or lavender-top	7 days refrigerated and 2 months frozen	Less than 10% error on assay from different anticoagulants, bilirubin, hemolysis, high total protein, or lipemia.	Used to measure exposure to toxic levels. Significant liver damage is likely if values exceed 300 mcg/mL at 4 hours after ingestion, or at > 50 mcg/mL 12 hours after ingestion.	\$20.00
ACTH (special handling)	plasma 0.5 mL	Collect in EDTA (purple) tube; freeze in plastic tube.	30 days @ -20C	Collect into purple-top tube. Immediately centrifuge and store frozen in plastic tubes. Stable if frozen for 9 days. Addition of protease inhibitors is not necessary. Avoid hemolysis; Bilirubin: no effect	<u>Canine</u> : 10-70 pg/mL Most reference laboratories use: > 12 pg/mL consistent with PDH < 10 pg/mL consistent with adrenal tumor. High (>500 pg/mL) consistent with primary hypoadrenocorticism. <u>Equine</u> : ACTH values in healthy horses are 9-35 pg/mL, but can vary with season (higher in Sept.). Values exceeding 150 pg/mL suggest PPID in a horses.	\$89.00
ACTH Stimulation	serum or plasma 0.5 mL	red-top or lavender-top	7 days @ 2-8C 3 mos @ -20C	Prednisolone will cross react by 49%. Other steroids show minimal interference. Bilirubin: Icterus will cause false elevation at high levels. Hemolysis: no effect. Lipemia at high concentrations may cause slight elevation in cortisol concentrations.	Inject 5 mcg/kg Cosyntropin IV: Resting: 1.0 - 4.5 mcg/dl Post-ACTH, 1 or 2 hr: 7-20 mcg/dl	\$84.00
Amikacin	serum or plasma 0.5 mL	red-top or lavender-top	30 days @ -20C	Hemolysis: no effect; Icterus: no effect Lipemia: no effect Cross reactivity: < 1% interference with other drugs and antibiotics, except tobramycin, which which there is high cross-reactivity. Limit of detection: 0.8 mcg/mL	Peak 40 mcg/ml Trough < 0.8 mcg/ml * Pharmacokinetic analysis if more than two samples are collected. * Contact lab for pharmacokinetic analysis. At least three samples are suggest for complete interpretation.	\$50.00

Bromide (potassium or sodium bromide)	serum 0.5 mL	red-top	60 days @ -20C	No interference with other drugs. Bromide and phenobarbital can be analyzed in same sample. Hemolysis: no effect Icterus: no effect Lipemia: no effect	100 - 200 mg/dl (with phenobarbital) 200 -300 mg/dl (monotherapy)	\$39.00
Cobalamin (Vitamin B12)	serum or plasma 0.5 mL	red-top or green-top (not purple-top)	8 hours @ 2-8C 6-8 wks @ -20C	Bilirubin: no effect; Hemolysis: no effect. EDTA has significant effect; do not use purple-top tubes. Do not use serum-separator tubes. Recent injections of Vitamin B12 will increase values.	Dogs: 252-908 ng/L Cats: 290-1,500 ng/L	\$20.00
Cortisol	serum, or plasma 0.5 mL	red-top, or lavender-top	7 days @ 2-8C 3 mos @ -20C	Prednisolone will cross react by 49%. Other steroids show minimal interference. Bilirubin: Icterus will cause false elevation at high levels. Hemolysis: no effect. Lipemia at high concentrations may cause slight elevation in cortisol concentrations.	<u>Resting:</u> 1.0 - 4.5 mcg/dl <u>Dexamethasone Suppression Test:</u> @ 4 hr < 1.4 mcg/dL; @ 8 hr < 1.4 mcg/dl. <u>Post-ACTH, 1 or 2 hr:</u> 7-20 mcg/dl	\$45.00
Cortisol urine	urine 1.0 mL	urine tube	7 days @ 2-8C 3 months @ -20C	Prednisolone will cross react by 49%. Other steroids show minimal interference.	$8-24 \times 10^{-6}$ Urine Cortisol: Creatinine Ratio	\$50.00
Cyclosporine	whole blood 1.0 mL	lavender-top	30 days @ -20C	* Because of metabolites, the assay overestimates true cyclosporine concentrations by 1.5-2x. For a true level, correct result by x 0.7 in dogs; and x 0.5 in cats.	300-600 ng/mL @ 12 hr. (may vary with disease)	\$67.00
Dexamethasone Suppression (low dose)	serum or plasma 0.5 mL	red-top or lavender-top	7 days @ 2-8C 3 months @ -20C	Prednisolone will cross react by 49%. Other steroids show minimal interference. Bilirubin: Icterus will cause false elevation at high levels. Hemolysis: no effect. Lipemia at high concentrations may cause slight elevation in cortisol concentrations.	<u>Resting:</u> 1.0 - 4.5 mcg/dl <u>Dexamethasone Suppression Test:</u> @ 4 hr < 1.4 mcg/dL; @ 8 hr < 1.4 mcg/dl.	\$84.00

Dexamethasone Suppression (high dose)	serum or plasma 0.5 mL	red-top or lavender-top	7 days @ 2-8C 3 mos @ -20C	Prednisolone will cross react by 49%. Other steroids show minimal interference. Bilirubin: Icterus will cause false elevation at high levels. Hemolysis: no effect. Lipemia at high concentrations may cause slight elevation in cortisol concentrations.	Resting: 1.0 - 4.5 mcg/dl Dexamethasone Suppression Test: @ 4 hr < 1.4 mcg/dL; @ 8 hr < 1.4 mcg/dl.	\$84.00
Dexamethasone Suppression (Equine)	serum or plasma 0.5 mL	red-top or lavender-top	7 days @ 2-8C 3 mos @ -20C	Prednisolone will cross react by 49%. Other steroids show minimal interference. Bilirubin: Icterus will cause false elevation at high levels. Hemolysis: no effect. Lipemia at high concentrations may cause slight elevation in cortisol concentrations.	<u>Equine</u> : Collect samples at resting, 15 hr, and 19 hr after dexamethasone (40 mcg/kg, IM). Reference range: values should be 1.0 < mcg/dL.	\$84.00
Digoxin	serum 0.5 mL	red-top	7 days @ 2-8C 2 months @ -20C	Hemolysis: no effect; Bilirubin: No effect Lipemia: No effect Heparin tube: decrease by 5% EDTA tube: decrease by 7% Do not use serum-separator tubes.	0.8 - 2.5 ng/ml	\$45.00
Gentamicin	serum or plasma 0.5 mL	red-top or lavender-top	30 days @ -20C	Hemolysis, Icterus, Lipemia produce < 5% error in the assay. Cross reactivity: < 1% interference with other drugs and antibiotics. Limit of detection: 0.27 mcg/mL	<u>Peak</u> : 20 mcg/mL <u>Trough</u> : < 0.27 mcg/ml * Contact lab for pharmacokinetic analysis. At least three samples are suggest for complete interpretation.	\$50.00
Parathyroid Hormone (intact) iPTH	plasma 1 mL	lavender-top	up to 72 hours at room temperature; 2 months for plasma @ -20C	Avoid hemolysis, lipemia, or icteric samples as it may give false results.	* Results should be interpreted in the light of calcium levels. Published levels in dogs are 11.2-72.8 pg/mL, but levels should be undetectable when calcium is increased. Intraoperative levels should decline rapidly after tissue is removed. (Conversion: pg/mL x 0.1053 =	\$25 (single) or \$55 for surgical panel
Phenobarbital	serum or plasma 0.5 mL	red-top, or lavender-top	2 days @ 2-8 C 1 month @ -20C	Bilirubin: no effect; Hemolysis: no effect EDTA or Heparin Tube: no significant effect. Do not use serum-separator tubes.	15 - 40 mcg/ml	\$45.00

Progesterone	serum 0.5 mL	red-top	90 days @ -20C 7 days @ 2-8C	Hemolysis: no effect; Bilirubin: No effect Lipemia: slight decrease. Slight (<1%) interference with other steroid hormones.	< 0.95 ng/mL anestrus, proestrus; 15.7-70 ng/mL diestrus, and pregnancy	\$45.00
Theophylline	serum 0.5 mL	red-top	30 days @ -20C	Hemolysis, Icterus, produce < 5% error in the assay. Lipemia produces <10% error. Cross reactivity: < 1% interference with other drugs, and 1.5% cross reactivity with theobromine. Limit of detection: 0.82 mcg/mL	10 - 20 mcg/ml	\$45.00
TLI Canine (Trypsin-Like Immunoreactivity)	serum, 0.5 mL	red-top	7 days @ 2-8 C 6 month @ -20C.	Dogs should be fasted for at least 6 hours or overnight prior to assay. To avoid interference from fibrin, allow clot to form in tube before centrifugation. The TLI assay is specific for dogs and should not be used as a test for cats.	> 5.2 ng/mL in healthy dogs up to 45.2 ng/mL; < 1.9 ng/mL indicative of pancreatic insufficiency. (One laboratory reported that < 2.5 ng/mL was diagnostic for EPI.) Values between 2.5 - 5.0 ng/mL should be retested after a 12 to 15 hour fast. High levels (>50 ng/mL) are suggestive of, but not diagnostic for pancreatitis.	\$40.00
Troponin I (cardiac)	serum 0.5 mL	red-top	5 days @ 2-8 C 30 days @ -20C	EDTA interferes with assay; do not use lavender top tubes. Hemolysis and lipemia have no effect on assay.	0.05-0.1 ng/mL. Less than 0.2-0.26 ng/mL is generally considered normal.	\$22.00
T4 (Total T4)	serum 0.5 mL	red-top	7 days @ 2-8C 2 months @ -20C	Do not use serum-separator tubes. Hemolysis: no effect; Icterus will falsely increase levels.	1.0 - 4.0 mcg/dl	\$45.00
TSH	serum 0.5 mL	red-top	1 week @ 2-8C 2 months @ -20C	Hemolysis: interpret with caution. Lipemic samples: clear with centrifuge. (TSH and T4 can be measured on same sample).	0.03 - 0.6 ng/mL	\$50.00
T4 and TSH combined	serum 0.5 mL	red-top	1 week @ 2-8C 2 months @ -20C	See menu for TSH and T4.	See menu for TSH and T4.	\$72.00

Vancomycin	serum 0.5 mL	red-top	30 days @ -20C	Hemolysis, Icterus, Lipemia produce < 5% error in the assay. Cross reactivity: < 1% interference with other drugs, and 1.5% cross reactivity with theobromine. Limit of detection: 2.0 mcg/mL	Peak: 30-40 mcg/mL Trough: 5-10 mcg/mL	\$36.00
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Vitamin B12                      see Cobalamin

<p><b>Mailing Address:</b>  Clinical Pharmacology Laboratory Room C-268  Attn: Lyndy Harden  College of Veterinary Medicine  4700 Hillsborough Street  Raleigh, NC 27606</p>	<p><b>Lab Contacts:</b>  Lyndy Harden, phone: 919-513-6565; pager 919-565-0257  Dr. Mark Papich, faculty supervisor: 513-6221, after hours 602-0175  Backup: Delta Dise, Lab Tech III, 513-6385</p>
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**Instructions for Submission:** Collect all samples in tube as indicated in chart. Timing of sample will be according to accepted protocols for each drug or hormone. NCSU-hospital samples will be logged into the UVIS system. All samples should be delivered to the Clinical Pathology Laboratory for processing and billing. Referring DVMs may submit samples directly to address listed above. Special requests should be directed to the individuals listed as Lab Contacts above.