Therapeutic Drug Monitoring Guidelines and Sampling Recommendations

See below for recommendations specific to each drug.

Drug	Time to Steady State	Peak Sample	Recommended Sample Time	Trough Sample	Comments
Digoxin					
Dog, Cat	~ 7 days	2-5 hours	Peak if suspect toxicity; trough for lack of efficacy	Before next dose (or 8 hours after the last dose)	Use glass tubes preferably
Horse	~ 4 days				
Gentamicin					
Dog, Cat	~ 6 hrs	1 hour	Peak and trough	8-12 hours post-dose or before next dose	
Horse	~ 1 day	1 hour	Peak and trough	8-12 hours post-dose	
Phenobarbital					
Dog, Cat	2 weeks	4-6 hours	Trough for routine monitoring; peak if toxicity is suspected	Before next dose	
Horse	~ 4 days				
Potassium Bromide	~ 3 months		Sample anytime, at least **1ml** of serum required.		
Theophylline					
Dog	~ 1 day	1-2 hours	Both peak and trough, unless using slow-release formulation	Before next dose	
Cat	~ 2 days				
Horse	~ 2.5 days				
Thyroxine (T4)					
Dog, Cat	2-3 days	4-8 hours	See Endocrinology Section for further details.		
Cyclosporine A					
Dog	2-3 days		Trough sample	12 hours post dose	Require 2 mls of whole blood in EDTA

General Collection – Collect blood into a red-top vacutainer, centrifuge and then remove serum and put in glass tube.

Note: ***Do not use serum separator tubes for therapeutic drug monitoring***. The silicon gel can bind drugs and cause artificial decreases in concentrations.

Specific Sampling Recommendations

Digoxin

Specimen Collection and Handling

1. Collect the sample immediately prior to the next dose if dosing BID. (If dosing SID, especially in cats, collect the sample 10 – 12 hours post digoxin administration).
2. Collect blood by venipuncture into a plain, red-topped tube, separate serum from cells. The required volume of serum is 0.5 ml.
3. Store and transport in glass containers only (cardiac glycosides absorbs to plastic).
4. Transport samples to the laboratory on ice. If a delay of greater than 24 hours is anticipated between sample collection and arrival at Diagnostic Services, the sample should be shipped frozen.

Gentamicin

Specimen Collection and Handling

1. Collect blood sample 1 hour after IM or SQ dosing for peak determination or just before the next dose for trough determination.
2. Collect blood by venipuncture into plain red-topped or heparinized tube. Separate serum or plasma from the cells and place into a plastic tube. The required volume of serum is 0.5 ml.
3. Store and transport in plastic containers only (gentamicin absorbs to glass).
4. Transport samples to the laboratory on ice. If a delay of greater than 24 hours is anticipated between sample collection and arrival at Diagnostic Services, the sample should be shipped frozen.

Phenobarbital

The sampling time in relation to drug administration depends upon the therapeutic considerations. If seizures are not being controlled in the patient, **trough** sampling is best. If toxicity is suspected, **peak** sampling (4 to 6 hours after drug administration) is best. If you are concerned that an individual may have unusual pharmacokinetics that are affecting the seizure control, then sample at both the peak and trough times. The two samples will enable the clinical pharmacologist to estimate an individual animal's serum or plasma phenobarbital half-life which may facilitate the calculation of an adjusted dose or timing of the phenobarbital dosage regimen for the patient. For best assessment of steady state serum or plasma concentrations, at least two weeks should have elapsed since the last adjustment in the dosage regimen.

Specimen Collection and Handling

1. Samples should be collected after the phenobarbital reaches steady state for the dosage that the animal is receiving. This takes ~10 - 14 days for phenobarbital in a dog.
2. Collect blood by venipuncture into plain, red-topped tube; separate serum from cells and remove the serum. The required volume of serum is 0.5 ml.
3. Store and transport in a glass or plastic tube
4. Transport samples to the laboratory on ice. If a delay of greater than 24 hours is anticipated between sample collection and arrival at Diagnostic Services, the sample should be shipped frozen.

Potassium Bromide

Sample Collection and Handling

1. Collect a sample at any time during the day after the patient reaches steady state (~ 3 months).
2. Collect blood by venipuncture into a plain, red-topped tube. Separate serum from the cells (at least 1 ml serum is required).
3. Store and transport in a glass or plastic tube.
4. Transport samples to the laboratory on ice. If a delay of greater than 24 hours is anticipated between sample collection and arrival at Diagnostic Services, the sample should be shipped frozen.
5. Avoid hemolysis and/or lipemia as it interferes with the assay

Cyclosporine

Sample Collection and Handling

1. Collect 2 mls of whole blood into an EDTA tube at 12 hours post treatment.
2. Transport samples to Diagnostic Services on ice.

Procainamide

Sample Collection and Handling

1. Collect the sample immediately prior to the next dose for trough serum concentration.
2. Collect blood by venipuncture into plain, red-topped tube. Separate serum from cells. The required volume of serum is 0.5 ml.
3. Transport samples to the laboratory on ice. If a delay of greater than 24 hours is anticipated between sample collection and arrival at Diagnostic Services, the sample should be shipped frozen.

Quinidine

Sample Collection and Handling

1. Collect the sample immediately prior to the next dose for trough serum concentration.
2. Collect blood by venipuncture into plain, red-topped tube. Separate serum from cells. The required volume of plasma or serum is 0.5 ml.
3. Transport samples to the laboratory on ice. If a delay of greater than 24 hours is anticipated between sample collection and arrival at Diagnostic Services, the sample should be shipped frozen.

Theophylline

Specimen Collection and Handling

1. Collect the sample immediately prior to the next dose for trough serum concentration.
2. Collect blood by venipuncture into plain, red-topped tube. Separate serum from cells. The required volume of serum is 0.5 ml.
3. Transport samples to the laboratory on ice. If a delay of greater than 24 hours is anticipated between sample collection and arrival at Diagnostic Services, the sample should be shipped frozen.