

THERAPEUTIC DRUG MONITORING



Phenobarbitone

Phenobarbitone levels take 2-3 weeks to reach steady state. Samples for monitoring are therefore taken at least 3 weeks after treatment starts and 3 weeks after any changes are made to the dose.

Sample type: Serum (red top tube)

Monitoring is on a trough sample taken within one hour of the next scheduled dose.

Recommended levels vary in different texts. Ettinger quotes an optimal range of 100 -120 $\mu\text{mol/l}$ and suggests that hepatotoxicity is more likely if the level exceeds 133 $\mu\text{mol/l}$. The measured level always needs to be interpreted in light of how well seizure activity is being controlled.

Potassium Bromide

Potassium bromide can be used alone or in conjunction with phenobarbitone for seizure control. The drug has a long half life and therefore it takes 2-3 months to reach steady state. Levels are assessed 3 months after treatment is initiated on a trough sample (i.e. about an hour before the next dose is due).

Sample type: Serum (red top tube)

Therapeutic levels:

12.5 – 37.6 mmol/l (1 – 3 mg/ml) for potassium bromide alone
12.5 – 25.0 mmol/l (1 – 2 mg/ml) when used in conjunction with phenobarbitone
>37.6 mmol/l (3 mg/ml) is considered toxic

Toxicity can be seen in dogs when concentrations of >25 mmol/l (>2mg/ml) are found when potassium bromide is being used in combination with phenobarbitone.

Reference:

Podell M. Antiepileptic drug therapy. Clin Techniq Small Anim Pract 1998; 13:185-192.

Digoxin

Digoxin levels should be determined 7 days after starting therapy and 7 days after any changes are made to the dose. For routine monitoring, the sample is taken 8 – 10 hours post treatment. If the concern is toxicity then a peak sample is taken 3-5 hours post treatment.

Sample type: Serum (red top tube)

Therapeutic level: 1.3 - 2.6 nmol/L
Toxic level: >2.6 nmol/L

Cyclosporine

Cyclosporine has been shown to be effective in the treatment of anal furunculosis and atopy in dogs and a number of conditions in cats. Routine monitoring is probably not necessary if there is good response to treatment. If the standard dose is not producing the desired result then check trough levels.

The half life is short (about 6 hours) so levels can be assessed within a couple of days of starting treatment. Trough levels are measured on a sample taken just before the next dose.

Sample type: EDTA whole blood (purple top tube)

The therapeutic range does vary depending on the disease being treated. For anal furunculosis, the aim is a trough level of 300-500 ng/ml.