Frequently-Asked Questions: Thyroid Medication and Monitoring

How soon after beginning thyroid hormone supplementation should I monitor the effectiveness of the dose?

The clinical effects of supplementation will be observed one to two months after starting therapy, especially where there are skin or hair abnormalities. Steady state levels of thyroid hormones will be reached within a week or so of therapy but in a new case TSH concentrations may not be fully suppressed until after a few weeks of treatment. Some people prefer to compare the clinical response to treatment with the laboratory test results leading to the recommendation to wait 6 weeks before obtaining the first monitoring sample. From a pharmacokinetic perspective alone, a monitoring sample can be obtained from a new case or following a regimen change in an established case after 10 to 14 days of treatment. In chronic therapy of a long established case, TSH concentration can be expected to reflect the preceding few days of supplementation.

How do I interpret thyroid hormone concentrations when the patient is receiving thyroid supplementation?

The canine therapeutic monitoring profile should be used. T4 and free T4 concentrations indicate that treatment has recently been received, and whether dosages are adequate to maintain levels within the normal range. For the most part, it gives us information about the dose, administration or absorption of the therapeutic product since the last pill was given, and is interpreted with regard to the hours post-pill at which the sample was drawn. TSH measurement gives a slightly longer-term picture of the adequacy of therapy (last 2 - 4 days). Concentrations of T3 and free T3 indicate the adequacy of the active thyroid hormone metabolite.

On a BID protocol we hope to achieve values at the top or slightly above the reference range at the expected time of peak concentration (approximately 3 hours post pill) and a value within the lower half of the reference range if sampled just prior to the administration of the next pill (trough concentration). The target range, necessarily, depends on the interval post-pill at which the sample was obtained. The variability in T4 half-lives in dogs is sufficiently narrow that in a BID case a thyroid monitoring result can be interpreted with confidence anytime after 3 hours post-pill as long as that interval is known. Another aim of adequate thyroid supplementation is to keep TSH suppressed within the reference range. A high TSH indicates demand for T4, and inadequate supplementation.

Occasionally, there are apparently discordant messages provided by the T4 and TSH results. If T4 is low but TSH well suppressed, this suggests that dose, administration or absorption was inadequate on the day of the test but that overall the pituitary is satisfied that thyroid supplementation is adequate (assuming a high TSH was detected at the time of diagnosis).

The opposite pattern of good T4 results with a high TSH result is sometimes seen. In these cases, thyroid therapy on the day of the test is better than on the preceding days. This could be consistent with poor compliance except on the clinic visit day or reflect the presence of an intermittent interfering factor such as gastrointestinal disturbance.
Why are T3 and T4 values low even though I am treating with a high dose of thyroid hormone?

The most common cause of failed T4 therapy is noncompliance by the owner or avoidance of therapy by the animal, where the dog never receives the prescribed level of medication. Diets with a high fiber or high mineral content also slightly limit absorption of thyroid supplements. In addition, there are occasional dogs which absorb oral thyroid medication poorly in which no underlying problem can be identified.

A dog was diagnosed with hypothyroidism and started on thyroid supplementation. Some, but not all clinical signs have disappeared. What should I do?

Have a monitoring profile done to confirm that the animal is receiving and absorbing adequate thyroid supplement. If a confident diagnosis of hypothyroidism was made, the hormone levels are adequate and TSH is well suppressed, consider another concurrent disease. If the diagnosis of hypothyroidism was presumptive, that diagnosis may be wrong. Where skin or hair abnormalities are the main complaint, biopsy or investigation of possible allergic conditions may be helpful.

If there is concern that the original diagnosis may not have been correct, withdraw the medication and retest in 6 weeks.

A dog is receiving thyroid supplementation, but the initial diagnosis of hypothyroidism was never confirmed. How can I determine if this dog is really hypothyroid?

Once an animal is receiving thyroid hormone medication, thyroid testing can only tell if that medication appears to be well absorbed. No comment can be made about the patient’s endogenous thyroid functional status. Because of the suppressive effects of thyroid medication on endogenous thyroid hormone production in normal dogs, a withdrawal period of 6-weeks with no thyroid supplement is recommended before a diagnostic sample can be taken. After 6 weeks of no thyroid supplement, the dogs’ endogenous thyroid status can be assessed, and is free from interference by thyroid medication. Even in laboratory confirmed cases of hypothyroidism; clinical signs generally do not recur until after a few months without therapy.

If a dog is receiving thyroid supplement and I want to take him off of supplement, do I have to do this gradually?

Animals do not need to be weaned off of T4 supplementation. There is no apparent harm in abruptly stopping thyroid supplementation.