The Akita and hypothyroidism

Hypothyroid disease affects a large percentage (as much as 70-90% !) of the breed and is easily treated by twice daily hormone replacement therapy. It is not at all expensive to maintain. Before condemning your Akita's behavior, invest in a complete thyroid panel, one that includes a look at all levels of thyroid function.

What is the thyroid gland?

The thyroid is a large ductless gland in the neck that secretes hormones regulating growth and development through the rate of metabolism.

What is Hypothyroidism and what causes it?

Hypothyroidism is a condition in which there are low concentrations of thyroid hormones in the blood. It is one of the most common hormonal disorders in dogs, but rare in cats. Thyroid hormone is important for the normal regulation of metabolic rate and activity in many tissues and a deficiency of the hormone results in reduced metabolic activity and abnormal changes in many organ systems. If present from birth (i.e. congenital) hypothyroidism is called “Cretinism.”

There are many potential causes of low thyroid hormone production including :

- A failure of the thyroid gland to develop at all (called agenesis) ...results in congenital hypothyroidism.
- Underdevelopment of thyroid tissue mass (hypoplasia) is a cause of primary hypothyroidism (rare).
- Iodine deficiency during fetal development (rare) - results in congenital hypothyroidism, or in adulthood causes acquired hypothyroidism (rare).
- Autoimmune disease in which the body produces antibodies against the body's own thyroid tissue. These antibodies destroy the normal thyroid tissue replacing it with fibrous tissue. This is called lymphocytic thyroiditis and is one of the most common causes of primary hypothyroidism in dogs.
- Degeneration of the thyroid tissue due to cell death (necrosis) or reduced tissue mass (atrophy) is also a common cause of hypothyroidism.
- Cancer of the thyroid may cause primary hypothyroidism (rare).

- Lack of thyroid stimulating hormone (TSH) from the pituitary gland in the brain results in lack of stimulation of the thyroid to secrete it's hormones, resulting in secondary hypothyroidism - though this is uncommon (accounts for less than 5% of cases).
    - This can be due to a congenital defect in the pituitary and is associated with dwarfism because there is usually a lack of growth hormone as well .
    - This can be acquired as in cancer of the pituitary gland which results in reduced TSH secretion.
- Lack of secretion of thyrotropin releasing hormone (TRH) from the hypothalamus in the brain will result in a lack of production of TSH in the pituitary and so a lack of production of thyroid hormones - but this tertiary form of hypothyroidism has not been reported to occur in dogs
- Hypothyroidism can result following the surgical removal or chemical destruction or suppression of the thyroid gland as a treatment for thyroid cancer, and excess thyroid hormone secretion.. This is called iatrogenic hypothyroidism.

Which dog breeds are prone to hypothyroidism?:

Large and giant breeds of dogs are most often reported to be affected with hypothyroidism including Airedale Terriers, Akita, Beagles (lymphocytic thyroiditis), Boxers, Cocker Spaniels (American), Collie, Dachshunds, Doberman Pinschers, German Shepherd Dogs, Golden Retrievers , Irish Setters, Labradors, Miniature Schnauzers, Old English Sheepdogs and Shetland Sheepdogs. Some texts also mention the Alaskan Malamute as having a higher risk.

Most animals are affected during middle age (4-8 years) and both sexes are equally affected, though it appears that spayed females are at a higher risk.

What are some of the symptoms, signs, and warnings of hypothyroidism?:

Clinical signs of hypothyroidism in an affected individual can vary because the thyroid hormones affect many organ systems. Some dogs may display several of these signs, some only one or two, and some none at all.

In recent years, clinicians have noted the sudden onset of behavioral changes in dogs around the time of puberty or as young adults. Most of the animals have been purebreds or crossbreeds with an apparent predilection for certain breeds. Neutering these animals usually does not alter the symptoms and the behaviors may even intensify.

The clinical signs in these animals, before they show the sudden onset of behavioral aggression, can include minor problems such as inattentiveness, fearfulness, seasonal allergies, skin and coat disorders (e.g. pyoderma, allergic inhalant or ectoparasite dermatitis, alopecia, and intense itching). These may be early subtle signs of thyroid dysfunction, with no other typical signs of thyroid disease being manifested.

Some of the most common signs include:

- Lethargy
- Weakness and poor exercise tolerance
- Mental dullness; lack of concentration
- Weight gain
- Joint pain
- Anxiety, fearfulness, and phobias
- Submission; passivity
- Compulsiveness
- Seizures
- Aggression; erratic temperament
- Irritability; moodiness
- Hair loss (symmetrical on both sides of the body) on the flanks, neck, thighs and tail. Not usually itchy.
- Occasionally, in some breeds (eg Irish Setters), the coat becomes thicker
- Dull, dry, scurfy coat (dandruff). Occasionally itchy.
- Black pigmentation and thickening of the skin.
- Joint pain
- Abnormal estrus in breeding females (irregular, prolonged bleeding), infertility, abortions and stillbirths, fading puppy syndrome (early post-natal deaths).
- Abnormal lactation and breast development
- Reduced size (atrophy) of the testicles in males, poor libido and poor sperm production
- Low body temperature

- Neurological disorders including facial paralysis, head tilt, laryngeal paralysis, loss of proprioception (knuckling of the feet), mega esophagus, muscle wastage, stiffness, weakness
- Anemia, bleeding disorders, a low white cell count (hence a poor immune response to infections)
- Slow heart rate and abnormal cardiac rhythm. Cardiomyopathy.
- Constipation, and sometimes vomiting or diarrhea

In humans enlargement of the thyroid gland (seen as a swelling in the neck below the Adam's apple - called goiter) is a common feature of hypothyroidism but this is rare in dogs, except in association with thyroid cancer.

To quote Dr. Dodds, the nation's leading expert in canine thyroid disease,

"The typical history starts out with a quite, well-mannered and sweet-natured puppy or young adult dog. The animal was outgoing, attended training classes for obedience, working, or dog show events, and came from a reputable breeder whose kennel has had no prior history of producing animals with behavioral problems. At the onset of puberty or thereafter, however, sudden changes in personality are observed. Typical signs can be incessant whining, nervousness, schizoid behavior, fear in the presence of strangers, hyperventilating and undue sweating, disorientation, and failure to be attentive (canine cognitive dysfunction). These changes can progress to sudden unprovoked aggressiveness in unfamiliar situations with other animals, people and especially with children.

In adult dogs, moodiness, erratic temperament, periods of hyperactivity, lack of concentration, depression, mental dullness, lethargy, malaise, fearfulness and phobias, anxiety, submissiveness, passivity, compulsiveness, and irritability may be observed. After the episodes, most of the animals behave as though they were coming out of a trance like state, and are unaware of their previous behavior.

Another group of dogs show seizure or seizure-like disorders of sudden onset that can occur at any time from puberty to mid-life. These dogs appear perfectly healthy outwardly, have normal hair coats and energy, but suddenly seizure for no apparent reason. The seizures are often spaced several weeks to months apart, may coincide with the full moon, and can appear in brief clusters. In some cases the animals become aggressive and attack those around them shortly before or after having one of the seizures. The numbers of animals showing these various types of aberrant behavior appear to be increasing in frequency over the last decade.

In dogs with aberrant aggression, a large collaborative study between our group and Dr. Dodman and colleagues at Tufts University School of Veterinary Medicine has shown a favorable response to thyroid replacement therapy within the first week of treatment, whereas it took about three weeks to correct their metabolic deficit. Dramatic reversal of behavior with resumption of previous

problems has occurred in some cases if only a single dose is missed. A similar pattern of aggression responsive to thyroid replacement has been reported in a horse.

A sudden onset of behavioral changes in an otherwise healthy young or older animal should alert the client and veterinarian to the possibility of an underlying thyroid imbalance. The age at onset can range widely from 6 months to 15 years; spayed females and neutered males are at increased risk in comparison to sexually intact animals; mid-sized to large breeds are more often involved; and purebreds are much more likely to be affected than mixed breeds. While abnormal behavior can reflect underlying problems of a psychological nature, it also can have a variety of medical causes. Therefore, the medical evaluation should include a complete history, clinical examination and neurological work up, routine laboratory testing of blood counts, blood chemistry and thyroid profiles, urinalysis, fecal exam and x-ray. Additional specific laboratory tests may be indicated based on the specifics involved. If all of these tests prove to be negative, evaluation by a qualified behavioral consultant should be undertaken."

Examples from some of Dr. Dodds case studies:

Aggression

Chip W. - Parsons Jack Russell terrier, 7 year-old neutered male. Mood swings, aggression towards the owners, dry flaky, greasy skin and itching. Seven days after the diagnosis of hypothyroidism the dog's behavior totally changed; he no longer attacks household members and the scratching has significantly diminished.

Tater N. - Bull Terrier, 3 year-old neutered male. Originally diagnosed with rage syndrome, thyroid tests confirmed autoimmune thyroiditis. He is also deaf, and had been in several homes after developing behavioral problems. His current home is with an animal health technician, where everything was fine for a few months. Then he would suddenly jump up during sleep and roar like a lion. He attacked any person or animal or thing nearby, and then would become fully awake but unaware that anything had happened. After a diagnosis of autoimmune thyroiditis, twice daily thyroid supplement was initiated. Within 6 weeks his abnormal behavior had disappeared to the extent that he is now 90% rage-free.

Bailey A. - Dalmatian, 6 year-old intact female. Unpredictable, aggressive behavior began at age 2 and has continually worsened. She sheds excessively and is extremely lethargic, sleeping most of the day and night. Thyroid testing confirmed end-stage hypothyroidism, and thyroxine supplement for just 10 days resulted in restoration of normal energy pattern, and a calming of her overall demeanor.

Passivity

Daphne O. - Golden retriever, 8 year-old spayed female. Began with anxiety and panic attacks; diagnosed with autoimmune thyroiditis. Before treatment was given, she became very lethargic,

nonresponsive, and seemed unaware of her surroundings. Treatment with thyroxine twice daily restored her to normal activity level and behavior almost immediately.

Briar G. - Clumber spaniel, 5 year-old intact female. Acting very fatigued with signs of muscular weakness and massive coat shedding for two months. Not interested in any activity, refused to be touched or interact with other animals, children, or adults in the household. Testing revealed significant hypothyroidism, and treatment with twice daily thyroxine restored her attentiveness, energy level, as sociable behavior.

Phobias

Sherman C. - Cocker spaniel, 6 year-old intact male. This dog becomes easily excited and agitated during thunderstorms and other periods of noise, such as fire crackers. During these episodes he vocalizes, paces constantly, and cannot be touched. Diagnosed with autoimmune thyroiditis, he is now on twice daily thyroxine and once daily melatonin. His temperament is normal and his noise phobia appears to be under control. [This case illustrates the benefit of melatonin either alone or with thyroxine therapy, as needed, in managing phobias.]

Cognitive Disorder

Sally F. - English setter, 4 year-old spayed female. A top-winning obedience and agility dog, she suddenly began to lose concentration and misunderstand routine performance commands, especially during competition events. As the breed at highest risk for autoimmune thyroiditis, the owner requested testing, which confirmed the presence of thyroid autoantibodies and clinical hypothyroidism. Treatment with thyroid supplement twice daily restored her cognitive function within 30 days.

Hazel S. - Bloodhound, 6 year-old spayed female. This experienced search and rescue dog suddenly appeared to lose her concentration and scenting ability. With the exception of minor skin infections, she had produced a healthy litter and had never been ill. Testing revealed significant hypothyroidism, which responded to twice daily replacement with thyroxine and a restoration of her scenting and tracking ability.

Seizure Disorder

Rocky McC. - Golden retriever, 2 year-old intact male. Presented with cluster seizures. Thyroid testing revealed elevated TgAA, although basal thyroid levels were normal. A rabies vaccine had been given one month before the onset of seizures, and the area had been treated with pesticides. He was fed a raw food diet, but the allopathic veterinarian declined to accept him as a patient unless his diet was changed to commercial pet food. A holistic veterinarian was contacted, and he is now taking thyroxine and Pb. He has been seizure-free for 6 months.

Daisy M. - Labrador retriever mix, 5 year-old spayed female. This dog has idiopathic epilepsy under relatively poor control (seizures every 3 weeks). When routine booster vaccinations would normally be given, vaccine antibody titers were measured for parvovirus, distemper virus, and coronavirus.

Titer results for parvovirus and distemper were extremely high indicating a very good level of immune memory, but coronavirus titer was poor. Her neurologist insisted on a polyvalent booster vaccination because of the low coronavirus titer and risk of contracting parvovirus disease. Needless to say the client was amazed, because the vaccine titer for parvovirus was very high, and gastrointestinal immunity affords coronavirus protection rather than serum antibody levels. Booster vaccination was not given and another specialist agreed to prescribe thyroxine twice daily, as very low thyroid function was also discovered.

How is hypothyroidism diagnosed?:

Below is an article written by Dr. Dodds. It is a bit technical and dry, having been written by a veterinarian, but informative non-the-less.

Diagnosis and Management of Canine Thyroid Disease

by Dr. Jean Dodds D.V.M.
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"Although thyroid dysfunction is the most frequently recognized endocrine disorder of the dog, a definitive diagnosis may be difficult to establish. Clinical signs of thyroid dysfunction mimic symptoms resulting from other causes and interpretation of results of thyroid function tests can be problematical. Most canine thyroid disease is the result of autoimmune thyroiditis, which is a familial disorder of inherited predisposition similar to human Hashimoto's disease. Therefore, the most complete approach to thyroid testing should include assays for thyroid autoantibodies.

1. Baseline Thyroid Profiles

Because of the difficulties inherent to diagnosing thyroid disease, a complete baseline thyroid panel is advisable and should include measurements of total T4, total T3, free T4, free T3, and circulating T4 and T3 autoantibodies. This type of profile can be applied not only to clinical patients suspected of having thyroid disease, but also can be used for genetic screening of apparently healthy relatives to evaluate their fitness for breeding. A breeding female with circulating antithyroid antibodies can pass these along to the puppies transplacentally as well as via the colostrum. Furthermore, dogs with circulating antithyroid autoantibodies may eventually develop clinical symptoms of thyroid disease and/or be susceptible to other autoimmune diseases. Thyroid prescreening is thus very important for selecting potential breeding stock.

2. Genetic Screening for Thyroid Disease

Thyroid testing for genetic screening purposes is less likely to be meaningful before puberty. Screening is initiated, therefore, once healthy dogs and breeding females have reached sexual maturity (between 10 to 14 months in males and during the first anestrous period for females following their maiden heat). As

the female sexual cycle is quiescent during an estrus, any influence of sex hormones on baseline thyroid function will be avoided.

This period generally begins 12 weeks from the onset of the previous heat and lasts one month or longer. The interpretation of results from baseline thyroid profiles in intact females will be more reliable when they are tested in anestrous. Once the initial thyroid profile is obtained, dogs and breeding females should be rechecked on an annual basis to assess their thyroid function and overall health. This allows for early treatment, where indicated, to avoid the appearance or advancement of clinical signs associated with hypothyroidism.

For optimal health, young dogs under 15 to 18 months of age should have thyroid baseline levels in the middle to upper half of adult normal ranges. This is because puppies and adolescent dogs are still growing and maturing. Similarly, in older animals above 8 or 9 years of age, body functions slow down so that baseline thyroid levels may be in the lower third of the range in euthyroid individuals. For healthy young adults used for performance or breeding, optimum thyroid function should be at least at the mid-point of the laboratory normal ranges. Lower levels may be indicative of the early stages of thyroiditis among relatives of dog families previously documented to have thyroid disease.

3. Diagnosing Difficult or Equivocal Cases

Some dogs with typical clinical signs of hypothyroidism have circulating levels of thyroid hormones within the normal range. Most of these patients will improve clinically when given thyroid medication, because blood levels of thyroid hormones may not reflect cellular and tissue thyroid levels. A 6 to 8 week clinical trial of thyroid supplementation given twice daily is safe and appropriate for such patiisents, and is followed by rechecking the complete thyroid profile 4 to 6 hours after the morning pill. Response to thyroid therapy is considered an appropriate justification for continuing to prescribe thyroid hormone. The usual therapeutic dosage is 0.1 mg (100 ug) per 4.5 Kg (10 lbs.) BID.

Once the appropriate dose of thyroid supplement is established, annual retesting is recommended unless the dog exhibits any sign of illness in the intervening period.

If an animal is receiving thyroid supplementation and the original diagnosis is questioned, the clinician may wish to reevaluate the patient. Whenever thyroid therapy is discontinued, retesting is performed after 4 or preferably 6 weeks, because it takes at least a month for the animal's own pituitary-thyroid axis to be restored to full capacity.

4. Therapeutic Approaches for Refractory Cases or Those with Circulating Thyroid Autoantibodies

a. Use of T3 Supplement

When clinical signs of thyroid disease are only partially or poorly ameliorated by supplementation with L-thyroxine at standard dosages [0.1 mg per 4.5 Kg BID], combination therapy is often successful. In such cases, the T4 supplement may be poorly converted to T3 by the liver and other tissues, so that addition of a T3 supplement or a source of natural thyroid containing both T3 and T4 is indicated. The typical

treatment regimen includes the full dosage of T4 supplement given twice daily plus 1 ug per 0.5 Kg (1 lb.) of T3 supplement given two or three times daily. This combination has been particularly benificial for patients with concomitant liver disease or dysfunction, because the liver is the primary site of conversion of T4 to T3. The approach also applies to patients on anticonvulsant therapy for seizure disorder. Providing this low dosage of T3 supplement enhances levels of T3 in the central nervous system to assist in raising the seizure threshold. The dosage of anticonvulsant required for seizure control may be able to bel lowered or even discontinued. It may also offset any adverse effects of anticonvulsants on liver metabolism which could impair hepatocellular conversion of T4 to T3.

b. Reversal of Thyroid Autoantibodies

For patients with circulating T4 and/or T3 autoantibodies, even in the absence of typical clinical signs of thyroid disease, thyroidsupplementation is used to interrupt the progression of thyroiditis and reverse the stimulus for production of thyroid autoantibodies. Experience with over 70 cases followed periodically up to 4 years indicates that it usually takes between 5 to 7 months of thyroid replacement for circulating thyroid autoantibodies to wane progressively and disappear. The breeds most commonly exhibiting this pattern of autoimmune thyroiditis are Golden Retrievers, Shetland Sheepdogs, Old English Sheepdogs, and Doberman Pinschers, although many other breeds are also affected. The most prevalent circulating thyroid autoantibody is against T3, followed by a combination of T3 and T4 autoantibodies. In a few instances, the patients demonstrate only T4 autoantibodies. As would be expected, these patients also have elevated levels of antithyroglobulin antibodies.

Supplementation with L-thyroxine is believed to reverse the production of circulating thyroid autoantibodies by either inducing immune tolerance and/or by negative feedback inhibition of thyroid stimulating hormone and its effects on the thyroid stimulating hormone receptor. In a typical case, the standard therapeutic dose of L-thyroxine is given for 8 to 12 weeks and then the complete baseline thyroid profile is performed to determine whether levels of circulating thyroid autoantibodies are waning. Retesting prior to this time is unnecessary because the presence of circulating autoantibodies interferes with accurate measurement of T3 and/or T4. For cases in which clinical signs of pruritic skin disease are present along with high levels of circulating thyroid autoantibodies, addition of corticosteroids for 4 to 6 weeks may be helpful. Steroid dosages begin at 1 mg per Kg divided BID for the first week and are tapered gradually to conclude with low dose every other day therapy. Thyroid therapy is usually required for life with annual rechecks.

5. Other Factors Influencing Thyroid Metabolism

Because animals with autoimmune thyroid disease have generalized metabolic imbalance and may have associated immunological dysfunction, it is advisable to minimize their exposures to unnecessary drugs, chemicals and toxins, and to optimize their nutritional status with healthy balanced diets. Recent studies have implicated selenium deficiency and potentiated sulfonamides as contributors to thyroid dysfunction or imbalance. Challenging the immune system of these animals with multivalent modified-live vaccines also has been associated with adverse effects. General recommendations are to use killed vaccine products, when these are available; space vaccines at least 10 days to 2 weeks apart to

avoid excessive antigenic challenge; and perform serum antibody titration as an alternative to booster vaccination of adults in order to assess the adequacy of existing protection."

Diagnosis is based upon the clinical signs and laboratory tests, in particular the measurement of blood thyroxine (T4) concentrations will confirm the presence of hypothyroidism.

- Basal - Normal range is 17-46 nmol/l in dogs. Unfortunately, the basal concentration of T4 can be affected by other disease situations - called the " euthyroid sick syndrome" and so it is an unreliable measurement by itself. In addition several drugs can reduce the T4 concentrations:
    - Androgens, Diazepam, Glucocorticoids, Iodine, Mitotane, Penicillin, Phenobarbitone, Phenylbutazone, Phenytoin, Primidone, Propylthiouracil, Salicylates, Sulphonylureas, Thyroxine (T4)*, Triiodothyronine (T3)*
    - * Due to temporary suppression of TSH. Treatment with T3 or T4 should be discontinued for at least 2 months before estimating basal T4 concentrations.
    - A Thyroid Stimulating Hormone stimulation test should be performed to distinguish between drug suppression and true hypothyroidism.
- Thyroid Stimulating Hormone (TSH) stimulation test. Collect starved blood sample. Administer 0.1 IU TSH/ kg body weight IV. After 6 hours take second sample. Measure T4 in both samples. Hypothyroid dogs show little or no increase. Dogs with "euthyroid sick syndrome," or with drug interference show an increase in T4 in response to the TSH.

Other non-specific abnormal laboratory findings which may be present in hypothyroid patients include:

- Anaemia (normocytic, normochromic, non-regenerative)
- High blood cholesterol
- High blood triglyceride
- High blood creatine kinase
- Increased ALT, AST, ALT and LD
- Proteinuria - if auto-immune damage to kidney as well as thyroid

Diagnostic and Treatment Misunderstandings about Thyroid Disease:

In an excerpt from *Behavioral Issues with Thyroiditis***,** Dr. Dodds discusses some of the difficulties with diagnosing thyroid disease:

“Veterinarians commonly are confused about which tests are necessary to accurately diagnose thyroid dysfunction in the dog and cat, as well as another animal species. During case review, many veterinarians contact us about the reference normal ranges provided by their commercial clinical laboratory. Many colleagues assume that these reference ranges are finite and apply to all breeds and breed types [toy and small breeds have higher basal levels, while large or giant breeds and sighthounds have lower basal levels], as well as all ages and physiological circumstances. For example, veterinarians are generally unaware that the printed reference ranges on laboratory reports typically pertain to adults, and not to very young, adolescent, [higher basal levels] or geriatric animals [lower basal levels].

Furthermore, these reference ranges are intended as general guidelines and may not apply to individuals that are athletic, performance animals; under general anesthesia; undergoing sex hormonal change; a pregnant or nursing mother; obese; a patient that is ill or recovering from illness, or taking specific drugs that might influence thyroid function (e.g. corticosteroids, phenobarbital, potentiated sulfonamides, dietary soy and soy phytoestrogens, insulin, narcotic analgesics, salicylates, tricyclic antidepressants, furosemide, phenylbutazone, and o, p1-DDD). Daily diurnal rhythm fluctuations and the presence of circulating thyroid autoantibodies also changes basal thyroid levels. However, knowledge of these variables that affect thyroid function and circulating levels of thyroid hormones does not preclude their measurement. It is especially frustrating when a veterinarian tells the client that thyroid profiles cannot be measured accurately because the patient is receiving drugs such as corticosteroids or anticonvulsants. As long as the effects of these drugs are taken into account, there is no reason to avoid measuring thyroid function, especially when thyroid dysfunction may be an important underlying component of the patient's clinical problem.

While diagnosing thyroid dysfunction in companion animals can be particularly frustrating, especially when used for wellness screening of potential breeding stock, veterinarians may fail to appreciate that a simple total T4 test is usually nondiagnostic. In fact, the in-office testing of T4 has recently been shown to produce unreliable results in 52% of dogs and 62% of cats, and therefore should not be used even as a general diagnostic screening test. Complete thyroid profiling is the most accurate and correct way to diagnose thyroid dysfunction when coupled with clinical information about the animal. For genetic screening, thyroid testing requires not only thyroglobulin autoantibody (TgAA), but also circulating T3AA and T4AA, because not all dogs with autoimmune thyroiditis have positive TgAA, even though T3AA and/or T4AA are elevated [about 6% false negatives, presumably because the epitopes involved weren't recognized by the TgAA reagent.] Another significant problem is diagnostic over reliance on the canine endogenous TSH test. This test in the dog, unlike the equivalent one in humans, is only ~70% predictive, with a 20-40% discordancy rate (both false positives and false negatives occur).

In the cat, accurately diagnosing hyperthyroidism can be complicated when the animal has concurrent nonthyroidal illness or is very old. In geriatric cats with hyperthyroidism, the T4 can be suppressed to within the upper half of the normal adult reference range, not only because of the cat's age but also because they commonly have other illnesses. Furthermore, the free T4 assay measured by equilibrium dialysis can provide misleading information, because the assay may be elevated in about a third of cats with pre-existing liver, kidney, and gastrointestinal disease. While some of these cats may also be hyperthyroid, others are clearly euthyroid.

Regarding treatment of thyroid disease, the most common confusion surrounds the expected thyroid values for patients receiving appropriate doses of thyroid supplement thyroid supplement, and whether the therapy should be given once or twice daily. In the dog, Larry supplement is best given twice daily, even though the label directions which of which have been the same for many years indicate once daily dosing. The reason that twice daily dosing is preferred is to match the typical 12-16 hour physiological half-life of thyroxine in the dog. Monitoring of thyroid therapy should be performed at 4-6 hours post dose, and at that time the T4 and free T4 values should be in the upper third to 25% above the laboratory's normal reference range. Rechecking thyroid profiles on animals receiving thyroid supplement is best accomplished by performing the complete profile, and is essential for those animals with autoimmune thyroiditis to determine whether the autoantibodies present are waning. If the client has financial constraints and the case is not thyroiditis, a post-pill T4 and freeT4 will usually suffice. Finally, in the cat treatment with methimazole should be given twice daily or by topical application to the ear, as recently published data indicate that once a day treatment has an unreliable therapeutic effect. When monitoring cats on methimazole, it doesn't matter when the sample is drawn in relation to giving the medication, as the turn over time is long."

So what is the treatment for hypothyroidism?:

The main method of treatment for hypothyroid dogs is thyroid hormone replacement. Treatment with thyroid replacement therapy should only be started once any concurrent disease (eg diabetes or cardiac disease) has been stabilized. Also, the dose rate should be reduced to a quarter if heart disease is present.

Usually a synthetic thyroxine (T4) drug is given by mouth at a relatively high dose rate: 20mg/kg body weight twice daily.

Synthetic triiodothyronine (T3) can also be given in a dose of 5mg/kg body weight three times daily initially reducing to twice daily.

Dried thyroid tablets are NOT recommended for use in dogs because the active ingredient dose is very variable.

Dietary management involves a weight-reduction diet followed by maintenance on a relatively low-calorie ration. The aim is to get the animal's body weight back to normal and maintain it. Calorie intake needs to be increased if the patient loses too much weight while on treatment.

Stabilizing hypothyroid patients can be tricky, especially if other disorders are present at the same time.

Side effects are uncommon.

Because thyroid supplementation increases metabolic rate and activity in many tissues patients should be checked regularly (every 6 months) to ensure there are no signs of over-dosage.

The prognosis for most cases is good once they are stabilized on thyroid therapy and providing other concurrent major organ diseases are stable.

Are there any long-term negative effects if hypothyroidism is not treated?

Yes, there are several, and they can all be life threatening.

- **Atherosclerosis** is rare in dogs, but it has been reported to occur in dogs with untreated hypothyroidism, and this disease can create serious circulatory difficulties for the patient.
- **Myxoedema** (generalized body edema)
- **Coma** (very rare)
- **Sudden onset aggression:** In cases of unprovoked aggression you should immediately do a complete thyroid panel on your Akita. Akitas are prone to low thyroid function and sudden onset aggression can be a symptom.
- **Seizures**
- **Shortened life span** due to the stress of anxiety and phobias

Sources:

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