Doberman Pinschers Should Be Screened For Autoimmune Thyroiditis Before Breeding

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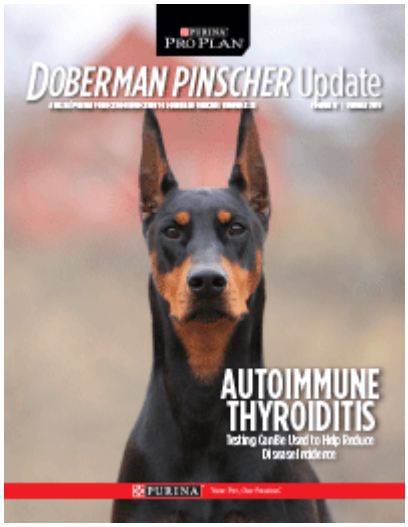

The telltale signs of hypothyroidism can be concerning in any dog, particularly in a young dog about to start a show campaign. Owner Kim Clark of Phoenix first noticed her 1-year-old Doberman Pinscher, “Raven,” unexplainably gaining weight before her second heat cycle. The beautiful black female had a huge appetite combined with a lack of energy and no interest in exercise. Sometimes Raven was grouchy with other dogs.

“Raven’s handler suggested that I have her tested for hypothyroidism because the signs were similar,” Clark says.

Clark took Raven to her primary veterinarian to have her blood tested for the endocrine disorder that results from an underactive thyroid gland, causing low thyroid hormone levels and affecting metabolic function throughout the body. Testing of Raven’s thyroid hormone levels for T4 (thyroxine) and T3 (triiodothyronine) were in the normal reference range. Thyroxine is the most significant thyroid hormone, and triiodothyronine is produced at lower levels.

Determined to help Raven return to a healthy, fit condition, Clark began taking the dog for underwater treadmill workouts at a veterinary orthopedic clinic. “The veterinarian saw how lethargic Raven was and how she refused to exercise and recommended that I have her retested using a full diagnostic panel to look at her thyroid level,” Clark says.

A private laboratory ran this blood test and reported below normal levels for Raven's TT4 (total T4) and fT4 (free T4) levels. The most alarming result was Raven's TgAA (thyroglobulin autoantibodies) level. Ideally, TgAA should be under 10, and Raven's level was 123. Raven was diagnosed with hypothyroidism secondary to autoimmune thyroiditis.

"I was crushed," Clark says. "I bought Raven to show her and have a litter once she finished."

Doberman Pinschers are among the breeds that are possibly predisposed for developing autoimmune thyroiditis, a type of hypothyroidism that occurs when the body's immune system attacks the thyroid gland. Autoimmune thyroiditis is not the same as hypothyroidism, though the majority of dogs — such as Raven — will eventually develop hypothyroidism.

Most hypothyroid dogs develop the condition before 6 years of age, with 46 percent diagnosed from 1 to 3 years of age and 29 percent from 4 to 6 years of age.[1] Predisposed breeds tend to develop the condition at a slightly younger age.

Although hypothyroidism is typically not life-threatening, the disorder must be managed by medications to supplement the low thyroid hormones.

According to the Orthopedic Foundation for Animals, the Doberman Pinscher ranks 45th among 112 breeds of which at least 100 hypothyroidism evaluations have been submitted. Almost 3,000 evaluations have been submitted for Dobermans. The majority, 78.8 percent, were normal and did not have hypothyroidism. Hypothyroid cases consisted of 16.6 percent that were equivocal, or questionable, 3.5 percent that were autoimmune thyroiditis, and 1.1 percent that were idiopathic hypothyroidism, or due to an unknown cause.

The Most Common Thyroid Disorder

Hypothyroidism is the most common thyroid disorder in dogs. Located near the trachea, the thyroid gland consists of a pair of glands that produce thyroid hormones. The most significant is thyroxine, which is why TTF (total thyroxine) testing is often used to screen dogs for hypothyroidism. The results can be skewed when a dog is sick or taking certain medications, accounting for why some dogs are mistakenly labeled as hypothyroid.

"There is no question that hypothyroidism is the most overdiagnosed endocrine disorder in dogs," says David Bruyette, DVM, DACVIM, founder and co-director of Veterinary Diagnostic Investigation and Consultation in Woodland Hills, California. "If a diagnosis is based only on TT4 levels, it will be wrong about 25 to 30 percent of the time."

Sometimes the first indication a dog may be hypothyroid comes from standard blood tests that reveal elevated blood cholesterol. About 75 percent of hypothyroid dogs have elevated blood cholesterol. This is due to an accumulation of lipids, or fat, in the blood because the thyroid hormones needed to break down lipids are not available or are not functioning correctly.

An accurate diagnosis for hypothyroidism often involves running a full diagnostic panel to measure the following thyroid hormone values.

Total T4 (TT4): The total thyroxine level is a measurement of thyroxine circulating free in the blood and thyroxine bound to proteins in the blood. Besides being used to screen a dog for hypothyroidism, this test is used to monitor the effectiveness of thyroid medication. Dogs with a TT4 value that is within the standard range and show no signs of illness generally are not hypothyroid.

Further testing may be warranted for some dogs having low TT4 values. For example, a dog that is severely ill from another condition may have "sick euthyroid illness." Dogs taking medications, such as glucocorticoids, phenobarbital, sulfa drugs, and sometimes nonsteroidal anti-inflammatory drugs (NSAIDS), may have lower TT4 values. Certain breeds, such as sighthounds, may have lower TT4 values based on laboratory reference ranges yet have normal thyroid function. None of these cases require medications because though the total T4 may be low, the free T4 is usually normal.

Free T4 (fT4): Free T4 is a measurement of non-protein-bound thyroxine circulating in the blood. Although separately fT4 is more expensive than the TT4 test, it is considered a better indicator of whether a dog is hypothyroid because fT4 is less affected by other illnesses and medications. Reference laboratories process fT4 values using techniques such as standard equilibrium dialysis (SED), considered the gold standard, radioimmunoassay (RIA), modified equilibrium dialysis (MED), or the fT4 two-step assay.

Thyroid-Stimulating Hormone (TSH): The level of TSH, also known as thyrotropin, is an indicator of thyroid function. When T4 concentrations are low, the pituitary gland produces TSH to signal the thyroid gland to produce more T4. TSH must be measured at the same time as total or free T4 to properly interpret the result. Normal TSH, fT4 and TT4 values are widely considered to rule out the possibility of hypothyroidism.

Thyroglobulin Autoantibodies (TgAA): Thyroglobulin autoantibodies indicate the possibility of autoimmune thyroiditis, also known as lymphocytic thyroiditis. Affected dogs are born with normal thyroid function, but for unknown reasons in early adulthood thyroid antibodies begin to attack thyroglobulin, a large protein made by cells in the thyroid, eventually destroying the thyroid gland.

Although it may take many years for this to happen and for the thyroid gland to become unable to produce thyroid hormones, the

presence of TgAA in a dog's blood alerts the veterinarian that the dog could be developing autoimmune thyroiditis. Because false positives are possible, a second test usually is performed. The TgAA test is independent of thyroid hormone status, thus a dog that tests positive for TgAA does not require thyroid hormone supplementation.

"Abnormal TgAA results appear before abnormal T4 results or signs of hypothyroidism," Dr. Bruyette says. "More than 60 to 70 percent of the thyroid tissue must be destroyed before abnormal T4 results are detected, which can take months to years. In some dogs, the disease never progresses."

Considering autoimmune thyroiditis may be inherited in Doberman Pinschers and there is no DNA test to identify carriers or affected dogs, breeders should have a complete thyroid panel run on dogs planned for breeding even if they show no signs of hypothyroidism, advises Dr. Bruyette. "This is especially true for dogs with a family history of autoimmune thyroiditis," he says.

A negative test for autoimmune thyroiditis or hypothyroidism does not guarantee a dog will always have negative results. "The downside to screening before breeding is that dogs can be negative for the first three years and then be positive the fourth year, after they've been bred," Dr. Bruyette says.

The Michigan State University Veterinary Diagnostic Laboratory (MSU VDL), one of the leading diagnostic testing laboratories in the country, received nearly 1,000 samples from Doberman Pinschers
out of 45,000 total submissions for thyroid testing in 2018. They recommend testing Doberman Pinschers and other predisposed breeds at least every other year or prior to breeding. Most affected dogs will be detected by 6 years of age.

"There is no way to thwart or stop the progression of autoimmune thyroiditis to clinical hypothyroidism," says MaryDee Sist, DVM, endocrinology specialist at MSU VDL. "But it is very useful information for a breeder to know whether a dog is positive for autoimmune thyroiditis to help reduce the incidence of hypothyroidism.

"Autoimmune thyroiditis is thought to be inherited as a recessive trait. Breeding a TgAA positive dog may produce affected dogs that will become hypothyroid later or are carriers. Although they are not clinically hypothyroid, carrier dogs can produce hypothyroid dogs when bred with other carrier or affected dogs."

Treating Thyroid Dysfunction

The good news for owners of Doberman Pinschers diagnosed with autoimmune thyroiditis or hypothyroidism is that medications can supplement a dog's low or dysfunctional thyroid hormones. Oral treatment with levothyroxine given once or twice a day is typically prescribed for affected dogs.

"This drug is available in pill and liquid form," Dr. Bruyette says. "Usually we recommend not giving the drug with food because we are not sure how food affects the drug's absorption in the body. After two weeks of medication, an fT4 test is recommended to determine if hormone levels are within the normal range. If not, the dosage may need adjusted."

Since Raven began taking thyroid medication, she has lost weight and is acting more like a "normal dog," Clark says. "She still has some lazy days when she likes to sleep in the warm sun, but overall she is doing great."

Clark urges Doberman Pinscher breeders to take advantage of hypothyroidism testing before breeding. "This allows a breeder to know he or she is doing all that is possible to try to prevent producing a dog with autoimmune thyroiditis, which may need to be on medication for the rest of its life." n

1 Greco DS, Davidson AP (eds). Blackwell's Five-Minute Veterinary Consult Clinical Companion: Small Animal Endocrinology and Reproduction. Hoboken, N.J.: Wiley-Blackwell. 2017.

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Signs of Hypothyroidism in Dogs

Weight gain, sometimes without an increase in appetite

Lethargy and lack of desire to exercise

Cold intolerance

Thin coat, with dull hair, excessive flaking and failure to regrow hair

Darkened, sometimes thick skin

"Tragic" expression, with droopy eyes

Skin and ear infections

Decreased fertility

Dry eye

Slow heart rate

Nonpainful lameness or gait abnormalities

How a Veterinarian Evaluates a Dog for Hypothyroidism

Considers whether his or her observations and those of the owner support the clinical signs of hypothyroidism

Studies whether a dog's bloodwork, including cholesterol readings, indicates possible hypothyroidism

If hypothyroidism is suspected, a veterinarian may want to send a blood sample to a diagnostic laboratory for testing the TT4 (total thyroxine) level. If the TT4 value is within the normal range, it is unlikely a dog is hypothyroid. If it is below the range or near the low end, a complete thyroid panel, including TT4, fT4 (free T4), TSH (thyroid-stimulating hormone), and TgAA (thyroglobulin autoantibodies), should be performed.

Source: David Bruyette, DVM, DACVIM, founder and co-director of Veterinary Diagnostic Investigation and Consultation in Woodland Hills, California

AKC Canine Health Foundation Supports Hypothyroidism Research

The AKC (American Kennel Club) Canine Health Foundation has supported the following studies aimed at learning more about hypothyroidism in dogs.

An investigation at Michigan State University studied 114 purebred dogs of 30 breeds with subclinical thyroiditis identified from the Orthopedic Foundation for Animals (OFA) Thyroid Registry Database to define the outcome of their thyroid status over multiple years. The $35,630 study was funded by OFA and administered by the AKC Canine Health Foundation.

"We found at the time of retesting that 33 percent of the TgAA (thyroglobulin autoantibodies) positive dogs became hypothyroid, 51 percent maintained positive or equivocal TgAA results, and 16 percent returned to normal TgAA," says Brian Petroff, DVM, PhD, associate professor of pathobiology and diagnostic investigations and principal investigator of the study. "These results suggest that the majority of dogs with elevated TgAA either exhibit persistent autoimmune thyroiditis with continued risk of hypothyroidism or progress to hypothyroidism."

A study at the University of Utrecht in the Netherlands evaluated three diagnostic tests to identify an accurate, affordable way to differentiate hypothyroid dogs from those with sick euthyroid illness. The $48,195 investigation was funded by the AKC Canine Health Foundation. Principal investigator Jan Mol, PhD, associate professor, says, "We found that measuring plasma growth hormone (GH) concentrations after a TRH (thyrotropin-releasing hormone) stimulation test greatly improves diagnosis. Ideally, a TRH-stimulation test would give the best answer at the lowest expense though unfortunately not many veterinary diagnostic labs around the world can do ghrelin concentration measurements in dogs."

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