

## (levothyroxine sodium tablets), USP

For replacement therapy for diminished thyroid function in dogs (canine hypothyroidism).

ITEM#	DESCRIPTION	STRENGTH	UNIT
510155	Thyro-Tabs <sup>®</sup> Canine	0.1 mg	1,000 Tablets
510156	Thyro-Tabs <sup>®</sup> Canine	0.1 mg	120 Tablets
510157	Thyro-Tabs <sup>®</sup> Canine	0.2 mg	1,000 Tablets
510158	Thyro-Tabs <sup>®</sup> Canine	0.2 mg	120 Tablets
510159	Thyro-Tabs <sup>®</sup> Canine	0.3 mg	1,000 Tablets
510160	Thyro-Tabs <sup>®</sup> Canine	0.3 mg	120 Tablets
510161	Thyro-Tabs <sup>®</sup> Canine	0.4 mg	1,000 Tablets
510162	Thyro-Tabs <sup>®</sup> Canine	0.4 mg	120 Tablets
510163	Thyro-Tabs <sup>®</sup> Canine	0.5 mg	1,000 Tablets
510164	Thyro-Tabs <sup>®</sup> Canine	0.5 mg	120 Tablets
510165	Thyro-Tabs <sup>®</sup> Canine	0.6 mg	1,000 Tablets
510166	Thyro-Tabs <sup>®</sup> Canine	0.6 mg	120 Tablets
510167	Thyro-Tabs <sup>®</sup> Canine	0.7 mg	1,000 Tablets
510168	Thyro-Tabs <sup>®</sup> Canine	0.7 mg	120 Tablets
510169	Thyro-Tabs <sup>®</sup> Canine	0.8 mg	1,000 Tablets
510170	Thyro-Tabs <sup>®</sup> Canine	0.8 mg	120 Tablets
510171	Thyro-Tabs <sup>®</sup> Canine	1.0 mg	1,000 Tablets
510191	Thyro-Tabs <sup>®</sup> Canine	1.0 mg	120 Tablets

### FEATURES AND BENEFITS

- Available in both 1,000-count bottles and 120-count (dispense-ready) bottles.

### Canine levothyroxine sodium tablet that achieves the new USP/FDA tablet potency standards

- Provides a 36 month real-time tablet dose stability
- 95% - 105% dose potency





## (levothyroxine sodium tablets), USP

Tablets

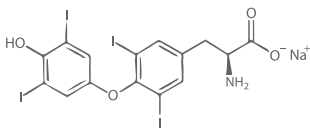
Synthetic T4 Tablets for dogs

For oral use in dogs

Approved by FDA under NADA # 141-448

**CAUTION:** Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

**DESCRIPTION:** Thyro-Tabs<sup>®</sup> Canine (levothyroxine sodium tablets), USP contains synthetic crystalline L-3,3',5,5'-tetraiodothyronine sodium salt [levothyroxine (T4) sodium]. Synthetic T4 is identical to that produced in the canine thyroid gland. Levothyroxine sodium has an empirical formula of C<sub>15</sub>H<sub>10</sub>I<sub>4</sub>N NaO<sub>4</sub> • H<sub>2</sub>O, molecular weight of 798.85 g/mol (anhydrous), and structural formula as shown:



**INDICATION:** For replacement therapy for diminished thyroid function in dogs.

**DOSAGE AND ADMINISTRATION:** The initial daily dose is 0.1 mg/10 pounds (0.01 mg/lb; 0.022 mg/kg) body weight as a single dose every 24 hours or as a divided dose every 12 hours. The dose may then be adjusted by monitoring the serum total thyroxine (TT4) concentrations 4 to 6 hours post-tablet administration, along with clinical response, of the dog every 4 to 8 weeks until an adequate maintenance dose is established. Due to potential differences in bioavailability, monitor serum TT4 concentrations and clinical response when switching from another levothyroxine sodium formulation to Thyro-Tabs Canine.

To minimize day-to-day variations in serum TT4 concentrations (see **CLINICAL PHARMACOLOGY**), owners should consistently administer Thyro-Tabs Canine either with or without food.

**CONTRAINDICATIONS:** Do not use in dogs with thyrotoxicosis or uncorrected adrenal insufficiency.

**WARNINGS:** In humans and rodents, excess *in utero* exposure to thyroid hormones is associated with hypothalamic-pituitary-thyroid axis dysfunction and morphological thyroid gland defects in the offspring. The safety of Thyro-Tabs Canine has not been evaluated in breeding, pregnant, or lactating dogs.

**HUMAN WARNINGS:** Not for use in humans. Keep out of reach of children. In the event of accidental ingestion, seek medical advice immediately and show the product label to the physician. Wash hands after handling.

**PRECAUTIONS:** Dogs with underlying cardiac disease that are diagnosed with hypothyroidism should be closely monitored during the dose establishment phase. Adjustment of cardiac medication or levothyroxine sodium dosage may be needed depending on clinical response.<sup>1-4</sup>

**ADVERSE REACTIONS:** In a 6-month US field study with 92 dogs, the most commonly reported adverse reactions by percentage of dogs experiencing the reaction included: anorexia (17%), dermatitis (15%), vomiting (15%), otitis externa (14%), lethargy (14%), polydipsia (13%), diarrhea (11%), leukocytosis (9%), pruritus (8%), tachypnea (8%), polyuria (5%), hyperactivity (4%), and seborrhea (1%).

One dog was withdrawn from the study at the owner's request because of increased water consumption and urination, which was possibly related to levothyroxine sodium.

Hematocrit and red blood cell counts exceeded the upper limit of the reference range in seven dogs by the end of the study. Liver enzyme (ALP, ALT, or AST) elevations related to levothyroxine administration were reported in three dogs. In two of the dogs with elevated ALT and AST, the elevations resolved by Day 70 and Day 126, respectively.

The following events were reported voluntarily to LLOYD, Inc. (as of 2015): Allergic-type hypersensitivity reactions (pruritus, hives, rash, facial swelling), alopecia, anorexia, vomiting, diarrhea, polyuria, polydipsia, hyperactivity, tachypnea, lethargy, collapse, and high or low serum total thyroxine concentrations.

For a copy of the Safety Data Sheet (SDS) or to report suspected adverse drug events, contact LLOYD, Inc. at 1-800-831-0004. For additional

information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or <http://www.fda.gov/AnimalVeterinary/SafetyHealth>.

**CLINICAL PHARMACOLOGY:** Levothyroxine sodium has poor oral bioavailability in dogs (10-20%) with peak serum TT4 concentrations within 4 to 6 hours (fasted state). Administration of levothyroxine sodium with food reduces oral bioavailability.<sup>5</sup> In most dogs, the estimated half-life is approximately 10-14 hours. Levothyroxine sodium is excreted in the feces.

**EFFECTIVENESS:** In a US field study with 92 dogs, dogs were administered a starting daily dose of 0.1 mg/10 lb (0.022 mg/kg) body weight. The dose was administered either once every 24 hours or as 0.05 mg/10 lb (0.011 mg/kg) body weight every 12 hours. The dose could be increased or decreased (without a change in frequency) after 6, 10, and 18 weeks, based on clinical findings and serum thyroid hormone concentrations. The majority of the dogs (80%) were dosed at 0.08-0.12 mg/10 lb (0.008-0.012 mg/lb; 0.018-0.026 mg/kg) by the end of the study, with the majority of dogs (69.7%) requiring one dose change.

The product was considered effective if the serum TT4, free thyroxine (fT4), and thyroid stimulating hormone (TSH) concentrations were all within the desired treatment ranges when collected 4 to 6 hours post-tablet administration after 182 ± 5 days of treatment (TT4: 15-94 nmol/L; fT4: 8-36 pmol/L; TSH: ≤ 37 mU/L). Of the 78 evaluable cases, 59 (75.6%) were considered treatment successes. There was no statistical difference in the success rate between the once daily or divided dose treatment groups. Clinical signs of hypothyroidism (weight gain, lethargy, bradycardia, seborrhea, alopecia, hyperpigmentation, scaling, and hypercholesterolemia) generally improved by the end of the study (Day 182 ± 5). Respiratory rate, excluding panting dogs, increased during the study along with activity level.

**ANIMAL SAFETY:** In a laboratory study, levothyroxine sodium was administered to 32 healthy, 7-10 month old, euthyroid Beagle dogs (4 males and 4 females per group) at 0X, 2X, 6X, and 10X the initial dose of 0.10 mg/10 lb (0.01 mg/lb) once daily for 26 weeks. Increased serum TT4 and fT4 concentrations were directly proportional to an increasing dose of

levothyroxine sodium. Decreased serum TSH concentrations were inversely proportional to an increasing dose of levothyroxine sodium. Dogs treated with levothyroxine sodium had elevated red blood cell indices (hemoglobin, hematocrit, and red blood cell count) and ALT but these did not exceed the normal reference ranges. Dogs treated with levothyroxine sodium had lower albumin, calcium, globulins, and total protein values but these did not fall below the normal reference ranges. Vomiting, diarrhea, excitation, rapid respiration, tachycardia, and feces with blood were observed in all treatment groups, but were seen with greater frequency in dogs treated with levothyroxine sodium. Decreased pituitary gland and thyroid/parathyroid gland organ weights were also observed in euthyroid dogs treated with levothyroxine sodium.

**STORAGE CONDITIONS:** Store at controlled room temperature 20°-25°C (68°-77°F) with excursions allowed between 15° and 30°C (59° and 86°F). Protect from light and moisture.

**HOW SUPPLIED:** Thyro-Tabs Canine (levothyroxine sodium tablets), USP is available as scored, color-coded ovoid tablets in 9 strengths: 0.1 mg - yellow; 0.2 mg - pink; 0.3 mg - green; 0.4 mg - maroon; 0.5 mg - white; 0.6 mg - purple; 0.7 mg - orange; 0.8 mg - blue; and 1.0 mg - tan, in bottles of 120 and 1,000 tablets.

Approved by FDA under NADA # 141-448

Manufactured by:  
LLOYD, Inc.  
Shenandoah, IA 51601

Distributed by: MWI  
Boise, ID 83705  
[www.VetOne.net](http://www.VetOne.net)

#### REFERENCES:

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2. Flood JA, Hoover JP. Improvement in myocardial dysfunction in a hypothyroid dog. *Can Vet J* 2009;50:828-834.
3. Chow B, French A. Conversion of atrial fibrillation after levothyroxine in a dog with hypothyroidism and arterial thromboembolism. *J Small Anim Pract* 2014;55:278-282.
4. Sangster JK, Panciera DL, Abbott JA. Cardiovascular effects of thyroid disease. *Compend Contin Educ Vet* 2013;35:E5.
5. Le Traon G, Burgaud S, Horspool LJ. Pharmacokinetics of total thyroxine in dogs after administration of an oral solution of levothyroxine sodium. *J Vet Pharmacol Ther* 2008;31:95-101