



Specialty Medicine Compounding Pharmacy

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Thyroid Replacement Therapy

Many patients with hypothyroidism have been disturbed by the lack of availability of many thyroid products, including Armour Thyroid®, WesThroid®, Nature-Throid®, and Thyrolar®. Some patients have been able to obtain a new formulation of Armour Thyroid®, but many have complained that it doesn't seem to work as well as it used to.

Our bodies naturally produce two thyroid hormones: tri-iodothyronine, also known as liothyronine, (T3) and thyroxine (T4). In order for the thyroid to produce T3 and T4, two other hormones in the body must be working properly: thyrotropin releasing hormone (TRH) in the hypothalamus and thyroid stimulating hormone (TSH) in the pituitary. Both T3 and T4 are released, but in the body much of the T4 is converted into T3. T3 is considerably more potent than T4. Thyroid hormones are used by every cell in the body to aid in its energy production. Many people suffer from hypothyroidism, or low production of thyroid hormone. Hypothyroidism can be caused by genetic defects in the production of thyrotropin releasing hormone (TRH), thyroid stimulating hormone (TSH) or thyroid hormone (T3 and T4); from post-partum thyroiditis; from iodine deficiency; from over-treatment of hyperthyroidism (a condition of too much thyroid); from use of medications such as amiodarone; or from many other causes. The result is that there is a decrease in the production and secretion of thyroid hormone. Whatever the cause of the hypothyroidism, patients may experience cold intolerance, changes in their hair and nails, depressive symptoms, uncontrollable weight gain, uncontrollable cholesterol, sluggish behavior and overall loss of energy. To treat this condition, patients are routinely prescribed thyroid replacement therapy. Thyroid replacement comes in two forms: desiccated whole thyroid (beef or pork) and synthetic thyroid.

Prescription desiccated thyroid is dried, processed pork thyroid that contains a mix of the two thyroid hormones: liothyronine (T3) and levothyroxine (T4) as well as many other minor thyroid hormones that are naturally produced in the thyroid gland. Synthetic thyroid products that contain only T4 include the products called Synthroid®, Levoxyl® and Levotheroid® and their generic, levothyroxine. Synthetic thyroid products that contain only T3 include Cytomel® and its generic, liothyronine. Synthetic products that contain a fixed dose of both T3 and T4 include Thyrolar® and its generic, liotrix. There are several kinds of desiccated thyroid, including the brands Armour Thyroid®, WesThroid®, and Nature-Throid®.

In addition, there are over-the-counter desiccated cow thyroid products. Unlike desiccated pork thyroid which is available only by prescription, these cow thyroid hormone products are not produced according to the United States Pharmacopeia (USP)'s Good Manufacturing Practices for Drug Products and Excipients, so the amount of thyroid in each capsule may not be consistent. In addition, these products may contain organ tissue other than thyroid, and may confer a small risk of bovine spongiform encephalopathy (BSE), also known as "mad cow disease." These desiccated cow thyroid products therefore are not recommended.

Thyroid replacement products that have recently become unavailable include Armour Thyroid®, WesThroid®, Nature-Throid® and Thyrolar®. Armour Thyroid® has been reformulated, but the product may still be difficult to find. WesThroid®, Nature-Throid® and Thyrolar® are all still on back-order as their makers attempt to reformulate the products. We at Specialty Medicine Compounding Pharmacy can create any formulation of desiccated thyroid, and we can formulate the same T3:T4 dose ratios of Armour



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Thyroid®, WesThroid®, Nature-Throid®. We can do this because stock pork desiccated T3 and T4 powder is still available. We compound it according to your doctor's prescription and put it into capsules. For those looking for a compounded alternative to Thyrolar®, we cannot make capsules with synthetic thyroid hormone, but we can compound the ratio of T3 and T4 found in the product using stock desiccated thyroid. In addition, if any of the name brand thyroid products does not seem to have the right ratio of T3 and T4 for you, we can custom-formulate a ratio of desiccated T3 and T4 according to your doctor's instructions.

Some patients have asked about the difference between the dosages of Armour Thyroid® compared to WesThroid® and Nature-Throid®. This confusion arises from the differences in definition of the term "grain" by the manufacturers of these products. Traditionally, one grain is equal to 65 mg, so a 2 grain product, for example, would contain 130 mg of active ingredient. However, the Armour Thyroid® manufacturer defines their "grain" as 60 mg, instead of the traditional 65 mg. So a 2 grain capsule of Armour Thyroid® actually contains 120 mg of thyroid, rather than 130 mg as it would in a traditional grain product. WesThroid® and Nature-Throid® products are marketed in terms of milligrams, and these are usually multiples of the traditional 65 mg grain. Depending on whether your physician wishes to keep you on the same dosage of thyroid as you were before, we make our thyroid capsules in multiples of either 60 mg (for those patients previously taking Armour Thyroid®) or 65 mg (for those patients previously taking WesThroid® or Nature-Throid®).

Whatever form of thyroid is taken, several things need to be kept in mind about how to take it. Thyroid should be taken first thing in the morning with water only and without food or other medications. You should wait 30 minutes after taking the medication before eating, taking vitamins or medications, or drinking anything other than water. Remember to get your TSH level, and any other thyroid levels your doctor deems necessary, checked at least twice a year. Several medications may interact with thyroid, so make sure your doctor(s) and pharmacist(s) know you are taking thyroid whenever you get a new prescription.

Table 1: List of Commercially Available Thyroid Products

Commercially Available Thyroid Products			
Synthetic T4	Synthetic T3	Synthetic T4 and T3	Desiccated T4 and T3
Synthroid®	Cytomel®	Thyrolar®	Armour Thyroid®
Levoxyl®			WesThroid®
Unithroid®			Nature-Throid®
Levothyroid®			

Table 2: Comparisons of the T4:T3 Ratio of Mixed Thyroid Hormone Products.

Product	Ratio T4: T3
Armour Thyroid®	4.22: 1
WesThroid®	4.22:1
Nature-Throid®	4.22:1
Thyrolar®	4:1