

## New Zealand Data Sheet

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### 1 PRODUCT NAME

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LEVOTHYROXINE 50 microgram and 100 microgram tablets

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### 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

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Levothyroxine sodium (anhydrous) 50 microgram and 100 microgram.

Each tablet contains 50 micrograms (0.05 mg) or 100 micrograms (0.1 mg) anhydrous levothyroxine sodium, which is the monosodium salt of the levorotary isomer of thyroxine.

For the full list of excipients, see section 6.1.

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### 3 PHARMACEUTICAL FORM

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Levothyroxine 50 microgram (0.05 mg) tablets are white, uncoated, biconvex tablets, engraved on one face with "LT" and "50" on the other.

Levothyroxine 100 microgram (0.1 mg) tablets are white, uncoated, biconvex tablets, engraved on one face with "LT" and "100" on the other.

The tablets must be swallowed whole. Do not halve the tablets. Dose equivalence when the tablet is divided has not been established.

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### 4 CLINICAL PARTICULARS

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#### 4.1 Therapeutic indications

Levothyroxine is indicated for the treatment of hypothyroidism.

This product should only be prescribed for use in new patients, or those who cannot tolerate other levothyroxine products.

#### 4.2 Dose and method of administration

A pre-therapy ECG is valuable, as changes induced by hypothyroidism may be confused with ECG evidence of ischaemia. If the increase in metabolism is too rapid (causing diarrhoea, nervousness, rapid pulse, insomnia, tremors and sometimes anginal pain

where there is latent myocardial ischaemia), dosage must be reduced or withheld for a day or two, then restarted at a lower level.

In younger patients, and in the absence of heart disease, a serum levothyroxine (T4) level of about 70 to 160 nanomols per litre, or a serum thyrotrophin level of less than 5 milliunits per litre, should be aimed at. In those aged over 50, and/or in the presence of heart disease, clinical response is probably a more acceptable criterion of dosage than serum levels.

## **Dose**

### **Adults**

Initially 50 to 100 micrograms daily and adjust at 4 to 6 week intervals by 50 micrograms until normal metabolism is steadily maintained. This may require doses of 100 to 200 micrograms daily.

With patients aged over 50 years, it is not advisable to exceed 50 micrograms a day initially. Where there is cardiac disease 25 micrograms, given as 50 micrograms on alternate days, is more suitable. In this condition the daily dosage may be slowly increased by 25 micrograms increments (given as 50 micrograms on alternate days) at intervals of perhaps four weeks. This dosing regimen is illustrated in **Table 1** below.

**Table 1 – Recommended dosage regimen for levothyroxine tablets**

<b>DAILY DOSE</b>	<b>DOSING REGIMEN</b>
<b>25 micrograms</b>	One 50 microgram tablet on alternate days
<b>50 micrograms</b>	One 50 microgram tablet daily
<b>75 micrograms</b>	One 50 microgram tablet daily and one 50 microgram tablet on alternate days
<b>100 micrograms</b>	One 100 microgram tablet daily
<b>125 micrograms</b>	One 100 microgram tablet daily and one 50 microgram tablet on alternate days

### **Children**

In congenital hypothyroidism and juvenile myxoedema, the largest dose consistent with freedom from toxic effects should be given. The dosage is guided by clinical response, growth assessment and appropriate thyroid function tests - clinically normal pulse rate and absence of diarrhoea or constipation are the most useful indicators. Thyrotrophin levels may remain elevated during the first year of life in children with neonatal hypothyroidism due to resetting of the hypothalamic-pituitary axis.

For infants with congenital hypothyroidism a suitable starting dose is 25 micrograms levothyroxine sodium, given as 50 micrograms every other day, is advisable. This may be slowly increased by increments of 25 micrograms (given as 50 micrograms on alternate days) every two to four weeks until optimal response is achieved. This dosing regimen is illustrated in **Table 1** above. The same dosing regimen applies to juvenile myxoedema, except that the starting dose for children older than one year may be 2.5 to 5 micrograms/kg/day. The calculated daily dose equivalent should be rounded to the nearest 25 micrograms to determine the actual prescribed dose.

### **Method of administration**

It is recommended that levothyroxine tablets are only prescribed to patients who are able to swallow whole tablets.

Levothyroxine tablets should be taken on an empty stomach, preferably before breakfast.

### **4.3 Contraindications**

Hypersensitivity to the active substance(s) or to any of the excipients listed in section 6.1.

Thyrotoxicosis.

### **4.4 Special warnings and precautions for use**

#### **Adrenal insufficiency**

Patients with panhypopituitarism or other causes predisposing to adrenal insufficiency may react unfavourably to levothyroxine treatment, and it is advisable to initiate corticosteroid therapy before giving levothyroxine sodium in these cases.

#### **Cardiac problems**

Special care is needed in patients with symptoms of myocardial insufficiency or ECG evidence of myocardial infarction or ischaemia.

#### **Diabetes**

Special care is needed in patients with diabetes mellitus or insipidus. Levothyroxine raises blood sugar levels and this may upset the stability of patients receiving antidiabetic agents.

Patients should be monitored carefully to ensure the correct dose is prescribed.

#### **Potential for bone loss**

Subclinical hyperthyroidism may be associated with bone loss. In women, long-term levothyroxine sodium therapy has been associated with increased bone resorption, thereby decreasing bone mineral density, especially in post-menopausal women on greater than replacement doses or in women who are receiving suppressive doses of levothyroxine sodium. The increased bone resorption may be associated with increased serum levels and urinary excretion of calcium and phosphorus, elevations in bone alkaline phosphate and suppressed serum parathyroid hormone levels. To minimise the risk of osteoporosis, dosage of levothyroxine should be titrated to the lowest possible effective level.

#### **Elderly**

Special care is needed in the elderly.

#### **Paediatric population**

Parents of children receiving levothyroxine should be advised that partial loss of hair may occur during the first few months of therapy, but this effect is usually transient and subsequent regrowth usually occurs.

#### **4.5 Interaction with other medicines and other forms of interaction**

##### **Anticoagulants**

Levothyroxine increases the effect of anticoagulants and it may be necessary to reduce the dose of anticoagulant if excessive hypoprothrombinaemia and bleeding are to be avoided.

##### **Phenytoin**

Phenytoin levels may be increased by levothyroxine.

##### **Anticonvulsants**

Anticonvulsants such as carbamazepine and phenytoin enhance the metabolism of thyroid hormones and may displace them from plasma proteins. Initiation or discontinuation of anticonvulsant therapy may alter levothyroxine sodium dose requirements.

##### **Cardiac glycosides**

If co-administered with cardiac glycosides, adjustment of dosage of cardiac glycoside may be necessary.

##### **Sympathomimetic agents**

The effects of sympathomimetic agents are also enhanced.

##### **Tricyclic antidepressants**

Levothyroxine increases receptor sensitivity to catecholamines thus accelerating the response to tricyclic antidepressants.

##### **Cholestyramine**

Cholestyramine given concurrently reduces the gastrointestinal absorption of levothyroxine.

##### **Statins**

Reports indicate that some HMG-CoA reductase inhibitors (statins), such as simvastatin and lovastatin, may increase thyroid hormone requirements in patients receiving thyroxine therapy. It is unknown if this occurs with all statins. Close monitoring of thyroid function and appropriate thyroxine dose adjustments may be necessary when thyroxine and statins are co-prescribed.

##### **Decrease of thyroxine dosage requirements**

A number of drugs may decrease serum concentration of thyroxine-binding globulin, and therefore decrease thyroxine dosage requirements, including androgens and anabolic steroids.

##### **Increase of thyroxine dosage requirements**

- A number of other drugs may decrease absorption of thyroxine sodium, and therefore increase thyroxine dosage requirements. These include antacids (e.g. aluminium hydroxide), bile acid sequestrants (e.g. colestipol), cation exchange resins (e.g. kayexalate), sucralfate, calcium carbonate and ferrous sulphate
- Co-administration of oral contraceptives, as well as a number of other drugs including oestrogen, tamoxifen, clofibrate, methadone and 5-fluorouracil may

increase serum concentration of thyroxine-binding globulin, and therefore increase thyroxine dosage requirements

- Treatment with imatinib was associated with increased thyroxine dosage requirements in hypothyroid patients
- Treatment with amiodarone has been associated with multiple effects on thyroid function including increased thyroxine dosage requirements in hypothyroid patients.

### **Thyroid function tests**

A number of drugs may affect thyroid function tests and this should be borne in mind when monitoring a patient on levothyroxine sodium therapy.

## **4.6 Pregnancy and lactation**

### **Pregnancy**

Levothyroxine has been taken by a large number of pregnant women and women of childbearing age without any form of definite disturbances in the reproductive process having been observed so far. Thyroid hypo- or hyperactivity in the mother may, however, unfavourably influence the foetal outcome or well-being.

### **Breastfeeding**

Levothyroxine is excreted in breast milk in low concentrations and this may be sufficient to interfere with neonatal screening for hypothyroidism.

### **Fertility**

No information held by the sponsor.

## **4.7 Effects on ability to drive and use machines**

Levothyroxine is not expected to interfere with the ability to drive or operate machinery based on the pharmacokinetic and pharmacodynamic properties.

## **4.8 Undesirable effects**

The following effects are indicative of excessive dosage and usually disappear on reduction of dosage or withdrawal of treatment for a few days.

### **Immune system disorders**

Hypersensitivity reactions such as skin rash and pruritus have been reported.

### **Metabolism and nutrition disorders**

Increased appetite, abdominal cramps, nausea, vomiting, diarrhoea.

### **Nervous system disorders**

Excitability, insomnia, restlessness, headache, tremors, seizure, and psychotic depression. Rare cases of pseudotumour cerebri (benign intracranial hypertension) have been reported, especially in children.

### **Cardiac disorders**

Anginal pain, cardiac arrhythmias, palpitation, tachycardia, increased blood pressure, heart failure, myocardial infarction.

### **Musculoskeletal, connective tissue and bone disorders**

Cramps in skeletal muscle, muscular weakness, decreased bone mineral density. Excessive dose may result in craniosynostosis in infants, and premature closure of epiphyses in children with compromised adult height.

### **Skin and subcutaneous tissue disorders**

Sweating, flushing, hair loss.

### **Reproductive system and breast disorders**

Menstrual irregularity, impaired fertility.

### **General disorders**

Fatigue, heat intolerance, fever, excessive loss of weight.

### Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation of the medicine is important. It allows continued monitoring of the benefit/risk balance of the medicine. Healthcare professionals are asked to report any suspected adverse reactions  
<https://nzphvc.otago.ac.nz/reporting/>

## **4.9 Overdose**

### **Symptoms**

In addition to exaggeration of side effects the following symptoms may be seen:

Agitation, confusion, irritability, hyperactivity, headache, sweating, mydriasis, tachycardia, arrhythmias, tachypnoea, pyrexia, increased bowel movements and convulsions.

The appearance of clinical hyperthyroidism may be delayed for up to five days.

### **Treatment**

Gastric lavage or emesis is required if the patient is seen within several hours of taking the dose.

Treatment is symptomatic, and tachycardia has been controlled in adults by 40 mg doses of propranolol given every six hours and other symptoms by diazepam and/or chlorpromazine as appropriate.

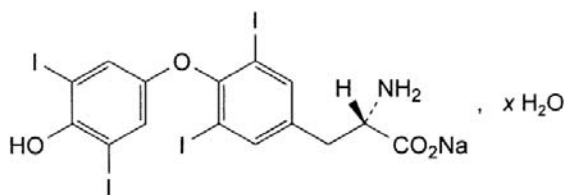
For advice on the management of overdose please contact the National Poisons Centre on 0800 POISON (0800 764 766).

## 5 PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Thyroid hormones, ATC code: H03AA01

#### Chemical structure



Sodium (2S)-2-amino-3-[4-(4-hydroxy-3,5-diiodophenoxy)-3,5-diiodophenyl]propanoate

$C_{15}H_{10}I_4NNaO_4 \cdot xH_2O$  with  $x \approx 5$

CAS number: 25416-65-3

#### Mechanism of action

Levothyroxine sodium is the monosodium salt of the levorotary isomer of thyroxine.

Levothyroxine (T4) is a naturally occurring hormone produced by the thyroid gland and converted to the more active hormone triiodothyronine (T3) in peripheral tissues. The precise signals controlling the conversion of T4 to T3 within the cell are not known. The thyroid hormones are required for normal growth and development, particularly of the nervous system.

They increase the resting or basal metabolic rate of the whole organism and have stimulatory effects on the heart, skeletal muscle, liver and kidney. Thyroid hormones enhance lipolysis and the utilization of carbohydrate.

**100 microgram levothyroxine is equivalent in activity to 20 to 30 microgram liothyronine/triiodothyronine or 60 mg Thyroid BP and/or local pharmacopoeia specification.**

This medicine has been given a provisional consent under Section 23 of the Act. This means that further evidence on this medicine is awaited or that there are specific conditions of use.

Provisional consent is valid till 11 November 2018.

## **5.2 Pharmacokinetic properties**

### **Absorption**

Following oral administration the absorption of levothyroxine is incomplete and variable, especially when taken with food. The amount absorbed increases during fasting conditions.

Levothyroxine is nearly totally bound to serum protein.

### **Metabolism**

The main pathway for the metabolism of levothyroxine (T4) is its conversion, by deiodination, to the active metabolite triiodothyronine (T3). Further deiodination of T4 and T3 leads to production of inactive products.

### **Elimination**

Levothyroxine is eliminated slowly from the body with a half-life of approximately 7 days in a normal person. This may be reduced in hyperthyroid states or increased in hypothyroid patients.

Renal or hepatic diseases do not appear to have any significant effect on the disposition of levothyroxine.

In man, approximately 20 - 40% of levothyroxine is eliminated in the faeces and approximately 30 - 55% of a dose of levothyroxine is excreted in the urine.

## **5.3 Preclinical safety data**

No further data of relevance.

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# **6 PHARMACEUTICAL PARTICULARS**

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## **6.1 List of excipients**

Sodium citrate  
Maize starch  
Lactose  
Acacia powdered  
Magnesium stearate  
Purified water

## **6.2 Incompatibilities**

None known.



**6.3 Shelf life**

24 months for Levothyroxine 100 microgram tablets  
18 months for Levothyroxine 50 microgram tablets

**6.4 Special precautions for storage**

Store below 25°C. Protect from light.

**6.5 Nature and contents of container**

50 microgram tablets in blister packaging with PVC/PVdC film (heat treated foil/heat seal lacquer) containing 28 tablets per pack.

100 microgram tablets in blister packaging with PVC/PVdC film (heat treated foil/heat seal lacquer) containing 28 tablets per pack.

**6.6 Special precautions for disposal and other handling**

No special requirements

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**7 MEDICINE SCHEDULE**

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Prescription Medicine

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**8 SPONSOR**

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Boucher & Muir (NZ) Ltd t/a Mercury Pharma (NZ)  
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Auckland 0753

Phone 0800 565 633

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**9 DATE OF FIRST APPROVAL**

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Date of grant of Provisional Consent to distribute the medicine: 6 November 2008

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## **10 DATE OF REVISION OF THE TEXT**

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20 October 2017

Summary table of changes:

<b>Section changed</b>	<b>Summary of new information</b>
All	Datasheet format updated and minor editorial changes
3	Change in tablet markings. Addition of statement on tablet division
6.3	Reduction in shelf life of 50 microgram strength