Liothyronine (T3) is indicated for the treatment of hypothyroidism. However, levothyroxine (synthetic L-T4) remains the treatment of choice in hypothyroidism with the aim of therapy being to restore physical and psychological well-being while maintaining normal laboratory reference range serum TSH levels.¹

At the end of 2017 a NHS England consultation on drugs of low clinical value was published². The joint clinical working group recommended the prescribing of liothyronine for any new patient should be initiated by a consultant endocrinologist in the NHS, and that de-prescribing of liothyronine in ‘all’ patients is not appropriate, as there are recognised exceptions. The Regional Medicines Optimisation Committee published guidance in November 2018.

The British Thyroid Association (BTA) advise that a small proportion of patients treated with levothyroxine continue to suffer with symptoms despite adequate biochemical correction. In these circumstances, where levothyroxine has failed and in line with BTA guidance, endocrinologists providing NHS services may recommend liothyronine for individual patients after a carefully audited trial of at least 3 months’ duration of liothyronine.

Exclusions:
Liothyronine is used for patients with thyroid cancer, in preparation for radioiodine ablation, iodine scanning, or stimulated thyroglobulin test. In these situations, it is appropriate for patients to obtain their prescriptions from the secondary care centre undertaking the treatment and not be routinely obtained from primary care prescribers.
If consultant psychiatrists want to prescribe it for treatment-resistant depression then it should also only be prescribed in secondary care and this SCG does not apply.

AREAS OF RESPONSIBILITY FOR SHARED CARE

This shared care agreement outlines suggested ways in which the responsibilities for managing the prescribing of liothyronine for hypothyroidism can be shared between the specialist setting and the patient’s GP, for those patients who are established on liothyronine therapy. GPs are invited to participate. If the GP is not confident to undertake these roles, then he or she is under no obligation to do so. In such an event, the total clinical responsibility for the patient for the diagnosed condition remains with the specialist. If a specialist asks the GP to prescribe this drug, the GP should reply to this request as soon as practicable.

Sharing of care assumes communication. The intention to share care is usually explained to the patient by the doctor initiating treatment. It is important that patients are consulted about treatment and are in agreement with it.

The doctor who prescribes the medication legally assumes clinical responsibility for the drug and the consequences of its use.

REFERRAL AND INITIATION

GPs should not initiate liothyronine in patients for any indication. GPs must refer all patients on liothyronine for a review with a NHS endocrinologist if they have not seen one. These patients should then be offered an annual follow-up appointment by the endocrinologist.
Endocrinologists who wish to initiate liothyronine for new patients must submit information via Dorset CCG’s Individual Patient Treatment process for approval before commencing treatment.
RMOC guidance states:
“As specified by the British Thyroid Association Executive Committee, it is acknowledged that a proportion of individuals on levothyroxine are not satisfied with therapy and have persistent symptoms despite a normal serum TSH. Such symptoms should be investigated.
and patients thoroughly evaluated for other potentially modifiable conditions before the potential commencement of liothyronine is considered. In some cases a retrospective review of the original diagnosis of hypothyroidism may be necessary. Levothyroxine dose titration, drug interactions and patient adherence should be fully assessed prior to consideration of combination therapy, as profound differences in response to small adjustments in levothyroxine dosage have been observed. Patients established on liothyronine who have an annual review with a NHS endocrinologist should be considered for switching to levothyroxine. However, the most recent NHS consultation has recognised that there are patients who are exceptions and are not suitable for switching to levothyroxine.

Liothyronine may be prescribed in secondary care for thyroid cancer suppression pathways. It has also been used in secondary-care mental health for treatment resistant depression, but prescribing remains the responsibility of secondary care.

**Specialist Responsibilities**

1. To assess the patient, establish the diagnosis and confirm the need for liothyronine
2. For new patients who require liothyronine submit a request to the Individual Patient Treatment team and wait for approval before commencing trial therapy. Ensure patient has responded to liothyronine adequately before approaching GP to take on prescribing.
3. For established patients plan annual follow-up and at each appointment, after clinical review and discussion with patient, consider feasibility of switching to levothyroxine.
4. Inform GP of clinical reasons for continuing liothyronine and include dosing and monitoring information.
5. If patient is suitable for switching, manage the switch to levothyroxine before transferring care of the patient back to the GP.
6. To be available for advice if the patient’s condition changes and to arrange for the patient to be followed up as necessary.
7. Patients should be informed that this is a rarely used product and there is the potential for instability in supply. The current number of market authorisation holders may change.

**General Practitioner Responsibilities**

1. To not initiate liothyronine in any new patients
2. Encourage patients to attend their annual follow-up appointment with a NHS endocrinologist for patients established on liothyronine.
3. Follow specialist dosing and monitoring recommendations.
4. Respond appropriately to patients who present with possible side-effects.
5. Report any adverse events via the Yellow Card Scheme of the Medicines and Health Care Regulatory Agency (MHRA) at [www.yellowcard.mhra.gov.uk](http://www.yellowcard.mhra.gov.uk)
6. To liaise with the specialist regarding any complications of treatment.
7. To deal with general health issues of the patient.
8. To check for possible drug interactions when newly prescribing concurrent medication.

**Patient’s role (or that of carer)**

1. Comply with prescribed therapy regimen as recommended by the specialist, including attending for monitoring.
**SUPPORTING INFORMATION**

**Dosage and Administration**

By mouth:

Initially 10-20 micrograms daily; increased to 60 micrograms daily in 2-3 divided doses, dose should be increased gradually, smaller initial doses given for the elderly.

Dose equivalence and conversion:

20–25 micrograms of liothyronine sodium is equivalent to approximately 100 micrograms of levothyroxine sodium. Brands without a UK license may not be bioequivalent and dose adjustment may be necessary.

**Contraindications**

Thyrotoxicosis

**Cautions**

Cardiovascular disorders; diabetes insipidus; diabetes mellitus (dose of antidiabetic drugs including insulin may need to be increased); elderly; hypertension; long-standing hypothyroidism; myocardial infarction; myocardial insufficiency; panhypopituitarism (initiate corticosteroid therapy before starting liothyronine); predisposition to adrenal insufficiency (initiate corticosteroid therapy before starting liothyronine)

**Side effects**

Frequency not known

**Usually at excessive dosage:** Anginal pain; arrhythmias; diarrhoea; excitability; insomnia; hypersensitivity reactions; palpitation; restlessness; tachycardia; tremor; vomiting

**Others:** fever; flushing; headache; heat intolerance; muscle cramp; muscular weakness; oedema; pruritus; rash; sweating; weight-loss.

**Interactions**

From SPC:

Liothyronine sodium therapy may potentiate the action of anticoagulants. Phenytoin levels may be increased by liothyronine. Anticonvulsants, such as carbamazepine and phenytoin enhance the metabolism of thyroid hormones and may displace thyroid hormones from plasma proteins. Initiation or discontinuation of anticonvulsant therapy may alter liothyronine dose requirements.

If co-administered with cardiac glycosides, adjustment of dosage of cardiac glycoside may be necessary. Colestyramine and colestipol given concurrently reduces gastrointestinal absorption of liothyronine.

Liothyronine raises blood sugar levels and this may upset the stability of patients receiving antidiabetic agents.

Liothyronine increases receptor sensitivity to catecholamines thus accelerating the response to tricyclic antidepressants. A number of drugs may affect thyroid function tests and this should be borne in mind when monitoring patients on liothyronine therapy.

Co-administration of oral contraceptives may result in an increased dosage requirement of liothyronine sodium.
Amiodarone may inhibit the deiodination of thyroxine to triiodothyronine resulting in a decreased concentration of triiodothyronine with a rise in the concentration of inactive reverse triiodothyronine.

As with other thyroid hormones, Liothyronine may enhance effects of amitriptyline and effects of imipramine.

Metabolism of thyroid hormones accelerated by barbiturates and primidone (may increase requirements for thyroid hormones in hypothyroidism).

Requirements for thyroid hormones in hypothyroidism may be increased by oestrogens.

This list is not exhaustive. The manufacturer’s summary of product characteristics (SPC) and the most current edition of the British National Formulary should be consulted for full information on contra-indications, warnings, side-effects and drug interactions.

Drug costs:

Liothyronine 20mcg 28 tablets Drug Tariff Feb 2019 £204

The 5 and 10 microgram capsules are classed as specials and prices vary between about £4 and £6 per tablet so consideration must be given to how a suitable dose can be achieved in the most cost-effective way.

References

4. BNF www.medicinescomplete.com
5. https://www.medicines.org.uk/emc/product/5905#INTERACTIONS

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