

Wirral Guidance on the Prescribing of Liothyronine (T3) Containing Products for the Management of Primary Hypothyroidism

Recommendations

- Prescribing of liothyronine or liothyronine containing products (e.g. Armour Thyroid[®] (AT), Nature-Throid[®], Westhroid[®], Cytomel[®], NP[®] Thyroid and ERFA[®] thyroid) for the treatment of primary hypothyroidism is NOT recommended.
- Patients who are being prescribed liothyronine (with or without levothyroxine), should be switched to levothyroxine alone, where appropriate.
- Prescribing of thyroid hormones should be in line with Royal College of Physicians guidance [1].

Rationale

Levothyroxine is the Wirral thyroid hormone of choice as it is suitable for once daily dosing due to its long half-life (one week), provides stable and physiological quantities of thyroid hormones for patients requiring replacement [2] and is cost effective. There is overwhelming evidence to support the use of thyroxine alone in the treatment of hypothyroidism, usually prescribed as levothyroxine [2]. Levothyroxine (T4) is a pro drug converted to liothyronine (T3) in the body [3].

Routine prescribing of liothyronine is not recommended by national and international guidelines for various reasons including:

- Liothyronine has a much shorter half-life and steady-state levels cannot be maintained with once daily dosing [4].
- The combination of levothyroxine and liothyronine, in both non- and physiological proportions, has **not** consistently been shown to be more beneficial than levothyroxine alone with respect to cognitive function, social functioning and wellbeing. The variation in hormonal content and large amounts of liothyronine may lead to increased serum concentrations of T3 and subsequent thyrotoxic symptoms, such as palpitations and tremor [4].
- Liothyronine may be subject to supply issues and the amount of active ingredient may not be standardised so can vary from batch-to-batch, providing variable control [5].
- There is currently insufficient evidence of clinical cost effectiveness to support the use of liothyronine (either alone or in combination) for the treatment of hypothyroidism [6,7]. Liothyronine (available as licensed 20 microgram tablets and unlicensed 5 microgram tablets) is considerably more expensive than levothyroxine [7] (appendix 1). Other liothyronine-containing preparations (such as AT and ERFA Thyroid) are unlicensed, therefore the safety and quality of these products cannot be assured [5].

The British Thyroid Association (BTA) does not recommend the routine prescribing of additional liothyronine in any presently available formulation, as it is inconsistent with normal physiology, has insufficient evidence to show that combination therapy is

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superior to T4 monotherapy, and may be harmful [2]. There is no convincing evidence to support the routine use of T3 monotherapy [2].

It is recognised that some patients on levothyroxine remain symptomatic despite treatment leading to TSH levels in the therapeutic range. The reasons for this are not fully understood and such patients should be under the care of an endocrinologist [1].

Advice on Switching from Liothyronine (T3) to Levothyroxine (T4):

Patients who are stable on T3 or T4/T3 combination who have clearly not tolerated or benefited from T4 (despite adequate length trial of T4)

These patients should not be switched to T4, unless the clinician believes a re-trial of T4 is justified (if clinical circumstances have changed).

If T3 or T4/T3 combination is to continue, it may be preferable that the patient is supervised by an accredited endocrinologist with documentation of patient agreement after being fully informed of the uncertain benefits, likely risks of over-replacements and potential adverse consequences and lack of safety data [2].

All other patients on T3 or T4/T3 combination, including those who are unstable, those who are symptomatic and those with no clear documentation of an adequate length trial of T4 previously

These patients can be switched from T3 (including T3-containing products) to the equivalent dose of T4, taking into account any other T4 the patient is also co-prescribed and the patient's most recent thyroid function tests. The majority of patients can be switched by a GP. Specialist advice may be sought in exceptional circumstances, e.g. very unstable/highly symptomatic patients.

Equivalent doses

The BNF states that 20–25 micrograms of liothyronine is equivalent to 100micrograms of levothyroxine [8]. The basic 'rule of thumb' in converting thyroid doses is that 100micrograms of levothyroxine is roughly equivalent to 25micrograms of liothyronine, or 1 grain (60mg) of AT, based on clinical responses [4]. See dose conversion chart, Appendix 2.

Monitoring

Patients should have repeat TFTs 1-2 months after switching to determine the appropriateness of their new dose [8].

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Appendix 1. Cost of liothyronine containing products in Wirral CCG Aug 15 – July 16.

Liothyronine containing product	Total Items (Aug 15- July 16).	Cost (£)	Average cost per item (£)	Average cost per 100 tablet/capsule (£)
Armour thyroid	20	2866.69	143.33	167
Cytomel	4	1,520.65	380.16	411
Erfa Thyroid	25	1663.54	66.54	60
Liothyronine	593	224431.88	378.47	672
Nature Throid	18	7,553.63	419.65	172
Total	660	238,036.39	n/a	n/a
Overall average	n/a	n/a	360.66	558
Levothyroxine (tablets and capsules)	198,229	601,851.82	3.04	7.66

Appendix 2. Dose conversion chart [4,8].

Liothyronine - total daily dose (microgram)	Equivalent levothyroxine once daily dose (microgram)
5	20
10	40
15	60
20	80
25	100
30	120
35	140
40	160
45	180
50	200
55	220*
60	240*

*BNF states that maintenance dose of levothyroxine is up to 200 micrograms once daily [4]

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