Distribution: Scottish Prescribing Advisors Association (SPAA)
NHS Board Medical Directors
NHS Board Directors of Pharmacy

01 November 2017

Dear Colleague,

Review of Appropriate use of Levothyroxine (T4) and Liothyronine (T3)

Levothyroxine (T4) is recommended for the management of hypothyroidism. Liothyronine (T3) is not (routinely) recommended for the management of hypothyroidism. At medication review, patients currently treated with liothyronine (T3) may be suitable for therapeutic switch to the preferred levothyroxine (T4).

The Effective Prescribing Programme (EPP) has been considering and developing a number of opportunities for Boards to take forward clinically safe efficiencies in prescribing practice. This opportunity looks at promoting the best practice in the management of hypothyroidism and ensuring that the use of the recommended levothyroxine (T4) has been optimised. This best practice should be used for any patient initiating treatment with levothyroxine (T4) and may also be applied to patients already prescribed liothyronine (T3) during a medication review. The EPP Board support the view that there is currently insufficient clinical evidence of effectiveness and cost effectiveness to support the use of liothyronine (T3) (either alone or in combination) for the treatment of hypothyroidism and that any review of a patient prescribed liothyronine (T3) should be carried out in a holistic and safe manner[1].

Both levothyroxine (T4) and liothyronine (T3) are prescribed to patients with hypothyroidism in NHS Scotland (Appendix 3). Levothyroxine (T4) is a prodrug that is converted to liothyronine (T3) by the body, and due to its long half-life, provides stable and physiological quantities of thyroid hormones, allowing a once daily dosage. Liothyronine (T3) has a much shorter half-life which results in less stable levels of thyroid hormones and requires multiple daily dosing. When used in combination there is a risk of high levels of serum liothyronine (T3) leading to thyrotoxic symptoms.

Clinical review of patients currently treated with liothyronine (T3) should adopt a patient-centered approach through full engagement and shared decision making. Face to face consultations are essential, before any switch from liothyonine (T3) to levothyroxine (T4) is made. There should be the assurance that the switch is a trial, and that the patient can return to the original treatment if the agreed outcomes are not achieved.

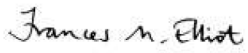
Based on this assessment and the evidence provided in appendices 1 to 4, NHS Boards are asked to:

- Review the position of liothyronine (T3) in their formularies
- Ensure that clinicians are advised on optimising the use of levothyroxine (T4)
- Ensure that liothyronine (T3) is only initiated on the advice of an endocrinologist
- Consider switching use of liothyronine (T3) to levothyroxine (T4) at medication review
- On switching data should be collected to numbers changed and if patients have experienced any problems on change to help inform practice

[1] Royal College of Physicians. The diagnosis and management of primary hypothyroidism. A statement made by the Royal College of Physicians on behalf of: The Association of Clinical Biochemistry, British Thyroid Foundation, Society for Endocrinology, British Thyroid Association, British Society of Paediatric Endocrinology and Diabetes; endorsed by the Royal College of General Practitioners. 2011

- Consult local clinicians regarding the contents of this letter

If you have feedback or suggestions for any additional implementation support that could be provided through the Effective Prescribing Programme, please get in touch.



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Aide Memoire

Levothyroxine (T4) should be initiated once daily at a dose of 0.8 to 1.6 micrograms/kg, which is usually 50 to 125 micrograms. A lower dose should be used for elderly patients and patients with cardiac disease. It must be taken on an empty stomach, with no food consumption for 30 minutes, and not taking it in this way may prevent optimised treatment.

The aims of treatment are to manage the patients hypothyroid symptoms and maintain thyroid stimulating hormone (TSH) levels within the normal range. If the TSH levels are too low than there is an increased risk of developing atrial fibrillation and osteoporosis. If the aims of treatment are not achieved with levothyroxine (T4) then the following should be checked:

- Is the dose correct for the weight of the patient?
- Is the treatment being taken correctly on an empty stomach?
- Are there other treatments that might impair adsorption, (antacids, proton pump inhibitors, histamine-2-receptor antagonists)?
- Are there other undiagnosed endocrine of auto-immune conditions?
- Are there other causes of fatigue, (depression, fibromyalgia, etc)?

These factors should be taken into account for any patient being considered for liothyronine (T3) treatment and when reviewing existing patients. **Liothyronine must only be initiated on the advice of an endocrinologist.**

Appendices 1 & 2: British Thyroid Association – Management of Primary Hypothyroidism & FAQs for GPs

bta_statement_on_the_management_of_

faq_for_gps_.pdf

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Appendix 3

Liothyronine Potential Savings (January – December 2016)

Health Board	Patient Count	Number of Paid Items	Paid Quantity	PD Paid GIC excl. BB	Potential Saving* (5% patients switched)	Potential Saving* (15% patients switched)	Potential Saving* (25% patients switched)
NHS AYRSHIRE & ARRAN	106	586	38,627	£327,402.61	£15,188.44	£48,602.99	£82,017.55
NHS BORDERS	28	186	7,672	£66,159.14	£2,324.47	£12,150.75	£21,263.81
NHS DUMFRIES & GALLOWAY	45	292	20,682	£176,703.52	£7,724.80	£21,263.81	£33,414.56
NHS FIFE	75	392	23,894	£205,007.75	£10,755.34	£33,414.56	£57,716.05
NHS FORTH VALLEY	52	353	23,137	£200,265.58	£11,366.91	£24,301.50	£39,489.93
NHS GRAMPIAN	41	209	16,195	£136,693.75	£6,557.39	£18,226.12	£30,376.87
NHS GREATER GLASGOW & CLYDE	268	1,379	113,125	£968,282.06	£46,200.67	£121,507.48	£203,525.03
NHS HIGHLAND	62	418	25,898	£223,104.45	£10,619.94	£27,339.18	£48,602.99
NHS LANARKSHIRE	144	841	62,050	£528,372.80	£25,262.50	£66,829.12	£109,356.73
NHS LOTHIAN	199	951	49,967	£430,251.52	£21,269.15	£91,130.61	£151,884.35
NHS ORKNEY							
NHS SHETLAND							
NHS TAYSIDE	165	1,041	75,254	£644,983.13	£30,761.09	£75,942.18	£124,545.17
NHS WESTERN ISLES							
Scotland	**1,194**	**6,742**	**460,981**	**£3,946,453.01**	**£195,071.14**	**£543,745.99**	**£908,268.44**

*Potential saving (one quarter) based on switching liothyronine 20mcg tables for therapeutically equivalent dose of levothyroxine (75mcg tablets at price of £4.00 for 28 pack) by NHS Board. The British National Formulary suggests 20-25mcg liothyronine is equivalent to 100mcg levothyroxine. Other references suggest a 1:3 ratio. As such, patient dosage may require adjustment. The savings below are based on a 75mcg levothyroxine : 20mcg liothyronine equivalence.