

## Different thyroid assays may greatly affect diagnosis and management of hypothyroidism

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## ACCEPTED LETTER

### In response to 'Investigating hypothyroidism'

## Different thyroid assays may greatly affect diagnosis and management of hypothyroidism

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## **Investigating hypothyroidism: Different thyroid assays may greatly affect diagnosis and management of hypothyroidism**

Dear Editor,

In their review on investigating hypothyroidism, Siskind et al <sup>1</sup> fail to mention the often unrecognised impact of different thyroid assays and reference ranges on the diagnosis and management of hypothyroidism. It is generally believed that assay differences are accounted for by assay specific reference intervals. We, however, recently reported <sup>2</sup> that the diagnosis and management of subclinical hypothyroidism (SCH) to be strikingly different depending on thyroid stimulating hormone (TSH) and free thyroxine (fT4) assays provided by Abbott Laboratories and Roche Diagnostics, employed by 75% of clinical laboratories in the UK.

We identified 53 patients with Roche defined SCH, of whom 40 (75.5%) had normal thyroid function and 13 (24.5%) had SCH when analysed with Abbott assays. We also identified 40 patients with Abbott defined SCH of whom 28 (70%) had SCH and 12 (30%) had results indicative for levothyroxine replacement when analysed with Roche assays.<sup>2</sup> Only 44% of patients had concordant results on both methods because of assay differences (between method bias) and variation in reference intervals. Compared to Abbott TSH results, the Roche TSH results were not only 40% higher but its upper reference limit 18% lower and it therefore reported a greater number of high TSH results. Compared to the Abbott fT4 assay, Roche fT4 results were 16% higher but its lower reference limit 25% higher, it therefore reported a greater number of low fT4 results. It, however, is uncertain whether Roche assays lead to incorrect diagnosis and treatment of SCH or Abbott assays lead to missed diagnosis and under-treatment of SCH. We have also subsequently reported that monitoring of levothyroxine replacement in primary hypothyroidism using Abbott and Roche TSH assays may result in different clinical management decisions in 14% of patients.<sup>3</sup>

Clinicians should be aware that assay differences and variations in reference ranges will directly impact the diagnosis and management of hypothyroidism.

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