

High Sensitivity for Early Detection of Thyroid Cancer Recurrence

B·R·A·H·M·S hTg sensitive KRYPTOR

High sensitivity for efficient follow-up

For patients with differentiated thyroid carcinoma (DTC) an early detection of recurrent tumors is crucial. Rising hTg levels at very low concentrations after therapy are not detectable using conventional immunoassays (FAS ≈ 1.0 ng/ml) without rhTSH stimulation. The Thermo Scientific™ B·R·A·H·M·S™ hTg sensitive KRYPTOR™ assay renders this undesirable stimulation step obsolete.^{1,2,3}

The measuring ranges of commercially available high sensitive assays are comparable with functional assay sensitivities set at around 0.1 ng/ml.⁴ It has been shown that the B·R·A·H·M·S hTg sensitive KRYPTOR assay offers highest sensitivity and specificity in unstimulated samples (Figure 3).

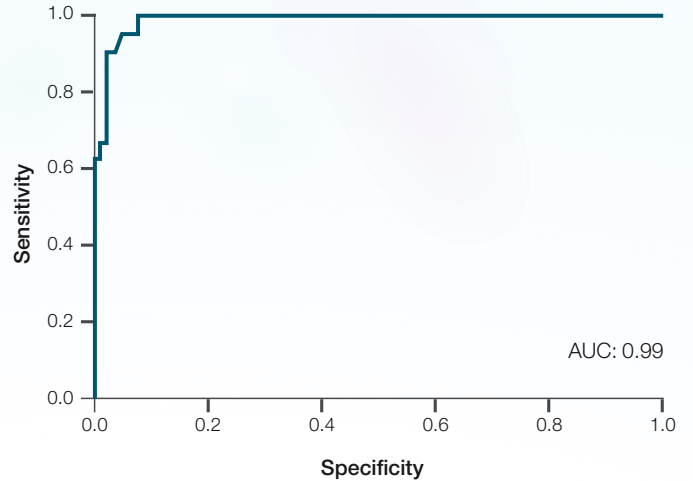


Figure 1 Receiver Operator Curve obtained by comparing basal B·R·A·H·M·S hTg sensitive KRYPTOR and clinical data.^{modified 5}

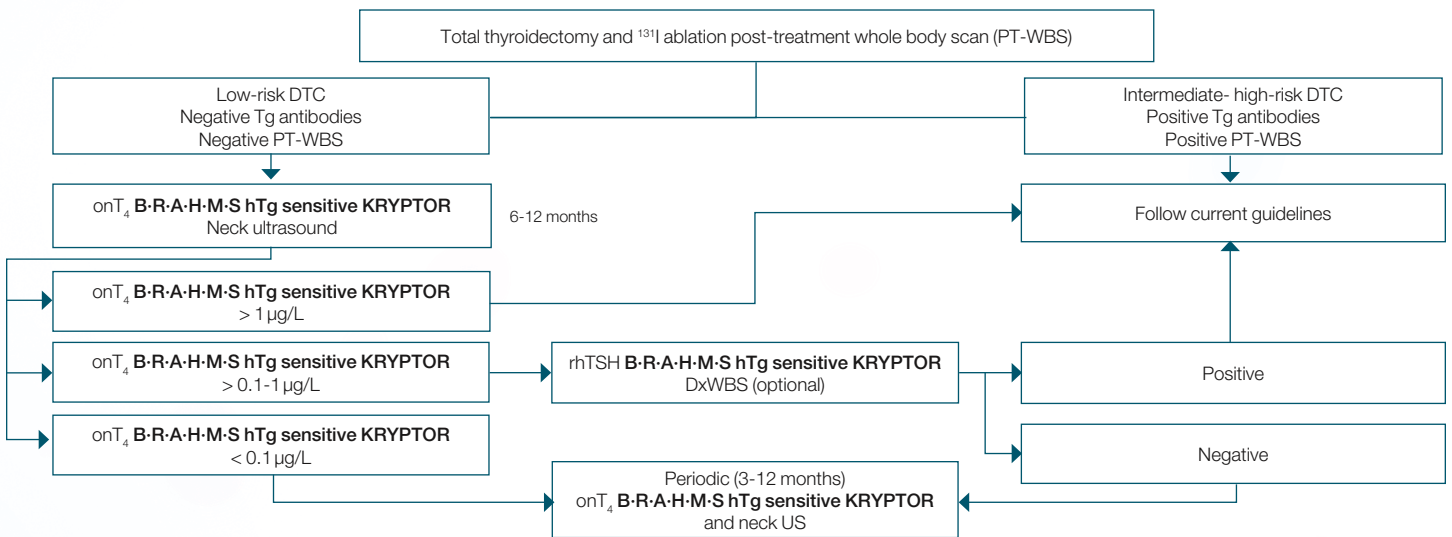


Figure 2 Algorithm for DTC follow-up^{modified 6}

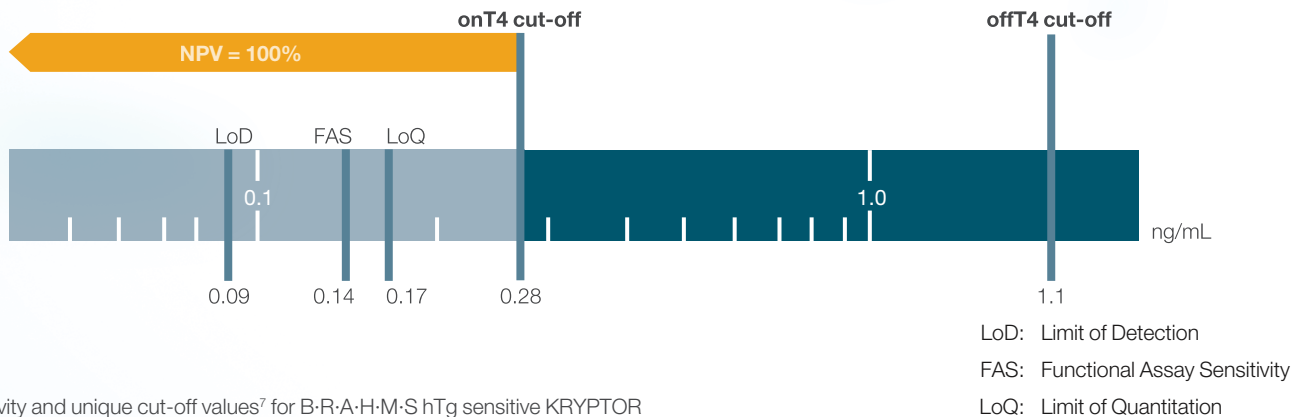
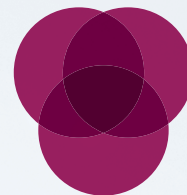


Figure 3 Sensitivity and unique cut-off values⁷ for B·R·A·H·M·S hTg sensitive KRYPTOR



Excellent indicator for long-term remission

B·R·A·H·M·S hTg sensitive KRYPTOR is able to predict a favorable long-term outcome in low to intermediate risk DTC patients.

With a cut-off value of 0.28 ng/ml and without rhTSH stimulation (onT4) B·R·A·H·M·S hTg sensitive KRYPTOR offers a negative predictive value (NPV) of 100% with a sensitivity of 100% and a specificity of 94.7% (Table 1).

Patients with a B·R·A·H·M·S hTg sensitive KRYPTOR value of less than 0.28 ng/mL measured onT4 in combination with negative imaging at first post ablation visit can be considered cured.⁷

B·R·A·H·M·S hTg sensitive KRYPTOR	cut-off	NPV	sensitivity	specificity
onT4	<0.28 ng/mL	100.0%	100.0%	94.7%
stimulated (rhTSH)	<1.1 ng/mL	99.5%	90.9%	97.7%

Table 1 Pre-treatment cut-off values for prediction of favorable long-term outcome⁷

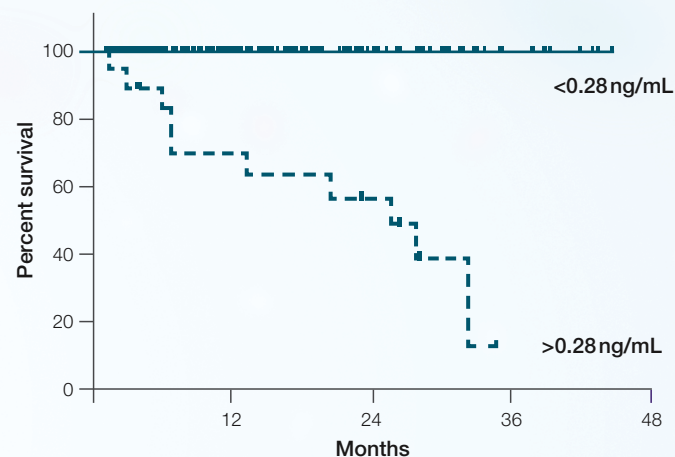


Figure 4 Kaplan-Meier curve of event-free survival at a proposed cut-off of 0.28 ng/mL over 48 months.^{modified 7}

Unbiased determination of hTg levels

The B·R·A·H·M·S hTg sensitive KRYPTOR assay is the only assay tested in a recent trial that does not overestimate the hTg level when compared to a mass spectrometry (MS) result. Most other Thyroglobulin assays produce results considerably higher than those from MS and the B·R·A·H·M·S hTg sensitive KRYPTOR assay.⁸

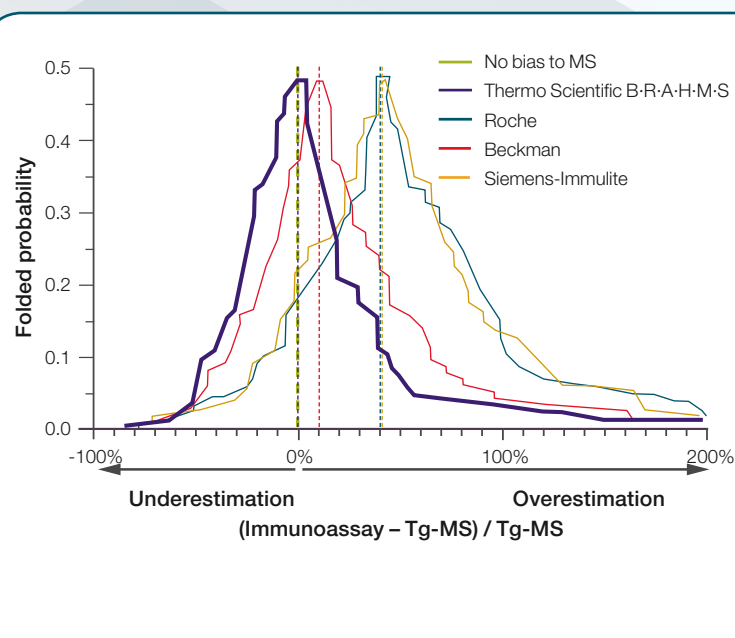


Figure 5 Mountain curves showing overestimation of commercially available hTg assays.^{modified 8}

Interferences in hTg measurement

One of the challenges in reliable Thyroglobulin determination are assay interferences. For confident follow-up of DTC patients it is necessary to rule out interferences during Tg measurement.

The most common cause of interference are anti-Tg autoantibodies (TgAb).

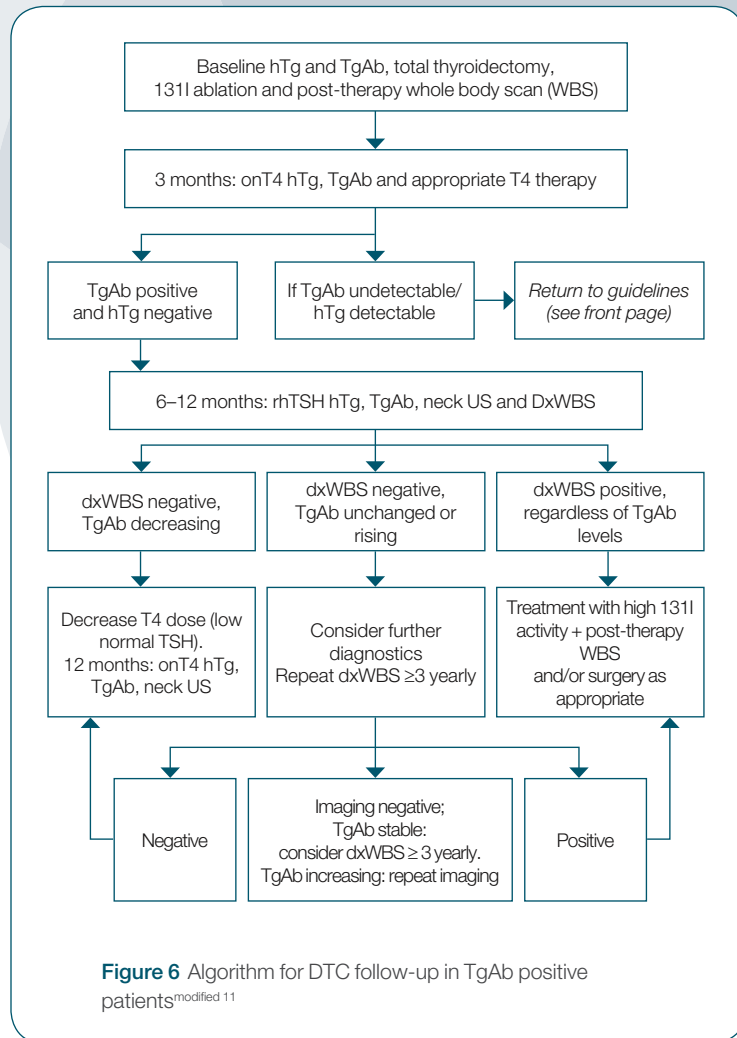
For detection and measurement of these autoantibodies B·R·A·H·M·S anti-Tgn KRYPTOR offers highest sensitivity and specificity thanks to the native human Thyroglobulin used in the assay design.

In TgAb positive patients B·R·A·H·M·S anti-Tgn KRYPTOR can be used as a surrogate marker for Thyroglobulin. A decline of positive TgAb of $\geq 36.4\%$ or below the cut-off (33ng/mL) predicts a positive outcome of the disease (93.6% NPV, 86.7% PPV).^{9,10}

In addition, with the mini-recovery the B·R·A·H·M·S hTg sensitive KRYPTOR provides a tool to detect all interferences possible during hTg measurement:

- hTg autoantibodies (anti-Tg)
- heterophilic antibodies
- high-dose hook effect.

As a verification test the mini-recovery concept offers the most comprehensive approach.



References

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