

<b>Department:</b>	Laboratory and Blood Bank ( Hormone)		
<b>Document:</b>	Internal Policy and Procedure		
<b>Title:</b>	Analysis of Free T3 Level		
<b>Applies To:</b>	All Laboratory Staff		
<b>Preparation Date:</b>	January 06, 2025	<b>Index No:</b>	LB-IPP-102
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## 1. PURPOSE:

1.1 To illustrate the necessary steps required for performing Free T3 (fT3) assay on COBAS e411.

## 2. DEFINITONS:

2.1 Free T3 (fT3): is the thyroid hormones triiodothyronine (T3).

## 3. POLICY:

3.1 The thyroid hormones triiodothyronine (T3) and thyroxine (T4) are secreted into the bloodstream by the thyroid gland and play a vital role in regulating the body's metabolic rate, influencing the cardiovascular system, growth and bone metabolism, and are important for normal development of gonadal functions and nervous system.

3.2 The determination of free T3 has the advantage of being independent of changes in the concentrations and binding properties of the binding proteins; additional determination of a binding parameter (T-uptake, TBG) is therefore unnecessary. Therefore, free T3 is a useful tool in clinical routine diagnostics for the assessment of the thyroid status. Free T3 measurements support the differential diagnosis of thyroid disorders, are needed to distinguish different forms of hyperthyroidism, and to identify patients with T3 thyrotoxicosis.

## 4. PROCEDURE:

4.1 **Principle:** Competition principle.

4.2 **Specimen collection and preparation:** Serum collected using standard sampling tubes or tubes containing separating gel. Undiluted Li-heparin, K2-EDTA and K3-EDTA plasma. Stable for 7 days at 2°-8 °C, 30 days at -20 °C.6 Freeze only once

4.3 **Method:** See policy of loading sample on machine (Ref: Operative Manuals' of COBAS e411).

4.4 **Calculation:** The analyzer automatically calculates the analyte concentration of each sample in  $\mu$ IU/mL

4.5 **Status:** Stat and Routine

4.6 **Reference ranges:** Euthyroid: (2.0-4.4 pg/mL)

4.6.1 Detailed information about reference intervals in children, adolescents and pregnant women, refer to the brochure "Reference Intervals for Children and Adults", English: 04640292.

4.7 **Limitations- interference:**

4.7.1 The assay is unaffected by icterus (bilirubin < 1128  $\mu$ mol/L or < 66 mg/dL), hemolysis (Hb <0.621 mmol/L or < 1.0 g/dL), lipemia (Intralipid< 2000 mg/dL), biotin (< 286 nmol/L or < 70 ng/mL), IgG < 7 g/dL, IgA< 1.6 g/dL and IgM < 1 g/dL.

4.7.2 Samples should not be taken from patients receiving therapy with high biotin doses (i.e. > 5 mg/day) until at least 8 hours following the last biotin administration.

4.7.3 The presence of autoantibodies may induce high molecular weight complexes (macro-TSH) which may cause unexpected high values of TSH.8 In rare cases, interference due to extremely high titers of antibodies to analyte-specific antibodies, streptavidin or ruthenium can occur. These effects are minimized by suitable test design.

4.7.4 For diagnostic purposes, the results should always be assessed in conjunction with the patient's medical history, clinical examination and other findings.

4.8 **Measuring range:** 0.4-50 pmol/L

4.8.1 Values below the Limit of Blank are reported as < 0.4 pmol/L.

4.8.2 Values above the measuring range are reported as > 50 pmol/L.

## 5. MATERIALS AND EQUIPMENT:

5.1 **Reagent:** For preparation see package insert

5.1.1 M Streptavidin-coated microparticles (transparent cap), 1 bottle, 12 mL: Streptavidin-coated microparticles 0.72 mg/mL; preservative.

5.1.2 Anti-T3-Ab~Ru (bpy) (gray cap), 1 bottle, 18 mL: Monoclonal anti-T3-antibody (sheep) labelled with ruthenium complex 18 ng/mL; phosphate buffer 100 mmol/L, pH 7.0; preservative.

5.1.3 T3~biotin (black cap), 1 bottle, 18 mL: Biotinylated T3 2.4 ng/mL; phosphate buffer 100 mmol/L, pH 7.0; preservative.

5.2 **Calibration:**

5.2.1 Every Elecsys reagent set has a barcoded label containing specific information for calibration of the particular reagent lot. The predefined master curve is adapted to the analyzer using the relevant CalSet.

5.2.2 Calibration must be performed once per reagent lot using fresh reagent (i.e. not more than 24 hours since the reagent kit was registered on the analyzer). Calibration interval may be extended based on acceptable verification of calibration by the laboratory.

5.2.3 Renewed calibration is recommended as follows:

5.2.3.1 After 8 weeks when using the same reagent lot

5.2.3.2 After 7 days when using the same reagent kit on the analyzer

5.2.3.3 As required: e.g. quality control findings outside the defined limits

5.3 **Quality control:**

5.3.1 For quality control, use PreciControl Universal or PreciControl Thryo Sensitive. In addition, other suitable control material can be used.

5.3.2 Controls for the various concentration ranges should be run individually at least once every 24 hours when the test is in use, once per reagent kit, and following each calibration.

## 6. RESPONSIBILITIES:

6.1 Hormone shift on charge is responsible for, running calibration and control and samples of FT3.

6.2 Hormone staff are responsible for running FT3 samples every morning.

## 7. APPENDICES:

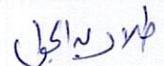
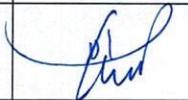
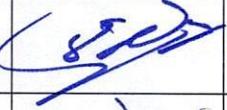
7.1 N/A

## 8. REFERENCES:

8.1 Operator's manual for the analyzer

8.2 Company Leaflets of reagents

**9. APPROVALS:**

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