BLOOD SPOT TEST SPECIFICATIONS

Free T3

Clinical Information

Triiodothyronine (T3) is the active thyroid hormone, which is primarily involved in directing the metabolic activity of cells. A properly regulated thyroid is essential to a wide array of biochemical processes in the body. Free T3 is the non-protein-bound fraction circulating in the blood, representing about 0.4% of the total circulating T3, which is available to tissues. ZRT's blood spot assay is a direct assay for free T3, and therefore a reliable indicator of circulating free T3.

Elevated free T3 levels are seen in hyperthyroid patients, but levels can be normal in hypothyroid patients. Low free T3 can be a result of poor conversion of thyroxine (T4) to T3, often as a result of high cortisol levels due to stress, heavy metal toxicity, or nutritional deficiencies (e.g. selenium and zinc). Symptoms of subclinical hypothyroidism and hyperthyroidism can be seen even when thyroid hormone levels appear to be normal, because thyroid hormone activity can be affected by interactions with other hormone systems, particularly estrogens and cortisol. Management of thyroid dysfunction requires an understanding of these interactions and careful monitoring of treatment with regular thyroid function tests that include a free T3 level.

Reference range levels of free T3 are 2.4—4.2 pg/mL.

References:

McDermott MT, Ridgway EC. Subclinical hypothyroidism is mild thyroid failure and should be treated. J Clin Endocrinol Metab 2001;86:4585-90.

Baskin HJ, Cobin RH, Duick DS, Gharib H, Guttler RB, Kaplan MM, Segal RL; AACE. American Association of Clinical Endocrinologists medical guidelines for clinical practice for the evaluation and treatment of hyperthyroidism and hypothyroidism. Endocr Pract. 2002;8:457-69.

Miller GD, Rogers JC, DeGroote SL, Schmitz D. Clinical inquiries: which lab tests are best when you suspect hypothyroidism? J Fam Pract 2008;57:613-4.

Assay Method: ELISA

Intra-assay Precision

Intra-assay precision was determined by choosing three samples spanning the reference range, and analyzing them multiple times within the same run. Results are shown below:

Mean Free T3 Concentration (pg/mL)	Standard Deviation	Coefficient of Variation (C.V. %)
3.0	0.35	8.1
3.5	0.42	10.6
4.5	0.57	8.5

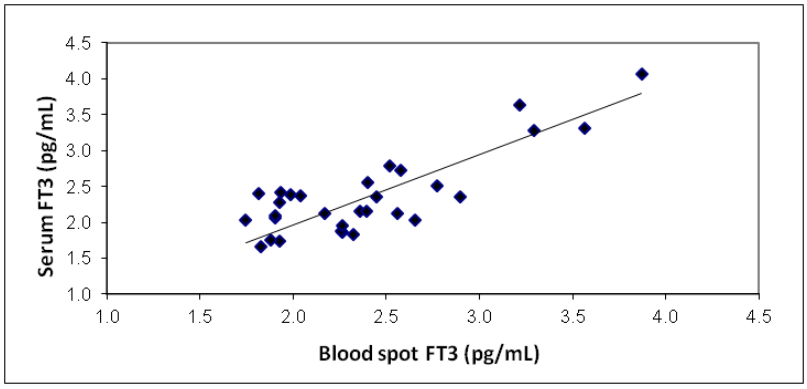
Inter-assay Precision

Inter-assay precision was determined by choosing three samples spanning the reference range, and analyzing them in multiple times throughout different runs. Results are shown below:

Mean Free T3 Concentration (pg/mL)	Standard Deviation	Coefficient of Variation (C.V. %)
2.3	0.34	14.6
3.1	0.42	13.7
5.1	0.68	13.4

Accuracy

To test the accuracy of the dried blood spot assay for Free T3, dried blood spot samples collected at the same time as corresponding serum samples were analyzed by linear regression. Resulting correlation data are shown below (R = 0.82):



Analyte Stability

The dried blood spot samples are stable for more than 1 month at room temperature.

Specimen Collection

Kits for blood spot collection contain a filter paper collection card, finger lancets, an alcohol prep pad, sterile gauze, a band-aid, easy-to-follow instructions, and a mailer to return the sample for analysis.