US BioTek LABORATORIES

• PATIENT REPORT

16020 Linden Ave N, Shoreline, WA 98133 USA • usbiotek.com • +1.206.365.1256

26211-0702

Dr Test Doctor (Test Doctor) Test Clinic. 123 Test Street, Test Suburb Victoria 3125

Patient ID P000060
Ext ID 26211-0702

Test Patient

Sex: Female • 56yrs • 01-Jan-70
123 Home Street, Test Suburb VIC 3125

RECEIVED
30-Jul-26

Clinical Notes .

METABOLIC INSIGHT

	Collected
Specimen type - Blood-Serum	29-Jul-26
Specimen type - Blood-Na Citrate	29-Jul-26
Specimen type - Blood-K2EDTA	29-Jul-26
Specimen type - Blood-EDTA	29-Jul-26

RENAL FUNCTION TESTS (UEC)

TEST	RESULT	H/L	REFERENCE	UNITS
Sodium	135		(135-145)	mmol/L
Potassium	5.2		(3.5-5.2)	mmol/L
Chloride	101		(95-110)	mmol/L
Bicarbonate	25		(22-32)	mmol/L
Anion Gap	14		(8-16)	mmol/L
Urea Nitrogen (BUN)	3.70		(3.50-8.00)	mmol/L
Creatinine	58		(45-90)	umol/L
Creatinine (mmol/L)	0.06		(0.05-0.10)	mmol/L
Estimated GFR	>90		(>90)	mL/min/1.73m^2

LIVER FUNCTION TESTS (LFT)

TEST	RESULT	H/L	REFERENCE	UNITS
Bilirubin (Total)	2		(1-20)	umol/L
ALP	80		(30-110)	U/L
GGT	29		(5-35)	U/L
ALT	19		(5-35)	U/L
AST	18		(5-30)	U/L
Protein, Total	66		(60-80)	g/L
Albumin	44.0		(33.0-48.0)	g/L
Globulin	22	L	(26-39)	g/L

GLYCAEMIC MANAGEMENT

TEST	RESULT	H/L	REFERENCE	UNITS
Glucose	5.0		(3.0-5.4)	mmol/L
Insulin	17.0	H	(4.0-10.0)	mU/L
HOMA Score	3.8	H	(<2.0)	ratio
Glycosylated Haemoglobin (HbA1c)	5.6		(4.4-5.6)	%
Glycosylated Hb (IFCC)	24		(15-42)	mmol/mol
Estimated Average Glucose	6.3			mmol/L

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LIPIDS PROFILE

TEST	RESULT	H/L	REFERENCE	UNITS
Cholesterol	5.8	H	(<5.5)	mmol/L
Triglycerides	1.7		(<2.0)	mmol/L
HDL (Protective)	1.1		(1.0-2.2)	mmol/L
Non-HDL Cholesterol	4.7	H	(<4.0)	mmol/L
LDL-C (Atherogenic)	3.9	H	(<3.0)	mmol/L
Cholesterol/HDLC Ratio	5.3	H	(<5.0)	ratio
LDL/HDL Ratio	3.6	H	(<3.2)	ratio

SPECIFIC LIPOPROTEINS

TEST	RESULT	H/L	REFERENCE	UNITS
Apolipoprotein A-1	1.26		(1.10-2.05)	g/L
Apolipoprotein B	1.43	H	(0.60-1.30)	g/L
Ratio (ApoB/Apo-A1)	1.13		(0.35-1.15)	ratio
Lipoprotein (a)	133.0	H	(<75.0)	nmol/L

LIPOSCREEN-LDL SUBFRACTIONS

TEST	RESULT	H/L	REFERENCE	UNITS
Very Low Density Lipoprotein (VLDL)	0.62	H	(<0.60)	mmol/L
Mid Density Lipoprotein (IDL-1)	0.47		(<0.60)	mmol/L
Mid Density Lipoprotein (IDL-2)	0.31		(<0.40)	mmol/L
Mid Density Lipoprotein (IDL-3)	0.62	H	(<0.60)	mmol/L
Low Density Lipoprotein (LDL-1)	1.37		(<1.50)	mmol/L
Low Density Lipoprotein (LDL-2)	0.65		(<0.80)	mmol/L
Low Density Lipoprotein (LDL-3)	0.10		(<0.20)	mmol/L
Low Density Lipoprotein (LDL-4)	<DL		(<0.01)	mmol/L
Low Density Lipoprotein (LDL-5)	<DL		(<0.01)	mmol/L
Low Density Lipoprotein (LDL-6)	<DL		(<0.01)	mmol/L
Low Density Lipoprotein (LDL-7)	<DL		(<0.01)	mmol/L
Mean Particle Size	271		(>268)	Angstrom
LDL Phenotype Pattern	Type A - Normal			

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IRON STUDIES

TEST	RESULT	H/L	REFERENCE	UNITS
Iron	10		(8-30)	umol/L
Transferrin	2.4		(1.8-3.5)	g/L
Transferrin Saturation	17		(15-45)	%
Ferritin	80		(30-300)	ug/L

IRON STUDIES INTERPRETATION TABLE

Condition/Symptom	IRON	TRANSFERRIN SATURATION	FERRITIN	TRIAL OF ORAL IRON
Iron Deficiency	Decreased	Decreased	Decreased	Haemoglobin normalises
Iron Deficiency & Acute Phase Response	Decreased	Normal or Decreased	"Normal" <100 ug/L	Partial Response
Acute Phase Response	Decreased	Decreased	Increased	No Response
Iron Overload	Increased	Increased	Increased	Not Appropriate

KEY VITAMIN MARKERS

TEST	RESULT	H/L	REFERENCE	UNITS
Vitamin B12	584		(120-1000)	pmol/L
Active Vitamin B12	87.00		(>35.00)	pmol/L
Folate	22		(6-45)	nmol/L
Vitamin D	50	L	(50-200)	nmol/L

CVD INFLAMMATORY MARKERS

TEST	RESULT	H/L	REFERENCE	UNITS
Homocysteine	18.0	H	(5.0-15.0)	umol/L
High Sensitivity C-Reactive Protein	5.5	H	(<5.0)	mg/L
Fibrinogen	4.2		(2.0-4.5)	g/L

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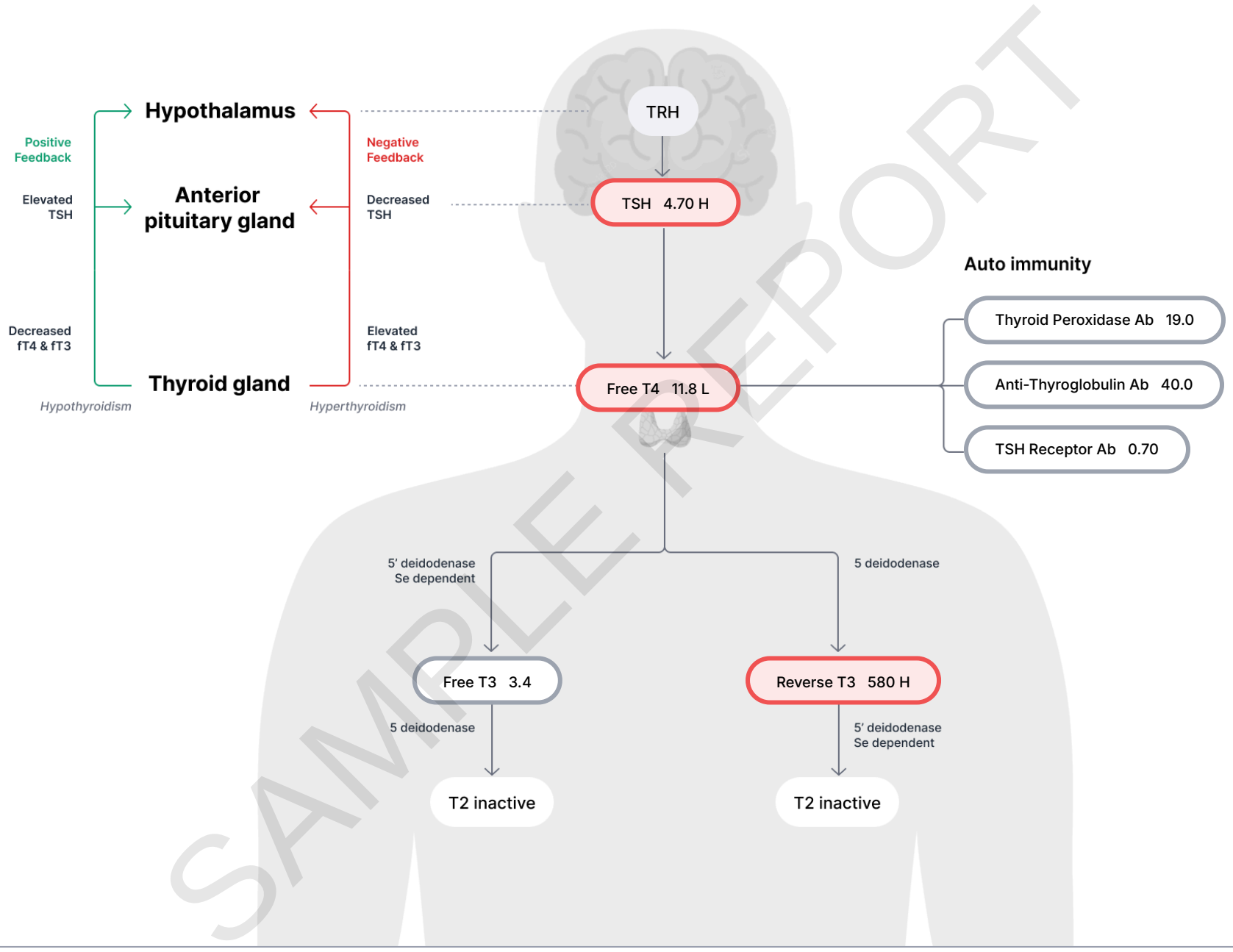
Legend Not Tested | Within Range | Out of Range | L = Low, LL = Critically Low | H = High, HH = Critically High | Regulator | Enzyme

Thyroid System



THYROID FUNCTION

TEST	RESULT	H/L	REFERENCE	UNITS
TSH	4.70	H	(0.40-4.00)	IU/L
Free T4	11.8	L	(12.0-22.0)	pmol/L
Free T3	3.4		(3.1-6.8)	pmol/L
Reverse T3	580	H	(230-540)	pmol/L
FT3/RT3 Ratio	0.59	L	(1.20-2.20)	ratio
Anti-Thyroglobulin Ab	40.0		(<115.0)	IU/mL
Thyroid Peroxidase Ab	19.0		(<34.0)	IU/mL
TSH Receptor Ab	0.70		(<1.80)	IU/L

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HORMONAL HEALTH

TEST	RESULT	H/L	REFERENCE	UNITS
Progesterone (P4)	**0.36**			nmol/L
Estradiol (E2)	**202.0**			pmol/L
DHEA Sulphate	**11.0**	**H**	(0.3-6.7)	umol/L
Testosterone (TT)	**1.10**		(0.10-1.42)	nmol/L
Sex Hormone Binding Globulin	**29**		(27-128)	nmol/L
Calc. Free Testosterone (Vermeulen)	**21.0**		(1.0-22.0)	pmol/L

SERUM HORMONES REFERENCE RANGES

HORMONE	Progesterone	Estradiol	Estrone	FSH	LH
UNITS	nmol/L	pmol/L	pg/mL	mIU/mL	mIU/mL
Early Follicular	-	-	15 - 150	-	-
Follicular	0.16 - 0.62	114 -332	-	3.5 - 12.5	2.4 -12.6
Late Follicular	-	-	100 - 250	-	-
Mid-Cycle Peak	-	315 - 1828	-	3.0 - 19.2	10.5 - 85
Ovulation Phase	0.18 - 13.2	222 - 1959	-	4.7 - 21.5	14.0 - 95.6
Luteal Phase	13.1 - 46.3	222 - 854	15 - 200	1.7 - 7.7	1.0 - 11.4
Post Menopause	0.16 - 0.40	18.4 - 505	15 - 55	25.8 - 134.8	7.7 - 58.5
Pregnant (1st Trimester)	35 - 141	563 - 11902	-	-	-
Pregnant (2nd Trimester)	80.8 - 265	5729 - 78098	-	-	-
Pregnant (3rd Trimester)	187 - 679	31287 - 110100	-	-	-
MALE	0.16 - 0.47	41 - 159	-	1.5 - 12.4	1.7 - 8.6

SHBG RANGES, FEMALE:

NOT ON Oral Contraception: 24 - 230 nmol/L

On Oral Contraception: 89 - 379 nmol/L

Post Menopausal: 46 - 277 nmol/L

Pregnancy: 59 - 1363 nmol/L

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Renal Function Test Comment

ESTIMATED GFR COMMENT:

eGFR (mL/min/1.73m2) is calculated by the laboratory using the CKD-EPI formula eGFR > 90 mL/min/1.73 sq.m - Normal GFR

Lipids Profile Comment

The National Vascular Disease Prevention Alliance (NVDPA) treatment target levels for high risk people are:

Total Cholesterol <4.0 mmol/L

Fasting Triglycerides < 2.0 mmol/L

Non-HDL Cholesterol <2.5 mmol/L

HDL-Cholesterol >=1.00 mmol/L

LDL-Cholesterol <2.0 mmol/L

Increased non-HDL Cholesterol is a significant marker for subclinical atherosclerosis (ref: Cardiology Today 2013; 3(2): pp25-27).

LDL-C COMMENT:

Low levels of HDL cholesterol and high levels of LDL cholesterol are associated with an increased risk of atherosclerotic vascular disease. A LDL Subfractions test may be considered to determine the presence of small, dense (highly atherogenic) LDLs which are a primary cause of Coronary Artery Disease (CAD). The LDL subtypes are not detectable through conventional Lipid Profiles.

APOLIPOPROTEIN B ELEVATED:

Apolipoprotein B levels increase during pregnancy, hypercholesteremia, LDL receptor defect, bile obstruction, hyperlipemia type II, and nephrotic syndrome.

Suspect: Elevated LDL, Hyperlipoproteinemia type 2a or 2b, Hyper-beta-lipoproteinemia, Arterial Stenosis (High Apo B can be associated with carotid or coronary stenosis).

Further testing: Liposcreen LDL subfractions, Lipoprotein-a, Oxidised LDL.

Consider the following actions: Treat as for elevated Cholesterol and Triglycerides, 1 g TID Niacin OR inositol hexaniacinate (non-flush if availalable), use Psyllium and other water soluble fibres, vegetable-based diet including soy products, Zinc supplementation and Anti-oxidants.

ELEVATED HOMOCYSTEINE:

Elevated homocysteine levels may result from low levels of folic acid, vitamin B6, or vitamin B12, some drugs and renal impairment, as well as several inherited defects. However, an elevated plasma homocysteine may also be due to high protein/Paleo diet.

The following genetic SNPs in CBS, MTHFR, MTR, MTRR may also impact levels of plasma homocysteine.

NOTE: Fasting overnight is required for this test. A falsely elevated result can occur if the blood has not been preserved appropriately and there is a delay in separation of the plasma from cells.

Lipoproteins Comment

LIPOPROTEIN(a) ELEVATED:

Consists of an LDL bound to Apolipoprotein component. Causes atherothrombogenesis and strongly associated with peripheral and coronary events. Consider the following possible causes: Genetic predisposition, Excessive intake of partially hydrogenated oils/fats, low-fibre, low vegetable-based diet, Hypothyroidism, Post-Menopausal elevation, Diabetes, particularly with central obesity, Chronic renal insufficiency, Simvistatin Therapy, Compounded likelihood of CVD if also high LDL and/or total Cholesterol.

Consider the following actions: Aerobic Exercise, Dietary modification, 1 g TID Niacin OR inositol hexaniacinate (non-flush if availalable), CoQ10, L-lysine, proline, HRT if indicated, Magnesium, Coronary vasodilator therapy - as elevated Lp(a) may impair normal vasodilation mechanisms. Vitamin C, L-Lysine and Vitamin E are also beneficial. Increased HDL levels appear to reduce the threat posed by high levels of Lp(a).

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Liposcreen Comment

Liposcreen LDL Subfractions

The Liposcreen LDL Subfractions test provides a superior indicator for Coronary Artery Disease (CAD) risk than other conventionally available lipid profiles.

Many individuals with normal LDL and HDL cholesterol levels remain at risk from CAD, as these conventional tests do not convey the detail of the CAD risk.

Liposcreen additionally quantifies the different LDL subfractions.

LDL Phenotype Pattern:

This patient has a LDL profile indicative of Type A, which is deemed **Normal**.

Type A (Patient may have some or all of the below present)

Deemed a normal profile.

Predominance of large/buoyant (less atherogenic) LDL subclasses (LDL 1 and 2).

Mean Particle Size of > 268 Angstrom (A).

Elevated Cholesterol, Normal Triglycerides, Elevated Apo B

Follow up/Review Timeframe:

Follow up Liposcreen testing, for this patient, is recommended in 12 months.

Iron Studies Comment

IRON STUDIES INTERPRETATIONS TABLE

CONDITION/SYMPTOM	IRON	TRANSFERRIN SATURATION	FERRITIN	TRIAL OF ORAL IRON
Iron Deficiency	Decreased	Decreased	Decreased	Haemoglobin normalises
Iron Defic. & Acute Phase Response	Decreased	Normal or Decreased	"Normal" <100 ug/L	Partial Response
Acute Phase Response	Decreased	Decreased	Increased	No Response
Iron Overload	Increased	Increased	Increased	Not Appropriate

FERRITIN COMMENT:

Serum ferritin levels >30 µg/L demonstrates healthy iron stores as long as co-existing inflammatory disease or hepatocellular damage are not present.

General Chemistry Comment

ACTIVE B12 WITHIN RANGE:

This active B12 result indicates that the patient is vitamin B12 sufficient. For patients with renal impairment, correlation with Total B12, homocysteine and/or methylmalonate is required.

The most common causes of vitamin B12 deficiency are malabsorption due to pernicious anemia or aging, insufficient dietary intake, and other acquired defects. Physiologic deficiency can be confirmed by performing Methylmalonic acid (MMA) levels and/or Homocysteine plus Folate assays. Screening for Pernicious Anaemia with intrinsic factor antibodies (IF-Ab) and gastric parietal cell antibodies (GPC-Ab) is recommended.

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BORDERLINE VITAMIN B12 LEVEL:

Vitamin B12 levels are considered to be borderline and need to be interpreted with the clinical presentation, folate level, FBE and blood film.

Further investigation to consider: - Intrinsic Factor and Parietal Cell Antibodies (to exclude possible pernicious anaemia). - Gastrin to assess possible hypochlorhydria.

SERUM FOLATE COMMENT:

High/Normal Folate levels do not necessarily reflect adequate levels of 5 MTHF (the most readily useable form of folate in the body). If the serum Folate level is low, look at the Homocysteine level which will be elevated, whilst MMA levels will be normal. Further assessments to consider: Folate Metabolism Profile (THF, Folinic Acid, 5-MTHF), MTHFR gene status.

VITAMIN D COMMENT:

Vitamin D adequacy: ≥50 nmol/L at the end of winter (level may need to be 10–20 nmol/L higher at the end of summer, to allow for seasonal decrease).

Mild vitamin D deficiency: 30–49 nmol/L

Moderate vitamin deficiency: 12.5–29 nmol/L

Severe vitamin D deficiency: <12.5 nmol/L

Consider measuring vitamin D by LCMS if the result does not correlate clinically or does not change with vitamin D supplementation.

FASTING INSULIN ELEVATED:

Increased levels and increased insulin/glucose ratios are found with pancreatic islet β cell hyperplasia or insulinomas.

Non-insulin dependent diabetes mellitus and insulin therapy may also give high levels.

FASTING GLUCOSE NORMAL:

NORMAL - Diabetes mellitus unlikely; GTT not indicated.

HOMA SCORE is a standard measure of insulin resistance.

It is calculated as follows; (Blood Glucose X Fasting Insulin) / 22.5.

HOMA Resistance Grade

<= 2.0	Normal
2.1 - 2.2	Borderline
2.3 - 3.0	Moderate
>= 3.1	Severe

Thyroid Function Comment

ELEVATED TSH LEVEL:

TSH is the initial test of thyroid function as it is more sensitive than free T4 to alterations of thyroid status in patients with primary thyroid disease.

High levels are found in primary Hypothyroidism. Interpret results with clinical correlation.

ELEVATED REVERSE T3 LEVEL:

Elevated reverse T3 (rT3) reflects increased peripheral conversion of thyroxine (T4) toward the inactive metabolite rT3 rather than the biologically active triiodothyronine (T3). This pattern indicates an alteration in thyroid hormone metabolism at the tissue level and may

occur independently of circulating thyroid hormone concentrations.

rT3 is generated via 5-deiodinase (D3) activity, which inactivates T4 and T3. Increased rT3 levels are typically associated with reduced conversion of T4 to active T3 (via D1/D2 pathways), resulting in a relative reduction in tissue T3 availability despite potentially normal serum TSH and T4 levels.

Elevated rT3 is commonly observed in the context of physiological stress or altered metabolic states, including systemic illness, inflammation, caloric restriction, and increased cortisol exposure. This response is considered an adaptive mechanism to reduce metabolic demand during periods of stress. Alterations in hepatic function, nutrient status (e.g., selenium, zinc), and certain medications may also influence deiodinase activity and contribute to elevated rT3.

From a biochemical perspective, elevated rT3 may be associated with a reduced T3:rT3 ratio, which can provide additional context regarding peripheral thyroid hormone utilisation. However, rT3 should not be interpreted in isolation, as its clinical significance remains dependent on the broader thyroid profile and clinical presentation.

ACCREDITATION SCOPE: Please note that the above test is currently not under the laboratory's scope of accreditation.

Methodology

Ion-Selective Electrodes (ISE), Automated Chemistry/Immunochemistry, Gel Electrophoresis, Liquid Chromatography-Mass Spectrometry (LC-MS/MS/MS)