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NAME	: Mrs. PARVEEN WALIA	PATIENT ID	: 1718910
AGE/ GENDER	: 58 YRS/FEMALE	REG. NO./LAB NO.	: 012501080024
COLLECTED BY	: SURJESH	REGISTRATION DATE	: 08/Jan/2025 10:49 AM
REFERRED BY	:	COLLECTION DATE	: 08/Jan/2025 10:51AM
BARCODE NO.	: 01523609	REPORTING DATE	: 08/Jan/2025 12:54PM
CLIENT CODE.	: KOS DIAGNOSTIC LAB		
CLIENT ADDRESS	: 6349/1, NICHOLSON ROAD, AMBALA CANTT		

Test Name	Value	Unit	Biological Reference interval
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CLINICAL CHEMISTRY/BIOCHEMISTRY

CALCIUM

CALCIUM: SERUM <i>by ARSENAZO III, SPECTROPHOTOMETRY</i>	9.8	mg/dL	8.50 - 10.60
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INTERPRETATION:-

1. Serum calcium (total) estimation is used for the diagnosis and monitoring of a wide range of disorders including diseases of bone, kidney, parathyroid gland, or gastrointestinal tract.
2. Calcium levels may also reflect abnormal vitamin D or protein levels.
3. The calcium content of an adult is somewhat over 1 kg (about 2% of the body weight). Of this, 99% is present as calcium hydroxyapatite in bones and <1% is present in the extra-osseous intracellular space or extracellular space (ECS).
4. In serum, calcium is bound to a considerable extent to proteins (approximately 40%), 10% is in the form of inorganic complexes, and 50% is present as free or ionized calcium.

NOTE:- Calcium ions affect the contractility of the heart and the skeletal musculature, and are essential for the function of the nervous system. In addition, calcium ions play an important role in blood clotting and bone mineralization.


HYPOCALCEMIA (LOW CALCIUM LEVELS) CAUSES :-


1. Due to the absence or impaired function of the parathyroid glands or impaired vitamin-D synthesis.
2. Chronic renal failure is also frequently associated with hypocalcemia due to decreased vitamin-D synthesis as well as hyperphosphatemia and skeletal resistance to the action of parathyroid hormone (PTH).
3. **NOTE:-** A characteristic symptom of hypocalcemia is latent or manifest tetany and osteomalacia.

HYPERCALCEMIA (INCREASE CALCIUM LEVELS) CAUSES:-

1. Increased mobilization of calcium from the skeletal system or increased intestinal absorption.
 2. Primary hyperparathyroidism (pHPT)
 3. Bone metastasis of carcinoma of the breast, prostate, thyroid gland, or lung.
- NOTE:-** Severe hypercalcemia may result in cardiac arrhythmia.




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ENDOCRINOLOGY

THYROID STIMULATING HORMONE (TSH)

THYROID STIMULATING HORMONE (TSH): SERUM **> 100.000^H** μ IU/mL 0.35 - 5.50
 by CMIA (CHEMILUMINESCENT MICROPARTICLE IMMUNOASSAY)

3rd GENERATION, ULTRASENSITIVE

INTERPRETATION:

AGE	REFERENCE RANGE (μ U/mL)
0 – 5 DAYS	0.70 – 15.20
6 Days – 2 Months	0.70 – 11.00
3 – 11 Months	0.70 – 8.40
1 – 5 Years	0.70 – 7.00
6 – 10 Years	0.60 – 5.50
11 - 15	0.50 – 5.50
> 20 Years (Adults)	0.27 – 5.50
PREGNANCY	
1st Trimester	0.10 - 3.00
2nd Trimester	0.20 - 3.00
3rd Trimester	0.30 - 4.10

NOTE:- TSH levels are subjected to circadian variation, reaching peak levels between 2-4 a.m and at a minimum between 6-10 pm. The variation is of the order of 50 %. Hence time of the day has influence on the measured serum TSH concentration.

USE:- TSH controls biosynthesis and release of thyroid hormones T4 & T3. It is a sensitive measure of thyroid function, especially useful in early or subclinical hypothyroidism, before the patient develops any clinical findings or goitre or any other thyroid function abnormality.


INCREASED LEVELS:


- 1.Primary or untreated hypothyroidism, may vary from 3 times to more than 100 times normal depending on degree of hypofunction.
- 2.Hypothyroid patients receiving insufficient thyroid replacement therapy.
- 3.Hashimotos thyroiditis.
- 4.DRUGS: Amphetamines, Iodine containing agents and dopamine antagonist.
- 5.Neonatal period, increase in 1st 2-3 days of life due to post-natal surge.

DECREASED LEVELS:

- 1.Toxic multi-nodular goitre & Thyroiditis.
- 2.Over replacement of thyroid hormone in treatment of hypothyroidism.
- 3.Autonomously functioning Thyroid adenoma
- 4.Secondary pituitary or hypothalamic hypothyroidism
- 5.Acute psychiatric illness
- 6.Severe dehydration.
- 7.DRUGS: Glucocorticoids, Dopamine, Levodopa, T4 replacement therapy, Anti-thyroid drugs for thyrotoxicosis.




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8.Pregnancy: 1st and 2nd Trimester

LIMITATIONS:

- 1.TSH may be normal in central hypothyroidism, recent rapid correction of hyperthyroidism or hypothyroidism, pregnancy, phenytoin therapy.
- 2.Autoimmune disorders may produce spurious results.

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INTACT PARATHYROID HORMONE (PTH)

INTACT PARATHYROID HORMONE (PTH): SERUM <i>by CLIA (CHEMILUMINESCENCE IMMUNOASSAY)</i>	131.5^H	pg/mL	9.5 - 75.0
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Intpretation:-

Parathyroid hormone (PTH) is produced and secreted by the parathyroid glands, which are located along the posterior aspect of the thyroid gland. The serum calcium level regulates PTH secretion via negative feedback through the parathyroid calcium sensing receptor (CASR). Decreased calcium levels stimulate PTH release. Secreted PTH interacts with its specific type II G-protein receptor, causing rapid increases in renal tubular reabsorption of calcium and decreased phosphorus reabsorption. It also participates in long-term calciostatic functions by enhancing mobilization of calcium from bone and increasing renal synthesis of 1,25-dihydroxy vitamin D, which, in turn, increases intestinal calcium absorption.

The assay is useful for:

- Differential diagnosis of hypercalcemia
- Diagnosis of primary, secondary, and tertiary hyperparathyroidism
- Diagnosis of hypoparathyroidism
- Monitoring end-stage renal failure patients for possible renal osteodystrophy

Interpretation of results:

- An (appropriately) low PTH level and high phosphorus level in a hypercalcemic patient suggests that the hypercalcemia is not caused by PTH or PTH-like substances.
- An (appropriately) low PTH level with a low phosphorus level in a hypercalcemic patient suggests the diagnosis of paraneoplastic hypercalcemia.
- A low or normal PTH in a patient with hypocalcemia suggests hypoparathyroidism.

Low serum calcium and high PTH levels in a patient with normal renal function suggest resistance to PTH action (pseudohypoparathyroidism type 1a, 1b, 1c, or 2) or, very rarely, bio-ineffective PTH.

Elevated PTH value with a normal serum calcium in many cases in India is due to secondary hyperparathyroidism, primary cause being Vitamin D deficiency.



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IMMUNOPATHOLOGY/SEROLOGY
ANTI THYROGLOBULIN ANTIBODIES (ATG)

ANTI THYROGLOBULIN ANTIBODIES (ATG): SERUM	62.3^H	IU/mL	< 10.0
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by CMIA (CHEMILUMINESCENT MICROPARTICLE IMMUNOASSAY)

INTERPRETATION

1. Thyroglobulin is produced only by the thyroid gland and is a major component of the thyroid follicular colloid. Autoantibodies to thyroglobulin (TG autoantibodies) are often present in patients with autoimmune thyroid disease.
2. For diagnostic purposes, anti-TPO results should be used in conjunction with clinical information and other test results. Autoantibodies may be found in less than 10% of the normal population at low levels and in patients with non-thyroidal illnesses, such as the inflammatory rheumatic diseases.

CLINICAL UTILITY

1. Diagnosis of autoimmune thyroid disease and its separation from other causes of thyroiditis.
2. Investigation of cause of goitre. * Follow up of deranged thyroid hormones.
3. Evaluation of thyroid involvement in non thyroid related autoimmune diseases like SLE or RA.
4. Evaluation of cases of pregnancy with autoimmune thyroid disorder like Hashimoto's thyroiditis, Grave's Disease, etc.
5. Assessment of risk of foetal involvement in case of pregnancy with thyroid dysfunction.
6. As a apart of assessment of infertility.

INCREASED LEVELS

1. Mild to moderate- in many thyroid and autoimmune disorders such as thyroid cancer, type I diabetes, rheumatoid arthritis, perenicious anaemia and autoimmune collagen vascular disease.
2. Significantly increased- Hashimoto's thyroiditis and Grave's disease.
3. Higher levels also seen women and with increasing age.

NOTE:

1. Rising levels may be more significant than the stable levels.
2. All these antibodies if present in the mother can increase the risk of thyroid dysfunction in te foetus/ new born.
3. Thyroglobulin antibodies can interfere with assay of thyroglobulin as cancer marker.
4. Serial testing for monitoring should be done by the same laboratory using same methodolog



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TUMOUR MARKER
THYROGLOBULIN

THYROGLOBULIN (Tg): SERUM by CMA (CHEMILUMINESCENT MICROPARTICLE IMMUNOASSAY)	0.61^L	ng/mL	1.7 - 55.0
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INTERPRETATION:

CONDITION	THYROGLOBULIN REFERENCE RANGE
NORMAL INDIVIDUALS	1.70 – 55.00
POST THYROIDECTOMY	0.0 – 9.0

NOTE:

1. This test is not recommended for the diagnosis of Thyroid cancer
2. Presence of Thyroglobulin autoantibodies can interfere in the assay leading to an under estimation of Thyroglobulin levels. Therefore the Thyroglobulin antibody status should be determined when measuring Tg
3. Minimum 6 weeks should elapse post thyroidectomy or thyroid gland ablation prior to testing
4. Thyroglobulin levels may remain elevated for several months following successful cancer therapy. In these cases post treatment baseline values followed by serial determinations are recommended for monitoring.
5. Post thyroidectomy the values of Thyroglobulin (Tg) are between 0-9 ng/mL. After thyroidectomy, Presence of elevated Thyroglobulin (Tg) levels gives an indication of reoccurrence of metastatic disease.

CLINICAL USE:

1. Primarily used as a tumor marker in patients with a diagnosis of Differentiated Thyroid carcinoma (DTC). Tg levels are elevated in both Thyroid, Papillary & Follicular carcinoma
2. Serial measurements of Tg are most useful in detecting recurrence of DTC following surgical resection or radioactive Iodine ablation
3. Aids in the management of infants with Congenital Hypothyroidism
4. Differential diagnosis of Hyperthyroidism. Tg is elevated in all patients with Hyperthyroidism except in cases of Thyrotoxicosis factitia.

INCREASED LEVELS:

1. Thyroid Papillary & Follicular carcinoma
2. Non neoplastic thyroid conditions like Thyroid adenoma, Subacute thyroiditis, Hashimoto's thyroiditis & Graves' disease
3. Regions of Endemic goiter
4. Neonates
5. Third trimester pregnancy

*** End Of Report ***




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