

THYROGLOBULIN

INTRODUCTION

Thyroglobulin (Tg) is used as a tumor marker in patients with differentiated thyroid cancer like Papillary carcinoma, Follicular carcinoma and mixed carcinomas. It is also elevated in several benign conditions and in the serum of normal individuals with a half life of 65 hours. Hence Tg should not be used for screening and diagnosis of thyroid cancer.

NORMAL RANGE

1.7-55.6 ng/mL

CLINICAL USE

- 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
- Serial measurements of Tg are most useful in detecting recurrence of DTC following surgical resection or radioactive Iodine ablation
- Aids in the management of infants with Congenital Hypothyroidism
- Differential diagnosis of Hyperthyroidism. Tg is elevated in all patients with Hyperthyroidism except in cases of Thyrotoxicosis factitia

Risk Assessment in Athyrotic individuals on suppressive therapy

Thyroglobulin in ng/mL	Risk of clinically detectable recurrent Papillary / Follicular carcinoma
<0.1	Minimal risk (<1-2%)
>=0.1-2.0	Low risk
2.1-9.9	Increased risk
>=10.0	Significant risk (>25%)

INTERPRETATION

Increased Levels

- Thyroid Papillary & Follicular carcinoma
- Non neoplastic thyroid conditions like Thyroid adenoma, Subacute thyroiditis, Hashimoto's thyroiditis & Graves' disease
- Regions of Endemic goitre
- Neonates
- Third trimester of pregnancy

HIGH RISK FACTORS FOR THYROID CARCINOMA IN PATIENTS WITH THYROID NODULE

- History of head and neck radiation
- Age <20 or >45 years
- Bilateral disease
- Enlarging neck mass
- Male gender
- Family history of thyroid cancer or MEN 2
- Vocal cord paralysis
- Nodule fixed to adjacent structures
- Enlarged lymph nodes

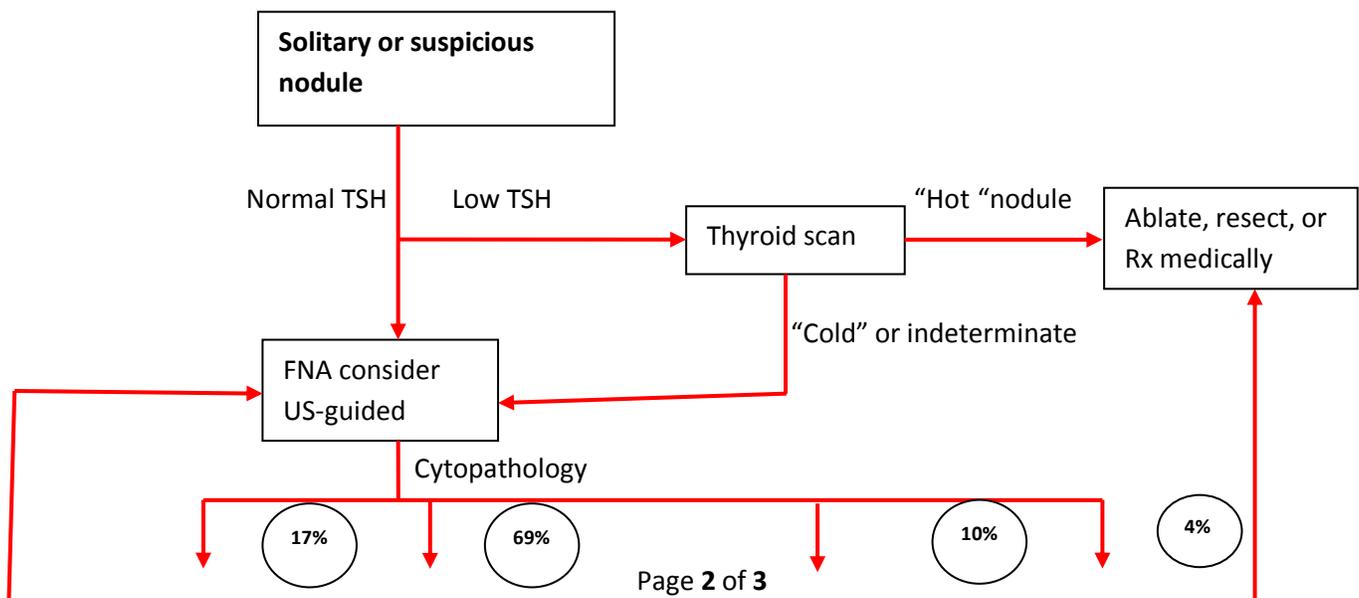
LABORATORY DIAGNOSIS

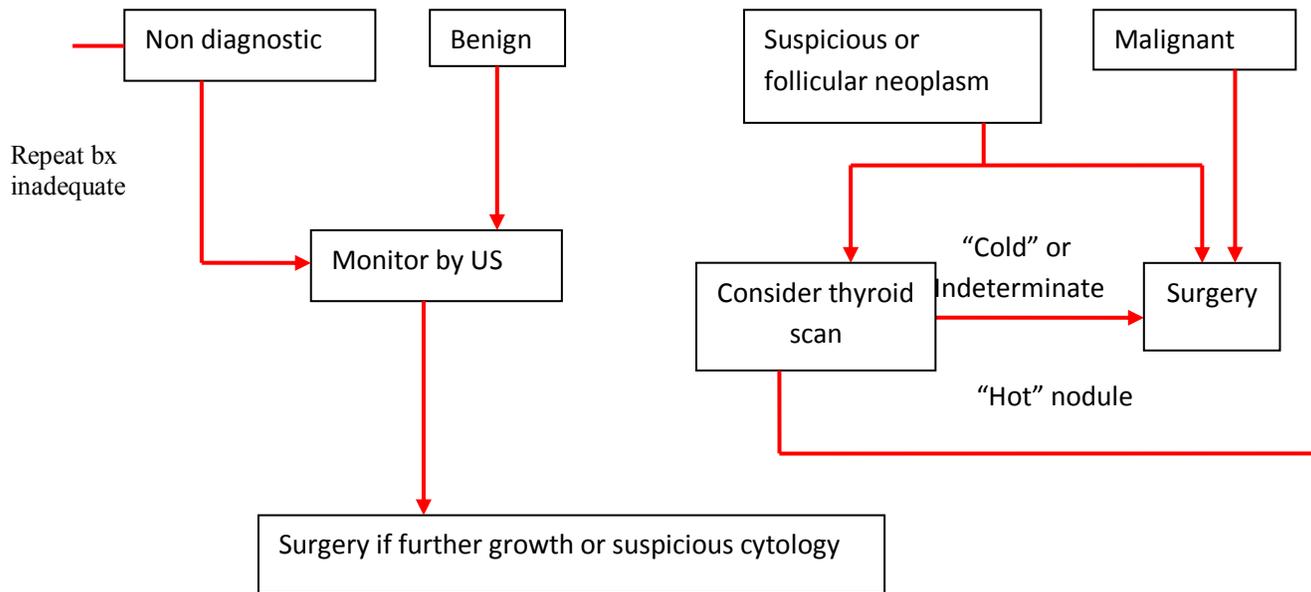
- Fine needle aspiration cytology (FNAC) of Thyroid nodule
- Biopsy
- Ultrasound
- Thyroglobulin levels

MONITORING THYROID CANCER

Following thyroidectomy and / or radioactive iodine therapy, plasma thyroglobulin levels should be undetectable unless residual thyroid tissue or metastatic lesion is present. Discontinue thyroid hormone replacement therapy. Exogenous TSH is administered to the patient which normally stimulates 5 fold increase in thyroglobulin levels if responsive thyroid tissue is present. However if thyroid tumor remnant or well differentiated thyroid tumor is present, TSH stimulates a 10 fold increase in thyroglobulin levels but in case of a poorly differentiated thyroid tumor, TSH stimulates only a 3 fold increase in thyroglobulin levels.

Approach to patient with thyroid nodule





LIMITATIONS

- Not recommended for screening & diagnosis of Thyroid cancer
- 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
- Minimum 6 weeks should elapse post thyroidectomy or thyroid gland ablation prior to testing
- 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