

Utilization of Thyroglobulin Tests in NL

Guideline

American Thyroid Association guideline: Routine measurement of Thyroglobulin (Tg) for initial evaluation of thyroid nodules is not recommended. Tg and Tg antibodies should be assessed longitudinally following thyroidectomy for thyroid cancer.

Practice Points

1. Thyroid cancer is one of the fastest growing cancer diagnoses worldwide. It is three times more likely in women than men.
2. Thyroglobulin is a protein uniquely produced by the thyroid gland. Its level ranges from 3–40 mg/ml in a healthy patient
3. Serum Tg levels can be elevated in most thyroid diseases and are an insensitive and non-specific test for thyroid cancer. Following thyroidectomy, Tg levels will be absent or very low unless thyroid cancer recurs. So, an increase in Tg levels suggests reoccurrence of thyroid cancer.
4. The presence of anti-Tg antibodies, which occur in about 25% of thyroid cancer patients and 10% of the general population will falsely lower serum Tg in immune metric assays. Consequently, both Tg and anti-Tg are ordered at the same time.

Methods (PI: Dr. Jocelyn Law)

1. Results of thyroglobulin tests from 2014 to 2019 were obtained from Eastern Health Biochemistry laboratory and matched with 963 patients in the provincial registry diagnosed with thyroid cancer from 2013 to 2020.
2. Patients with Tg < 0.1 mg/ml were assumed to have had a thyroidectomy in absence of a record of thyroid cancer in the cancer registry.
3. Those tests in patients without thyroid cancer or assumed thyroidectomy were classified as potentially unnecessary if only one Tg test was performed.

Results

- Of 963 thyroid cancer patients 74% were female, 14% were <40 years of age, 55% were 40–64, and 31% were ≥ 65 years.
- 15,618 Tg tests were undertaken in the six years of the study in 4,135 patients.

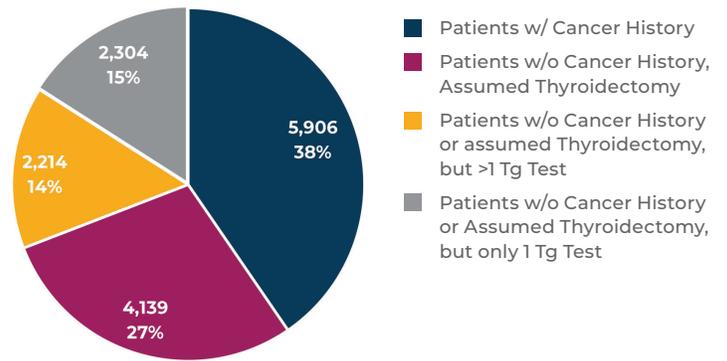


Figure 1. Tg tests in People with Thyroid Cancer, Those Assumed to Have had a Thyroidectomy, and in Those Without Cancer History or Thyroidectomy

- 15% of Tg tests were undertaken once in people without thyroid cancer or assumed thyroidectomy.
- 270 of 963 thyroid cancer patients did not have a Tg test.
- Of patients tested, 56% had a single potentially unnecessary test.

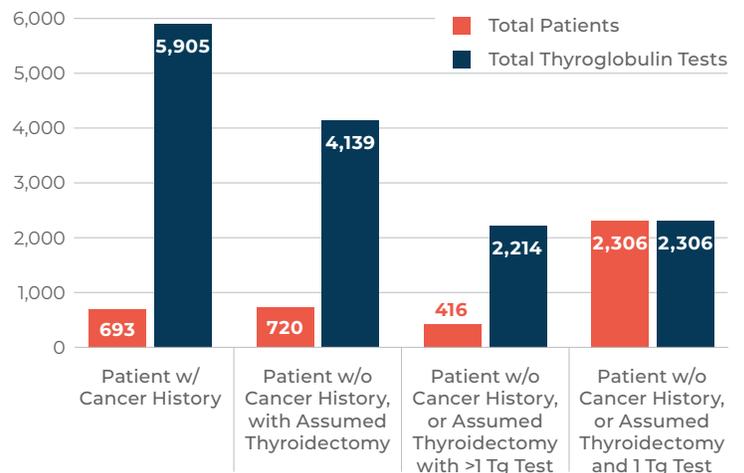


Figure 2. Number of Tg Tests in Those with Thyroid Cancer, Those Assumed to Have had a Thyroidectomy, and in Those with Neither

- The 693 thyroid cancer patients had 8.5 Tg tests/patient, the 720 patients assumed to have had a thyroidectomy had 5.7 tests/patient, the 416 patients with neither, but >1 Tg test had 5.3/patient.
- A limitation is that thyroidectomy can be undertaken for reasons other than differentiated thyroid cancer who do not need a Tg test in follow-up. This unnecessary use is thus unknown.

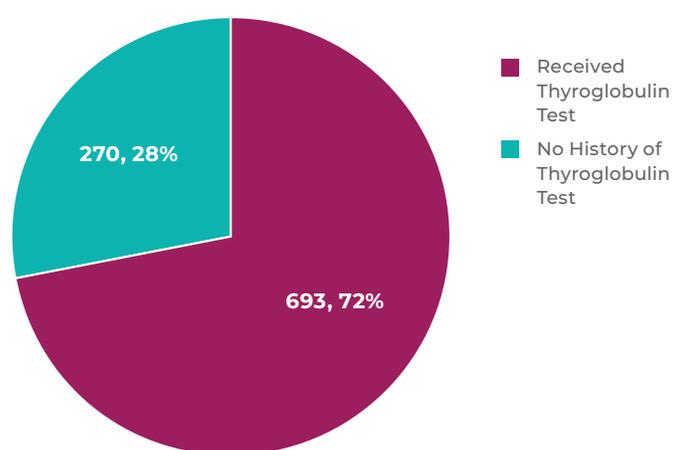


Figure 3. Thyroid Cancer Patients who Had and Did Not Have Tg Tests

- Of 963 patients registered as having had thyroid cancer from 2013–2020, 28% did not have a Tg test.

Conclusions

1. The majority of Tg tests were in patients with registered thyroid cancer or assumed to have a thyroidectomy, or had multiple Tg tests. However, single potential unnecessary Tg testing likely occurred in the majority of patients tested.
2. The absence of Tg testing in 28% of thyroid cancer patients may be related to death, out-migration and lost to follow-up, had a hemithyroidectomy, or another type of thyroid cancer besides differentiated thyroid cancer that did not require Tg monitoring. However the prognosis for thyroid cancer is very good (90% survival at 10 years) limiting the impact of death on potential under-utilization. This data suggest under-utilization of Tg testing in some thyroid cancer patients may have occurred.