

Enhanced Primary Care Pathway: Thyroid Nodules

1. Focused summary of Thyroid Nodules relevant to Primary Care

Thyroid nodules may be found during a physical examination or incidentally on imaging of the neck. The majority of thyroid nodules are benign, however, approximately 5% may be malignant.

General examination of the thyroid gland may be a part of the routine physical examination, however risk factors for thyroid malignancy include a history of head and neck radiation, a family history of thyroid cancer or rare inherited diseases such as MEN- 2. In these patients a baseline thyroid ultrasound would be warranted to screen for thyroid cancer.

Differential diagnosis of thyroid mass noted on physical examination include a thyroglossal duct cyst, thyroid hemorrhagic cyst, lymph nodes or a parathyroid adenoma. A dedicated thyroid ultrasound is the first line test for differentiation of a thyroid mass. Final work up will be determined by the results of the ultrasound and clinical picture.

Thyroid nodule guidelines recommend that a thyroid/neck ultrasound be conducted on all patients with a suspected thyroid nodule or goiter or an incidental abnormality of the thyroid gland noted on another imaging modality (e.g. MRI, CT, PET scan etc.). The ultrasound report should characterize the nodule by outlining the following features: size, location, composition, echogenicity, margins, calcifications, shape if taller than wide and vascularity. Based on the American Thyroid Association guidelines, these features should then be summarized in the report in the form of risk stratifying each nodule for malignancy and guiding FNA decision making.

2. Checklist to guide your in-clinic review of the patient with a thyroid nodule

- Absence of red flag features (change in voice or hoarseness, difficulty swallowing or dysphagia, rapid growth, obstructive symptoms, stridor)
- Assess for risk factors for malignancy (history of head and neck radiation, a family history of thyroid cancer or rare inherited diseases such as MEN-2)
- Clinical assessment of **patient** to determine if hyperthyroid, hypothyroid (uncommon) or euthyroid and request TSH
- Clinical assessment of **nodule** (fixed vs. mobile, tender, cervical lymph nodes, skin changes)
- Dedicated thyroid ultrasound requesting malignancy risk stratification based on the American Thyroid Association guidelines

3. Links to additional resources for physicians and patients

For physicians:	American Thyroid Association guidelines www.thyroid.org/
	Link to Endo website: www.calgaryendocrinology.com
	American Association of Clinical Endocrinologists, American College of Endocrinology, and Associazione Medici Endocrinologi Medical Guidelines for Clinical Practice for the Diagnosis and Management of Thyroid Nodules – 2016 Update: www.aace.com/files/thyroid-nodule-guidelines.pdf
For patients:	www.mythyroid.com
	Up to date Patient Education: Thyroid nodules (Beyond the Basics) www.uptodate.com/contents/thyroid-nodules-beyond-the-basics

4. Clinical flow diagram with expanded detail

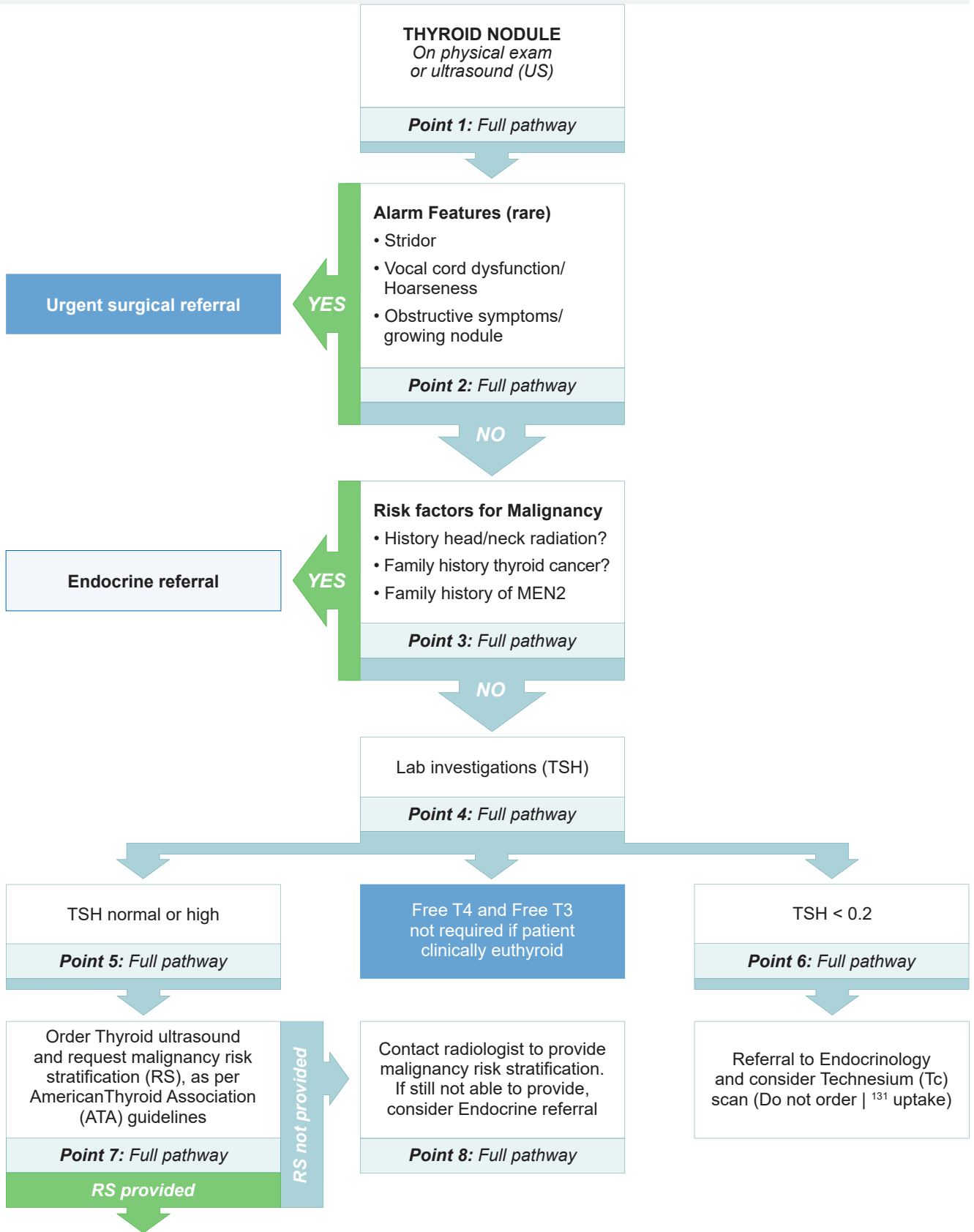
This AHS Calgary Zone Pathway has been developed with consideration of the most current evidence based clinical guidelines for diagnosis and management of Thyroid Nodules from both Endocrinology and Primary Care literature.

The following is a best-practice clinic pathway for the management of Thyroid Nodules in the primary care medical home. Included is a flow diagram and expanded detail explanation to determine which nodules may be followed in the primary care medical home and which require referral and specialist management.

THYROID NODULE PATHWAY

Specialist LINK | Local: 403.910.2551 | Toll free: 1.844.962.5465 (LINK) | www.specialistlink.ca

THYROID NODULE REFERRAL | Fax: 403.403.955.8634



Further management as outlined by malignancy risk stratification

Point 9: Full pathway

ATA U/S PATTERN	ATA risk of cancer	Recommended action
High suspicion	> 70% - 90%	<ul style="list-style-type: none"> ■ If ≥ 10 mm: Endocrinology referral + biopsy recommended ■ If < 10 mm: U/S surveillance in 6-12 months, Endocrinology referral to be considered. If increase in size or features on monitoring, refer to Endocrinology
Intermediate suspicion	10% - 20%	<ul style="list-style-type: none"> ■ If ≥ 10 mm: Endocrinology referral + biopsy recommended ■ If < 10 mm: U/S surveillance q 12 months, <u>No</u> Endocrinology referral
Low suspicion	5% - 10%	<ul style="list-style-type: none"> ■ If ≥ 1.5 cm: Optional FNA, U/S follow up in 12-24 months. Endocrinology referral could be considered ■ If < 1.5 cm: U/S surveillance q 24 months. <u>No</u> Endocrinology referral
Very low suspicion	< 3%	<ul style="list-style-type: none"> ■ Clinical follow-up and U/S in 2 years ■ If ≥ 2 cm and growing: Optional biopsy, follow up U/S in 12 months, or consider Endocrinology referral ■ If < 2 cm: Routine clinical follow up only

Table 6, Fig. 2 p. 14 American Thyroid Association (ATA) guidelines. Thyroid 26(1) 2016.

* If biopsy required for further work up of the nodule, a community ultrasound guided biopsy by radiology may be ordered at the same time as Endocrine referral or biopsy will be done/ordered at initial Endocrine appointment

1. Thyroid nodule on physical exam or ultrasound:

Commonly thyroid nodules are found incidentally on physical exam of the neck or imaging of the neck (US, CT or MRI). The presence of a thyroid nodule should be confirmed with a dedicated ultrasound of the neck and thyroid as this will help to characterise the nodule and detect any other associated nodules or lymph nodes.

2. Alarm features:

When a thyroid nodule or other neck mass is noted, it is important to screen for alarm features or red flags (although rare). These include: stridor, that may suggest compression of the airway; hoarseness, that may suggest compression of the vocal cords by the lesion (a poor prognostic sign); or dysphagia that may suggest compression of the esophagus. Other concerning features include obstructive symptoms or a rapidly growing nodule (may suggest an aggressive malignancy or hemorrhage into a mass).

3. Risk factors for Thyroid Cancer

While most cases of papillary thyroid cancer (PTC) are spontaneous, there are several risk factors that increase an individual's risk. These include a history of head or neck radiation (e.g. treated for lymphoma at a younger age) or **radiation** fallout from power plant accidents or nuclear weapons (e.g. Chernobyl, Fukushima etc.)

There are several hereditary conditions that are associated with an increased risk of **papillary thyroid cancer**.

1. Cowden syndrome
2. Familial Adenomatous Polyposis
3. Carney complex, type 1
4. Familial non-medullary thyroid carcinoma (strong family history of papillary thyroid cancer)

There are several hereditary conditions that are associated with an increased risk of **medullary thyroid cancer**.

About 2 out of 10 **medullary thyroid carcinomas** (MTCs) are hereditary. The combination of MTC and tumors of other endocrine glands is called multiple endocrine neoplasia type 2 (MEN 2). In MEN 2a, MTC occurs along with pheochromocytomas and with parathyroid gland adenomas. In MEN 2b, MTC is associated with pheochromocytomas and with benign neuromas. This subtype is much less common than MEN 2a.

4. Laboratory investigation:

When investigating a thyroid nodule a TSH should be requested at baseline. This helps to distinguish if a nodule is non-functional, which the majority are, or possibly functional (i.e. hot). A TSH alone is a good screen for baseline thyroid function and if >0.2 with a clinically euthyroid patient, there is a high probability that the free T4 will be normal and therefore does not need to be ordered. If a TSH is <0.2 there is a possibility the nodule is functional (i.e. hot) (see Step 6).

5. TSH normal or elevated:

A normal or elevated TSH is suggestive of a non-functional adenoma. The risk of malignancy in a non-functional adenoma is approximately 5%. Therefore, if the TSH is normal or elevated and the nodule meets criteria for a biopsy, a fine needle aspiration under ultrasound guidance should be arranged. A technicium (Tc) thyroid scan is not needed in these cases.

6. TSH <0.2

A TSH below 0.2 (despite values between 0.1-0.2 being within the normal range) may indicate that the thyroid nodule is functional (i.e. hot; shows increased uptake of technicium or radioactive iodine). The risk of malignancy in functional (i.e. hot) nodules is very low.

A technicium (Tc) thyroid scan provides a qualitative picture of radioiodine distribution within the gland. If there is increased uptake in the area of the nodule (correlated with the ultrasound findings) with suppression of iodine uptake elsewhere this is in keeping with a functional (i.e. hot) nodule.

In an otherwise non suspicious nodule, biopsy of a hyperfunctional / hot nodule is not indicated. The follicular cells in a hot nodule may be interpreted as highly abnormal as they can resemble thyroid cancer cells when seen under the microscope. However, hot nodules that are suspicious (e.g., irregular borders) should be considered for possible biopsy via fine needle aspiration.

7. U/S guided biopsy.

Ultrasound guided biopsies are recommended for several reasons:

- a) In nodules that have both a cystic and a suspicious solid component, ultrasound helps to ensure that the suspicious solid component of the nodule is biopsied.
- b) Ultrasound allows for visualization of the needle and surrounding structures (eg. carotid artery, jugular vein and associated lymph nodes)

8. If malignancy risk stratification is not provided on U/S, please contact radiology group to provide a detailed report of each nodule's risk for malignancy as outlined above. If the radiologist is unable to provide risk stratification for thyroid cancer, consider Endocrinology referral for recommendations. This will allow a specific patient plan to be formulated with consideration of the current ATA guidelines, thus ensuring appropriate further investigation, follow up and management of patients.

9. Using the American Thyroid Association thyroid nodule ultrasound malignancy risk stratification as a guide, patients with the sole recommendation of clinical and U/S follow up may continue to be managed in the medical home without the need for specialist referral.