Primary Care Pathway: Thyroid Nodules

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Important note: The Thyroid Nodule Pathway was established in 2018 and requires updating to reflect recent changes in thyroid nodule risk stratification. While we work on these revisions, providers may continue using this as a general management guide alongside recommendations from thyroid ultrasound reports (using TIRADS risk scores), thyroid cytology, and ThyroSPEC molecular reporting.

For assistance interpreting thyroid nodule reports or management recommendations, please contact Specialist Link Endocrinology.

1. Thyroid nodule

Thyroid nodule discovered via physical exam or ultrasound

2. Check for alarm features

- Stridor
- Vocal cord dysfunction / hoarseness
- Obstructive symptoms / growing nodule

Specialist Link: Endocrine surgery or otolaryngology

Yes → Urgent surgical referral

No

3. Risk factors for malignancy

- History head/neck radiation?
- Family history thyroid cancer?
- Family history of MEN2

Yes → Endocrine referral

No

4. Lab investigations (TSH)

When investigating a thyroid nodule, a TSH should be requested at baseline.Free T4 and Free T3 not required if patient clinically euthyroid

- TSH normal or high → Order Thyroid ultrasound and request risk stratification (RS), as per American Thyroid Association guidelines
  - RS not provided → Contact radiologist to provide risk stratification. If not able to provide, consider Endocrine referral
  - RS provided
- TSH < 0.2 → Referral to Endocrinology and consider Technesium (Tc) scan

5. Further management

As outlined by malignancy risk stratification

High suspicion > 70% - 90%	Intermediate 10% - 20%	Low 5% - 10%	Very low < 3%
■ 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	■ If ≥ 10 mm: Endocrinology referral + biopsy recommended ■ If < 10 mm: U/S surveillance q 12 months, No Endocrinology referral	■ 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. No Endocrinology referral	■ 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

* 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

PATHWAY PRIMER

- 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.

CHECKLIST

- 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

EXPANDED DETAILS

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). Consider calling Specialist Link tele-advice (otolaryngology or endocrine surgery).

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. Lab investigations

- 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).
- **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.
- **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 nonsuspicious 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.
- **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 (e.g. carotid artery, jugular vein and associated lymph nodes)

- 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.
- 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.

BACKGROUND

About this pathway

- 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.
- This pathway is intended to provide evidence-based guidance to support primary care providers in caring for patients within the medical home.

Authors and conflict of interest declaration

- This pathway was reviewed in 2018. Names of participating reviewers and their conflict of interest declarations are available on request.

Pathway review process, timelines

- Primary care pathways undergo scheduled review every three years, or earlier if there is a clinically significant change in knowledge or practice.

Copyright information

DISCLAIMER

This pathway represents evidence-based best practice but does not override the individual responsibility of health care professionals to make decisions appropriate to their patients using their own clinical judgment given their patients' specific clinical conditions, in consultation with patients/alternate decision makers. The pathway is not a substitute for clinical judgment or advice of a qualified health care professional. It is expected that all users will seek advice of other appropriately qualified and regulated health care providers with any issues transcending their specific knowledge, scope of regulated practice or professional competence.

PROVIDER RESOURCES

Advice options

Non-urgent advice is available to support family physicians.

- In the Calgary Zone, specialistlink.ca connects family physicians and specialists in real time via a tele-advice line. For thyroid nodules, endocrine surgery and otolaryngology tele-advice services are available. Family physicians can request non-urgent advice online at specialistlink.ca or by calling **403-910-2551**. The service is available from 8 a.m. to 5 p.m. (with some exceptions), Monday to Friday (excluding statutory holidays). Calls are returned within two hours.
- Not-urgent electronic advice is available across the province via Alberta Netcare eReferral eConsult (responses are received within five calendar days). Visit the eReferral Learning Centre for more information.

For physicians:	American Thyroid Association guidelines www.thyroid.org/
	Link to Endocrinology 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

PATIENT RESOURCES

For patients:	www.mythyroid.com
	Up To Date patient education: Thyroid nodules (Beyond the Basics) www.uptodate.com/contents/thyroid-nodules-beyond-the-basics