

Otterbein University

Digital Commons @ Otterbein

Nursing Student Class Projects (Formerly MSN)

Student Research & Creative Work

Summer 7-20-2018

Papillary Thyroid Carcinoma

Nicolette Vanaman

nicolette.vanaman@gmail.com

Follow this and additional works at: https://digitalcommons.otterbein.edu/stu_msn



Part of the [Nursing Commons](#)

Recommended Citation

Vanaman, Nicolette, "Papillary Thyroid Carcinoma" (2018). *Nursing Student Class Projects (Formerly MSN)*. 284.

https://digitalcommons.otterbein.edu/stu_msn/284

This Project is brought to you for free and open access by the Student Research & Creative Work at Digital Commons @ Otterbein. It has been accepted for inclusion in Nursing Student Class Projects (Formerly MSN) by an authorized administrator of Digital Commons @ Otterbein. For more information, please contact digitalcommons07@otterbein.edu.

Papillary Thyroid Carcinoma (PTC)

Nicolette Vanaman, RN, BSN

Otterbein University, Westerville, Ohio

Background

"The thyroid gland sits in the middle of the neck around the windpipe. It makes a hormone called thyroid hormone, which is important for many metabolic functions" (Jin, J., 2017, p. 1920). Papillary thyroid carcinoma is the most common type of malignancy within the endocrine system. It accounts for 60,220 new cases each year and in 2013 in the United States, it accounted for an estimated 1,850 deaths. (McCance, Huether, Brasher, & Rote, 2014) There are 4 classifications of thyroid carcinoma. Papillary carcinoma which is what we will be discussing accounts for about 85% of all thyroid carcinomas, follicular carcinoma accounts for 10-15%, medullary or (MTC) only accounts for about 5% of thyroid carcinomas, but it is the most aggressive and deadly form of thyroid carcinoma. (Chernock & Hagemann, 2015) Lastly, anaplastic is so rare it doesn't even account for 1% of thyroid carcinomas. (Aldrink & Hoffman, 2018) Working with a general pediatric surgeon that performs thyroidectomies weekly due to this common malignancy was one of the main reasons papillary thyroid carcinoma was the topic chosen.

Pathophysiological Processes

Thyroid carcinoma is typically found by either the patient or primary care physician that palpates a small nodule on the thyroid gland. Thyroid nodules are common findings within the general public and a majority of the nodules found are usually benign. (Nguyen, Huang, Park, Khullar, & Plodkowski, 2015) A thyroid nodule is a lump or cluster/growth of cells in the thyroid which is located in the anterior portion of the neck. About 5% of thyroid nodules are malignant. (Nguyen, Huang, Park, Khullar, & Plodkowski, 2015) Another way these are found are by incidental metastatic tumor findings that usually occur in the lymph nodes, lungs, brain, or bone. (McCance, Huether, Brasher, & Rote, 2014)

Underlying Pathophysiology

Thyroid cells become cancerous when genetic abnormalities occur causing them to mutate. Some of these abnormalities include environmental factors such as radiation exposure. (Rehan, K., 2014) Once these gene mutations occur they make the cells grow and multiply. These cancerous cells do not die and continue to grow and spread. Once they have grown and multiplied in that area they then can travel and attack healthy cells of other parts of the body such as the lymph nodes. (Rehan, 2014) Many researchers hypothesize that changes in certain genes such as the RET gene or the BRAF gene cause the thyroid cells to abnormally divide and this may be the cause of PTC. (Rehan, 2014)

- RET/PTC Gene:** mutations of the RET/PTC gene account for 10-30% of PTC patients. (Rehan, 2014)
 - More common in children and people exposed to radiation
- BRAF Gene:** mutations of the BRAF gene are found in 30-70% of patients.
 - Less common in children
 - Many believe these mutations cause more aggressive cancers that metastasize. (Rehan, 2014)

Significance of Pathophysiology

The significance of these pathophysiological processes is important for many reasons. One of the main reasons understanding the pathophysiological process is for the treatment and cure of thyroid carcinoma. Early detection and diagnosis is key for papillary thyroid carcinoma. For stage I and stage II PTC, survival rate is nearly 100%. Delayed presentation and diagnosis can result in more aggressive cancerous cells that metastasize to lymph nodes, brain, bones and lungs. Understanding the cells that undergo metaplasia and rapidly divide and grow can help surgeons make the decision for the best treatment options. Total thyroidectomies have a high survival rate if caught early due to the ability to remove the entire gland and stop the proliferation process of the cells.

Understanding the genes that undergo mutations most likely causing some cases of PTC can help with early detection with family histories. In return we as caregivers can decrease the amount of radiation as much as possible for the patients with positive family histories and the gene mutations.

Signs & Symptoms

- Palpable thyroid nodule
- Painless nodule
- Hard consistency
- Average size of < 5cm
- Moves with trachea when swallowing
- Tight or full feeling in their neck
- Signs of hoarseness when talking

(Somasunder, 2018)
Figure 1. Papillary Thyroid Carcinoma Pathology

Pathophysiology	
Papillary thyroid carcinoma	
➤ GROSS	<ul style="list-style-type: none"> Soft, firm, hard, cystic. Solitary / multinodular Contain brownish black fluid
➤ Microscopy	<ul style="list-style-type: none"> Nuclear grooves Orphan Annie eye nuclei → characteristic Psoanomma bodies (50%)
➤ Spread	<ul style="list-style-type: none"> Slowly progressive and less aggressive Spread through lymphatics Most commonly to lungs followed by bone, liver and brain Blood spread less often

(Healthlove.in, n.d.)

Risk Factors

- Family history of thyroid cancer
- Family history of goiters
- Whole body radiation
- Exposure to high levels of radiation (Rejan, 2014)

Characteristics of PTC

- Peak onset ages 30-50 years old
- More common in women than men, 3:1 ratio
- Prognosis is related to tumor size and age
- < 1.5cm is a good prognosis
- < 55 years old have a much better prognosis
- PTC is most commonly due to radiation exposure
- > 50% of the cases exposed to radiation will have metastases to the lymph nodes (Clayman, G., 2018)

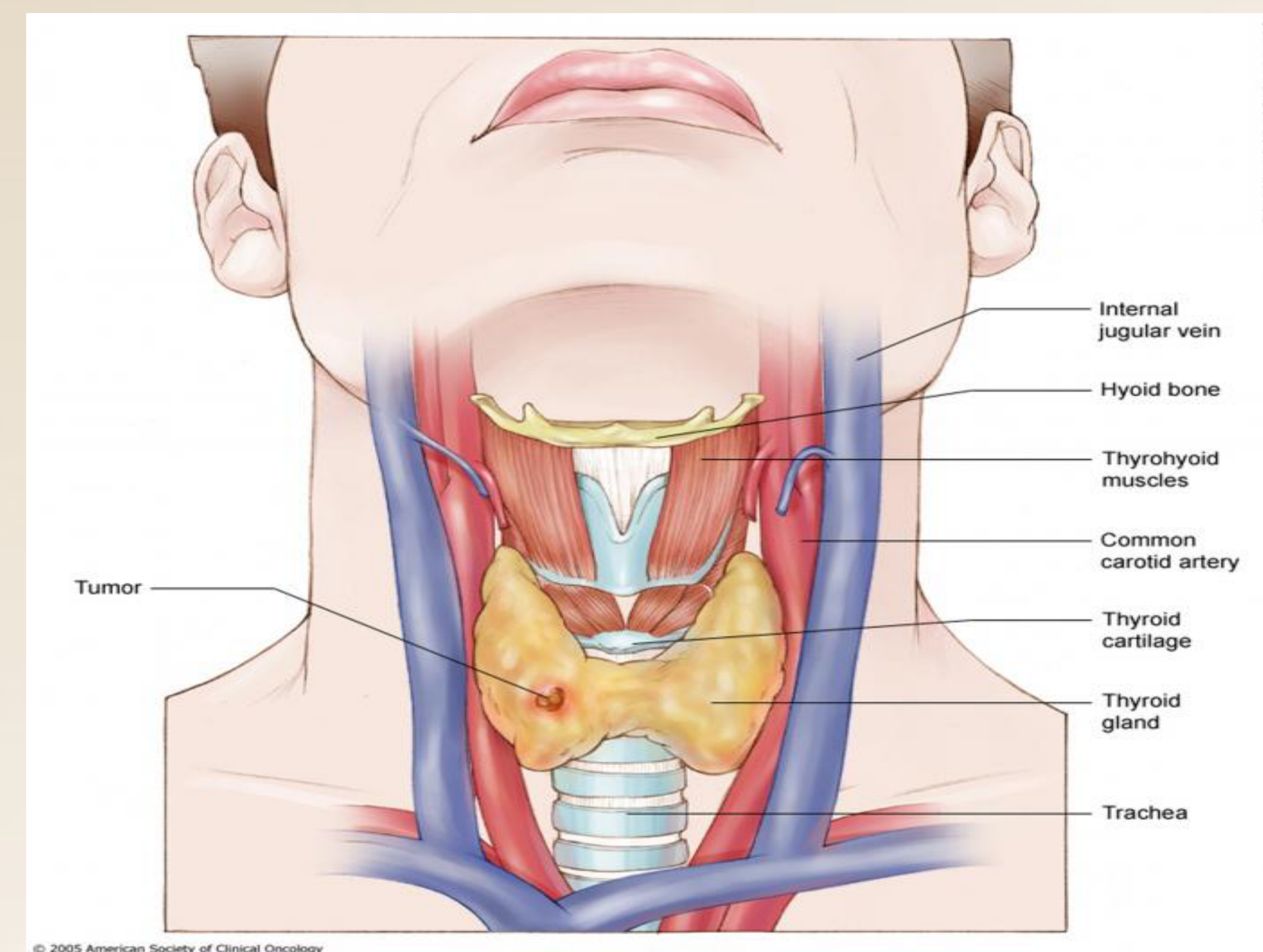
Diagnostic Workup

Once a thyroid nodule is found, these are the next steps to take for diagnostic purposes.

- Serum Thyroid-Stimulating Hormone or (TSH) level
- Thyroid and neck ultrasound (US)
- Abnormal TSH and US then lead to a thyroid uptake scan.
 - Hot: hyperfunctioning nodule
 - Cold: nonfunctioning nodule
- Cold nodules then require a fine needle aspiration or FNA

(Nguyen, Lee, Huang, Khyllar, & Plodkowski, 2015)

Figure 2. Neck dissection showing thyroid cancer within the thyroid



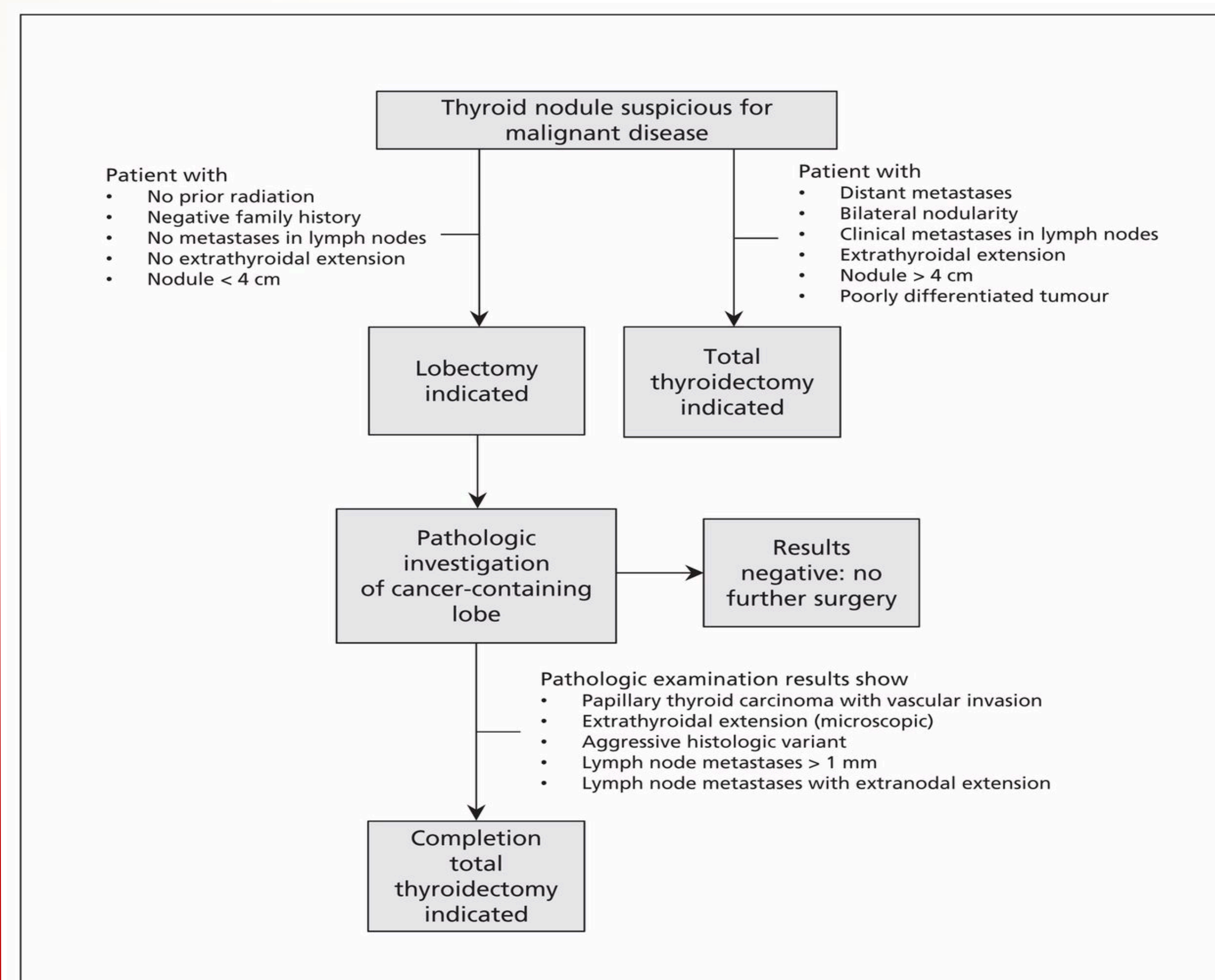
© 2005 American Society of Clinical Oncology
Cancer.net <https://www.cancer.net/cancer-types/thyroid-cancer/stages>

Treatment

- Radioactive iodine treatment
- Surgery
 - Total Thyroidectomy
 - Hemithyroidectomy or lobectomy

A total thyroidectomy is recommended for treatment because 5-10% of thyroid cancer recurrences are found in the contralateral lobe, meaning the other lobe that was not removed now also had PTC. If the whole thyroid is removed it decreases the risk of recurrence. (Nguyen, et al., 2015)

Figure 3. Treatments for thyroid nodules



(Kluijfhout, W., Rotstein, L., & Pasternak, J. (2016)

Nursing Implications

Early detection and diagnosis is key for a favorable prognosis in PTC. As an advance practice nurse, palpating the thyroid gland is part of the advance practice nurses head to toe assessment. During the head to toe assessment the APN should palpate the anterior aspect of the neck as well as the surrounding lymph nodes within the neck and behind the ears. Findings of a nodule or enlarged lymph nodes could prompt further diagnostic testing. APN's should be able to palpate for nodules and enlarged lymph nodes and then make appropriate referrals to either endocrinology or surgery. If the APN works within one of those subspecialties they would then need to know which diagnostic tools to use to diagnose PTC and then refer to surgery based on US and the uptake scan. Findings of PTC are highly curable if caught early. It is the responsibility of the APN to assess, diagnose and treat appropriately if any abnormalities are found on a physical exam.

Figure 4. 75 year old female with PTC



(The human protein atlas, n.d.)

Conclusion

- Although not a common type of cancer, PTC is the most common type of endocrine cancer
- More women than men are diagnosed with PTC
- Thyroid carcinoma is currently the 6th most common malignancy diagnosed in women. (Tuttle, et al., 2010)
- High survival rate at nearly 100% for stage I and stage II
- Total thyroidectomies are the recommended treatment for patients diagnosed with PTC after a FNA.
- Long term care/follow up is required for these patients as they will need to replace their calcium supplements due to no longer having a thyroid.

Figure 5. Papillary thyroid cancer*

Stage	5-Year Relative Survival Rate
I	near 100%
II	near 100%
III	93%
IV	51%

(American Cancer Society, 2016)

References

- Chernock, R., & Hagemann, I. (2015). Molecular pathology of hereditary and sporadic medullary thyroid carcinomas. *American Journal of Clinical Pathology*, 143(6), 768-777. doi: 10.1309/AJCPHWAC1TUYJ7DD
- Hoffman, R. P., & Aldrink, J. H. (2018). Thyroid Lump! What next? *Nationwidechildrens surgical grand rounds*. Powerpoint presentation
- Jin, J. (2017). Screening for thyroid cancer. *Journal of American Medical Association*, 317(8), 1920. doi: 10.1001/jama.2017.5254
- Nguyen, Q. T., Lee, E. J., Huang, M. G., Park, Y. I., Khullar A., & Plodkowski, R. A. (2015). Diagnosis and treatment of patients with thyroid cancer. *American Health and Drug Benefits*, 8(1), 30-40. PMC4415174
- Somasundar, P. S. (2018). Papillary Thyroid Carcinoma. *Medscape*. Retrieved from: <https://medscape.medscape.com/article/282276-overview#5>
- Tuttle, R. M., Ball, D. W., Byrd, D., Dilawari, R. A., Doherty G. M., Duh, Q., Ehya, H., . . . Wirth, L. J. (2010). Thyroid Carcinoma. Clinical practice guidelines in oncology. *National comprehensive Cancer Network*, 8(11), 1228-1274. doi: 10.6004/jncn.2010.0093

Additional Sources

- American Cancer Society. (2016). Thyroid Cancer survival rates by type and stage. Retrieved from: <https://www.cancer.org/cancer/thyroid-cancer/detection-diagnosis-staging/survival-rates.html>
- Cancer.net (2018). Thyroid Cancer: Stages. *ASCO*. Retrieved from: <https://www.cancer.net/cancer-types/thyroid-cancer/stages>
- Clayman, G. (2018). Papillary Thyroid Cancer, Symptoms, treatments, and prognosis for papillary thyroid carcinoma. *Endocrineweb*. Retrieved from: <https://www.endocrineweb.com/conditions/thyroid-cancer/papillary-cancer>
- Healthlove.in. (n.d). Papillary Thyroid Carcinoma Pathology. Retrieved from: <http://healthlove.in/thyroid/papillary-thyroid-carcinoma-causes-symptoms-prevention-treatment/attachment/papillary-thyroid-carcinoma-pathology/>
- Kluijfhout, W. P., Rotstein, L. E., & Pasternak, J. D. (2016). Well- differentiated thyroid cancer: Thyroidectomy or lobectomy? *CMAJ*, 188(17-18), 517-520. doi: <https://doi.org/10.1503/cmaj.160336>
- Rehan, K. M. (2014). Papillary Thyroid Cancer Causes and Risk Factors. *Endocrineweb*. Retrieved from: <https://www.endocrineweb.com/conditions/thyroid-cancer/papillary-thyroid-cancer-causes>
- The Human Protein Atlas. (n.d). Thyroid cancer. Retrieved from: <https://www.proteinatlas.org/learn/dictionary/pathology/thyroid+cancer+2/detail+1+magnification+1>



OTTERBEIN
UNIVERSITY