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Evaluation of Thyroid Nodules in Primary Care

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Disclosure Information

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Evaluation of Thyroid Nodules in Primary Care

- **FINANCIAL DISCLOSURE:**
 - I have no financial interest related to this presentation.
- **UNLABELED/UNAPPROVED USES DISCLOSURE:**
 - No unlabeled or unapproved uses for medications will be covered in this presentation.

Objectives

1. Distinguish between benign nodules from those that are malignant or highly suspicious for malignancy
2. Design an initial diagnostic plan of care for the patient who presents with a thyroid nodule
3. Evaluate laboratory and radiologic exams to determine appropriate follow-up and referral of the patient with benign or malignant thyroid nodule

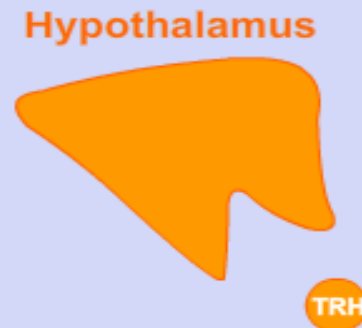
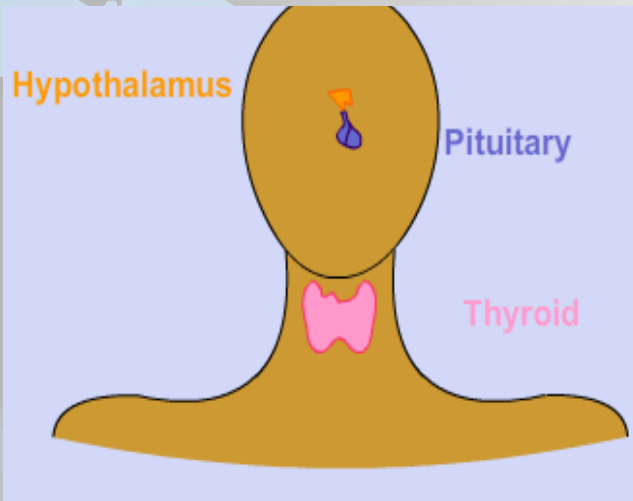
You just found a thyroid mass during a routine evaluation for a sore throat

What now???

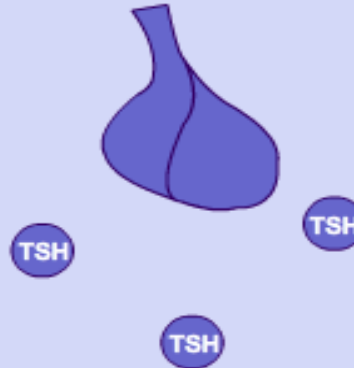


Image: Microsoft clip art

A & P: Hypothalamic-Pituitary-Thyroid Axis

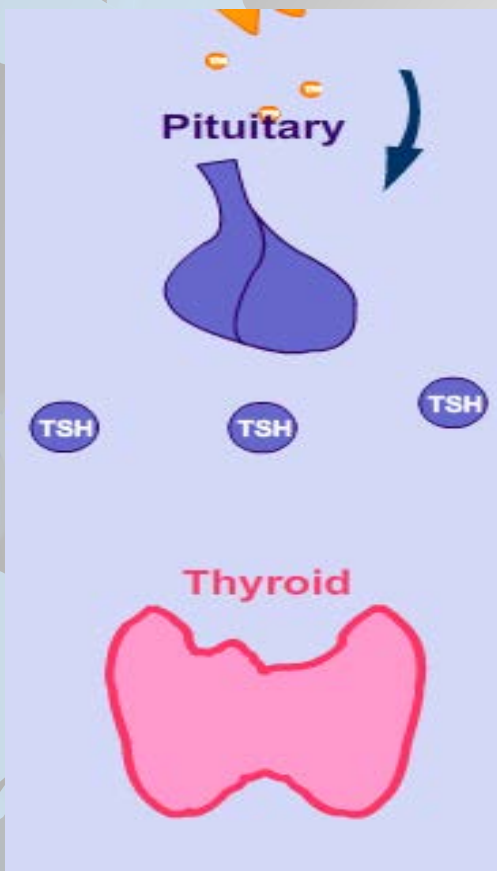


TRH
Pituitary

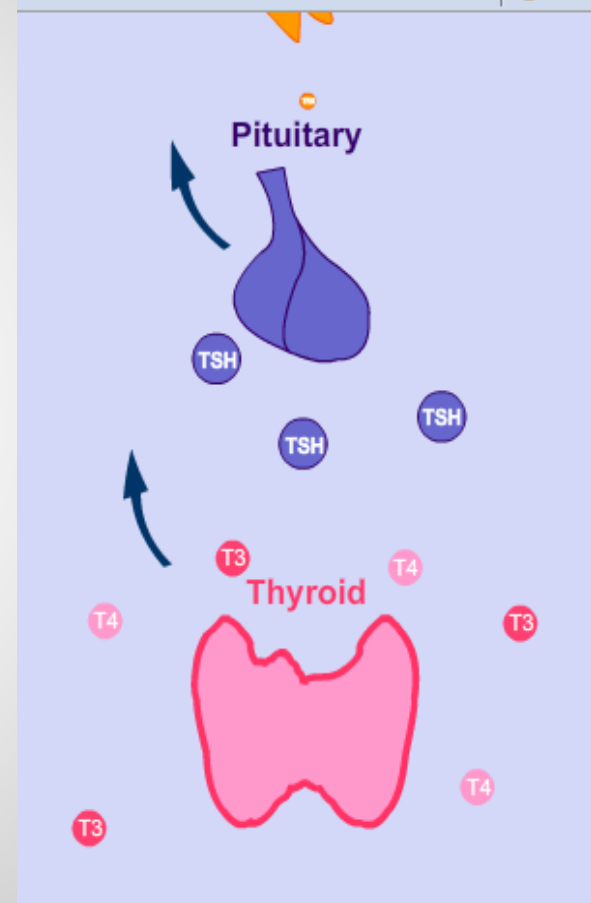


TRH from Hypothalamus stimulates Pituitary Gland to produce TSH

A & P: Hypothalamic-Pituitary-Thyroid Axis

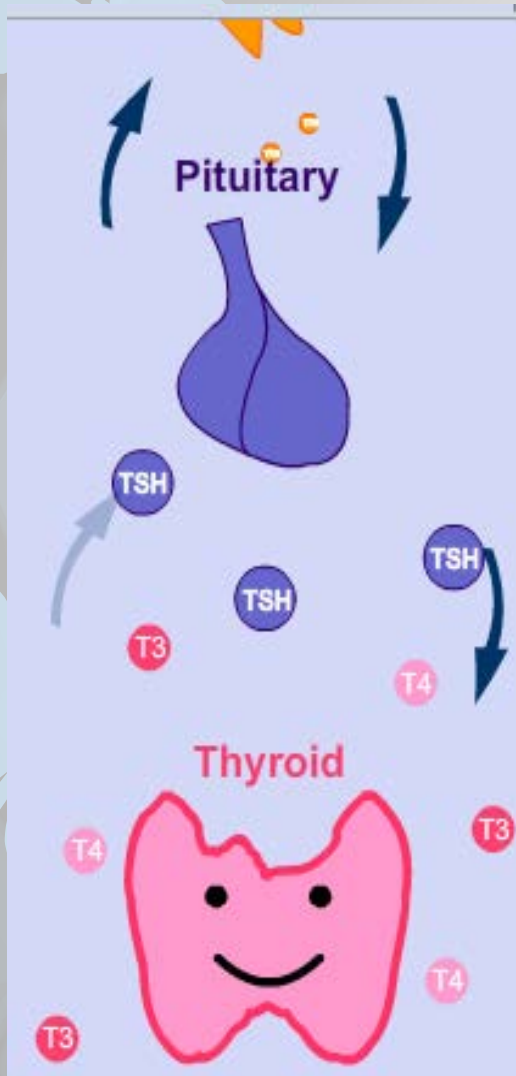


TSH from Pituitary stimulates Thyroid Gland to produce T_3 and T_4



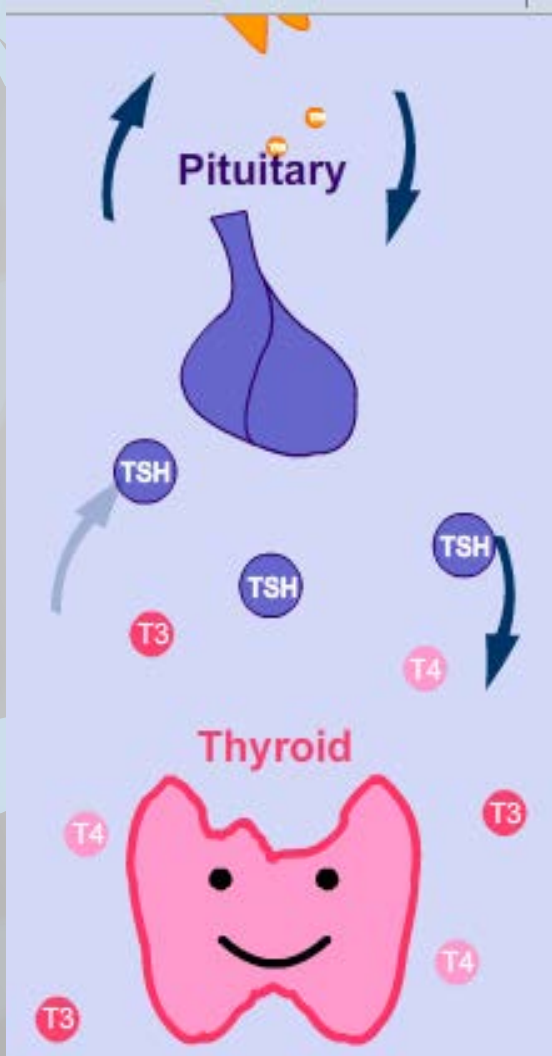
A & P:

Hypothalamic-Pituitary-Thyroid Axis



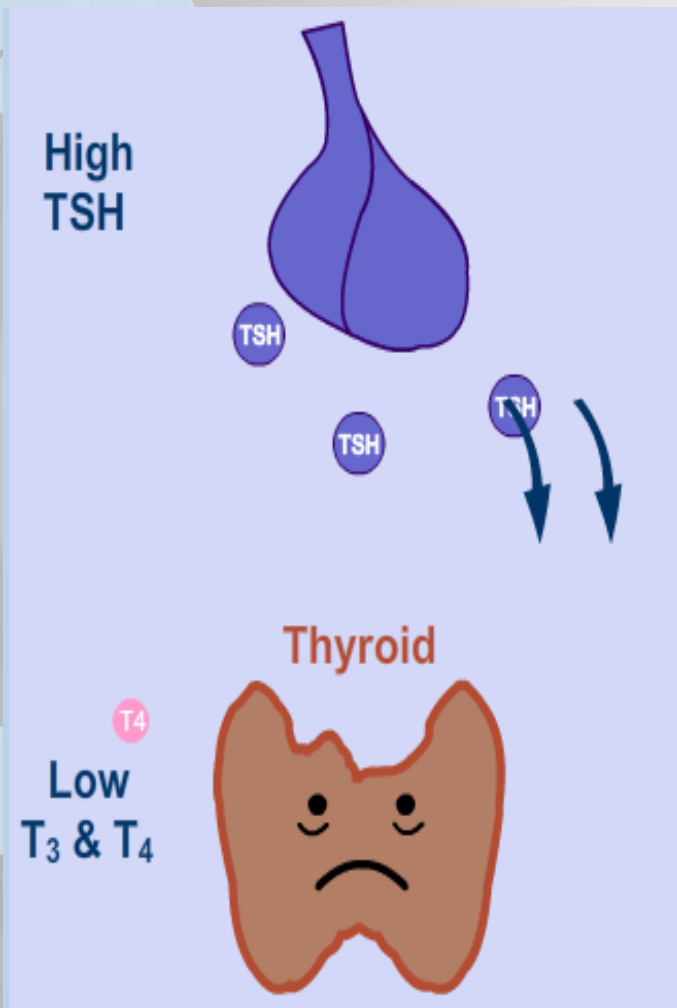
- Circulating T₃ & T₄ feed back to Hypothalamus & TRH ↓
- Without TRH, Pituitary TSH ↓
- Without TSH, Thyroid T₃ and T₄ ↓
- Peripheral conversion of T₄ to T₃

Physiology - Euthyroid



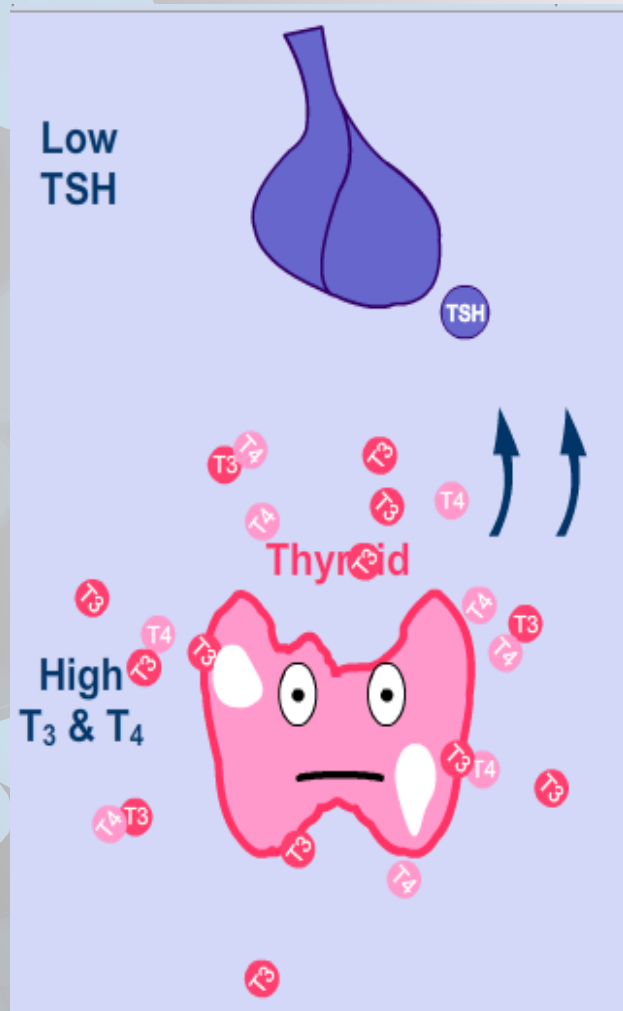
- T3 and T4 in balance
- Negative Feedback System
 - works similar to home heater thermostat

Pathophysiology- Hypothyroid



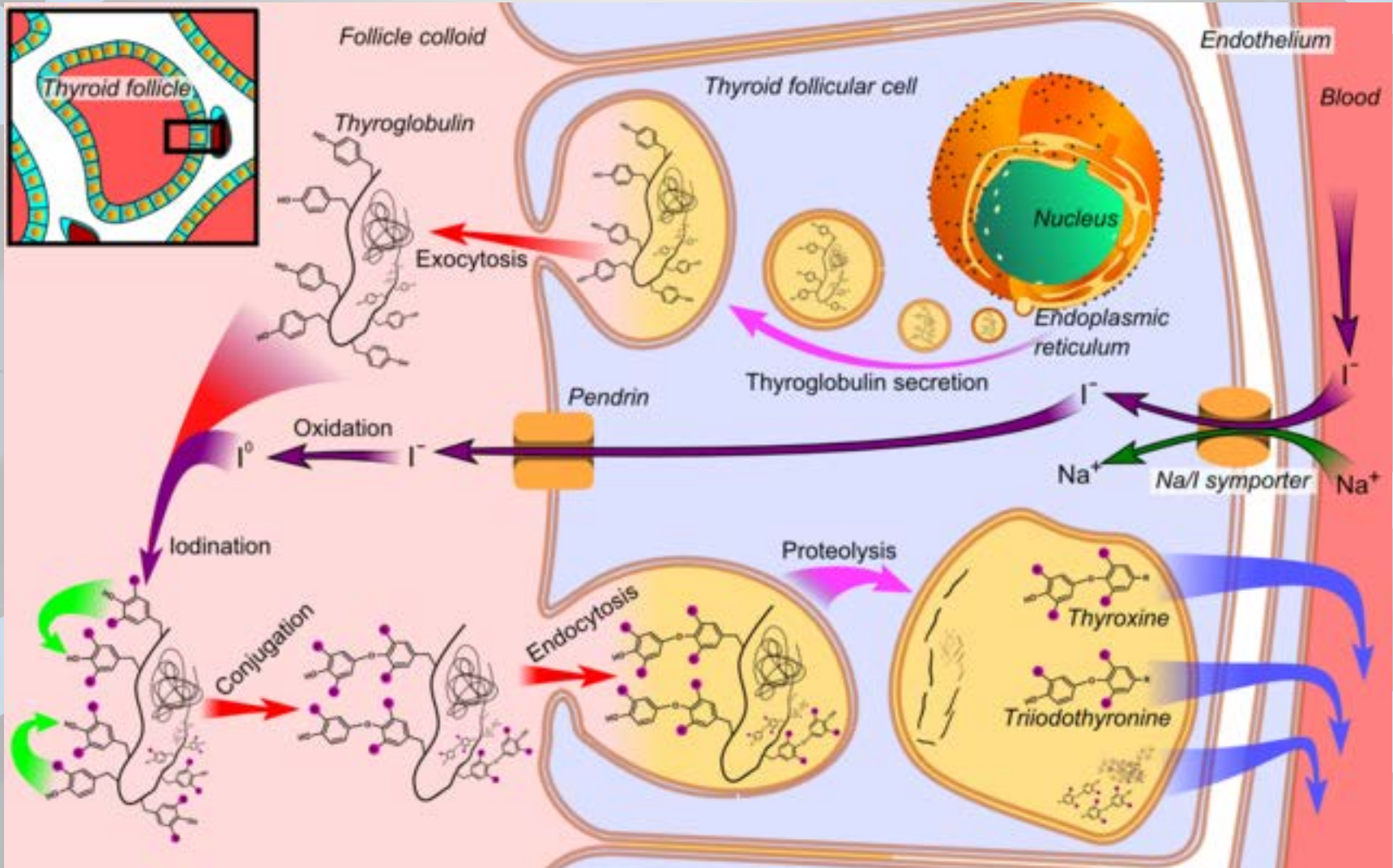
- Inadequate T_3 & T_4
- Pituitary Gland produces more & more TSH (TSH \uparrow)
- Cause somatic symptoms: slow, dry

Pathophysiology - Hyperthyroid

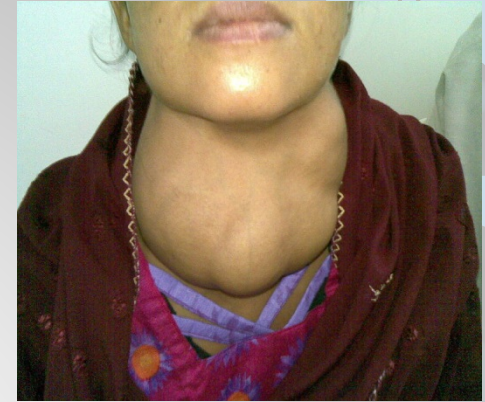


- Overactive gland or nodule
- Too much T_3 & T_4
 - Feeds back to Hypothalamus & Pituitary Gland
 - Turns off the TSH

Thyroglobulin, Iodine & T₃ & T₄



Neck Mass



- Goiter
 - Diffusely enlarged thyroid gland
 - Could be multi-nodular
 - Iodine deficiency
- Nodules: benign vs malignant
 - Hyperactive nodule: fx independently from TSH stim. – rarely cancer
 - Hypoactive nodule – more likely to be malignant

History to Gather

- Palpable mass or non-mobile
- Dysphasia/Hoarse Voice
- Childhood exposure to ionizing radiation
- FH – Thyroid cancer or Multiple Endocrine Neoplasm

Physical Exam

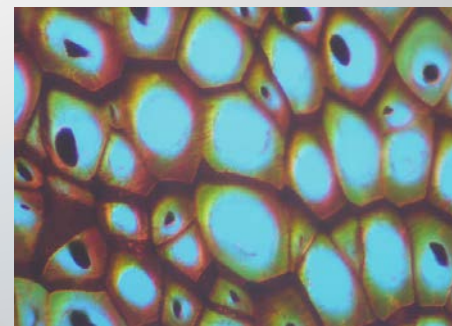
- Thyroid evaluation – posterior approach
- Cervical lymph nodes



Image: OSCEumbrella [youtube.com/watch?v=exGgjm55Stw](https://www.youtube.com/watch?v=exGgjm55Stw)

Diagnostic Tests

- Blood
- Radiologic
- Cytology & Tissue



AHRQ Rating Scheme: Strength of Recommendations

Rating	Definition
A	Strongly recommends. Can improve important health outcomes. Well-designed, well-conducted studies
B	Recommends. Can improve important health outcomes.
C	Recommends. Based on expert opinion.
D	Recommends against. Based on expert opinion.
E	Recommends against. Does not improve health outcomes or harms outweigh benefits.
F	Strongly recommends against. Does not improve health outcomes or harms outweigh benefits.
I	Recommends neither for nor against. The panel concludes that the evidence is insufficient to recommend for or against

Adapted from: AHRQ, 2009

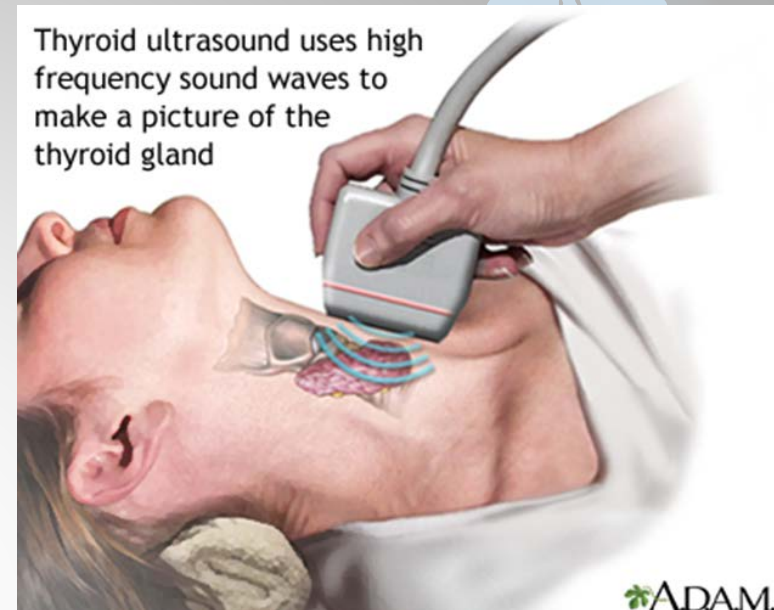
Serum studies

- **TSH***
- T_3 & T_4
- Thyroglobulin
- Anti-Thyroglobulin antibodies

* **Strong supporting evidence**

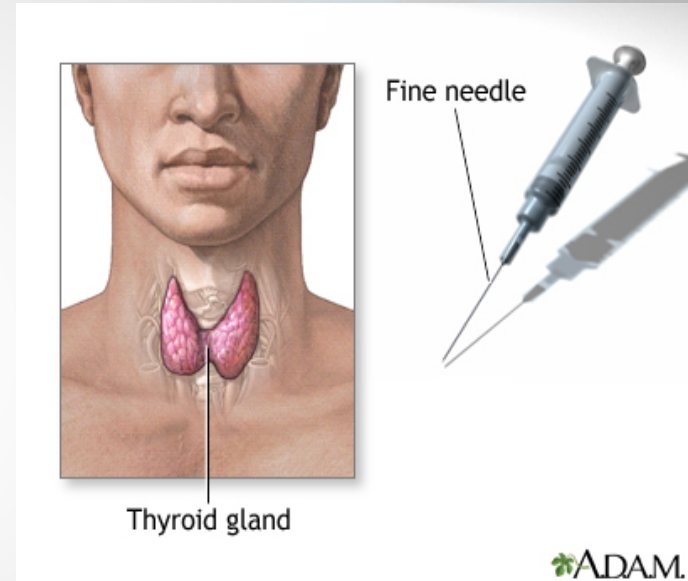
Radiologic studies

- Thyroid Ultrasound
 - Presence, size & location
 - Benign vs suspicious features
 - Suspicious lymph nodes
- Radionuclide scan – “hot vs cold”
 - Hyperfunctioning – malignancy rare
 - Hypofunctioning – malignancy more common



Cytologic & Tissue Exams

- FNA
 - Benign
 - Malignant
 - Non-Diagnostic
 - Thyroidectomy
- Tissue Biopsy
 - General or HEENT surgeon



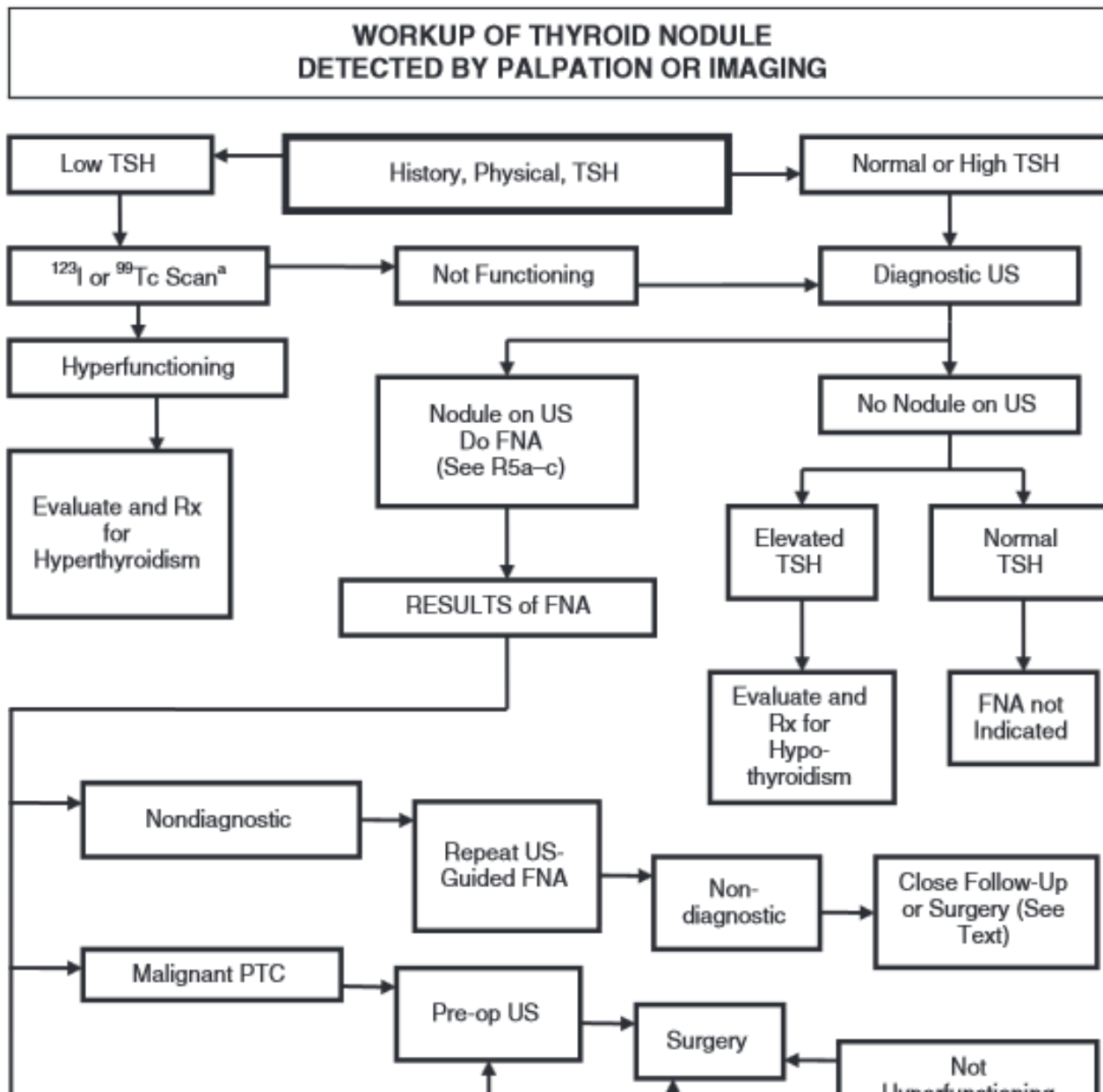
Case Study /Work-up a nodule



- Subjective
 - 45 y/o female c/o sore throat x 2d
 - No other sx's
 - No voice change, dysphagia, or noticeable mass
 - Hx of routine dental & orthodontic x-rays in childhood
 - No FH thyroid or endocrine cancer

Case Study (continued)

- Objective
 - Palpable 1cm nodule over left side of thyroid.
 - No cervical lymphadenopathy
 - TSH – 1.4 (0.4 - 4.0 mIU/L)



Source: Cooper et. al, 2009

Benign Nodules

- Thyroid Adenomas
- Hyperplastic Nodules
- Thyroid Cysts
- Thyroiditis
 - Hashimotos (autoimmune)
 - Sub-acute (viral, post partum)
 - Suppurative (abscess)

Treatment of Benign Nodules

- Correct any deficiencies/infection
 - Iodine intake
 - Hyper or hypo thyroid
- Hyperfunctioning nodule
 - Medical tx, Ablation
- Thyroiditis
 - Hyperthyroid may become hypothyroid

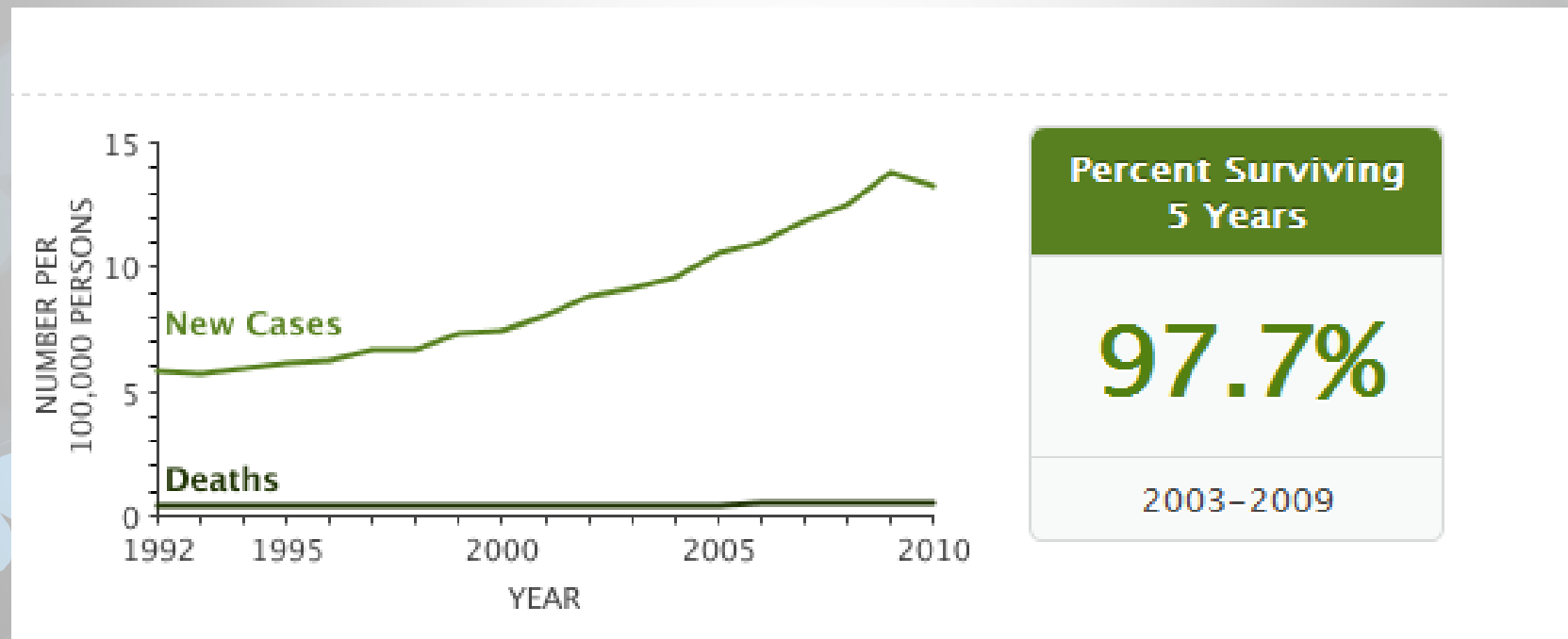
Referral & Follow-up: Benign Nodule

- Endocrinology Referral
- Serial UTZ 6-18 mos after 1st FNA
 - Stable size: F/U 3-5 years
 - Increase in size: Rpt FNA w/UTZ, if persistent: Surgery
 - Recurrent cystic nodules: Surgery

Thyroid Cancer on the Rise

Rising Rates – 60,000 estimated new cases in 2013

More women affected than men



Source: SEER, National Cancer Institute

Malignant Thyroid Carcinomas

- Papillary: 86%
- Follicular: 9%
- Medullary: 2%
- Anaplastic: 1%

Source: National Cancer Institute

Referral & Follow-up:

Malignant, Suspicious or Indeterminate Disease

- Endocrinology
- Surgery Referral
 - General Surgery
 - HEENT Surgery

Treatment of Thyroid Cancer

- Surgery
 - Lobectomy or near-total/total thyroidectomy
 - Central-compartment & lateral neck dissection
 - Completion thyroidectomy
- Radioactive Iodine 131 Ablation (RAI)
 - Low Iodine Diet prior to I 131

Treatment (continued)

- TSH suppression therapy
- External beam irradiation
- Chemotherapy (currently not recommended)
- Surgical resection of metastases
- Referral to clinical trials

F/U Medullary & Anaplastic TC

- Endocrinology to manage
- Much more complicated F/U
- High rate of metastasis
- Higher mortality rate
- More complex surgeries and neck dissections – trach

Case Study Continues...



- Three years later
- Insurance change
- Patient returns to your office S/P near-total thyroidectomy, taking levothyroxine

Image: Microsoft clip art

Follow up

- Positive for Papillary Carcinoma
- TSH: 0.08 (0.4 – 4.0)
- Thyroglobulin (TG): undetectable
 - Suppressed vs non-suppressed
- Ultrasound: WNL

Long Term Follow-up Papillary and Follicular TC

- TSH suppression
- Cervical Ultrasound F/U
- Periodic Thyroglobulin levels
 - Suppressed vs non-suppressed
 - Recombinant human thyrotropin (rhTSH)-mediated therapy
- Iodine ¹³¹ body scan

TSH suppression

- Decreased risk of recurrence
- Hypothyroid range ($<0.1\text{mUL}$)
- Levothyroxine (T_4) recommended
 - Long half life
 - Use same brand
 - May have brand at generic price
- Triiodothyronine (T_3)

Thyroglobulin (Tg) & Tg Antibodies

- Tg from functioning thyroid tissue
 - Post thyroidectomy & RAI, s/b zero
- Tg antibodies artificially lower Tg levels
- Suppressed vs non-suppressed Tg
 - Test while taking T_4 (suppressed)
 - Recombinant human thyrotropin (rhTSH)-mediated therapy

Ultrasound & Body Scan

- UTZ of neck & lymph node eval
- Whole Body Scan I ¹³¹

Follow-up of Low Risk Patients Follicular and Papillary TC

- Consultation with endocrinology
- Continued TSH suppression
 - Use T₄ to suppress TSH <0.1
- Annual UTZ
- Tg & anti-Tg antibodies q6-12 mos
 - Should remain undetectable & neg

Referrals: Professional & Patient

- www.thyca.org/download/document/239/downloads.pdf
- www.cancer.gov/cancertopics/wyntk/thyroid.pdf

Free Patient Resources

www.thyca.org



Do you or someone you know have

Thyroid Cancer?

ThyCa's free services can help.

- One-to-One Support
- Support Groups
- Award-Winning Web Site
- Downloadable Low-Iodine Cookbook
- Newsletters
- Awareness brochures
- Thyroid Cancer Awareness Month
- Workshops
- Conferences

Ask us for free materials.

Visit www.thyca.org E-mail thyca@thyca.org

Call 1-877-588-7904

ThyCa: Thyroid Cancer Survivors'
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A national non-profit 501 (c)(3) organization of thyroid cancer
survivors, family members, and health care professionals.



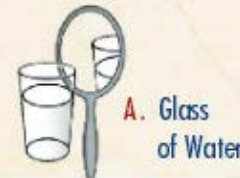
POWER OF  PREVENTION®

HOW TO TAKE THE THYROID

Neck Check™

WWW.POWEROPREVENTION.COM

ALL YOU WILL NEED IS



A. Glass
of Water



B. Handheld
Mirror

References

- AHRQ. (2009). Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. Available at: <http://www.guideline.gov/content.aspx?id=15606>
- Cooper, D. S., Doherty, G. M., Haugen, B. R., Kloos, R. T., Lee, S. L., Mandel, S. J., Mazzaferri, E. L., . . . Tuttle, R. M. (2009). Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid*, 19(11). Available at: <http://www.thyca.org/download/document/409/DTCguidelines.pdf>

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