Hyperthyroidism and Hypothyroidism: PBL

David Schneider, MD, FAAFP

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David Schneider, MD, FAAFP

Faculty Physician/Team Leader/Didactics Director/Procedures Director Santa Rosa Family Medicine Residency; Professor of Family and Community Medicine, University of California-San Francisco, School of Medicine

Dr. Schneider cares for the underserved in Santa Rosa, CA, serving Latino, Southeast Asian, and Eritrean populations. His professional interests include the doctor-patient relationship, clinical skills, and teaching the breadth and depth of family medicine for over 20 years. Cardiovascular system conditions are one of his specialty topics, and he points to “the growing body of evidence suggesting that lifestyle is as effective as, or more effective than, pharmacologic interventions in primary prevention.” He also focuses on conditions of the endocrine system (especially thyroid), skin and dermatology, primary prevention focusing on lifestyle, and procedures. Dr Schneider is board certified not only in Family Medicine, but also in Integrative Holistic Medicine. He produces Dr. Dave’s To Your Health segments for Wine Country Radio and BlogTalkRadio.com.

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Learning Objectives

1. Practice applying new knowledge and competencies gained from hyper/hypo-thyroidism sessions, and receive feedback from expert faculty.
2. Interact collaboratively with peers to solve complex and challenging case-study scenarios.
3. Develop problem-solving skills that promote effective reasoning to manage hyper/hypo-thyroidism within the context of professional practice.

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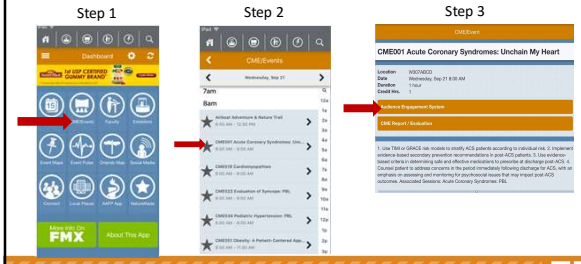
Audience Engagement System

Step 1 Step 2 Step 3



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Chief Complaint: Ms B.K.

- 77 yo Sikh woman (from Punjab) c/o anxiety in July 2015.

History of Present Illness

- 77 yo Sikh woman visits a physician in Ludhiana, Punjab, India, where she lives. She reports anxiety and increased fear.

Past Medical History

- Previously diagnosed by physician in Ludhiana w/depression & anxiety.
- PMH o/w neg.
- PSH neg.

Medications, Allergies

- No meds at this time.
- NKA.

Family History

- "Negative," per Dr in Ludhiana.

Social History

- Never smoked.
- No ETOH.
- Both prohibited in Sikhism.

Review of Systems

- Per chart from India (w/translation from daughter):
  - No chest pain, no SOB.
  - Feels hot.
  - Nothing else documented.

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Physical Examination

- Per chart, w/translation from daughter:
  - Eyes, ears = WNL.
  - Goiter of neck.
  - Lungs & heart WNL.
  - No edema.

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Laboratory/Radiology

- TSH = 0.05 (low).
- Free T4 = 41 pmol/L (high—nl range = 10-23).

- Diagnosis? Further testing needed?

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Hyperthyroidism

- Suppressed TSH + high FT4.

- What is the most likely cause of her hyperthyroidism?

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Hyperthyroidism

- Young (women): Graves' disease.
  - Diffusely enlarged thyroid.
- Older (women): toxic multinodular goiter.
  - Irregular goiter, asymmetric exam, nodules, etc.

- No US. TMNG more likely in our 77 yo.
- Treatment options?

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Hyperthyroidism Treatment

- Symptomatic: β-blockers (all equivalent).
- Decrease hormone synthesis:
  - **Surgery: near-total or total thyroidectomy.
  - Radioiodine therapy.
  - Long-term thionamide.
    - Which would you choose?

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Our Pt's Choice

- Symptomatic Rx propranolol.
- Chronic thionamide.
  - Carbimazole.
    - Used in Europe & Asia.
    - Metabolized completely to methimazole ➔ interchangeable.
    - 40% higher dose vs MMI to yield identical MMI dose.

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Our Pt's Management

- Carbimazole 5 mg bid (= 7.1 mg MMI).
- No further MD visits noted in India.
  - Comments?
- Feb 2016: cholecystectomy in India.
  - No thyroid testing available, no notes, ? if done.
  - Uneventful recovery.

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Start All Over

- 4/2016: pt moves to Santa Rosa to live w/daughter.
- 6/15/16: pt presents to our ED c/o progressive SOB, constipation, urinary frequency, nocturia.
  - No dysuria.
  - Occ cough, no fever.

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6/15/16 ED Visit

- Meds:
  - Carbimazole 5 mg, taking 3-4 daily.
  - Propranolol 40 mg, taking ½ - 1 bid.
  - Clonazepam 0.5 mg prn anxiety.
  - Sertraline 25 mg daily.
  - Pantoprazole 20 mg daily.
  - Domperidone SR.
- Comments?

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Physical Examination

- BP 160/80, T=97.9, P=70, R=20, SpO2=98%.
- 52.2 kg.
- CV/pulm/chest: WNL.
- Abd WNL.

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Laboratory/Radiology

- EKG WNL. Rate = 66.
- Chem panel WNL except:
  - Cr = 1.01/GFR = 53.
  - T pro = 9.0 (6.4-8.2). Alb @ LLN = 3.5.
- NT-pro-BNP WNL. Trop neg.
- UA WNL.

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Laboratory/Radiology

- CBC ➔ borderline anemia: Hgb = 11.7 (12-15.5), Hct = 36.1 (36.0 – 47).
- CXR: RLL subsegmental atelectasis vs scar.
- TSH = 58.

- Comments? Suggestions for management?

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ED Plan #1

- Dx hypothyroidism, unspecified (E03.9).
- Add levothyroxine 100 mcg daily.

- Comments?

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ED Plan #1 Comments

- In pts over 70 or those w/CV dz, begin w/low dose LT4, 25 – 50 mcg daily.
- Otherwise, can begin near target dose of ~ 1.6-1.8 mcg/kg/day.
- Other options for this pt? Add liothyronine (=T3 = Cytomel®)?

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ED Plan #1 Comments

- Pt is still on carbimazole!!
- Excess carbimazole (methimazole =MMI in US) can cause hypothyroidism.
- Don't add T3—diagnostic confusion!

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Return to ED 6/21/16

- Different ED MD (FP residency trained), but seen both times by our R3 on ED rotation.
- c/o SOB, but constipation has improved in LT4.
- Sleep has improved on melatonin.
- Tired, weak, no change since 6/15.
- Anxiety, "choking" sensation around neck.

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6/21/16 ED Visit: Meds

- Meds:
  - Carbimazole 5 mg, taking 3-4 daily.
  - Propranolol 40 mg, taking ½ - 1 bid.
  - Clonazepam 0.5 mg prn anxiety.
  - Sertraline 25 mg daily.
  - Pantoprazole 20 mg daily.
  - Domperidone SR.
  - Levothyroxine 100 mcg daily.

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Physical Examination #2

- BP 124/60, T=97.9, P=72, R=16, SpO2=98%.
- 59.0 kg.
- Sl fullness in thyroid area.
- CV/pulm/chest: WNL.
- Abd WNL.

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Laboratory/Radiology #2

- EKG WNL. Rate = 76.
- Chem panel WNL except:
  - Cr = 0.96/GFR = 57.
  - T pro = 8.9 (6.4-8.2). Alb borderline = 3.4.
- CBC unchanged.
- CXR unchanged.

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Laboratory/Radiology #2

- TSH 8.84.
- Comments?

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ED Plan #2

- Dx hypothyroidism, unspecified (E03.9).
- Discontinue carbimazole.
- Thyroid US ordered by ED Dr.
- Comments?

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Initial Presentation to FHC

- 6/23/16, ED F/U initial visit: pt w/anxiety.
  - Gen=A & O, flat affect.
  - Neck=supple, L thyroid larger, no mass.
  - Heart & lungs WNL.
- Sertraline increased to 50 mg daily.

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Subsequent FHC Visits

- 7/7/16: eye irritation (art tears) + clonazepam refill.
- 7/19/16: "URI sx." Cough, productive, worsening, HA, no sick contacts. Azithro for bronchitis, nonresolving.

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Establish Care Visit w/New PCP (R2)

- 7/25/16: anxiety & SOB increasing. + palpitations. Feels terrible. ED info reviewed, labs ordered.
  - CBC unchanged.
  - Chem panel ~ WNL, Cr = 0.84/GFR=67.

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New Info—7/25/16

- TSH ordered that day = 0.02.
- Free T4 = 4.0 (0.8-1.8).
- Lipids:
  - Tot = 93.
  - LDL = 17.
  - HDL = 24.
  - TG's = 258.
- Discussion.

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Intrinsic + Iatrogenic Hyperthyroidism!

- At 7/25 visit, before results returned, reduce LT4 by ½.
- Thyroid US showed multinodular goiter, most of very low suspicion, 1 low suspicion & >1.5 cm.
- Plan thyroid nuclear scan when pt off meds.
- 8/2, few days after results returned, D/C LT4.

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Next Steps

- Thyroid nodule FNA planned (sorry, no time for the full thyroid nodule talk now).
- 8/16: pt to ED, Dx PNA & + IGRA (Quantiferon Gold) received that morning.
  - Pt Dx's w/TB, + smear, full cultures pending.
  - TSH 0.01 in ED – but acutely ill & hospitalized!

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Follow-Up

- Pt being treated for TB, cultures pending.
- 8/31/16: TSH = 0.01, FT4 = 2.9 (0.8-1.8).
- 9/2: pt started on MMI 5 mg bid.

- Comments?

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Comments

- MMI doses up to 15-20 mg can/**should** be given **once** daily.
- Responded well to low-mod dose of carbimazole in past, low dose is a good starting point here.
- Scan not done – TNMG presumed. OK?

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Diagnostic Certainty?

- Occam's Razor: "Among competing hypotheses, the one with the fewest assumptions should be selected." ➔ try to fit everything into 1 Dx.
- Schneider's Shaver: "What vertebrate has 4 wings & flies?" ➔ **2 birds**. 1 Dx doesn't always fit the diagnostic info.

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Questions?

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Contact Info

- David Schneider, MD
- Work email: schneid2@sutterhealth.org

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Associated Sessions

- Hyperthyroidism and Hypothyroidism: I Heat Up, I Cool Down

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Interested in More CME on this topic?

aafp.org/fmx-endocrine

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