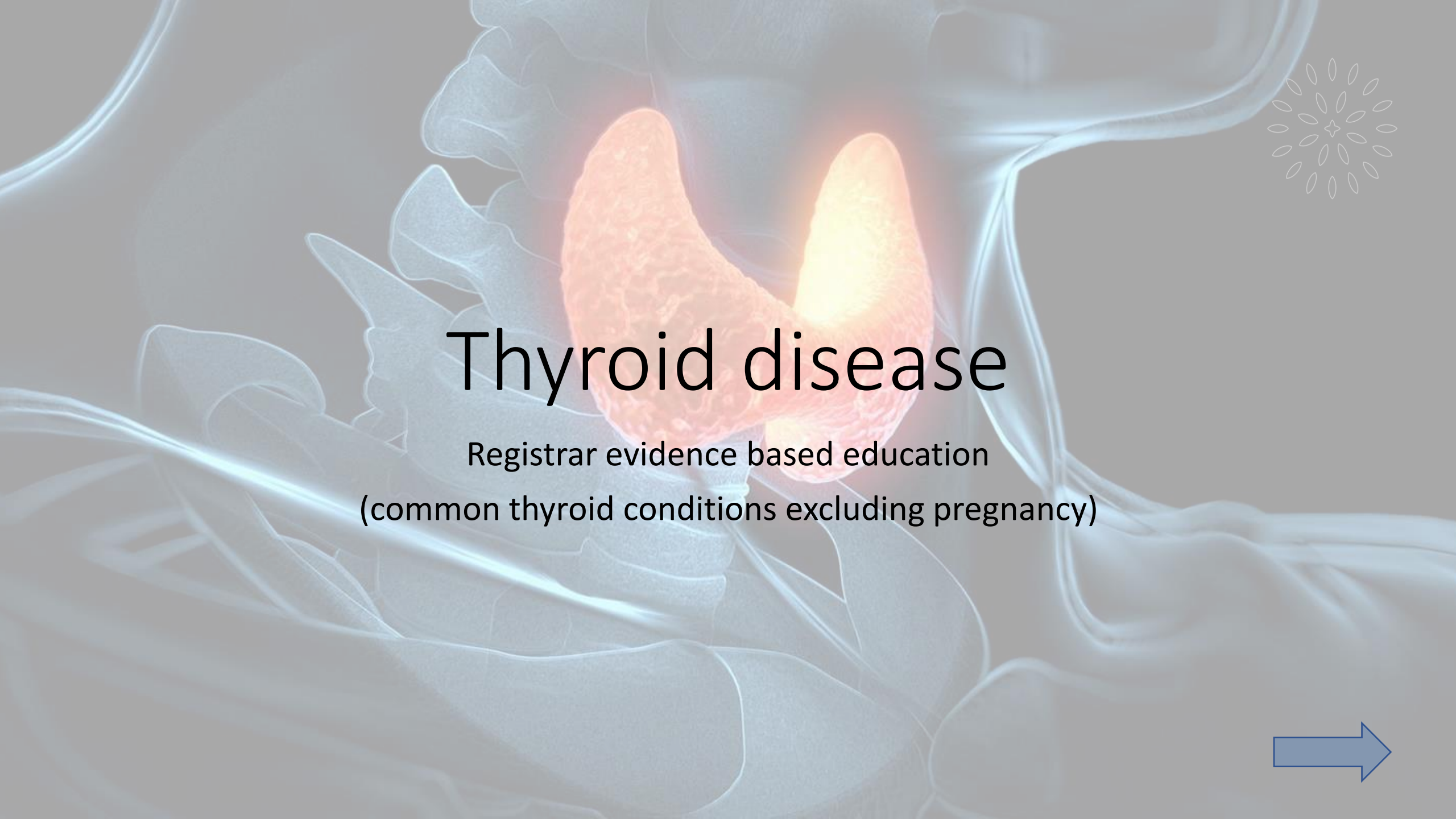
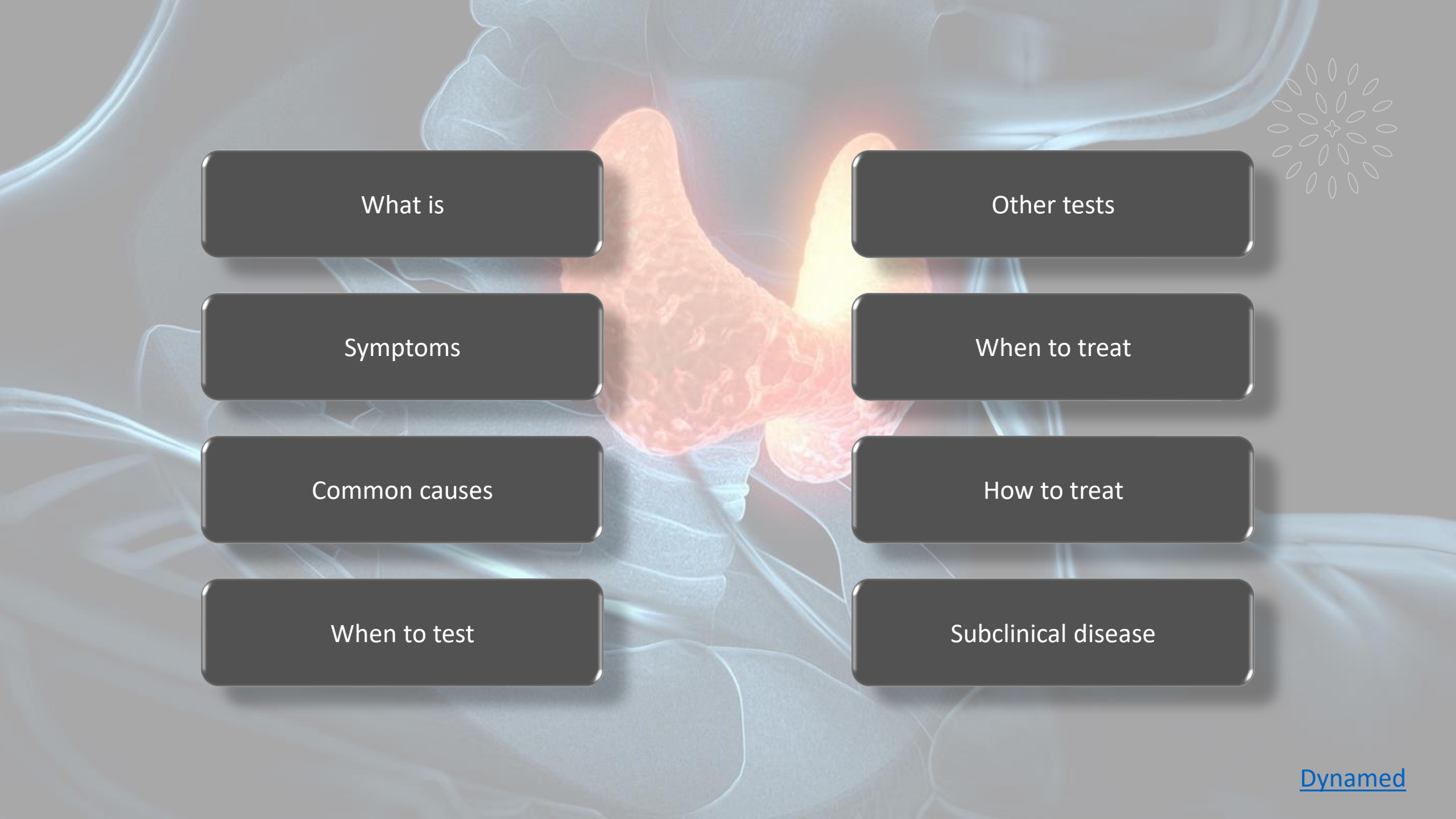


Thyroid disease

Registrar evidence based education

(common thyroid conditions excluding pregnancy)


What is
Symptoms
Common causes
When to test
Other tests
When to treat
How to treat
Subclinical disease

Dynamed

Definitions

- What is the thyroid?
- What is hypothyroid?
- What is hyperthyroid

Symptoms

- What are the symptoms of hypothyroid?
- What are the symptoms of hyperthyroid?

Common causes

- What is the most common cause of hypothyroid?
- What are the most common causes of hyperthyroid?

Testing

- When do you screen for thyroid disease?
- What tests do you use when testing for thyroid disease?
- What tests do you avoid when testing for thyroid disease?

Other tests

- What other tests for thyroid disease are there?
- When is it clinically indicated to order them?

Treatment

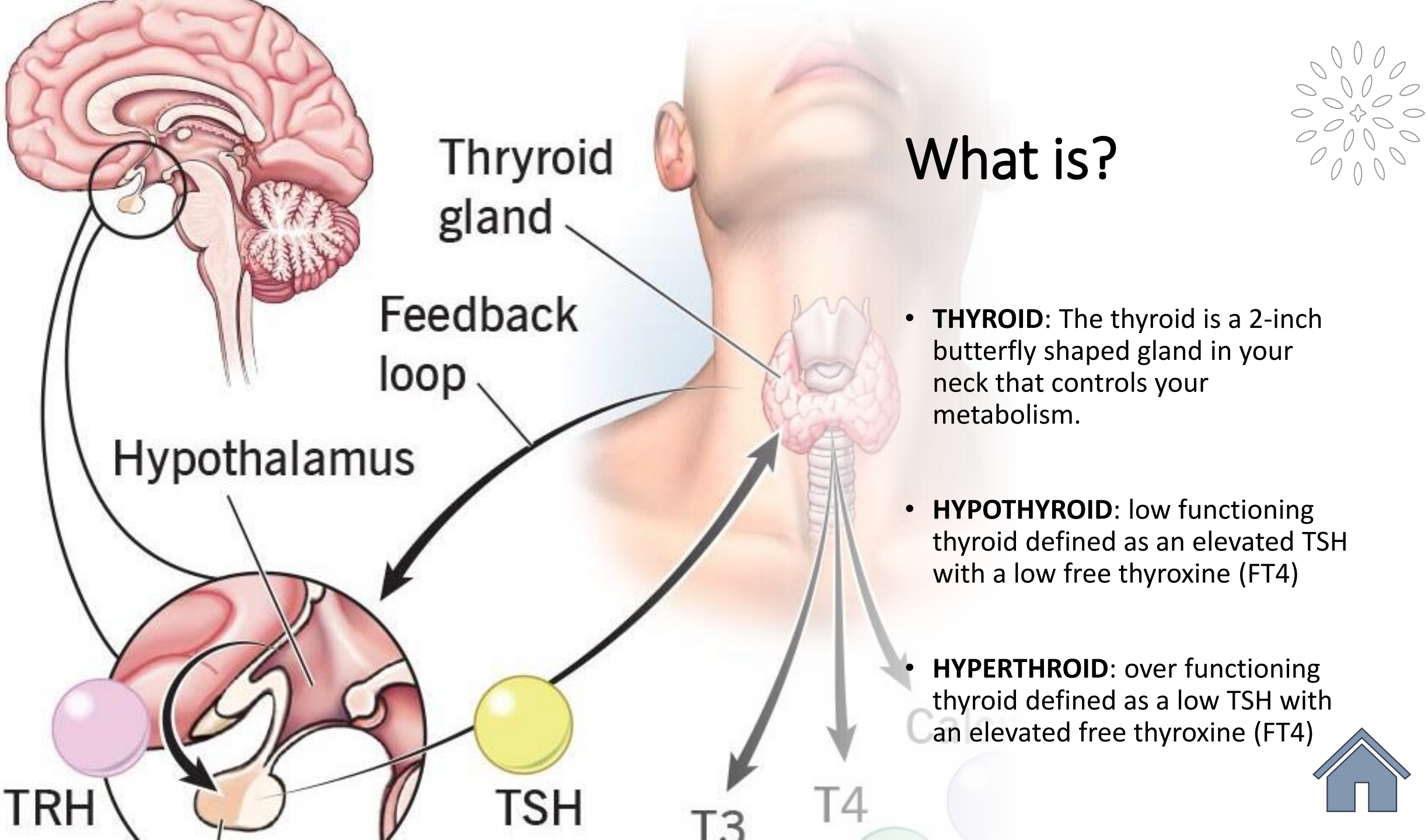
- When do you treat?
- What do you not treat?

Treatment

- How do you treat?

Subclinical disease

- What is it?
- What are the risks and harms of treating?
- Who should be treated?



What is?

- **THYROID**: The thyroid is a 2-inch butterfly shaped gland in your neck that controls your metabolism.
- **HYPOTHYROID**: low functioning thyroid defined as an elevated TSH with a low free thyroxine (FT4)
- **HYPERTHROID**: over functioning thyroid defined as a low TSH with an elevated free thyroxine (FT4)

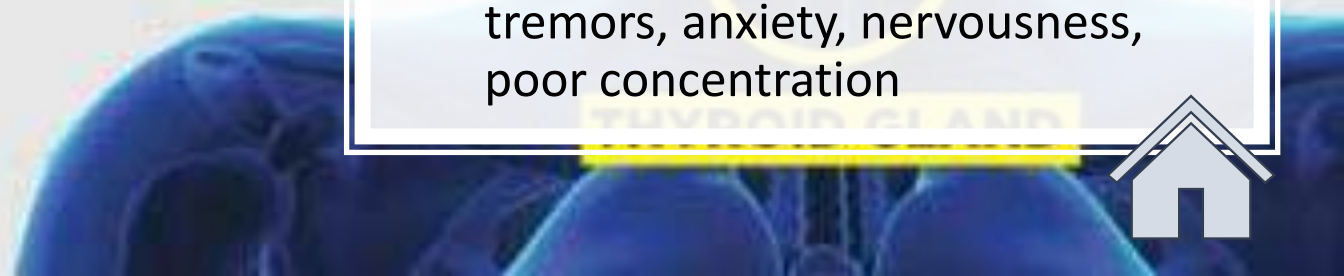
SYMPTOMS TO WATCH FO

HYPERTHYROIDISM

- Weight loss
- Increased appetite
- Fast heart rate
- Anxiety/nervousness
- Irritability
- Shaking/trembling of the hands
- Sweating
- Feeling warm often/ greater sensitivity to heat
- Insomnia
- Frequent bowel movements and/or diarrhea
- Muscle weakness
- Thin skin and brittle hair
- Changes in the menstrual cycle (usually shorter, lighter periods)

HYPOTHYROIDISM

- Weight gain and/or diffic losing weight
- Constipation
- Fatigue
- Forgetfulness
- Depression
- Dry skin and hair/hair los
- Slow heart rate
- Feeling cold often/greate sensitivity to cold
- Changes in the menstrual (usually longer, heavier per

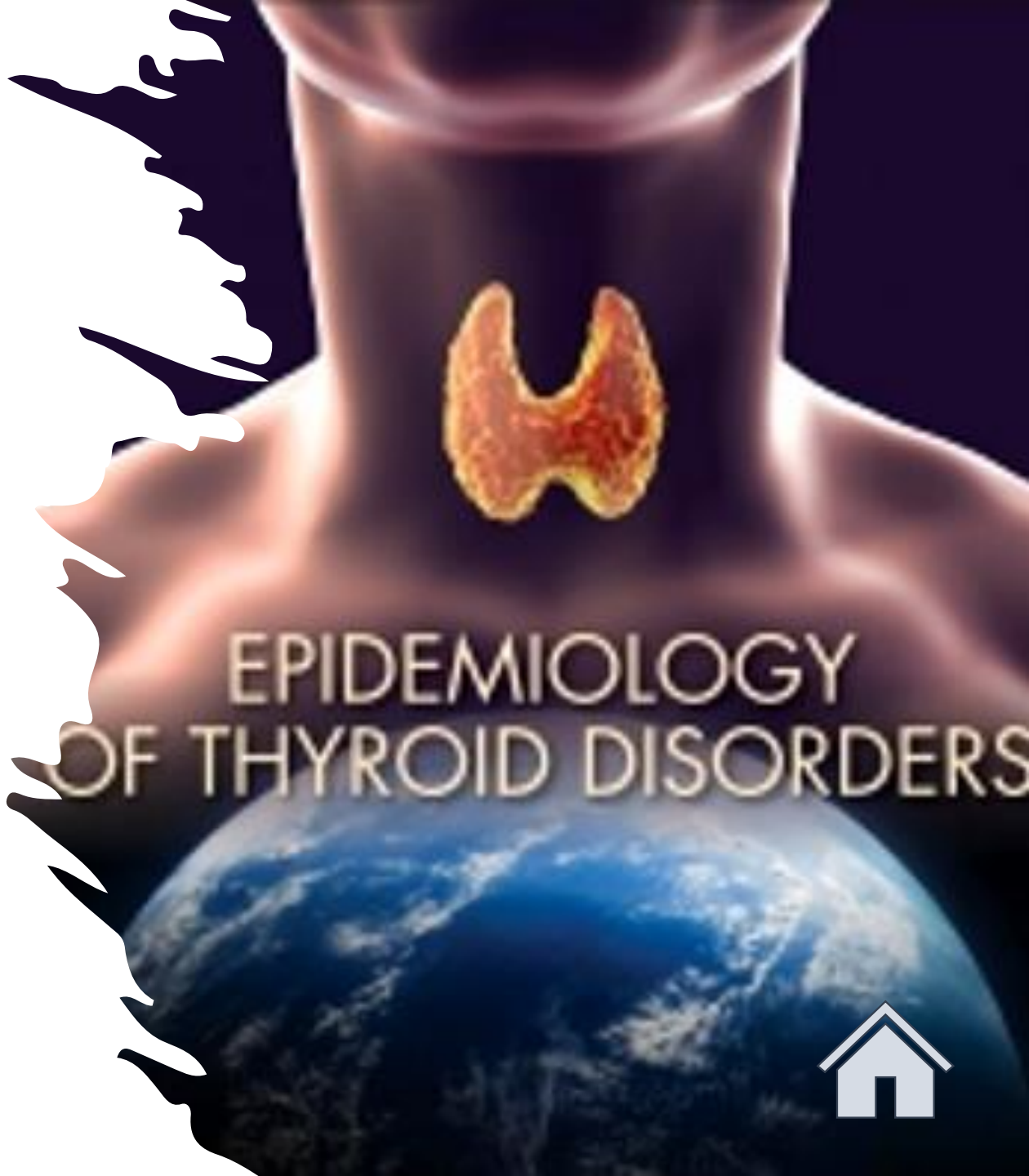


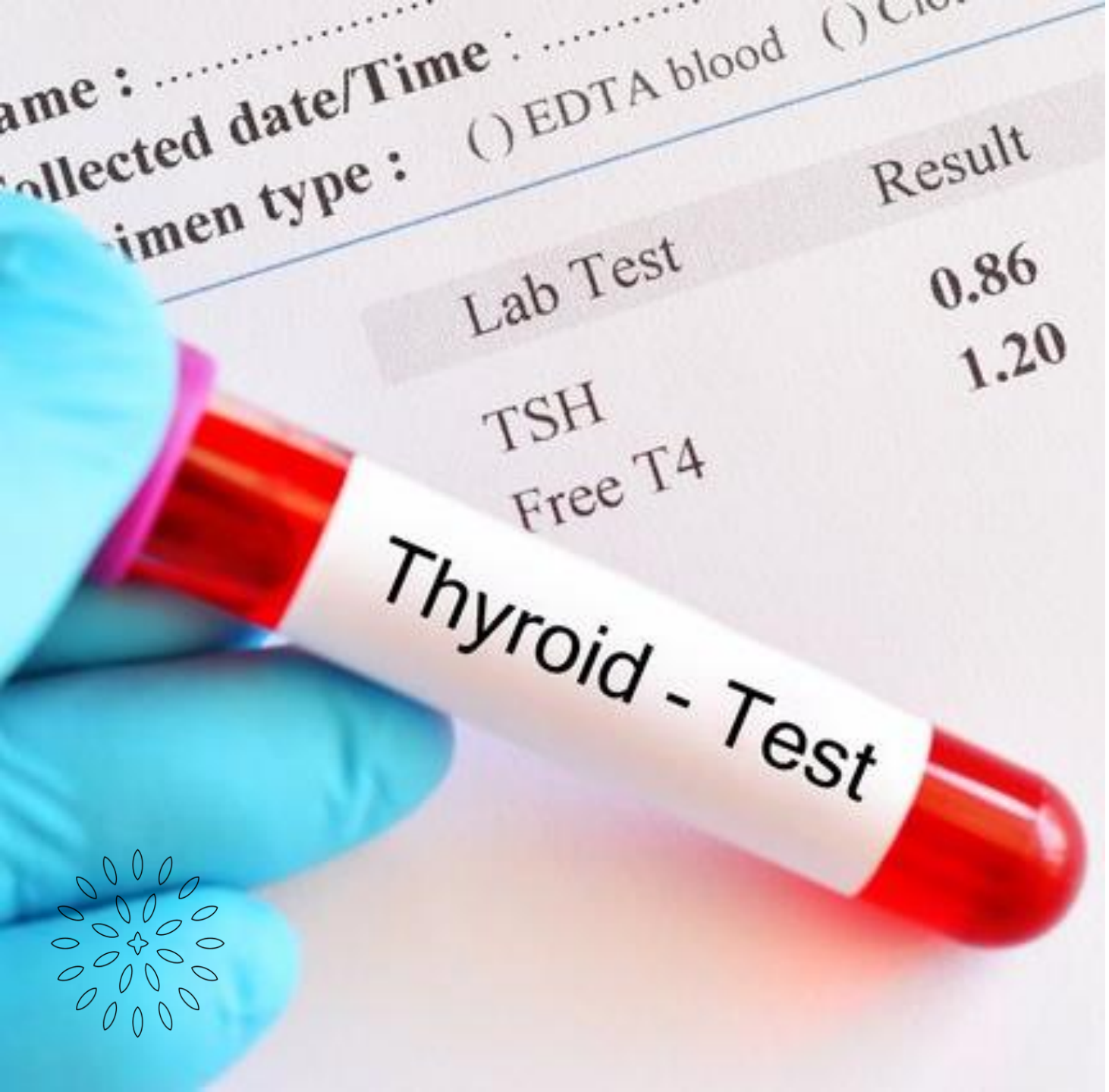
- **Signs and symptoms** are nondiagnostic and nonspecific. Most common presenting symptoms are:
- **Hypothyroid:** dry skin, cold sensitivity, fatigue, voice changes, constipation, weight gain
- **Hyperthyroid:** heat intolerance, increased sweating, palpitations, weight loss despite increased appetite, fatigue, fine tremors, anxiety, nervousness, poor concentration

Common causes

- **Hypothyroid**: autoimmune thyroiditis (Hashimoto's disease)
  - 0.3-3.7% of people in the US
  - 7x higher in women

- **Hyperthyroid**: Grave's disease (autoimmune), toxic multinodular goiter, toxic thyroid adenoma
  - 0.5% of people in the US have overt hyperthyroidism





Testing

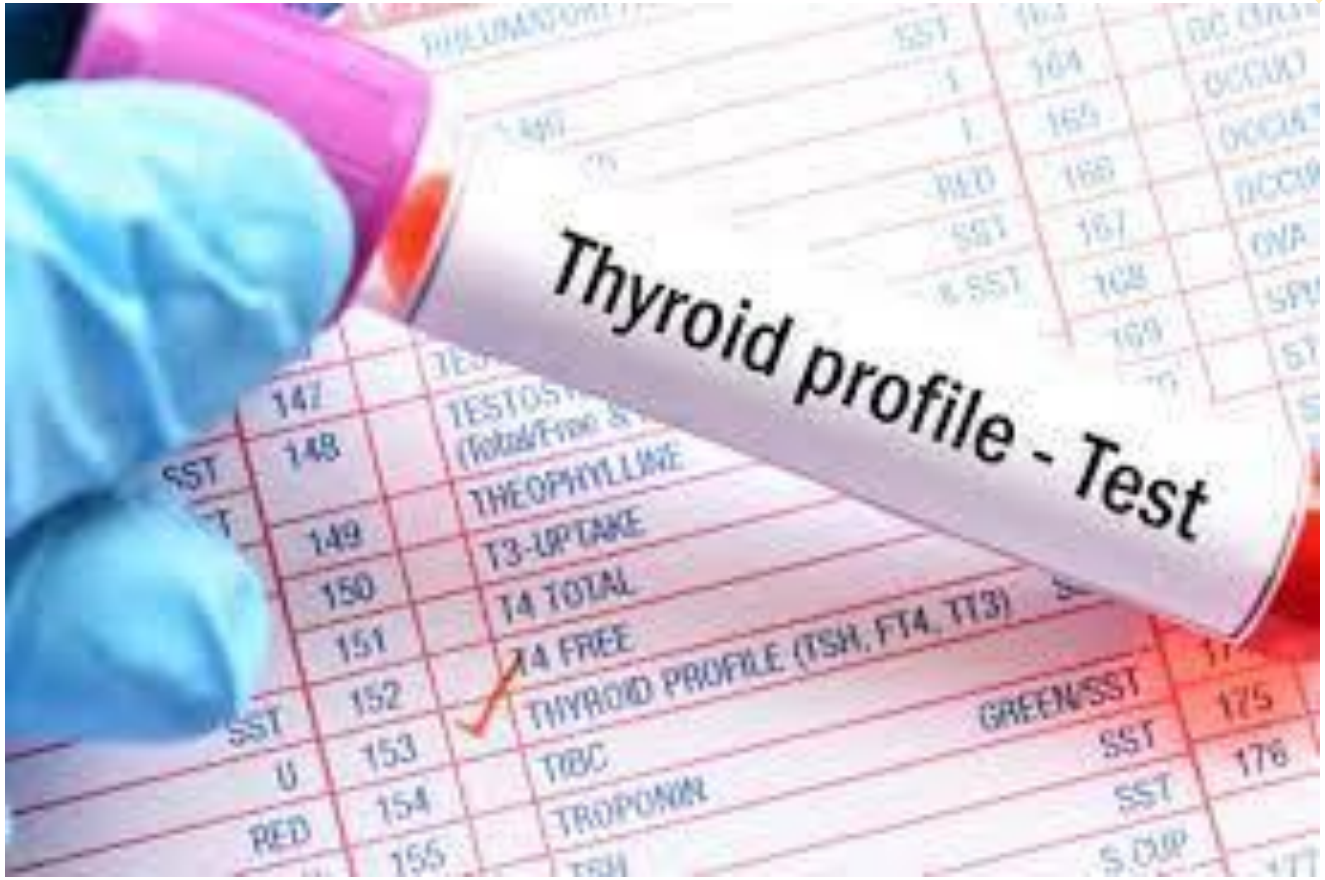
- Screening: never *screen* for thyroid disease, this includes for well visits or 'usual labs'

- Testing for thyroid disease should be performed on symptomatic individuals by ordering a TSH with reflex to FT4
  - Normal TSH range: 0.5-4.5uIU/mL
  - Normal FT4 range: 0.82-1.77ng/dL

- Do not:
  - test in critically or acutely ill patients
  - order T4 or total or free T3 in patients with hypothyroid
  - order a thyroid ultrasound unless there is a palpable abnormality

Other tests

- **Hypothyroid**
  - **Anti thyroid peroxidase antibodies (Anti-TPO)** confirms Hashimoto's but does not help the diagnosis or management of hypothyroid
- **Hyperthyroid**
  - If Grave's is suspected and TSH is low and FT4 is high, no further tests or imaging is needed
  - **TT3** (over FT3) if TSH is low with a normal FT4 for T3-thyrotoxicosis
  - **Radioactive iodine uptake scan (RAIU)** if clinical goiter/enlarged thyroid or when diagnosis is unclear
  - **Thyroid scintigraphy** may be helpful if nodule present to determine if it is hot or cold (cold/indet need biopsy)
  - **TSH receptor antibodies (TRAb)**: confirms graves if diagnosis is still in question, informs ability to stop meds
  - **Serum thyroglobulin** can be measured if RAIU is low or absent

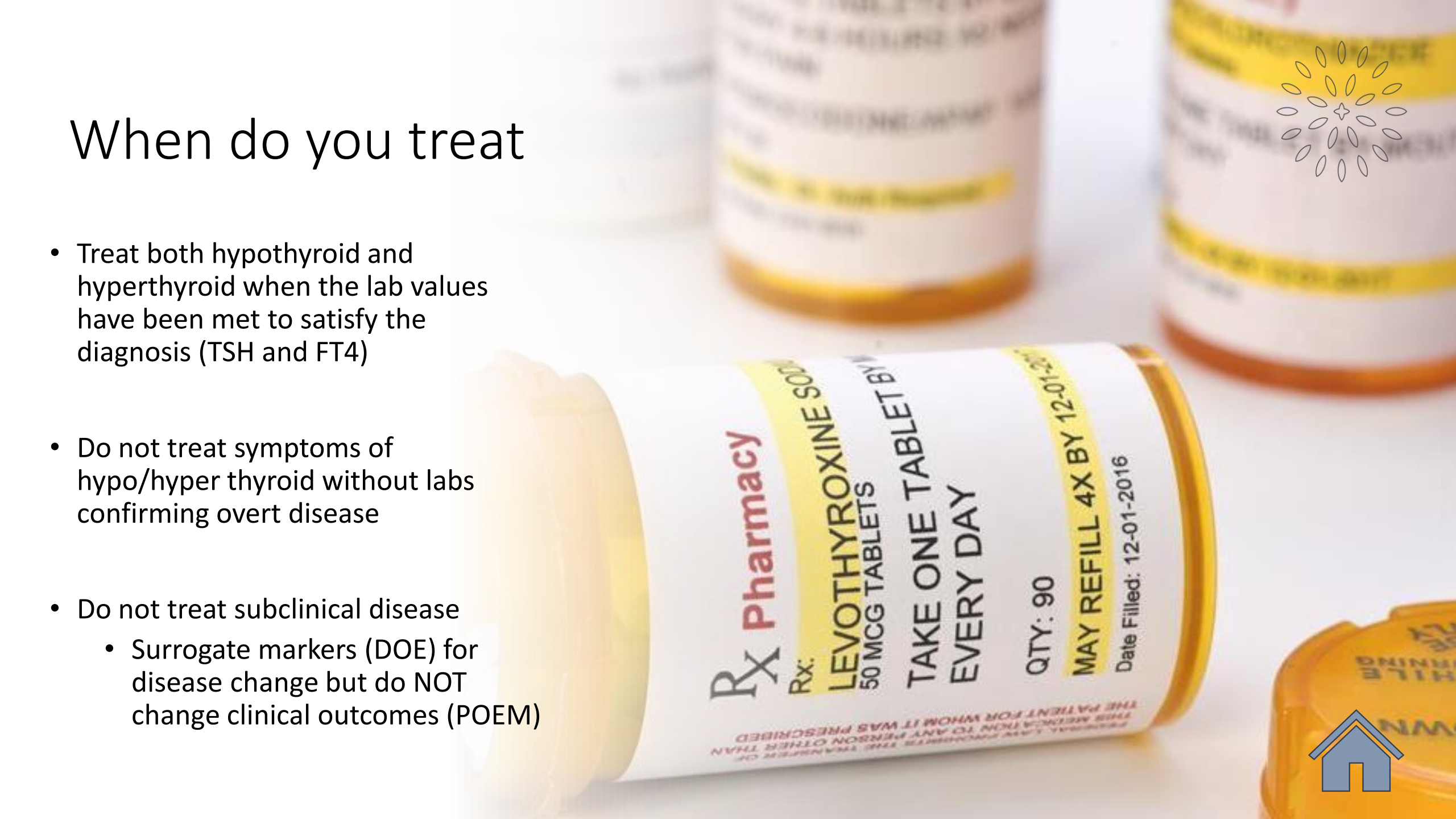


When do you treat

- Treat both hypothyroid and hyperthyroid when the lab values have been met to satisfy the diagnosis (TSH and FT4)

- Do not treat symptoms of hypo/hyper thyroid without labs confirming overt disease

- Do not treat subclinical disease
  - Surrogate markers (DOE) for disease change but do NOT change clinical outcomes (POEM)



Treatment

Hypothyroid

- Levothyroxine

Hyperthyroid

- Beta blockers
- Antithyroid medication
- Radioactive iodine
- Thyroidectomy

Hypothyroid treatment

- Levothyroxine monotherapy is recommended
  - No difference between brand vs generic
- Starting dose is 1.6mcg/kg
  - If >60yo or CAD present start at 12.5 – 50mcg
- Measure TSH every 4-6 weeks
  - Adjust dose by 12.5-25mcg until the TSH is in the normal range
- Once a stable dose has been established TSH can be repeated every 1-2 years
- If on a high dose can try weekly administration of full week's dose or check for GI causes of malabsorption
- Adding or using triiodothyronine/liothyronine (T3), thyroid extracts, or thyroid analogs is not recommended

Hyperthyroid treatment

- Beta blockers for symptom relief of tachycardia, tremors and anxiety
  - Atenolol 25-100mg, propranolol 10-40mg q8hr or ER version 80-160mg

Treat underlying cause

- ***Radioactive iodine***: treatment of choice for Grave's, also treats toxic multinodular goiter and toxic thyroid adenoma
  - Most will have permanent hypothyroid after 2-6 months and need replacement
- ***Thyroidectomy***: preferred for goiter induced compression symptoms, also treats adenomas, and Grave's
- ***Antithyroid medication***: methimazole 5-120mg, PTU 50-300mg q8
  - Measure FT4 and TT3 2-6 weeks after initiation then every 3 months
    - TSH can remain suppressed for months, checking TSH will not change management
  - Start low and titrate accordingly
  - Taper dose after 12-18 months if TRAb levels are normal
  - Remission occurs in 30-70% of patients within the first year
  - Not preferred for multinodular goiter/adenomas

Hyperthyroid treatment

Treatment of underlying cause

- ***Grave's***: radioactive iodine (treatment of choice), antithyroid medication, thyroidectomy
- ***Toxic multinodular goiter***: Radioactive iodine and thyroidectomy are both preferred over low dose long term antithyroid medication
- ***Toxic thyroid adenoma***: Radioactive iodine and thyroidectomy are both preferred over low dose long term antithyroid medication

Subclinical disease

- Widespread screening and treatment of subclinical thyroid dysfunction may be harmful due to psychological effects of labeling, false positive results, overdiagnosis and overtreatment
- Treating subclinical disease affects surrogate markers for disease change but does NOT change clinical outcomes

SUBCLINICAL HYPOTHYROID

- High TSH with normal FT4
- Consider treatment if:
  - TSH >10
  - Anti-TPO titer high in certain populations
- Start at 25 - 50mcg and titrate every 4-6 weeks based on TSH

SUBCLINICAL HYPERTHYROID

- Low TSH with normal FT4 and TT3
- Consider treatment if:
  - TSH < 0.1 in asymptomatic patients <65yo without cardiac risk factors
  - TSH low but > 0.1 in symptomatic patients >65yo with cardiac risk factors, heart disease or osteoporosis