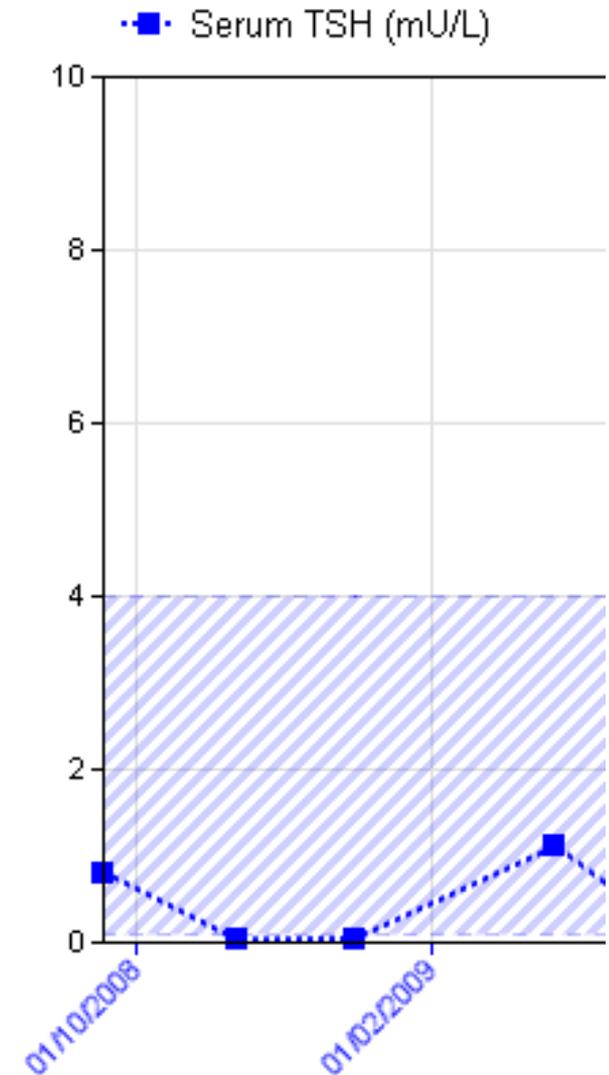


Non Thyroid Surgery

In patients with Thyroid disorders



Your Health. Our Priority.



The Thyroid disease problem.

Is Thyroid disease a problem with anaesthetic?

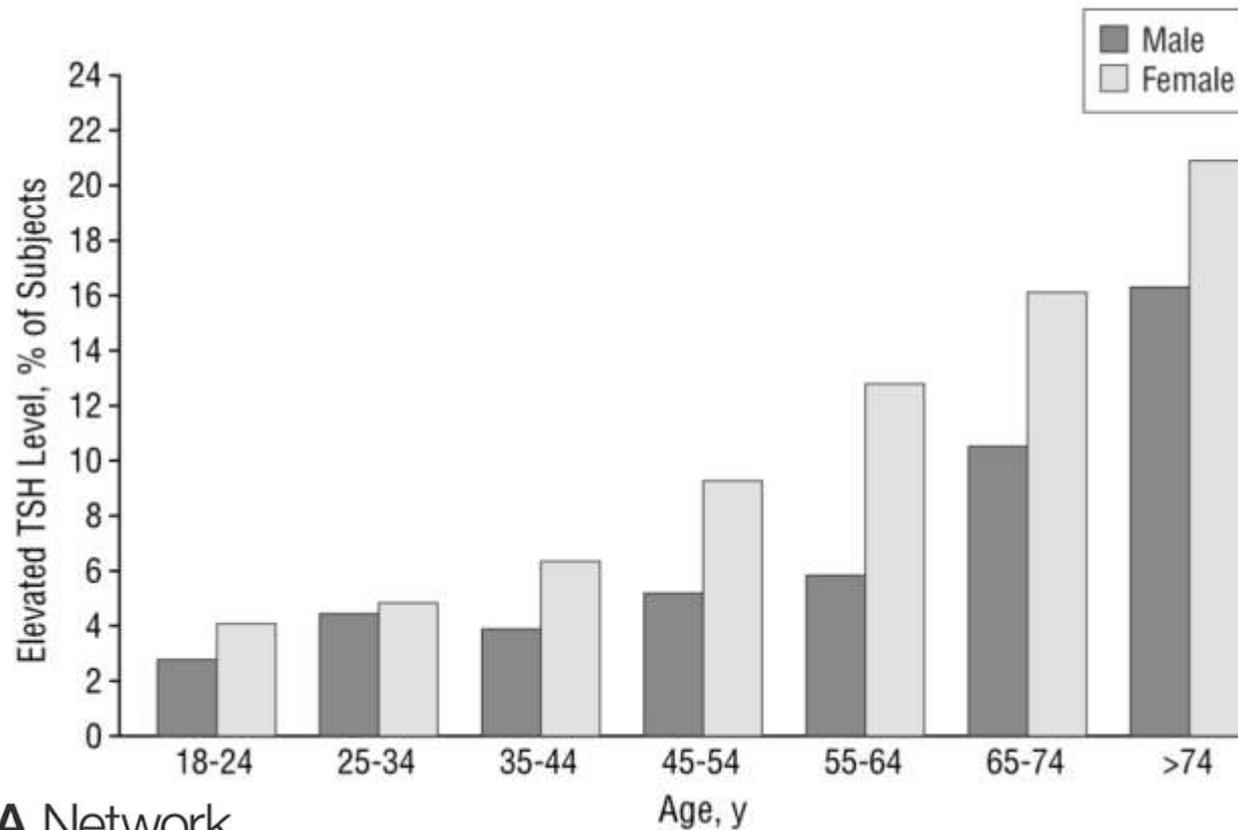
Why worry? The Physiology

The evidence.

A pragmatic approach

From: **The Colorado Thyroid Disease Prevalence Study**

Arch Intern Med. 2000;160(4):526-534. doi:10.1001/archinte.160.4.526



The **JAMA** Network

THYROID STIMULATING HORMONE

Symptom	Presence	Absence
Current symptoms		
Constipation*	27	2
Hoarse voice*	30	1
Deep voice*	16	2
Changed symptoms		
More constipation*	43	3
Horser voice*	11	2
Deeper voice	0	4
Drier skin	4	5
Feeling colder*	35	-4
More tired	4	4
Puffier eyes*	35	-2
More muscle cramps	5	4
Weaker muscles*	-2	12
Slower thinking	-5	9
Poorer memory	1	7

CVS GI Renal

CNS & PNS Endocrine

Locomotive system

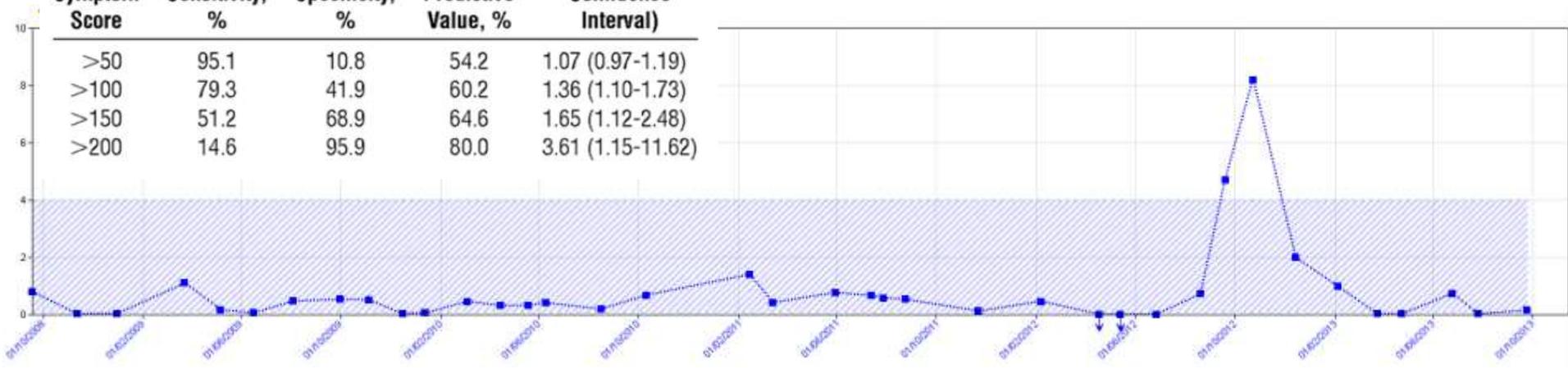
Skeletal

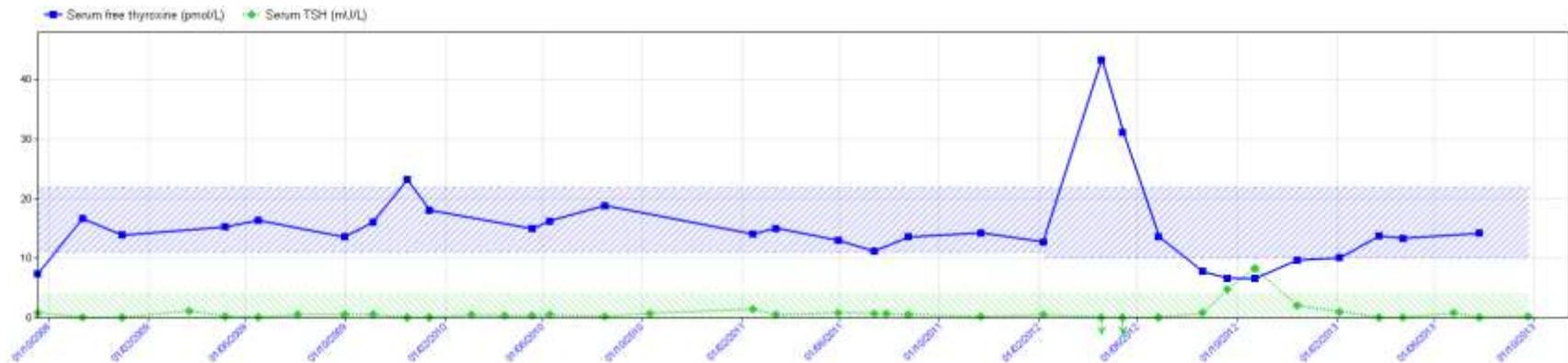
Respiratory

Skin & Hair

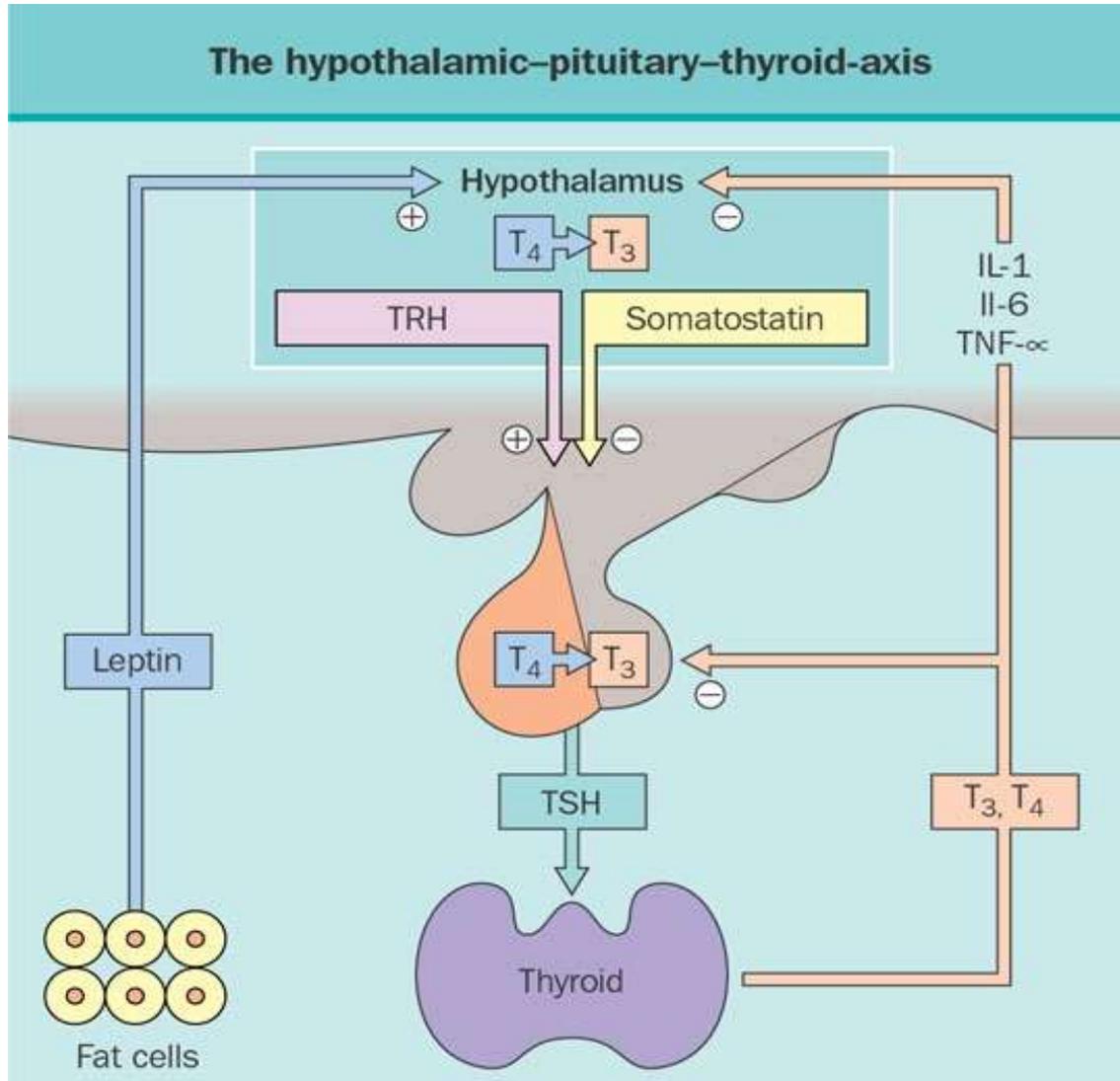


Symptom Score	Sensitivity, %	Specificity, %	Positive Predictive Value, %	Likelihood Ratio (95% Confidence Interval)
>50	95.1	10.8	54.2	1.07 (0.97-1.19)
>100	79.3	41.9	60.2	1.36 (1.10-1.73)
>150	51.2	68.9	64.6	1.65 (1.12-2.48)
>200	14.6	95.9	80.0	3.61 (1.15-11.62)

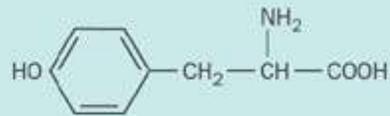




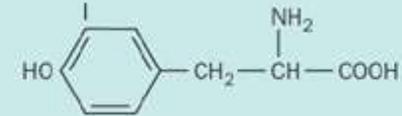
Skim over the A&P



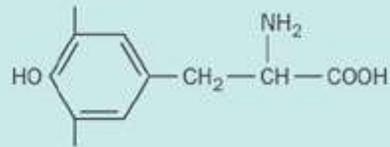
Thyroid hormones and related compounds



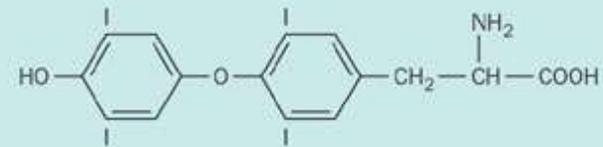
Tyrosine



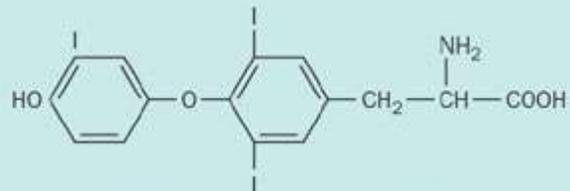
3-iodotyrosine (MIT)



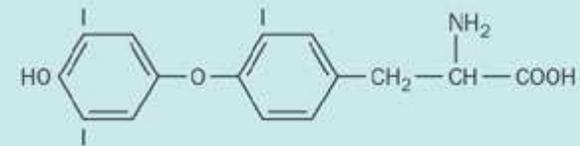
3,5-diiodotyrosine (DIT)



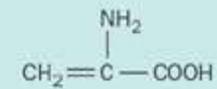
Thyroxine (T₄)



3,5,3'-triiodothyronine (T₃)



3,3',5'-triiodothyronine (reverse T₃)



Dehydroalanine (DHA)



Hypothyroid

Surgical outcomes

No Randomised trials vs Euthyroid patients

Older case studies 1960s and 1970s [Br J Anaesthesia]

- Intraoperative hypotension,

- Cardiovascular collapse,

- Extreme sensitivity to opioids, sedatives, and anaesthesia in undiagnosed patients with hypothyroidism.

Myxedema coma is described as a rare postoperative complication in patients with unrecognized severe hypothyroidism [1960s and 1990s].

High mortality rate.

Hypothermia, hypotension, bradycardia, hyponatremia, hypoglycemia, and hypoventilation.



Hypothyroid

Surgical Outcomes

Two retrospective cohort studies examined peri- and postsurgical outcomes in moderately hypothyroid patients

1983 Study no difference in perioperative outcomes or arrhythmias (n=59)

1984 (n= 40) More complications

intraoperative hypotension in non-cardiac surgery

more heart failure in cardiac surgery (29 vs 6% p,0.05).

More GI and neuropsychiatric complications

less likely to mount a fever with infection.

However, there were no differences in perioperative blood loss, LOS, or the prevalence of arrhythmia, hypothermia, hyponatremia, delayed anaesthetic recovery, tissue integrity, wound healing, pulmonary complications or death.

Hypothyroid

Subclinical Hypothyroid Hi TSH, Normal fT4
Randomised controlled trials

CABG No Significant difference
except slight post op
AF transient.

Table 1. Preoperative Characteristics of Patients Undergoing Coronary Artery Bypass Grafting

Variable	Euthyroid Mean ± SD, No. (%)	SCH Mean ± SD, No. (%)	<i>p</i> Value
Patients	224 (81.5)	36 (13.1)	
Age, y	65.3 ± 9.4	65.4 ± 11.4	0.954
Men	157 (70.1)	25 (69.4)	0.938
Body mass index, kg/m ²	24.6 ± 3.0	24.7 ± 3.1	0.783
Laboratory measurements			
TSH, mIU/L	1.95 ± 0.96	5.76 ± 1.77	<0.001
Free thyroxine, ng/dL	1.14 ± 0.21	1.08 ± 0.20	0.135

PTCA No significant problems
in hypothyroid



Hypothyroid

Recommendations- pragmatic

Severe	free Thyroxine < 6.5 mmol/L (severe hypothyroid symptoms) emergency consider iv T3 and T4 (as per myxoedema coma)
Moderate	Elevated TSH (>7.5) and low free T4 Do not delay emergency surgery Elective delay and ensure Euthyroid pre-op Urgent surgery (contact endocrinology to start replacement 1.5mcg/kg Levothyroxine)
Subclinical	Elevated TSH (<7.5) No delay in procedures required.

Hyperthyroidism

Increased Cardiac Output

AF 8% patients with Thyrotoxicosis
increasing with age

Subclinical Thyrotoxicosis 3x risk AF

Dyspnoea

Weight loss, Malnutrition



Informed Consent and State dependent
memory.

Hyperthyroidism

No published Studies

Fear of Thyroid storm (from Thyroidectomy experience)

Hyperthyroidism **Urgent**

When you absolutely positively have to treat.

Treat as if emergency Thyroidectomy in Graves disease.

Beta-Blockade

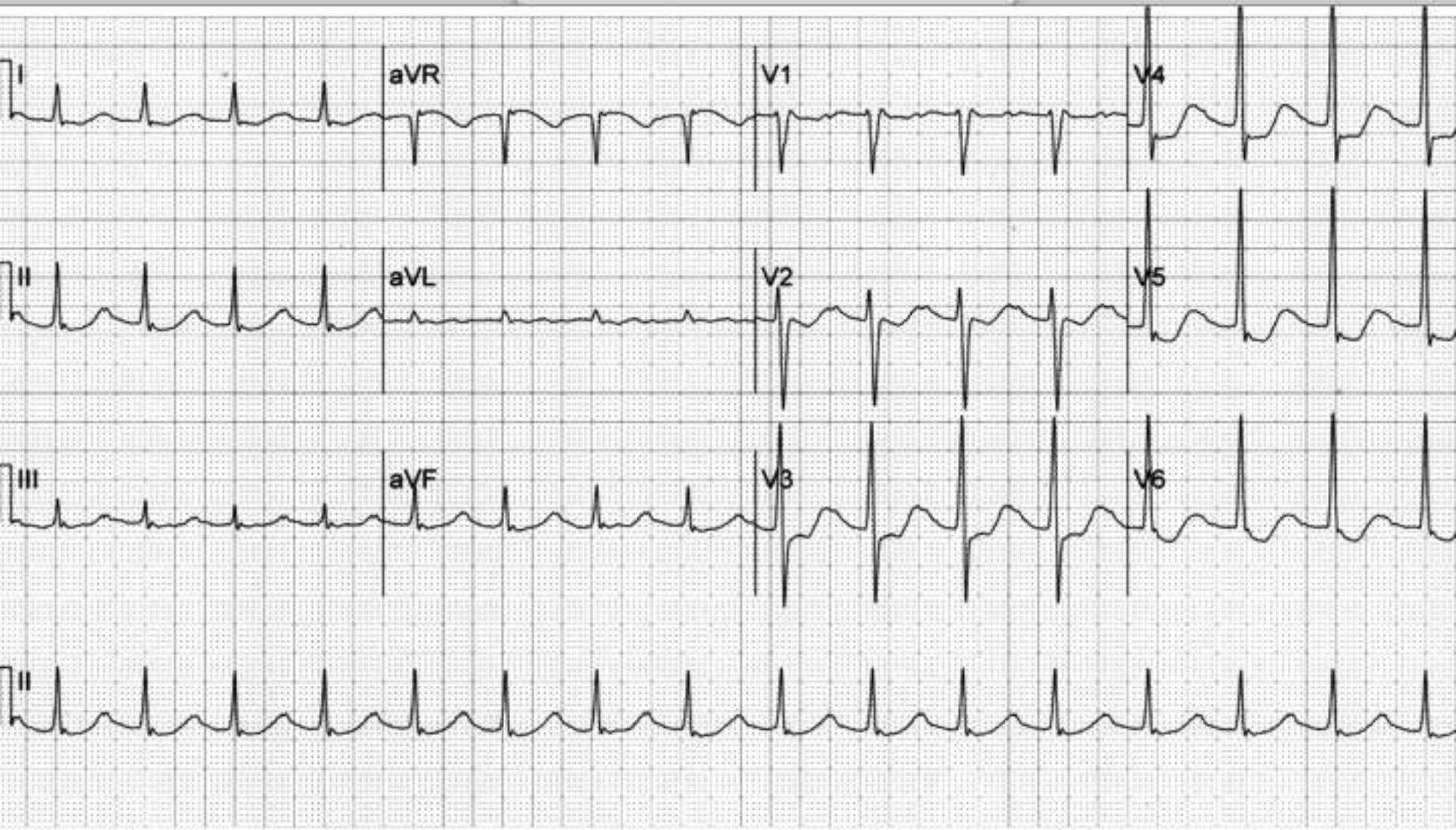
Atenolol (may need up to 200mg od) or metoprolol

Propranolol IV intraoperatively to control fever, tachycardia,
hypertension

Carbimazole/ Propylthiouracil

Potassium Iodide (Wolff- Chaikoff effect)

Hypokalaemia & Thyrotoxicosis





CASE Study



- 54 year old man awaiting knee replacement.
- 6 months history of central chest pain, shortness of breath on exertion and hypertension. Awaiting Cardiology Cons follow up.
- He gave an eighteen month history of tiredness, joint aches cold intolerance and weight gain.
- On physical examination he was noted to have pigmentation of the palmar creases.

- Cholesterol 11.0 mmol/l
- Triglycerides 7.2 mmol/l
- HDL-C 1.2 mmol/l

- Hb 137 g/l
- MCV 103 fl
- WBC 6.0 *10⁹/l

TSH	104	mU/l
Free T4	<6	pmol/l

Pragmatically

Use the TSH as a guide

Ask for help if TSH abnormal

Don't necessarily need to delay treatment in vast majority of cases.

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THYROID
FOUNDATION
Registered Charity No. 1066391

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