GENERAL INTERNAL MEDICINE REVIEW COURSE

NOVEMBER 2020

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- DUE TO TIME CONSTRAINTS content of some slides will be only discussed briefly but is here so you can STUDY it on your OWN
- Each organ system has multi-year subspecialty training
- Expectations: establish a working diagnosis, initiate treatment, know when to refer to a specialist
- Limitations: diagnostic testing, availability of specialists
- Do the best you can (medical ethics)
  - If it's key to the diagnosis, facilitate external testing
  - Give it your best guess and initiate treatment and assess for response
  - Refer to specialist when indicated
  - See them back to coordinate care

ENDOCRINE DISORDERS

- Pancreas -> Insulin resistance & Diabetes
- Thyroid gland -> Hypothyroidism and Hyperthyroidism
- Adrenal glands -> Addison’s disease / Cushing’s disease

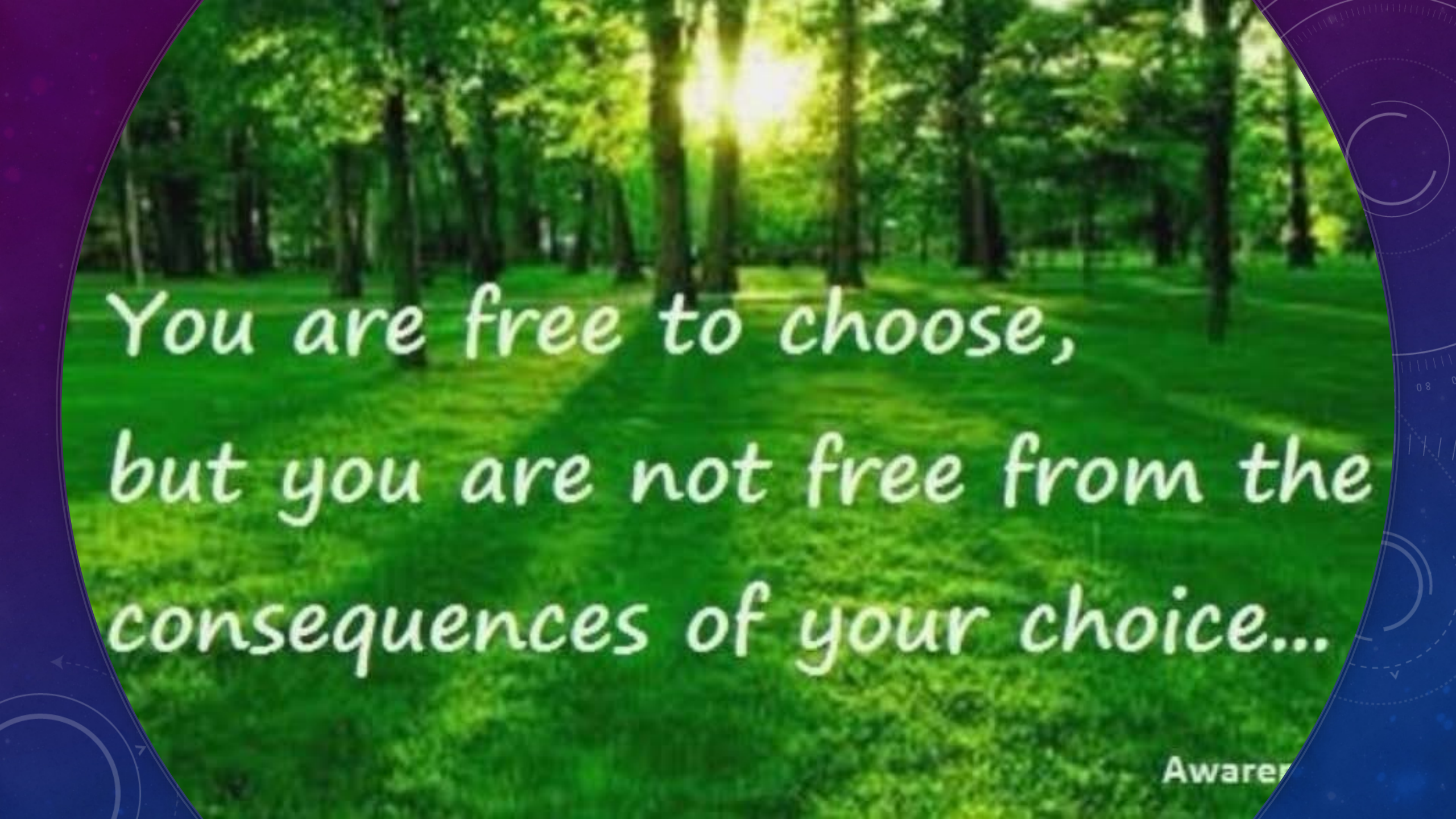
GOOD HEALTH

"Do you not know that your body is a temple? Therefore honor God with your body."

- 1 Corinthians 6:19, 20

"So whether you eat or drink, or whatever you do, do it all for the glory of God."

- 1 Corinthians 10:31


You are free to choose,
but you are not free from the
consequences of your choice...
Awaren

METABOLIC SYNDROME

- Syndrome with 4 parts (insulin resistance)
  - Central obesity
  - High blood sugar
  - High blood pressure
  - Abnormal lipids (high trigs and/or low HDL)

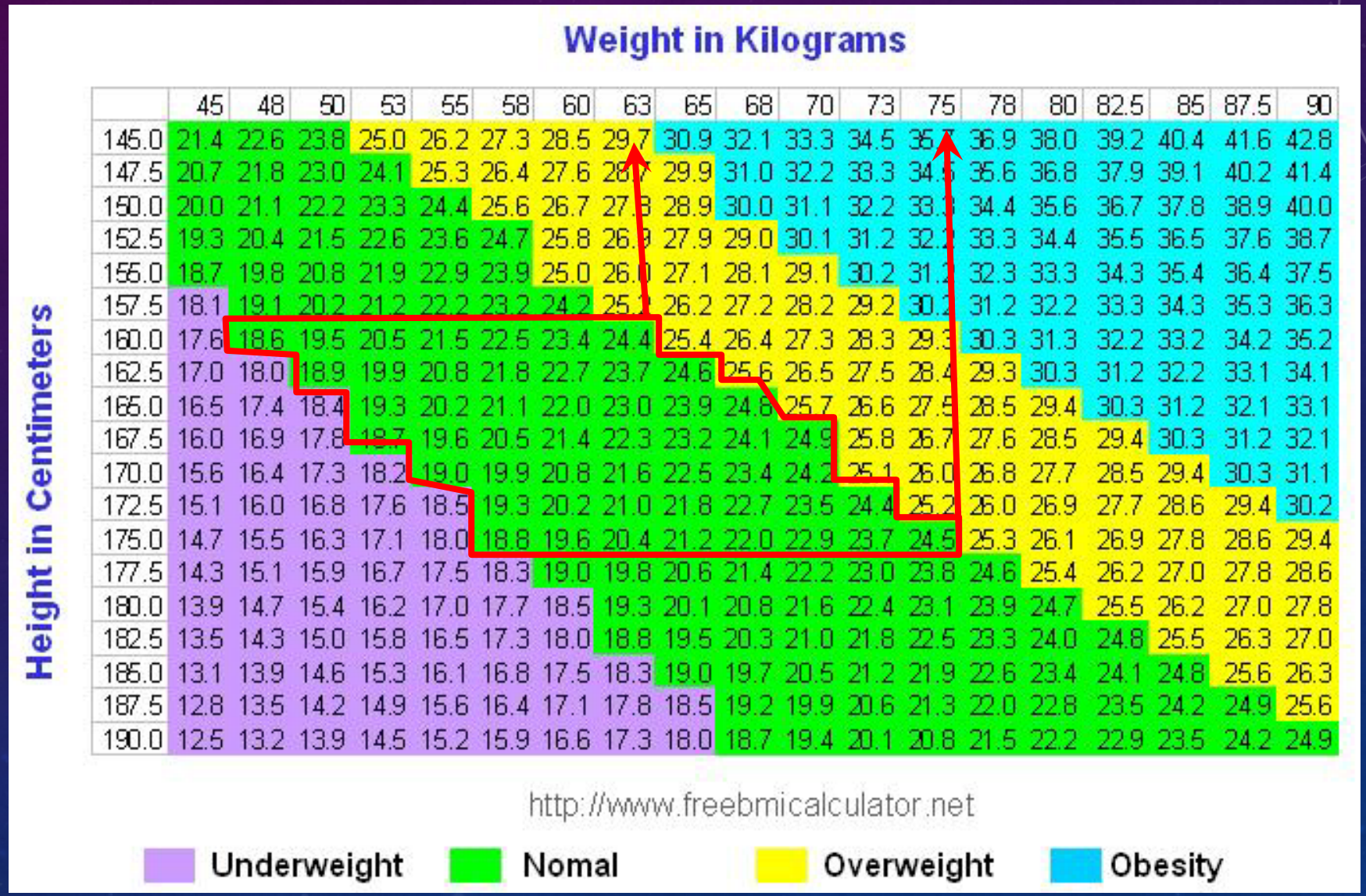
- Most develop overt diabetes over time
- Markedly increased risk for cardiovascular events (heart disease & stroke)

CENTRAL OBESITY

- Measured by waist circumference
- Risk of heart attack & diabetes much higher in central obesity
- Measure at belly button
  - Women > 88 cm
  - Men > 102 cm


"Apple" vs. "Pear"
Above the waist
Below the waist
A.D.A.M.

BODY MASS INDEX



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147.5	20.7	21.8	23.0	24.1	25.3	26.4	27.6	28.7	29.9	31.0	32.2	33.3	34.5	35.6	36.8	37.9	39.1	40.2	41.4
150.0	20.0	21.1	22.2	23.3	24.4	25.6	26.7	27.8	28.9	30.0	31.1	32.2	33.3	34.4	35.6	36.7	37.8	38.9	40.0
152.5	19.3	20.4	21.5	22.6	23.6	24.7	25.8	26.9	27.9	29.0	30.1	31.2	32.2	33.3	34.4	35.5	36.5	37.6	38.7
155.0	18.7	19.8	20.8	21.9	22.9	23.9	25.0	26.0	27.1	28.1	29.1	30.2	31.2	32.3	33.3	34.3	35.4	36.4	37.5
157.5	18.1	19.1	20.2	21.2	22.2	23.2	24.2	25.2	26.2	27.2	28.2	29.2	30.2	31.2	32.2	33.3	34.3	35.3	36.3
160.0	17.6	18.6	19.5	20.5	21.5	22.5	23.4	24.4	25.4	26.4	27.3	28.3	29.3	30.3	31.3	32.2	33.2	34.2	35.2
162.5	17.0	18.0	18.9	19.9	20.8	21.8	22.7	23.7	24.6	25.6	26.5	27.5	28.4	29.3	30.3	31.2	32.2	33.1	34.1
165.0	16.5	17.4	18.4	19.3	20.2	21.1	22.0	23.0	23.9	24.8	25.7	26.6	27.5	28.5	29.4	30.3	31.2	32.1	33.1
167.5	16.0	16.9	17.8	18.7	19.6	20.5	21.4	22.3	23.2	24.1	24.9	25.8	26.7	27.6	28.5	29.4	30.3	31.2	32.1
170.0	15.6	16.4	17.3	18.2	19.0	19.9	20.8	21.6	22.5	23.4	24.2	25.1	26.0	26.8	27.7	28.5	29.4	30.3	31.1
172.5	15.1	16.0	16.8	17.6	18.5	19.3	20.2	21.0	21.8	22.7	23.5	24.4	25.2	26.0	26.9	27.7	28.6	29.4	30.2
175.0	14.7	15.5	16.3	17.1	18.0	18.8	19.6	20.4	21.2	22.0	22.9	23.7	24.5	25.3	26.1	26.9	27.8	28.6	29.4
177.5	14.3	15.1	15.9	16.7	17.5	18.3	19.0	19.8	20.6	21.4	22.2	23.0	23.8	24.6	25.4	26.2	27.0	27.8	28.6
180.0	13.9	14.7	15.4	16.2	17.0	17.7	18.5	19.3	20.1	20.8	21.6	22.4	23.1	23.9	24.7	25.5	26.2	27.0	27.8
182.5	13.5	14.3	15.0	15.8	16.5	17.3	18.0	18.8	19.5	20.3	21.0	21.8	22.5	23.3	24.0	24.8	25.5	26.3	27.0
185.0	13.1	13.9	14.6	15.3	16.1	16.8	17.5	18.3	19.0	19.7	20.5	21.2	21.9	22.6	23.4	24.1	24.8	25.6	26.3
187.5	12.8	13.5	14.2	14.9	15.6	16.4	17.1	17.8	18.5	19.2	19.9	20.6	21.3	22.0	22.8	23.5	24.2	24.9	25.6
190.0	12.5	13.2	13.9	14.5	15.2	15.9	16.6	17.3	18.0	18.7	19.4	20.1	20.8	21.5	22.2	22.9	23.5	24.2	24.9

METABOLIC SYNDROME

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  - High blood pressure
  - Abnormal lipids (high trigs and/or low HDL)

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HIGH BLOOD SUGAR

- “borderline” or elevated fasting blood sugar
  - Between 100 and 125mg/dL
  - About 10% per year develop full diabetes
- Mildly elevated HgbA1c (5.7% to 6.5%)

- Diabetes
  - FBS above 126mg/dL or HgbA1c above 6.5%
  - RBS above 200mg/dL

METABOLIC SYNDROME

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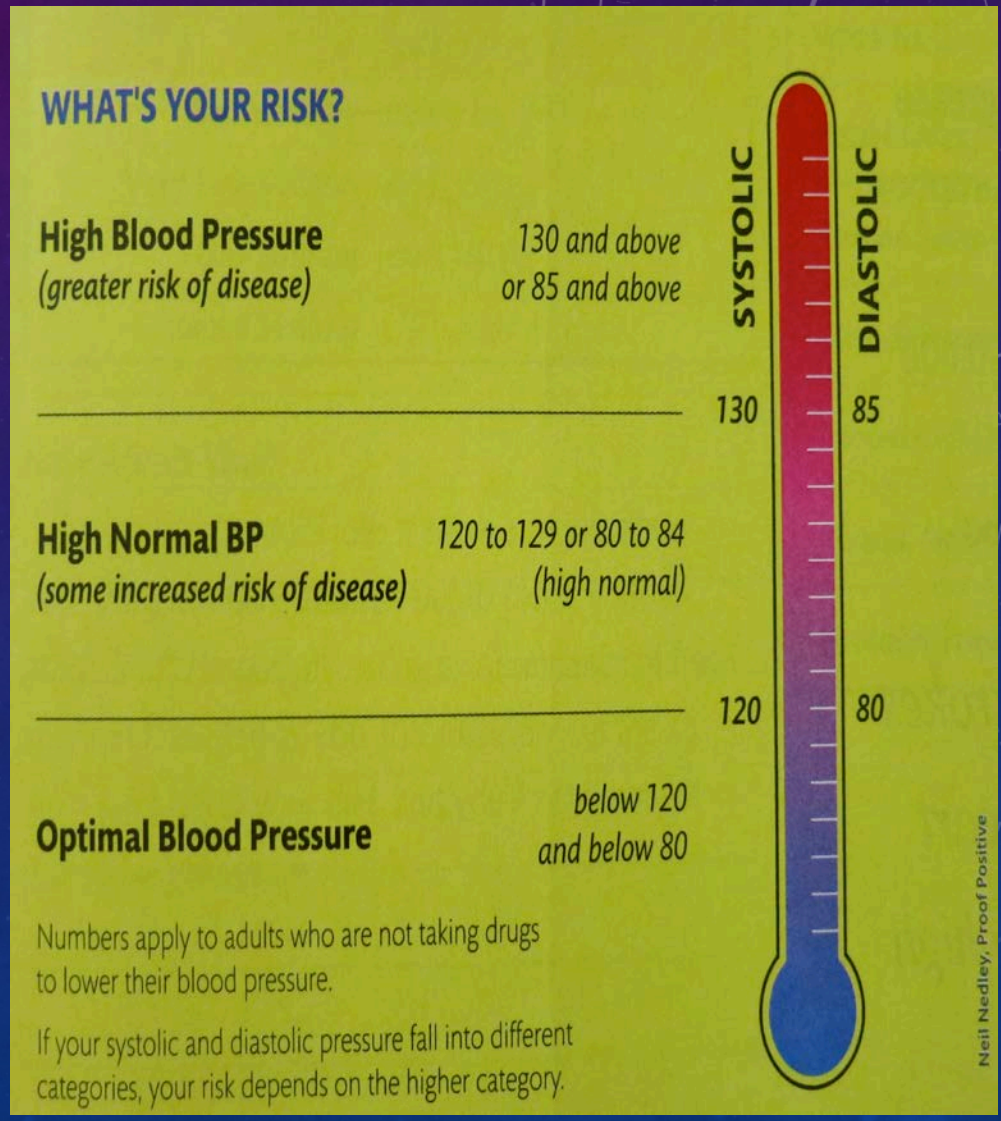
HIGH BLOOD PRESSURE

- **Nutrition**
  - High potassium, low salt diet can improve BP by 10-15 points!
- **Exercise**
  - Regular exercise can lower BP by another 8 points!



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ABNORMAL CHOLESTEROL

Elevated triglycerides

- Above 150mg/dL (1.7mmol/dL)

Low HDL cholesterol

- Women below 50 mg/dL
- Men below 40 mg/dL

METABOLIC SYNDROME

- Syndrome with 4 parts
  - Central obesity
  - High blood sugar (including borderline)
  - High blood pressure (“pre-hypertension”)
  - Abnormal lipids (high trigs or low HDL)

- Any **3** of the 4 equals metabolic syndrome

WHY DO WE CARE?

- Up to 2x the risk of stroke and heart attack
- Some US studies 2.6 times higher cardiovascular death and 2 times higher all cause mortality EVEN IN THE ABSENCE of baseline cardiovascular disease and diabetes
- Risk of cardiovascular event or death is similar to those with “full” diabetes or hypertension

METABOLIC SYNDROME

Etiology

- Insulin resistance
- Cells have reduced use of insulin & fats
- Pancreas has higher production of insulin

ENERGY EFFICIENCY

- Example: taking a long road trip
  - How many liters of petrol will you need?
  - Depends on your car
  - Depends on fuel efficiency


YAMAHA
125

ENERGY EFFICIENCY

- Example: taking a road trip
  - How many liters of petrol will you need?
  - Depends on your car
  - Depends on fuel efficiency
- Caloric intake
  - Some people **USE** calories (fat, carbohydrates) much more
  - Others **EAT** more calories than they need
  - Excess calories are “stored” in the body for later use (central obesity)
  - Genetics: Asians and Hispanics more likely

METABOLIC SYNDROME

- Syndrome with 4 parts
  - Central obesity
  - High blood pressure
  - High blood sugar
  - Abnormal cholesterol

- Treatment
  - **Diet & Lifestyle modification**
  - Medications

MAKE A *NEW START* TODAY!

- **N**utrition
- **E**xercise
- **W**ater
- **S**unlight
- **T**emperance
- **A**ir
- **R**est
- **T**rust in God

SUCCESSFUL WEIGHT CONTROL

Long-term behavioral treatment, whatever form it takes, encourages patients to practice four key behaviors

1. Exercise regularly
2. Consume a lower-calorie diet
3. Monitor weight regularly
4. Record food intake and physical activity

WEIGHT LOSS

- As little as 5-10% weight loss results in
  - improved blood tests (glucose, cholesterol)
  - improved blood pressure
  - reduced cardiovascular mortality

- Set realistic goals with patients
  - 10% in 3-6 months
  - From 110kg to 100kg or from 100kg to 90kg


THIS ONE
RUNS ON MONEY
AND MAKES
YOU FAT
THIS ONE
RUNS ON FAT
AND SAVES
YOU MONEY

No matter how slow you go, you are still lapping everybody on the couch.

American Heart Association. | Go Red for women

METABOLIC SYNDROME

- Treatment – Medications
  - Target FBS < 150 and HgbA1c < 7.5%
    - Start with oral hypoglycemics
    - Metformin (first line) + sulfonylurea (if needed)
    - SGLT2 inhibitor (dapagliflozin, empagliflozin, canaglifozin)
    - “glitazones” + sitagliptin
    - Insulins
  - Target BP < 140/85mmHg
    - Diuretics
    - Ace-I or ARB if proteinuria
    - Beta blockers/calcium channel blockers
  - Use aspirin & statins for all if no contraindication

CVD / ASCVD RISK

- Known atherosclerosis
  - Peripheral vascular disease
  - Prior heart attack
  - Stroke
- Diabetes
- High risk profile (age, family history etc)
  - Framingham, European Heart Score

METABOLIC SYNDROME

- Primary Cholesterol target is LDL
  - Latest ACC/AHA guidelines emphasize that **statins** are the mainstay of therapy and do not encourage other therapies
  - Highly controversial to target a number (LDL < 70) versus high intensity therapy
- Secondary targets
  - Non-HDL cholesterol targets
  - Triglyceride targets

ATP III CHOLESTEROL GUIDELINES

Drugs Affecting Lipoprotein Metabolism

Drug Class	Agents and Daily Doses	Lipid/Lipoprotein Effects		Side Effects	Contraindications
HMG CoA reductase inhibitors (statins)	Lovastatin (20-80 mg) Pravastatin (20-40 mg) Simvastatin (20-80 mg) Fluvastatin (20-80 mg) Atorvastatin (10-80 mg) Cerivastatin (0.4-0.8 mg)	LDL HDL TG	↓18-55% ↑5-15% ↓7-30%	Myopathy Increased liver enzymes	Absolute: • Active or chronic liver disease Relative: • Concomitant use of certain drugs*
Bile acid sequestrants	Cholestyramine (4-16 g) Colestipol (5-20 g) Colesevelam (2.6-3.8 g)	LDL HDL TG	↓15-30% ↑3-5% No change or increase	Gastrointestinal distress Constipation Decreased absorption of other drugs	Absolute: • dysbeta-lipoproteinemia • TG >400 mg/dL Relative: • TG >200 mg/dL
Nicotinic acid	Immediate release (crystalline) nicotinic acid (1.5-3 gm), extended release nicotinic acid (Niaspan®) (1-2 g), sustained release nicotinic acid (1-2 g)	LDL HDL TG	↓5-25% ↑15-35% ↓20-50%	Flushing Hyperglycemia Hyperuricemia (or gout) Upper GI distress Hepatotoxicity	Absolute: • Chronic liver disease • Severe gout Relative: • Diabetes • Hyperuricemia • Peptic ulcer disease
Fibric acids	Gemfibrozil (600 mg BID) Fenofibrate (200 mg) Clofibrate (1000 mg BID)	LDL *(may be increased in patients with high TG)* HDL TG	↓5-20% ↑10-20% ↓20-50%	Dyspepsia Gallstones Myopathy	Absolute: • Severe renal disease • Severe hepatic disease

ELEVATED TRIGLYCERIDES

Treat elevated triglycerides.

ATP III Classification of Serum Triglycerides (mg/dL)

<150	Normal
150-199	Borderline high
200-499	High
≥500	Very high

Treatment of elevated triglycerides (≥150 mg/dL)

- Primary aim of therapy is to reach LDL goal
- Intensify weight management
- Increase physical activity
- If triglycerides are ≥200 mg/dL after LDL goal is reached, set secondary goal for non-HDL cholesterol (total – HDL) 30 mg/dL higher than LDL goal.

Comparison of LDL Cholesterol and Non-HDL Cholesterol Goals for Three Risk Categories

Risk Category	LDL Goal (mg/dL)	Non-HDL Goal (mg/dL)
CHD and CHD Risk Equivalent (10-year risk for CHD >20%)	<100	<130
Multiple (2+) Risk Factors and 10-year risk ≤20%	<130	<160
0-1 Risk Factor	<160	<190

If triglycerides 200-499 mg/dL after LDL goal is reached, consider adding drug if needed to reach non-HDL goal:

If triglycerides 200-499 mg/dL after LDL goal is reached, consider adding drug if needed to reach non-HDL goal:

- intensify therapy with LDL-lowering drug, or
- add nicotinic acid or fibrate to further lower VLDL.

If triglycerides ≥500 mg/dL, first lower triglycerides to prevent pancreatitis:

- very low-fat diet (≤15% of calories from fat)
- weight management and physical activity
- fibrate or nicotinic acid
- when triglycerides <500 mg/dL, turn to LDL-lowering therapy.

Treatment of low HDL cholesterol (<40 mg/dL)

- First reach LDL goal, then:
- Intensify weight management and increase physical activity
- If triglycerides 200-499 mg/dL, achieve non-HDL goal
- If triglycerides <200 mg/dL (isolated low HDL) in CHD or CHD equivalent consider nicotinic acid or fibrate.

METABOLIC SYNDROME - “TIP OF THE ICEBERG”

- People ask me “everything is normal?”
- Disease of lifestyle, carries substantial risk
- Unless you as a doctor emphasize the risk, your patients won’t know!
- PREVENTION is BETTER than TREATMENT
- Consider pharmacologic treatment if diet & lifestyle changes don’t work **after 3-6 months**, especially for those who are high risk (asa, statin, metformin)
- ALWAYS treat trigs > 800 (risk of pancreatitis)

EVIDENCE-BASED DIABETES MANAGEMENT

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LOMA LINDA UNIVERSITY

SUPERVISED AND EDITED BY TIFFANY PRIESTER, MD

CLINICAL PRESENTATION

- Classic symptoms
  - Polyuria and polydipsia
  - Nocturia
  - Blurred vision
  - Weight loss
  - Fatigue

TYPES OF DIABETES

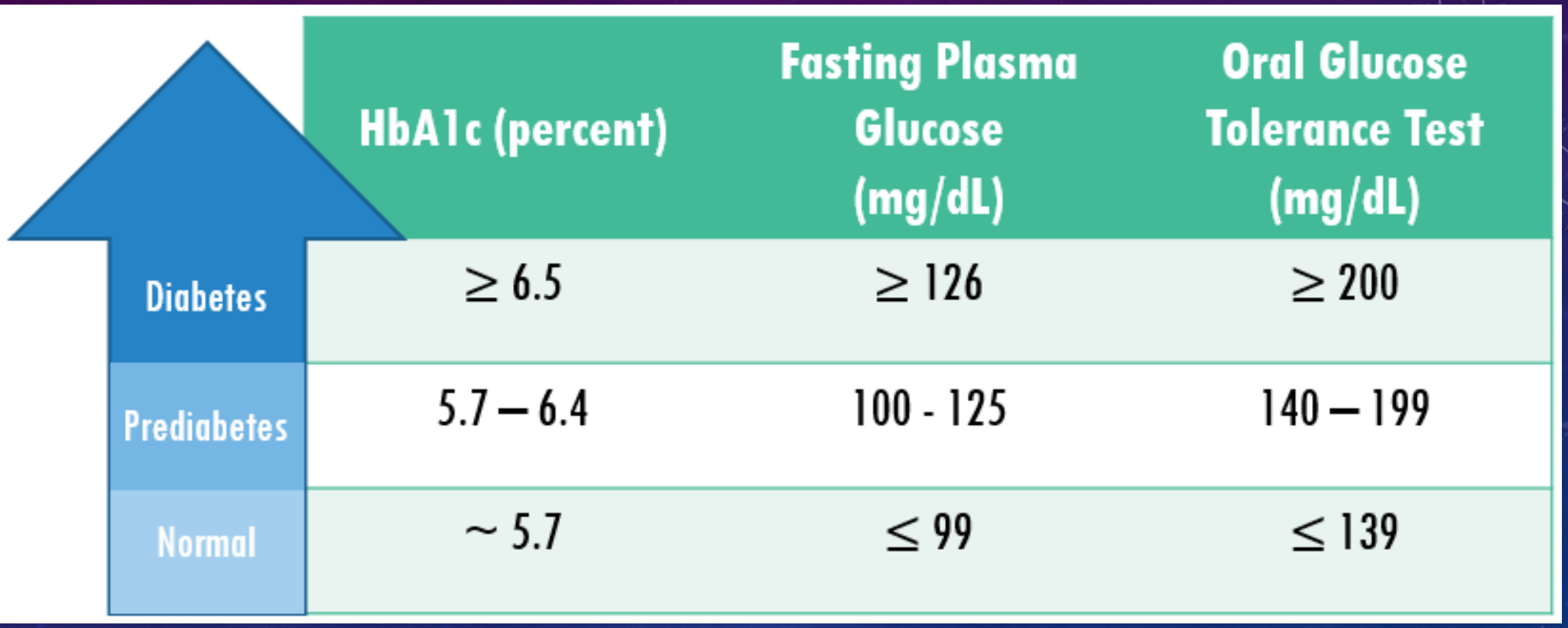
Type 1

- Insulin deficiency caused by destruction of the pancreatic beta cells.
- Most often diagnosed in children or adolescents
- Thin or normal weight
- Family history common
- Sudden Onset
- Ketoacidosis common

Type 2

- Increased peripheral insulin resistance
- Generally occurs in adults
- Often obese
- Family history common
- Gradual onset
- Ketoacidosis rare

DIAGNOSTIC CRITERIA



	HbA1c (percent)	Fasting Plasma Glucose (mg/dL)	Oral Glucose Tolerance Test (mg/dL)
Diabetes	≥ 6.5	≥ 126	≥ 200
Prediabetes	5.7 – 6.4	100 - 125	140 – 199
Normal	~ 5.7	≤ 99	≤ 139

In the absence of symptoms of hyperglycemia, diagnosis should be confirmed with repeat testing on subsequent day

SCREENING FOR DIABETES

- Once yearly screening in patients age 40-70 and any one
  - hypertension,
  - hyperlipidemia,
  - BMI ≥25
- Preferred screening tests
  - Fasting plasma glucose
  - Glycosylated hemoglobin (A1C)

COMMONLY AVAILABLE DIABETES MEDICATIONS

- Metformin
  - DPP4 Inhibitors (“gliptins”)
- Sulfonylureas
- Glitazones (Thiazolidinedions)
- GLP1 Receptor Agonists
- SGL2 Inhibitors
- Insulin

METFORMIN

- Mechanism: Reduces glucose released liver, decreases insulin resistance in muscle cells
- No hypoglycemia
- Helps with weight loss
- Contraindicated with eGRF<30
  - Cr 2.8 in 60year-old 80kg male
- Side effects: GI (Nausea, diarrhea usually at high doses)

DPP4 INHIBITORS ("GLIPTINS")

- Vildagliptin (Galvus), Sitagliptin (Janumet)
  - Mechanism: Prolongs the action of GLP-1, increases glucose-dependent insulin secretion and decrease glucagon production
- No hypoglycemia
- Renal dose adjustment required (half dose with renal patients), can be used in ESRD
- Few adverse effects

SULFONYLUREAS

- Glipizide (Novoglip), Glimepiride (Diapride), glibenclamide (Glycoben), Gliclazide
- Mechanism: Stimulates pancreas to increase insulin production
- High risk of hypoglycemia. Avoid in frail elderly
- Safe in kidney disease except glibenclamide
- Side effects: Weight gain

GLITAZONES (THIAZOLIDINEDIONS)

- Pioglitazone (Tripride)
- Mechanism: Increases insulin sensitivity in adipose tissue and muscle, decreases liver glucose output
- No risk of hypoglycemia
- **Generally not recommended in renal impairment due to potential for fluid retention**
- **Contraindicated in heart failure, hepatic impairment, osteoporosis, history of bladder cancer**
- Side effects: weight gain, fluid retention, bone fractures

GLP1 RECEPTOR AGONISTS

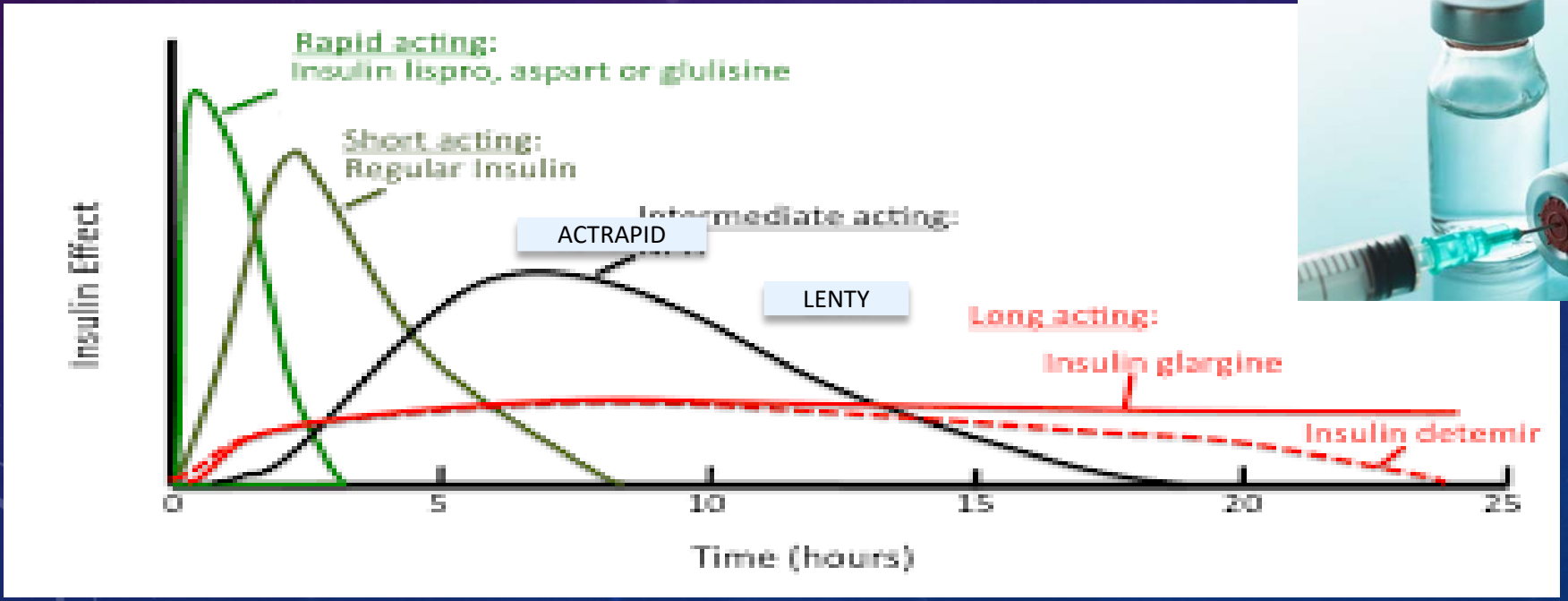
- Lixisenatide, Liraglutide, Exenatide
- Mechanism: Mimics the effect of incretin hormones to increase glucose-dependent insulin secretion and decrease glucagon production
- No risk of hypoglycemia
- Helps with weight loss
- Not recommended for eGFR <30
- Side effects: GI (N/V/D), thyroid cancer

SGL2 INHIBITORS

- Canaglifozin, Empaglifozin, Dapaglifozin
- Mechanism: Inhibits glucose reabsorption in the kidneys
- No hypoglycemia
- Helps with weight loss
- **New studies showing mortality benefit in heart failure**
- Not recommended with eGFR <30-60 depending on agent
- Risk of genitourinary infections, polyuria, hypovolemia

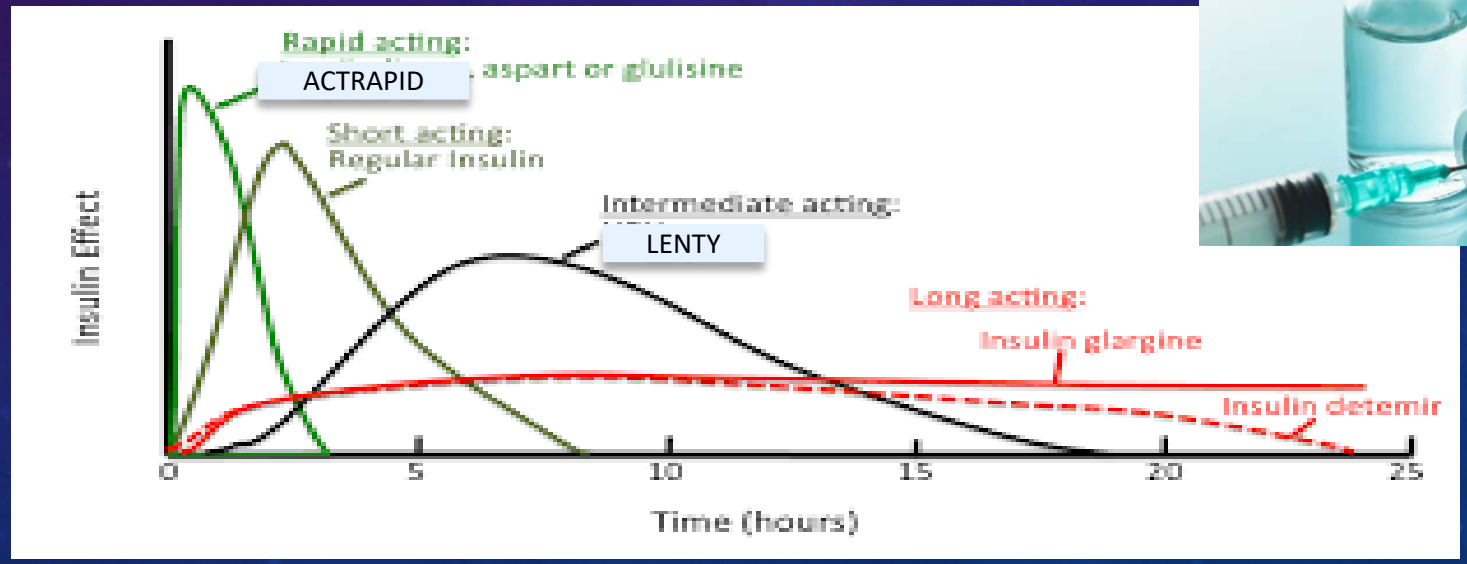
INSULIN

- Long acting (24 hours): Lantus (Glargine), Detemer
- Intermediate acting (BD dosing): Lente
- Short acting (2-4 hours): Actrapid



INSULIN

- Side effects: Weight gain, hypoglycemia, hypersensitivity reactions
- Preferred in ESRD
- Requires refrigeration



MANAGEMENT OF TYPE 2 DIABETES

- Diabetes education
- Low refined carbohydrate diet
  - “Nothing white”
- Weight loss
- Exercise

CHOICE OF INITIAL THERAPY

- If A1c < 9.0, consider monotherapy
  - Metformin is first line if no contraindications
  - If Metformin contraindicated, consider sulfonylurea
- If A1c >9.0, consider starting with dual therapy
  - Metformin + sulfonylurea or DPP4 inhibitor

TREATMENT GOAL

- Young patients without established complications should have an A1C goal of 7 to 7.5 if this can be achieved without significant hypoglycemia or other side effects
- Older adults and those with comorbid conditions or limited life expectancy may have A1C targets 8 to 8.5 due to limited likelihood of benefit from intensive therapy balanced against the side effects of medications.

MANAGEMENT OF PERSISTENT HYPERGLYCEMIA

- Monitor HgbA1c every 3 months (substitute blood sugar log - fasting and 2 hrs post prandial)
- For most patients, add a second medication when glycemic treatment goal is not achieved within three months
  - Second line: Metformin + sulfonylurea or DPP4 inhibitor
  - If treatment goal not achieved within another three months, Metformin + sulfonylurea + DPP4 inhibitor

STARTING INSULIN

- Have patients continue metformin and DPP4 inhibitors while on insulin, stop sulfonylureas
- Start with basal long acting insulin
  - Start with 10-20 units daily
  - Increase by 2 units per day until fasting at goal (100-150mg/dL or 5.5 – 8.5 mmol/L)
  - Have patients check blood glucose before breakfast and at bedtime before their dose
- If post-prandial blood sugars remain high, start short acting insulin TDS with meals starting 6 units with small meals, 8 units with medium meals and 10 units with big meals.

LONG-TERM COMPLICATIONS OF DIABETES

- Macrovascular Complications
  - Increased risk of cardiovascular, peripheral vascular and cerebrovascular disease – heart attack and stroke
- Microvascular comlications
  - Peripheral neuropathy
  - Diabetic ulcers
  - Chronic Kidney Disease

LONG-TERM COMPLICATIONS OF DIABETES

Eye pathology

- Proliferative diabetic retinopathy
- Cataracts
- Glaucoma

PREVENTION AND SCREENING FOR DIABETES COMPLICATIONS

- Risk reduction for microvascular disease
  - Smoking cessation
  - Blood pressure control (ACE-i is often a good first medication for renal protection)
  - Aspirin and statin therapy for high risk patients (monitor lipid profile)
  - Measure urine protein yearly and, if positive, initiate ACE-i to slow renal disease
- Diabetic eye exam yearly
- Routine foot examination for neuropathy, PVD, diabetic ulcers, fungal infections

TYPE 1 DIABETES

- Confirming the diagnosis:
  - Send out for pancreatic autoantibodies against glutamic acid decarboxylase 65 (GAD65)

- Treatment differences from type 2:
  - Patients will need life-long insulin therapy. This should be initiated on diagnosis of the disease
  - Metformin helpful in increasing insulin sensitivity

ENDOCRINE DISORDERS

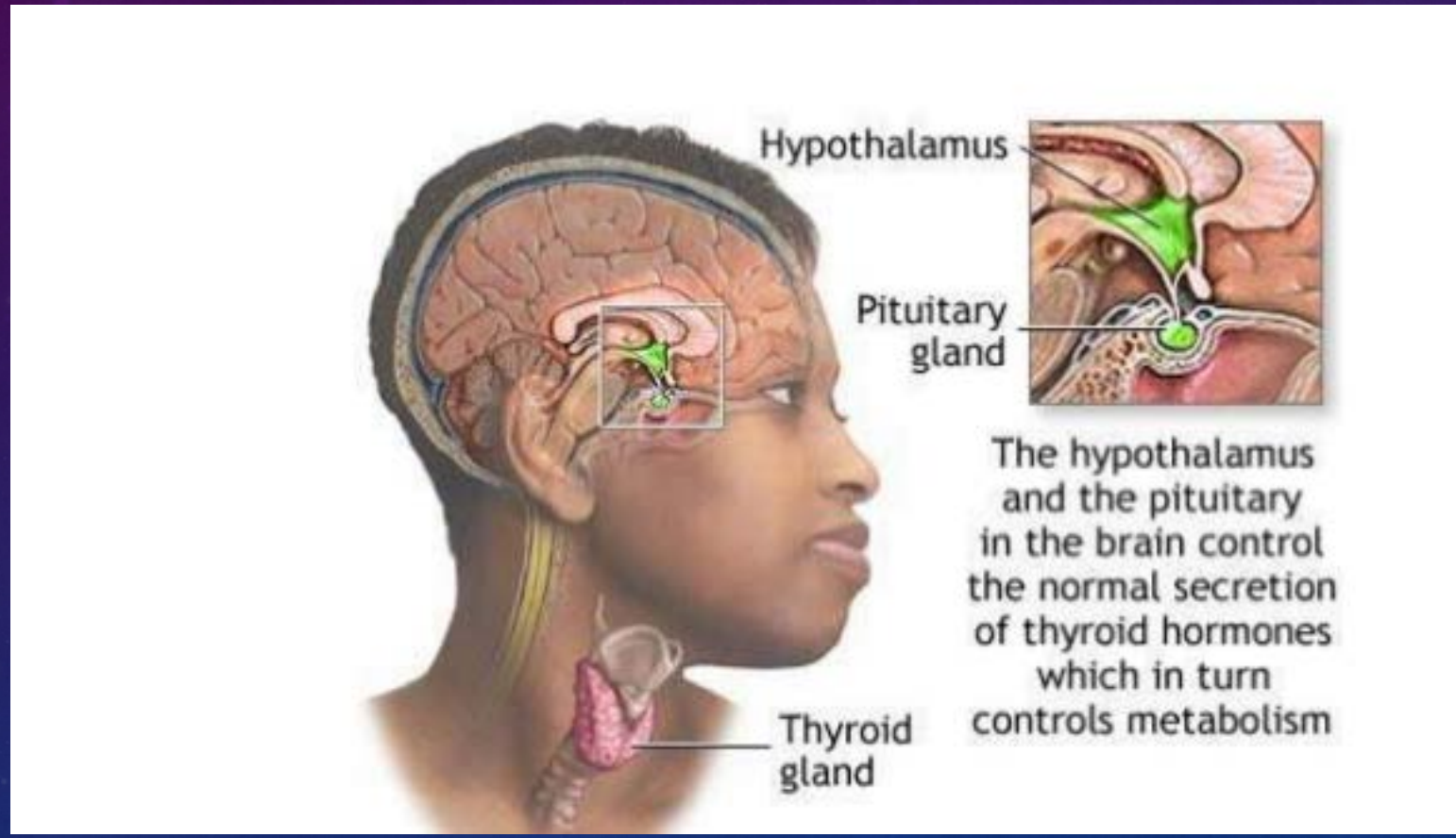
- Insulin / Pancreas -> Diabetes
- Thyroxin / Thyroid gland -> Hypothyroidism and Hyperthyroidism
- Adrenal glands -> Addison’s disease / Cushing’s disease

- The following slides are selected from a presentation found online

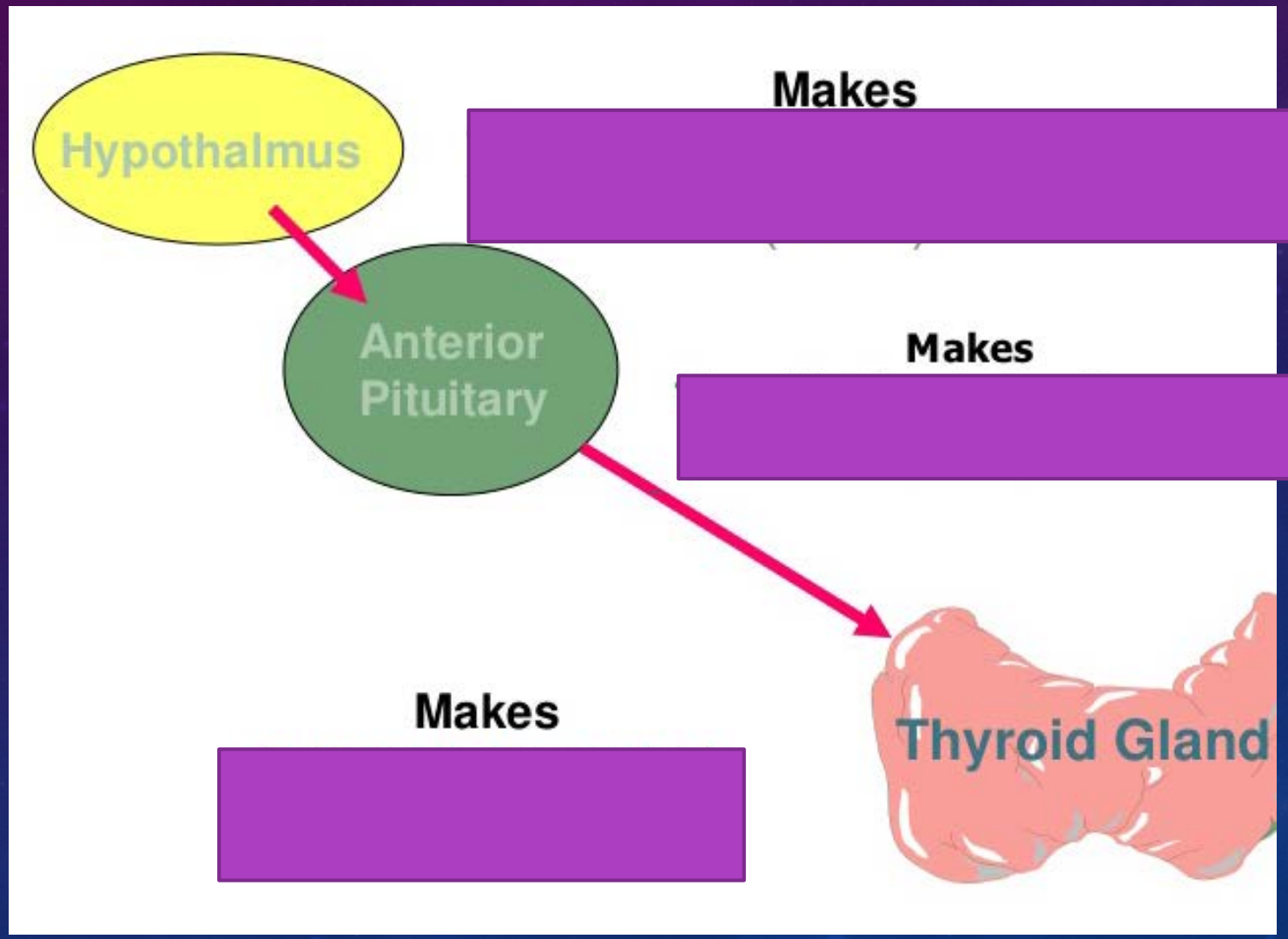
THYROID DISEASE

SEJAL NIRBAN FY1

THYROID PHYSIOLOGY



HYPOTHALAMUS-PITUITARY-THYROID AXIS



THYROID HORMONE SYNTHESIS, METABOLISM AND ACTION

- Iodine enters thyroid gland and is used for T3 and T4 production
- Hormones are released from the thyroid and vast majority are protein bound (TBG) and deposited in peripheral cells
- T4 has 4 iodine atoms, removal of one produces T3

Total= Bound to TBG

Free= Unbound

T3 & T4

- Facilitate normal growth and development
- Increase metabolism
- Increase catecholamine effects

TSH

- Most useful marker of thyroid hormone function
- Released in a pulsatile diurnal rhythm- highest at night

HYPOTHYROIDISM

Insufficient thyroid hormone

1. Primary: thyroid gland failure
2. Secondary: pituitary gland failure
3. Tertiary: hypothalamus failure

HYPOTHYROIDISM CAUSES

Primary hypothyroidism

- Iodine deficiency- most common cause worldwide
- Congenital
- Autoimmune mediated
  - Hashimoto's thyroiditis- B lymphocytes invade thyroid
- Iatrogenic- post-thyroidectomy or radio-iodine treatment
- Drug-induced – Anti-thyroid, lithium, amiodarone
- Severe infection
- Trauma to thyroid/pituitary/hypothalamus
- Pituitary tumour

HYPERTHYROIDISM CAUSES

Hyperthyroidism (thyrotoxicosis) is excess thyroid hormone

- Autoimmune
  - Graves Disease (76%)
  - F>M, age 20-40
  - IgG auto antibodies bind TSH receptors T3 & T4
  - Leads to gland hyper function
- Toxic adenoma and toxic multinodular goitre
- Viral Thyroiditis (de Quervain's)
  - Fever and ESR- self limiting
- Exogenous Iodine
- Neonatal thyrotoxicosis
- Drugs- Amiodarone
- TSH secreting pituitary adenoma (rare)

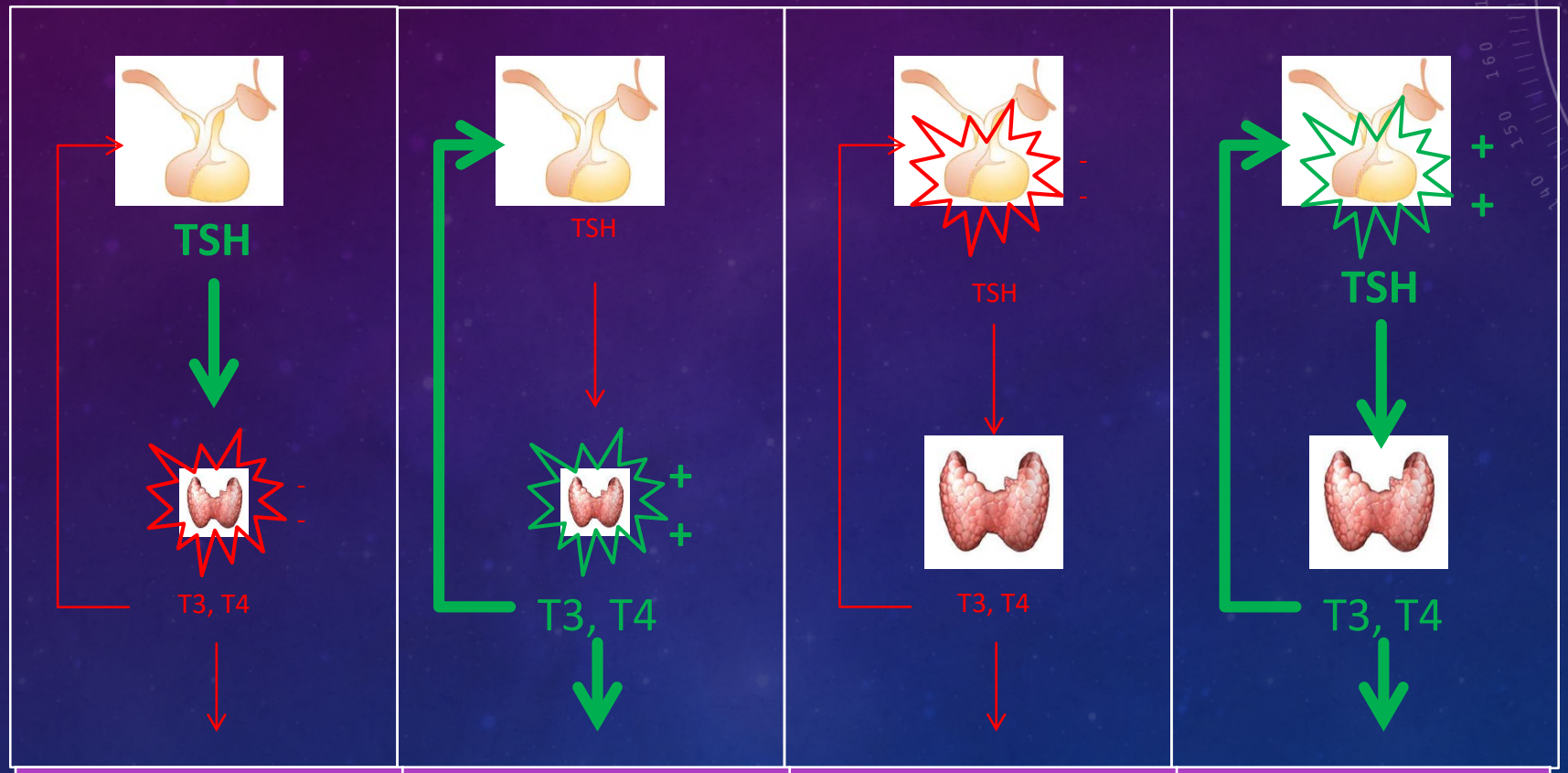
INVESTIGATING THYROID DISEASE

- TSH- first thing you assess
  - Normal range 0.5-5 μU/ml
  - Supressed= Hyperthyroid
  - Elevated= Hypothyroid

If TSH abnormal request Free T4

- Elevated= Hyperthyroid
- Suppressed= Hypothyroid

INVESTIGATIONS – TFTS



Hypothyroidism	Hyperthyroidism	Hypopituitarism	TSH secreting tumour
↑TSH; ↓T4,T3	↓TSH; ↑T4,T3	↓TSH; ↓T4,T3	↑TSH; ↑T4,T3

HYPOTHYROIDISM - MANAGEMENT

- Conservative
  - Lifestyle - smoking cessation, weight loss
- Medical
  - **Levothyroxine (T4)**
    - Repeat TSH in 6/52
    - Adjust dose according to clinical response and normalisation of TSH
    - Caution in patients with IHD- risk of exacerbation of MI
    - Clinical improvement may not begin for 2/52
    - Symptom resolution 6/12→ if not consider +T3
- Surgical
  - Symptomatic – carpal tunnel decompression, thyroidectomy if compression of local structures

HYPERTHYROIDISM - MANAGEMENT

- Conservative
  - Smoking cessation – especially with Graves's ophthalmology, associated with worse prognosis

- Medical
  - Symptomatic – β-blockers
  - Carbimazole, propylthiouracil (50% relapse)
    - Risk of agranulocytosis
  - Radio-iodine treatment
  - Long term likely to become hypothyroid

THYROID STORM

- Life threatening emergency (rare) – 30% mortality even with early recognition and management

- Exacerbation of thyrotoxicosis precipitated by stress i.e.
  - Surgery
  - Infection
  - Trauma

- Signs
  - Fever
  - Agitation and confusion
  - Tachycardia +/- AF

THYROID CANCERS

Type of tumour	Frequency (%)	Age at presentation (years)	20 year survival (%)
Papillary	70	20-40	95
Follicular	20	40-60	60
Anaplastic	5	>60	<1
Medullary	5	>40	50
Lymphoma	2	>60	10

- The above slides were selected from a presentation found online

ENDOCRINE DISORDERS

- Insulin / Pancreas -> Insulin resistance & Diabetes
- Thyroxin / Thyroid gland -> Hypothyroidism and Hyperthyroidism
- Adrenal glands -> Addison’s disease / Cushing’s disease

ADRENAL GLANDS

- Insufficient or excess cortisol / aldosterone / sex hormones
- Condensed for this presentation

ADRENAL INSUFFICIENCY

- Most common clinical scenarios
  - Chronic vague symptoms (weakness, fatigue, falls, dizziness, hypotension)
  - Acute illness (rapid shock and deterioration)
  - HIV and TB associated (persistent tachycardia, hypotension, cyclical decompensation)
  - Frequent or chronic home steroid use (COPD, asthma, autoimmune disease)
- Treatment based on presentation
  - Hospitalized or unstable: Treat immediately with empiric IV steroids
  - Stable or chronic: Check ACTH levels versus empiric treatment
  - May need fludrocortisone for mineralocorticoid action if chronic
  - Continuous low dose replacement versus taper

ENDOCRINE DISORDERS

- Insulin / Pancreas -> Diabetes
- Thyroxin / Thyroid gland -> Hypothyroidism and Hyperthyroidism
- Adrenal glands -> Addison’s disease / Cushing’s disease

- Not addressed
  - Hormone secreting tumors (neuroendocrine tumors)
  - Gonadal hormone imbalance or failure
  - Pituitary failure / Sheehan’s syndrome
  - Calcium homeostasis / parathyroid glands
  - Acromegaly/Gigantism/Dwarfism