DIABETES MELLITUS

	TYPE I (5%)	**TYPE II** (90%)
DEFECT	Autoimmune destruction of pancreatic β-cell • Severe glucose intolerance; Requires insulin to live	Obesity → Insulin resistance → pancreatic β-cell failure • Mild glucose intolerance
ONSET	Sudden onset • < 20 years (youth); can occur at any age • Associated with HLA-DR3 & HLA-DR4	Gradual onset • > 40 years; strong genetic predisposition • Associated with obesity; ↑ age → ↓ insulin production
SYMPTOMS	Polydipsia and polyuria (osmotic diuresis) Polyphagia and weight loss (unopposed glucagon)	Often clinically silent (may have polyuria & polydipsia)

SCREENING All adults > 45 every 3 years

DIAGNOSIS

HbA_{1C}	≥ 6.5%	Reflects blood glucose over RBC lifespan (~120 days) <5.7% = normal; diabetics should aim to keep their HbA_{1C} < 7%
Fasting plasma glucose (x2)	≥ 126	Fasting for > 8 hours < 100 = normal
2 hour oral glucose tolerance test	≥ 200	Most sensitive test, but expensive and inconvenient Preferred test in gestational diabetes, PCOS and CF related diabetes < 140 = normal
Random plasma glucose	≥ 200	Symptoms must also be present <140 = normal

TREATMENT	MECHANISM	ADVANTAGES	SIDE EFFECTS
Diet & exercise			
Metformin	↑ Insulin sensitivity in liver	Weight loss. Doesn't cause hypoglycemia	GI upset, lactic acidosis Contraindicated in renal failure
Sulfonylureas	Stimulate pancreatic insulin production	Inexpensive	Weight gain, hypoglycemia
Acarbose	↓ GI glucose absorption		GI upset
Thiazolidinediones	↓ Insulin resistance in fat & muscle	↓ insulin levels	Hepatotoxicity (monitor LFTs)

CHRONIC COMPLICATIONS & MANAGEMENT

Tight blood glucose control → ↓ microvascular complications (nephropathy, retinopathy); uncertain effect on microvascular complications (MI, stroke)
Diabetic sensorimotor polyneuropathy affecting:
Small nerve fibers → "positive" sxs (pain, paresthesia, allodynia)
Large nerve fibers → "negative" sxs (numbness, loss of proprioception & vibration)

Heart	Check cholesterol levels every year; if LDL > 100 → statin Check BP at every visit; if >130/80 → ACEi or ARB MI is most common cause of death in diabetics
Kidney	Screen for microalbuminemia (30-300 in 24hrs) every year; if present → ACEi or ARB Check BUN/Creatinine every year
Eye	Annual screening for diabetic retinopathy Complications: retinopathy (hemorrhage, microaneurysms, vessel proliferation), glaucoma, cataracts
Nerves	Annual pediatric exam; Monofilament testing is used to determine presence of peripheral neuropathy Complications: peripheral neuropathy, erectile dysfunction, gastroparesis (tx: metoclopramide)
Misc.	All diabetics > 30 → daily aspirin (81mg) All diabetics should receive the pneumococcal vaccine

ACUTE COMPLICATIONS	DKA	HHS
Patient	Type I DM; younger age	Type II DM; older age
Presentation	Kussmaul respiration, blurred vision, altered mentation	Altered mentation
Glucose (mg/dL)	250-500	> 600 (often > 1,000)
Bicarbonate (mEq/L)	< 18	> 18
Anion Gap	↑, ⊕ serum ketones	Normal, ⊖ serum ketones
Serum Osmolality (mOsm/kg)	< 320	> 320

MANAGEMENT OF DKA & HHS

IV Fluids	0.9% normal saline; once glucose ≤200, add dextrose 5%
Insulin	Continuous IV insulin infusion; switch to SQ insulin once glucose ≤ 200, Bicarb > 18, or AG < 12
Potassium	If serum K+ ≤ 5.2 → IV potassium If serum K+ <3.3 → hold insulin Nearly all patients are K+ depleted, even with 'hyperkalemia'
Bicarbonate	Consider for patients with pH <6.9
Phosphate	Consider for serum phosphate <1, cardiac dysfunction, or respiratory depression Monitor serum calcium frequently

Serum anion gap and β-hydroxybutyrate are the best markers for indication of DKA resolution