Diabetes Mellitus – High-Yield Summary

Definition
- Diabetes mellitus (DM) is a metabolic syndrome characterized by chronic hyperglycemia due to:
- Insulin deficiency
- Insulin resistance
- Or both

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Magnitude of the Problem
- DM is an "iceberg disease" (many undiagnosed cases).
- Global prevalence in adults ≈ 4%.
- 171 million affected worldwide (WHO, 2000).
- Expected to double by 2030, especially in Asia & Africa.
- Rising prevalence linked to:
- Urbanization
- Obesity
- Westernized diet
- Sedentary lifestyle
- Population aging

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Classification
1. Type 1 DM (IDDM)
2. Type 2 DM (NIDDM)
3. Gestational Diabetes Mellitus (GDM)
4. Secondary Diabetes Mellitus

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Type 1 Diabetes Mellitus
- Autoimmune destruction of pancreatic β-cells
- → Absolute insulin deficiency
- Usually affects children & young adults
- Peak onset: 10–14 years
- Associated with HLA-DR3, DR4

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Type 2 Diabetes Mellitus
- Due to insulin resistance + relative insulin deficiency
- Early stage: hyperinsulinemia
- Strongly associated with:
- Obesity (especially central obesity)
- Age > 40 years
- Lifestyle factors
- Most common type worldwide

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Gestational Diabetes Mellitus (GDM)
- Occurs in 2–5% of pregnancies
- Resembles type 2 DM
- Usually resolves after delivery
- 20–50% develop type 2 DM later
- Risks to fetus:
- Macrosomia a baby being significantly larger than average at birth, often defined as over 8 pounds, 13 ounces (4,000 grams) or more
- Congenital anomalies
- Respiratory distress syndrome

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Secondary Diabetes Mellitus
- Pancreatic disorders: chronic pancreatitis, cystic fibrosis
- Hormonal excess: Cushing's, acromegaly High levels of the hormone cortisol
- Drug-induced: corticosteroids, thiazides, toxins (e.g. alloxan)

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Natural History of DM

Agent Factors
- Insulin deficiency (absolute or partial)
- β-cell destruction
- Insulin resistance
- Genetic mutations
- Autoimmunity

Host Factors
- Age
- Genetics
- Immune mechanisms
- Obesity (central obesity → insulin resistance)

Environmental Factors
- Sedentary lifestyle
- Diet (excess calories)
- Viral infections (rubella, mumps)
- Stress
- Urbanization

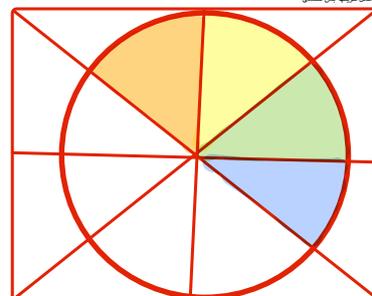____

Risk Factors

Non-modifiable
- Age
- Family history
- Ethnicity

Modifiable
- Obesity
- Physical inactivity
- Hypertension
- Dyslipidemia
- Smoking
- Impaired fasting glucose (>100 mg/dL)

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Clinical Picture
- Classic triad:
- Polyuria
- Polydipsia
- Polyphagia
- Type 1: weight loss, fatigue
- Type 2: often asymptomatic

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Diagnosis

DM is diagnosed by any one of:
- Fasting plasma glucose ≥ 126 mg/dL
- 2-hour OGTT ≥ 200 mg/dL
- Random plasma glucose ≥ 200 mg/dL with symptoms
- HbA1c ≥ 6.0%

Prediabetes
- Impaired fasting glycemia: 100–125 mg/dL
- Impaired glucose tolerance: 2-hr OGTT 140–199 mg/dL

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Complications

Acute
- Diabetic ketoacidosis (DKA)
- Hypoglycemia

Chronic
Macrovascular
- Atherosclerosis
- Coronary artery disease
- Stroke
- Peripheral vascular disease
- Diabetic foot

Microvascular
- Retinopathy → blindness
- Neuropathy → glove & stocking pattern
- Nephropathy → chronic renal failure

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Prevention & Control

Type 1 DM
- Genetic predisposition (HLA-DR3, DR4)
- Possible protective factors:
- Breastfeeding
- Vitamin D supplementation in infancy

Type 2 DM
- Lifestyle modification:
- Healthy weight
- ≥ 150 min/week physical activity
- High-fiber diet
- Whole grains
- Reduced fat intake

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🔥 Exam High-Yield Points
- DM = hyperglycemia + insulin problem
- Type 1 → autoimmune, young, absolute insulin deficiency
- Type 2 → insulin resistance, obesity, adults
- HbA1c reflects last 3 months
- Most common cause of adult blindness & kidney failure

وَكُنْ فِي الطَّرِيقِ عَفِيفَ الخُطَى
شَرِيفَ السَّمَاعِ كَرِيمَ النَّظَرْ
وَكُنْ رَجُلاً إِنْ أَتَوْا بَعْدَهُ
يَقُولُونَ مَرَّ وَهَذَا الأَثَرْ