An overview of Diabetes Mellitus

Type 1 Diabetes (Insulin-Dependent)

Pathophysiology:

- Autoimmune destruction of pancreatic **beta cells** → **absolute insulin deficiency**.
- Requires lifelong insulin therapy to survive.

Typical Symptoms:

- **Acute onset** (days to weeks):
  - **Polyuria** (excessive urination).
  - **Polydipsia** (excessive thirst).
  - **Weight loss** (despite normal/increased appetite).
  - **Lethargy** and fatigue.
  - **Recurrent infections** (e.g., thrush).

Diabetic Ketoacidosis (DKA):

  - Nausea/vomiting, fruity-smelling breath, rapid breathing, confusion.
  - Life-threatening without urgent insulin and fluid replacement.

Key Features:

- **Age**: Usually diagnosed <30 years (but can occur at any age)
- **Autoantibodies**: Presence of anti-GAD, IA-2, or islet cell antibodies
- Beta cells (insulin) destroyed but alpha cells (glucagon) preserved

Management:

- **Insulin regimens**: Multiple daily injections (MDI) or insulin pumps.
- **Monitoring**: Frequent blood glucose checks, HbA1c target ≤48 mmol/mol (≤6.5%).

Type 2 Diabetes (Non-Insulin-Dependent)

Pathophysiology:

- **Insulin resistance** + **relative insulin deficiency** (beta cell dysfunction).
- Strongly linked to **obesity**, sedentary lifestyle, and genetic predisposition.

Typical Symptoms:

- **Insidious onset** (often asymptomatic for years):
  - **Polyuria**, **polydipsia** (milder than in Type 1).
  - **Fatigue**, blurred vision.
  - **Recurrent infections** (e.g., urinary tract, skin).
  - **Slow-healing wounds**.
- **May present with complications**: Neuropathy, retinopathy, or cardiovascular disease.

Key Features:

- **Age**: Usually >30 years (increasingly seen in younger, obese individuals).
- **Risk Factors**: Obesity, family history, ethnicity (South Asian, African-Caribbean).
- **Image Reference**: *Treatment diagram*: Multi-organ targets (e.g., metformin [liver], SGLT2 inhibitors [kidney], GLP-1 analogues [intestine]).

Management:

- **Lifestyle**: Weight loss, diet, exercise.
- **Oral agents**: Metformin (first-line), sulfonylureas, SGLT2 inhibitors, DPP-4 inhibitors.
- **Injectable therapies**: GLP-1 agonists, insulin (added if oral agents fail).
- **HbA1c target**: Individualized (typically 48–58 mmol/mol; 6.5–7.5%).

Key Differences

Feature	Type 1 Diabetes	Type 2 Diabetes
Onset	Acute	Gradual/asymptomatic
Insulin	Absolute deficiency (required)	Resistance + relative deficiency
Body Weight	Normal or underweight	Overweight/obese
Autoantibodies	Present	Absent
Ketoacidosis	Common at diagnosis	Rare (unless severe stress/ illness)

Additional Notes

- **Diagnosis**:
  - **Type 1**: Elevated blood glucose + ketones/autoantibodies.
  - **Type 2**: HbA1c ≥48 mmol/mol (6.5%) or fasting glucose ≥7 mmol/L.
- **Complications**: Both types risk retinopathy, nephropathy, neuropathy, and CVD.
- **Emerging Therapies**: Bariatric surgery for Type 2 with obesity; insulin analogues for tailored regimens.

Clinical Pearl: Always screen for **DKA** in Type 1 patients with acute symptoms. For Type 2, prioritize **weight management** and **complication screening** (e.g., annual foot/eye exams).