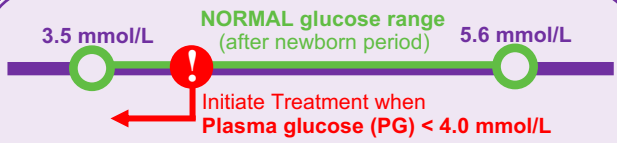
TYPE 1 DIABETES MELLITUS: OVERVIEW

- **Pathophysiology:** **Autoimmune** destruction of insulin-producing **pancreatic beta cells** in the islets of Langerhans, resulting in **insulin deficiency**
- **Age of presentation:** Can present at any age; Bimodal distribution of peaks at 4 - 6 years old and early puberty (10 – 14 years old)
- **Risk factors:** both genetic (relatives with T1DM) and environmental factors
  - In **genetically susceptible individuals**, exposure to one or more **environmental agents** likely triggers **immune response**



RECOMMENDED GLYCEMIC TARGETS

- ✓ **A1C ≤ 7.5** (7 in some guidelines) **fasting** PG **4.0 – 8.0** mmol/L, **postprandial** PG **5.0 – 10.0** mmol/L
- ✓ Pre-prandial targets of 6.0-10.0 mmol/L
- ✓ Consider higher A1C target if prior significant hypoglycemia or hypoglycemia unawareness

DIAGNOSIS

Clinical Presentation

- **Polyuria:** osmotic diuresis due to increased urinary glucose excretion
  - Secondary **enuresis** or **nocturia** in children
- **Polydipsia:** result of increased serum osmolality
- **Polyphagia**
- **Diabetic Keto Acidosis (DKA)**
- **Weight loss:** due to hypovolemia, increased catabolism (impaired glucose utilization, increased muscle & fat breakdown)
- Factors that may help differentiate T1DM vs T2DM :
  - *Body habitus:* Obesity is important risk factor for T2DM

Investigations

- ❑ **Diagnosis of diabetes:**
  - **Fasting** PG **≥ 7 mmol/L**
  - **Random** PG **≥ 11.1 mmol/L**
  - **PG ≥ 11.1** 2 hr post 75 g OGTT (OGTT not frequently used for diagnosis in children)
  - **A1C not used** to diagnose T1DM in children
- ❑ If asymptomatic, second test always needed; single test sufficient if symptomatic
- ❑ Lab results to support T1DM vs T2DM: antibodies (e.g., GAD65), insulin, C-peptide

MANAGEMENT

Education

- ✓ Training for patients & families by **multidisciplinary teams:**
  - *Insulin; BG & ketone monitoring; sick-day management; DKA; hypoglycemia; correction factors*
- ✓ Anticipatory guidance
- ✓ Dietician referral
- ✓ **Carbohydrate counting** to match insulin to intake, allows flexibility in diet (I:C ratio)

Insulin

- ➢ **Treat to meet glycemic targets**
- ➢ Two types of intensive insulin regimens: **Multiple daily injections** (MDI) & **continuous subcutaneous insulin infusion** (CSII; insulin pump)
- ➢ Less intensive BID & TID regimens
- ➢ Fingerstick or continuous glucose monitoring (CGM)
- ➢ **Hypoglycemia management:**
  - Mild & moderate: oral simple carbohydrate e.g., **fruit juice**
  - Severe: **glucagon** (IM, intranasal, SC), **IV dextrose**

ACUTE COMPLICATIONS

- ! **Hypoglycemia** (due to insulin)
- ! **Diabetic Ketoacidosis (DKA)**

SCREENING

Check for…	Starting…	Frequency
Glycemic control (**A1C**)	At Dx	q3months
Autoimmune thyroid (**TSH & TPO**)	At Dx	q2years
Celiac & Adrenal insufficiency	-	As indicated
Nephropathy	Age **12** (if Dx >5 years ago)	Annually
Retinopathy	Age **15** (if Dx >5 years ago)	Annually
Neuropathy	Age **15** (with poor glycemic control)	Annually (after 5 years of Dx)
Dyslipidemia	Age **12** (if no extra risk factors)	Repeat at 17
Hypertension	At Dx	q6months

LONG TERM COMPLICATIONS

Microvascular Disease
- Diabetic nephropathy
- Diabetic retinopathy
- Peripheral & autonomic neuropathy

Macrovascular Disease
- Cardiac disease (CAD, MI)
- Peripheral vascular disease
- Cerebrovascular disease (stroke)

Hypertension

Dyslipidemia

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