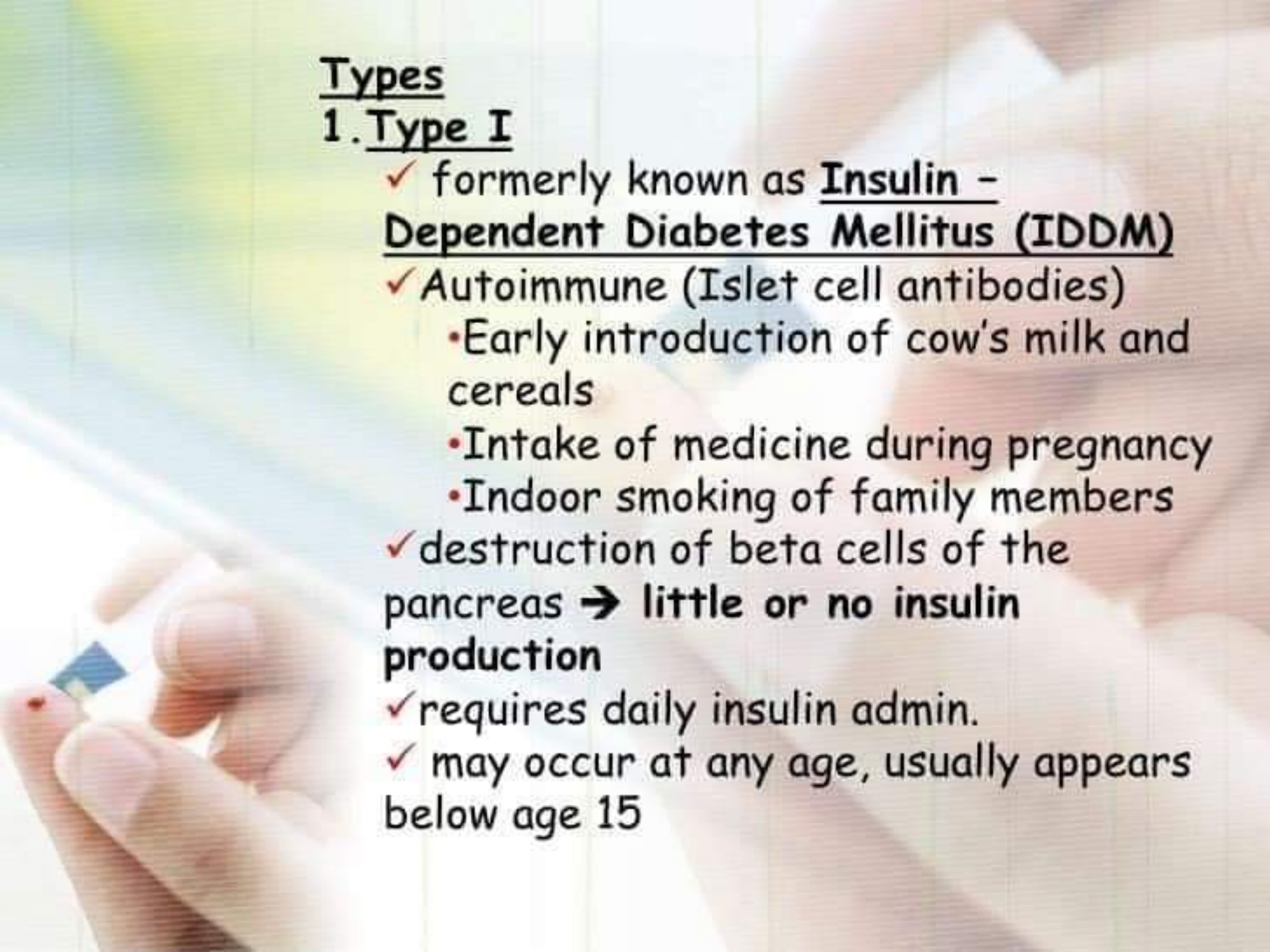
DIABETES MELLITUS

- is a chronic disorder of carbohydrate, protein, and fat metabolism resulting from **insulin deficiency** or abnormality in the use of insulin



Types

1. **Type I**
   - ✓ formerly known as **Insulin – Dependent Diabetes Mellitus (IDDM)**
   - ✓ Autoimmune (Islet cell antibodies)
     - Early introduction of cow's milk and cereals
     - Intake of medicine during pregnancy
     - Indoor smoking of family members
   - ✓ destruction of beta cells of the pancreas → **little or no insulin production**
   - ✓ requires daily insulin admin.
   - ✓ may occur at any age, usually appears below age 15

2. Type II

- ✓ formerly known as **Non Insulin-Dependent Diabetes Mellitus (NIDDM)**
- ✓ probably caused by:
  - disturbance in insulin reception in the cells
  - ↓ number of insulin receptors
  - loss of beta cell responsiveness to glucose leading to slow or ↓ insulin release by the pancreas
- ✓ occurs over age 40 but can occur in children
- ✓ common in overweight or obese
- ✓ w/ some circulating insulin present, often do not require insulin

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Pre-Diabetes

- Impaired fasting glucose (IFG)
  - FPG- 100-125mg/dL
- Impaired glucose tolerance (IGT)
  - OGTT 140-199mg/dL
- HbA1c 5.7-6.4%

Risk Factors

- Obesity
- Race
- History of CVD
- HTN
- Physical inactivity
- Familial history
- Polycystic Ovary Syndrome
- Gestational Diabetes

Clinical Manifestations (Signs and Symptoms)

- Polyuria
- Polydipsia
- Polyphagia
- weight loss
- nausea / vomiting
- changes in LOC (severe hyperglycemia) (sleepiness, drowsiness → coma)
- recurrent infection, prolonged wound healing
- altered immune and inflammatory response, prone to infection (glucose inhibits the phagocytic action of WBC → ↓resistance)
- genital pruritus – (hyperglycemia and glycosuria favor fungal growth : **candidal infection** – resulting in pruritus, common presenting symptom in women)
- weakness
- fatigue
- ↑ blood sugar / glucose level
- (+) glucose in urine (glycosuria)

Diagnostics

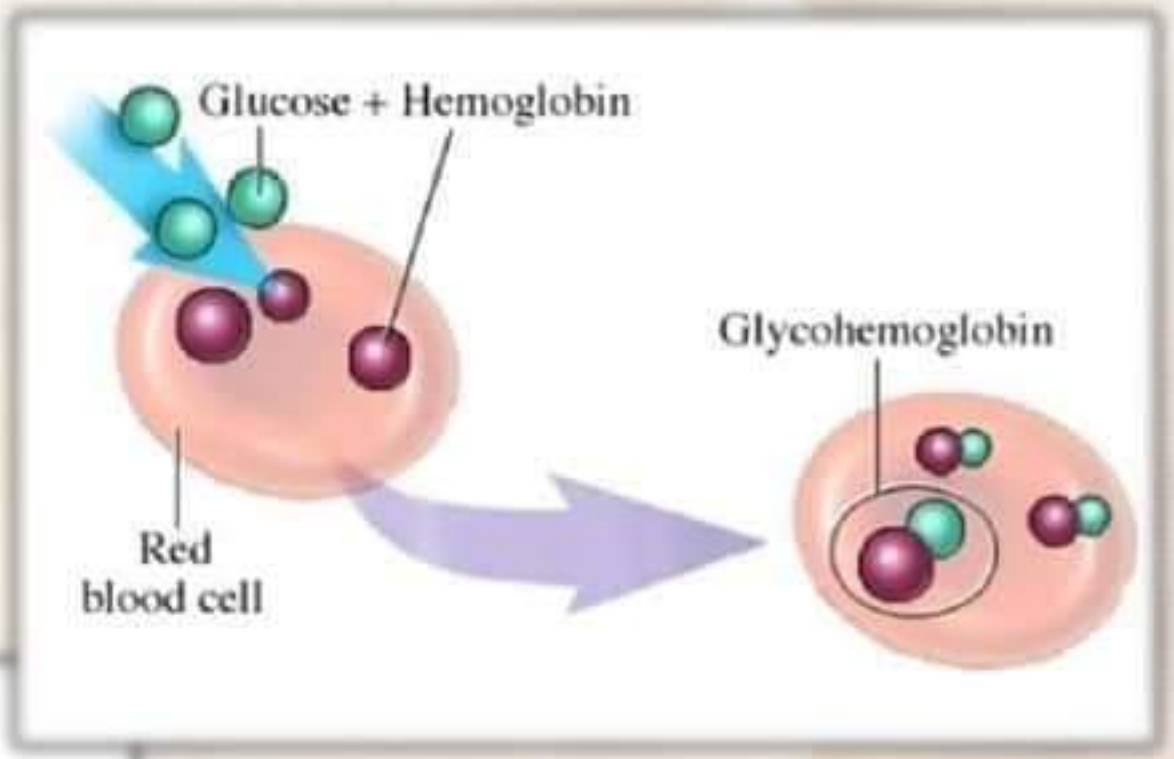
Fasting Plasma Glucose

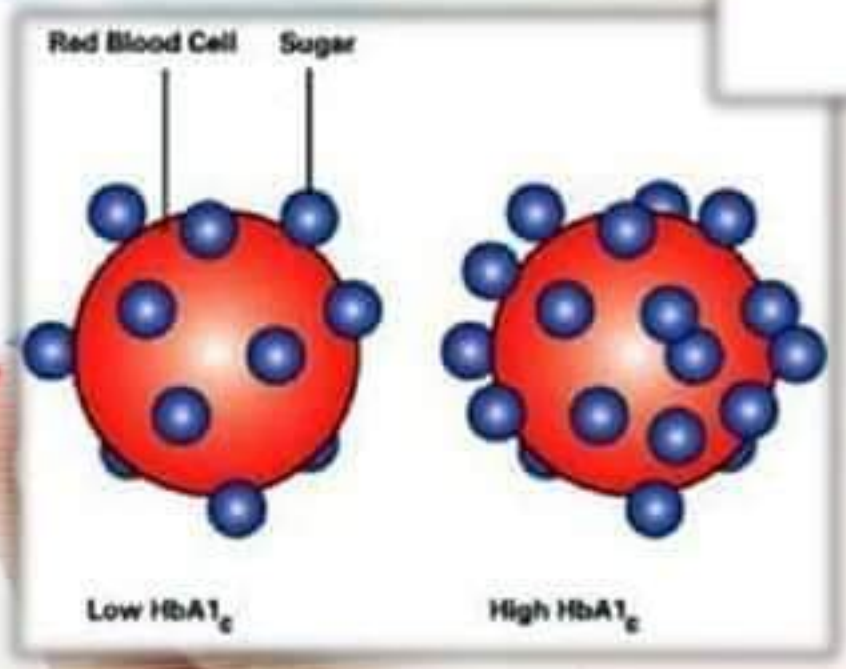
Oral Glucose Tolerance Test (OGTT)

Glycoselated Hemoglobin (HbA1c)

- HbA1c is a test that measures the amount of glycated hemoglobin in your blood. Glycated hemoglobin is a substance in red blood cells that is formed when blood sugar (glucose) attaches to hemoglobin.

(HbA1c)


Glucose + Hemoglobin
Glycohemoglobin
Red
blood cell


Red Blood Cell
Sugar
Low HbA1c
High HbA1c

Glycoselated Hemoglobin (HbA1c)

Immediate past month	50%
2nd month	25%
3rd month	15%
4th month	10%

Urinalysis

- Glycosuria
- Ketone bodies

Diagnostic Criteria

- **Classic signs of HYPERGLYSEMIA with CPG ≥200mg/dL**
- OGTT ≥200mg/dL
- FPG ≥126mg/dL
- A1C ≥ 6.5%

Interventions for Diabetes Mellitus

A.Dietary Management

1. Follow individualized meal plan and snacks as scheduled
   - Balanced diabetic diet – **50% CHO, 30% fats, 20% CHON, vitamins and minerals**
   - diet based on pts. size, wt., age, occupation and activity
2. Pt. must have adequate CHO intake to correspond to the time when insulin is most effective
3. Routine blood glucose testing before each meal and at bedtime is necessary during initial control, during illness and in unstable pts.
4. Do not skip meals
5. Measure foods accurately, do not estimate
6. Less added fat, fewer fatty foods and low-cholesterol

Interventions for Diabetes Mellitus

A.Dietary Management

7. Advise use of complex carbohydrates to help stabilize blood sugar. Meal should include more fiber and starch and fewer simple or refined sugars.
8. Avoid concentrated sweets, high in sugar (jellies, jams, cakes, ice cream)
9. If taking insulin, eat extra food before periods of vigorous exercise
10. Avoid periods of fasting and feasting
11. Keep weight at normal level, obese diabetics should be on a strict weight control program and should lose weight.

B. Teach pt. on correct administration of insulin and other hypoglycemic agents.

1. insulin in current use may be stored at room temp., all others in ref. or cool area
2. avoid injecting cold insulin → lead to tissue reaction
3. roll insulin vial to mix, do not shake, remove air bubbles from syringe
4. press (do not rub) the site after injection (rubbing may alter the rate of absorption of insulin)
5. avoid smoking for 30 mins. after injection (cigarette smoking ↓absorption)

6. Rotate sites

- Failure to rotate sites may lead to Lipodystrophy
- **Lipodystrophy** – localized disturbance of fat metabolism
- Ex. Lipohypertrophy – thickening of subcutaneous tissue at injection site, feel lumpy or hard, spongy
  - → result to **↓ absorption of insulin** → **making it difficult to control the pt.'s blood glucose**

ACUTE COMPLICATIONS OF DIABETES MILLETUS

- DIABETIC KETO-ACIDOSIS (DKA)
- INSULIN SHOCK
- HYPERGLYCEMIC, HYPEROSMOLAR,
  NONKETOTIC (HHONK) COMA
- DAWN PHENOMENON
- SOMOGYI EFFECT