Type 1 Diabetes Mellitus

Lauren Farmer and Katie Gallagher

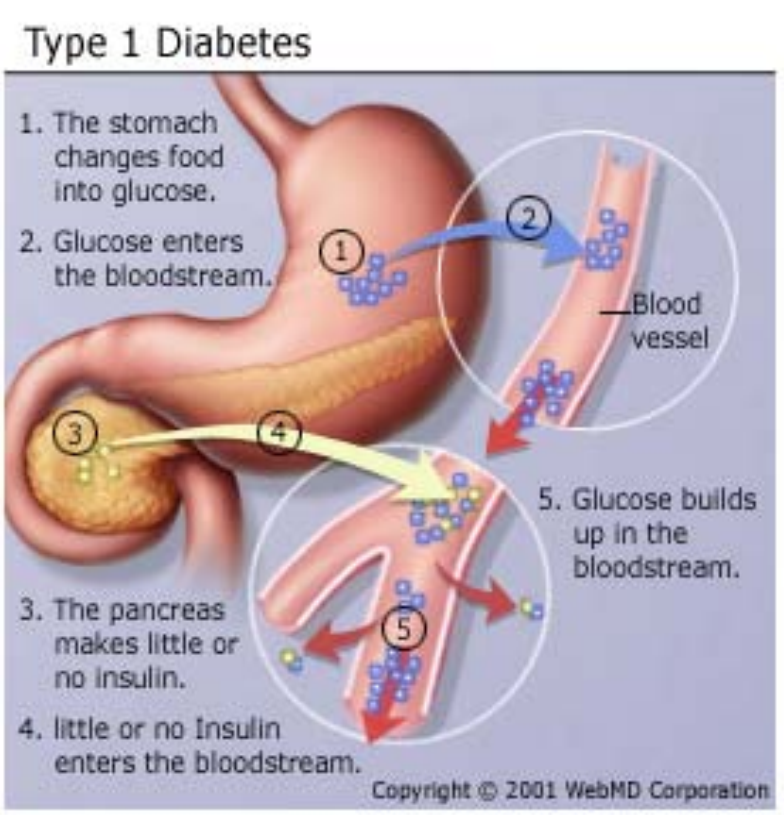
What is Type 1 Diabetes Mellitus?

- Once known as juvenile diabetes, is a chronic condition in which the pancreas produces little or no insulin
  - Hormone needed to allow glucose to enter cells to produce energy
- Genetics, family history, environmental factors, and exposure to certain viruses can contribute

What is Type 1 Diabetes Mellitus?

- Symptoms are typically sudden and may include:
  - increased thirst (polydipsia), frequent urination (polyuria), extreme hunger (polyphagia), unintended weight loss, fatigue, weakness, irritability, and blurred vision

What is Type 1 Diabetes Mellitus?



T1DM vs. T2DM

	Type 1	Type 2
General Description:	Body makes too little or no insulin (insulin-dependent)	Body cannot use the insulin it makes (non-insulin-dependent)
Cause:	Beta cells in pancreas are attacked by body's own cells	Diet related insulin release is so large/frequent that receptor cells have becomes less sensitive to insulin
Onset:	Sudden	Gradual
Age:	Any age but mostly young	Mostly in adults
Prevention:	Cannot be prevented	Can be prevented or delayed with healthy lifestyle
Management:	Insulin injections with diet and exercise	Oral medications or insulin injections with diet and exercise

Rachel Roberts

- Female, 12 y.o. in the 7th grade
- Admitted with acute-onset hyperglycemia after fainting at soccer practice

- Ht: 5’ Wt: 82 (37.3kg) BMI: 16.01
  Temp: 98.6 BP: 122/77

Rachel Roberts

- Chief complaints:
  - Strep throat a few days prior
  - Feeling very thirsty (polydipsia)
  - Increased urination, into the night hours (polyuria)
- Family hx:
  - Father has HTP
  - Mother has Hyperthyroidism
  - Sister has Celiac Disease

Assessment

- 12 year-old female with newly diagnosed Type I Diabetes Mellitus upon hospital admission with a blood-glucose level of 724 mg/dL

Height of 5’ (60in)
Patient is at 50th percentile for height/age
Prior weight of 90 lbs (normal)
BMI of 16

Weight of 82 lbs (37.3kg)
25th percentile for weight/age
Patient is at 91% of UBW

- Estimated energy requirements of about 2100-2200 kcals/day, 80-107g of protein per day.

Assessment (Labs)

Normal Lab Values	Rachel's Lab Values
Sodium: 136 - 145	126
Glucose: 70 - 110	683
Phosphate: 2.3 - 4.7	1.9
Osmolality: 285 - 295	295.3
HbA1c: 3.9 - 5.2	14.6
C-peptide: 0.51 - 2.72	0.10
ICA	+
GADA	+
IAA	+

Assessment (Labs) Cont.

Normal Lab Values: Urinalysis	Rachel's Lab Values
Specific Gravity: 1.003 - 1.030	1.035
pH: 5 - 7	4.9
Protein: Neg	100
Glucose: Neg	+
Ketones: Neg	+
Prot chk: Neg	+

Diagnosis: PES Statements

- Type I Diabetes Mellitus related to serum glucose levels as evidenced by abnormal laboratory results, unintended weight loss, frequent urination, increased thirst, and increased hunger.

- **N.C. 2.2 -** Altered nutrition related laboratory values in sodium, glucose, phosphate, osmolality, HbA1c, c-peptide, ICA, GADA, IAA related to new T1DM diagnosis as evidenced by laboratory results.

- **N.B. 1.1** - Food and nutrition related knowledge deficit related to lifestyle changes required for T1DM as evidenced by changes required for the new diagnosis.

Nutrition Requirements

- Nutrition requirements for total fat, saturated fat, cholesterol, fiber, vitamins and minerals are the same as for the general population.

- Estimated Energy Requirements are 2100-2200 kcalories per day and 80-107 grams of protein per day.

EER for Females 9 through 18 Years:
EER = 135.3 - 30.8 x Age + PA x (10.0 x wt + 934 x ht) +25
= 2144 kcals
Protein = 2144 kcal x 15% = 321.6 kcal
= 2144 kcal x 20% = 428.8 kcal
Protein = 321.6 kcal/ 4 kcal/g = 80.4 grams
= 428.8 kcal/ 4 kcal/g = 107.2 grams

- Rachel should consume 210 - 315 grams of carbohydrate per day to meet her recommended 40-60% carbohydrate per day.

CHO - 2100 x .40 = 840/4 = 210
2100 x .60 = 1260/4 = 315

- Rachel should consume 58-81 grams of fat per day to meet her recommended 25-35% fat per day.

Fat - 2100 x .25 = 525/9 = 58
2100 x .35 = 735/9 = 81

- Based off of her diet history, Rachel should increase her fruit and vegetable consumption.

Treatment Goals

- **Meal Planning** - Helps to keep consistent timing of meals and snacks in order to keep consistent diabetes medication times.

- **Carbohydrate Counting** - Concentrates on the total amount of carbohydrate in meals and snacks. The amount of food containing 15 grams of carbohydrate counts as one carbohydrate choice.

- **Exchange System** - Provides uniformity in meal planning and allows a variety of foods. This uses the system of "exchange" or substitution of different foods within each of the three groups: carbohydrates, meat and meat substitutes, and fats.

Intervention

- Begin Apidra 0.5 u every 2 hours until glucose is 150-200 mg/dL.
- Progress Apidra using ICR 1:15.
- Continue glucose checks hourly.
- Once glucose levels have stabilized, provide caregivers and patient with nutrition education and instruction on carbohydrate counting, the exchange system, and meal planning.

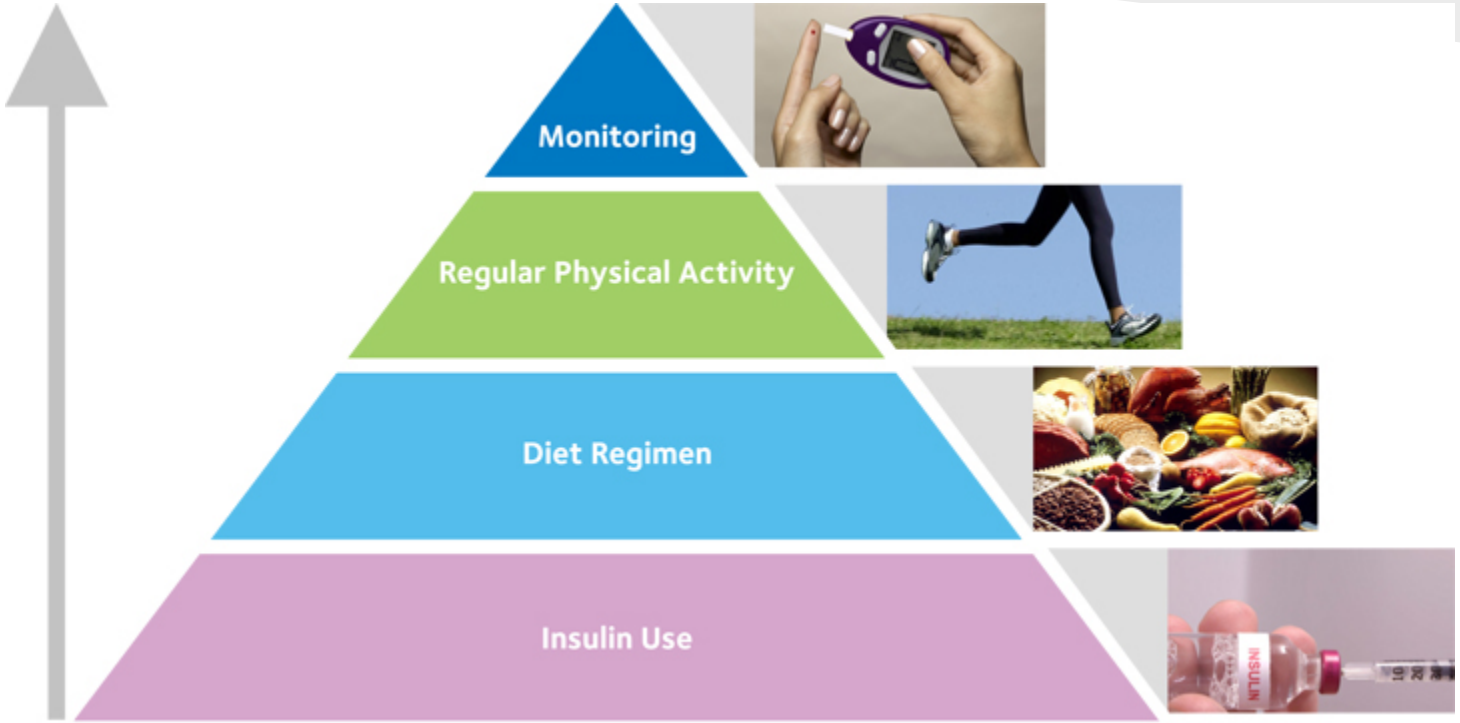
Monitor/Evaluation

- Provide a food log to the patient in order to assist in the new dietary changes and to effectively teach carbohydrate counting and evaluate compliance during follow-up session.

- Self-monitoring of blood glucose (SMBG) and A1C levels taken and recorded by the patient to be reviewed at the next session.

- Reevaluation of laboratory results will be conducted at the next session to monitor glucose control. Original abnormalities will be monitored as well as total cholesterol, low-density lipoproteins, and triglycerides in order to monitor lipid profile and blood pressure.

Monitor/Evaluation



Questions?

Any questions regarding Rachel or her plan?

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