

Diabetes Mellitus Seminar

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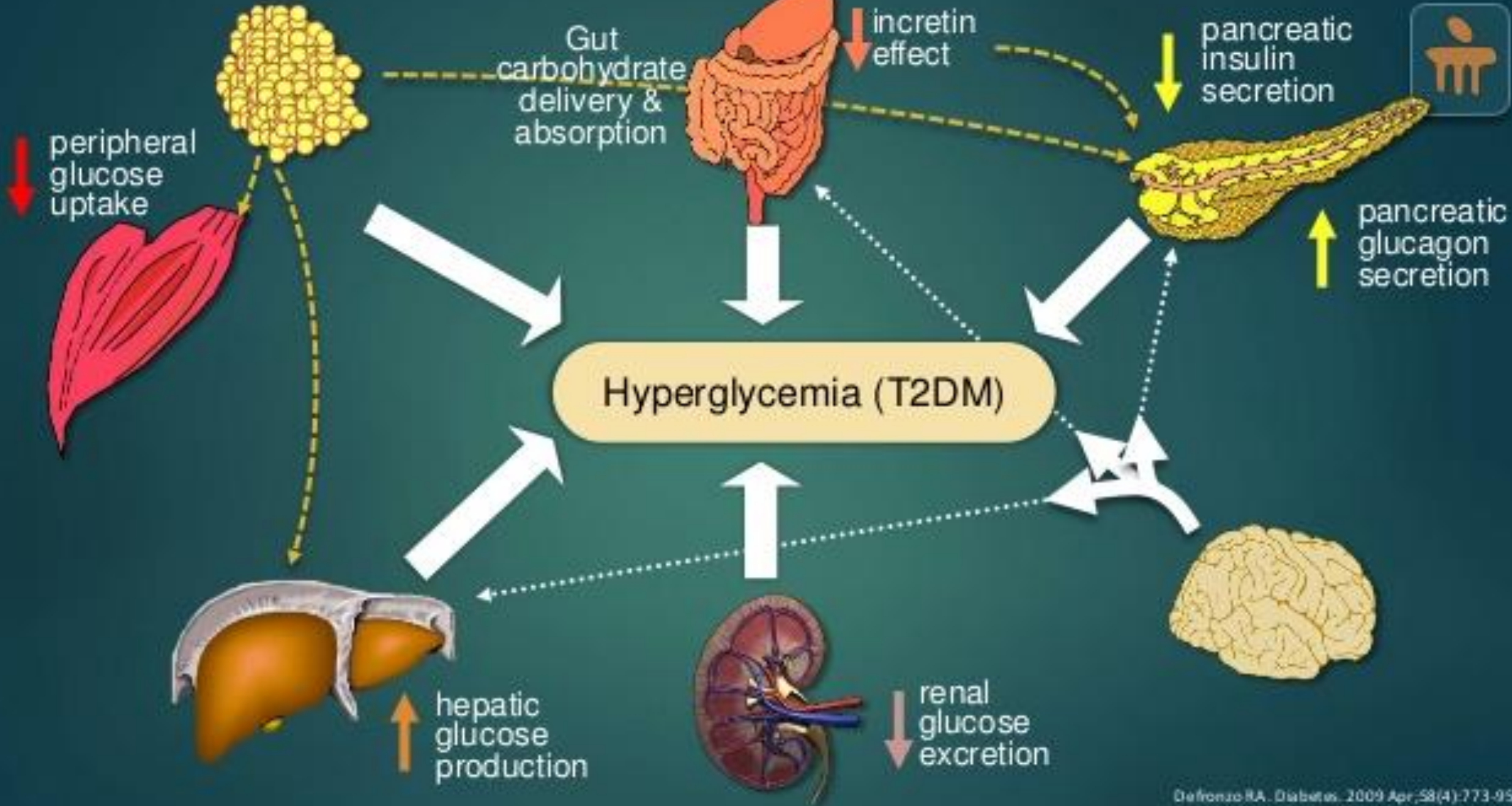
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What are the types of diabetes?

What are the classical symptoms of diabetes?

All the following are considered as basic defects in type 2 diabetes pathophysiology, except:

1. increase incretin (gut).
2. Increase glucagon (Alfa cells -pancreas).
3. Decrease insulin (Beta cells-pancreas).
4. Decrease peripheral uptake of glucose (Skeletal muscles, liver and fat) also called insulin resistance.
5. Increase lipolysis.
6. Increase hepatic output of glucose (Liver)
7. Increased appetite/neurotransmitter dysfunction (brain)
8. Increased reabsorption of glucose (kidney)



By 6 years since type 2 diabetes diagnosis, how much the percentage of the patients will require insulin therapy:

1. 20%
2. 30%
3. 40%
4. 50%
5. 60%

The following are true regarding type 1 diabetes, except:

1. It constitutes 5-10% of all diabetes
2. It is an autoimmune mediated B cells destruction induced by viral illness
3. It is associated with insulin resistance
4. It is commonly affected younger age groups
5. Can developed as a part of polyendocrine syndrome.

Which patients should not be considered for screening of diabetes:

1. 55 years old man, BMI 24 and with recent MI
2. 33 years old women, BMI 30, and history of PCOS.
3. 44 years old man, BMI 28, and HDL-C of 34 mg/dL.
4. 54 years old man with BMI 23, completely healthy, and negative family history of diabetes.
5. 22 years old woman, BMI 29, acanthosis nigricans, and previous gestational diabetes.
6. 30 years old physically active man, BMI 24, and mother with type 2 diabetes.

As a part of screening, a 35 years old woman has the following labs results: (FBS 110, RBS 135, and A1c 5.5). what to do next:

1. She has type 2 diabetes
2. She should repeat FBS
3. She should repeat RBS
4. She should repeat A1c
5. She has normal lab tests

The same woman, but has the following labs results: (FBS 99, RBS 170, A1c 6.7):

1. She has type 2 diabetes
2. She should repeat FBS
3. She should repeat RBS
4. She should repeat A1c
5. She has normal lab tests

The same woman has the following results
(FBS 127, RBS 180, A1c 6.0)

1. She has type 2 diabetes
2. She should repeat FBS
3. She should repeat RBS
4. She should repeat A1c
5. She has normal lab tests

The same woman with wt loss, polyuria and the following labs results (FBS 160, RBS 270, A1c 8.0)

1. She has type 2 diabetes
2. She should repeat FBS
3. She should repeat RBS
4. She should repeat A1c
5. She has normal lab tests

Serial monitoring of blood glucose is indicated in all except:

Serial monitoring of blood glucose is indicated in all except:

1. Insulin treated diabetes.
2. Pregnancy with diabetes.
3. Type 2 diabetes on metformin
4. Recurrent hypoglycemia.
5. Major illness.

A1c is falsely increased in the following condition, choose one:

1. Hypertriglyceridemia
2. Hemolytic anemia
3. Chronic liver disease
4. Iron deficiency anemia
5. Pregnancy
6. Red blood cell transfusions

Glycated hemoglobin (HbA1c) limitations:

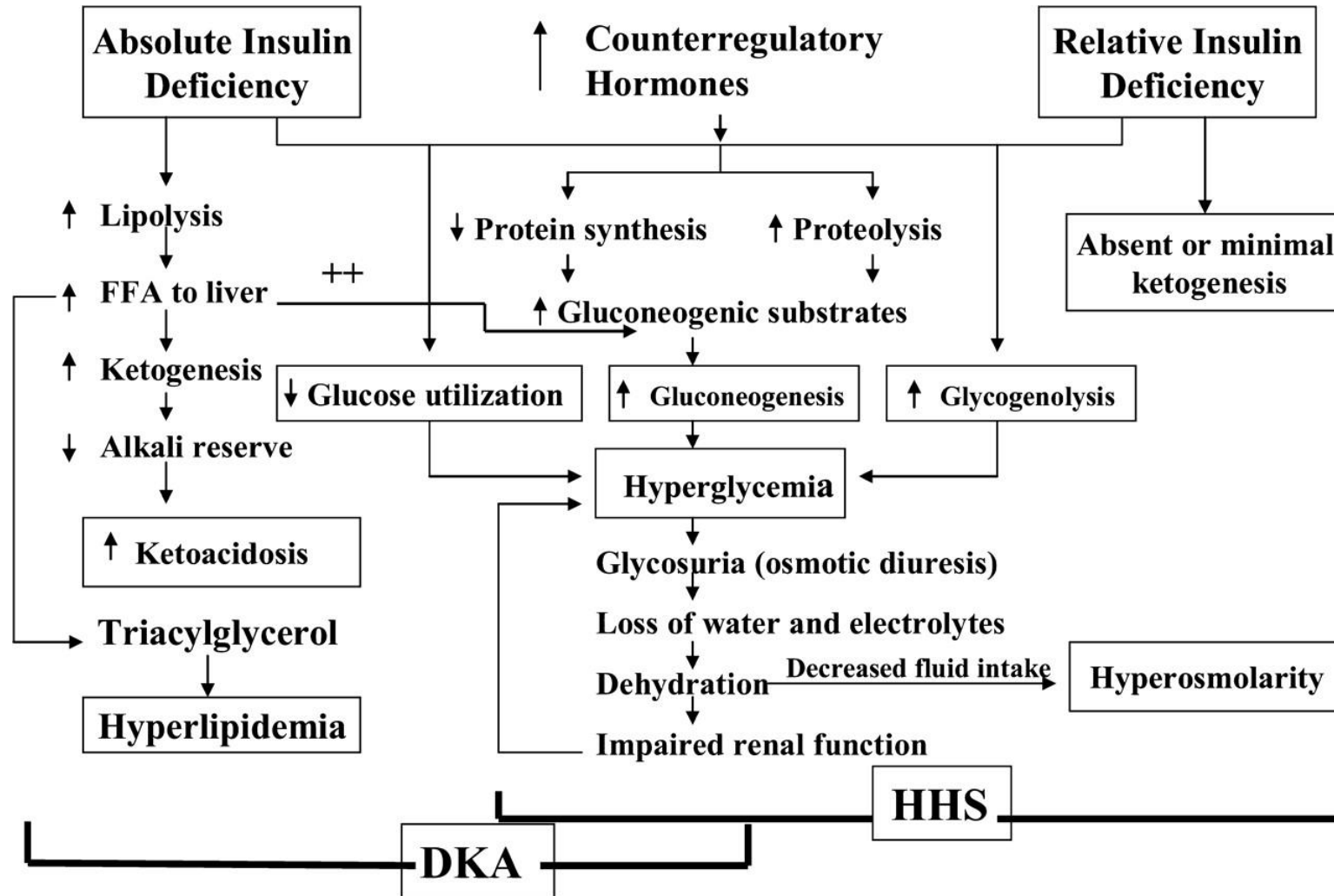
- B12 deficiency
- Chronic renal failure
- Hyperbilirubinemia
- Hemoglobin F
- Iron deficiency anemia
- Lead poisoning
- Alcoholism
- High doses of aspirin

- Hypertriglyceridemia
- Hemolytic anemia
- Chronic liver disease
- A reduced RBC lifespan (e.g., Hepatomegaly, splenomegaly).
- Pregnancy
- Blood transfusions
- B12 & iron therapy
- Phlebotomy
- Erythropoietin therapy

- **Variable results in Hemoglobinopathies according to the methods used.**

What are the acute complications of diabetes?

Pathogenesis of DKA and HHS: stress, infection, or insufficient insulin.



Abbas E. Kitabchi et al. Dia Care 2009;32:1335-1343

Causes of Diabetic Ketoacidosis

- Omission or reduced daily insulin injections (the most common)
- Infection
- Pregnancy
- Hyperthyroidism
- Medications: steroids, thiazides, antipsychotics, sympathomimetics
- Cerebrovascular accident or myocardial infarction
- GI hemorrhage
- Pulmonary embolism
- Pancreatitis
- Major trauma
- Surgery

Diagnostic criteria for HHS include the following except:

1. Plasma glucose concentration >33.3 mmol/L (600 mg/dL)
2. Arterial pH >7.30
3. Serum bicarbonate <15 mmol/L
4. Small ketonuria, absent to mild ketonemia
5. Effective serum osmolality >320 mOsm/kg

What are differences between HHS and DKA?

What are the points in management that are different between HHS and DKA?

Comparison between Diabetic Ketoacidosis and Non-ketotic hyperosmolar diabetic state (HHS)

	DKA	HHS
Age	Younger	Elderly
Type of diabetes	Type 1	Type 2
Duration of symptoms	Short (hours to days)	Long (days to weeks)
Dehydration	Mild to moderate	Severe
Venous pH	<7.3	≥7.3
Serum bicarbonate	<15 mmol/L	≥15 mmol/L
Effective serum osmolality	Variable	>320 mOsm/kg
Associated illness	Not common	Very common CVA,MI
Urine ketone	++++	+/-
Mortality	<1	40%

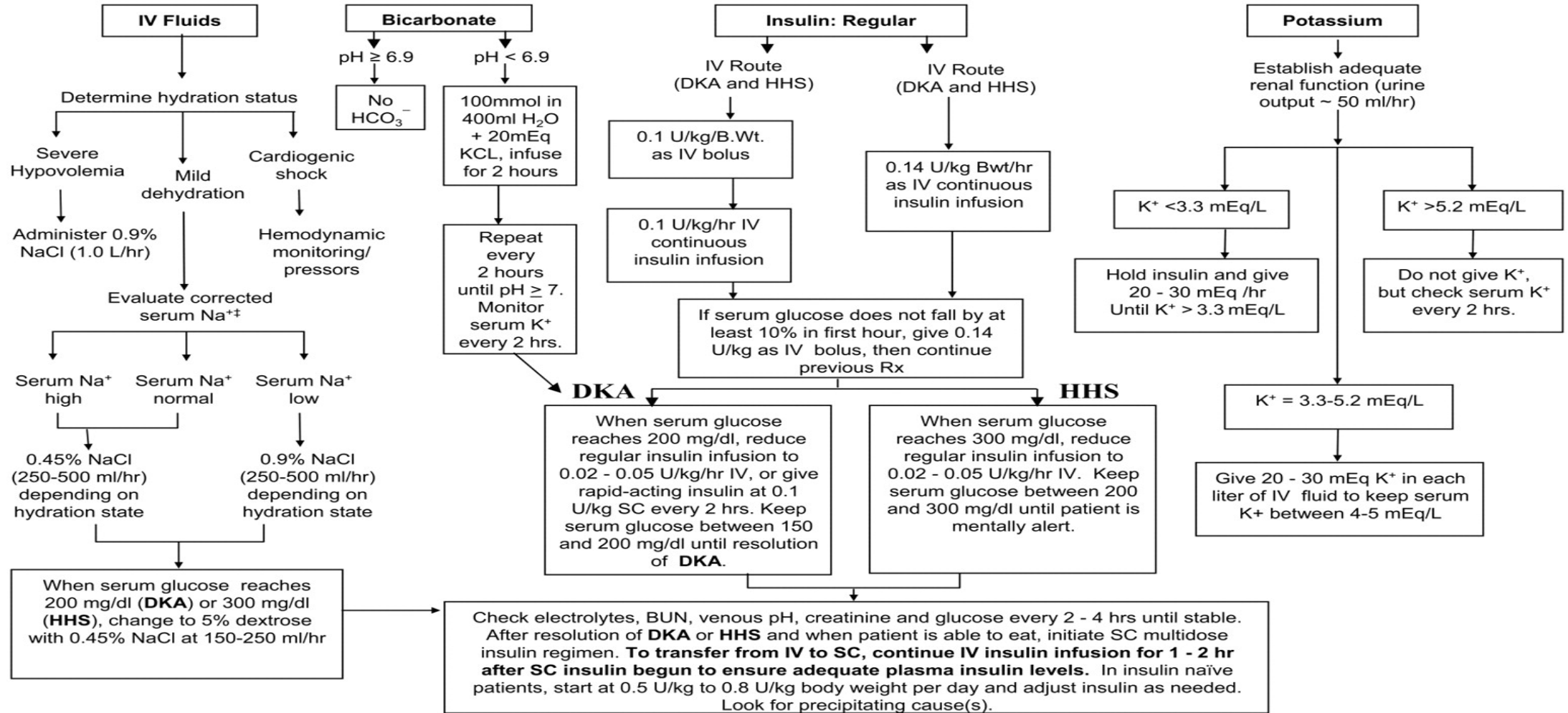
A 32-year-old woman presented to the emergency assessment unit feeling unwell. Although confused, she was able to confirm that she had previously had no serious known illnesses. There was no record of her on the hospital computer system. On examination, she was thin, unwell and tachypnoeic. Her temperature was 34.8°C, her pulse was 120 beats per minute and her BP was 79/42 mmHg. Her oxygen saturation was 98% (94–98) breathing air. Urinalysis showed ketones 3+.

Investigations:

- serum sodium 151 mmol/L (137–144)
 - serum potassium 5.9 mmol/L (3.5–4.9)
 - serum bicarbonate <5 mmol/L (20–28)
 - serum urea 13.2 mmol/L (2.5–7.0)
 - serum creatinine 148 µmol/L (60–110)
 - random plasma glucose 31.2 mmol/L
 - ECG slightly peaked T waves
 - In addition to insulin, what is the most appropriate infusion?
- A. sodium chloride 0.45%
 - B. calcium carbonate
 - C. sodium bicarbonate 8.4%
 - D. sodium chloride 0.9%
 - E. colloid

Protocol for management of adult patients with DKA or HHS. DKA diagnostic criteria: blood glucose 250 mg/dl, arterial pH 7.3, bicarbonate 15 mEq/l, and moderate ketonuria or ketonemia.

Complete initial evaluation. Check capillary glucose and serum/urine ketones to confirm hyperglycemia and ketonemia/ketonuria. Obtain blood for metabolic profile. Start IV fluids: 1.0 L of 0.9% NaCl per hour.†



A 26-year-old woman was admitted with diabetic ketoacidosis. After 24 hours of treatment with intravenous fluids, potassium and insulin, her normal subcutaneous insulin regimen was resumed. However, she felt nauseated, her blood glucose began to rise and there was a concomitant increase in urine ketones (3+). On examination, her pulse was 118 beats per minute and her BP was 106/66 mmHg.

- Investigations:
 - serum sodium 136 mmol/L (137–144)
 - serum potassium 4.4 mmol/L (3.5–4.9)
 - serum bicarbonate 15 mmol/L (20–28)
 - serum creatinine 78 μ mol/L (60–110)
 - random plasma glucose 7.3 mmol/L
 - What is the most appropriate next step in management?
- A. increase subcutaneous bolus insulin with meals
 - B. Keep the same management.
 - C. increase subcutaneous basal insulin at bedtime
 - D. start fixed-rate intravenous insulin infusion
 - E. start glucose 5% with fixed-rate intravenous insulin

- A 64-year-old woman with a 20-year history of type 2 diabetes mellitus presented following the sudden onset of a painful right eye. She had noticed drooping of her right eyelid but no double vision. There were no other neurological symptoms. On examination, there was a complete right-sided ptosis, with her eye position down and out. Her pupils were equal on both sides.
- Investigations
- haemoglobin A1c 7.4%
- MR scan of brain no evidence of any intracranial pathology
- She was worried about her long-term prognosis and outcome.
- What is the most likely prognosis?

A 15-year-old male admitted to the hospital for new onset polyuria, and weight loss. His RBS is 350 mg/dL, hemoglobin A1c is 11.5%, and urine negative for ketone. He has no significant past medical history. His weight is 66 kg and height is 1.55 m. What is the next treatment?

- A. Insulin glargine 33 units daily plus insulin aspart 15 units TID.
- B. Insulin detemir 15 units daily plus insulin aspart 5 units TID.
- C. Insulin glargine 20 units daily plus insulin aspart correctional scale only 4 times daily
- D. Insulin detemir 10 units once daily plus metformin 1g BID.
- E. Insulin detemir 10 units twice daily plus metformin 1g BID.

Insulin types	Onset	Peak	Duration of action
Conventional insulin			
Short-acting regular	30–60 minutes	2 hours	6 hours
Intermediate-acting	2–4 hours	4–6 hours	18 hours
Analogs			
Ultra-short-acting			
Lispro	5–15 minutes	60 minutes	2 hours
Aspart	5–15 minutes	60 minutes	2 hours
Glulisine	5–15 minutes	60 minutes	2 hours
Long-acting			
Glargine	2–4 hours	Not significant	24 hours
Detemir	2–4 hours	Not significant	20 hours

In a patient with diabetes mellitus, the following findings indicates targeted control except:

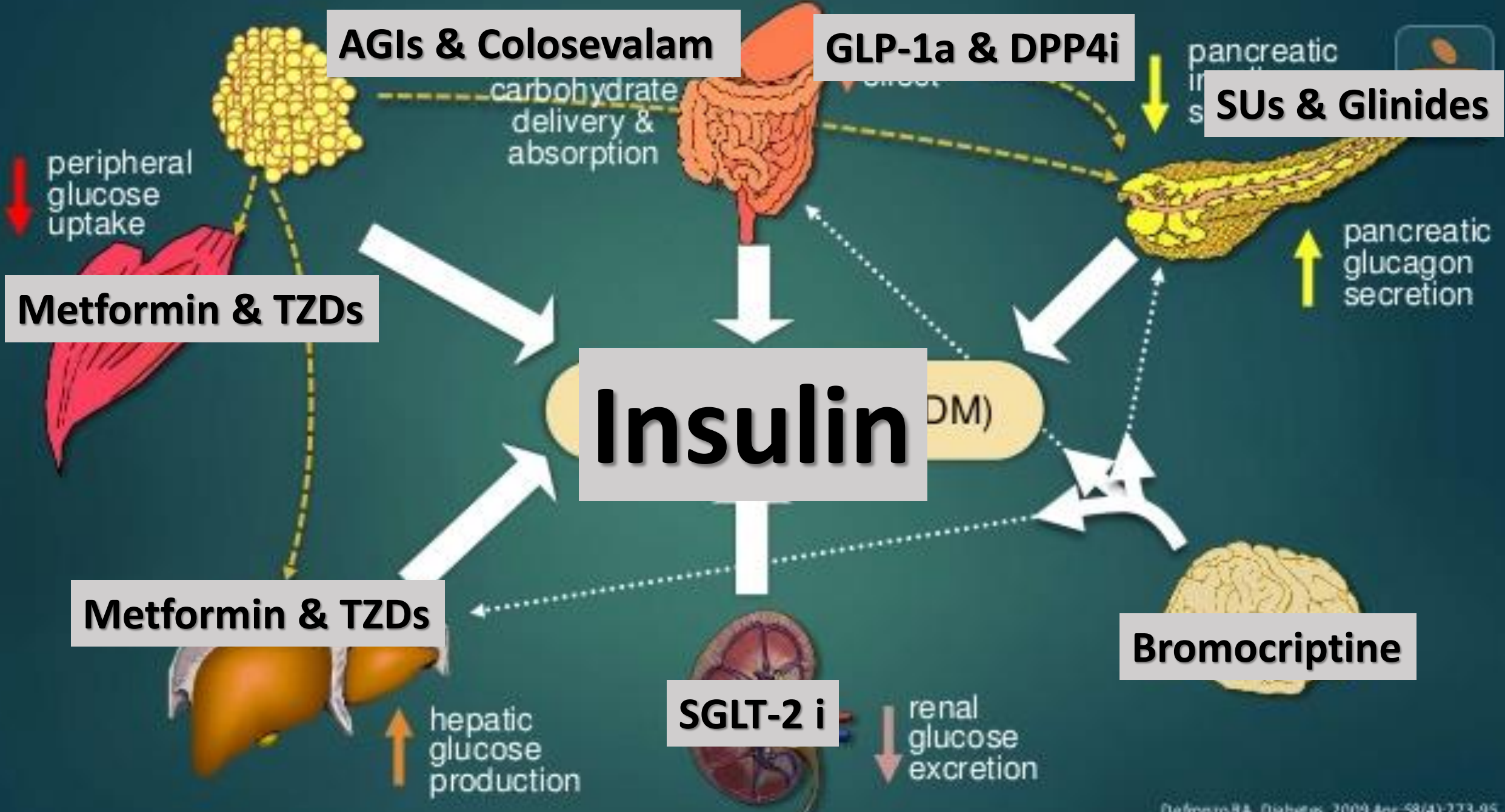
1. A1c 6.8
2. Pre-prandial capillary glucose of 128
3. Post-prandial capillary glucose of 200
4. Bedtime capillary glucose of 135
5. Blood pressure 137/87
6. LDL-C 95 mg/dl
7. HDL-C 42
8. TG 133

A 20 years old man recently diagnosed (1 year) with type 1 diabetes. He was started with BB insulin treatment. Which of the following is not recommended for him?

1. Spot urine test with albumin/creatinine ratio and Dilated pupil retinal exam
2. A1c measurement every three months then 6 monthly if controlled
3. Frequent serial blood glucose monitoring
4. Supervised exercise
5. Dietary modification.

A 67 years old man with type 2 diabetes for 17 years, hypertension, and CKD stage IIIA, has frequent attacks of palpitations and sweating at night. His A1c was 6.5 last month. The patient current treatments are glibenclamide 5 OD, metformin 1g bid, candesartan 16 mg, and rosuvastatin 10 mg. what to do next:

1. Do nothing
2. Stop metformin
3. Reduce metformin to 0.5 g bid
4. Reduce candesartan to 8 mg OD
5. Stop glibenclamide



AGIs & Colosevalam

GLP-1a & DPP4i

SUs & Glinides

Metformin & TZDs

Insulin (DM)

Metformin & TZDs

Bromocriptine

SGLT-2 i

A 55 years old woman with 4-year history of type 2 diabetes on metformin 1g bid. On routine follow up, her A1c was 8. The feels frustrated to have off target A1c despite treatment and life style measures, and refuses any kind of injectable therapy. Examinations disclose to BMI 30 and BP 135/80. What is the best next option?

1. Add glimepride
2. Add liraglutide
3. Add empagliflozin
4. Add pioglitazone
5. Add saxagliptin.

A 40 years old man with new onset polyuria, thirst, and 10 kg weight loss to be 60 kg at time of presentation. He mother has type 2 diabetes on metformin 1g bid + vildagliptin 50 bid. Investigations shows A1c 11, RBS 350 mg/dL, urine negative for ketone. What is the best next option:

1. Metformin 1g BID + vildagliptin 50 bid
2. Metformin 1 BID + gliclazide 60 mg OD
3. Insulin aspart 5 U tid and insulin glargine 15 U bt
4. Regular insulin 5 U tid + metformin 1g bid
5. Premixed insulin 15 U bid.

A 65 years old patients with type 2 diabetes on dapagliflozin 10 mg + metformin 1000 bid and gliclazide 30 OD. Presented with acute confusional state with viral encephalitis and shifted to intensive care. What is the best option for diabetes management?

1. Continue the same
2. Continue the same but stop metformin
3. Continue the same but stop dapagliflozin
4. Stop all, and start basal bolus insulin therapy
5. Stop all and start glucose/K/insulin infusion therapy

A 65 years old man with sudden Rt sided hemiplegia. Past Hx T2DM and HTN. Current treatment metformin 1g bid, and glibenclamide 5 mg. The patient examination reveals rt sided weakness, conscious with no dysphagia. Next option for diabetes is?

1. Initiate liraglutide
2. stop metformin
3. stop glibenclamide
4. Stop all, and start basal bolus insulin therapy
5. Stop all and start glucose/K/insulin infusion therapy

