

MINISTRY OF HEALTH OF UKRAINE

ODESA NATIONAL MEDICAL UNIVERSITY

Department of Family Medicine and Polyclinic Therapy



CONFIRMED by

Prorector for scientific and pedagogical work

Eduard BURYACHKIVSKIY

September 1st, 2023

**METHODOLOGICAL RECOMMENDATIONS
FOR PRACTICAL CLASSES
IN THE EDUCATIONAL DISCIPLINE**

Faculty: international, course: 6

**EDUCATIONAL DISCIPLINE:
MANAGEMENT OF DIABETES IN THE PRACTICE OF A FAMILY DOCTOR"**

Approved:

At the meeting of the department of family medicine and polyclinic therapy
Odessa National Medical University

Minutes No. 1 dated 30 / 08 / 2023 .

Head of the department



Valentyna VELYCHKO

Authors:

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PRACTICAL TRAINING

Practical lesson № 1

Topic 1: Type 2 diabetes, epidemiology, etiology, pathogenesis and classification

Goal: Acquiring knowledge about type 2 diabetes, its etiology and pathogenesis, main risk factors for development and modern classification.

Basic concepts: Definition of type 2 diabetes. Epidemiology of diabetes in the world, prognosis of morbidity. Etiology and pathogenesis of diabetes. Type 2 diabetes: role of genetic predisposition, obesity, external risk factors. Insulin resistance and impaired insulin secretion. Modern classification of diabetes according to the American Diabetes Association and the World Health Organization.

Equipment: multimedia projector

Plan:

1. Organizational measures (greetings, verification of those present, notification of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

—requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);
—questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

1. Insulin secretion is normal and in diabetes of various types.
 2. The concept of glucagon and its role in the body.
 3. Classification of carbohydrate metabolism disorders.
 4. Definition of prediabetes. What nosologies are related to this condition?
 5. Etiology and pathogenesis of type 2 diabetes.
 6. Modifiable and non-modifiable risk factors for the development of type 2 diabetes.
 7. Concept of insulin resistance.
 8. Mechanism of development of insulin resistance.
 9. Modern classification of type 2 diabetes.
 10. Prevalence of type 2 diabetes in Ukraine and in the world in general
 11. MODY-diabetes. Similarities and differences from type 2 diabetes.
 12. Gestational diabetes. Definition and causes of development.
-
3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):
—content of tasks (tasks, clinical situations, etc.);

Tasks:

Task 1. A 35-year-old man was operated on for gastric ulcer. Body weight deficit of 10 kg. After the operation, the glucose level in whole capillary blood on an empty stomach is 6.7 mmol/l. When re-examined - 11.1 mmol/l (after a meal), the level of glycosylated hemoglobin is 10%.

1. Give an interpretation of the presented laboratory data.
2. Are additional methods of examination of the patient required?
3. Your previous diagnosis.
4. Treatment plan and monitoring of the patient.

Task 2. A 16-year-old girl had polyuria and polydipsia for 2 months. She lost 8 kg with a good appetite. In connection with the appearance of complaints of abdominal pain and nausea, she was urgently hospitalized. Glycemia was found to be 18 mmol/l, glucosuria 24 g/l. Against the background of the appointment of insulin and infusions of isotonic solutions of sodium chloride and glucose, the mentioned complaints, including thirst, disappeared.

1. What is the most likely diagnosis?
2. Make a plan for further examination of the girl.
3. Administer treatment to the patient as needed.
4. Make a plan for rational nutrition and physical activity.

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	Define the term type 2 diabetes.	Terminology - type 2 diabetes	
2	Etiology of type 2 diabetes	Risk factors for the development of type 2 diabetes. Epidemiology of type 2 diabetes.	
3	Pathogenesis of the development of type 2 diabetes	Pathogenesis of the development of insulin resistance and disease. Leading factors of pathogenesis.	
4	Modern classification of type 2 diabetes.	Etiological classification. Classification according to ICD 10.	
5	To determine the main groups of persons at increased risk for the development of type 2 diabetes.	To give recommendations to a patient of a risk group regarding the prevention of the development of type 2 diabetes.	

—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information in case of use of ideas, developments, statements,

information;

- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

—control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

Test tasks.

1. A 37-year-old patient complains of general weakness, weight loss, significant thirst (drinks up to 7 liters per day), polyuria. Objectively: the skin and tongue are dry. The limits of the heart have not changed, the pulse is 80 per minute. Urine analysis: specific gravity - 1006, leukocytes 2-6 in the field of view. Blood analysis unchanged. What is your previous diagnosis?
 - A. Diabetes insipidus
 - B. Acute pyelonephritis
 - C. Diabetes
 - D. Primary aldosteronism
 - E. Acute glomerulonephritis
2. Which of the following is NOT a risk factor for the development of type 2 diabetes?
 - A. Adiposity
 - B. Presence of diabetes in relatives of the 2nd and 3rd line of kinship
 - C. Age
 - D. Ethnicity
 - E. Presence of cardiovascular diseases in the anamnesis
3. The main place in the pathogenesis of diabetes belongs to:
 - A. Pituitary tumors
 - B. Increased synthesis of insulin
 - C. Violation of the body's immune reactivity
 - D. Damage to B-cells of the islets of Langerhans
 - E. Decreased production of glucagon
4. Where is insulin produced?
 - A. A- cells of the pancreas
 - B. B-cells of the pancreas
 - C. PP - cells of the pancreas
 - D. The exocrine part of the pancreas
 - E. Insulin is administered from the outside and is not produced independently anywhere in the body
5. How does insulin affect the level of glucose in the blood?
 - A. Increases
 - B. Reduces
 - C. Does not affect in any way
6. Which of the listed hormones is NOT counterinsular?
 - A. Adrenalin
 - B. Glucagon
 - C. Thyroxine
 - D. Glucocorticosteroids

- E. Prolactin
7. How does glucagon affect the level of glucose in the blood?
 - A. Increases
 - B. Reduces
 - C. Does not affect in any way
 8. An increase in the level of blood glucose can occur as a result of all causes, except:
 - A. Emotional
 - B. Alimentary
 - C. Deficiency of blood insulin level
 - D. Endocrine
 - E. Excess blood insulin level
 9. Is the following statement true: The prevalence of type 2 diabetes depends on ethnicity?
 - A. So
 - B. No
 - C. It is difficult to say
 10. What percentage of patients with type 2 diabetes are overweight or obese?
 - A. ~10-15%
 - B. ~20-30%
 - C. ~50-60%
 - D. ~80-90%
 - E. All without exception

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

1. Essentials of Family Medicine, Philip D Sloane, Lisa M Slatt, Mark H Ebell, Louis B Jacques, Mindy A Smith/ 2017/ ISBN-10 / ASIN: 0781781884 ISBN-13 / EAN: 9780781781886 Lippincott Williams & Wilkins
2. Current Diagnosis & Treatment in Family Medicine Jeannette E. South-Paul, Samuel C. Matheny, Evelyn L. Lewis/2018/, ISBN: 0-07-151004-4 McGrawHill Medical.
3. The Color Atlas and Synopsis of Family Medicine, 3rd Edition by Richard Usatine, Mindy Ann Smith, E.J. Mayeaux, Heidi Chumley, 1680 pages,/ 2018/ ISBN-10 : 1259862046 ISBN-13 : 978-1259862045 McGraw-Hill Education
4. Family Medicine: Ambulatory Care and Prevention, Sixth Edition (Lange Clinical Manuals) 6th Edition Mindy A. Smith, MD (East Lansing, MI), Leslie A. Shimp, PharmD, MS (Ann Arbor, MI), Sarina Schrage, MD, MS (Madison, WI) 1088 pages /2020/ ISBN-10: 0071820736 ISBN-13: 978-0071820738 McGraw-Hill Education

5. Textbook of Family Medicine 9th Edition by Robert E. Rakel MD , David Rakel MD ,1215 pages,/2015/, ISBN-13 : 978-0323239905 ISBN-10: 0323239900 Saunders; 9th Edition (March 6, 2020).

Electronic information resources:

1. Association of Diabetologists of Ukraine <http://uda.in.ua/>
2. American Diabetes Association
<https://www.diabetesjournals.org>http://care.diabetesjournals.org/content/41/Supplement_1/S1
3. European Association for study of Diabetes. <https://www.easd.org>
4. Centers for Disease Control and Prevention <https://www.cdc.gov/>
5. NICE | The National Institute for Health and Care Excellence <https://www.nice.org.uk/>

Practical lesson № 2

Topic 2: Clinic, diagnosis and differential diagnosis, screening of type 2 diabetes

Goal: Acquiring knowledge about the clinical manifestations of type 2 diabetes, its diagnosis and screening, differential diagnosis with other diseases.

Basic concepts: The main clinical symptoms of diabetes. Diagnosis of diabetes. Screening for type 2 diabetes and testing for risk factors. Diagnostic criteria for diabetes and other categories of hyperglycemia. Additional research methods. Differential diagnosis of type 2 diabetes with other diseases.

Equipment: multimedia projector

Plan:

1. Organizational measures (greetings, verification of those present, notification of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

—requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);
—questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

1. Diagnostic criteria of prediabetes.
2. Testing of patients with risk factors for the development of type 2 diabetes.
3. Clinical manifestations of type 2 diabetes.
4. What diagnostic tests are used to diagnose type 2 diabetes?
5. What is the purpose of determining laboratory tests - C-peptide of blood serum, insulin of blood plasma, HOMA-index?
6. Indications for conducting an oral glucose tolerance test.
7. Rules for conducting an oral glucose tolerance test
8. Criteria for compensation of type 2 diabetes.
9. Additional research methods for type 2 diabetes.

10. What diseases should be differentially diagnosed with type 2 diabetes.
11. Diagnostic value of determination of HbA1c. What factors affect the level of HbA1c.

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):
—content of tasks (tasks, clinical situations, etc.);

Tasks:

Task 1. A 72-year-old woman suffers from type II diabetes, and the accompanying pathology is hypertension II stage disease, II B stage heart failure. Uses metformin. The day before, she suffered a hypertensive crisis, after which sharp weakness, myalgias, increased thirst, dry mouth, and polyuria appeared. Arterial pressure - 140/95 mm Hg, heart rate - 98/min, edema and the smell of acetone are absent.

1. Your previous diagnosis.
2. What additional laboratory examinations are necessary
3. Carry out a differential diagnosis of the detected condition in the patient.
4. What measures should be taken for the patient to prevent the development of a comatose state?
5. Assign treatment to the patient.

Task 2. A 26-year-old patient has been suffering from diabetes for 3 years. Receives Humodar R 6 units and Humodar B 20 units in the morning and Humodar R 4 units and Humodar B 16 units in the evening. Complains of moderate dry mouth and headache in the morning, bad sleep at night, weakness. Objective data without pathological changes. Glycemic profile: 8 hours. – 14 mmol/l, 2 p.m. – 7 mmol/l, 7 p.m. - 6 mmol/l. Glucosuria (night portion) - 0.3 l - 0.5%. Urine reaction to acetone is negative.

1. Your previous diagnosis.
2. Plan for additional examination as needed.
3. What diseases should be differentially diagnosed?
4. What is the most appropriate treatment tactic in this case?

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	Define the term prediabetes, type 2 diabetes.	Terminology - prediabetes, type 2 diabetes, diagnostic criteria.	
2	Clinical manifestations of type 2 diabetes	The main clinical manifestations of type 2 diabetes (major and minor). Algorithm for diagnosis of type 2 diabetes.	
3	Methods of diagnosing diabetes of various	Describe the methods of diagnosing	

	types	diabetes of different types	
4	Laboratory methods of diagnosis of type 2 diabetes.	Indications and conditions for conducting a glucose tolerance test (TTG). Indications and conditions for determination of HbA1c. Plan additional laboratory, instrumental research, consultations. Be able to evaluate OGTT, data of glycemic and glucosuric profiles.	
5	Differential diagnosis of type 2 diabetes.	Conduct a differential diagnosis of type 2 diabetes with other diseases based on the main symptoms.	

—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

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- references to sources of information in case of use of ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

—control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

Test tasks.

1. What is the normal level of glucose in the blood?
 - A. 1.3–3.5 mmol/l;
 - B. 6.0–8.0 mmol/l;
 - C. 3.3–5.5 mmol/l;
 - D. 10.5–12.5 mmol/l
 - E. 0.3–0.5 mmol/l;

2. What syndromes are not characteristic of diabetes?
 - A. thirst;
 - B. polydipsia;
 - C. polyphagia;
 - D. polyuria;
 - E. anemia.

3. Manifestations of hyperosmolar syndrome?
 - A. proteinuria;
 - B. retinopathy;
 - C. uremia;
 - D. the smell of acetone from the mouth;

E. reduced skin turgor.

4. Main manifestations of ketoacidosis syndrome?

- A. proteinuria;
- B. retinopathy;
- C. uremia;
- D. the smell of acetone from the mouth;
- E. the skin is moisturized.

5. Give an assessment of the glucose tolerance test: fasting blood glucose 5.5 mmol/l, after 2 hours - 7.0 mmol/l.

- A. violation of glucose tolerance;
- B. questionable test;
- C. normal test;
- D. overt diabetes mellitus;
- E. prediabetes

6. The following are of diagnostic value in diabetes mellitus:

- A. radioisotope studies;
- B. laboratory tests of blood, urine;
- C. X-ray studies;
- D. laparoscopy;
- E. study of pancreatic juice.

7. Patient L., 19 years old, suffers from diabetes. The smell of acetone from the mouth appeared against the background of acute respiratory infections. During the urine examination, a positive reaction to acetone was found. What additional research methods should be prescribed to the patient to confirm the diagnosis?

- A. urine analysis for sugar;
- B. blood test for glucose every hour and urine test for acetone;
- C. general blood test;
- D. biochemical blood analysis;
- E. culture from the nose and throat for microflora.

8. A 35-year-old man was operated on for gastric ulcer. Body weight deficit of 10 kg. After the operation, the glucose level in whole capillary blood on an empty stomach is 6.7 mmol/l. When re-examined - 11.1 mmol/l (after a meal), the level of glycosylated hemoglobin is 10%. Give an interpretation of the presented data:

- A. Diabetes;
- B. Impaired glucose tolerance;
- C. Diabetes risk group;
- D. Norm;
- E. Postoperative hypoinsulinemia.

9. A 16-year-old girl had polyuria and polydipsia for 2 months. She lost 8 kg with a good appetite. In connection with the appearance of complaints of abdominal pain and nausea, she was urgently hospitalized. Glycemia was found to be 18 mmol/l, glucosuria 24 g/l. Against the background of the appointment of insulin and infusions of isotonic solutions of sodium chloride and glucose, the mentioned complaints, including thirst, disappeared. What is the most likely diagnosis?

- A. Type 2 diabetes;
- B. Type 1 diabetes;

- C. Renal glycosuria;
- D. Diabetes insipidus;
- E. Secondary (symptomatic) diabetes mellitus.

10. 5 g/l of glucose was found in the urine of an 18-year-old boy for the first time. Fasting blood glucose - 5.1 mmol/l. There are no complaints. Which of the studies will most reliably rule out diabetes?

- A. Daily glucosuria;
- B. Daily fluctuations of glycemia;
- C. Level of insulin in plasma;
- D. Glucose tolerance test;
- E. Glycemia after a meal.

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

1. Essentials of Family Medicine, Philip D Sloane, Lisa M Slatt, Mark H Ebell, Louis B Jacques, Mindy A Smith/ 2017/ ISBN-10 / ASIN: 0781781884 ISBN-13 / EAN: 9780781781886 Lippincott Williams & Wilkins
2. Current Diagnosis & Treatment in Family Medicine Jeannette E. South-Paul, Samuel C. Matheny, Evelyn L. Lewis/2018/, ISBN: 0-07-151004-4 McGrawHill Medical.
3. The Color Atlas and Synopsis of Family Medicine, 3rd Edition by Richard Usatine , Mindy Ann Smith , E.J. Mayeaux, Heidi Chumley, 1680 pages,/ 2018/ ISBN-10 : 1259862046 ISBN-13 : 978-1259862045 McGraw-Hill Education
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Electronic information resources:

1. Association of diabetologists of Ukraine <http://uda.in.ua/>
2. American Diabetes Association. https://www.diabetesjournals.orghttp://care.diabetesjournals.org/content/41/Supplement_1/S1
3. European Association for the study of Diabetes. <https://www.easd.org>
4. Centers for Disease Control and Prevention <https://www.cdc.gov/>
5. NICE/The National Institute for Health and Care Excellence <https://www.nice.org.uk/>

Practical lesson № 3

Topic 3: Type 1 diabetes: epidemiology, etiology, pathogenesis and classification

Goal: Acquiring knowledge about type 1 diabetes, its etiology and pathogenesis, main risk factors for development and modern classification.

Basic concepts: Definition of type 1 diabetes. Epidemiology of diabetes in the world, prognosis of morbidity. Etiology and pathogenesis of diabetes. Type 1 diabetes: role of genetic predisposition, obesity, external risk factors. Insulin resistance and impaired insulin secretion. Modern classification of diabetes according to the American Diabetes Association and the World Health Organization.

Equipment: multimedia projector

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

—requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);
—questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

1. Define type 1 diabetes.
2. Prevalence of type 1 diabetes.
3. Peculiarities of the age structure of type 1 diabetes mellitus.
4. Classification of carbohydrate metabolism disorders.
5. Insulin resistance and impaired insulin secretion.
6. Pathogenesis of type 1 diabetes.
7. Risk factors for the development of type 1 diabetes.
8. Classification of type 1 diabetes.
9. Reasons for the development of diabetes of other known etiology.

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):

—content of tasks (tasks, clinical situations, etc.);

Tasks:

Task 1. Patient V., 14 years old, has been suffering from diabetes for 6 years. Receives insulin "Actrapid" 49 units/day + "Protofan" 25 units/day. The course of diabetes is labile. There is a

history of repeated comatose states. Episodic increase in blood pressure, decreased visual acuity, thirst, weakness and pain in the legs are disturbing. During ophthalmoscopy, microaneurysms of blood vessels, hemorrhages in the retina are found on the fundus. On the rheovasogram, the pulse amplitude decreases. Fasting glycemia - 11.7 mmol/l, glucosuria - 2% (2.5 l), no acetone was detected in the urine.

1. Formulate the main diagnosis according to the classification.
2. Describe the etiology of this condition
3. What tests should be performed on the child?

Task 2. A 25-year-old patient is unconscious. He has been suffering from diabetes for 10 years. The course of the disease is labile. For 2 years - proteinuria, arterial hypertension. During the last week, she suffered from enterocolitis, complained of weakness, polyuria. Today, the condition has significantly worsened, hallucinations and oliguria have appeared. The condition is serious, unconscious. Convulsions are noted. The skin and mucous membranes are dry, pale. The tongue is dry, coated with a brown coating. The turgor of tissues is sharply reduced. Muscle hypertonus, meningeal signs are determined. The eyeballs are soft. There is no smell of acetone from the mouth. Breathing is frequent, shallow. Heart sounds are deaf, tachycardia up to 110 per minute. Blood pressure 80/40 mm Hg. The stomach is soft.

1. Your previous diagnosis?
2. What laboratory data will confirm the diagnosis?
3. What is the pathogenesis of this condition?

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	Define the term type 1 diabetes.	Terminology - type 1 diabetes	
2	Etiology of type 1 diabetes	Risk factors for the development of type 1 diabetes. Epidemiology of type 1 diabetes.	
3	Pathogenesis of the development of type 1 diabetes	Pathogenesis of the development of insulin resistance and disease. Leading factors of pathogenesis.	
4	Modern classification of type 1 diabetes.	Etiological classification. Classification according to ICD 10.	
5	To determine the main groups of persons at increased risk for the development of type 1 diabetes.	To give recommendations to a patient of a risk group regarding the prevention of the development of type 1 diabetes.	

—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information in case of use of ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

—control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

Test tasks.

1. The normal level of glucose in the blood is:

- A) 3.3 - 5.5 mmol/l
- B) 3.5 - 5.6 mmol/l
- C) 2.0 - 4.5 mmol/l
- D) 2.3 - 6.0 mmol/l
- E) 3.5 - 11.0 mmol/l

2. A 46-year-old female patient with diabetes did not eat after the injection of insulin. The nurse found that the patient had body tremors, convulsions, and severe sweating. What complication can you think of?

- A) Hypoglycemic coma
- B) Hyperglycemic coma
- C) Hypertensive syndrome
- D) Hypotonic syndrome
- E) Hyperthermic syndrome

3. What are the clinical and pathogenetic characteristics of type I diabetes (several options)

- A) Autoimmune destruction of β -cells leads to absolute insulin deficiency
- B) Formation of insulin resistance, loss of insulin reception
- C) Slow progression of metabolic disorders, the disease is more threatening complications than classical manifestations
- D) The onset of the disease is mainly in childhood
- E) The onset of the disease is mainly after 45-50 years

4. Define the organs - targets of chronic complications of diabetes (several answers)

- A) Eyes
- B) Kidneys
- C) Heart and blood vessels
- D) Lungs
- E) Pancreas

5. The pancreas produces:

- A) Glucagon;
- B) parathyroid hormone;
- C) Adrenaline;
- D) Vasopressin.

6. Glands of mixed secretion include:

- A) Pineal gland;
- B) Pancreas;
- C) Thymus;
- D) Liver.

7. The level of glucose in the blood is regulated by the hormone:

- A) Vasopressin;
- B) Insulin;
- C) Oxytocin;
- D) Parathormone.

8. Diabetes occurs when there is a lack of:

- A) Testosterone;
- B) thyroxine;
- C) Glucagon;
- D) Insulin

9. The pathogenesis of type I diabetes is based on:

- A) Hereditary predisposition + infection with β -cytotropic viruses
- B) Chronic overeating, alimentary obesity + hereditary predisposition
- C) Hereditary predisposition
- D) Destructive diseases of the pancreas

10. Acute complications of type 1 diabetes are:

- A) Nephropathy
- B) Neuropathy
- C) Ketoacidotic conditions
- D) Diabetic foot

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

1. Essentials of Family Medicine, Philip D Sloane, Lisa M Slatt, Mark H Ebell, Louis B Jacques, Mindy A Smith/ 2017/ ISBN-10 / ASIN: 0781781884 ISBN-13 / EAN: 9780781781886 Lippincott Williams & Wilkins
2. Current Diagnosis & Treatment in Family Medicine Jeannette E. South-Paul, Samuel C. Matheny, Evelyn L. Lewis/2018/, ISBN: 0-07-151004-4 McGrawHill Medical.
3. The Color Atlas and Synopsis of Family Medicine, 3rd Edition by Richard Usatine , Mindy Ann Smith , E.J. Mayeaux, Heidi Chumley, 1680 pages,/ 2018/ ISBN-10 : 1259862046 ISBN-13 : 978-1259862045 McGraw-Hill Education
4. Family Medicine: Ambulatory Care and Prevention, Sixth Edition (Lange Clinical Manuals) 6th Edition Mindy A. Smith, MD (East Lansing, MI), Leslie A. Shimp, PharmD, MS (Ann Arbor, MI), Sarina Schrage, MD, MS (Madison, WI) 1088 pages /2020/ ISBN-10: 0071820736 ISBN-13: 978-0071820738 McGraw-Hill Education
5. Textbook of Family Medicine 9th Edition by Robert E. Rakel MD , David Rakel MD ,1215 pages,/2015/, ISBN-13 : 978-0323239905 ISBN-10: 0323239900 Saunders; 9th Edition (March 6, 2020).

Electronic information resources:

1. Association of diabetologists of Ukraine <http://uda.in.ua/>
2. American Diabetes Association. <https://www.diabetesjournals.org> http://care.diabetesjournals.org/content/41/Supplement_1/S1
3. European Association for the study of Diabetes. <https://www.easd.org>
4. Centers for Disease Control and Prevention <https://www.cdc.gov/>
5. NICE | The National Institute for Health and Care Excellence <https://www.nice.org.uk/>

Practical lesson № 4

Topic 4: Clinic, diagnosis and differential diagnosis, screening of type 1 diabetes

Goal: Acquiring knowledge about the clinical manifestations of type 1 diabetes, its diagnosis and screening, differential diagnosis with other diseases.

Basic concepts: The main clinical symptoms of diabetes. Diagnosis of diabetes. Screening for type 1 diabetes and testing for the presence of risk factors for the disease. Diagnostic criteria for diabetes and other categories of hyperglycemia. Additional research methods. Differential diagnosis of type 1 diabetes with other diseases.

Equipment: multimedia projector

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

—requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);
 —questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

1. Clinical symptoms and key signs of type 1 diabetes.
2. Typical course of type 1 diabetes.
3. Diagnostic methods for detecting type 1 diabetes.
4. Principles of diagnosis of type 1 diabetes mellitus at the stage of primary medical care
5. Functional studies of type 1 diabetes.
6. Principles of screening research in high-risk groups
7. Criteria for diagnosis of type 1 diabetes.
8. Differential diagnosis of type 1 diabetes with other diseases.

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):
—content of tasks (tasks, clinical situations, etc.);

Tasks:

Task 1. Patient M., 15 years old, has been suffering from diabetes for 3 years. Receives 22 units of insulin during the day. After suffering from pneumonia two weeks ago, the condition worsened. Thirst increased, abdominal pain, nausea, vomiting, drowsiness appeared. She lost consciousness in the evening. The smell of acetone from the mouth. Pulse at 98 per minute, blood pressure 85/50 mmHg.

1. Your previous diagnosis? 2. Assign priority necessary studies. 3. With what conditions is it necessary to carry out a differential diagnosis?
4. Where should emergency care begin? 5. What further therapy is necessary?

Task 2. The woman is 27 years old. Complains about the appearance of boils on the skin, weight loss (by 10 kg), fatigue within 2 months after the flu. Objectively: internal organs without pathology. Oral GTT: fasting blood sugar content - 7.2 mmol/l, after 120 minutes. - 13.1 mmol/l.

1. Evaluate the data of OGTT
2. Specify the most probable diagnosis. 3. What is the genesis of this disease? 4. What additional examinations should be conducted.
5. Prescribe treatment

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	Define the term prediabetes, type 1 diabetes.	Terminology of type 1 diabetes, prediabetes. Epidemiology of type 1 diabetes.	
2	Clinical manifestations of type 1 diabetes	Write the clinical symptoms of type 1 diabetes.	
3	Methods of diagnosis of diabetes	Describe the methods of diagnosing type 1 diabetes. What is type 1	

		diabetes screening?	
4	Laboratory methods of diagnosis of type 1 diabetes	Indications and conditions for conducting a glucose tolerance test (TTG). Indications and conditions for determination of HbA1c. Plan additional laboratory, instrumental research, consultations. Be able to evaluate OGTT, data of glycemic and glucosuric profiles.	
5	Differential diagnosis of type 1 diabetes.	Conduct differential diagnosis of type 1 diabetes	

—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information in case of use of ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

—control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

Test tasks.

1. Specify the drug that must be administered to a patient with a hypoglycemic coma:

- A) Glucose 40% 20 - 40 ml.
- B) Simple insulin 20 - 40 units IV.
- C) Diphenhydramine 1% - 1 ml p/sh.
- D) Vikasol 1/% - 2 ml IV.
- E) Analgin 50% = 2 ml in/m.

2. Patient V., 48 years old, suffers from diabetes and takes insulin. After the administration of the usual dose of insulin, the patient felt very hungry, there was a feeling of trembling in the body, sharp weakness, the skin was covered with sweat. After a few minutes, the patient lost consciousness. Objectively: moist skin, pulse 80/min, blood pressure – 150/90 mmHg, severe muscle hypertonicity. Heart sounds are muffled, vesicular breathing in lungs, abdomen is soft. What complication did the patient have?

- A) Hyperglycemic coma.
- B) Hypoglycemic coma.
- C) Epileptic attack.
- D) Hypertensive crisis
- E) Fainting

3. Patient K, 40 years old, developed general weakness, sweating, and tremors of the limbs 20 minutes after administration of 32 units of insulin. This is typical for:

- A) Hepatic coma
- B) Hyperglycemic coma
- C) State of hypoglycemia
- D) Hyperosmolar coma
- E) Hyperlactatemic coma

4. What diagnostic laboratory method helps to determine the average level of glycemia in a patient for the last three months?

- A) urine for ketone compounds
- B) urine for glucose
- C) glycated hemoglobin
- D) glucose tolerance test
- E) fasting blood glucose

5. Determine the early clinical symptoms of diabetes (several answers).

- A) polyphagia
- B) polyuria
- C) polydipsia
- D) numbness of the limbs
- E) decrease in visual acuity

6. The cause of sustained tachycardia in patients with type 1 diabetes is all except:

- A) Autonomic cardiac neuropathy
- B) Combination of diabetes mellitus and thyrotoxicosis
- C) Hypokalemia
- D) Diabetic cardiomyopathy
- E) Ischemic heart disease

7. What is the main type of heredity characteristic of patients with type 1 diabetes?

- A) Polygenic
- B) Autosomal dominant
- C) Heterogeneous
- D) Autosomal recessive
- E) All answers are correct

8. Transient visual disturbances in patients with diabetes are most likely associated with:

- A) Refractive disorder
- B) Edema of the retina
- C) Hemorrhages in the vitreous body
- D) A + B
- E) B + C

9. 5 g/l of glucose was found in the urine of an 18-year-old boy for the first time. Fasting glycemia - 5.1 mmol/l. There are no complaints. Which of the studies is likely to help rule out diabetes?

- A) Daily glucosuria
- B) Glycemia after a meal
- C) Glucose tolerance test
- D) Diurnal fluctuations of glycemia
- E) Level of insulin in blood plasma

10. Patient K. has been suffering from diabetes for 28 years. During the last year, the dose of insulin decreased by 14 units. In the urine analysis: protein - 1.7 g/l, sugar - 0.8%, many erythrocytes, cylinders. The indicated signs are a manifestation of:

- A) Diabetic nephropathy
- B) Decompensation of diabetes.
- C) Insulin resistance.
- D) Chronic insulin overdose syndrome.
- E) Pyelonephritis.

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

1. Essentials of Family Medicine, Philip D Sloane, Lisa M Slatt, Mark H Ebell, Louis B Jacques, Mindy A Smith/ 2017/ ISBN-10 / ASIN: 0781781884 ISBN-13 / EAN: 9780781781886 Lippincott Williams & Wilkins
2. Current Diagnosis & Treatment in Family Medicine Jeannette E. South-Paul, Samuel C. Matheny, Evelyn L. Lewis/2018/, ISBN: 0-07-151004-4 McGrawHill Medical.
3. The Color Atlas and Synopsis of Family Medicine, 3rd Edition by Richard Usatine , Mindy Ann Smith , E.J. Mayeaux, Heidi Chumley, 1680 pages,/ 2018/ ISBN-10 : 1259862046 ISBN-13 : 978-1259862045 McGraw-Hill Education
4. Family Medicine: Ambulatory Care and Prevention, Sixth Edition (Lange Clinical Manuals) 6th Edition Mindy A. Smith, MD (East Lansing, MI), Leslie A. Shimp, PharmD, MS (Ann Arbor, MI), Sarina Schrager, MD, MS (Madison, WI) 1088 pages /2020/ ISBN-10: 0071820736 ISBN-13: 978-0071820738 McGraw-Hill Education
5. Textbook of Family Medicine 9th Edition by Robert E. Rakel MD , David Rakel MD ,1215 pages,/2015/, ISBN-13 : 978-0323239905 ISBN-10: 0323239900 Saunders; 9th Edition (March 6, 2020).

Electronic information resources:

1. Association of diabetologists of Ukraine <http://uda.in.ua/>

2. American Diabetes Association.

<https://www.diabetesjournals.org>http://care.diabetesjournals.org/content/41/Supplement_1/S1

3. European Association for the study of Diabetes. <https://www.easd.org>

4. Centers for Disease Control and Prevention <https://www.cdc.gov/>

5. NICE/The National Institute for Health and Care Excellence <https://www.nice.org.uk/>

Practical lesson № 5

Topic 5: Modification of the lifestyle of patients with diabetes, as a method of compensating the disease and preventing complications and improving the prognosis.

Goal: Acquiring knowledge by the acquirer regarding the modification of the lifestyle of patients with type 2 diabetes, physical activity, and eating habits.

Basic concepts: Management of diabetes. Lifestyle modification for patients with type 1 and type 2 diabetes, namely physical activity, balanced nutrition, weight control, and rejection of bad habits. Glycemic goals in diabetes.

Equipment: multimedia projector

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

—requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);
—questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

1. Which do you know the non-medicinal methods of treatment for type 2 diabetes? List the general principles.
2. Physical activity at type 2 diabetes and the rules for their implementation.
3. What undesirable conditions can occur in patients with type 2 diabetes with excessive physical activity?
4. Concept of diet. What diets do you know?
5. Indications and contraindications for prescribing different diets.
6. Nutrition principles for type 2 diabetes.
7. Target indicators glucose level in type 2 diabetes.
8. What do you think is the role of education in the treatment of patients with type 2 diabetes?

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):
—content of tasks (tasks, clinical situations, etc.);

Tasks:

Task 1. A 22-year-old girl came to her family doctor for a preventive check-up in October. The state of health is satisfactory, there are no complaints. He has been suffering from well-controlled type I diabetes for 3 years. Her 70-year-old grandmother has breast cancer. The last Pap test was done a year ago, no abnormalities were recorded. Her height is 172 cm, weight is 61 kg, BMI is 20 kg/m². The indicator of glycated hemoglobin A1c is 6.5%, the last indicator of the glucometer is 6.54 mmol/l.

1. Diagnose the patient.
2. What additional examination methods can be prescribed
3. Which doctor's recommendation would be most appropriate for this patient?
4. Provide exercise recommendations to the patient.

Task 2. A 55-year-old patient is suspected of having diabetes during a professional examination. Was not treated. Objectively: height - 170 cm, body weight - 106 kg, skin of normal moisture. Ps- 76/min., rhythmic, the left limit of the relative dullness of the heart is shifted 1 cm to the left of the midclavicular line, the heart sounds are weakened, BP- 140/80 mm Hg. Fasting glycemia - 6.9 mmol/l. Glucose content in daily urine is 0.5% with a diuresis of 2.5 liters.

1. Diagnose the patient.
2. What is the plan for additional examination of the patient.
3. What is the primary treatment strategy?
4. Provide guidance on healthy diabetes education.

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	Principles of non-drug treatment for type 2 diabetes	Make a non-drug treatment plan for a patient with type 2 diabetes	
2	Lifestyle modification tips for patients with type 2 diabetes	Provide recommendations on teaching a healthy lifestyle for type 2 diabetes.	
3	Benefits of physical activity.	What are the benefits of physical activity?	
4	Physical activity with type 2 diabetes, conditions and rules for their implementation.	Provide recommendations on physical exercises to a patient with type 2 diabetes.	
5	Nutrition for type 2 diabetes.	Provide nutrition recommendations to a patient with type 2 diabetes. What foods should be excluded from the diet of patients with type 2 diabetes.	

—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information in case of use of ideas, developments, statements, information;

- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

—control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

Test tasks.

1. A 55-year-old patient was diagnosed with diabetes during a professional examination. Was not treated. Objectively: height - 170 cm, body weight - 106 kg, skin of normal moisture. Ps - 76/min., rhythmic, the left border of relative dullness of the heart is shifted 1 cm to the left of the midclavicular line, heart sounds are weakened, BP - 140/80 mm Hg. Fasting glycemia - 6.9 mmol/l. Glucose content in daily urine is 0.5% with a diuresis of 2.5 liters. What is the primary treatment strategy?

- Assign the patient only diet therapy
- Prescribe metformin
- Prescribe glibenclamide
- Assign repaglinide
- Prescribe insulin

2. A 62-year-old woman came to see a gynecologist with complaints of itching of the vulva. He has been suffering from chronic pancreatitis for 8 years. Increased nutrition, body weight 102 kg, height 158 cm. Palpable inguinal lymph nodes up to 0.8 cm. Scratching marks on the skin of the perineum. Blood sugar - 7.8 mmol/l. What is the most likely diagnosis?

- Obesity of alimentary genesis
- Vulvitis
- Lymphogranulomatosis
- Diabetes
- Allergic dermatitis

3. A 38-year-old patient underwent a glucose tolerance test: fasting capillary blood glucose - 5.9 mmol/l, after 2 hours - 8.9 mmol/l. Evaluate the test results:

- Normal test
- Violation of glucose tolerance
- Violation of fasting glycemia
- Doubtful test
- Overt diabetes

4. A 33-year-old patient with newly diagnosed diabetes maintains glycemia after eating less than 10.0 mmol/l with the help of a diet. He refrains from insulin therapy. What research is most important to conduct for the differentiation of 1st (insulin-dependent) and 2nd (non-insulin-dependent) types of diabetes?

- Glucose tolerance test
- Fasting glycemia study
- Determination of antibodies to islet cells
- Determination of glycosylated hemoglobin of blood
- Determination of fructosamine in the blood

5. A 40-year-old man complains of weakness, weight loss, and abdominal pain. Objectively: diffuse hyperpigmentation of the skin, polyarthrititis (wrist joints and hip joint), palpable enlarged liver. Blood sugar 9.25 mmol/l. What is the most likely diagnosis?

- A. Hemochromatosis
- B. Addison's disease
- C. Carcinoma of the pancreas
- D. Insulin-dependent diabetes
- E. Chronic hepatitis

6. When conducting a glucose tolerance test for a 13-year-old child with third-degree obesity, the following was established: fasting blood sugar - 5.4 mmol/l, 1 hour after a carbohydrate load - 10 mmol/l, 2 hours later - 7.8 mmol/l. What measures should be taken to normalize carbohydrate metabolism?

- A. Diet, physical activity
- B. Sugar-lowering collections of herbs
- C. Preparations of the biguanide series
- D. Sulfanilamide drugs
- E. Insulin

7. A 22-year-old girl came to her family doctor for a preventive examination in October. The state of health is satisfactory, there are no complaints. She has been suffering from well-controlled type I diabetes for 3 years. Her 70-year-old grandmother has breast cancer. The last Pap test was done a year ago, no abnormalities were recorded. Her height is 172 cm, weight is 61 kg, BMI is 20 kg/m². The indicator of glycated hemoglobin A1c is 6.5%, the last indicator of the glucometer is -6.54 mmol/l. Which doctor's recommendation would be most appropriate for this patient?

- A. Modification of the diet in order to reduce weight
- B. Take a test for the human papilloma virus (HPV test)
- C. Get a mammogram
- D. Get vaccinated against the flu
- E. Light aerobic exercise every day

8. A 58-year-old patient complains of periodic headache, dizziness, and tinnitus. He has been suffering from diabetes for 15 years. Objectively: heart sounds are rhythmic, heart rate - 76/min., accent of the II tone over the aorta, blood pressure - 180/110 mm Hg. In urine: relative density - 1.014. The daily loss of protein in the urine is up to 1.5 g. The drug of choice for the treatment of arterial hypertension in this patient will be:

- A. ACE inhibitor
- B. β -blocker
- C. Antagonist of calcium channels
- D. Thiazide diuretic
- E. α -blocker

9. A 23-year-old woman suffering from insulin-dependent diabetes was brought to the emergency department with confused consciousness, inadequate fussy behavior, sweating, increased salivation, and tachycardia. What kind of research should be done in the first place?

- A. General blood test
- B. Plasma electrolytes
- C. Blood sugar analysis
- D. Gas composition of arterial blood
- E. Blood urea and creatinine

10. A 68-year-old man called the district doctor in connection with the appearance of an attack-like cough with a small amount of "rusty" sputum, pain in the right side associated with deep breathing and coughing. He has insulin-dependent diabetes. Objectively: temperature - 39.2°C,

blood pressure - 24/min, pulse - 114 beats/min, blood pressure - 110/70 mm Hg. Art. The skin is dry, hyperemia of the cheeks. During auscultation on the right in the lower parts of the lungs - moist sonorous small-bubble rales. What should be the tactics of the district doctor?

- A. Send for examination at the polyclinic.
- B. Hospitalize in a therapeutic department.
- C. Prescribe outpatient treatment.
- D. Hospitalize in the endocrinology department.
- E. Hospitalize in the intensive care unit.

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

1. Essentials of Family Medicine, Philip D Sloane, Lisa M Slatt, Mark H Ebell, Louis B Jacques, Mindy A Smith/ 2017/ ISBN-10 / ASIN: 0781781884 ISBN-13 / EAN: 9780781781886 Lippincott Williams & Wilkins
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3. The Color Atlas and Synopsis of Family Medicine, 3rd Edition by Richard Usatine , Mindy Ann Smith , E.J. Mayeaux, Heidi Chumley, 1680 pages,/ 2018/ ISBN-10 : 1259862046 ISBN-13 : 978-1259862045 McGraw-Hill Education
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Electronic information resources:

1. Association of diabetologists of Ukraine <http://uda.in.ua/>
2. American Diabetes Association
<https://www.diabetesjournals.org>http://care.diabetesjournals.org/content/41/Supplement_1/S1
3. European Association for the study of Diabetes. <https://www.easd.org>
4. Centers for Disease Control and Prevention <https://www.cdc.gov/>
5. NICE/The National Institute for Health and Care Excellence <https://www.nice.org.uk/>

Practical lesson № 6

Topic 6: Treatment of type 2 diabetes and indications for switching to insulin therapy. Methods of controlling the level of glucose in the blood

Goal: Acquisition of knowledge by the learner regarding modern methods of monitoring blood glucose levels in patients with type 2 diabetes, techniques of using a glucometer. Knowledge about the treatment of type 2 diabetes, indications and contraindications for drug treatment, groups of hypoglycemic drugs, their mechanism of action, indications for switching to insulin therapy, insulin classification, insulin therapy regimens.

Basic concepts: Blood glucose monitoring. Glucometer and rules for working with it. Modern methods of controlling the level of glucose in the blood. Algorithm for the treatment of type 2 diabetes. Drug therapy: modern drugs for the treatment of type 2 diabetes, their mechanism of action, features of use and contraindications. Indications for insulin therapy.

Equipment: multimedia projector, glucometer.

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

—requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);
—questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

1. General principles of treatment of type 2 diabetes. Groups of hypoglycemic drugs. Indications and contraindications for their use.
2. The mechanism of action of sugar-lowering drugs.
3. Side effects of the use of sugar-lowering drugs.
4. Indications for switching to insulin therapy.
5. Classification of insulins. Modes of insulin therapy.
6. Insulin administration technique.
7. Modern devices for administering insulin. Insulin pump.
8. Complications of insulin therapy and methods of their correction.
9. What can affect glucose level indicators when using a glucometer.
10. Modern methods of controlling the level of glucose in the blood.
11. System of continuous monitoring of blood glucose level.

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):
—content of tasks (tasks, clinical situations, etc.);

Tasks:

Task 1. A 46-year-old patient has been suffering from diabetes for 9 years and receives Monotard insulin 26 units in the morning and 6 p.m. Tonight. Complaints of weakness, lethargy in the morning after sleep, headache, sweating at night. Objectively: pulse - 72/min., blood pressure -

125/70 mm Hg. The limits of the heart are normal. Liver +4 cm. Blood sugar: 8:00 - 14 mmol/l, 12:00 -9 mmol/l, 17:00 - 11 mmol/l. Urine sugar in the range of 0.5-1%.

1. What is the patient's diagnosis
2. What is the most likely cause of the patient's complaints at night?
3. What additional examination methods should be prescribed to the patient.
4. Is it necessary to adjust insulin therapy?

Task 2. A 63-year-old patient suffers from type 2 diabetes. He receives glibenclamide in a dose of 15 mg per day and metformin 1000 mg per day. After physical exertion, I felt weakness, dizziness, shortness of breath, slight pain in the heart area. Blood pressure 70/30 mm Hg. Pulse 110 per minute. According to the ECG: dome-shaped elevation of the ST segment, depression of the ST segment in the reciprocal zone, appearance of the QS wave.

1. What are the tactics in relation to the patient?
2. What additional examination methods should be prescribed
3. What hypoglycemic therapy is necessary for the patient?
4. Correct the patient's treatment.

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	Types of glucometers	Rules for using a glucometer	
2	Indicators of glucose in the blood	Normal blood glucose levels in healthy people	
3	Indicators of glucose in the blood	The range of blood glucose levels in patients with diabetes	
4	How many times do you need to measure your sugar level with a glucometer?	Give examples. Self-monitoring of patients with type 2 diabetes.	
5	How to check the functioning of the glucometer?	Read the instructions.	

—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information in case of use of ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

—control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

Test tasks.

1. In a 30-year-old woman with influenza, fasting glycemia was found to be 11.3 mmol/l, and glucosuria was 25 g/l. Height 168 cm, weight 67 kg. What research is most informative for clarifying the diagnosis?
 - A. Fasting insulinemia
 - B. Daily fluctuations of glycemia
 - C. Daily fluctuations of glucosuria
 - D. Glycemia one hour after a meal
 - E. Glucose tolerance test
2. A 10-year-old girl consulted a doctor with complaints of thirst, frequent urination, and weight loss. He considers himself sick for about a month. Objectively: pathology of internal organs was not detected. What laboratory examination should be carried out in the first place?
 - A. Glucose tolerance test
 - B. Urine analysis for sugar from daily diuresis
 - C. Fasting blood sugar test
 - D. Urine analysis for acetone
 - E. Glucose profile
3. A 38-year-old patient underwent a glucose tolerance test: fasting capillary blood glucose - 5.9 mmol/l, after 2 hours - 8.9 mmol/l. Evaluate the test results:
 - A. Violation of fasting glycemia
 - B. Violation of glucose tolerance
 - C. Normal test
 - D. Doubtful test
 - E. Overt diabetes
4. A 23-year-old woman suffering from insulin-dependent diabetes was brought to the emergency department with confused consciousness, inappropriate fussy behavior, sweating, increased salivation, and tachycardia. What kind of research should be done in the first place?
 - A. Blood urea and creatinine
 - B. General blood test
 - C. Plasma electrolytes
 - D. Gas composition of arterial blood
 - E. Blood sugar analysis

5. A 62-year-old woman came to see a gynecologist with complaints of itching of the vulva. He has been suffering from chronic pancreatitis for 8 years. Increased nutrition, body weight 102 kg, height 158 cm. Palpable inguinal lymph nodes up to 0.8 cm. Scratching marks on the skin of the perineum. Blood sugar - 7.8 mmol/l. What is the most likely diagnosis?
- Obesity of alimentary genesis
 - Vulvitis
 - Diabetes
 - Lymphogranulomatosis
 - Allergic dermatitis
6. A 55-year-old woman suffers from severe depression, polyuria, nocturia, and severe thirst. She has a history of radical mastectomy due to breast carcinoma (one year ago). In the blood: glucose-5.5 mmol/l, Na⁺-149 mmol/l; K⁺- 3.6 mmol/l; Ca²⁺-2.37 mmol/l (serum); urea (serum) - 10.71 mmol/l. Urine osmolality is 150 mOsm/l. What is the most likely diagnosis?
- Diabetes insipidus
 - Psychogenic polydipsia
 - Renal glycosuria
 - Hypercalciuria
 - Syndrome of inappropriate secretion of anti-diuretic hormone (SIADH)
7. A woman, 6-7 weeks pregnant, turned to a doctor for women's consultation. From the anamnesis, it was found that he has been suffering from diabetes in a severe form since the age of 15. According to the oculist's conclusion, retinopathy II century. Had 2 pregnancies that ended in stillbirth. Blood sugar content -15 mmol/l. During a bimanual examination, it was established that the uterus is enlarged (as in pregnancy, up to 7 weeks). What are the doctor's tactics?
- Prolongation of pregnancy under blood sugar control
 - Genetic consultation
 - Termination of pregnancy is indicated
 - Consultation of an endocrinologist
 - Hospitalization in critical periods of pregnancy
8. A 22-year-old woman consulted a doctor to plan a pregnancy. There is a history of diabetes for two years. No diabetic complications were detected during the survey and examination. Fasting glycemia in the range of 6.0-7.0 mmol/l. Which analysis among the listed should be prescribed to adequately assess glycemic control?
- The level of glycosylated (glycated) hemoglobin (HbA1c)
 - Glucosuric profile
 - Glycemic profile
 - Postprandial glycemia
 - C-peptide level
9. A 22-year-old girl came to her family doctor for a preventive check-up in October. The state of health is satisfactory, there are no complaints. He has been suffering from well-controlled type I diabetes for 3 years. Her 70-year-old grandmother has breast cancer. The last Pap test was done a year ago, no abnormalities were recorded. Her height is 172 cm, weight is 61 kg, BMI is 20 kg/m². The indicator of glycated hemoglobin A1c is 6.5%, the last indicator of the glucometer is -6.54 mmol/l. Which doctor's recommendation would be most appropriate for this patient?
- Get vaccinated against the flu
 - Modification of the diet in order to reduce weight
 - Take a test for the human papilloma virus (HPV test)

- D. Get a mammogram
- E. Light aerobic exercise every day

10. During the examination of the 64-year-old patient, the doctor diagnosed obesity (body mass index 36 kg/m², waist circumference 118 cm), arterial hypertension (170/105 mm Hg), impaired carbohydrate tolerance. During the examination, an increase in the level of blood cholesterol was revealed. Determine the patient's diagnosis.

- A. Diabetes
- B. Arterial hypertension
- C. Metabolic syndrome H
- D. Hypothalamic syndrome
- E. Alimentary obesity

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

1. Essentials of Family Medicine, Philip D Sloane, Lisa M Slatt, Mark H Ebell, Louis B Jacques, Mindy A Smith/ 2017/ ISBN-10 / ASIN: 0781781884 ISBN-13 / EAN: 9780781781886 Lippincott Williams & Wilkins
2. Current Diagnosis & Treatment in Family Medicine Jeannette E. South-Paul, Samuel C. Matheny, Evelyn L. Lewis/2018/, ISBN: 0-07-151004-4 McGrawHill Medical.
3. The Color Atlas and Synopsis of Family Medicine, 3rd Edition by Richard Usatine , Mindy Ann Smith , E.J. Mayeaux, Heidi Chumley, 1680 pages,/ 2018/ ISBN-10 : 1259862046 ISBN-13 : 978-1259862045 McGraw-Hill Education
4. Family Medicine: Ambulatory Care and Prevention, Sixth Edition (Lange Clinical Manuals) 6th Edition Mindy A. Smith, MD (East Lansing, MI), Leslie A. Shimp, PharmD, MS (Ann Arbor, MI), Sarina Schrage, MD, MS (Madison, WI) 1088 pages /2020/ ISBN-10: 0071820736 ISBN-13: 978-0071820738 McGraw-Hill Education
5. Textbook of Family Medicine 9th Edition by Robert E. Rakel MD , David Rakel MD ,1215 pages,/2015/, ISBN-13 : 978-0323239905 ISBN-10: 0323239900 Saunders; 9th Edition (March 6, 2020).

Electronic information resources:

1. Association of diabetologists of Ukraine <http://uda.in.ua/>
2. American Diabetes Association <https://www.diabetesjournals.org> https://care.diabetesjournals.org/content/41/Supplement_1/S1
3. European Association for the study of Diabetes. <https://www.easd.org>
4. Centers for Disease Control and Prevention <https://www.cdc.gov/>
5. NICE/The National Institute for Health and Care Excellence <https://www.nice.org.uk/>

Practical lesson № 7

Topic 7: Acute complications of type 2 diabetes, their treatment and prevention.

Goal: Acquisition of knowledge by the learner regarding the mechanism of occurrence and clinical manifestations of acute complications of type 2 diabetes, their diagnosis, differential diagnosis, treatment and prevention.

Basic concepts: Acute complications of type 2 diabetes. Ketoacidotic states with diabetic (hyperketonemic) coma. Peculiarities of their course, symptoms and differential diagnosis, methods of diagnosis and treatment. Hyperosmolar (nonacidotic) diabetic coma. Etiology, pathogenesis, clinic, diagnosis, differential diagnosis, treatment. Hypoglycemic coma, hypoglycemic conditions. Etiology, pathogenesis, clinic, diagnosis, treatment.

Equipment: multimedia projector.

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

—requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);
—questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

1. Diabetic ketoacidotic and lactacidemic coma.
2. Causes and mechanism of development.
3. Hyperosmolar diabetic coma.
4. Causes of hyperosmolar coma.
5. Mechanism of development.
6. Hypoglycemia.
7. Causes and mechanism of development.
8. Differential diagnosis of various types of tumors in diabetes.
9. Treatment and prevention of ketoacidotic coma.
10. Emergency care and prevention in case of diabetic comas

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):

—content of tasks (tasks, clinical situations, etc.);

Tasks:

Task 1. In a 25-year-old patient with diabetes Type I beta 1 hour after the next injection, weakness, hunger, and sweating occurred. After 10 minutes, convulsions occurred, loss of consciousness. During examination: unconsciousness, tonic and clonic muscle spasms. The skin is moist. Blood pressure - 140/80 mm Hg, pulse - 90/min, rhythmic. There is no smell of acetone in exhaled air.

1. Diagnose the patient
2. What emergency condition did the patient have?
3. Plan of additional laboratory studies
4. Provide emergency care to the patient.

Problem 2. A 65-year-old diabetic patient started taking antibiotics for pneumonia and in the absence of appetite, canceled glibenclamide. Soon the thirst increased, drowsiness, leg muscle cramps appeared. He fainted and was hospitalized. Objectively: consciousness is absent, the skin is dry. The tone of the eyeballs is reduced, breathing is shallow, accelerated. Blood glucose - 36 mmol/l. The reaction of urine to acetone is negative, to glucose - positive.

1. Diagnose the patient
2. What emergency condition did the patient have?
3. Plan of additional laboratory studies
4. Provide emergency care to the patient.

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	Diabetic ketoacidosis.	Etiology. Pathogenesis. Clinic. Diagnosis and treatment.	
2	Hyperosmolar diabetic coma.	Etiology. Pathogenesis. Clinic. Diagnosis and treatment	
3	Lactic acidosis.	Etiology. Pathogenesis. Clinic. Diagnosis and treatment.	
4	Hypoglycemia. Hypoglycemic coma.	Etiology. Pathogenesis. Clinic. Diagnosis and treatment.	
5	Prevention of diabetic coma.	Methods of preventing the development of tumors	
6	Compile the algorithm of emergency medical care in the case of the development of ketoacidosis and ketoacidotic coma in a patient at the level of primary medical care.	Write an algorithm of medical care at the pre-hospital stage	

—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information in case of use of ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

—control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

Test tasks.

1. A 23-year-old woman with diabetes type 2 diabetes, on the 28th week of pregnancy, she was delivered unconscious before the intensive care unit. A sharp smell of acetone comes from the mouth, breathing is noisy, the skin is dry, the tone of the eyeballs and muscles is reduced. Pulse-142/min. Blood pressure - 60/25 mm Hg. Art. Make a diagnosis:
 - A. Ketonemic coma
 - B. Lactacidemic coma
 - C. Hypoglycemic coma
 - D. Hyperosmolar coma
 - E. Hepatic coma
2. A 65-year-old patient was hospitalized in the intensive care unit in a comatose state. Sick of type II diabetes for 10 years. In the last 2 weeks, pronounced polyuria, polydipsia were observed. Blood serum glucose - 30 mmol/l, arterial blood pH - 7.3. Blood plasma osmolarity - 350 mOsm/l. The patient was diagnosed with diabetic hyperosmolar coma. What is the main pathogenetic mechanism of coma?
 - A. Hypocoagulation
 - B. Hyponatremia
 - C. Dehydration
 - D. Increase in tubular reabsorption
 - E. Increasing glomerular filtration
3. A 64-year-old diabetic patient was treated with metformin. In connection with the increased use of diuretics for blood pressure. Gradually, the effectiveness of the diuretic decreased, nausea and vomiting appeared. Contact with the patient is difficult. The skin is dry. There is no smell of acetone. AT-180/100 mm Hg. Tones of the heart are deaf. Ps-98/min. Breathing is vesicular. Stomach is painful in the epigastrium. Liver +4 cm. Blood glucose - 48 mmol/l, Na - 156 mmol/l, K - 5.2 mmol/l, urea -15 mmol/l. Which pharmacological approach should I start with?
 - A. Urgent hydration of the patient
 - B. Correction of Na⁺ content in the blood
 - C. Purpose of sodium bicarbonate
 - D. Correction of blood pressure with the help of sodium sulfate
 - E. Transfer the patient to treatment with protamine-zinc insulin
4. A 46-year-old patient has been suffering from diabetes for 9 years and receives Mono-tard insulin 26 units in the morning and 6 p.m. Tonight. Complaints of weakness, lethargy in the morning after sleep, headache, sweating at night. Objectively: pulse - 72/min., blood pressure - 125/70 mm Hg. Art. The limits of the heart are normal. Liver +4 cm. Blood sugar: 8:00 - 14 mmol/l, 12:00 - 9 mmol/l, 17:00 - 11 mmol/l. Urine sugar in the range of 0.5-1%. What is the most likely cause of the patient's complaints at night?
 - A. Insufficient dose of insulin in the morning
 - B. Insufficient evening dose of insulin
 - C. Presence of hepatitis
 - D. Climacteric syndrome
 - E. Excess dose of insulin in the evening

5. A 65-year-old diabetic patient started taking antibiotics for pneumonia and in the absence of appetite, canceled glibenclamide. Soon the thirst increased, drowsiness, leg muscle cramps appeared. He fainted and was hospitalized. Objectively: consciousness is absent, the skin is dry. The tone of the eyeballs is reduced, breathing is shallow, accelerated. Blood glucose - 36 mmol/l. The reaction of urine to acetone is negative, to glucose - positive. Determine the patient's condition:
 - A. Ketoacidotic coma
 - B. Hyperosmolar coma
 - C. Delayed allergic reaction
 - D. Cerebral coma
 - E. Lactacidemic coma

6. A 9-year-old boy developed polydipsia, polyuria, weakness, nausea. During the examination: the consciousness is confused, the skin is dry, the eyeballs are soft, Kussmaul breathing, the smell of acetone from the mouth, the heart sounds are dull, the abdomen is soft, painless. Blood sugar - 19 mmol/l. Name the acute condition that occurred in the child?
 - A. Ketoacidotic coma
 - B. Hyperosmolar coma
 - C. Cerebral coma
 - D. Hepatic coma
 - E. Acute renal failure

7. A 10-year-old boy has been diagnosed with diabetes. During the inspection the smell of acetone from the mouth is noted. In the blood: sugar - 20.5 mmol/l. In urine: sugar - 20 g/l, acetone - (+++). What can explain the appearance of acetone in exhaled air and urine?
 - A. Violation of water and electrolyte balance
 - B. Violation of acid-alkaline balance
 - C. Increased breakdown of ketogenic amino acids and lipids
 - D. Violation of glucose phosphorylation processes
 - E. Weakening of glycolysis processes

8. A patient with type I diabetes, who was brought to the intensive care unit in a condition ketoacidotic coma, in the first three hours, the following was administered intravenously as treatment: saline solution 1.2 l, Ringer's solution 400 ml, potassium chloride solution 7.5% 200 ml, cocarboxylase 5 ml. What other means must be administered to the patient?
 - A. Erythrocyte mass
 - B. 10% calcium chloride solution
 - C. 4% sodium bicarbonate solution
 - D. Blood plasma
 - E. Promedol

9. A 72-year-old woman suffers from type II diabetes, and the accompanying pathology is hypertension II stage disease, II B stage heart failure. Uses metformin. The day before, she suffered a hypertensive crisis, after which sharp weakness, myalgias, increased thirst, dry mouth, and polyuria appeared. Arterial pressure - 140/95 mm Hg, heart rate - 98/min, edema and the smell of acetone are absent. What measures should be taken for the patient to prevent the development of a comatose state?
 - A. Doubling the metformin dose
 - B. Use of hypotonic solution of sodium chloride
 - C. Additional appointment of extended-release insulin
 - D. Cancellation of metformin, appointment of short-acting insulin

E. Appointment of glibenclamide

10. In a 25-year-old patient with diabetes Type I beta 1 hour after the next injection, weakness, hunger, and sweating occurred. After 10 minutes, convulsions occurred, loss of consciousness. During examination: unconsciousness, tonic and clonic muscle spasms. The skin is moist. Blood pressure - 140/80 mm Hg, pulse - 90/min, rhythmic. There is no smell of acetone in exhaled air. First aid is required:
- Intravenous jet 40% solution of glucose 40.0
 - Intravenous drip of 5% solution of glucose 500.0
 - IV jet 40% solution of glucose 80.0 with 8 units of insulin
 - Intravenous drip of 20% solution of glucose 60.0 with 10 units of insulin
 - IV jet 40% solution of glucose 500.0

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

- Essentials of Family Medicine, Philip D Sloane, Lisa M Slatt, Mark H Ebell, Louis B Jacques, Mindy A Smith/ 2017/ ISBN-10 / ASIN: 0781781884 ISBN-13 / EAN: 9780781781886 Lippincott Williams & Wilkins
- Current Diagnosis & Treatment in Family Medicine Jeannette E. South-Paul, Samuel C. Matheny, Evelyn L. Lewis/2018/, ISBN: 0-07-151004-4 McGrawHill Medical.
- The Color Atlas and Synopsis of Family Medicine, 3rd Edition by Richard Usatine, Mindy Ann Smith, E.J. Mayeaux, Heidi Chumley, 1680 pages, / 2018/ ISBN-10 : 1259862046 ISBN-13 : 978-1259862045 McGraw-Hill Education
- Family Medicine: Ambulatory Care and Prevention, Sixth Edition (Lange Clinical Manuals) 6th Edition Mindy A. Smith, MD (East Lansing, MI), Leslie A. Shimp, PharmD, MS (Ann Arbor, MI), Sarina Schrage, MD, MS (Madison, WI) 1088 pages /2020/ ISBN-10: 0071820736 ISBN-13: 978-0071820738 McGraw-Hill Education
- Textbook of Family Medicine 9th Edition by Robert E. Rakel MD, David Rakel MD, 1215 pages, /2015/, ISBN-13 : 978-0323239905 ISBN-10: 0323239900 Saunders; 9th Edition (March 6, 2020).

Electronic information resources:

- Association of diabetologists of Ukraine <http://uda.in.ua/>
- American Diabetes Association
<https://www.diabetesjournals.org> http://care.diabetesjournals.org/content/41/Supplement_1/S1
- European Association for the study of Diabetes. <https://www.easd.org>
- Centers for Disease Control and Prevention <https://www.cdc.gov/>
- NICE/The National Institute for Health and Care Excellence <https://www.nice.org.uk/>

Practical lesson № 8

Topic 8: Chronic complications of type 2 diabetes, their treatment and prevention.

Goal: Acquiring knowledge about micro- and macrovascular complications in type 2 diabetes. Mechanism of their development, clinical picture, diagnosis, treatment and prevention of development.

Basic concepts: Chronic complications of diabetes. Micro- and macrovascular complications of type 2 diabetes. Diabetic nephropathy, clinic, differential diagnosis, diagnosis, treatment and prevention. Diabetic retinopathy: stages of the process, diagnosis, prevention and treatment. Diabetic neuropathy, classification, clinic, diagnosis and treatment. Diabetic foot: classification, diagnosis, treatment. Prognosis of type 2 diabetes

Equipment: multimedia projector.

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

—requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);
—questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

1. Mechanism of development of chronic complications of diabetes.
2. Damage to the cardiovascular system. Early symptoms and principles of diagnosis and treatment.
3. Damage to the eyes. Early symptoms and principles of diagnosis and treatment.
4. Damage to the kidneys. Early symptoms and principles of diagnosis and treatment.
5. Damage to the nervous system. Early symptoms and principles of diagnosis and treatment.
6. Diabetic foot syndrome. Early symptoms and principles of diagnosis and treatment.
7. Foot care and rules for choosing shoes.
8. Oral care rules for type 2 diabetes.
9. Basic principles of prevention of chronic complications of type 2 diabetes.

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):

—content of tasks (tasks, clinical situations, etc.);

Tasks:

Task 1. A 53-year-old man has been suffering from diabetes for 5 years. He goes to the doctor with complaints of pain and cramps in the lower limbs, a feeling of numbness in them, frostbite. When examining the lower extremities, the feet are normal in color, warm to the touch, all types

of sensitivity are significantly reduced, hyperkeratosis, pulsation in the arteries of the extremities is preserved. What complication most likely occurred in the patient?

1. Diagnose the patient.
2. What complication did the patient have?
3. What additional studies should be conducted?
4. Patient treatment plan.

Task 2. A 36-year-old patient complains of headache, weakness, loss of appetite, thirst, swelling of the face and legs. From the age of 18, he receives 42-54 units of insulin per day for diabetes. The condition is difficult. The face is gray, puffy, swelling on the legs. BP = 210/110 mm Hg. st., pulse 110/min, rhythmic. Heart, lungs - without features. Liver along the edge of the costal arch. Glycemic profile: 9-12-10 mmol/l. An. urine: relative density 1022, sugar 3%, protein - 1.32 g/l, leuk. - 3-5 in p/z. There is little urine. What complication developed in the patient?

1. Diagnose the patient.
2. What complication did the patient have?
3. What additional studies should be conducted?
4. Patient treatment plan.

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	Classification and pathogenesis of diabetic angiopathy	To classify and indicate the links of the pathogenesis of diabetic microangiopathy and macroangiopathy.	
2	Diabetic retinopathy, characteristics of stages.	Clinic, diagnostics and modern medicinal and instrumental methods of treatment.	
3	Diabetic nephropathy, characteristics of stages.	Clinic, diagnostics and modern medicinal and instrumental methods of treatment.	
4	Classification of central and peripheral diabetic neuropathy.	Classification and clinical symptoms, diagnostic methods.	
5	Peculiarities of clinical manifestations of autonomic neuropathy of the heart and gastrointestinal tract.	Clinical manifestations and diagnosis of complications	
6	Treatment of patients with diabetic angiopathy.	Principles of treatment for various types of complications in diabetes	

—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the

- work program of this educational discipline;
- references to sources of information in case of use of ideas, developments, statements, information;
 - compliance with the legislation on copyright and related rights;
 - provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.
- control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

Test tasks.

1. A 58-year-old patient complains of periodic headache, dizziness, and tinnitus. He has been suffering from diabetes for 15 years. Objectively: heart sounds are rhythmic, heart rate - 76/min., accent of the II tone over the aorta, blood pressure - 180/110 mm Hg. In urine: relative density - 1.014. The daily loss of protein in the urine is up to 1.5 g. The drug of choice for the treatment of arterial hypertension in this patient will be:
 - A. β -blocker
 - B. Antagonist of calcium channels
 - C. ACE inhibitor
 - D. Thiazide diuretic
 - E. α -blocker
2. A 52-year-old man has been suffering from diabetes for 18 years. A year ago, he had cystitis. Takes maninil 0.005 - 3 times a day. Objectively: height - 176 cm, weight - 82 kg. Fluctuation fasting blood glucose - 10.3-12.4 mmol/l. Detected proteinuria - 0.033 g/l. To prevent the progression of diabetic nephropathy, it is most appropriate to:
 - A. Increase the dose of Maninil
 - B. Reduce the daily caloric intake of food
 - C. Replace maninil with insulin
 - D. Add insulin therapy
 - E. Prescribe antibacterial therapy
3. A 39-year-old patient has been suffering from diabetes for 10 years. The last year marks coldness of toes, pain and feeling of numbness. Objectively: the skin of the lower extremities is dry, thin, cold to the touch; pulsation on the femoral and popliteal arteries is preserved. What is the most likely diagnosis?
 - A. Diabetic microangiopathy of vessels of the lower extremities
 - B. Diabetic macroangiopathy of vessels of the lower extremities
 - C. Raynaud's disease
 - D. Obliterating atherosclerosis of the vessels of the lower extremities
 - E. Obliterating endarteritis of the vessels of the lower extremities
4. A 68-year-old patient complains of sharp pain in the right foot, swelling of the fingers and darkening of the skin of the IV finger. He has been suffering from diabetes for 15 years and is treated irregularly. What complication of diabetes did the patient have?
 - A. Gangrene of the IV toe of the right foot
 - B. Felon
 - C. Hematoma
 - D. Erysipelas
 - E. Fracture of the IV toe of the right foot

5. A 64-year-old patient has been suffering from diabetes for 14 years. About three weeks therefore, the skin of the distal phalanx of the first toe of the left foot became cold, bluish-black. The pain is not intense. The pulse on the arteries of the foot is not determined, on the popliteal artery it is preserved. Glycemia level - 12.4 mmol/l. Ultrasound scanning - stenosis of the lower leg arteries, blood flow - collateral compensated. Tibial-brachial index - 0.7. On the x-ray of the foot - the destruction of the distal phalanx of the first finger. Determine the degree of diabetic foot according to Wagner:
- The first
 - The second
 - The third
 - Fourth
 - Fifth
6. Three days after the injury of the right foot(car accident) a patient with type II diabetes, of moderate severity, developed pain and darkening of the toes. Blood sugar-10 mmol/l, leukocytosis 10·10⁹/l, body temperature-37.1°C. The right foot is slightly swollen, painful during palpation, the 1st and 3rd toes are sharply swollen with cyanotic spots on the front surface, movements are full. Pulsation on the peripheral arteries of the right foot is slightly weakened, on the popliteal artery it is satisfactory. What additional examinations should be conducted to decide on treatment tactics?
- Ultrasound of the vessels of the right limb and X-ray of the right foot in 2 projections
 - X-ray of the right foot in 2 projections
 - Ultrasound of the vessels of the right lower extremity
 - Biochemical examination of blood
 - Rheovasography of 1-3 toes of the right foot
7. A 36-year-old patient complains of headache, weakness, loss of appetite, thirst, swelling of the face and legs. From the age of 18, he receives 42-54 units of insulin. per day for diabetes. The condition is difficult. The face is gray, puffy, swelling on the legs. BP = 210/110 mm Hg. st., pulse 110/min, rhythmic. Heart, lungs - without features. Liver along the edge of the costal arch. Glycemic profile: 9-12-10 mmol/l. Urine analysis: relative density 1022, sugar 3%, protein - 1.32 g/l, leukocytes - 3-5 in p/z. There is little urine. What complication developed in the patient?
- Kidney amyloidosis.
 - Diabetic glomerulosclerosis
 - Chronic pyelonephritis
 - Nephrotic syndrome
 - Glomerulonephritis
8. A 25-year-old woman, who has been suffering from diabetes since the age of 9, was admitted to the nephrology department with significant swelling on the legs, face, hands. BP – 200/110 mmHg; Nv - 90 g/l, blood creatinine - 850 μmol/l, urine protein - 1.0 g/l, 1 - 10-15 in the field of vision. Glomerular filtration 10 ml/min. What are the doctor's tactics?
- Active conservative therapy of diabetic nephropathy
 - Diet therapy
 - Transfer to the hemodialysis department
 - Transfer to the endocrinological dispensary
 - Kidney transplantation
9. A 53-year-old man has been suffering from diabetes for 5 years. Refers to a doctor with complaints of pain and cramps in the lower limbs, a feeling of numbness in them, frostbite. When examining the lower extremities, the feet are normal in color, warm to the

touch, all types of sensitivity are significantly reduced, hyperkeratosis, pulsation in the arteries of the extremities is preserved. What complication most likely occurred in the patient?

- A. Diabetic foot syndrome, ischemic form
- B. Chronic venous insufficiency
- C. Diabetic foot syndrome, mixed form
- D. Obliterating endarteritis
- E. Diabetic foot syndrome, neuropathic form

10. A woman, 6-7 weeks pregnant, turned to a doctor for women's consultation. From the anamnesis it was found out that he has been suffering from severe diabetes since the age of 15. According to the ophthalmologist's conclusion, retinopathy II century. Had 2 pregnancies that ended in stillbirth. Blood sugar content -15 mmol/l. During a bimanual examination, it was established that the uterus is enlarged (as in pregnancy, up to 7 weeks). What are the doctor's tactics?

- A. Prolongation of pregnancy under blood sugar control
- B. Termination of pregnancy is indicated
- C. Genetic consultation
- D. Consultation of an endocrinologist
- E. Hospitalization in critical periods of pregnancy

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

1. Essentials of Family Medicine, Philip D Sloane, Lisa M Slatt, Mark H Ebell, Louis B Jacques, Mindy A Smith/ 2017/ ISBN-10 / ASIN: 0781781884 ISBN-13 / EAN: 9780781781886 Lippincott Williams & Wilkins
2. Current Diagnosis & Treatment in Family Medicine Jeannette E. South-Paul, Samuel C. Matheny, Evelyn L. Lewis/2018/, ISBN: 0-07-151004-4 McGrawHill Medical.
3. The Color Atlas and Synopsis of Family Medicine, 3rd Edition by Richard Usatine , Mindy Ann Smith , E.J. Mayeaux, Heidi Chumley, 1680 pages,/ 2018/ ISBN-10 : 1259862046 ISBN-13 : 978-1259862045 McGraw-Hill Education
4. Family Medicine: Ambulatory Care and Prevention, Sixth Edition (Lange Clinical Manuals) 6th Edition Mindy A. Smith, MD (East Lansing, MI), Leslie A. Shimp, PharmD, MS (Ann Arbor, MI), Sarina Schrager, MD, MS (Madison, WI) 1088 pages /2020/ ISBN-10: 0071820736 ISBN-13: 978-0071820738 McGraw-Hill Education
5. Textbook of Family Medicine 9th Edition by Robert E. Rakel MD , David Rakel MD ,1215 pages./2015/, ISBN-13 : 978-0323239905 ISBN-10: 0323239900 Saunders; 9th Edition (March 6, 2020).

Electronic information resources:

1. Association of diabetologists of Ukraine <http://uda.in.ua/>
2. American Diabetes Association.
<https://www.diabetesjournals.org>http://care.diabetesjournals.org/content/41/Supplement_1/S1
3. European Association for the study of Diabetes. <https://www.easd.org>
4. Centers for Disease Control and Prevention <https://www.cdc.gov/>
5. NICE/The National Institute for Health and Care Excellence <https://www.nice.org.uk/>

Practical lesson № 9

Topic 9: The role of the family doctor in the management of patients with type 1 and type 2 diabetes.

Goal: Acquisition of knowledge by the learner regarding the management of patients with type 2 diabetes by a family doctor.

Basic concepts: Peculiarities of management of patients with type 1 and type 2 diabetes by a family physician. The concept of reimbursement of medicines for the treatment of patients with diabetes. Prescribing sugar-lowering drugs under the "Affordable Medicines" program. Indications for referral of a patient with type 1 and type 2 diabetes to specialized specialists.

Equipment: multimedia projector.

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

—requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);
 —questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

1. Peculiarities of management of patients with type 1 and type 2 diabetes by a family doctor
2. What tests should a family doctor prescribe to a patient with type 1 and type 2 diabetes to prevent the development or progression of diabetes complications.
3. The multiplicity of the purpose of these studies.
4. General principles of prevention of type 1 and type 2 diabetes in relatives of a patient with diabetes at the primary level.
5. Concept of reimbursement.
6. What hypoglycemic drugs can a family doctor prescribe to a patient under the "Affordable Medicines" program?
7. Indications for referral to an endocrinologist.

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):

—content of tasks (tasks, clinical situations, etc.);

Tasks:

Task 1. A 27-year-old boy turned to his doctor for the first time in the past few years, worried about the results of a lipidogram. He said that he did not want to get atherosclerosis and started doing such an analysis every year since he was 22 years old. This year, for the first time, he recorded an indicator (5.0 mmol/l), which is higher compared to the previous four years (no more than 4.1 mmol/l). There is no family history of arterial hypertension or early ischemic heart disease. His grandmother has been suffering from type II diabetes since the age of 58. His 64-year-old grandfather underwent radical prostatectomy for prostate cancer.

1. Are there risk factors for diabetes in the patient?
2. Plan of additional examination of the patient
3. What recommendations for a balanced diet should be given to the patient.
4. What next step in patient management would be most appropriate?

Task 2. A 38-year-old patient complains of a periodic rash in the area of the beard and mustache, which is accompanied by moderate pain. He has been ill for 2 years. Objectively: in the area of the beard and mustache against the background of hyperemia and moderate infiltration - multiple grouped pustular elements, small erosions and purulent crusts.

1. Your previous diagnosis.
2. What concomitant disease should the patient be examined for first of all?
3. Make a patient examination plan.
4. Principles of patient treatment.

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	General principles of management of patients with type 2 diabetes by a family doctor	State the general principles of management	
2	Principles of management of patients with type 1 diabetes by a family doctor.	State the general principles of management	
3	The concept of drug reimbursement.	How to get medicines under the reimbursement program?	
4	Algorithm for prescribing hypoglycemic drugs to a patient with type 2 diabetes.	Compile an algorithm for a 45-year-old patient with type 2 diabetes	
5	Algorithm for prescribing sugar-lowering drugs.	Give examples. The list of drugs prescribed for the treatment of diabetes according to the program "Available medicines", their features of use.	

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—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information in case of use of ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

—control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

Test tasks.

1. A 45-year-old patient with arterial hypertension (BP 140/100 mm Hg) was diagnosed with CHD, atherosclerotic cardiosclerosis HF IIB, III FC, type II diabetes mellitus, subcompensated. Which of the following hypotensive agents should be used?

- A. Enalapril
- B. Verapamil
- C. Atenolol
- D. Hypothiazide
- E. Hydralazine

2. A 68-year-old man called the district doctor in connection with the appearance of an attack-like cough with a small amount of "rusty" sputum, pain in the right side associated with deep breathing and coughing. He has insulin-dependent diabetes. Objectively: temperature - 39.2oC, heart rate - 24 per minute, pulse - 114 beats/min, blood pressure - 110/70 mm Hg. The skin is dry, hyperemia of the cheeks. During auscultation on the right in the lower parts of the lungs - moist sounding small-bubble rales. What should be the tactics of the district doctor?

- A. Send for examination at the polyclinic.
- B. Hospitalize in a therapeutic department.
- C. Prescribe outpatient treatment.
- D. Hospitalize in the endocrinology department.
- E. Hospitalize in the intensive care unit.

3. In a patient suffering from diabetes, the upper eyelid of the right eye suddenly drooped. The doctor found dilation of the right pupil and divergent strabismus on the right. No other changes in the neurological status were noted. What disease did the patient have?

- A. Neuropathy of the right oculomotor nerve
- B. Diabetic polyneuropathy
- C. Acute violation of cerebral circulation
- D. Brain tumor
- E. Secondary meningitis

4. Which of the listed drugs cannot be prescribed under the "Affordable Medicines" program?
- A. Methamine
 - B. Glibenclamide
 - C. Gliclazide
 - D. Metformin
 - E. Victoza
5. A 60-year-old man was delivered in an unconscious state. He suffers from diabetes and hypertension, takes insulin and hypotensive drugs. Objectively: the condition is serious. The skin is dry, turgor is reduced. The tongue is dry, coated with a brown coating. The tone of muscles and eyeballs is reduced. Body temperature is 38.2 C. Heart sounds are dull. Pulse of weak filling 108/min. Blood pressure - 90/50 mm Hg. Breathing is frequent, shallow. There is no smell of acetone. Blood sugar - 58 mmol/l, sugar in urine - 15 g/l, ketone bodies are absent. Total protein - 105 g/l, urea - 16 mmol/l, sodium - 238 mmol/l, potassium - 5.5 mmol/l, lactic acid 0.8 mmol/l. Who is it about?
- A. Hyperosmolar
 - B. Ketoacidotic
 - C. Lactic acid
 - D. Brain
 - E. Uremichna
6. Medicines containing the active substance metformin include all of the following, except:
- A. Glucophage
 - B. Diaformin
 - C. Methamine
 - D. Metaphor
 - E. Amaryl
7. The following trade names belong to sulfonylurea preparations:
- A. Glibenclamide
 - B. Oxide
 - C. Insufor
 - D. Glutazone
 - E. Jardines
8. Patient with diabetes, 50 years old. After the occurrence of furunculosis of the skin and the appointment of antibiotics, glibenclamide was discontinued. The patient's condition worsened, increased thirst, dryness, diuresis 4.5 l/day, fainted. Objectively: the skin is dry. Breathing is superficial, accelerated. RS - 100/min., BP - 90/40 mm Hg. Tones of the heart are deaf. The stomach is soft. Liver +5 cm. Glycemia 43 mmol/l, reaction to acetone in urine is negative, glucose is positive. Determine the nature of the condition.
- A. Ketoacidotic coma
 - B. Hypermolar coma
 - C. Infectious-toxic shock
 - D. Diabetic ketoacidosis
 - E. Lactoacidotic coma
9. A 38-year-old patient complains of a periodic rash in the area of the beard and mustache, which is accompanied by moderate pain. He has been ill for 2 years. Objectively: in the area of the beard and mustache against the background of hyperemia and moderate infiltration - multiple

grouped pustular elements, small erosions and purulent crusts. What concomitant disease should the patient be examined for first of all?

- A. Intestinal dysbiosis
- B. Tuberculosis infection
- C. Diabetes
- D. Hepatitis C
- E. Disease of the thyroid gland

10. A 27-year-old boy went to his doctor for the first time in the past few years concerned about the results of a lipidogram. He said that he did not want to get atherosclerosis and started doing such an analysis every year since he was 22 years old. This year, for the first time, he recorded an indicator (5.0 mmol/l), which is higher compared to the previous four years (no more than 4.1 mmol/l). There is no family history of arterial hypertension or early ischemic heart disease. His grandmother has been suffering from type II diabetes since the age of 58. His 64-year-old grandfather underwent radical prostatectomy for prostate cancer. In addition to information about the main risk factors for cerebrovascular disease and recommendations for a balanced diet, what next step in the patient's management would be most appropriate?

- A. Repeat the determination of the level of total cholesterol after 5 years
- B. Pass the glucose tolerance test
- C. Start statin therapy
- D. Determine the level of prostate-specific antigen (PSA test)

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

1. Essentials of Family Medicine, Philip D Sloane, Lisa M Slatt, Mark H Ebell, Louis B Jacques, Mindy A Smith/ 2017/ ISBN-10 / ASIN: 0781781884 ISBN-13 / EAN: 9780781781886 Lippincott Williams & Wilkins
2. Current Diagnosis & Treatment in Family Medicine Jeannette E. South-Paul, Samuel C. Matheny, Evelyn L. Lewis/2018/, ISBN: 0-07-151004-4 McGrawHill Medical.
3. The Color Atlas and Synopsis of Family Medicine, 3rd Edition by Richard Usatine , Mindy Ann Smith , E.J. Mayeaux, Heidi Chumley, 1680 pages,/ 2018/ ISBN-10 : 1259862046 ISBN-13 : 978-1259862045 McGraw-Hill Education
4. Family Medicine: Ambulatory Care and Prevention, Sixth Edition (Lange Clinical Manuals) 6th Edition Mindy A. Smith, MD (East Lansing, MI), Leslie A. Shimp, PharmD, MS (Ann Arbor, MI), Sarina Schrager, MD, MS (Madison, WI) 1088 pages /2020/ ISBN-10: 0071820736 ISBN-13: 978-0071820738 McGraw-Hill Education
5. Textbook of Family Medicine 9th Edition by Robert E. Rakel MD , David Rakel MD ,1215 pages,/2015/, ISBN-13 : 978-0323239905 ISBN-10: 0323239900 Saunders; 9th Edition (March 6, 2020).

Electronic information resources:

1. Association of diabetologists of Ukraine <http://uda.in.ua/>
2. American Diabetes Association.
<https://www.diabetesjournals.org>http://care.diabetesjournals.org/content/41/Supplement_1/S1
3. European Association for the study of Diabetes. <https://www.easd.org>
4. Centers for Disease Control and Prevention <https://www.cdc.gov/>
5. NICE/The National Institute for Health and Care Excellence <https://www.nice.org.uk/>

Practical lesson № 10

Topic 10: Psychological aspects in the management of patients living with a chronic disease, namely diabetes.

Goal: Acquisition of knowledge by the learner regarding the psychological aspects of management of patients with type 1 and type 2 diabetes by a family doctor.

Basic concepts: Psychological prerequisites for the occurrence of diseases of the endocrine system, namely diabetes. Psychological characteristics of people with type 2 diabetes. Screening questionnaires on the "quality of life" of people with type 2 diabetes. Peculiarities of psychological management of patients with type 2 diabetes.

Equipment: multimedia projector.

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

—requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);

—questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

- 1) What mental disorders are most often registered in patients with diabetes?
- 2) Differences in mental disorders in patients with type 1 and type 2 diabetes?
- 3) Differences in mental disorders in patients with diabetes depending on age?
- 4) Cognitive changes in patients with type 1 and type 2 diabetes?
- 5) Prevention of mental disorders in patients with diabetes
- 6) Prevention of cognitive disorders in patients with diabetes

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):

—content of tasks (tasks, clinical situations, etc.);

Tasks:

Task 1. The patient is 61 years old, has been suffering from diabetes for 15 years, the average value of glycosylated hemoglobin is 8.0-8.2%. In the last few years, he notes a decrease in attention and memory. Relatives make similar complaints about the patient's health.

1. Diagnosis of the patient's condition
2. Treatment tactics

Task 2. A 31-year-old man has been suffering from diabetes for 5 years. Conscientiously fulfills the doctor's prescription. On average, glycosylated hemoglobin is 6.8-7.0%. At the last screening examination, it was found that the level of glycosylated hemoglobin was 7.6%. After that, the patient developed apathy, general weakness, daily affairs became a burden for the patient.

1. Diagnosis of the patient's condition
2. Treatment tactics

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	Definition of the term "Mental disorder"	Define the term	
2	What are the differences in mental disorders in patients with type 1 and type 2 diabetes	Give examples	
3	Are there differences in mental disorders in patients with diabetes depending on age?	Give examples	
4	What are the cognitive changes in patients with type 1 and type 2 diabetes?	Give examples	
5	Methods of prevention of mental and cognitive disorders in patients with diabetes	List methods of prevention and determine their meaning.	

—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information in case of use of ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;

- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

—control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

- 1) Buchberger B et al. Symptoms of depression and anxiety in youth with Type 1 diabetes: a systematic review and meta-analysis. *Psychoneuroendocrinol.* 2016;70:70-84. Lloyd CE et al.
- 2) Prevalence and correlates of depressive disorders in people with Type 2 diabetes: results from the International Prevalence and Treatment of Diabetes and Depression (INTERPRET-DD) study, a collaborative study carried out in 14 countries. *Diabetes Med.* 2018;35(6):760-9.
- 3) Chaturvedi SK et al. More anxious than depressed: prevalence and correlates in a 15-nation study of anxiety disorders in people with Type 2 diabetes mellitus. *General Psychiatry.* 2019;32(4).
- 4) Khalil M et al. The association between sleep and diabetes outcomes—a systematic review. *Diabetes Res Clin Pract.* 2020;161:108035.
- 5) Ogilvie RP, Patel SR. The epidemiology of sleep and diabetes. *Curr Diab Rep.* 2018;18(10):82.
- 6) Hagger Vet al. Diabetes distress is more strongly associated with HbA1c than depressive symptoms in adolescents with Type 1 diabetes: results from Diabetes MILES Youth—Australia. *Pediatric Diabetes.* 2018;19(4):840-7.
- 7) Tan ML et al. Factors associated with diabetes-related distress over time among patients with T2DIABETES in a tertiary hospital in Singapore. *BMC Endocr Disord.* 2017;17(1):36.
- 8) Aljuaid MO et al. Diabetes-related distress assessment among Type 2 diabetes patients. *J Diabetes Res.* 2018;7328128:1-10.
- 9) Biessels GJ, Despa F. Cognitive decline and dementia in diabetes mellitus: mechanisms and clinical implications. *Nature Rev Endocrinol.* 2018;14(10):591-604.
- 10) Pal K et al. Mild cognitive impairment and progression to dementia in people with diabetes, prediabetes and metabolic syndrome: a systematic review and meta-analysis. *Soc Psychiatry Psychiatr Epidemiol.* 2018;53(11):1149-60.

Practical lesson № 11

Topic 11: Basic principles of insulin therapy.

Goal: Acquisition of knowledge by the learner regarding the principles of insulin therapy, drug classification and treatment regimen.

Basic concepts: Characteristics of the main insulin preparations. Indications and contraindications for insulin therapy. Classification of insulin preparations of ultrashort, short, intermediate and long action, insulin analogs. Regime of insulin therapy.

Equipment: multimedia projector.

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

—requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);
—questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

1. Basic principles of insulin therapy
2. Characteristics of the main insulin preparations.
3. Indications for insulin therapy.
4. Contraindications to insulin therapy.
5. Classification of insulin preparations.
6. Insulin analogues.
7. Regime of insulin therapy.
8. General recommendations for patients on insulin therapy.

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):

—content of tasks (tasks, clinical situations, etc.);

Tasks:

Task 1. Patient K., 59 years old. Height 167 cm, body weight 69 kg. He has been suffering from diabetes for 10 years. The condition was compensated by diet and maninil 0.005 per day. During the last year, despite the increase in the dose of maninil to 0.015 per day and strict adherence to the diet, the patient's condition worsened. The level of glucose in fasting blood is 13.5 - 15.8 mmol/l, in urine - 2.5 - 3.0% with a diuresis of 3 l, the reaction of urine to acetone is negative.

1. Make a diagnosis (type of diabetes, degree of severity, state of compensation).
2. Prescribe and justify further therapy.

3. Pharmacokinetics of Monotard insulin. Write a prescription.

Task 2. Patient S., 39 years old. He has been suffering from diabetes for 9 years. He receives insulin Aktrapid NM 6 units and Protofan NM 28 units in the morning and 16 units of Protofan NM in the evening. At this dose of insulin, diabetes is compensated. However, in the first half of the day (13-14 hours), a hypoglycemic state occurs, which is eliminated by taking carbohydrate food.

1. Probable cause of hypoglycemia.
2. To which group of drugs are the insulins Aktrapid NM and Protofan NM their pharmacokinetics?
3. Name the complications of insulin therapy. Write a prescription.

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	Basic principles of insulin therapy	List the main principles of insulin therapy	
2	General characteristics of the main insulin preparations. Classification of insulin preparations.	Give a general description of the main insulin preparations and their classification.	
3	Indications and contraindications for insulin therapy.	What are the indications and contraindications for insulin therapy.	
4	Draw up a treatment plan for a patient who needs simultaneous use of hypoglycemic drugs and insulin therapy.	Give an example	
5	Draw up a treatment plan for a patient who needs insulin therapy.	Give an example	

—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

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—control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

Test tasks.

1. The mechanism of action of insulin is an increase in transmembrane transport such substances:
 - A. Albumins;
 - B. Globulins;
 - C. Calcium;
 - D. Glucose
 - E. sodium

2. The patient was diagnosed with type 1 diabetes for the first time. There is no ketoacidosis. What is the approximate daily dose of insulin he needs:
 - A. 0.5 units/kg/day;
 - B. 0.3 units/kg/day;
 - C. 1 unit/kg/day;
 - D. <40 units/kg/day;
 - E. >40 units/kg/day

3. In which of the listed conditions are diabetes patients indicated insulin treatment:
 - A. Diabetes mellitus with obesity was detected for the first time;
 - B. Ischemic heart disease due to diabetes;
 - C. Diabetes in old age;
 - D. Diabetic retinopathy;
 - E. Diabetic ketoacidosis

4. Insulin for daily use should be stored:
 - A. In the freezer;
 - B. In the refrigerator;
 - C. At human body temperature;
 - D. At a temperature of 18-25 C in a dark place;
 - E. At a temperature of 18-25 C on the window

5. A short-acting insulin preparation is:
 - A. Humodar K 25;
 - B. Humodar B;
 - C. Humodar R;
 - D. Protafan NM;
 - E. Humulin NRH

6. An insulin preparation of medium duration of action is:
 - A. Humodar R;
 - B. Humodar B;
 - C. Aktrapid NM;
 - D. Farmasulin H;
 - E. Novorapid

7. Ultra-short-acting insulin analogues are:
 - A. Humodar R;
 - B. Humodar B;
 - C. Protafan NM;
 - D. Lantus;

E. Novorapid

8. A 15-year-old boy with type 1 diabetes for 5 years is at an endocrinologist's appointment. Physical development corresponds to 10 years. When objective examination - hepatosplenomegaly. Laboratory indicators indicate decompensation of diabetes. What recommendation should the doctor give:

- A. To compensate for diabetes;
- B. Determine thyrotropin hormone;
- C. Determine bone age;
- D. Prescribe vitamin therapy;
- E. Improve nutrition

9. The patient, 33 years old, has been suffering from diabetes for 5 years. For the last 3 years he has been receiving more than 100 units of insulin per day. Body weight increased by 10 kg. Blood glucose fasting 13 mmol/l, in daily urine - 3%. Universal microangiopathy. What due to lack of diabetes compensation:

- A. Insulin resistance;
- B. Chronic insulin overdose syndrome;
- C. Insufficient dose of insulin;
- D. Progressive kidney damage;
- E. Allergic reaction to insulin

10. The patient, 62 years old, suffers from type 2 diabetes. Diabetes is compensated by diet and glibenclamide 5 mg 2 times a day. The patient should undergo an operation for an inguinal hernia. What should be the tactics of hypoglycemic therapy:

- A. Leave the previous treatment regimen;
- B. Cancel glibenclamide;
- C. Prescribe short-acting insulin preparations;
- D. Prescribe long-acting insulin;
- E. Replace glibenclamide with metformin

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

1. Essentials of Family Medicine, Philip D Sloane, Lisa M Slatt, Mark H Ebell, Louis B Jacques, Mindy A Smith/ 2017/ ISBN-10 / ASIN: 0781781884
ISBN-13 / EAN: 9780781781886 Lippincott Williams & Wilkins
2. Current Diagnosis & Treatment in Family Medicine Jeannette E. South-Paul, Samuel C. Matheny, Evelyn L. Lewis/2018/, ISBN: 0-07-151004-4 McGrawHill Medical.
3. The Color Atlas and Synopsis of Family Medicine, 3rd Edition by Richard Usatine , Mindy Ann Smith , E.J. Mayeaux, Heidi Chumley, 1680 pages,/ 2018/ ISBN-10 : 1259862046 ISBN-13 : 978-1259862045 McGraw-Hill Education

4. Family Medicine: Ambulatory Care and Prevention, Sixth Edition (Lange Clinical Manuals) 6th Edition Mindy A. Smith, MD (East Lansing, MI), Leslie A. Shimp, PharmD, MS (Ann Arbor, MI), Sarina Schragar, MD, MS (Madison, WI) 1088 pages /2020/ ISBN-10: 0071820736 ISBN-13: 978-0071820738 McGraw-Hill Education
5. Textbook of Family Medicine 9th Edition by Robert E. Rakel MD , David Rakel MD ,1215 pages,/2015/, ISBN-13 : 978-0323239905 ISBN-10: 0323239900 Saunders; 9th Edition (March 6, 2020).
6. Guideline 00488. Treatment and monitoring of type 2 diabetes [Electronic resource] / Hannele Yki-Järvinen. – 2017. – Mode of access to the resource:<https://guidelines.moz.gov.ua/documents/3325>
7. Guideline 00491. Insulin therapy in type 2 diabetes [Electronic resource] / Hannele Yki-Järvinen – 2018. – Mode of access to the resource:<https://guidelines.moz.gov.ua/documents/3328>

Practical lesson № 12

Topic 12: General rules of insulin therapy.

Goal: Acquisition of knowledge by the learner regarding the start of insulin therapy in patients with type 2 diabetes. Insulin injection techniques. Rules for selection and correction of insulin doses.

Basic concepts: Principles of starting insulin therapy. Insulin injection technique. Typical errors of insulin therapy. Choosing the right dose of insulin. Rules for correction of insulin dose. Schemes of titration of different insulins in type 2 diabetes.

Equipment: multimedia projector.

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):
 - requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);
 - questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

1. Principles of starting insulin therapy.
2. Technique of insulin injections. Insulin injection sites.
3. Schemes of insulin therapy.
4. General recommendations for drug therapy of type 2 diabetes.
5. Typical errors of insulin therapy and ways to solve and prevent them.
6. Selection of insulin dose.
8. Rules for adjusting the dose of short insulin.
9. Correction of the dose of short insulin in case of acetonuria.
10. Rules for adjusting the dose of long-acting insulin.
11. Schemes of titration of different insulins in type 2 diabetes.

12. The "morning dawn" phenomenon. Mechanism of occurrence.
13. Correction of the "morning dawn" phenomenon.

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):
—content of tasks (tasks, clinical situations, etc.);

Tasks:

Task 1. Patient A., 46 years old, has been suffering from diabetes for 18 years. Height - 172 cm, body weight - 64 kg. He is treated with Humodar B insulin at a dose of 20 units in the morning and 14 units in the evening. Follows a diet. Research results: fasting blood glucose - 9.6 mmol/l. Glucosuric profile: 8-14 hours. 0.5 l - 2% glucose, 2-7 p.m. - 0.75 l - 1.5%, 7-11 p.m. - 0.5 l - 0.2%, 23-8 hours. - 0.6 l - 0.5% glucose.

1. Diagnosis (type of diabetes, state of compensation).
2. Determine whether it is possible to replace insulin with hypoglycemic drugs with sulfonylurea derivatives.
3. Indicate whether the patient needs to increase Humodar B, if so, at what time and approximate additional dose. What should be done to reduce fasting blood glucose?
4. Determine whether it is possible to prescribe biguanides in addition to insulin. Justify the answer.
5. Indicate whether the patient needs to be prescribed potassium preparations or products that are rich in potassium? Justify the answer.
6. Criteria for full compensation of carbohydrate metabolism.
7. Beginning and duration of action of Insulin B, Humodaru B, Aktrapide NM, Ultralente NM. Write prescriptions for the indicated insulins.

Task 2. Patient L., 39 years old. He has been suffering from diabetes for a month. The patient was prescribed insulin therapy: 6 units of Aktrapid NM and 18 units of Protofan NM in the morning, 4 units of Actrapid NM and 10 units of Protofan NM in the evening. A few days later, the patient turned to the doctor with complaints of periodically occurring weakness, sweating, hand tremors, and a feeling of numbness of the tongue. This condition occurs when the patient does not eat for a long time, and is eliminated after eating.

1. What are the patient's complaints related to?
2. Determine whether a correction of the insulin dose or its replacement with another drug is required.
3. Specify the onset and duration of action of insulin Aktrapid NM and Protofan NM.

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	General principles of starting insulin therapy	What are the general principles of starting insulin therapy?	
2	Schemes of insulin therapy	Give examples	

3	Insulin titration schemes for type 2 diabetes.	Give examples	
4	Typical errors of insulin therapy	What are the ways to prevent mistakes during insulin therapy? Achieving compensation for type 2 diabetes.	
5	The "morning dawn" phenomenon.	Mechanism of occurrence. Correction of the "morning dawn" phenomenon.	

—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information in case of use of ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

—control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

Test tasks.

1. A 10-year-old boy came to the hospital with complaints of polyuria, polydipsia, and a 25% weight loss over the past 3 months. During the examination, glycemia was found to be 16 mmol/l, acetone in the urine (+++). Diabetes was diagnosed for the first time. What should be the prescribed daily dose of insulin?

- A. 2 units/kg.
- B. 0.25 units/kg.
- C. 0.1 IU/kg per hour.
- D. 0.5 units/kg.
- E. 1 unit/kg.

2. Patient N., 24 years old, suffers from type 1 diabetes and is treated with insulin prolonged action. Fluctuations in glucose level during the day from 15.2 mmol/l to 22.0 mmol/l, fasting – 16.0 mmol/l. Your treatment tactics:

- A. Add sulfonylurea drugs;
- B. Add biguanides;
- C. Replace long-acting insulin with a drug from another manufacturer;
- D. Increase the daily dose of long-acting insulin;
- E. Add short-acting insulin before each meal;

3. A 22-year-old patient was diagnosed with diabetes for the first time after suffering the flu. Fasting glycemia - 15.2 mmol/l; glucosuria - 2.5 g/l; glycosylated hemoglobin - 10%. What treatment should be prescribed?

- A. Thiazolidinediones.
- B. Acarbose.
- C. Biguanides.
- D. Sulfonylurea derivatives of the II generation.
- E. Insulin therapy.

4. The child is 6 years old. The mother notes that the boy has been going to the toilet several times at night for the last 2 weeks, drinks a lot of water, has lost weight, and periodically complains of stomach pain. On examination: the skin is pale, dry, peeling on the soles, blush on the cheeks. Lips and tongue are bright red, dry. Internal organs without features. The smell of acetone from the mouth. Glycemia - 12 mmol/l. Diagnosed: diabetes mellitus. What therapy is most appropriate in the near future?

- A. Simple insulin.
- B. Diet therapy.
- C. Biguanides.
- D. Long-acting insulin.
- E. Insulin of medium duration.

5. A 9-year-old boy has diabetes for the first year. Receives insulin (humulin R, HNP) at the rate of 0.4 Units/kg of body weight per day. Insulin is injected under the skin of the arm with a pen. What measures should be taken to prevent lipodystrophy?

- A. Limit fats in the child's diet.
- B. Change the place of insulin injection.
- C. Reduce the dose of insulin.
- D. Periodically switch to another type of insulin.
- E. Prescribe antioxidants.

6. The patient is 46 years old. He has been suffering from diabetes for 9 years, receives Monotard insulin 26 units. in the morning and 6 p.m. Tonight. Complaints of weakness, lethargy in the morning after sleep, headache, 60 perspiration at night. Objectively: pulse 72 per minute, blood pressure - 125/70 mm Hg. The limits of the heart are normal. Liver +4 cm. Blood sugar: 8.00 - 14 mmol/l; 12.00 - 9 mmol/l; 17.00 - 11 mmol/l. Urine sugar in the range of 0.5-1%. What are the complaints most likely related to?

- A. Excess dose of insulin in the evening
- B. Insufficient evening dose of insulin
- C. Presence of hepatosis
- D. Climacteric syndrome
- E. Insufficient dose of insulin in the morning

7. A 16-year-old patient has been suffering from type I diabetes mellitus of medium severity since the age of 6. There are no complications of diabetes. Receives in the morning - 6 units. "Actropide" and 20 units. "Monotard", and in the evening - 4 units of "Actropid" and 12 units. "Monotard". Objectively: height - 179 cm, weight - 80 kg. Fasting glycemic profile - 7.6 mmol/l, 13.00 - 8.6 mmol/l, 18.30 - 9 mmol/l, 22.00 - 7.2 mmol/l. Diuresis - 1.7 l. Glucosuria - 5 g/l, portion - 300 ml, 0.5% sugar. What are the tactics of further treatment?

- A. Leave the dose of drugs unchanged
- B. Increase the dose of "Monotard" in the morning
- C. Increase the dose of "Monotard" in the evening
- D. Increase the dose of insulin "Actropid" in the morning and in the evening
- E. Additionally, inject short-acting insulin at lunch

8. The patient injects insulin into the lateral surfaces of the shoulders, abdomen, and thighs. It feels most comfortable when the drug is injected into the stomach. What can this be due to?
- The speed of insulin absorption
 - The convenience of injecting insulin into the stomach
 - Fewer nerve receptors
 - Self-suggestion
 - Availability of injections
9. A 35-year-old man suffers from chronic insulin-dependent diabetes cholecystitis. Receives Lente insulin 20 units in the morning, 12 units in the evening. After eating, pain appeared in the right hypochondrium, nausea, vomiting, drowsiness, increased polyuria. Which pre-medical care will most reliably prevent the development of a critical condition within the next few hours?
- Changing the regimen of insulin therapy
 - Use of painkillers
 - Use of cholagogues
 - Exclusion of fats from food
 - Reducing carbohydrates in food
10. The patient is 13 years old. He became acutely ill. Thirst, polyuria, weakness, lost 4 kg in 2 weeks. Objectively: the general condition is satisfactory, there is no smell of acetone. The level of glucose in the fasting blood is 32 mmol/l, in the urine 6%, acetone +. Your tactics?
- Short-acting insulin
 - Long-acting insulins
 - Biguanides
 - Sulfonylurea drugs
 - Diet

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

- Essentials of Family Medicine, Philip D Sloane, Lisa M Slatt, Mark H Ebell, Louis B Jacques, Mindy A Smith/ 2017/ ISBN-10 / ASIN: 0781781884
ISBN-13 / EAN: 9780781781886 Lippincott Williams & Wilkins
- Current Diagnosis & Treatment in Family Medicine Jeannette E. South-Paul, Samuel C. Matheny, Evelyn L. Lewis/2018/, ISBN: 0-07-151004-4 McGrawHill Medical.
- The Color Atlas and Synopsis of Family Medicine, 3rd Edition by Richard Usatine , Mindy Ann Smith , E.J. Mayeaux, Heidi Chumley, 1680 pages,/ 2018/ ISBN-10 : 1259862046 ISBN-13 : 978-1259862045 McGraw-Hill Education

4. Family Medicine: Ambulatory Care and Prevention, Sixth Edition (Lange Clinical Manuals) 6th Edition Mindy A. Smith, MD (East Lansing, MI),

Leslie A. Shimp, PharmD, MS (Ann Arbor, MI), Sarina Schrager, MD, MS (Madison, WI) 1088 pages /2020/ ISBN-10: 0071820736 ISBN-13: 978-0071820738 McGraw-Hill Education

5. Textbook of Family Medicine 9th Edition by Robert E. Rakel MD , David Rakel MD ,1215 pages,/2015/, ISBN-13 : 978-0323239905 ISBN-10: 0323239900 Saunders; 9th Edition (March 6, 2020).

Practical lesson № 13

Topic 13: Complications of insulin therapy.

Goal: Acquiring knowledge about the main complications of insulin therapy and their prevention.

Basic concepts: Complications of insulin therapy: hypoglycemic states, insulin allergy, post-injection lipodystrophy, insulin resistance, chronic insulin overdose (Somoji syndrome), insulin edema and their prevention.

Equipment: multimedia projector.

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

—requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);
—questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

1. Signs of chronic insulin overdose
2. Hypoglycemia. Mechanism of development.
3. Degrees of severity of hypoglycemia.
4. Treatment of hypoglycemia.
5. Consequences of hypoglycemia.
6. The Somozhda phenomenon. Mechanism of development. Clinical and laboratory manifestations, methods of correction.
7. Treatment of the Somozhda phenomenon.
8. Insulin resistance. Mechanism of development.
9. Treatment of insulin resistance.
10. Allergic reactions to insulin. Mechanism of development.
11. Treatment of allergic reactions to insulin.

12. Prevention of immune reactions to insulin.
13. Post-injection insulin lipodystrophy. Pathogenesis.
14. Treatment of insulin lipodystrophy.
15. Prevention of insulin lipodystrophy.
16. Insulin edema. Mechanism of development.
17. Treatment of insulin edema.
18. The risk associated with the repeated use of disposable needles.

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):

—content of tasks (tasks, clinical situations, etc.);

Tasks:

Problem 1. Patient P., 30 years old. He has been suffering from diabetes for 8 years. He receives insulin Humodar R 6 units and Humodar B 18 units in the morning, Humodar R 4 units and Humodar B 12 units in the evening. Complains of moderate dry mouth and increased urination after dinner. Good sleep at night. Additional studies. Glycemic profile: 8 hours. - 7.9 mmol/l, 2 p.m. - 11 mmol/l, 6 p.m. - 12 mmol/l, 9 p.m. - 12 mmol/l. Urine glucose (night portion) - 0.5%, urine reaction to acetone - negative.

1. Make a diagnosis.
2. Determine the survey plan.
3. Assign treatment to the patient.
4. Which of the listed conditions can be a complication of insulin therapy (hypoglycemia, insulin resistance, anemia, lipodystrophy, Somoji syndrome)?

Task 2. Patient D., 25 years old. He has been suffering from diabetes for 6 years. Takes insulin Protofan NM 24 units in the morning and 14 units in the evening. Complains of thirst, more during the day, increased fatigue and weakness. Additional studies. Glucosuric profile: 8-14 hours 1.5 l - 2% glucose; 2-7 p.m. - 1.0 l - 0.5%; 7-11 p.m. 1.0 l - 2%; 23-8 hours - 0.7 l - 0.5% glucose. Fasting glycemia is 9 mmol/l. Urine reaction to acetone is negative.

1. Make a diagnosis.
2. Determine the survey plan.
3. Assign treatment to the patient.
4. Name the signs of chronic insulin overdose (labile course of diabetes, acetonuria without high glycemia, increased appetite, decreased work capacity, increased body weight).

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	Hypoglycemia with insulin overdose.	Clinical symptoms of hypoglycemia.	

2	Is it possible to reuse the same needle when injecting insulin.	Explain the reason. Consequences of such use.	
3	Allergic reactions to insulin.	What can be allergic reactions, symptoms.	
4	Somoji syndrome, mechanism of occurrence,	Clinical symptoms.	
5	Prevention of complications of insulin therapy.	Methods of preventing complications of insulin therapy.	

—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information in case of use of ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

—control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

Test tasks.

1. A nurse teaches patient M., 42 years old, to make insulin injections on his own. Prevention of which complication of insulin therapy involves changing the injection site?

- A. Tissue necrosis
- B. Soft tissue infection
- C. Allergic reaction
- D. Drug embolism
- E. Lipodystrophies

2. A nurse conducts training with a patient with diabetes. She explains to him the technique of injecting insulin with an insulin syringe and a needle 1.5 cm long. At what angle should the needle be inserted?

- A. 45 °
- B. 60 °
- C. 50 °
- Д. 90 °
- E. 35 °

3. Patient V., 56 years old, with type 2 diabetes mellitus, constantly injects insulin into his right thigh. What potential complication does it provoke?

- A. Lipodystrophies
- B. Tissue necrosis
- C. Infiltrate
- D. Thrombophlebitis
- E. Allergic reaction

4. In a patient with insulin-dependent diabetes mellitus, there is a disappearance of subcutaneous fat on the outer surface of the left shoulder. What is this complication?

- A. Necrosis
- B. Fat embolism
- C. Lipodystrophy
- D. Hematoma
- E. Pyrogenic reaction

5. A patient with diabetes is prescribed insulin in the amount of 20 IU (1 ml of insulin = 100 IU). What amount of insulin (in ml) should be drawn into a syringe with a capacity of 1 ml or 2 ml?

- A. 0.2 ml
- B. 0.3 ml
- C. 0.4 ml
- D. 0.5 ml
- E. 0.6 ml

6. A 15-year-old boy has been suffering from diabetes for the second year. Objectively: the tongue is dry. Manifestations of cheilitis in the corner of the mouth. Diabetic blush. Liver +4cm, soft. Fasting glycemia is 12.3 mmol/l. glucosuria 25 g/l. Increased levels of cholesterol and triglycerides in the plasma. For the prevention of diabetic lesions

- A. Achieve stable normoglycemia
- B. Prescribe angioprotective agents
- C. Prescribe vitamins A, E, C
- D. Prescribe aldose reductase inhibitors
- E. Prescribe hypolipidemic agents

7. A 17-year-old boy receives insulin due to diabetes: before breakfast and dinner - short-acting and long-acting, before lunch - short-acting. Sleep is restless, in the morning - weakness, headache. Glycemia: 8-00 – 10.1 mmol/l, 12-00 – 6.6 mmol/l, 17-00 – 4.3 mmol/l, 21-00 – 3.7 mmol/l. Acetone + in the morning portion of urine. What is associated with the appearance of acetonuria?

- A. Overdose of long-acting insulin before dinner
- B. An insufficient dose of long-acting insulin before dinner
- C. Insufficient dose of long-acting insulin before breakfast
- D. An overdose of short-acting insulin before dinner
- E. Insufficient daily dose of long-acting insulin

8. A patient with insulin-dependent type of diabetes receives insulin —Protafan 32 units before breakfast and 16 units before dinner. The last glycemic profile: 8 hours - 7.5; 1 p.m. - 12.0; 6 p.m. - 14.2; 9 p.m. - 16.0; 3 h -- 9.0 (mmol/l). Your actions to prevent further decompensation of carbohydrate metabolism.

- A. Change the dose of insulin - Protafan by 36 units in the morning and 20 units in the evening
- B. Reduce the amount of carbohydrates for the evening
- C. Transfer the patient to another insulin
- D. Reduce the amount of carbohydrates at lunch
- E. Change the dose of insulin —Protafan by 30 units in the morning and 12 units in the evening.

9. The child is 6 years old. The mother notes that for the last 2 weeks the child has been going to the toilet several times at night, drinks a lot of water, has lost weight, and periodically complains of stomach pain. On examination, the skin is pale, dry, peeling on the soles, blush on the cheeks. Lips and tongue are bright red, dry. Internal organs without features. The smell of acetone from the mouth. Glycemia is 12 mmol/l. Diagnosed: diabetes mellitus. What therapy is most appropriate in the near future?

- A. Simple insulin
- B. Diet therapy.
- C. Biguanides.
- D. Long-acting insulin.
- E. Insulin of medium action.

10. The child is 7 years old. Since the age of 2, he has been diagnosed with diabetes and receives regular insulin therapy. In the morning after the insulin injection, the child did not eat anything until 1:00 p.m. At 3:00 p.m., the child developed a cold sweat, paleness, tremors of the tongue and hands. What causes this condition?

- A. Hypoglycemia
- B. Hyperglycemia
- C. Thyrotoxicosis
- D. Hypoxia
- E. Hypercalcemia

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

1. Essentials of Family Medicine, Philip D Sloane, Lisa M Slatt, Mark H Ebell, Louis B Jacques, Mindy A Smith/ 2017/ ISBN-10 / ASIN: 0781781884 ISBN-13 / EAN: 9780781781886 Lippincott Williams & Wilkins
2. Current Diagnosis & Treatment in Family Medicine Jeannette E. South-Paul, Samuel C. Matheny, Evelyn L. Lewis/2018/, ISBN: 0-07-151004-4 McGrawHill Medical.
3. The Color Atlas and Synopsis of Family Medicine, 3rd Edition by Richard Usatine, Mindy Ann Smith, E.J. Mayeaux, Heidi Chumley, 1680 pages,/ 2018/ ISBN-10 : 1259862046 ISBN-13 : 978-1259862045 McGraw-Hill Education
4. Family Medicine: Ambulatory Care and Prevention, Sixth Edition (Lange Clinical Manuals) 6th Edition Mindy A. Smith, MD (East Lansing, MI), Leslie A. Shimp, PharmD, MS (Ann Arbor, MI), Sarina Schrage, MD, MS (Madison, WI) 1088 pages /2020/ ISBN-10: 0071820736 ISBN-13: 978-0071820738 McGraw-Hill Education
5. Textbook of Family Medicine 9th Edition by Robert E. Rakel MD, David Rakel MD, 1215 pages,/2015/, ISBN-13 : 978-0323239905 ISBN-10: 0323239900 Saunders; 9th Edition (March 6, 2020).

Practical lesson № 14

Topic 14: Modern devices for insulin therapy.

Goal: Acquisition of knowledge by the learner regarding modern methods of insulin administration.

Basic concepts: Devices for introducing insulin. Rules of their use. Insulin pump: advantages and disadvantages. Rules of use. Devices for monitoring glycemia. Rules for prescribing insulin by a family doctor.

Equipment:multimedia projector.

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

—requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);
—questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

1. Modern insulin injection devices.
2. Insulin pump. General characteristics.
3. Rules for using an insulin pump.
4. Advantages of using an insulin pump over classical insulin therapy.
5. Indications and contraindications for prescribing pump insulin therapy.
6. Modern devices for monitoring the blood glucose level. Indications for their use.
7. Glucometer. General characteristics.
8. Blood glucose monitoring systems.
9. Inhalation route of insulin administration.
10. What research should be conducted on the patient before using inhaled insulin?

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):

—content of tasks (tasks, clinical situations, etc.);

Tasks:

Task 1. A 58-year-old patient has been suffering from type II diabetes for 3 years. Followed a diet, regularly took glibenclamide. Delivered urgently with acute abdomen clinic. Objectively: increased nutrition, dry skin. In the lungs - vesicular breathing. Heart sounds are rhythmic, 90/min. Blood pressure - 130/70 mm Hg. The stomach is "board-shaped". Blood sugar - 9.8 mmol/l. Laparotomy is indicated for the patient.

1. Your previous diagnosis.

2. Make a plan for additional examination to confirm the diagnosis.

3. How should the treatment of diabetes be continued?

Task 2. A 52-year-old man has been suffering from diabetes for 18 years. A year ago, he had cystitis. Takes maninil 0.005 -3 times a day. Objectively: height - 176 cm, weight - 82 kg. Fluctuations in fasting glycemia -10.3-12.4 mmol/l. Detected proteinuria - 0.033 g/l.

1. What complication could develop in the patient?

2. Make a plan for additional examination of the patient.

3. What is most appropriate for the prevention of complications?

4. Are there indications for switching to another method of insulin administration?

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	Modern devices for injecting insulin.	What modern devices do you know? Principle of operation.	
2	Insulin pump: advantages and disadvantages. Rules of use	The principle of the insulin pump. Its advantages, indications for use.	
3	Modern devices for monitoring the blood glucose level. Indications for their use.	Give examples. Indications for use.	
	Inhalation route of insulin administration.	Indications for use. Contraindication.	
4	Assess the need for an insulin pump in a 72-year-old patient who requires insulin therapy and has grade 2 dyscirculatory encephalopathy.	Solving the clinical situation	
5	Assess the need for an insulin pump in a 56-year-old patient who requires insulin therapy, has grade 2 obesity and intermittent hypoglycemia and hyperglycemia due to poor adherence to the diet.	Solving the clinical situation	

—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information in case of use of ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

—control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

Test tasks.

1. Possible routes of insulin administration, except for:
 - A. Insulin syringe
 - B. Oral
 - C. Syringe pen
 - D. Insulin pump
 - E. Inhalant

2. The insulin pump is intended for the use of the following insulin preparations, except:
 - A. long-acting insulin
 - B. short-acting insulin
 - C. ultrashort-acting insulin
 - D. all answers are incorrect
 - E. all answers are correct

3. An insulin pump delivers one type of insulin in the following ways, except:
 - A. Bolusly
 - B. Continuously
 - C. Orally
 - D. all answers are incorrect
 - E. all answers are correct

4. There are the following forms of bolus, except:
 - A. Standard bolus
 - B. Super bolus
 - C. Extra bolus
 - D. Square bolus
 - E. Double bolus

5. Factors that can change the need for insulin and require correction of the basal dose, except:
 - A. Weight gain or loss
 - B. Emotional state of the patient
 - C. Drug therapy affecting insulin sensitivity
 - D. Changes in eating, sleeping, or exercise routines
 - E. Deterioration of control over hyperglycemia

6. The patient injects insulin into the lateral surfaces of the shoulders, abdomen, and thighs. It feels most comfortable when the drug is injected into the stomach. What can this be due to?
 - A. Self-suggestion
 - B. The speed of insulin absorption
 - C. The convenience of injecting insulin into the stomach
 - D. Fewer nerve receptors
 - E. Availability of injections

7. A 56-year-old patient has non-insulin-dependent diabetes. The disease is compensated by diet and glurenorm. The patient is waiting for an operation for panarritium. Tactics of hypoglycemic therapy?
 - A. Do not change therapy
 - B. Cancel glurenorm
 - C. Prescribe monocomponent insulin

- D. Prescribe recombinant insulin
- E. Assign maninil

8. A 58-year-old patient has been suffering from type II diabetes for 3 years. Followed a diet, regularly took glibenclamide. Delivered urgently from the acute abdomen clinic. Objectively: increased nutrition, dry skin. In the lungs - vesicular breathing. Heart sounds are rhythmic, 90/min. Blood pressure - 130/70 mm Hg. The stomach is "board-shaped". Blood sugar - 9.8 mmol/l. Laparotomy is indicated for the patient. How is it advisable to continue the treatment of diabetes?

- A. Continue taking glibenclamide
- B. Semilong - in the morning, and insulin in the afternoon and evening
- C. Ilyurenorm 1 t. 3 times a day
- D. Transfer the patient to simple insulin
- E. Maninil 1 t. 3 times a day

9. A 52-year-old man has been suffering from diabetes for 18 years. A year ago, he had cystitis. Takes maninil 0.005 -3 times a day. Objectively: height - 176 cm, weight - 82 kg. Fluctuations in fasting glycemia -10.3-12.4 mmol/l. Detected proteinuria - 0.033 g/l. To prevent the progression of diabetic nephropathy, it is most appropriate to:

- A. Replace maninil with insulin
- B. Increase the dose of Maninil
- C. Reduce the daily caloric intake of food
- D. Add insulin therapy
- E. Prescribe antibacterial therapy

10. A 9-year-old boy has been suffering from diabetes for the first year. Receives insulin (humulin R, NPH) at the rate of 0.4 units/kg of body weight per day. Insulin is injected under the skin of the arm with a pen. What measures should be taken to prevent lipodystrophy?

- A. Limit fats in the child's diet
- B. Reduce the dose of insulin
- C. Change the place of insulin injection
- D. Periodically switch to another type of insulin
- E. Prescribe antioxidants

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

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Practical lesson №15

Topic 15: Myths related to insulin.

Goal: Learning by the learner about prejudices about insulin therapy.

Basic concepts: Myths and phobias that arise in patients at the beginning of insulin treatment. Methods of their debunking by a family doctor.

Equipment: multimedia projector.

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, the purpose of the lesson, motivation of applicants to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

—requirements for theoretical readiness of applicants to perform practical classes (knowledge requirements, list of didactic units);
 —questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

Question:

1. What myths about the use of insulin do you know?
2. Methods of helping patients cope with the fear of using insulin.
3. Can insulin cause addiction?
4. Can insulin cause blindness, kidney failure, or death?
5. Is it possible to prescribe insulin to overweight and obese patients?
6. Is it true that patients on insulin therapy can eat whatever they want without following a proper diet?
7. Can pregnant women be prescribed insulin?
8. Rules that will help reduce painful sensations from insulin injection.
9. Can diabetes be completely cured?

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):
—content of tasks (tasks, clinical situations, etc.);

Tasks:

Task 1. Conduct a conversation with patients who have been prescribed insulin for the first time.

1. What fears did patients have regarding the use of insulin?
2. How do you plan to help patients cope with their fears?

Task 2. Patient K. is 48 years old and has been suffering from diabetes for 8 years. BMI - 31.5 kg/m². He is treated with Humodar B insulin at a dose of 20 units in the morning and 14 units in the evening. Currently, he is scheduled for a cholecystectomy.

1. Should the patient be withdrawn from insulin and transferred to hypoglycemic therapy? Argue your opinion.

—recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.)

No	Main tasks	Instructions	Answers
1	Myths and fears of insulin therapy.	What existing myths and fears do you know?	
2	Rules of communication with a patient who needs insulin therapy.	Give examples	
3	Ways to debunk myths about insulin therapy by a family doctor.	Methods of helping patients cope with the fear of using insulin	

—Requirements for work results, including to registration: in the case of independent preparation for a practical lesson, an indicative card for a practical lesson is filled out.

Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information in case of use of ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

—control materials for the final stage of the lesson: assignments, tasks, tests, etc. (if necessary).

Test tasks.

1. A 45-year-old man with normal body weight was diagnosed with diabetes for the first time. It was not possible to correct blood glucose with the help of diet, glycemia during the day from 10 to 15 mmol/l. What drug is optimal in this case?
- Sulfanilamide hypoglycemic drugs
 - Insulin
 - Biguanides
 - Biguanides in combination with sulfonamide hypoglycemic drugs
 - Insulin in combination with sulfonamide hypoglycemic drugs
2. A 46-year-old patient has been suffering from diabetes for 9 years and receives Monotard insulin 26 units. in the morning and 6 p.m. Tonight. Complaints of weakness, lethargy in the morning after sleep, headache, sweating at night. Objectively: pulse - 72/min., blood pressure - 125/70 mm Hg. The limits of the heart are normal. Liver +4 cm. Blood sugar: 8:00 - 14 mmol/l, 12:00 -9 mmol/l, 17:00 - 11 mmol/l. Urine sugar in the range of 0.5-1%. What is the most likely cause of the patient's complaints at night?
- Insufficient evening dose of insulin
 - Excess dose of insulin in the evening
 - Presence of hepatosis
 - Climacteric syndrome
 - Insufficient dose of insulin in the morning
3. A 63-year-old patient suffers from type 2 diabetes. He receives glibenclamide at a dose of 15 mg per day and metformin at 1000 mg per day. After physical exertion, I felt weakness, dizziness, shortness of breath, slight pain in the heart area. Blood pressure 70/30 mm Hg. Pulse 110 per minute. According to the ECG: dome-shaped elevation of the ST segment, depression of the ST segment in the reciprocal zone, appearance of the QS wave. The patient was hospitalized in the heart attack department. What hypoglycemic therapy is necessary for the patient?
- Discontinue glibenclamide
 - Transfer to insulin therapy
 - Leave previous therapy
 - Discontinue metformin
 - Discontinue metformin and glibenclamide, prescribe gliclazide
4. The patient is 13 years old. I was very sick. Thirst, polyuria, weakness, lost 4 kg in 2 weeks. Objectively: the general condition is satisfactory, there is no smell of acetone. Glucose level: fasting blood - 32 mmol/l, urine - 6%, acetone (+). Your tactics?
- Diet therapy
 - Appointment of sugar-lowering herbs
 - Purpose of biguanides
 - Purpose of sulfonylurea derivatives
 - Appointment of insulin therapy
5. A 46-year-old patient has been suffering from diabetes for 9 years and receives Monotard insulin 26 units. in the morning and 6 p.m. Tonight. Complaints of weakness, lethargy in the morning after sleep, headache, sweating at night. Objectively: pulse - 72/min., blood pressure - 125/70 mm Hg. The limits of the heart are normal. Liver +4 cm. Blood sugar: 8:00 - 14 mmol/l, 12:00 -9 mmol/l, 17:00 - 11 mmol/l. Urine sugar in the range of 0.5-1%. What is the most likely cause of the patient's complaints at night?
- Insufficient dose of insulin in the morning
 - Insufficient evening dose of insulin

- C. Presence of hepatosis
- D. Climacteric syndrome
- E. Excess dose of insulin in the evening

6. A 36-year-old patient complains of headache, weakness, loss of appetite, thirst, swelling of the face and legs. From the age of 18, he receives 42-54 units of insulin per day for diabetes. The condition is difficult. The face is gray, puffy, swelling on the legs. BP = 210/110 mm Hg. st., pulse 110/min, rhythmic. Heart, lungs - without features. Liver along the edge of the costal arch. Glycemic profile: 9-12-10 mmol/l. An. urine: relative density 1022, sugar 3%, protein - 1.32 g/l, leuk. - 3-5 in p/z. There is little urine. What complication developed in the patient?

- A. Kidney amyloidosis.
- B. Diabetic glomerulosclerosis
- C. Chronic pyelonephritis
- D. Nephrotic syndrome
- E. Glomerulonephritis

7. When transferring a patient treated with pig insulin to a human dose the last:

- A. Remains preliminary;
- B. Increases;
- C. It is decreasing

8. A 16-year-old patient has been suffering from type 1 diabetes of moderate severity since the age of 6. There are no complications. He receives 6 units of "Actrapid" insulin and 20 units of "Monotard" in the morning, 4 units of "Actrapid" and 12 units of "Monotard" in the evening. Height - 179 cm, body weight - 80 kg. Glycemic profile: fasting 7.6 mmol/l; 13.00 - 8.6 mmol/l; 18.30 - 9 mmol/l; 22.00 - 7.2 mmol/l. Diuresis - 1.7 l. Glucosuria - 5 g/l, portion - 300 ml, sugar - 0.5%. What are the tactics of further treatment?

- A. Increase the dose of "Monotard" in the evening.
- B. Increase the dose of "Monotard" in the morning.
- C. Additionally, inject short-acting insulin at lunch.
- D. Leave the dose unchanged.
- E. Increase the dose of "Actrapid" in the morning and in the evening.

9. A patient with insulin-dependent type of diabetes receives insulin "Protafan" 32 units before breakfast and 16 units before dinner. The last glycemic profile: 8.00 - 7.5 mmol/l, 13.00 - 12.0 mmol/l, 18.00 - 14.2 mmol/l, 21.00. - 16.0 mmol/l, 3.00 - 9.0 mmol/l. What actions of the doctor are appropriate in the prevention of further decompensation of carbohydrate metabolism?

- A. Change the dose of "Protafan" insulin in the morning by 30 units, and in the evening by 12 units.
- B. Reduce the amount of carbohydrates at dinner.
- C. Reduce the amount of carbohydrates at lunch.
- D. Change the dose of Protafan insulin to 36 units in the morning and 20 units in the evening.
- E. Transfer the patient to other insulins.

10. The patient has insulin-dependent diabetes mellitus and is treated with long-acting insulin. Fluctuations in glucose level during the day - 15.2-22.0 mmol/l, fasting - 28.6 mmol/l. What is the further treatment strategy?

- A. Sulfonylurea drugs.

- B. Biguanides.
- C. Long-acting insulins.
- D. Diet.
- E. Short-acting insulins

4. Summing up:

- checking and discussing the answers of higher education applicants
- control of the level of professional skills and abilities
- evaluation of each answer, setting of grades
- answer to possible questions
- task for the next class

5. List of recommended literature (main, additional, electronic information resources):

Main:

1. Essentials of Family Medicine, Philip D Sloane, Lisa M Slatt, Mark H Ebell, Louis B Jacques, Mindy A Smith/ 2017/ ISBN-10 / ASIN: 0781781884
ISBN-13 / EAN: 9780781781886 Lippincott Williams & Wilkins
2. Current Diagnosis & Treatment in Family Medicine Jeannette E. South-Paul, Samuel C. Matheny, Evelyn L. Lewis/2018/, ISBN: 0-07-151004-4 McGrawHill Medical.
3. The Color Atlas and Synopsis of Family Medicine, 3rd Edition by Richard Usatine , Mindy Ann Smith , E.J. Mayeaux, Heidi Chumley, 1680 pages,/ 2018/ ISBN-10 : 1259862046 ISBN-13 : 978-1259862045 McGraw-Hill Education
4. Family Medicine: Ambulatory Care and Prevention, Sixth Edition (Lange Clinical Manuals) 6th Edition Mindy A. Smith, MD (East Lansing, MI), Leslie A. Shimp, PharmD, MS (Ann Arbor, MI), Sarina Schrage, MD, MS (Madison, WI) 1088 pages /2020/ ISBN-10: 0071820736 ISBN-13: 978-0071820738 McGraw-Hill Education
5. Textbook of Family Medicine 9th Edition by Robert E. Rakel MD , David Rakel MD ,1215 pages,/2015/, ISBN-13 : 978-0323239905 ISBN-10: 0323239900 Saunders; 9th Edition (March 6, 2020).