

**MINISTRY OF HEALTH PROTECTION OF UKRAINE  
ODESA NATIONAL MEDICAL UNIVERSITY**

International faculty  
Department of Internal Medicine №1

**CONFIRMED:**  
Acting vice-rector for research and educational work  
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**METHODOLOGICAL DEVELOPMENT OF PRACTICAL CLASSES FROM  
EDUCATIONAL DISCIPLINE**

Faculty, course: international faculty, 4<sup>th</sup> course

Educational discipline: Actual problems of endocrinology (elective discipline)

**Confirmed:**

Meeting of the department of Internal Medicine No. 1 of the Odessa National Medical University  
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## Practical lessons

### **Topic 1. Diabetes mellitus: etiology, pathogenesis, classification, clinic, diagnosis. Diabetes mellitus type 1: modern methods of treatment**

**The main goals:** to indicate the relevance of the topic, know the etiopathogenetic classification of diabetes mellitus, know the risk factors for the development of diabetes mellitus types 1 and 2, know the etiopathogenesis of type 1 and 2 diabetes mellitus, know the diagnostic criteria for diabetes, be able to determine the type of diabetes and the severity and compensation criteria

**Key words:** autoimmune process, insulin resistance, obesity, hyperglycemia, diet, hypoglycemic therapy, physical activity, psycho-emotional state.

**Equipment:** laptop with a presentation, a multimedia projector, individual assignments on the topic of a practical lesson

#### **Plan:**

**1. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**

**2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.)**

- 1) Etiology and pathogenesis of type 1 and 2 diabetes mellitus.
- 2) Etiopathogenetic classification of diabetes mellitus, stage, development of type 1 2 diabetes mellitus.
- 3) Diagnostic criteria for diabetes mellitus, severity of the disease and compensation criteria.
- 4) Requirements for the diagnosis: main, complications and accompanying.
- 5) Main clinical symptoms.
- 6) Instrumental research methods
- 7) Differential diagnosis of 1 and 2 types of diabetes mellitus.
- 8) The most common complications of diabetes mellitus: micro-macroangiopathy, polyneuropathy, cardiovascular complications, nephropathy and diabetic osteoarthropathy.
- 9) General principles of treatment of diabetes mellitus types 1.
- 10) Know the basic principles of diet therapy for patients with type 1 diabetes and dosed physical activity.
- 11) Know the criteria for compensation of carbohydrate metabolism in patients with type 1 diabetes mellitus, insulin therapy.
- 12) Characteristics of the main insulin preparations, indications for their use. Insulin therapy regimens. Pump and cell therapy.
- 13) Principles of rational diet therapy and dosed exercise.

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

#### *3.1 task content:*

1. A 40-year-old woman was admitted to the admission department of the hospital, diagnosed with an acute abdomen. From the anamnesis it is known that 3 weeks ago she began to feel strong thirst, took a lot of fluids, excreted a significant amount of urine, lost weight, complained about the absence of menstruation (which until that time was regular). During the examination: leukocytes in the blood are  $15.6 \times 10^9 / L$ , glycemia -  $13.2 \text{ mmol} / l$ , glucosuria -  $37 \text{ g} / l$ , a positive reaction to acetone in urine. Determine the reason for this condition of the patient:

2. Male 56 years old. Obesity degree 3 (height 174cm, weight 108 kg.) No complaints. Fasting blood glucose levels are in the range of 7.8-10.6 mmol / l. Within 8 years, arterial hypertension. Currently BP 140/90, 130/85 (taking reserpine). No abnormalities were found on the part of internal organs.

QUESTION:

1. Diagnosis
2. Therapeutic tactics

#### *3.2 control materials for the final stage of the lesson:*

1. In a patient 56 years of age, with obesity, with an active examination of glucose in plasma of

venous blood onset glycemc index 9 mmol / l. Diagnose:

- A Secondary diabetes
- B Type 1 diabetes mellitus
- C Type 2 diabetes
- D Influenza glycemc control
- E Transient hyperglycemia

2. In a boy of 12 years during glucose tolerance test, the following glucose indicators were found: onset - 4,5 mmol / l, after 1 hour. - 7.5 mmol / l, after 2 hours. - 5.6 mmol / liter. Your conclusion?

- A Glucose tolerance is not affected
- B Glucose tolerance is disturbed
- C It is necessary to further examine glucose in plasma of venous blood onset
- D It is necessary to further examine glucose in plasma of venous blood against the background of nutrition
- E. Define glycosylated hemoglobin

3. A patient, 39 years old, for 20 years suffering from bronchial asthma. During the past 5 years, due to frequent sting attacks, prednisone was prescribed. During the hospitalization, he complained to the polydipsia, dry mouth, increased appetite and polyuria. Blood glucose levels were detected - 10.9 mmol / l. Your previous diagnosis:

- A Type 1 diabetes mellitus
- B Type 2 diabetes mellitus
- C Steroid Diabetes Mellitus
- D Kidney Diabetes
- E Diabetes mellitus associated with a genetic defect insulin

4. The patient, 22 years old, suffers from diabetes the 2nd year. Diabetic complications were not detected in her. Glycemia is onset in the range of 6.0-7.0 mmol / l. Married. Try to have a healthy baby. To prevent fetal disease, choose the most informative diagnostic method for fertilization permission:

- A Glycemic Profile
- B Glycosylated hemoglobin
- C Glucosuric profile
- D C peptide
- E Postrandial glycemia

5. Mother complains about the child's lag in growth and sexual development, frequent urinary defecation, bad healing of morning on the skin. Objectively: flush on the cheeks, dry skin and mucous membranes. What kind of examination do you want to assign to a child to clarify the diagnosis?

- A Blood test for glucose and glycosylated hemoglobin
- B General analysis of blood
- C Total urinalysis
- D Determination of liver blood samples
- E Determination of blood electrolytes

6. At the age of 20, there were complaints of dry mouth, thirst, diuresis - 5-6 l / day, significant weight loss. The examination revealed dry skin, pyoderma, bleeding gums, enlargement of the liver 3 cm below the costal arch. Glucosuria 15-20 g / l. Make a preliminary diagnosis:

- A non-diabetes mellitus
- B Psychogenic polydipsia
- C Renal glucosuria
- D Type 1 diabetes mellitus
- E Disorders of glucose tolerance

7. At the reception of the endocrinologist - a boy 15 years old with diabetes, type 1 of 5 years. Physical development corresponds to 10 years. In an objective examination - hepatosplenomegaly. Laboratory indices indicate decompensation of diabetes mellitus. What advice should a doctor give you?

- A Compensate for diabetes mellitus
- B Determine thyroid-stimulating hormone
- C Determine the bone age
- D Appoint vitamin therapy
- E improve nutrition

8. The patient, 62 years old, suffers from diabetes mellitus type 2. Diabetes is compensated by diet and gliclazid 60 mg per day. The patient should have surgery for inguinal hernia. What should be the tactics of hypoglycemic therapy:

- A Leave the previous treatment plan
- B Cancel gliclazide
- C Inject short-acting insulin
- D To prescribe long-acting insulin
- E Replace gliclazidmetformin

9. In a patient, 22 years old, after the flu was first detected diabetes mellitus. Glucose in plasma of venous blood onset - 10.2 mmol / l, glucosuria - 20 g / l, glycosylated hemoglobin - 8%. What treatment should be prescribed:

- A Insulin therapy
- B Sulphonylurea derivatives
- C Acarbose
- D Metform
- E Inhibitors of PPP-4

#### 4. Summary:

#### 5. Recommended reading list

##### Basic:

- Ogurtsova K, da Rocha Fernandes JD, Huang Y, et al. IDF Diabetes Atlas: global estimates for the prevalence of diabetes for 2015 and 2040. *Diabetes Res ClinPract* 2017;128:40-50.
- American Diabetes Association. 9. Pharmacologic Approaches to Glycemic Treatment: Standards of Medical Care in Diabetes -- 2020. *Diabetes Care* 2020;43:S98-S110.
- Davies MJ, D'Alessio DA, Fradkin J, et al. Management of hyperglycaemia in type 2 diabetes, 2018. A consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). *Diabetologia* 2018;61:2461-98.

##### Additional:

- American Diabetes Association. Economic costs of diabetes in the U.S. in 2017. *Diabetes Care* 2018;41:917-28.
- Malik S, Zhao Y, Budoff M, et al. Coronary artery calcium score for long-term risk classification in individuals with type 2 diabetes and metabolic syndrome from the multi-ethnic study of atherosclerosis. *JAMA Cardiol* 2018;2:1332-40.

### **Topic 2. Type 2 diabetes: modern methods of treatment. Emergency conditions of diabetes. Hypoglycemic coma, hypoglycemic conditions. Ketoacidotic states and coma, hyperosmolar diabetic coma**

**Purpose:** to avoid acute decompensation, prevent or delay the appearance of late disease complications, decrease mortality, and maintain a good quality of life.

**Key words:** diet, hypoglycemic therapy, physical activity, psycho-emotional state, ketoacidosis, hyperosmolarity, lactic acidosis, hypoglycemia.

**Equipment:** laptop with a presentation, a multimedia projector, individual assignments on the topic of a practical lesson

**Plan:**

**1. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**

**2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.)**

2.1 Questions to test basic knowledge of the topic of the lesson:

- 1) General principles of treatment of diabetes mellitus types 2.
- 2) Algorithm of stepwise therapy for type 2 diabetes mellitus.
- 3) Principles of rational diet therapy and dosed exercise.
- 4) Drug therapy: characteristics of the main groups of drugs and indications for their appointment according to the protocols for the provision of medical care for patients with type 2 diabetes mellitus.
- 5) The pathogenesis of ketoacidosis, and causes.
- 6) Stages of development of ketoacidotic coma (mild ketoacidosis, expressed and actually coma).
- 7) Clinical variants of ketoacidotic coma.
- 8) Syndrome of hyperglycemia, acidosis, dehydration, hypoglycemia.
- 9) Pathogenesis, clinic, treatment and prevention of hypoglycemia, hypoglycemic coma.
- 10) Diseases accompanied by hypoglycemia (insulinoma, functional hyperinsulinism).
- 11) Mechanism and causes of lactic acidosis, pathogenesis of lactic acidotic coma.
- 12) Mechanism and causes of hyperosmolar condition, pathogenesis hyperosmolar coma.

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

*3.1 task content:*

Male 56 years old. Obesity degree 3 (height 174cm, weight 108 kg.) No complaints. Fasting blood glucose levels are in the range of 7.8-10.6 mmol / l. Within 8 years, arterial hypertension. Currently BP 140/90, 130/85 (taking reserpine). No abnormalities were found on the part of internal organs.

QUESTION

1. Diagnosis
2. Therapeutic tactics

2. Patient M., 24 years old, diagnosed with type 1 diabetes 8 months ago. He has a negative attitude to insulin therapy, misses injections, does not control glycemia, and does not follow a diet. Deterioration of well-being within 10 days, when it appeared weakness, severe thirst, polyuria. Objectively: A state of moderate severity. Answers questions late, in monosyllables. The skin is dry. Smell of acetone in exhaled air. There are no wheezing in the lungs. BP 100/70 mm Hg Pulse 90 / min.

Questions:

1. Make a preliminary diagnosis.
2. Make a differential diagnosis.
3. Prescribe treatment.

*3.2 control materials for the final stage of the lesson*

Select one correct answer:

1. In a woman 45 years old, with obesity 1 item. glycemia was detected on the surface of 10 mmol / l, after eating - 14.8 mmol / l, glucosuria 3%, acetone in urine absent. The sick brother's brother suffers from diabetes mellitus. What type of diabetes is a patient?

- A Hereditary Diabetes Mellitus
- B Type 1 diabetes mellitus
- C Type 2 diabetes
- D Diabetes associated with the disease of the exocrine part of pancreas
- E Diabetes associated with endocrinopathies

2. In a patient, 52 years old, during prophylaxis glycemia was discovered on the nose - 7.2 mmol / l, glucosuria - 0.5 g / l. Height - 167 cm, weight - 92 kg Determine the primary treatment tactic:

- A Insulin therapy
- B Diet therapy and metered physical activity
- C derivatives sulfonylureas
- D Metformin
- E Glucagon-like polypeptide

3. The patient, 48 years old, has a height of 162 cm, weight is 90 kg. He suffers from diabetes mellitus type 2 for 2 years, on diet therapy. Glycemia onset - 12.4 mmol / l, glucosuria 21.5 g / l. Identify the tactics of further treatment:

- A Insulin therapy
- B Diet therapy and metered physical activity
- C derivatives sulfonylureas
- D Methformin
- E Acarboza

4. A woman, 72 years old, suffers from type 2 diabetes mellitus, concomitant pathology - hypertensive disease of the second century, heart failure of the second grade. Uses metformin. The day before suffered a hypertensive crisis, after which there was a sharp weakness, myalgia, increased thirst, dry mouth, polyuria. BP - 140/95 mm Hg, heart rate - 98 per minute, swelling and smell of acetone absent. What measures should be taken for the patient?

- A Additionally, prescribe glimepiride
- B Increase metformin dose
- C Define the PPP-4 inhibitor
- D Adjunct to long-acting insulin
- E To cancel metformin and prescribe insulin preparations

5. Patient M., 28 years old, suffers from diabetes mellitus for 3 years. It receives 54 IU insulin overnight. After a ten days postponement of the sore throat, the condition worsened. Increased general weakness, increased thirst, appeared, nausea, vomiting, drowsiness, fatigue. Hospitalized. At inspection: In an unconscious state, breathing is liquid and noisy, the smell of acetone from the mouth. Skin, tongue dry, skin turgor is lowered. Pulse 114 per minute, small, AT 85/50 mm Hg The lower edge of the liver is 3 cm below the costal arch. Blood glucose is 32 mMol / L. The reaction to acetone is abruptly positive. Which of the following measures should you start treatment for?

- A Rehydration therapy
- B Correction of electrolyte balance
- C Warning of iatrogenic hypoglycemia
- D Recovery of acid-base balance
- E Prevention of infectious complications

6. A woman 59 years old suffering from diabetes 20 years. Treated with oral hypoglycemic agents, last year insulin therapy. Diabetes is in a state of compensation. Disturbing abdominal pain, bloating, unformed fecundity, imperative defecation in the dream. Can a diagnosis be?

- A Chronic hepatitis
- B Chronic cholecystitis
- C Diabetic hepatoses
- D Chronic gastritis
- E Diabetic enteropathy

7. In a patient 21 years of age who suffers from diabetes for 8 years, glycemia is 10.2 mMol / l, prandial 14.3 mMol / l, daily glucosuria 41.1 g / l, albuminuria 230 mg per day, AT 110 / 70 mmHg Determine the diagnosis?

- A Type 1 diabetes mellitus in a state of decompensation, chronic diabetic kidney disease
- B Type 1 diabetes mellitus, diabetic kidney disease, microalbuminuria of moderate severity
- C Type 1 diabetes mellitus in a state of decompensation, severe microalbuminuria
- D Diabetes mellitus type 1 in a state of decompensation,
- E Type 1 diabetes mellitus in a state of decompensation, chronic renal insufficiency

8. A woman 21 years old with diabetes mellitus with a 2 year age, complicated by progressive diabetic retinopathy and nephropathy, is advised on the possibility of pregnancy. What is the appropriate recommendation for a sick person?

- A Pregnancy is not desirable
- B Pregnancy is possible with stable compensation of sugar diabetes
- C Pregnancy is possible after photocoagulation retina
- D Pregnancy is possible with a decrease in proteinuria
- E Pregnancy contraindicated

9. Antihypertensive drugs are most appropriate in the treatment of patients with diabetes mellitus with nephropathy?

- A ACE
- B Loop diuretics
- C  $\beta$ -blockers
- D Blockers of calcium channels
- E Thiazidodiuretics

10. A patient with type 1 diabetes has a diagnosis of "syndrome of a diabetic foot of a neuropathic form". Which of the following drugs is best for the patient?

- A Derivatives of pentoxifylline
- B Static
- C derivatives of thioctic acids
- D Antiagregant
- E Antiplatelet drugs

#### 4. Summary:

#### 5. Recommended reading list

##### Main:

- Zheng Y, Ley SH, Hu FB. Global aetiology and epidemiology of type 2 diabetes mellitus and its complications. *Nat Rev Endocrinol*. 2018 Feb;14(2):88-98. [[PubMed](#)]
- Malek R, Hannat S, Nechadi A, Mekideche FZ, Kaabeche M. Diabetes and Ramadan: A multicenter study in Algerian population. *Diabetes Res ClinPract*. 2019 Apr;150:322-330. [[PubMed](#)]
- Picke AK, Campbell G, Napoli N, Hofbauer LC, Rauner M. Update on the impact of type 2 diabetes mellitus on bone metabolism and material properties. *Endocr Connect*. 2019 Mar 01;8(3):R55-R70. [[PMC free article](#)] [[PubMed](#)]
- Carrillo-Larco RM, Barengo NC, Albitres-Flores L, Bernabe-Ortiz A. The risk of mortality among people with type 2 diabetes in Latin America: A systematic review and meta-analysis of population-based cohort studies. *Diabetes Metab Res Rev*. 2019 May;35(4):e3139. [[PubMed](#)]
- CepedaMarte JL, Ruiz-Matuk C, Mota M, Pérez S, Recio N, Hernández D, Fernández J, Porto J, Ramos A. Quality of life and metabolic control in type 2 diabetes mellitus diagnosed individuals. *Diabetes MetabSyndr*. 2019 Sep - Oct;13(5):2827-2832. [[PubMed](#)]
- Steffensen C, Dekkers OM, Lyhne J, Pedersen BG, Rasmussen F, Rungby J, Poulsen PL, Jørgensen JOL. Hypercortisolism in Newly Diagnosed Type 2 Diabetes: A Prospective Study of 384 Newly Diagnosed Patients. *HormMetab Res*. 2019 Jan;51(1):62-68. [[PubMed](#)].
- Qin Z, Zhou K, Li Y, Cheng W, Wang Z, Wang J, Gao F, Yang L, Xu Y, Wu Y, He H, Zhou Y. The atherogenic index of plasma plays an important role in predicting the prognosis of type 2



diabetic subjects undergoing percutaneous coronary intervention: results from an observational cohort study in China. *CardiovascDiabetol.* 2020 Feb 21;19(1):23. [[PMC free article](#)] [[PubMed](#)]  
-Nowakowska M, Zghebi SS, Ashcroft DM, Buchan I, Chew-Graham C, Holt T, Mallen C, Van Marwijk H, Peek N, Perera-Salazar R, Reeves D, Rutter MK, Weng SF, Qureshi N, Mamas MA, Kontopantelis E. Correction to: The comorbidity burden of type 2 diabetes mellitus: patterns, clusters and predictions from a large English primary care cohort. *BMC Med.* 2020 Jan 25;18(1):22. [[PMC free article](#)] [[PubMed](#)]

### **Topic 3. Chronic complications of diabetes: macroangiopathy, microangiopathy, neuropathy , diabetic foot syndrome. Iodine deficiency diseases of the thyroid gland. Nodular forms of goiter. Thyroid cancer. Diseases of the parathyroid glands.**

**Purpose:** Vascular injuries are the one of the leading syndromes in diabetes mellitus. In most cases their intensity determines patient's capacity for work, prognosis and duration of his life. In this regard the timely and accurate diagnostics as well as treatment of diabetic angiopathies becomes the leading value in diabetology. The problem of angiopathies has an interdisciplinary character and isn't a purely diabetologic issue. This problem has multiple links to ophthalmology, neurology, and surgery. The knowledge of clinical peculiarities and therapeutical tactics at different stages of angiopathies of different localization allows maintaining the patient's capacity for work for longer time.

**Key words:** microangiopathies, macroangiopathies, retinopathy, neuropathy, the iodine deficiency diseases, thyroid cancer, parathyroid glands.

**Equipment:** laptop with a presentation, a multimedia projector, individual assignments on the topic of a practical lesson

#### **Plan:**

**1. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**

**2. Control of the reference level of knowledge(written work, written test, frontal survey, etc.)**

2.1 Questions to test basic knowledge of the topic of the lesson:

- 1)Standards for the diagnosis of angiopathy and neuropathy
- 2)General principles of treatment and prevention of chronic complications of patients with diabetes mellitus type 1 and 2
- 3) Promising methods of treating diabetes
- 4)General pathophysiological mechanisms of comatose state development
- 5) Main clinical syndromes of comatose states, coma stages
- 6)Criteria for differential diagnosis of comatose states
- 7)Methods of providing emergency care, intensive care at the stages of treatment of precomatose and comatose states
- 8)Peculiarities of anatomy and physiology of endocrine system
- 9)Anamnesis of endocrine patients
- 10)Objective investigation
- 11)Methods of instrumental and laboratory diagnosis
- 12)Differential diagnosis of cancer of thyroid gland and diseases of parathyroid gland with other diseases

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

#### *3.1 task content:*

Clinical task №1.

Patient, 49 years old, was admitted unconscious. Skin, chewing sclera. Ascites. The edge of the liver is compacted, +4 cm, spleen +2 cm. Deep noisy breathing, respiratory rate - 20 min. with a

fruity odor from the mouth. Tongue dry. The eyeballs are soft palpation. According to relatives, the patient abuses alcohol. Recently, the patient felt thirsty, often urinated, lost 5 kg. 3 days ago, the amount of urine decreased, nausea and vomiting appeared. In the analysis of urine rel.pl.-1032, the reaction is acidic, a positive reaction to acetone. Your preliminary diagnosis:

#### Clinical task №2

A 28-year-old patient underwent surgery for diffuse toxic goiter. One month before the operation she was treated in the therapeutic department, receiving mercazolyl. Compensated discharged home. She did not receive outpatient treatment. Before surgery: Ps - 96 beats / min., Blood pressure - 125/70 mm Hg. On the second day after surgery, the condition deteriorated sharply. The patient is excited. Complains of palpitations, sweating, vomiting. Ps - 165 beats / min., Arrhythmic, small, atrial fibrillation. Blood pressure - 85/40 mm Hg Heart tones are loud. Vesicular respiration, in the lower parts of moist medium- and fine-bubble rales. The abdomen is soft, not painful. T- 39°C.

1. What is the most likely diagnosis?
2. Plan of investigations?
3. Treatment plan?

#### *3.2 control materials for the final stage of the lesson:*

1. Select one correct answer:

A patient K., suffering from diabetes 12 years old, is in a coma. Ob-ve: the skin is dry, breathous noisy, the smell of acetone with exhalation. BP 105/60 mm Hg Pulse 100 per min, blood pH 7.0.

What kind of coma is possible in a patient?

- A hypoglycemic
- B Ketoacidotic
- C Hyperosmolar
- D Lacticacid
- E Brain (stroke)

2. Patient A., 58 years old, suffers from diabetes 7 years. After a postponed food poisoning the state deteriorated. Ob-o: the skin is dry, the tongue is dry, is covered with white layers, breathing is superficial, the smell of acetone in the air is not felt. In sick nausea, diarrhea. Blood glucose is 41 mMol / L. Probable diagnosis?

- A Cerebral coma
- B Ketoacidic coma
- C Lactocidal Coma
- D Hypoglycemic Coma
- E Hyperosmolar Coma

3. Patient S., 32 years old, delivered unconscious in the intensive care unit. The patient has a card of a patient with diabetes mellitus. Insulin not found. Breathing is noisy, such as Kusmaul, the smell of acetone from the mouth, the skin is dry, the turgor is lowered, facial features are sharpened, periosteal reflexes are absent, the tone of the eyeballs is lowered. In the blood, the content of lactic acid is 1.2 mMol / L (norm 0.62-1.3 mMol / L), glycemia is 29 mMol / L. Who can be suspected of?

- A Hyperosmolar
- B Brain
- C Cathodic
- D Hypochloric
- E Lactatedemic

4. A patient 49 years old was taken to the hospital in an unconscious state. Skin, yellow sclera. Ascites The edge of the liver is compacted, +4 cm, the spleen +2 cm. Deep noisy breathing, BD - 20 / min. with a fruit smell from the mouth. The tongue is dry. 5. Eyeballs are palpated soft. According to relatives, the patient abuses alcohol. Recently, the patient felt thirsty, there were a lot

and empty urine, lost weight by 5 kg. 3 days ago the amount of urine decreased, there was nausea, vomiting. In urine analysis, the density is 1,032, the acid reaction, a positive reaction to acetone.

Your previous diagnosis?

- A liver coma.
- B Ketoacidic coma.
- C Uremic Coma.
- D Cerebral coma.
- E Alcoholic Coma.

6. Patient M., 28 years old, suffers from diabetes mellitus for 3 years. It receives 54 IU insulin overnight. After a ten days postponement of the sore throat, the condition worsened. Increased general weakness, increased thirst, appeared, nausea, vomiting, drowsiness, fatigue. Hospitalized. At inspection: In an unconscious state, breathing is liquid and noisy, the smell of acetone from the mouth. Skin, tongue dry, skin turgor is lowered. Pulse 114 per minute, small, AT 85/50 mm Hg The lower edge of the liver is 3 cm below the costal arch. Blood glucose is 32 mMol / L. The reaction to acetone is abruptly positive. Which of the following measures should you start treatment for?

- A Rehydration therapy
- B Correction of electrolyte balance
- C Warning of iatrogenic hypoglycemia
- D Recovery of acid-base balance
- E Prevention of infectious complications

6. Patient D., 40 years old. 2 months after the surgical treatment for diffuse toxic goiter complains of chilliness, drowsiness, apathy, decreased appetite, constipation. Objectively: the skin to the touch is dry, cold, pale, the face is somewhat puffy, dense lips swelling. The thyroid gland is not palpable, the heart sounds are muffled. Pulse - 53 per minute, blood pressure - 100/65 mm Hg. What is the cause of this condition of the patient?

- A Hypoparathyroidism
- B Heart failure
- C Recurrence of toxic goiter
- D Nephrotic syndrome
- E with hypothyroidism

7. A patient of 45 years, 2 months after the subacute thyroiditis transferred, complained of progressive general and muscular weakness, fatigue, chilliness, drowsiness, weight gain against the face and limb edema, constipation, dry skin, hair loss. The GCS was treated. On examination: the patient is flaccid, adynamic, the skin has a pale yellow color, a cold color. The face is puffy, the eyelids are swollen, the lips are thickened. Body temperature 35,8 ° C. Pulse 58 per minute. CBC: Hb 100 g / l, Er - 3,5 \* 10<sup>12</sup> / l, L - 3,5 \* 10<sup>9</sup> / l, ESR 25 mm / hour. The blood levels of thyrotropin are increased, and T3 and T4 are reduced. Your diagnosis?

- A DM
- B Primary hypothyroidism
- C Central hypothyroidism
- D Autoimmune thyroiditis
- E Adverse effects of medication

8. Patient 40, operated for a pituitary tumor. Complains of adynamia, drowsiness, constipation, decreased blood pressure, pain in the heart, amenorrhea. Blood content of T4 free. - 3, 3nMol / l (norm 11, 8 -24, 6 nmol / l), TTG - 0.3 mIU / l.b What hypothyroidism can there be?

- A. Initial
- B. Central
- C. Peripheral
- D. Transit

## E. Postoperative

9. Patient D., 40 years old. 2 months after the surgical treatment for diffuse non-toxic goiter complains of chilliness, drowsiness, constipation. Objectively: the skin feels pale, the face is puffy. The sonority of heart sounds is low. Pulse - 56 minutes per minute, blood pressure - 100/65 mm Hg. What caused this condition of the patient?

- A Hypoparathyroidism
- B Heart failure
- C Relapse of toxic goiter
- D Nephrotic syndrome
- E hypothyroidism

10. The patient N., 55 years old, complained of an enlargement of the thyroid gland, was observed during the last two years. Objectively: signs of hypothyroidism, palpation of the thyroid gland is densified. Regional lymph nodes are not enlarged. In the serum of the patient, a high titer of antibodies to thyroid peroxidase. Indicate the preliminary diagnosis.

- A Autoimmune thyroiditis. Hypothyroidism
- B Diffuse goiter. Hypothyroidism
- C Endemic goiter. Hypothyroidism
- D Chronic thyroiditis. Hypothyroidism
- E Primary hypothyroidism

## 4. Summary:

### 5. Recommended reading list:

#### Basic:

1. Davidson's "Principles of Practice of Medicine" 20th edition 2021, Elsevier limited.
2. Harrison's "Principles of internal medicine" Volume 1,2, 2020, USA. - Cardiology
3. Williams Textbook of Endocrinology by Shlomo Melmed; Ronald Koenig; Clifford Rosen; Richard Auchus; Allison Goldfine , 2019.
4. Greenspan's Basic and Clinical Endocrinology, Tenth Edition by David Gardner; Dolores Shoback, 2018

#### Additional:

1. <https://www.asn online.org/education/training/fellows/educationalresources.aspx#Guidelines>
2. American Association of Clinical Endocrinologists and American College of Endocrinology - Clinical Practice Guidelines for Developing a Diabetes Mellitus Comprehensive Care Plan - © 2019

### **Topic 4: Thyroiditis. Thyrotoxicosis: clinical forms. Grave`s disease: complications, treatment. Hypothyroidism. Diseases of the adrenal glands. Chronic adrenal insufficiency. Acute adrenal insufficiency.**

**Purpose:** to explain the essence of the thyroiditis, thyrotoxicosis, hypothyroidism, the causes of its occurrence, the role of various factors in the etiopathogenesis, approaches to diagnosis, treatment and prevention.

**Key words:** thyroiditis, thyrotoxicosis, hypothyroidism, adrenal diseases process.

**Equipment:** laptop with a presentation, a multimedia projector, individual assignments on the topic of a practical lesson

#### Plan:

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge(written work, written test, frontal survey, etc.)**
  - 2.1 Questions to test basic knowledge of the topic of the lesson:
    - 1) Determination of thyrotoxicosis, hypothyroidism.

- 2) Epidemiology of HT and T in the world.
- 3) Risk factors for HT and T.
- 4) The mechanism of hormonal and metabolic disorders in HT and T.
- 5) Etiology and pathogenesis of HT and T.
- 6) Clinical presentation of HT and T.
- 7) Typical clinical presentation of HT.
- 8) Multiple organ complications of HT.
- 9) Diagnostic criteria for HT and T.
- 10) The indications for use and analysis of results of hormonal assays.
- 11) Peculiarities of anatomy and physiology of endocrine system
- 12) Anamnesis of endocrine patients.
- 13) Objective investigation.
- 14) Methods of instrumental and laboratory diagnosis.
- 15) Differential diagnosis of chronic insufficiency of adrenal cortex.
- 16) Treatment of chronic insufficiency of adrenal cortex.

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

#### *3.1 task content:*

1. The 45-year-old patient, after suffering from subacute de Kerven's thyroiditis, complained of progressive general and muscular weakness, fatigue, chills, drowsiness, weight gain on the background of swelling of the face and extremities, constipation, dry skin, hair loss. On examination: the patient is lethargic, adynamic, the skin has a pale yellowish tinge, cold. The face is puffy, the eyelids are swollen, the lips are thickened. Body temperature 35.8 ° C. PS 58 per minute. An. blood total: Hb 100g / l, Er-3,5 \* 10<sup>12</sup> / l, L -3,5 \* 10<sup>9</sup> / l, ESR 25 mm / h. The content of thyrotropin in the blood is increased, and T3 and T4 are reduced

1. What is the most likely diagnosis?
2. Plan of investigations?
3. Treatment plan?

2. Patient M., 32 years old, complains of muscle weakness, periodic cramps, attacks of severe general weakness, polyuria, nocturia, elevated blood pressure. Ill for 8 months. Heart tones are muted, accent II tone over the aorta, blood pressure - 170/100 mm Hg. Art., has no edema. In the blood: potassium - 3.0 mmol / l, glucose - 5.3 mmol / l. In the general analysis of urine: alkaline reaction of urine, protein - 0,066 g / l L - 3-5 in p.z. Hypoisostenuria is determined.

1. What pathogenetic mechanisms underlie cardiovascular dysfunction system in the patient?
2. Complications of this condition?
3. Pathogenetic treatment?

#### *3.2 control materials for the final stage of the lesson*

1. At the patient of 30 years after the transferred or carried influenza constantly there is a delicacy, irritability, a sweating. The patient lost weight, appeared tremor, palpitations, exophthalmos. On examination: skin moist, exophthalmos, pulse - 120 in 1 min., Thyroid gland enlarged, soft, painless. Blood TSH - 0.2 mIU / l (N - 0.4-4 mIU / l). Your diagnosis?

- A Endemic goiter
- B Dysfunctional goiter
- C Autoimmune thyroiditis
- D Diffuse nontoxic goiter
- E Thyroid cancer

2. In the first hours after subtotal resection of the thyroid in connection with a toxic goiter, the patient developed a marked mental and motor arousal. A sharp hyperemia of the face, neck, upper and lower extremities. t body - 40-41 ° C, increased sweating. Tachycardia is rapidly increasing, in 140-200 per minute, atrial fibrillation. What complication develops in the patient?

- A Asphyxiation
- B Anaphylaxis Shock
- C Hypoparathyroidism
- D Myocardial infarction
- E thyrotoxic crisis

3. A 37-year-old woman is treated in a hospital due to thyrotoxicosis of a severe course, goiter 2, endocrine ophthalmopathy. takes Mercazolil in a dose of 60 mg / day. For 3 weeks of treatment, a feeling of zdushuvannya in the throat began to disturb. What is the possible cause of worsening of the patient's condition?

- A Neurotic condition
- B allergy to Mercazolil
- C Medication hypothyroidism
- D Ineffective treatment with Mercazolil
- E goiter due to Mercazolilum

4. The patient is 40 years old, has an autoimmune thyroiditis, frequent ventricular extrasystoles have appeared. The doctor appointed amiodarone for a long time. What laboratory indicators are monitored once a year in a patient?

- A complete blood count
- B Ionogram
- C Level of thyroid hormones
- D Concentration of thyroid antibodies
- E Level of uric acid in blood plasma

5. A woman, 32 years old, asked about an increase in the thyroid gland. With anamnesis it is known that during the accident at the Chernobyl NPP was in the zone of increased radioactive fallout. The enlargement of the thyroid gland marks within 1 year, it gradually progresses. Objectively: thyroid enlarged to 2 in. In it a dense knot is palpated, sedentary, painless. Submandibular lymph nodes are enlarged, painful. At US in thyroid gland the hypochoic formation without precise borders with kaltsinatami is revealed. Blood pressure 120/70 mm Hg Pulse 78 in min.

Based on the data given, the patient can be suspected

- A Thyroid cancer
- B Diffuse nontoxic goiter
- C Thyroid adenoma
- D Pidgestriroiditis
- E phylactic goiter

6. Patient S., 52 years old, delivered urgently to the clinic with complaints of severe weakness, dizziness, weight loss, lack of appetite, nausea, vomiting, severe pain in the epigastric region, diarrhea, increased pigmentation of the skin. The most likely diagnosis?

- A Pellagra
- B Addison's crisis
- C Meningoencephalitis
- D Acute gastroenteritis
- E Scleroderma

7. A 47-year-old patient is on a survey due to frequent episodes of an increase in blood pressure to 280/140 mm Hg. In the last few months. Family history of hypertension is negative. In the morning he complains about an intense headache, palpitation, anxiety. AO 300/160 mm Hg, heart rate - 128 in 1 min. Previously, under similar conditions, hyperglycemia, leukocytosis were registered, after the quenching the crisis, pronounced polyuria was noted. Choose a class of drugs to eliminate this hypertensive crisis:

- A  $\alpha$ -blockers

- B  $\beta$ -blockers
- C antagonists of calcium
- D ACE inhibitors
- E Diuretics

8. At the 38-year-old woman after quarrel there was a giddiness, delicacy. In the history of anorexia, weight loss, nausea, diarrhea. Hypotension 50/30 mm Hg In an upright position. Pulse 110 in min., Small, rhythmic. Blood glucose - 3.3 mmol / l. Hyponatremia. Hyperkalemia. Hyperpigmentation of the skin. Excretion 17-ACS with urine reduced. Preliminary diagnosis:

- A Hidden internal bleeding
- B pregnancy, hypotension
- C Vegetative-vascular dystonia, hypotonic type
- D Collapse with adrenal insufficiency
- E Diabetes mellitus, hypoglycemia

9. Define an endocrine disease, always accompanied by a decrease in body weight:

- A Insuloma
- B Hyperparathyroidism
- C Hypothyroidism
- D Addison's Disease
- E Type 2 diabetes mellitus

10. Patient 40, with primary adrenal insufficiency, constantly takes prednisolone up to 7.5 mg per day. In connection with the exacerbation of pulmonary tuberculosis, reduced the dose of prednisolone to 5 mg per day. After 2 days the condition worsened, there was a sharp weakness, nausea, vomiting, blood pressure dropped to 80/40 mm Hg. The drug of choice for the treatment of a patient is currently:

- A Prednisolone
- B Ftivazide
- C Dexamethasone
- D Hydrocortisone
- E Rifampicin

#### **4. Summary:**

#### **5. Recommended reading list**

##### **Basic:**

1. Davidson's "Principles of Practice of Medicine" 20th edition 2021, Elsevier limited.
2. Harrison's "Principles of internal medicine" Volume 1,2, 2020, USA. Endocrinology
3. Williams Textbook of Endocrinology by Shlomo Melmed; Ronald Koenig; Clifford Rosen; Richard Auchus; Allison Goldfine , 2019.
4. Greenspan's Basic and Clinical Endocrinology, Tenth Edition by David Gardner; Dolores Shoback, 2018

##### **Additional:**

1. <https://www.asn.org/education/training/fellows/educationalresources.aspx#Guidelines>
2. American Association of Clinical Endocrinologists and American College of Endocrinology - Clinical Practice Guidelines Comprehensive Care Plan - © 2019

**Topic 5. Hormone-active tumors of the adrenal glands: primary hyperaldosteronism ( Conn's syndrome ). Pheochromocytoma. Androsteroma, cortisteroma, corticosteroma. Diseases of the hypothalamic-pituitary system: Cushing's disease. Acromegaly. Hypopituitarism, diabetes insipidus. Diseases of the gonads.**

**Purpose:** to explain the essence of the pituitary and hypothalamus diseases, the causes of its occurrence, the role of various factors in the etiopathogenesis, approaches to diagnosis, treatment and prevention.

**Key words:** pituitary and hypothalamus diseases, Cushing disease, acromegaly, hypopituitarism, diabetes insipidus, pheochromocytoma, androsteroma, corticoestroma, corticosteroma.

**Equipment:** laptop with a presentation, a multimedia projector, individual assignments on the topic of a practical lesson

**Plan:**

**1. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**

**2. Control of the reference level of knowledge(written work, written test, frontal survey, etc.)**

2.1 Questions to test basic knowledge of the topic of the lesson:

- 1) Determination of concept of HPS diseases.
- 2) Epidemiology of HPS diseases.
- 3) Risk factors of HPS diseases.
- 4) Mechanism of hormonal and metabolic disorders at the diseases of HPS.
- 5) Etiology and pathogenesis of HPS diseases.
- 6) Classification of HPS diseases.
- 7) Clinical picture of HPS diseases.
- 8) Polyorganic complications of HPS diseases.
- 9) Diagnostic criteria of HPS diseases.
- 10) Choice of method of treatment of HPS diseases.
- 11) Treatment of chronic insufficiency of adrenal cortex

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

*3.1 task content:*

1. The endocrinologist was urgently called to the urology department to a 46-year-old patient, M., who was admitted with an attack of renal colic. During the instrumental examination the patient lost consciousness. Blood pressure dropped to 40/20 mm Hg. Art. History of long-term (6 years) use of glucocorticoids in connection with rheumatoid arthritis. I stopped taking glucocorticoids 3 days ago. Objectively: inhibited, deaf heart tones, pulse - 100 / min., Weak filling, rhythmic. Lungs and organs of the abdominal cavity without features.

1. What is the most likely diagnosis?
2. Plan of investigations?
3. Treatment plan?

2. To the patient T. with disturbance of a cardiac rhythm in cardiological the department is invited to consult an endocrinologist. From the anamnesis it is known that 3 months ago the patient gave birth to a full-term child. In the postpartum period there was heavy bleeding, further general concern weakness, weakness. There is no lactation. Paleness grew, appeared profuse diarrhea. She was hospitalized in the gastroenterology department, where she developed a heart rhythm disorder. During the examination: sick pale, dry skin, yellowish, swollen, cold to the touch. Language sluggish, tongue enlarged. Blood pressure - 60/40 mm Hg., bradycardia, arrhythmia.:

1. What is the most likely diagnosis?
2. Complications of this condition?
3. Pathogenetic treatment?

*3.2 control materials for the final stage of the lesson:*

1. Patient R., is treated for a septic condition, suddenly there was a significant weakness, adynamia, vomiting, diarrhea. Sopor. Pulse is threadlike, 110 is sutured, blood pressure is 60/40 mm Hg. On the ECG: tachycardia, a decrease in the voltage of all the teeth. Laboratory data: hyponatremia,



hypochloraemia, hyperkalemia, hypoglycemia. Indicate the reason for the development of this state:

- A Hypothalamic crisis
- B Acute adrenal insufficiency
- C Hypoglycemic coma
- D Pargyropituitarism
- E Acute myocardial infarction

2. Patient D., 42 years old, after physical exertion lost consciousness. BP decreased to 40/20 mm Hg. In the anamnesis, a long (5 years) use of glucocorticoids, due to the fact that he has bronchial asthma. In the last 4 days, glucocorticoids do not take. Objectively: inhibited, skin of normal color, normal humidity, heart sounds deaf, heart rate 100 per minute., Weak filling, rhythmic. The level of glucose in the blood is 3.0 mmol / l, sodium - 117 mmol / l, potassium - 6.0 mmol / l. Establish a preliminary diagnosis.

- A Cardiogenic shock
- B Adrenal crisis
- C Acute adrenal insufficiency
- D Hypovolemic shock
- E Hypoglycemic coma

3. Patient K., 29, with satisfactorily compensated type 1 diabetes mellitus, developed frequent hypoglycemia, nausea, intestinal disorders, hyperpigmentation of the skin (bronze color), blood pressure - 70/50 mm Hg, Hb 100 g / l. What can cause a decrease in pressure?

- A Chronic adrenal insufficiency
- B Diabetic enteropathy
- C Diabetic gastropathy
- D Overdose of antidiabetic drugs
- E Development of diabetes insipidus

4. Patient V., 18 years old, was taken to the hospital by an ambulance car without consciousness. From additional studies: increased potassium levels in the serum up to 8 mmol / l, the level of cortisol - 18 µg in 100 ml of plasma. On the ECG - high pointed T. At CT - signs of calcification of the adrenal glands. What is the most likely diagnosis?

- A Insufficiency of the adrenal cortex
- B Hyperosmolar coma
- C Hyperlactacidemic coma
- D Thyrotoxic crisis
- E Hypoglycemic coma

5. The patient is 43, taken in serious condition. According to the man, he is sick with Addison's disease. Constantly took 5 mg of prednisolone. During the week the drug did not take, as there was pain in the stomach, appetite worsened, yesterday did not eat due to nausea and vomiting. Patient in a co-morbid state. Skin and mucous hyperpigmented. Turgor of the skin and muscles is reduced. Heart tones are muffled, accelerated, blood pressure is 60/40 mm Hg, heart rate is 96 / min. Sodium blood - 130 mmol / l, potassium - 5.5 mmol / l. What hormone deficiency plays a leading role in the development of complications?

- A aldosterone
- B Corticotropin (ACTH)
- C Adrenaline
- D Norepinephrine
- E Cortisol

6. A 15-year-old patient complains of excessive body weight, headache, irritability, fatigue. A significant increase in body weight occurred at the age of 14 years. Body weight - 90 kg, height 160

cm, the correct constitution. The distribution of fatty tissue is uniform. On the hips, abdomen and mammary glands are pink thin striae. AO - 145/90 mm Hg.

Your diagnosis?

- A Vegetosovascular dystonia
- B Alimentary-constitutional obesity
- C Pubertal-youthful dyspituitarism
- D Itenko-Cushing's disease
- E Syndrome Itenko-Cushing

7. A 37-year-old patient turned to a doctor about overweight with the goal of losing weight. Objectively: height 160 cm, weight 125 kg. The distribution of fatty tissue is uniform. Which method of treatment will be most appropriate?

- A Drug therapy
- B Subconscious diet
- C Subcultural diet and exercise
- D bariatric surgery
- E Psychotherapeutic correction of eating behavior

8. Patient S., 28 years of age, complained about the lack of sexual development, decreased potency, and infertility. Objectively: body proportions are eunuchoid, height 185 cm, weight 75 kg, gynecomastia. The external genitalia are formed correctly, in size correspond to the age. Eggs are reduced in size, compacted. Genital chromatin 32%. Karyotype 47XXY / 46XY. Possible diagnosis?

- A "Clean" gonadal dysgenesis
- B Klinefelter's Syndrome
- C Shereshevsky-Turner Syndrome
- D Initial hypogonadism
- E Meyer-Rokytansky-Kyustner Syndrome

9. Patient V., 20 years old, was sent to the military registration and enlistment office for ascertaining his sex. At birth, the floor was defined as male. Objectively: height 174 cm, weight 75 kg, body intersexual proportions, mammary glands developed, sexual haemorrhage by female type, high voice, regular bloody discharge from age 15, external genitalia represented by penile 5 cm, urethra opens at scrotum, which is satisfactory Is developed, in the left part of it the testicle is palpated up to 2.5 cm. With ultrasound examination of the pelvic organs, a unicorn uterus with an ovary has been found. Karyotype of 46XY / 46XX. Possible diagnosis?

- A Initial hypogonadism
- B "Clean" gonadal dysgenesis
- C Shereshevsky-Turner Syndrome
- D Oriental hermaphroditism
- E Meyer-Rokytansky-Kyustner Syndrome

10. Patient V., 18 years old, was sent to the military registration and enlistment office for determining fitness for military service. Objectively: the proportions of the male body, height 175 cm, weight 105 kg, obesity, the distribution of adipose tissue is relatively uniform, with predominant fat deposition on the face, abdomen, and extremities, bilateral gynaecomastia is determined, on the skin of the thighs of the shoulders, the abdomen a significant number of pale pink stretch marks. Heart rate is 78 per min., BP - 155/90 mm Hg. Internal organs without changes. The external genitalia are correctly formed, corresponding to the age, on the roentgenogram of the Turkish saddle - without destructive changes. Prolactin, cortisol, LH, FSH, testosterone is within normal limits. What is the cause of obesity in a patient?

- A Adiposo-genital dystrophy
- B Prolactinoma
- C Itzenko-Cushing's disease

D Alimentary-constitutional type

E Hypothalamic syndrome

**4. Summary:**

**5. Recommended reading list**

**Basic:**

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2. Harrison's "Principles of internal medicine" Volume 1,2, 2020, USA. Endocrinology
3. Williams Textbook of Endocrinology by Shlomo Melmed; Ronald Koenig; Clifford Rosen; Richard Auchus; Allison Goldfine , 2019.
4. Greenspan's Basic and Clinical Endocrinology, Tenth Edition by David Gardner; Dolores Shoback, 2018

**Additional:**

1. <https://www.asn online.org/education/training/fellows/educationalresources.aspx#Guidelines>
2. American Association of Clinical Endocrinologists and American College of Endocrinology - Clinical Practice Guidelines Comprehensive Care Plan - © 2019