

## HORMONAL AND ANTIHORMONAL DRUGS (part I)

**A. Actuality** Currently, there is an increase in the incidence of pathological conditions caused by the insufficiency or hyperfunction of the endocrine glands. It is obvious that in the first case hormonal drugs are administered as replacement therapy, and in the second case antihormonal drugs are indicated. Hormonal drugs are also used in the treatment of non-endocrine diseases, as pathogenic therapy.

**B. The purpose of the training is:** to study the pharmacology of hormonal and antihormonal drugs, the principles of selecting drugs according to the pathology and according to the indications, the correct method of prescription.

**C. Learning objectives:**

1) The student **must know:** the definition and classification of hormonal and antihormonal drugs, their pharmacokinetics and pharmacodynamics, forms of delivery and routes of administration of the main drugs, indications, contraindications and adverse reactions.

2) The student **must be able to:** prescribe hormonal and antihormonal drugs in different medicinal forms, indicate them according to the pathological condition and emergency situations.

**D. Knowledge of previous and related disciplines necessary for interdisciplinary integration.**

**Physiology.** General characteristic of endocrine glands. The hormones. The participation of hormones in the body's integral reactions. Pituitary gland. The connection between the pituitary gland and the hypothalamus. Thyroid. Parathyroid glands. Endocrine pancreas.

**Histology.** Endocrine system. The structure of the endocrine glands. The hypothalamus. Pituitary gland.

**Endocrinology.** Peripheral endocrine glands. Thyroid. Parathyroid glands.

**Biochemistry.** The structure, the influence on the metabolism and the mechanism of action of the hormones of the hypothalamus (liberins, statins), the pituitary gland, the thyroid gland, the parathyroid gland and the pancreas.

**Pathophysiology.** Pathophysiology of the endocrine glands. Hyperfunction and hypofunction of the pituitary, thyroid and parathyroid glands, adrenals, gonads and endocrine pancreas, physiopathological mechanisms.

**E. Self-training questions:**

1. Notions of hormone, hormonal and antihormonal drug.
2. Classification of hormonal drugs according to chemical structure and mechanism of action.
3. The mechanism of action of polypeptide and steroid hormones at the cellular level.
4. Hormonal drugs of the hypothalamus: classification, mechanisms of action, indications, adverse reactions.
5. Hormonal medications of the pituitary gland: classification. Adenohypophysis drugs: mechanism of action, indications, adverse reactions.

6. Hormonal drugs of the thyroid gland. Mechanism of action, influence on organ functions and metabolism. Indications, contraindications, adverse reactions, pharmacokinetics.

7. Antithyroid drugs: classification, mechanisms of action, indications and adverse reactions of thioamides, iodine drugs, beta-adrenoblockers.

8. Calcitonin: drugs, mechanism of action, indications, adverse reactions.

9. Hormonal drugs of the parathyroid gland: mechanism of action, effects, indications, adverse reactions.

10. Classification of antidiabetic drugs according to the mechanism of action.

11. Insulin drugs: classification by duration of action of human insulins, mechanisms of action. The influence of insulin on carbohydrate, lipid, protein, hydrosaline balance, liver, striated muscles and adipose tissue metabolism. Indications, side effects and pharmacokinetics of insulin drugs.

12. Drugs used in diabetic (hyperglycemic) and hypoglycemic coma.

13. Classification of oral antidiabetics.

14. Sulfonylureas as antidiabetics: mechanism of action, hypoglycemic effect and other effects, indications, adverse reactions.

15. BigAUnides as antidiabetics: mechanism of action, hypoglycemic effect, other effects, indications, adverse reactions.

16. Meglitinides: mechanism of action, hypoglycemic effect, indications.

17. Thiazolidinediones: mechanism of action, hypoglycemic effect, indications, adverse reactions.

18. Tetrasaccharides: mechanism of action, hypoglycemic effect, indications.

19. GLP-1-receptor agonists: mechanism of action, hypoglycemic effect, indications.

20. DPP-IV inhibitors: mechanism of action, hypoglycemic effect, indications.

21. Selective inhibitors of sodium glucose co-transport 2 (SGLT2): mechanism of action, hypoglycemic effect, cardiovascular effects, indications, adverse reactions.

**F. Individual works for the student's self-training** (points 1, 2 are done in written form during the preparation process)

**1) To prescribe** the following drugs in all medicinal forms:

1. Corticotropin. 2. Oxytocin. 3. Desmopressin 4. Chorionic gonadotropin. 5. Levothyroxine. 6. Thiamazole. 7. Parathyroidin. 8. Calcitonin. 9. Regular human insulin. 10. Insulin aspart. 11 Glibenclamide. 12. Metformin.

<i>Nr.</i>	<i>Drugs name</i>	<i>Doses, delivey form</i>
<b>1</b>	Calcitonin	Powder in amp. 0,0005 Sol.in amp. (50 and 100 IU) 1 ml Aerosol 50;100 and 200 UI
<b>2</b>	Corticotropin	Powder in amp.. 10; 20; 30 AU (i/m)

<b>3</b>	Desmopressin	Tabl. 0,0001 and 0,0002g Aerosol 0,001%-2,5 ml Sol. 0,004%-1 ml in amp.
<b>4</b>	Chorionic gonadotropin	Inject. Sol 0,05%-0,5ml Powder in vials 5000 and 1000 AU
<b>5</b>	Levothyroxine	Tabl. 0,00005; 0,000075 and 0,0001
<b>6</b>	Regular human insulin	Inject. sol 3ml (100UI/ml) Sol. In vials 10ml (100UI/ml)
<b>7</b>	Insulin aspart	Inject. Sol. 3ml (100UI/ml) Sol. In vials 10ml (100UI/ml)
<b>8</b>	Metformine	Tabl. 0,5; 0,85 and 1,0
<b>9</b>	Glibenclamide	Tabl. 0,005
<b>10</b>	Oxytocine	Sol. in amp. 5UI/ml-1ml Aerosol 10UI/ml-10 ml
<b>11</b>	Parathyroidin	Powder in amp. 0,00005 and 0,0001
<b>12</b>	Thiamazole	Tabl. 0,005 and 0,01 Sol. 4%-1 ml in amp.

**2) List the groups and drugs used in (for):** hypothyroidism, myxedema, protection of the thyroid gland from excessive radiation, hyperthyroidism, tetany, diabetes mellitus type 1, diabetes mellitus type 2, drugs that increase insulin release, drugs that increase insulin sensitivity, drugs that inhibit the absorption of glucose from the intestine in diabetes, drugs that contribute to the use of glucose in diabetes, diabetic coma, hypoglycemic coma, diabetes mellitus with obesity.