**HYPNOTICS. ANTICONVULSANTS.ANTIEPILEPTICS. ANTIPARKINSON. CENTRAL MYORELAXANT DRUGS ETHANOL (ETHYL ALCOHOL).**

1. **Actuality.** Medical and social aspects of use of ethyl alcohol requires

thorough study of the pharmacokinetics and its effects on the body. A separate problem is the interaction of alcohol and drugs.

Hypnotics require detailed study of the mechanisms of action and influence on sleep architecture, to select rational correction of sleep disorders and for preventing the adverse reactions of the abuse of hypnotic drugs.

Combating unknown genesis convulsive seizures requires emergency medical care and deep knowledge of the pharmacokinetic and pharmacodynamic properties of these drug’ classes.

Epilepsy, a medico-social disease, requires a detailed knowledge of pharmacokinetic and pharmacodynamic properties of antiepileptic drugs to ensure an effective and harmless treatment.

Treatment of Parkinson's disease or Parkinson's syndrome will be based on deep knowledge of the pharmacological properties of antiparkinsonian drugs.

**B. The purpose of the training is** to familiarize the students with the

pharmacological properties of hypnotics, symptomatic anticonvulsants, antiepileptics, antiparkinsonian drugs and ethyl alcohol.

**C.Learning objectives:**

1. The student must **know:** the general characteristicts of the hypnotics, symptomatic anticonvulsants, antiepileptics, antiparkinsonian drugs and ethyl alcohol, to classify them into distinct groups, all the while getting familiarized with their different nomenclatures, mechanisms of action, specific indications, contraindications, and adverse-reactions, as well as with their various dosage forms and ways of administation, finally including special peculiarities allowing to spot their overdose, followed by conventional methods of management.

2) The student must **be able to:** prescribe the compulsory drugs in all their clinically approved dosage forms, as well as to be able to select the optimal pharmacologic aproach(es) in order to treat and/or manage a given disorder.

**D.Initial level of knowledge required for interdisciplinary integration:**

 **Human physiology.** Sleep as a physiological process: its phases and levels. Theories of sleep. Interaction between cerebral cortex, hypothalamus and reticular formation during sleep and waking.

**E.Self-training questions:**

1. Hypnotic drugs. Principles of classification (by structure and duration of action)
2. Barbiturates. Classification by duration of action. Pharmacokinetics. Mechanism of action, influence on the structure of sleep, indications, side effects. Tolerance, drug addiction. Acute barbiturates intoxication: clinical picture, treatment. Particularities of barbiturates use in children. Particularities of hypnotic intoxication in children.
3. Benzodiazepines. Classification by duration of action. Pharmacokinetics. Mechanism of action, influence on the sleep structure, indications, adverse reactions. Benzodiazepine antagonists. Drug addiction.
4. Non-benzodiazepine hypnotics: Mechanism of action, influence on sleep structure, indications, adverse reactions, pharmacokinetics.
5. Melatonin receptor agonists: mechanism of action, influence on the structure of sleep, indications, adverse reactions.
6. Other groups of drugs with hypnotic action (antidepressants, H1-antihistamines, anxiolytics, antipsychotics, orexin antagonists, sedatives). Particularities of action and use.
7. Symptomatic anticonvulsant medications(widespread). Classification by group membership and influence on the respiratory center. Characteristics of groups. Particularities of use in children.
8. Antiepileptic drugs: classification, mechanisms of action, indications, adverse reactions, pharmacokinetics.
9. Antiparkinsonian drugs: classification, mechanisms of action, indications, adverse reactions, pharmacokinetics.
10. Antispastics of skeletal muscles (central muscle relaxants): classification, mechanism of action, indications.
11. Ethanol - pharmacokinetics (absorption, distribution, metabolism and elimination).
12. Pharmacodynamics of alcohol (ethanol) (influence on the central nervous system, cardiovascular system, digestive tract organs, local action, reflex action, antiseptic and energetic action). Indications.
13. The principles of treatment of acute alcohol intoxication and alcoholism. Interaction of alcohol with other drugs.

**F. Independent work** (is done in written form while preparing for the lesson)

**1.) Brief characteristics of compulsory drugs:**

 Down: Drug name. 1. Phenobarbital 2. Sodium thiopental 3. Oxazepam 4. Nitrazepam 5. Zopiclon 6. Diazepam 7. Levodopa 8. Selegilin 9. Trihexifenidyl 10. Amantadine 11. Bromocriptine 12. Phenytoin 13. Carbamazepine 14. Sodium Valproate 15. Etosuximide 16. Lamotrigine 17. Tolperison 18. Tizanidine. 19 Ethyl alcohol 20. Disulfiram. 21. Nakom.

 **Across:** 1. Medicinal form. 2. Way of administration. 3. Doses (therapeutic, maximal for one intake and for 24 hours). 4. Spectrum of action 5. Mechanism of action. 6. Indications and contraindications. 7. Side effects.

# 2.) Questions on medical prescriptions.

**To prescribe** the following drugs in all the possible medicinal forms:

1. Phenobarbital 2. Sodium thiopental 3. Oxazepam 4. Nitrazepam 5. Zopiclon 6. Diazepam 7. Levodopa 8. Trihexifenidyl 9. Selegilin 10. Amantadine 11. Phenytoin 12. Bromocriptine 13. Carbamazepine 14. Sodium valproate 15. Etosuximide 16. Lamotrigine 17. Tolperison 18. Tizanidine. 19 Ethyl alcohol 20. Disulfiram.21. Nakom.

**Drugs used in (for):** sleep deprivation (initial hyposomnia), early awakening (terminal hyposomnia), frequent nocturnal awakenings (intermittent hyposomnia), decreased sleep duration, superficial sleep, seizures of unknown genesis, major epilepsy attacks, minor epilepsy attacks, myoclonic seizures, (focal) epilepsy, epileptic seizure, Parkinson's disease, alcoholism, acute alcohol intoxication, overdose of benzodiazepine, spastic states of skeletal muscles (rigidity).

**3.) Tests** (Guidelines for Laboratory Work in Pharmacology).

**4.) Clinical case** (Guidelines for Laboratory Work in Pharmacology).

**5.) Virtual situations** (Guidelines for Laboratory Work in Pharmacology).

**6.) Virtual didactic movie.**

**7.) Tables**

Table N1

**Comparative characteristic of hypnotic drugs**

|  |  |  |  |
| --- | --- | --- | --- |
| Parameters | Barbiturates | Benzodiazepines | Non-benzodiazepines |
| Drugs with short duration |  |  |  |
| Drugs with medium duration |  |  |  |
| Drugs with long duration |  |  |  |
| Influence on the slow sleep phase |  |  |  |
| Influence on rapid sleep phase |  |  |  |
| Influence on sleep installation |  |  |  |
| Influence on sleep duration |  |  |  |
| Influence on nocturnal awakening |  |  |  |
| Degree of post-action syndrome (marked / reduced) |  |  |  |
| Other pharmacological effects |  |  |  |
| Enzymatic induction (pronounced / low) |  |  |  |
| Tolerance(specific/non specific) |  |  |  |
| Drug addiction(psychic, physical) |  |  |  |
| Inhibition of respiratory center (marked / reduced) |  |  |  |
| Specific antagonists |  |  |  |

Table 2

**Comparative characteristic of antiepileptic drugs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Drug | Administration in epilepsy | Status epilepticus | Partial crises | Induction of microsomal enzymes |
| Major crises | Minor crises | Psychomotor crises |
| Phenobarbital |  |  |  |  |  |  |
| Phenytoin |  |  |  |  |  |  |
| Carbamazepine |  |  |  |  |  |  |
| Clonazepam |  |  |  |  |  |  |
| Diazepam |  |  |  |  |  |  |
| Sodium valproate |  |  |  |  |  |  |
| Etosuximide |  |  |  |  |  |  |
| Lamotrigine |  |  |  |  |  |  |

Please express the presence of a pharmacologic effect with a “+” sign.

**8.) Solve the case:**

**Clinical case 1**

A patient with sleep disorder (falling asleep over 1-1.5 hours) used a hypnotic drug 10 minutes before sleep. Sleep occurred over 45 minutes, and in the morning at the awakening the patient noted the presence of drowsiness, decreased attention and work capacity.

Whici hypnotic drugs could use the patient?

What phenomenon occurred the next day?

What can be the causes of this phenomenon?

Which hypnotic drugs do you recommend to the patient?

**Clinical case 2**

In the emergency room, were brought to the hospital by the emergency team, 2 patients with convulsive syndrome and the doctor gave them parenteral drug A at the transport stage. The convulsions were abolished. In the hospitalization department, patient M was found to suffer from epilepsy, and patient N accidentally ingested a chemical compound.

Which drug the emergency team doctor gave?

What is the pharmacological group?

What is the mechanism of action of the drug?

What are the parenteral routes of administration of the drug and the particularities of the development of the effect and adverse reactions?

Prescribe the recipe.

9.) Crossword
 Determine hypnotic drugs:

1. Non-benzodiazepine drug
2. Long-acting benzodiazepine drug
3. Short-acting benzodiazepine drug
4. H1-antihistamine drug
5. Barbiturates with short duration of action
6. Barbiturates with long duration of action
7. Benzodiazepine antagonist.