Посветени на хуманността
МЕДИЦИНСКИ УНИВЕРСИТЕТ – ПЛОВДИВ
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Dedicated to humanity
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EXAMINATION TOPICS IN TOXICOLOGY FOR PHARMACY STUDENTS

General Toxicology

1. Basic concepts and processes - xenobiotics, toxins, poison, poisoning, acute and chronic poisoning, delayed toxicity. Classifications of the toxic substances.

2. Toxicity. Criteria for toxicity. Methods for evaluation of the toxic effects of chemical substances. Quantitative characteristics (LD50, ED50, TD50, TI).

3. The relation between the chemical and physical properties of substances, and their toxicity.

4. Factors, influencing the toxicity of the xenobiotics during the phases of absorption, distribution, metabolism, and excretion.

5. Toxicokinetics - absorption of xenobiotics in the organism - „gates of entrance" and absorption. Specifics related to the entrance route. The fate of the xenobiotics in the human body.

6. Distribution, biotransformation, and excretion of xenobiotics. Possibilities for pharmacological influence on the toxicity.

7. Mechanisms of the toxic action of xenobiotics – direct cytotoxicity and free-radical processes. Examples. Antioxidants.

8. Mechanisms of toxic action of xenobiotics - interaction with thiol (-SH) groups. Mechanisms of toxic action of cyanides, carbon monoxide, aromatic hydrocarbons and *Amanita phalloides.*

9. Mechanisms of toxic action of xenobiotics - alkylation of biomolecules; changes in neurotransmitter levels; blocking the transmission of nerve impulses.

10. Delayed toxicity – immunotoxicity, immunosuppression, and immune-mediated hypersensitivity. Xenobiotics and allergens.

11. Mutagenesis, and genotoxicity – mechanisms, effects, examples of toxicants.

12. Carcinogenesis – main processes and stages. Examples of carcinogenic toxicants.

13. Adverse drug reactions - basic concepts, classification, examples. Risk factors for adverse reactions.

14. Natural (physiological) antitoxic defense – components, types, and mechanisms.

15. Basic principles and approaches for treatment of acute and chronic poisonings. Basic detoxification methods – general and specific.

Special Toxicology

16. Drugs, used for treatment of poisonings - antidotes. Types, mechanism of action, examples.

17. Drugs, used for treatment of poisonings – solutions for infusion, organ-protective medications, symptomatic agents.

18. Organ toxicity – poisons with primary gastrointestinal toxicity. Types, mechanisms, examples of toxicants. Drug poisonings with salicylates - manifestations, treatment and prevention.

19. Organ toxicity – liver toxicity, mechanisms of liver injury. Examples – drugs, chemicals, toxins of biological origin.

20. Toxicity of Paracetamol - mechanism, manifestations and treatment. Intoxication with *Amanita phalloides* - manifestations and treatment.

21. Organ toxicity – neuronal toxicity. Types, mechanisms, examples. General characteristics and principles of treatment. Drug poisonings - benzodiazepines, antipsychotics, opioid analgesics and organophosphate pesticides – manifestations and treatment.

22. Organ toxicity - poisons with primary cardiovascular toxicity. Types, mechanisms, examples of toxicants.

23. Adverse drug reactions and toxicity of adrenomimetics, cardiac glycosides, beta blockers, Ca^{2+} channel blockers – manifestations, prevention, principles of treatment of intoxications.

24. Pulmonary toxicity – types and mechanisms of pulmonary toxicity, examples.

25. Poisonings with carbon monoxide, chlorine, nitric and sulfuric gases.

26. Organ toxicity - hematological toxicity - xenobiotics, affecting the blood. Xenobiotics with hematopoietic inhibitory effect. Homeostasis disruption and safety profile of anticoagulants.

27. Nephrotoxicity - types of kidney damage and nephrotoxic substances (metals, drugs).

28. Reproductive toxicity – drug-induced damage of reproduction and embryonic development. Pregnancy risk drug category (PRC) – definitions and examples.

29. Teratogenesis – mechanisms, factors, examples.

30. Drug abuse and dependence. Intoxications with opiates, psychostimulants and hallucinogens. Manifestations and treatment.

31. Intoxications with ethyl alcohol, methyl alcohol and ethylene glycol. Manifestations, treatment and prevention.

32. Intoxications with heavy metals - cadmium, arsenic, mercury, lead.

33. Toxo-allergic/anaphylactic shock. Causes, physical signs and treatment. Intoxications caused by reptiles and insects – local and general manifestations.

Main literature sources:

1. Casarett & Doull’s Essentials of Toxicology, 4e, **2021** Curtis D. Klaassen, John B. Watkins III.
2. Goldfrank's Toxicologic Emergencies, 11e, **2019** Lewis S. Nelson, Mary Ann Howland, Neal A. Lewin, Silas W. Smith, Lewis R. Goldfrank, Robert S. Hoffman.
3. Basic and clinical pharmacology with toxicology / Nadka Boyadjieva, Delyan Delev, Damianka Getova, Iliya Kostadinov, Lyudmil Peychev et al.; Ed. Nadka Boyadjieva. - 3rd ed.- Sofia : ARSO, **2021**.
4. Illustrated toxicology:With study questions / PK Gupta. - London : Elsevier, Academic press, **2018**.
5. A textbook of modern toxicology. Earnest Hodson /ed/ IV ed. J. Wiley and sons, Hoboken, New Jersey, **2010**
6. Basic principles of clinical toxicology. Yanko T. Iliev, Stefan Popov. - Plovdiv: Lax book, **2014**.

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Approved by:....................................
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