MEDICAL UNIVERSITY OF PLOVDIV
FACULTY OF PHARMACY
DEPARTMENT OF PHARMACOLOGY AND DRUG TOXICOLOGY

TOXICOLOGY EXAMINATION TOPICS FOR PHARMACY STUDENTS 2019/2020

1. Types of intoxications, classifications.

2. A short history of toxicology. Basic definitions – poison, poisoning. Current epidemiology of intoxications.

3. Toxic aggression – mechanisms of the injury and phenomena related to the toxic aggression. Mechanisms of toxicity in depth.

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

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

6. Basic terms and processes – toxic aggression and antitoxic defense.

7. Determinants, influencing the toxicity of the xenobiotics during the phases of absorption, distribution, metabolism, and excretion.

8. Penetration 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.

9. General guide to diagnosis in case of provisional poisoning.

10. Distribution, biotransformation, and excretion of xenobiotics. Toxicological and pharmacological characteristics for evaluation and prediction.

11. Toxic action of xenobiotics – cytotoxicity and free-radical processes, sulfhydryl (-SH) groups, and specific receptor proteins. Changes in the biochemical mechanisms, augmentation of the toxic effect. "Lethal synthesis".

12. Acute toxicity – "outward" manifestation of poisoning

13. Delayed toxicity 1 – immunotoxicity, immune suppression, and immune-mediated hypersensitivity. Xenobiotics and allergens.

14. Delayed toxicity 2 – reproductive toxicity, mutagenesis, and carcinogenesis.

15. The manifestation of organ toxicity. Pharmacological prevention of poisonings in general.

16. Natural antitoxic (physiological) defense – biological relevance, types, and mechanisms.

17. Medical antitoxic defense - "the 10 steps". Role of the pharmacist in case acute, chronic and ecological toxicity.

18. Basic principles and approaches for treatment of acute and chronic poisonings. Basic detoxication methods – general and specific.

19. Most common acute and chronic poisonings – principles of recognition, treatment, and prevention. Comparison between adverse drug reactions and drug poisoning.

20. Organ toxicity – hepatotoxicity, mechanisms of liver injury. Examples – drugs, chemicals, organic toxins.

21. Organ toxicity – neurotoxic poisons Types, mechanisms, typical toxicants. Examples.

22. Organ toxicity - poisons with primary cardiovascular toxicity. Types, mechanisms, representative toxicants. Examples. Pharmaceutical prevention.

23. Organ toxicity – poisons with primary gastrointestinal toxicity. Types, mechanisms, representative toxicants. Examples.

24. Hematotoxicology - xenobiotics, affecting the blood. Homeostasis disruption and safety profile of anticoagulants. Examples. Pharmaceutical prevention.

25. Drug poisonings – benzodiazepines, neuroleptics. Epidemiology, basic clinical characteristics, treatment. Pharmaceutical prevention.

26. Drug poisonings – NSAID, salicylates, paracetamol, etc. Epidemiology, basic clinical characteristics, treatment. Pharmaceutical prevention.

27. Drug poisonings – cardiac glycosides, calcium-channel blockers, β-blockers. Epidemiology, basic clinical characteristics, treatment. Pharmaceutical prevention.

28. Intoxications caused by reptiles and insects – local and general manifestations of poisoning.

29. Intoxications with carbon monoxide, chlorine, nitric and sulfuric gases. Environmental toxicity.

30. Intoxications with opiates, psycho stimulants and dyspeptic hallucinogens. The "New-born" narcotics. Drug addiction.

31. Intoxications with ethyl alcohol, methyl alcohol and ethylene glycol. Epidemiology and biological distinction.

32. Management of the toxicological medical treatment. Professional cooperation between the medical specialists and the pharmacist in the health-care system.

33. First-aid pre-medical treatment in case of poisoning (instructions for pharmacists) – principles, indications, techniques, medical and legal restrictions.

34. Antidotes. Types, mechanism of action, pharmaceutical formulations, application and delivery.

35. Toxo-allergic/anaphylactic shock. Causes, physical signs of manifestations and treatment. Role of the pharmacist – prevention and support ("the 10 steps").

36. Drug therapeutic treatment of poisoning – solutions for infusion, ogranoprotective medications, symptomatic agents.

Sources:

1. Lectures – prof. d-r Y. Iliev, MD, PhD, MHM, ERT
2. "Basic principles of clinical toxicology" – Y. Iliev, S. Popov. Lax book, Plovdiv, 2014
3. Practicals
4. "Toxicology tests for pharmacy students" – Engl. Ed, Lax book, Plovdiv, 2019
5. Internet – for reference
6. A textbook of modern toxicology. Earnest Hodson/ed/ IVed. J. Wiley and sons, Hoboken, New Jersey, 2010
7. Poisoning and Toxicology handbook. 4 th ed. Jerrold B. Leikin, MD. Frank P. Paloucek, PharmD/ Lexi-Comp, USA. 2008

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Topics for reports in toxicology

1. Epidemiology of the intoxications around the world and in Bulgaria
2. Bulgarian herbs with potential toxicity
3. Antidote drugs – from ancient to present times
4. Poisons and poisonings in the Antiquity – toxo-pharmaceutical basics
5. Comparative characteristics of the toxicity of benzodiazepine drugs
6. Current neuroleptics – a comparative pharmaco-toxicological characteristic
7. Drug toxicity of anti-arrhythmic
8. „New" narcotics – Pharmacological characteristics and toxicity
9. Comparative characteristic of alcohol poisonings – ethyl alcohol, methyl alcohol, and ethylene glycol
10. The most poisonous animals and herbs around the world
11. Toxic injury of the liver (steatosis, necrosis, cholestasis, tumors) and hepatoprotective drugs
12. Toxic injury of the kidney. Nephroprotective treatment
13. Toxic injury of the haemopoiesis (aplasia and agranulocytosis, hemolysis, haemo-depressive effect). Drugs with protective/stimulating activity on the leucopoiesis – recombinant growth factors
14. Toxic injury of the immune system (immunosuppression, immune-mediated reactions) – inhibitors of calcineurin, TOR-inhibitors, anti-proliferative cytostatic drugs, monoclonal and polyclonal antibodies.