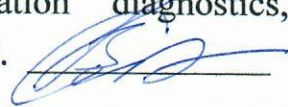


Test control over radiation medicine

Approved:

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1. The maximum permissible dose for group "A" per year is:

- A. 0.5 Baer
- B. 1.5 Baer
- C 5.0 Baer
- D. 10.0 Baer
- E. 3.5 Baer

2. The maximum permissible dose for group "B" per year is:

- A. 0.5 Baer
- B. 1.5 Baer
- C 5.0 Baer
- D. 10.0 Baer
- E. 3.5 Baer

3. Radiation research methods include:

- A. Sonography
- B. Tomography
- C. With Doppler
- D. radiocardiography
- E. Echography

4. The unit of measurement of the absorbed dose is:

- A. Baer
- B. Roentgen
- S. Gray
- D. Zievert
- E. Curie

5. The unit of measure for the equivalent dose is:

- A. Curie
- B. Roentgen
- S. Rad
- D. Gray
- E. Sievert

6. The first group of critical organs includes:

- A. Bone tissue
- B. Gonads

C. Thyroid gland

D. Liver

E. Leather

7. The third group of critical bodies includes:

A. Red bone marrow

B. Kidneys

C. Leather

D. Lens

E. Muscles

8. The physical half-life of a radionuclide is:

A. The time during which the activity of the drug is reduced by half due to withdrawal.

B. The decay time of half of the atoms of the nuclide

C. The time during which the activity of the radionuclide is reduced by half due to physical decay and due to withdrawal

D. Time of absorption of half of the atoms of the nuclide.

E. The time during which there is an accumulation of half of the atoms of the nuclide in the critical organ.

9. The unit of measurement of the activity of a radioactive substance is:

A. Becquerel

V. Zievert

S. Gray

D. Roentgen

E. Coulomb / kg

10. What is natural radioactivity:

A. Radiation of Alpha - particles

B. Emission of beta particles

C. Radiation of gamma particles

E. X-rays

E. Radiation of alpha, beta, gamma particles

11. How do you understand the meaning of isotopes:

A. Items with the same

B. Elements with different numbers of neutrons in the nucleus.

C. Elements with the same number of neutrons and protons in the nucleus

E. Elements with the same number of protons in the nucleus

12. The priorities for the discovery of natural radioactivity belong to:

A. Bor

W. Rutherford

S. Becquerel

D. Gray

E. Curie

13. Characterize Alpha particles:

A. High penetrating power

B. Average penetrating power

C. Low penetration

E. High energy radiation

E. Low energy radiation

14. In what units is the activity of radioactive substances measured:

A. Curie / kg

V. Joule / kg

S. Becquerel

D. Gray

E. Sievert

15. Gas discharge meters are used as sensors in:

A. dosimeters

B. In radiometers

C. With radiometers

D. scanners

E. Gamma cameras

16. Methods of protection for alpha radiation:

A. Shielding

B. It is not necessary

C. Distance

E. Time, shielding, distance

E. Time

17. Methods of protection for gamma radiation:

A. Shielding

B. It is not necessary

C. Distance

E. Time, shielding, distance

E. Time

18. The most radiosensitive is:

A. Red bone marrow

B. Spleen

C. Liver

D. Thyroid gland

E. Leather

19. The most resistant are:

- A. Red bone marrow
- B. Spleen
- C. Liver
- D. Thyroid gland
- E. Leather

20. The half-life of I (131) is:

- A. 8.3 days
- B. 8 days
- C. From 28 days
- D. 10 months
- E. 25 minutes

21 The half-life of Sr (90) is:

- A. 8.3 days
- B. 8 days
- C. From 28 days
- D. 10 months
- E. 25 minutes

22. The first group of critical organs includes:

- A. Gonads
- B. Thyroid gland
- C. Bones
- D. Leather
- E. Lymphoid tissue

23. The second group of critical organs includes:

- A. Gonads
- B. Thyroid gland
- C. Bones
- D. Leather
- E. Lymphoid tissue

24. Bergonier's theory was formulated in:

- A. 1911
- B. 1898
- C. Since 1906
- D. 1952
- E. 1946

25 Blair's theory was formulated in:

- A. 1911
- B. 1898
- C. Since 1906

D. 1952

E. 1946

26. Reparation processes in the human body are possible when exposed to ionizing radiation in a dose

A. 4 - 5 Rad

B. 10 Gr

C. From 6 Gr

D. 5 Baer

E. 10 Bq

27 Somatic effects are noted at dose

A. 4 - 5 Rad

B. 10 Gr

C. From 6 Gr

D. 5 Baer

E. 10 Bq

28. Describe Beta rays:

A. Average penetrating power

B. Low penetrating power

C. High penetrating power

D. High ionization density

E. High energy radiation

29. Describe the Gamma - rays:

A. Average penetrating power

B. Low penetrating power

C. High penetrating power

D. High ionization density

E. High energy radiation

30. What is radioactivity:

A. Number of decays per hour

B. Number of decays per minute

C. Number of pulses

D. Number of decays per second

E. Ratio of decay to mass of matter

31. Determine the approximate dose of radiation and the severity of acute radiation sickness caused by uniform external irradiation in the presence of the following clinical signs in victims A.: latency period of 30 days. In the blood, leukocytes are $3 \times 10^9 / l$. Platelets $100 \times 10^9 / l$. Agranulocytosis and thrombocytopenia were not observed.

A. Radiation dose 5 - 6 Gr

- B. Radiation dose 7 - 8 Gr
- C. Radiation dose 8 - 10 Gr
- D. Radiation dose 1 - 2 Gr
- E. Radiation dose 6 - 7 Gr

32. Determine the radiation dose to the victim due to uniform external radiation in the presence of the following clinical signs: the duration of the period is 15 - 25 days. In the clinical picture: bleeding, hair loss, infectious complications, in the blood: thrombocytopenia ($40 \times 10^9 / l$), ESR 20 - 40mm / h:

- A. Radiation dose 1 - 2 Gr
- B. Radiation dose 2 - 4 Gr
- C. Radiation dose 5 - 6 Gr
- D. Radiation dose 7 - 8 Gr
- E. Radiation dose 8 - 10 Gr

33. In the victim S., due to external uniform irradiation, the following clinical signs are noted during the period of the primary reaction: repeated vomiting, general weakness, headache, slight hyperemia of the skin and visible mucous membranes, body temperature within 37.0 - 37.5 C., disorder of the digestive tract. Significant approximate radiation dose:

- A. Radiation dose 1 - 2 Gr
- B. Radiation dose 2 - 4 Gr
- C. Radiation dose 5 - 6 Gr
- D. Radiation dose 7 - 8 Gr
- E. Radiation dose 8 - 10 Gr

34. Patient N. due to uniform external irradiation has the following clinical symptoms during the height of the disease: the duration of the latent period of the height of the disease is 8 - 17 days, in the clinical picture: bleeding, hair loss, infectious complications; the number of leukocytes in the blood is $05 \times 10^9 / l$, agranulocytosis appeared on the 8-20th day after irradiation, ESR 40-80mm / h:

- A. Radiation dose 1 - 2 Gr
- B. Radiation dose 2 - 4 Gr
- C. Radiation dose 5 - 6 Gr
- D. Radiation dose 7 - 8 Gr
- E. Radiation dose 8 - 10 Gr

35. During the peak period of severe radiation sickness, patient S. developed torrential diarrhea. The tongue is coated with a white coating, erosion on the mucous membrane of the mouth, the abdomen is soft, on palpation - rumbling. Set the form of radiation sickness:

- A. Intestinal
- B. Toxemic

- C Cerebral
- D. bone marrow
- E. Transitional

36. Patient V., with severe radiation sickness, developed pain in the mouth. Opening the mouth is difficult, chewing and swallowing are sharply disturbed, covered with viscous mucus and pus, there are multiple erosions. Set the form of radiation sickness.

- A. Toxemic
- B. Intestinal
- C. Ulcerative - necrotizing radiation stomatitis
- D. bone marrow
- E. Cerebral

37. Patient K., radiography laboratory assistant. The value of gamma irradiation per day is -0.65 R. After 2 years of work with 60 C, irritability, headaches, and poor appetite appeared during examination. Blood test is normal. 6 years after the termination of contact with ionizing radiation during examination, they complained of persistent headaches, dizziness, pain in the region of the heart, increased, fatigue, weakness, there is an unstable peripheral blood (especially white). Make a diagnosis:

Mild acute radiation sickness

- B. Acute radiation sickness of moderate degree
- C. Severe acute radiation sickness
- D. Chronic radiation sickness of the 2nd degree of severity
- E. Chronic radiation sickness grade 3

38. Patient G., researcher. Was irradiated for 10 seconds with 48 cobalt rods 80 mm high, 9 m in diameter, the total activity was 36 kg-eq. Radium. After 2:00, general weakness, dizziness, repeated vomiting, temperature up to 38.0 C. Intense hair loss in the frontotemporal region. Disease diagnosis:

- A. Acute radiation sickness of the 1st degree
- B. Acute radiation sickness of the II degree
- C Intestinal form of acute radiation sickness
- D. Acute radiation sickness of the III degree
- E. Toxemic form of acute radiation sickness

39. Patient G., underwent general short-term (less than 10 sec) uniform gamma and neutron irradiation. Pain, nausea, moderate unstable lymphopenia (10% in 1 mm (3)), moderate leukocytosis (11000 in 1 mm (3)). The transition to stages 2 and 3 of the disease is indistinct. When the patient is observed for 10 years, she remains practically healthy. A pathogenetic study of peripheral blood culture revealed rare chromosomal aberrations (0.01 - 0.03 per cell). Diagnose the disease:

- A. Toxemic form of acute radiation sickness
- B. Cerebral form of acute radiation sickness
- C. Intestinal form of acute radiation sickness
- D. Chronic radiation sickness of the 1st degree
- E. Mild acute radiation sickness

40 Patient P., on the overlay of an electron accelerator. The total dose for 8 years of work is 24.8 Ber. When stopped, complains of headache, poor appetite. An objective study did not reveal any health disorders. The picture of peripheral blood and bone marrow was normal. Make a diagnosis:

- A. Mild acute radiation sickness
- B. Acute radiation sickness of moderate degree
- C. Chronic radiation sickness of the 1st degree of severity
- D. Moderate acute radiation sickness
- E. Severe acute radiation sickness

41 Patient S., a nurse in the X-ray room. Has been working for 10 years. The total exposure doses for uniform gamma irradiation were 250 - 300 R. for 8 years of work. In the fifth year of work, general weakness, drowsiness, increased fatigue appeared, in the blood - moderate leukopenia (3600 - 4400 in 1 mm³), moderate unstable decrease in the number of platelets (3800000 in 1 mm³), ESR 18 mm / hour ... Make a diagnosis:

- A. Period of primary reaction of acute radiation sickness
- B. The peak period of acute radiation sickness
- C. Latent period of acute radiation sickness
- D. Chronic radiation sickness of mild degree
- E. Chronic moderate radiation sickness

42. Younger people are not allowed to work in radiological laboratories:

- A. 25 years
- B. 18 years old
- C. From 20 years old
- D. 27 years old
- E. 30 years

43. Radiation protection is not provided:

- A. Casings
- B. Detector
- C. With Containers
- D. Concrete pavements
- E. Distances

44. The receiver of radiation in all radio diagnostic devices is:

- A. Collimator

- B. Detector
- C. Induction unit
- D. Electronics unit
- E. Recorders

45. The natural background of external radiation on the territory of Ukraine creates a dose rate:

- A. $5 + 0.1 \text{mSv / year}$
- B. $2.5 + 0.1 \text{mSv / year}$
- C. From $7.2 + 0.1 \text{mSv / year}$
- D. $1.0 + 0.1 \text{mSv / year}$
- E. $10.0 + 0.1 \text{mSv / year}$

46. Dose absorbed:

- A. Ratio of the average energy transferred by ionizing radiation to matter in an elementary volume
- B. To the mass of matter in this volume
- C. Energy absorbed by a unit volume of air
- D. Maximum allowable dose
- E. Activity of a radioactive substance per unit of time

47. Radiation mutations result from:

- A. Direct action of radiation on DNA molecules in chromosomes
- B. Uniform external and internal radiation
- C. Combined exposure
- D. combined action of radiation
- E. Acute radiation sickness

48 In which phase of embryogenesis the radioresistance of the embryo is highest:

- A. Period of previous attachment of the egg to the uterine mucosa
- B. Stages of implantation
- C. Period of organogenesis
- E. Fruit period

49. The most typical form of acute radiation sickness is:

- A. Bone - cerebral
- B. Intestinal
- C. Thermal
- D. Transitional
- E. Cerebral

50. The fatal outcome in the toxic form of acute radiation sickness occurs on:

- A. 2 - 4 days
- B. 8 days
- C. 10 - 12 days

D. 12-14 days

E. 14-16 days

51. The number of leukocytes in the blood on the 3rd - 6th day in the latent period of acute radiation sickness of the III degree of severity is

A. 1.0 - 0.8 g / l

B. 0.8 - 0.5 g / l

C. 0.5 - 0.3 g / l

D. 0.1 - 0.2 g / l

E. 0.01 - 0.05 g / l

52. The beginning of the peak period at the II degree of severity of acute radiation sickness:

A. 2 - 4 days

B. 4-7 days

C. 8 - 15 days

D. 15 - 20 days

E. 2 - 4 hours

53. The intestinal form of acute radiation sickness develops at a dose of radiation:

A. 2 - 5 Gr

B. 10 - 20 Gr

C. 30 - 40 Gr

D. 5 - 10 Gr

E. 35 - 55 Gr

54. Epilar effect of the skin occurs at a dose

A. 1.0 - 0.5 gr

B. 1.5 - 2 Gr

C. 2.0 - 3.0 Gr

D. 3.5 - 5 Gr

E. 2.5 - 3.0 Gr

55. With a third degree radiation burn during the latency period, vesicles on the skin appear through:

A. 1 - 2 days

B. 2 - 3 days

C. 3 - 4 days

D. 4 - 5 days

E. 5 - 6 days

56. When carrying out iodine prophylaxis, the daily dose of potassium iodide for adults is:

A. 0.02 / day

B. 0.03g / day

C. From 0.3 / day

D. 0.5 g / day

E. 0.25 / day

57. The latent period with radiation cataract continues:

A. 2 - 3 weeks

B. 2 - 10 days

C. 1 - 2 weeks

D. 10 - 12 hours

E. Several months or a year

58. In chronic radiation sickness of the II degree of severity, the following is not observed:

A. Persistent leukopenia

B. Persistent reticulocytopenia

C. Rarely severe hemorrhagic syndrome

D. thrombocytopenia

E. Circulatory failure

59. X-ray examinations are indicated for children with:

A. 2 years

B. At 4 years old

C. From 6 years old

D. 8 years

E. 14 years old

60. The life expectancy after irradiation at a dose of 1200 - 1500 R is:

A. And 2 hours

B. 10 o'clock

C. From 24 hours

D. 2 - 3 days

E. 7 day

61. Patient M., during an accident, received a dose of external gamma and neutron irradiation of 300 R. An hour later, profuse vomiting, repeated, which was repeated within 6 hours, feeling unwell, general weakness, decreased motor activity for 3 days. Normal temperature, the absence of sharp changes in the activity of the central nervous system, a long latent period of the disease. Determine the form of radiation exposure by the severity of the flow:

A. Easy

B. Severe

C. Average

D. Extremely severe

E. Chronic

62. In what period of radiation sickness and for which form the vitamin complex is not indicated?

- A. The peak period of moderate radiation sickness
- B. During the initial period of severe ARS
- C. During the latent period of moderate radiation sickness
- D. In the recovery period of the average form of the disease
- E. During the height of the severe form of radiation sickness

63. What diseases most often have to differentiate chronic radiation sickness

- A. Organic lesions of the central nervous system
- B. Chronic gastroenteritis
- C. With myocarditis
- D. Focal nephritis
- E. Septic endocarditis

64. The patient has a superficially located thyroid nodule. In / in it was introduced 200 ml and (131) and after 24 hours of radiometry. The background radiation is 25 imp / min., Above the control site, 360 imp / min was calculated., Above the node, 500 imp / min. How long does it take to perform radiometry of the tumor node so that the measurement error does not exceed 3%?

- A. 10min
- B. 15min
- C. From 3 min
- D. 30min
- E. 30sec

65. The half-life of ^{32}P is:

- A. 60 days
- B. 10 days
- C. From 5 years old
- D. 14 days
- E. 1 year

On December 1, 1999, a gamma device with a charge of 60 E Gg-eq of radium was installed in the radiological department. What will be the gamma activity of this installation on July 31, 2000 in radium equivalents?

- A. 50.3 eq of radium
- B. 500.3 eq of radium
- C. 300.5 eq of radium
- D. 30.5 eq of radium
- E. 925.5 eq of radium

67. The dose rate of cosmic radiation at sea level is equal to 0.0304 g / g. What absorbed dose from the cosmic background will receive a person who lives in these

conditions for a year? The x-ray to radium conversion factor is 0.963.

A. 0.0293 Rad

B. 0.29 Rad

C. 2.93Rad

D. 2.93×10^{-10} J / kg

E. 2.93×10^4 J / kg

68. Are the acts of ionization evenly distributed in different parts of the cell (nucleus, nucleolus, cytoplasm) during its irradiation?

A. It depends on the number of acting particles and photons

B. It does not depend on the number of acting particles and photons

C. If the number of particles and photons is small

D. If the cell is in the sphere of action of a beam of particles (photons)

E. If the action of particles and photons is directed only at the nucleus

69. Half-life of radioactive strontium (^{90}Sr):

A. 28 days

B. 28 years old

C. 40 days

D. 30 min

E. 65 days

70. The half-life of radioactive gold (^{198}Au):

A. 6 hours

B. 3 days

C. From 8.3 days

D. 30 days

E. 30 min

71. Radioactive strontium (^{85}Sr) is used in radionuclide diagnostics for research:

A. Thyroid gland

B. Liver

C. From the kidneys

D. osteoarticular system

E. Skin

72. Ways of withdrawal of gishrugan (^{131}I):

A. Not displayed until complete disintegration

B. Through the intestines

C. Through the skin

D. With urine

E. Through the lungs

73. Output paths Bengal pink (^{131}I):

A. Not displayed until complete disintegration

- B. Through the intestines
- C. Through the skin
- D. With urine
- E. Through the lungs

74. What is the range of an alpha particle with an energy of 5 MeV in air and breast tissue?

- A. 35cm and 32.2mm
- B. 40m and 29.0mm
- C. With 25mm and 20mm.
- D. 50cm and 10mm.
- E. 5cm and 5mm.

75. In what case will there not be a significant drop in radiation with an increase in the distance from the source to the irradiated object?

- A. From 1 cm to 5 cm
- B. 5cm to 25cm
- C. 20cm to 50cm
- D. From 15cm to 75cm
- E. From 20cm to 100cm

76. Indicate devices that use the ability of ionizing radiation to cause light flashes (scintillations).

- A. Dosimeters
- B. Ionization chamber
- C. With Scanners
- D. Radiocirculograph
- E. Gamma - camera.

77. The wavelength of the bremsstrahlung radiation arising in the target of the beta tron is 0.001 A. What photon energy does this wavelength correspond to?

- A. 20.0 MeV
- B. 12.4 MeV
- C 30.5 MeV
- D. 35 MeV
- E. 25 MeV

78. What is the leading symptom in the characterization of all degrees of severity of acute radiation sickness?

- A. General weakness
- B. Body temperature
- C. Headache
- D. vomiting
- E. Hyperemia of the skin

79. Determine the severity of ARS using laboratory and clinical parameters in the latent period of the disease lasting 8 days: the number of lymphocytes on days 3-6 $0.1 \times 10^9 / l$, the number of leukocytes $< 0.5 \times 10^9 / l$, severe diarrhea, hair loss for 8 - 10 days.

- A. Easy
- B. Average
- C. Severe
- D. Extremely severe
- E. Toxic

80. Determine the approximate dose of uniform external radiation, if the victim has the following clinical signs of general intoxication, fever, intestinal syndrome, arterial hypotension. In the blood: the number of leukocytes is below $0.6 \times 10^9 / l$, agranulocytosis, thrombocytopenia, ESR 60 - 80mm / hour.

- A. 2 Gr
- B. 5 Gr
- C. From 10 Gr
- D. 6 Gr
- E. 3 - 4 Gr

The tests were compiled by Assoc. Dorofeeva T.K.