

1. When used with high energy treatment units compensating filters compared to a bolus have the advantage of a/an: 8:261
  - A. Greater skin sparing
  - B. Increased %DD
  - C. Reduced geometric penumbra
  - D. Increased beam divergence
2. A tray is mistakenly left in place during a given treatment of 200 cGy. The actual dose delivered if the tray factor is .91 is: 3:31
  - A. 242
  - B. 219
  - C. 182
  - D. 166
3. The most appropriate type of shielding block design for use with a small focal spot size source and a long block to surface distance (BSD) is a/an: 9:67
  - A. Straight block
  - B. Interlocking block
  - C. Divergent block
  - D. Concave block
4. The required thickness for a cerrobend block for a narrow photon beam in the 2-22 mV range is about: 9:68
  - A. 7.5 cm
  - B. 5 cm
  - C. 3 cm
  - D. 1.5 cm
5. An ideal bolus material should have the same \_\_\_\_\_ as the tissue it replaces. 8:332
  - A. Thickness
  - B. Valence number
  - C. Stopping power
  - D. Viscosity
6. The angle between the central axes of two beams is called the: 8:228
  - A. Hinge angle
  - B. Wedge angle
  - C. Separation angle
  - D. Plateau angle
7. The weakest link in the treatment planning and delivery chain is/are: 3:59
  - A. Variations in machine output
  - B. Failure to correct for tissue inhomogeneities
  - C. Imprecise positioning and immobilization
  - D. Calculation and dosimetry errors
8. Which of the following is a reason for providing generous margins around a target volume? 3:56
  1. Displacement of tumors in different positions
  2. Shifts in the overlaying skin surfaces
  3. Respiratory motions
  - A. 1 only
  - B. 2 only
  - C. 3 only
  - D. 1, 2, & 3
9. The main advantage of using Lipowitz metal over lead in making shielding blocks is that it: 8:276
  - A. Is lighter than Pb
  - B. Requires less thickness than Pb
  - C. Is softer than Pb
  - D. Has a lower melting point than Pb
10. Which of the following would be least likely used in making a bolus? 3:96
  - A. Rice
  - B. Gelatin
  - C. Lead pellets
  - D. Super Stuff

11. In the megavoltage range of a photon beam, what thickness of cerrobend is equivalent to 6 cm of pure lead? 8:277
- A. 4.5 cm C. 6 cm  
B. 5 cm D. 7.5 cm
12. The collimators are calibrated for a distance of 100 cm. To obtain a field size of 30 cm x 30 cm at 80 cm, what collimator setting is required? 3:51
- A. 13 cm C. 28 cm  
B. 24 cm D. 37.5 cm
13. The reduction of electron contamination in photon beams can be accomplished by all of the following, except: 8:281
- A. Employing electron filters  
B. Increasing distance between shadow tray and surface  
C. Increasing field size  
D. Reducing the angle of incidence
14. The ideal phantom equivalent material should possess the same \_\_\_\_\_ as the actual tissue to be treated. 8:157
1. *Effective density* 2. *Electrons per gram* 3. *Atomic number*
- A. 1 & 2 only C. 2 & 3 only  
B. 1 & 3 only D. 1, 2, & 3
15. Which of the following is the most accurate method of obtaining a patient contour? 8:240
- A. Computed tomography C. Angiography  
B. Scanography D. Tomography
16. In the x-ray energy region between 2 - 50 MeV, large energy changes are required to change the HVL and, therefore, beam quality should be stated in terms of its: 15:51
- A. Skin sparing effect C. Nominal peak of the photon energy  
B. Tissue-air ratio D. Scatter distribution
17. Wedged-shaped filters used on megavoltage therapy units may be constructed of: 8:213
1. *Lead* 2. *Copper* 3. *Aluminum*
- A. 1 & 2 only C. 2 & 3 only  
B. 1 & 3 only D. 1, 2, & 3
18. An external contour is obtained to:
1. *Localize internal structures* 2. *Eliminate contour irregularities* 3. *Aid in treatment planning*
- A. 1 only C. 3 only  
B. 2 only D. 1, 2, & 3
19. Compensating wedges that are used for correcting contour irregularities must be placed at least \_\_\_\_\_ from the patient to preserve the skin sparing effect of megavoltage irradiation. 8:267
- A. 15cm C. 9cm  
B. 12cm D. 5cm
20. The use of a universal wedge is most often employed to modify the output of: 8:215
- A. Electron beams C. Cobalt teletherapy beams  
B. Linear accelerator (photon) beams D. Orthovoltage beams

21. Whole body casts are an effective means of controlling patient movement during the treatment of: 3:59
- A. Skin patients  
B. Children  
C. Lung patients  
D. Head and neck patients
22. Effective patient immobilization of the head and neck region is often accomplished by a device called (a): 8:268
- A. Bite block system  
B. Cervical collar device  
C. Crouchfield tongs  
D. Striker frame
23. The reduction of block transmission penumbra can be accomplished by: 8:276
- A. Increasing block thickness  
B. Employing divergent blocks  
C. Decreasing block thickness  
D. Decreasing source to block distance
24. Contour irregularities can be compensated for by all of the following, except: 8:261
- A. Plaster of paris  
B. Bolus materials  
C. Compensating filtration  
D. Compensation wedges
25. In the formation of Lipowitz metal shield blocks, pouring must be done slowly to help avoid: 8:278
- A. Air bubble formation  
B. Agitation artifacts  
C. Premature hardening  
D. Lead precipitation
26. Simulation films are employed to check the accuracy or location of the following, except: 8:247
- A. Internal organs  
B. Shielding blocks  
C. Treatment field  
D. Penumbra margin
27. The most frequently used beam modifier to produce the desired dose distribution in an irregular non-uniform field is a: 3:94
- A. Bolus  
B. Compensator  
C. Universal wedge  
D. Blocking tray
28. A shadow tray is a transparent plastic tray sitting below the source head which serves to hold the: 8:275
- A. Shielding blocks  
B. Secondary collimators  
C. Field delineation devices  
D. Secondary radiation sources
29. In the construction of low melting point alloy shielding blocks, the following parameter(s) must be considered:  
1. *Beam quality*      2. *Source-to-skin distance*      3. *Source-to-block distance*
- A. 1 & 2 only  
B. 1 & 3 only  
C. 2 & 3 only  
D. 1, 2, & 3
30. Which of the following type of shielding block is normally placed as close to the patient as possible? 9:67
- A. Divergent block  
B. Straight block  
C. Nondivergent block  
D. Lead cutout
31. In general, when shielding blocks are employed, the acceptable amount of primary beam transmission is approximately: 9:67
- A. .1%  
B. 1%  
C. 5%  
D. 15%
32. The placement of a bolus directly on the skin surface to even out surface irregularities is appropriate for use with: 8:261
- A. Cobolt beam therapies  
B. Brachytherapies  
C. Megavoltage therapies  
D. Orthovoltage therapies



44. The primary reason that patients are tattooed is to:
- A. Avoid skin irritations  
B. Delineate tumor volume  
C. Align the beam with the patient  
D. Increase tumor sensitivity
45. Patient immobilization, whenever possible, should be performed in the: 8:268
- A. Erect position  
B. Supine position  
C. Lateral position  
D. Oblique position
46. In setting up patients for treatment, the correct collimator angle should "line up" with: 8:318
1. Portal markings on the patient's skin    2. Anatomical landmarks    3. Tattoo marks
- A. 1 only  
B. 2 only  
C. 3 only  
D. 1, 2, & 3
47. All of the following are important regarding contour making EXCEPT: 8:240
- A. Patient must be in treatment position  
B. Knowing the beam energy  
C. Horizontal line representing table top must be used  
D. Beam entry points should be indicated
48. Which of the following parameters is required in construction of cerrobend shielding blocks? 8:277
- A. Tumor volume  
B. Treatment time  
C. Skin slope  
D. Beam energy
49. The proper labeling for a cone should include: 22:19
1. Treatment unit    2. Field size    3. Source-cone distance
- A. 1 & 2 only  
B. 1 & 3 only  
C. 2 & 3 only  
D. 1, 2, & 3
50. If the given dose for a treatment is 250 cGy, what actual dose is given if the tray is left in and has a tray factor of .95?
- A. 238 cGy  
B. 263 cGy  
C. 274 cGy  
D. 294 cGy
51. A breast bridge angle inclinometer is most often used in maintaining the appropriate 9:107
- A. Position of the patient  
B. Collimator setting  
C. Gantry angulation  
D. Patient contour
52. Which of the following measurements are needed to aid you in checking the accuracy in a contour?
1. Patient AP and lateral separations    2. %DD    3. SSD
- A. 1 & 2 only  
B. 1 & 3 only  
C. 2 & 3 only  
D. 1, 2, & 3 8:239
53. An overhead sagittal laser line is useful in aligning the sagittal axis of the patient with the axis of: 8:268
- A. Wedge filters  
B. Table rotation  
C. Gantry rotation  
D. Simulator
54. A contour is found to vary significantly along the field width. Which of the following might be done to correct this problem when treating the patient? 8:265
- A. Add a scattering foil  
B. Increase beam energy  
C. Construct a compensator  
D. Alter the patient prescription

55. Which of the following methods is most appropriate for determining if cerrobend blocks are free of internal voids? 22:18
- A. Radiography  
B. Visual inspection  
C. Weighing the blocks  
D. Comparison with other cerrobend blocks
56. In order to produce the least amount of electron contamination from a shadow tray, the material should have an atomic number of about: 8:283
- A. 6  
B. 12  
C. 24  
D. 50
57. If a patient setup calls for the use of a wedge but it is inadvertently omitted, which of the following statements is true of the delivered dose?
- A. Skin sparing will increase  
B. Patient dose will increase  
C. Patient dose will decrease  
D. Patient dose is not effected
58. A wedge filter is normally placed within the beam: 8:213
- A. By attaching it to the source opening  
B. By placing it at a specified distance from the source  
C. Placing it on the skin surface  
D. None of the above
59. The principal advantage of a universal wedge is in its ability to function at all: 8:215
- A. Beam widths  
B. Energy levels  
C. SSD's  
D. Hinge angles
60. In order to demonstrate important reference points, lead markers are often placed on: 2:155
1. Scars      2. Incisions      3. Palpable nodes
- A. 1 only  
B. 2 only  
C. 3 only  
D. 1, 2, & 3
61. When should a light or plaster cast for immobilization be constructed? 8:267
- A. After simulation or localization  
B. Before taking simulation films  
C. After the first treatment  
D. None of the above
62. When compared to a bolus for a high energy field a compensator has the advantage of: 8:263
1. Maintaining skin sparing effect  
2. Increasing percentage depth dose  
3. Eliminating geometric divergence
- A. 1 only  
B. 2 only  
C. 3 only  
D. 1, 2, & 3
63. The inability to maintain the dimensional stability during transfer is the major drawback for the use of which type of contour device? 8:239
- A. Plaster strip  
B. Contour plotter  
C. Solder wire  
D. Bite block
64. The use of an independently moving collimator leaves to produce a wedge effect is termed: 4:75
- A. Slice wedging  
B. Isodose wedging  
C. Dynamic wedging  
D. Static wedging

65. The over compensation of a tissue equivalent compensator designed with the same thickness of the tissue it replaces is primarily due to the decrease in the: 8:263
- A. Beam quality  
B. Source-to-skin distance  
C. Scatter produced at depth  
D. Field size required
66. The use of a whole body cast is most often required for treatment volumes that include: 3:287
- A. Entire cerebro-spinal axis  
B. Entire pelvis  
C. Entire leg  
D. Entire thoracic cavity
67. A patient contour should be obtained with the: 8:240
1. Patient on the simulator couch  
2. Bony land marks indicated on the contour  
3. A line repressing to table indicated
- A. 1 only  
B. 2 only  
C. 3 only  
D. 1, 2, & 3
68. A bite block is normally employed to: 9:122
1. Keep the patient from moving  
2. Standardize the patient setup  
3. Prevent breathing throughout the treatment
- A. 1 & 2 only  
B. 1 & 3 only  
C. 2 & 3 only  
D. 1, 2, & 3
69. In order to achieve a 5% or smaller block transmission, it must have a thickness of about: 9:67
- A. 1.5 HVL  
B. 2.0 HVL  
C. 2.5 HVL  
D. 5.0 HVL
70. Which of the following field size and wedge angle respectively, would be associated with the highest dose region or hot spot? 8:232
- A. 10 x 10 cm, 15°  
B. 15 x 15 cm, 25°  
C. 15 x 15 cm, 30°  
D. 20 x 20 cm, 45°