放射治療測驗

Radiotherapy

2015 年 8 月 30 日星期日

Q1・Select the mistake as the shape of the small radiation source.

1）Grain 　　　　　　 2）Wire 　　　　　　 3）Seed 　　　　　　 4）Plate

Q2・Which ones is the unit to accelerate the particles along the circumference of the constant radius?

1）Linac 　　　　　　 2）Microtron 　　　　 3）Cyclotron 　　　 4）Synchrotron

Q3・Which is the organ of lowest tolerance dose in whole pelvic radiation?

1）Bladder 　　　　　 2）Ovary 　　　　　　 3）Colon 　　　　　 4）Rectum

Q4・Which one is not a component of the linac?

1）Ridge filter 　　　 2）Electron gun 　　　 3）Multi-leaf collimator 4）Flattening filter

Q5・Which one is not device of radiotherapy?

1）Linac 　　　　　　 2）Microtron 　　　　 3）da Vinci 　　　　 4）Gamma knife

Q6・Which is the correct about patients diagnosed with adenocarcinoma in prostate biopsy?

1）High prostate-specific antigen value is prognosis better than low value.
2）High Gleason score is prognosis better than low score.
3）Performance status 3 is prognosis better than status 0.
4）Well-differentiated adenocarcinoma is prognosis better than poorly-differentiated adenocarcinoma in histopathological classification.

Q7・Which organ is the adaptation of intracavitary irradiation?

1）Uterus 　　　　　　　　　　　　　　　 3）Stomach
2）Blood vessel 　　　　　　　　　　　　 4）Mammary gland

Q8・Which matter is not related to the radiation treatment plan?

1）Phantom 　　　　　　　　　　　　　　 3）Homeostasis
2）Simulator 　　　　　　　　　　　　　　 4）Dosimetry equipment

Q9・Which one is unnecessary in quality control of radiotherapy?

1）Location reproducibility of the isocenter. 　　 3）Calibration of the reference dosimeter.
2）Calibration of the monitor dosimeter. 　　　 4）Confirmation of the magnetic field shield.

Q10・Select the mistake dose distribution calculation algorithm of radiotherapy?

1）Pencil beam method 　　　　　　　　　 3）Equivalent TAR method
2）Power Doppler method 　　　　　　　　 4）Clarkson integration method

Q11・Which nuclide is used for internal therapy?

1）51Cr 　　　　　　 2）131I 　　　　　　 3）111In 　　　　　 4）125I

Q12・Which is organ of most lowest tolerance dose?

1）Skin   2）Ovary   3）Rectum   4）Kidney

Q13・Which is most high radiosensitivity?

1）Malignant lymphoma   3）Leukemia

2）Myeloma   4）Seminoma

Q14・Which cancer is not adapted to intraoperative irradiation using electron beam?

1）Liver cancer   3）Gastric cancer

2）Pancreatic cancer   4）Bladder cancer

Q15・Which factor is wrong that is related to radiation therapy effect?

1）Dose rate   3）Number of fractionation

2）One dose   4）Type of the radiation (radiation quality)

Q16・Which material is inappropriate for Soft-tissue-equivalent phantom?

1）MixDP   2）Polystyrene   3）Acrylic   4）Teflon

Q17・Which is wrong as a component of the linear accelerator?

1）Klystron   3）Doughnut type acceleration tube

2）Thyratron   4）Electron gun

Q18・Which of the following is cancer that you perform radical radiotherapy ?

1）laryngeal cancer   3）sigmoid colon cancer

2）kidney cancer   4）gastric cancer

Q19・Which of the following is usually the smallest irradiation field when you perform external irradiation?

1）medulloblastoma   3）epipharynx cancer

2）glottis carcinoma   4）Hodgkin's diseas

Q20・Which of the following is NOT arrangement position method in brachytherapy ?

1）Quimby system   3）Manchester system

2）Memorial system   4）RapidArc

Q21・Which of the following is adapted to Stereotactic Body Radiation Therapy ?

1）lung cancer   3）kidney cancer

2）gastric cancer   4）cancer of the uterine body

Q22・Which of following is wrong about radiation treatment planning?
1）In planning the radiation treatment, it is recommended to double check.
2）Checking the monitor unit value calculated is recommended by hand calculation or survey.
3）It is to be desirable that a beam data of radiotherapy planning system is verified regularly.
4）If you get the correct beam data in case of using three-dimensional radiotherapy planning system, you don't have to verify it on each patient.

Q23・Which of following is wrong about radiotherapy?
1）It is able to distinguish gamma-ray and X-ray by the wavelength.
2）An angle of the wedge filter is defined by an angle that crosses the isodose curve and the beam axis.
3）When you measure the percentage depth dose, you transfer the dosimeter from the bottom of the water phantom to the top of the water phantom.
4）You basically use a water phantom for the absorbed dose at calibration point of high energy photon beam.

Q24・Which of the following is wrong about a target volume provided in ICRU 50 and ICRU 60 at radiotherapy?
1）Gross Tumor Volume(GTV) is a tumor volume that can confirm by image and palpation. It includes a primary lesion, a lymph node metastasis or a distant metastasis.
2）Internal Target Volume(ITV) is a target volume including the effect by a motion of the internal organ(such as breathing) as Internal Margin(IM) in Clinical Target Volume(CTV).
3）Planning Target Volume(PTV) is a target volume including a set-up margin(SM) in every irradiation.
4）In the case of the postoperative irradiation and the prophylactic irradiation, there is possibility that Clinical Target Volume(CTV) doesn't exist.

Q25・Which of the following is a late effect of radiotherapy ?
1）stomatitis　　　　　2）dermatitis　　　　　3）esophagitis　　　　　4）myelitis

Q26・Which of the following is superior in biological effectiveness and not superior in radiation dose distribution ?
1）proton radiation
2）carbon ion radiation
3）fast neutron radiation
4）Co-60 gamma-ray

Q27・Which of the following is correct about carbon ion radiation ?
1）Penumbra is big.
2）Oxygen enhancement ratio is large.
3）Relative biological effectiveness is small.
4）It has the Bragg peak.

Q28・Which of the following is wrong about a side effect of total body irradiation (TBI) ?
1）infertility
2）secondary cancer
3）renal dysfunction
4）hyperthyroidism

Q29・Which of the following is the closest to the lattice energy(keV) of source when you perform permanent seed brachytherapy of prostate cancer ?

1）27.5 2）141 3）317 4）512

Q30・Which of the following is wrong about treatment technique of prostate cancer ?

1）3-dimensional conformal radiation therapy 3）intracavitary irradiation
2）high dose rate interstitial irradiation 4）intensity modulated radiotherapy

Q31・Which of the following(benign tumor and benign desease) is NOT adapted to radiotherapy ?

1）keloid 3）hypophyseal tumor
2）angioma（Kasabach-Merritt symdrome） 4）atheroma

Q32・Which one of MLC types has the largest leakage radiation dose through MLC

1）with flipped leaves 3）stepped edge correction
2）focused without correction 4）tongue and groove

Q33・Which of the following is true regarding the purpose of front pointer?

1）To check field size 3）To confirm SSD and central axis
2）To remark SCD 4）To know patient thickness

Q34・Which is the following is not true about TLD?

1）Be able to measure depth dose within phantom
2）To measure only photon beam
3）To measure surface dose in TBI
4）LiF, CaF_2:Mn, $CaSO_4$:Mn etc..

Q35・Which one of Linac energy needs to shield neutron?

1）Below 4MV 2）6MV 3）8MV 4）Over 10MV

Q36・Choose the answer that does NOT correctly describe PDD?

1）SSD 2）Energy 3）Field size 4）Dose rate

Q37・Choose the answer that does NOT correctly describes the CT-Simulation.

1）Using a same couch with linear accelerator
2）Have diverse patient with lots of CT scanning
3）Have same position when patient set up
4）Large FOV

Q38・Choose the correct answer that is an acceptable error range in CT Number.

1）For water, 0 ± 3 HU 3）For water, 100 ± 3 HU
2）For water, 10 ± 3 HU 4）For water, 1000 ± 3 HU

Q39 · Choose the answer that does NOT correctly describe Wedge filter?
1）Homogeneous dose distribution in Target volume
2）Penetrate the middle of wedge in case of Universal wedge system
3）WA = 1/2 (180- HA) (WA : Wedge angle   HA : Hinge angle
4）Beam reduction in case of individualized wedge system

Q40 · Choose the index of evaluating 3D-conformal radiation therapy.
1）Isodose curve
2）Beam's eye view
3）Dose-volume histogram
4）Isodose surface

Q41 · Which one is correct the absorbed dose of MKS unit?
1）J/kg
2）eV/Ion Pair
3）R/nC
4）Gy/nC

Q42 · Choose allowable error range penetrating among Multi-leaf collimator.
1）Below 1%
2）Below 4%
3）Below 7%
4）Below 10%

Q43 · Choose the correct method for treat Hodgkin's disease.
1）One portal electron beam method
2）Tangential method
3）Four portal method
4）Mantle method

Q44 · Choose the right bolus thickness to deliver the 100% dose into the skin when using 6 MV photon beam.
1）Using 1.0 cm bolus
2）Using 1.5 cm bolus
3）Using 2.0 cm bolus
4）Using 2.5 cm bolus

Q45 · Which one is adequate detector for find out the dropped Isotopes during ICR(Cs-137 50mCi)?
1）Parallel plate
2）GM counter
3）Well type
4）Film

Q46 · Which one of the following is not correct explanation of radiation sensitivity?
1）O_2 is one of the radiation sensitizer
2）Hyperthermia is able to kill S-phase cell
3）Hypoxic cell has normally higher radiation sensitivity
4）Do co-operation with hyperbaric oxygen therapy

Q47 · Choose the answer that is NOT QA Item of linear accelerator.
1）Flatness
2）Penumbra
3）Output
4）Ganty angle

Q48 · Choose the answer that correctly describes below image.

1）PDD   2）Energy   3）Symmetry, Flatness 4）TMR

Q49.　Choose the rectangular field size which has equal depth dose with 6×12 cm field size.
1）6×6 cm   2）8×8 cm   3）9×9 cm   4）12×12 cm

Q50.　What is the best way to decrease 'Hot spot' without "cold spot" in adjacent 2 fields.
1）Keep distance 1.5cm on the skin   3）Using different angle and energy
2）Using different angle   4）Using junction moving

Q51.　Which electron energy can be treated under 4cm from the skin?
1）6Mev   2）9Mev   3）12Mev   4）16Mev

Q52.　What is the prominent interaction in radiation therapeutic energy ranges?
1）Pair production   3）Compton interaction
2）Coherent scatter   4）Photoelectric interaction

Q53.　Calculation MU with wedge filter if MU of open beam is 150(wedge transmission factor(WTF) = 0.59)
1）150MU   2）189MU   3）203MU   4）254MU

Q54.　Choose the reason why eyeball shielding device with wax coated is used?
1）To clean
2）To comfortatle
3）To decrease scattered electron beam
4）To decrease secondary scatter ray produced by Pb materials.

Q55.　Choose the answer that correctly described Mayneord's F-factor.
1）PDD - Inverse squire law of distance   3）SSD – dose rate
2）SSD – TAR   4）Exposure dose – absorbed dose

Q56. Choose the reason why exposure dose is increased as the radiation field size increase.

1）Beam divergence
2）Block transmission
3）Auger contamination
4）Collimator scattering

Q57・Choose the answer that does NOT associated with QA & QC figure in ICR.

1）Check source dwell position (deviation ± 3mm)
2）Well type ion chamber for calibration HDR source
3）For identify length, diameter, serial No of source
4）Check duration of applicator

Q58. Selection the answer that ideal wedge filter below a picture.
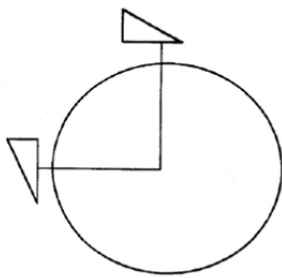
1）15°
2）30°
3）45°
4）60°

Q59. What is the record keeping requirement for personal radiation exposure records?

1）One year
2）Three year
3）Five year
4）Until authorized for disposal by the State Department of Health

Q60. What is a physical characteristric of dose distribution in a ICR?

1）Absorbed in a body
2）Scattered in a body
3）Inverse squire a low of distance
4）Using a point source or dummy soruce

Q61・Choose the answer that does NOT correctly describe the polarity effect.

1）Increased by electron energy
2）It depends on the draft of Ion chamber
3）In case of electron beam, it occurs often more than photon beam.
4）It occurred out of the ion cavity

Q62・Choose the answer that not adequate case for Intraluminal Implants.

1）Esophagus   2）Biliary duct   3）Bronchus   4）Rectum

Q63 · Choose the answer that does NOT correctly describe radiation shielding
1) MLC has the biggest penumbra.
2) Custom block has the smallest penumbra
3) Individual block is the best for convenience
4) MLC is the efficient type to shielding with diverse shapes.

Q64 · Choose the outbreak part of pancreas cancer.
1) Midsection of the pancreas
2) Head of the pancreas
3) Tail of the pancreas
4) Whole pancreas

Q65 · Choose the right statement about biological effect of proton.
1) It is regarless of depth
2) It is less than ^{60}CO gamma ray
3) It is related to LET
4) It is almost same as clinical energy area of electron

Q66. Choose the answer that does NOT best correctly treatment method for below CTV.
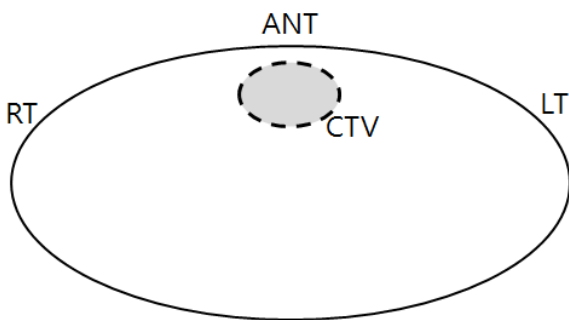
1) anterior 180° arc at the center of the CTV
2) two anterior oblique wedged fields
3) anterior open field and wedged both lateral fields
4) anterior split into two 90° arcs with wedges

Q67 · Choose the KERMA line that coincide dose distribution curve.
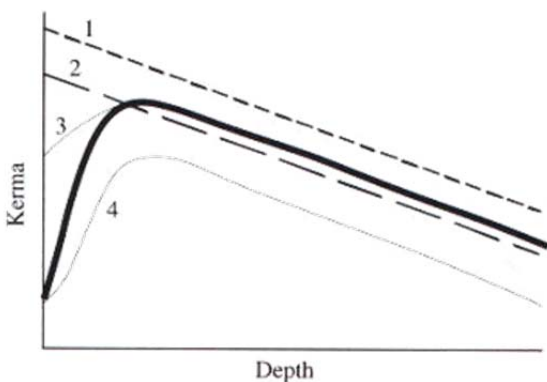
1) 1
2) 2
3) 3
4) 4

Q68 · Choose the answer that NOT correctly describes radiation treatment planning in IMRT.
1) To control dose rate.
2) To control photon energy
3) Using inverse planning for optimum fluence distribution.
4) Treatment method for patient with non-flattening radiation beam in multi directions

Q69‧Which system (it has own operating system and setting mode) is operating as file server in network?

1）SAN(Storage Area Network)
2）LTO(Linear Tape-Open)
3）NAS(Network Attached Storage)
4）RAID(Redundant Array of Independent Disks)

Q70. For Total Skin Electron Beam (TSEB) therapy, a large 1cm thick Lucite screen is often placed in front of the patient in order to:

1) Protect the patient from scattered radiation
2) Attenuate the bremsstrahlung component of the beam
3) Increase dose uniformity
4) Increase depth dose