Post-Test Questions

Article One (pp. 93–98)

1. The dominant cell type in lung carcinoma is
 - A. Squamous cell carcinoma
 - B. Small cell carcinoma
 - C. Adenosquamous carcinoma
 - D. Adenocarcinoma
2. Which of the following statements is false?
 - A. Women are more likely than men to develop lung adenocarcinoma
 - B. Women who have never smoked are more likely to develop lung cancer than men who have never smoked
 - C. Epidermal growth factor receptor (EGFR) mutations occur less frequently in women than in men
 - D. Lung cancer is the fourth most frequent cancer in women worldwide
3. Kirsten rat sarcoma (KRAS) mutations:
 - A. Show a predilection for women
 - B. Are more frequent in white populations than Asians
 - C. Are most commonly identified in never-smokers

Article Two (pp. 99–113)

4. Which one of the following changes was introduced in the 7th edition of the American Joint Committee on Cancer (AJCC) staging manual?
 - A. A single brain metastases was downgraded from M1 disease to T4 disease
 - B. An isolated 2-cm lesion without adenopathy is now considered T1a disease
 - C. Malignant pleural effusion is now considered stage IIIB disease
 - D. No changes were made to the 6th edition
5. The 7th edition of the AJCC staging manual now includes which of the following subgroups of primary lung cancer?
 - A. Small cell lung cancer
 - B. Carcinoid, typical only
 - C. Carcinoid, atypical only
 - D. All of the above
 - E. None of the above
6. Which of the following is *not* an objective of the TNM staging system set forth >50 years ago?
 - A. To aid the clinician in treatment planning
 - B. To give some indication of prognosis

- C. To develop a universal staging system for all solid and hematologic tumors
- D. To facilitate the exchange of information between treatment centers
- E. To contribute to continuing investigations of human malignancies

Article Three (pp. 114–120)

7. In the United States, which of the following cancers have a higher mortality rate per year than lung cancer?
 - A. Breast
 - B. Prostate
 - C. Colon
 - D. Pancreas
 - E. None of the above
8. The following observations were made by the National Lung Screening Trial *except*:
 - A. Low-dose computed tomography (LDCT) screening results in decreased lung cancer mortality
 - B. LDCT screening detects fewer lung nodules and lung cancers relative to chest radiography (CXR)
 - C. A true stage shift was seen where the absolute number of advanced stage cancers was decreased relative to those found on CXR
 - D. Few significant complications occurred from LDCT screening
 - E. None of the above
9. What are the potential harms of lung cancer screening?
 - A. Overdiagnosis
 - B. Radiation-induced cancers
 - C. High false-positivity rate
 - D. All of the above
 - E. None of the above

Article Four (pp. 121–127)

10. The most common complication of image-guided lung biopsy is:
 - A. Pulmonary hemorrhage
 - B. Tumor seeding

Pulmonary Malignancies; Guest Editors, Bradley B. Pua, MD and David C. Madoff, MD, FSIR

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- C. Pneumothorax
- D. Air embolism

11. Core needle biopsies are associated with all of the following *except*:
 - A. Increased definitive benign diagnostic rate over fine-needle aspiration
 - B. Can be especially useful in the diagnosis of lymphoproliferative disorders
 - C. Degree of use is institutional/operator dependent
 - D. Decreased complication rates
12. The following has been associated with requiring fewer needle passes to obtain an adequate diagnosis during a lung biopsy:
 - A. Distance of target lesion from pleural surface
 - B. Availability of onsite cytopathology.
 - C. Aspirating on the biopsy needle
 - D. Lesion size

Article Five (pp. 128–132)

13. The pneumothorax rate for percutaneous CT-guided procedures is:
 - A. 1–2%
 - B. 15–30%
 - C. 50%
 - D. >80%
14. The pneumothorax rate for ENB in the literature is:
 - A. <5%
 - B. 15–30%
 - C. 50%
 - D. >80%
15. Electromagnetic navigational bronchoscopy (ENB) is:
 - A. A combination of conventional and virtual bronchoscopy utilizing proprietary navigational software to facilitate sampling small peripheral lesions
 - B. A percutaneous CT-guided modality to biopsy pulmonary lesions
 - C. A modality hampered by its significant complication rate
16. Current uses for ENB include:
 - A. Biopsy of small peripheral lesions
 - B. Marking small lesions for parenchymal-sparing resections
 - C. Marking small lesions for stereotactic beam radiation therapy
 - D. All of the above

Article Six (pp. 133–140)

17. Surgical resection is the initial and primary mode of therapy for which stage of non-small cell lung cancer (NSCLC)?
 - A. I and II
 - B. IIIA
 - C. IIIB
 - D. IV
 - E. A and B
18. Essential aspects of surgical resection for early stage NSCLC include:
 - A. Removal of the lobe that contains the tumor
 - B. Evaluation of contralateral mediastinal lymph nodes
 - C. Evaluation of ipsilateral hilar and mediastinal lymph nodes
 - D. A and B
19. Which of the following statements regarding the use of surgery for stage III NSCLC is true?
 - A. It is recommended as single modality therapy
 - B. It is recommended for patients with bulky mediastinal disease
 - C. It can serve as an important part of multimodality therapy for select stage IIIA patients
 - D. It can serve as an important part of multimodality therapy for select stage IIIB patients
 - E. It has no recommended role in stage III treatment

Article Seven (pp. 141–150)

20. When treating patients with lung cancer with irreversible electroporation, which preprocedure step must be taken?
 - A. Calcium blockade
 - B. Midazolam and fentanyl sedation
 - C. α - and β -Blockade
 - D. Neuromuscular blockade
21. Follow-up FDG PET images 6 months post-RFA normally show the following if the tumor has a complete response:
 - A. Ground-glass opacification
 - B. Absent PET activity
 - C. PET activity exceeding pretreatment levels
 - D. PET activity at the peripheral margin of the tumor
22. Which of the following criteria is a relative contraindication for tumor ablation?
 - A. Implantable cardiac device
 - B. Insulin-dependent diabetes
 - C. Prior history of lung radiation therapy
 - D. Pulmonary fibrosis

Article Eight (pp. 151–156)

23. Lung radiofrequency ablation of small NSCLC is able to provide complete ablation of the targeted tumor in roughly:
 - A. 50% of tumors <2 cm
 - B. 90% of tumors <2 cm
 - C. 10% of tumors <2 cm
 - D. 70% of tumors <2 cm
24. Lung radiofrequency ablation of small NSCLC is:
 - A. The first treatment option of T1M0NO NSCLC
 - B. Not an option in T1M0NO NSCLC
 - C. A treatment option in nonsurgical candidates with a T1M0NO NSCLC
 - D. Superior to SBRT in T1M0NO NSCLC
25. After lung RF ablation:
 - A. No follow-up is needed
 - B. The ablation zone should be larger than the target tumor on early CT follow-up
 - C. The ablation zone should be smaller than the target tumor on early CT follow-up
 - D. Lung tumor will resolve in a few weeks
26. Choose all that apply. Predictive factor of survival after lung radiofrequency ablation (RFA) is/are:
 - A. Comorbidity index score
 - B. Size of the target tumor
 - C. FEV₁ at spirometry
 - D. The occurrence of a pneumothorax during RFA

Article Nine (pp. 157–168)

27. The “heat sink” phenomenon is more commonly seen with which of the following modalities?
 - A. Transcatheter arterial embolization
 - B. Radiofrequency ablation
 - C. Microwave ablation
 - D. Cryoablation
28. Which of the following postablation enhancement patterns is most characteristic of “benign periablational enhancement”?
 - A. Thin, circumferential smooth margins
 - B. Thick, circumferential
 - C. Thick, nodular
 - D. Central enhancement >15 HU
29. Which of the following is the most common pleural-based complication following thermal ablation of lung malignancies?
 - A. Pleural effusion
 - B. Bronchopleural fistula
 - C. Pneumothorax

- D. Pleural thickening
- E. Hemothorax

Article Ten (pp. 169–175)

30. What is the estimated mortality rate after lung radiofrequency ablation?
 - A. <0.01%
 - B. 0.01–0.1%
 - C. 0.1–1%
 - D. 1–10%
 - E. >10%
31. What is the most frequent complication after lung radiofrequency ablation?
 - A. Pleural effusion
 - B. Hemoptysis
 - C. Hemothorax
 - D. Pneumothorax
 - E. Pneumonia
32. Massive hemoptysis occurring days to weeks after lung radiofrequency ablation is most concerning for:
 - A. Pneumothorax
 - B. Pulmonary artery pseudoaneurysm
 - C. Pneumonia
 - D. Cancer recurrence
 - E. Bronchitis

Article Eleven (pp. 176–184)

33. Contraindications for regional chemotherapy of the lung include:
 - A. Prior surgery
 - B. Allergy to iodinated contrast media
 - C. Asthma
 - D. Age
 - E. All of the above
34. Which method has better outcome and lower side effects?
 - A. Isolated lung perfusion
 - B. Transpulmonary chemoembolization
 - C. Systemic chemotherapy
 - D. Lung suffusion
35. All of the following are true regarding isolated lung perfusion, *except*:
 - A. Anticoagulation therapy is not necessary
 - B. Pulmonary ventilation should remain for spreading the agents
 - C. Safe cannulation of these vessels needs thoracotomy incisions.
 - D. Complications such as adverse systemic inflammatory responses occur frequently

Article Twelve (pp. 185–190)

36. Standard of care for early stage lung cancer in a 65-year-old woman with good pulmonary functions is:
 - A. Lobectomy
 - B. Wedge resection
 - C. Stereotactic radiation
 - D. RFA
37. Stereotactic radiation is an absolute contraindication in centrally located early stage lung cancers. True or false?
38. LDR brachytherapy for early stage lung cancer is indicated in:
 - A. Patients undergoing lobectomy
 - B. Patients undergoing wedge resection
 - C. Resection with negative margins
 - D. Pregnant women who develop lung cancer

Article Thirteen (pp. 191–198)

39. A 68-year-old male current smoker presents with a cough, hemoptysis, and weight loss. Chest radiography demonstrates a right upper lobe lung mass. Computed tomography of the chest-abdomen-pelvis confirms a 4-cm right upper lobe mass, mediastinal lymphadenopathy, and multiple liver masses suggesting metastatic disease. A core biopsy of a liver mass demonstrates squamous cell carcinoma. He continues to work and perform his usual activities.

The preferred treatment option would be:

- A. The targeted agent erlotinib
 - B. Best supportive care alone
 - C. Platinum-based chemotherapy
 - D. Single-agent chemotherapy
40. A 52-year-old woman never-smoker presents after 2 months of a progressive nonproductive cough. Chest radiograph demonstrates a diffuse left lung infiltrate. Computed tomography of chest-abdomen-pelvis confirms extensive left lung opacities in both lobes of the left lung and multiple nodules in the right lung suggesting intrapulmonary metastatic disease. No lymphadenopathy was identified. Pulmonary function testing indicates near-normal FEV₁/FVC. Bronchoscopy-guided biopsy was nondiagnostic. Interventional radiology is consulted for a biopsy to confirm metastatic disease.

The preferred approach would be:

- A. Single fine-needle aspiration (FNA) pass with grossly visible material on the left side
 - B. Single FNA pass of a right-sided nodule for diagnosis; EGFR/ALK analysis

- C. Core biopsies of a right-sided nodule for diagnosis; EGFR/ALK analysis
 - D. Refer to surgery for video-assisted thoracoscopic surgery excisional biopsy for diagnosis; EGFR/ALK analysis

41. The patient in question 2 is diagnosed with adenocarcinoma of the lung that is EGFR mutation positive. The optimal front-line treatment would be:
 - A. Erlotinib
 - B. Platinum-based chemotherapy
 - C. Crizotinib
 - D. Bevacizumab

Article Fourteen (pp. 199–205)

42. All of the following statements regarding superior vena cava (SVC) stenting are true *except*:
 - A. Pulmonary edema, stent migration, and rupture of the SVC are complications that can occur with stenting
 - B. Lung cancer is the most common malignancy causing SVC syndrome
 - C. In patients with malignant SVC syndrome, angioplasty alone has been effective
 - D. SVC syndrome can have a gradual or acute onset of symptoms
43. Which of the regarding bronchial artery embolization (BAE) is true?
 - A. BAE must be performed distal to the origin of the spinal artery to prevent spinal infarct
 - B. Can be performed to treat pulmonary infarct
 - C. Should use coils to embolize in most cases
 - D. Usually has one common bronchial trunk off of the aorta
44. With which image-guided percutaneous ablative technique can the operator best visualize clear margins delineating the ablative zone under CT?
 - A. Cryoablation
 - B. Radiofrequency ablation
 - C. Laser ablation
 - D. Ethanol ablation

Article Fifteen (pp. 206–214)

45. Pneumothorax can result when which surface is transgressed with a needle?
 - A. Parietal pleura
 - B. Visceral pleura
 - C. Pulmonary parenchyma
 - D. Bronchial tree
 - E. All of the above

46. All of the following techniques can be used to access hard to reach lesions during biopsy *except*:
- A. Hydrodissection
 - B. Introduction of artificial pneumothorax
 - C. Curved needles
 - D. Using the “stick function” of ablation probes
 - E. All of the above
47. Recovering patients with the biopsy site down decreases the risk of pneumothorax to:
- A. 0%
 - B. 3%
 - C. 10%
 - D. 15%
 - E. None of the above