CHINESE

杰出气管镜专家

监: Professor Shiyue Li (李时悦)

Translated from the English: The Essential Bronchoscopist© (by Henri Colt)

BRONCHOSCOPY INTERNATIONAL™

rake press

Guangzhou Institute of Respiratory Disease, 2016

模块 I

Bronchoscopy International copyright 2013

模块的目标

EB（杰出气管镜专家）的读者不应该将其中的模块测试图看呈单纯一种测试，因为无论您是否或能否回答这些这些问题，读了这些内容，您都可以从中获得非常有用的信息。也许您会发现：有些问题的正确答案不止一个，这也许是一个善意的陷阱，而读者不应该将其看做是一种陷阱，而应该看做是帮助读者去思考某个问题的方式。一个模块含有 30 个问题及答案，您大概需要 2 小时去完成。当您完成后，您就可以去看考试后的内容，其包含 10 个多项选择题，主要针对每个模块中所包含知识的基础原理。针对每个问题，您也许只能在答案部分或图示部分找到答案的相关信息，但不能直接找到答案。只有在您阅读完考后的内容并准备进入下一级模块之前，您才能对您的答卷给出一个 100%准确率的判断。

杰出的支气管镜专家

EB 最初开设的主要目的是为了对支气管镜相关的理论知识进行学习。每个模块包含的有关支气管镜的知识由易到难呈阶梯状，线性学习及学习左右脑信息处理的最佳结合，而且最重要的是，使学习者在学习中得到乐趣，无论何种专业人员，都能将所学的知识应用到实践中对患者的关怀。

EB 为学习支气管镜相关的理论知识提供了一个标准化途径，适合用于现在的医学教育中本科生教育及研究生教育。标准化的问题-答案模式及与模拟支气管的示例图、技术图，能使学习者能够得到很多知识及启发。一个 100%准确的答卷及考后的内容回顾能使学者基本掌握每个模块中的知识点。

经过的 EB 理念的熏陶及多年支气管镜检查的经验，精英的支气管镜专家不仅获得了扎实的基础知识，并且积累了丰富的个体化经验，但并非教条的知识模式及习惯。“一个认为他一切都懂的人其实什么都不懂”的教育理念使杰出的支气管镜专家既有自信，又不断地探索新知识，打破旧传统，开辟新天地。

感谢李时悦教授团队，包括陈愉大夫、陈小波大夫、钟长镐大夫等各位所作出的贡献。

LEARNING OBJECTIVES TO MODULE I

IMPORTANT NOTE

Readers of The Essential Bronchoscopist© should not consider this module a test. In order to most benefit from the information contained in this module, every response should be read regardless of your answer to the question. You may find that not every question has only one "correct" answer. This should not be viewed as a trick, but rather, as a way to help readers think about a certain problem. Expect to devote approximately 2 hours of continuous study completing the 30 question-answer sets contained in this module.

支气管镜医师基础（Essential Bronchoscopist）的读者应该将这个模块视为一个测试。每一个问题后面提供了各种可能的选择项，虽然自己可能会倾向于某种选择，但为了最大程度地从这个模块所提供的信息获益，读者们应该仔细阅读每一个选择项。您可能会发现并不是所有问题都只有一个所谓"正确"答案。这不是一种故意刁难，而是帮助读者学会如何考虑问题的方法。完成这个模块中的 30 道问答题大概需要 2 个小时连续的时间。

When you are ready, you may choose to take the post-test. This ten multiple choice question test addresses specific elements of the learning objectives of each module. Questions pertain to information found in the answer paragraphs or figures in the module, but may not correspond directly with a question found in the module. A 100% correct answer score is expected on the post-test before readers can advance to the next module. If even one of your answers is incorrect, you must go back to the beginning of the post-test, and begin the entire test all over again. You may print out your test scores by hitting "print screen" on your monitor.

如果您已做完这些题并且准备就绪，您可以开始进行效果测试。效果测试中的 10 个选择题主要用于说明每个模块的特殊的学习目标。这些问题可能会就模块中的问题的答案或图片所提供的信息而提出，可能不会与那些问题本身直接相关。在效果测试中，读者应该尽可能获得 100%的正确率，如此才可进行下一个模块的学习。即使是只有一个问题回答错误，您都应该退回到效果测试的起始部分，重新开始进行整个测试。您可以将您的测试得分打印出来，只需点击"打印屏幕"这个图标。

At the conclusion of this Module I, the learner should be able to:

1. List three figures important to the history of bronchoscopy.
2. Describe the "ideal" prebronchoscopy patient assessment.
3. List at least FOUR instances in which flexible bronchoscopy is of limited value.
4. Describe at least THREE scenarios of a difficult airway, and solve their specific management problems.
5. Define flexion, extension, and rotation of the flexible bronchoscope.
6. Identify major upper airway anatomy.
7. Compare ester and amide topical anesthetics.

Created on 7/26/2002 11:45:00 AM

8. Describe at least THREE effects of flexible bronchoscopy on cardiovascular hemodynamics.
9. List the names of abnormal and normal trachea shapes.
10. Define the terms “resolution” and “radiation exposure”.

在这个模块的结论部分，读者应能达到以下目标：

1.列出支气管镜历史上三位重要人物；
2.描述“理想的”支气管镜诊疗术前对患者的评估；
3.列举出至少四个例子说明可弯曲支气管镜诊疗的局限性；
4.描述至少三种困难气道，并分别列出具体解决办法；
5.明确可弯曲支气管镜的内屈、外展、旋转能力；
6.认识上呼吸道解剖结构；
7.比较局麻药酯类和酰胺类的区别；
8.描述至少三种可弯曲支气管镜诊疗对血流动力学的影响；
9.列举出异常和正常气管的形状；
10.定义以下术语：“分辨率”和“射线辐射”

Bronchoscopy International copyright 2013

Question I.1: The first flexible bronchoscope was introduced to the world in

A. Freiberg, Germany
B. Copenhagen, Denmark
C. Philadelphia, PA

问题：1.1 可弯曲支气管镜第一次向世界介绍是在——
A．德国　　费尔伯格
B．丹麦　　哥本哈根
C．宾夕法尼亚州　　费城

Bronchoscopy International copyright 2013

Question I.2: Flexible fiberoptic bronchoscopy resides on the principle that light can be transmitted through glass fibers. This discovery is credited to

A. Baird and Hansell
B. Heel and O'Brien.
C. Hopkins and Kapany

问题 1.2 可弯曲纤维支气管镜的原理在于光可以被玻璃纤维传输这一发现是归功于

A．博德（英国）和汉绍尔（北美）
B．希尔（荷兰）和奥·拜仁（美国）
C．霍普金斯和卡帕尼（英国）

Created on 4/3/2011 8:05:00 AM

Bronchoscopy International copyright 2013

Question I.3: Which of the following should be addressed during a consultation for bronchoscopy

A. Analyze the request for bronchoscopy and justify the indication
B. Review history and physical and pertinent radiographic images
C. Formulate a prebronchoscopy plan with consideration to all bronchoscopic and nonbronchoscopic procedures needed to maximize diagnostic yield or therapeutic success
D. Discuss patient safety issues, comfort, and informed consent
E. All of the above

问题 1.3 如果您被咨询支气管镜检查的相关问题，下述哪项应该明确阐述？

A. 分析支气管镜检查的必要性，正确判断其适应症
B. 回顾病史、体格检查和有关影像学图像
C. 在支气管镜检查前制定周密的计划，需要考虑所有经支气管镜及非经支气管镜操作的过程，最大限度地提高诊断价值或治疗的成功率
D. 讨论病人安全性问题、舒适性及知情同意
E. 以上所有

Bronchoscopy International copyright 2013

Question I.4: All of the following should be routinely obtained prior to performing flexible bronchoscopy except

A. Chest radiograph
B. Platelet count
C. Physical examination with special attention to heart and lung examination
D. Allergy history and history and procedure-related adverse events
E. Review of potential risk factors

问题 1.4 以上所有应该常规地在进行可弯曲支气管镜检查前完成，除外

A. 胸片

B. 血小板计数

C. 仔细进行的心、肺部的体格检查

D. 了解过敏史、既往史、现病史中的不良事件

E. 回顾潜在的危险因素

Bronchoscopy International copyright 2013

F. Question I.5: According to American Thoracic Society guidelines, which of the following is an absolute contraindication to flexible bronchoscopy:

A. Patient with unstable asthma or status asthmaticus.
B. Patient with refractory hypoxemia or inadequate oxygenation during the procedure.
C. Recent or unstable angina or recent myocardial infarction.
D. Severe hypercarbia and significantly reduced forced expiratory volume in one second.
E. Superior vena cava obstruction.

问题 1.5 根据美国胸科学会指南，下列哪一项是纤维支气管镜的绝对禁忌症：

A. 患者不稳定性哮喘或哮喘持续状态
B. 在操作时反复出现低氧血症或氧合不足的患者
C. 近期的或不稳定型心绞痛和近期的心肌梗塞
D. 严重的高碳酸血症并 FEV1 明显下降
E. 上腔静脉阻塞

Bronchoscopy International copyright 2013

Question I.6 Originally, the flexible bronchoscope was designed to be held as shown in the Figure below. A reason for this is

A. The operator must always stand behind the patient; therefore it is best for the control section to be held in the left hand.
B. Dr. Ikeda, original designer of the flexible bronchoscope, was left-handed.
C. The operator must always stand to the right of the patient; therefore, it is best for the control section to be held in the left hand so that the bronchoscopist's right hand can be closest to the patient.
D. The operator must always stand to the left of the patient; therefore, it is best for the control section to be held in the left hand so that the bronchoscopist's right hand can be closest to the patient.

问题 1.6 最初，可弯曲支气管镜被设计持握为如下图中所示，其原因是

A. 操作者必须总是站在病人后方，所以最好是以左手把持控制部分
B. 池田医生——可弯曲支气管镜的发明者，是左利手者
C. 操作者必须始终站在病人的右边，因此，它最适合是以左手握住控制部，使操作者的右手可以接近病人
D. 操作者必须始终站在病人的左边，因此，它最适合是以左手把持控制部分，使操作者的右手可以接近病人

Bronchoscopy International copyright 2013

Question I.7 Maximum flexion of the distal bending tip of the flexible bronchoscope is obtained by which of the following

A. Moving the thumb upwards
B. Moving the thumb downwards

问题 1.7 可弯曲支气管镜的末端最大可弯曲性是以下

A．大拇指向上顶
B．大拇指向下压

Bronchoscopy International copyright 2013

Question I.8: Each of the following is considered “poor technique” when handling a flexible bronchoscope except

A. Twisting the insertion tube rather than rotating the entire instrument along its entire longitudinal axis.
B. Advancing the bronchoscope by pushing down from the handle.
C. Exerting excessive pressure with one’s fingers on the patient’s nostril or cheek.
D. Attempting to pass an instrument through a fully flexed distal extremity of the bronchoscope
E. Keeping the bronchoscope “in the midline” of the airway lumen throughout as much of the procedure as possible.

问题 1.8 在操作可弯曲支气管镜时出现以下各种情况是被认为“技术不良”，除了

A．扭转插入管而不是沿着它的整个纵轴旋转整个工具。
B．通过向下推进手柄来前进支气管镜。
C．对病人的鼻孔或脸颊用手指施加压力过大。
D．试图通过一个仪器凭借充分弯曲的支气管镜末端。
E．在操作的过程中尽可能地保持支气管镜在气道的“中间”。

Bronchoscopy International copyright 2013

Question I.9: Sensory anesthesia from the epiglottis to the vocal cords is obtained by numbing which of the following.

A. The Sphenopalatine nerve fibers
B. The Glossopharyngeal nerve
C. The Recurrent laryngeal nerve
D. The Superior laryngeal nerve
E. The second (maxillary) division of the trigeminal nerve

问题 1.9 从会厌到声带的感觉麻醉是通过以下何种麻醉达到：
A．蝶腭骨神经纤维
B．舌咽神经
C．喉返神经
D．喉上神经
E．三叉神经第二支（上颌支）

Bronchoscopy International copyright 2013

Question I.10: All of the following are responsible for a difficult or painful insertion of the flexible bronchoscope through the nasopharynx and oropharynx except.

A. Swelling of nasal mucosal membranes
B. Septum deviation
C. Nasal polyps
D. Hypertrophy of the nasal turbinates
E. Enlarged adenoids

问题 1.10 以下所有情况是由于以可弯曲支气管镜通过鼻咽和口咽时一次困难的或痛苦的插入，除了：
A. 鼻黏膜肿胀膜
B. 鼻中隔偏曲
C. 鼻息肉
D. 鼻甲肥厚
E. 腺样体肥大

Bronchoscopy International copyright 2013

Question I.11: Which of the following topical anesthetics should be used in a patient who has just informed you of a severe allergic reaction to Novocaine during a recent visit to the dentist.

A. Lidocaine
B. Benzocaine
C. Tetracaine
D. Cocaine
E. All of the above

问题 1.11 下列哪一种局部麻醉应该用于一个刚通知你最近的一次去看牙医时使用奴佛卡因出现严重的过敏反应的病人：

A. 利多卡因
B. 苯坐卡因
C. 丁卡因
D. 可卡因
E. 以上皆是

Bronchoscopy International copyright 2013

Question I.12: What is the official and commonly accepted name for the epiglottis shown.

A. Omega or infantile epiglottis
B. Horseshoe epiglottis
C. U-shaped epiglottis
D. Normal appearing epiglottis

问题 1.12 以下图中会厌所显示，哪个是官方和公认的名字：
A．Ω或小儿型会厌
B．马蹄形会厌
C．U 型会厌
D．普通型会厌

Bronchoscopy International copyright 2013

Question I.13: You have been asked to develop a bronchoscopy service in your hospital. You recognize that your success, income, and future hospital funding depends on clinical activity. You also recognize that declining to perform a procedure may not be conducive to your ambitions. You have spoken with several colleagues who have been in similar situations. One way to build and maintain a busy service and perform bronchoscopy in virtually every patient referred to you is to say that

A. Bronchoscopy is justified “in anyone who has an airway”
B. Bronchoscopy is justified in anyone with an abnormal chest radiograph.
C. Bronchoscopy is justified because you are working in a training program
D. Bronchoscopy is justified in order to avoid litigation
E. Bronchoscopy is justified in order to keep the referring physician happy

问题 1.13 你被要求在你所在的医院开发一个新的支气管镜检查。你认识到你的成功、收入和今后医院的资助将取决于这项临床检查。你也认识到，拒绝执行一个支气管镜检查可能不利于你的发展。你和与你情况类似的几个同行谈过。以下哪一种想法在对你的几乎所有的病人来讲，是建立并维持一个繁忙的服务和实施支气管镜检查的平衡：

A．“任何有气道的人”行支气管镜检查都是合理的。
B. 具有胸部 X 线照片异常的病人行支气管镜检查都是合理的。
C. 由于你在进行培训计划，任何人行支气管镜检查都是合理的。
D．为了逃避诉讼，任何人行支气管镜检查都是合理的。
E．为了满足顾问医生，任何人行支气管镜检查都是合理的。

Created on 4/3/2011 8:05:00 AM

Question I.14: All the following statements regarding the effects of flexible bronchoscopy on cardiovascular hemodynamics are correct except

A. Flexible bronchoscopy increases oxygen consumption ($V0_2$), decreases mixed venous oxygen (SvO_2), and oxygen delivery ($D0_{2)}$ remains unchanged.
B. Flexible bronchoscopy increases cardiac index (CI) by at least 10-15 percent.
C. Flexible bronchoscopy increases heart rate, and correlations have been noted between presence of arrhythmias and depth of oxygen desaturation, but not with presence of cardiovascular disease of chronic obstructive pulmonary disease.
D. Known coronary artery disease does not appear to increase the frequency of bronchoscopy-related cardiac ischemic events as long as precautions are taken (use of supplemental oxygen, judicious use of sedation, rapid procedure performance).
E. Impact of flexible bronchoscopy on cardiovascular function and oxygen saturation ends when the bronchoscope is removed from the airways.

问题 1.14 以下的所有情况关于可弯曲支气管镜对心血管系统血流动力学的影响是正确的，除了：

A．可弯曲支气管镜操作增加氧消耗(V02)，降低混合静脉血氧(SvO2)，氧气交换(D02)保持不变。
B．可弯曲支气管镜操作增加心脏指数（CI）至少百分之 10—15。
C．可弯曲支气管镜操作增加心率，和关联存在之间已经提到过的血氧饱和度下降的深度及心律失常，但不伴有慢性阻塞性肺部疾病相关的心血管疾病。
D．已知的冠状动脉疾病不会增加支气管镜相关心脏缺血事件的次数，只要采取好预防措施 (使用辅助供氧、明智地使用镇静、缩短操作时间)。
E．可弯曲支气管镜检查在心血管功能和血氧饱和度的影响在支气管镜离开气道时便会结束。

Bronchoscopy International copyright 2013

Question I.15: When referring to digital photography, video imaging, television, or fluoroscopic image intensifiers, the term “resolution” is defined as

A. Number of pixels per square centimeter
B. Number of lines per inch or line pairs per millimeter
C. Brightness of an image on screen
D. Sharpness of an image on screen

问题 1.15 当提及数字图象、录像、电视、或荧光镜图像增强，“分辨率”这个术语定义为：
A．像素每平方厘米
B．线数每英寸或线数每毫米
C．荧幕上图像的亮度
D．荧幕上图像的清晰度

Bronchoscopy International copyright 2013

Question I.16: When using a fluoroscopy C-arm, radiation exposure rates to the patient are higher when

A. The x-ray tube is closer to the table top
B. The x-ray tube is farther from the table top
C. X-ray tube to table distance is irrelevant

问题 1.16 当使用透视 C 形臂，病人接收辐射暴露的几率升高当出现以下情况：

A. X 线球管接近的台面
B. X 线球管远离的台面
C. X 线球管与诊台的距离与辐射是不相关的

Bronchoscopy International copyright 2013

Question I.17: Which of the following statements pertaining to bronchoscopy-related complications is least likely to be justified by anecdotal experience or clinical studies.

A. Fever and chills may occur as late as 6-8 hours after bronchoscopy.
B. Transient pulmonary infiltrates secondary to saline retention after bronchoalveolar lavage should be in the differential diagnosis of any patient with new or increased pulmonary infiltrates.
C. Continuous suction during bronchoscopy can reduce tidal volume and exacerbate preexisting hypoxemia.
D. Most bronchoscopy-related pneumothoraces occur several hours after the procedure.
E. The addition of conscious sedation can increase the likelihood of post-procedure hypoxemia or respiratory insufficiency

问题 1.17 下面哪个关于支气管镜相关并发症的陈述最少被过往经验或临床研究证实：

A. 支气管镜检查后到 6 - 8 个小时可能出现发烧和发冷。
B. 继发于支气管肺泡灌洗残留生理盐水所致的短暂的肺部浸润影应该在与任何病人出现新或增加的肺部浸润影鉴别。
C. 在支气管镜检查时持续负压吸引可降低潮气量和加重原有的低血氧。
D. 多数支气管镜相关性气胸出现在检查后的数小时。
E. 增加镇静药物会增加操作后低氧血症或呼吸衰竭的可能性。

Bronchoscopy International copyright 2013

Question I.18 The abnormality shown in the Figure below is on the

A. Left vocal cord
B. Right vocal cord
C. Epiglottis
D. Arytenoids

问题 1.18 下图中所见异常的部位是：
A. 左声带
B. 右声带
C. 会厌
D. 勺状软骨

Bronchoscopy International copyright 2013

Question I.19 The larynx seen in the Figure below is from an adult

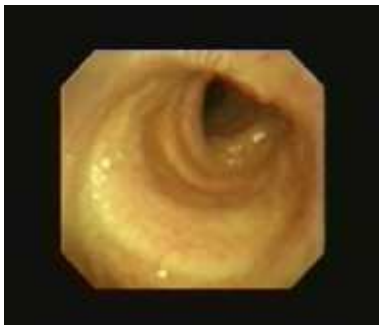
A. Man
B. Woman
C. Horse

问题 1.19 下图中所见的喉部是一个成年的
A. 男性
B. 女性
C. 马

Bronchoscopy International copyright 2013

Question I.20 The anatomic structure shown in the Figure below is

A. The most narrow part of the adult airway
B. The most narrow part of the pediatric airway
C. The most narrow part of the adult female airway
D. The most narrow part of the adult male airway



问题 1.20 下面图中的解剖结构是
A. 成人呼吸道最狭窄的部分
B. 儿童呼吸道最狭窄的部分
C. 成人女性呼吸道最狭窄的部分
D. 成人男性呼吸道最狭窄的部分

Bronchoscopy International copyright 2013

Question I.21: The average cross-sectional area of the trachea in a 30-year-old male is

A. 1.5 cm^2
B. 2.8 cm^2
C. 3.2 cm^2
D. 5.0 cm^2

问题 1.21 30 岁男性气管的平均横截面积是

A.1.5 cm^2
B.2.8 cm^2
C.3.2 cm^2
D.5.0 cm^2

Created on 4/3/2011 8:05:00 AM

Question I.22: How would you describe the trachea shown in the Figure below.

A. Normal C-shaped
B. Normal U-shaped
C. Normal horseshoe-shaped
D. Abnormal saber-shaped
E. Abnormal Lunate shaped

问题 1.22 你将如何描述下面图中气管所示。
A. 正常的 C 形
B. 正常的 U 形
C. 正常的马蹄形
D. 异常的剑鞘形
E. 异常的半月形

Bronchoscopy International copyright 2013

Question I.23 A 29-year-old woman with Wegener's granulomatosis and increasing shortness of breath undergoes flexible bronchoscopy. Based on the finding shown you should.

A. Attempt to pass the bronchoscope beyond the subglottic stricture in order to measure its length.
B. Request an angioplasty balloon in order to dilate the stricture immediately.
C. Request and endotracheal tube at the bedside, then attempt to push the bronchoscope beyond the stricture in order to determine whether it is simple or complex
D. Stop the examination, remove the bronchoscope. Keep the patent under observation, and notify otolaryngology, thoracic surgery and an interventional bronchoscopist of the finding.

问题 1.23 一个患有韦格纳氏肉芽肿的 29 岁女性，在支气管镜检查时出现加重的呼吸短促。基于下图的发现，你应该

A. 试图以支气管镜通过声门下狭窄部位，以测量其长度。
B. 准备一个气道成形术球囊，立即行球囊扩张术。
C. 准备床边气管插管，然后试图用力以支气管镜通过狭窄部位，以确定它是简单或复杂的
D. 停止检查，取出支气管镜。观察病人，并通知耳鼻喉科、胸外科和呼吸介入医师发现的情况。

Bronchoscopy International copyright 2013

Question I.24: Bleeding-related morbidity and mortality after flexible bronchoscopy is most frequently caused by

A. Massive pulmonary hemorrhage
B. Hypoxemia and respiratory insufficiency resulting from filling of ventilatory dead space
C. Dysrhythmias from hypovolemia
D. Hypotension and myocardial infarction

问题 1.24 支气管镜检查后出血相关的发病率和死亡率最常见的于：
A. 大量的肺组织出血
B. 气道窒息所致低氧血症及呼吸衰竭
C. 血容量不足所致的心律失常
D. 低血压和心肌梗塞

Bronchoscopy International copyright 2013

Question I.25: A patient with breast cancer and venous thromboembolism is on Warfarin (Coumadin). Her INR is 2.1. Flexible bronchoscopy is scheduled for tomorrow. Bronchoalveolar lavage and biopsy are planned. You are concerned about procedure-related bleeding. You might choose to do which of the following.

A. Refer the patient to someone else
B. Proceed with bronchoscopy. There is no need to hold Warfarin
C. Hold Warfarin the day of the procedure only
D. Hold Warfarin today and tomorrow, administer vitamin K 2.5 mg orally today, and repeat INR measurement the day of the procedure.
E. Administer vitamin K, 10 mg intravenously now. Fresh frozen plasma should be available for the procedure in case it is needed.

问题 1.25 一个患有乳腺癌和静脉血栓栓塞的病人在服用华法林治疗。她的 INR 值是 2.1，可弯曲支气管镜检查安排在明天。预期将予支气管肺泡灌洗和活检。你需要考虑操作相关的出血。你可能会选择以下哪种做法：

A. 把这个病人介绍给其他医生
B. 照常进行支气管镜检查，不需要暂停服用华法林
C. 检查的当天暂停服用华法林
D. 今天和明天均暂停服用华法林，今天给予维生素 K 2.5mg 口服，检查当天复查 INR
E. 立即给予维生素 K 10mg 静脉注射，新鲜冰冻血浆应随时准备在检查过程中可能用到

Bronchoscopy International copyright 2013

Question I.26: A 43-year-old woman with a history of healed tracheostomy presents to the emergency department with dyspnea and stridor. The first thing you do while preparing for flexible bronchoscopy is

A. Administer intravenous sedation and heliox
B. Place the patient's head and neck in the "sniff" position.
C. Administer oxygen and mist humidification.
D. Prepare for immediate tracheal dilatation using rigid bronchoscopy tubes of increasing diameter.

问题 1.26 一个既往有气管切开病史的 43 岁女性，因呼吸困难和喘鸣于急诊就诊。为了准备行支气管镜检查，你首先要做的是：

A. 给予静脉麻醉和吸入氦氧混合气体
B. 维持病人的头和颈部处于用力吸气位置
C. 给予吸入湿化氧气
D. 准备直接使用硬质支气管镜以逐渐增粗的管道扩张气管

Bronchoscopy International copyright 2013

Question I.27: Laryngoscopy and flexible bronchoscopy are frequently used to evaluate and monitor patients with potential or known inhalation injury. They are least helpful in patients with

A. Supraglottic edema from direct heat-induced mucosal injury
B. Glottic edema from smoke-induced mucosal injury
C. Soft tissue swelling that accompanies general body edema from fluid resuscitation
D. Bronchospasm

问题 1.27 喉镜检查和可弯曲支气管镜检查被经常用于评估和检查潜在的或已知的吸入性损伤。它们对以下哪类病人帮助最小：

A. 直接热感应粘膜损伤导致的喉头水肿
B. 吸烟引起粘膜损伤导致的声门水肿
C. 由于液体复苏治疗所致全身水肿伴随的软组织水肿
D. 支气管痉挛

Bronchoscopy International copyright 2013

Question I.28: Flexible bronchoscopy has been shown to be of limited value in all of the following except.

A. Pulmonary atelectasis after thoracic surgery
B. Solitary pulmonary nodules less than 2 cm in diameter
C. Isolated, unexplained pleural effusion
D. Hemoptysis with a nonlocalizing chest radiograph
E. Persistent asthma-like symptoms and chronic cough

问题 1.28 可弯曲支气管镜检查在以下情况中被认为有限的价值，除了

A. 胸科手术后的肺不张
B. 直径小于 2cm 的孤立肺结节
C. 单纯的原因不明的胸腔积液
D. 无明确胸部影像学定位病灶的咯血
E. 持续的哮喘样症状和慢性咳嗽

Bronchoscopy International copyright 2013

F. Question I.29: All of the following statements about endotracheal intubation are correct except

A. In obese patients in the supine position, elevating and supporting the shoulders in addition to elevating the head optimizes visualization by direct laryngoscopy
B. It is preferable to use a Miller Laryngoscope blade in patients with and anteriorly situated larynx
C. Rapid sequence induction (preoxygenation-sedation-muscle relaxation) facilitates bronchoscopic intubation
D. Cricoid pressure can be safely applied in patients who are at risk of aspiration
E. Patients with heart failure, myocardial ischemia or hypovolemia are at higher risk of peri-intubation mortality

问题 1.29 以下关于气管插管术的状况都是正确的，除了：

A. 肥胖的患者仰卧位，垫起和支撑肩膀，可使头部升高，使用直接喉镜时更清晰。
B. 在前位喉头的病人中，选择使用米勒喉镜叶片更好。
C. 快速的诱导程序（提高氧浓度——镇静——肌松）可帮助经支气管镜插管。
D. 在吸气困难的病人中应用压迫环状软骨环是安全的。
E. 心力衰竭, 心肌缺血或重度血容量不足的患者具有高风险的插管死亡率。

Bronchoscopy International copyright 2013

Question I.30 All the following findings are likely to make flexible bronchoscopic intubation of trauma victims more difficult except

A. Posterior displacement of the tongue and soft tissue edema
B. Vomitus, blood, and foreign bodies (teeth)
C. Agitation and anxiety
D. Using a larger caliber endotracheal tube over a larger caliber flexible bronchoscope
E. Rapid sequence anesthesia

问题 1.30 下面所有的发现可能使经支气管镜插管困难及易致患者创伤，除外

A．舌根后坠及软组织水肿
B．呕吐物、出血和异物（牙齿）
C．烦躁和焦虑
D．在一条较粗的支气管镜上使用一个大口径气管插管
E．快速的麻醉

Created on 4/3/2011 8:05:00 AM

模块 I

阶段测试答案

Answer I.1: B

Shigeto Ikeda, of Tokyo Japan introduced the first flexible fiberoptic bronchoscope at the Ninth International Congress on Diseases of the Chest held in Copenhagen in 1966. Frieberg is an important city for the history of bronchoscopy because it is the mother city of Gustav Killian (1860-1921), often called the father of bronchoscopy. Chevalier Jackson, the famous North American Otorhinolaryngologist, was from Philadelphia, where he produced a rigid bronchoscope with a distal illuminating tip in 1904.

答案 1.1 B

日本东京的池田医师（Shigeto Ikeda ）在 1966 年哥本哈根举行的第九届国际胸部疾病会议上首次介绍了可弯曲的纤维支气管镜。弗莱堡是支气管镜发展历史的一个重要城市，因为支气管镜之父——古斯塔夫•基利安（Gustav Killian (1860-1921)）出生于此城。来自费城的北美著名耳鼻喉科学家薛瓦利•杰克逊（Chevalier Jackson ）在 1904 年发明了一种带远端照明系统的硬质支气管镜。

Bronchoscopy International copyright 2013

Answer I.2: A

In 1927-1930, Baird (an Englishman) and Hansell (a North American) proposed that optical properties of glass fibers could be utilized. Heel (from Holland) and O'Brien (from the United States) developed cladding glass; the technique used to insulate and coat each light-transmitting optical glass fiber so that light could be transmitted through the fiber even if it were twisted and bent. Hopkins and Kapany (both from Great Britain) developed the optically arranged fiber bundle and are thus credited with the introduction of the word "fiberscope".

答案 1.2 A

在 1927-1930,博德(英国)和 Hansell(北美)提议在支气管镜上利用光纤技术。希尔(荷兰)和奥·拜仁(美国)发明包层玻璃，这项技术既往是用于套住和隔绝每根光纤，即使它被扭曲时，光线也可以通过光纤传输。霍普金斯和卡帕尼（英国）改进了光纤束排列，并因此被引入了“纤维内窥镜”的介绍中。

Bronchoscopy International copyright 2013

Answer I.3: E

Bronchoscopy is a minimally invasive procedure, but an invasive procedure nevertheless. Every indication for bronchoscopy must be justified, and alternatives means (invasive and noninvasive) for diagnosis or treatment should always be considered. Bronchoscopy can also be a very costly procedure. Use of accessory instruments, specimen processing, and time in the hospital, and consequences of potential procedure-related complications further increase the cost. If possible, everything should be done so that diagnostic yield is maximized and diagnosis is obtained from a single (and not repeated) procedure.

For example, if bronchoscopic inspection reveals no airway abnormalities, the bronchoscopist should be ready to perform transbronchoscopic sampling. In this case, yield might be increased if radiographic guidance is used, and is definitely increased if cytopathologic analysis is performed on-site. Informed consent is ethically justified because patients “have a right to know”, and has become mandatory in an increasing number of countries.

答案 1.3 E

支气管镜检查是一种微创手术,但是一种侵入性操作。种种迹象为支气管镜必须得到规范化，对诊断或治疗应总是考虑选择不同方法（侵入性或非侵入性）。支气管镜检查也可以是一个代价昂贵的操作。使用辅助工具、标本检验、和住院时间，和潜在的手术相关并发症的影响将会增加费用。如果可能的话,事事都应做到使诊断价值最大化和该诊断是通过一个单一的(而不是重复)操作。

例如，如果支气管镜检查无气道异常，那么支气管镜医生应准备好施行经支气管镜取样。在这种情况下,影像学引导的使用可能会提高诊断价值,和现场细胞病理学分析将肯定提高诊断价值。知情同意在伦理上是恰当的,因为患者“有知情权”在越来越多的国家已成为强制性的。

Bronchoscopy International copyright 2013

Answer I.4: B

Surveys performed by the American College of Chest Physicians and the American Association for Bronchology show that the number of laboratory tests routinely obtained prior to performing bronchoscopy are decreasing. Flexible bronchoscopy is very safe. In the absence of risk factors, complications such as bleeding are rare. Not all patients need to have platelet counts. In fact, in severely thrombocytopenic patients, flexible bronchoscopy with bronchoalveolar lavage has proven safety even when the scope is inserted nasally. Increasingly, experts advocate that platelet counts be obtained only in patients with a history and physical suggestive of a bleeding or coagulation disorder and undergoing endobronchial or bronchoscopic lung biopsies.

答案 1.4 B

由美国支气管镜协会和美国胸科医师学会联合进行的一项调查显示：接受支气管镜检查前例行的实验室检测项目逐渐减少。可弯曲支气管镜检查是很安全的。如果没有其它危险因素，出血等并发症是罕见的。并不是所有的患者都需要行血小板计数检测。事实上，患有严重血小板减少的患者，即使经鼻插入可纤维支气管镜进行支气管肺泡灌洗，也被证明是安全的。逐渐地, 专家认为血小板计数检测仅针对下述患者：既往病史和体查提示出血倾向或凝血障碍、拟接受支气管内膜活检或经支气管镜肺活检的病人。

Bronchoscopy International copyright 2013

Answer I.5: B

It is wiser to postpone or defer a procedure if patients are severely hypoxemic. Bronchoscopy itself causes a fall in oxygen saturation. In addition, every procedure-related complication causes hypoxemia. It is true that sometimes, "a bronchoscopist must be lucky", but what if it is not your or the patient's lucky day. The risks of the procedure, including potential need for intubation and mechanical ventilation should be carefully explained to critical patients and to their families. One good question to always ask is "will the results of this procedure alter medical management"? If the answer is "no", it is wiser to postpone the procedure.

Bronchoscopy has repeatedly been shown to be an extremely safe procedure. The patient trusts your judgment. Your "contract" is with the patient. Curiosity about the disease, outcome, or a macho attitude that 'I can do this" are nice, but in the grand scheme of medical ethics and morality, have no place here. Now, after that short editorial comment, back to the question…The American Thoracic Society has listed only four contraindications to bronchoscopy. These are absence of informed consent, operator inexperience, inadequate facilities, and inability to assure adequate oxygenation during the procedure. Prolonged hypoxemia during the procedure can lead to cardiac arrhythmias, myocardial infarction, mental status changes, and respiratory failure. In fact, some experts suggest that uncorrectable hypoxemia, hypertension, or elevated intracranial pressures are relative contraindications to bronchoscopy. Any procedure-related event such as bleeding or post-lavage related hypoxemia can increase or prolong a hypoxemic episode. Textbooks state that bronchoscopy is less safe in patients with recent or unstable angina, hypercarbia, superior vena cava obstruction, and unstable asthma, as well as in patients with uremia, pulmonary hypertension, and advanced age. Specific data regarding this "increased risk" are controversial.

答案 1.5 B

如果患者严重时血氧不足时，推迟或延期进行操作是明智的行为。支气管镜检查本身可导致血氧饱和度下降。此外,各种手术相关并发症均可导致低氧血症。有些时候,"支气管镜医生一定是幸运的"这个说法是真的,但是如果这天不是你的或病人的幸运日又会怎样。操作的风险，包括插管和机械通气的潜在需要应仔细地对急危重症患者和他们的家属解释。总是问的一个很好的问题是"检查的这些结果将改变治疗方案吗"?如果答案是"不"，那延期这个操作是明智的。

支气管镜检查一再被证明是一个非常安全的操作。患者信任你的判断。你的"契约"是对病人的。对疾病的好奇心,结果,或有以"我可以做到"的大男子气概的态度是好的,但在医学伦理学和道德体制中是一无是处的。现在,在这短暂的编辑评论之后,回到这个问题…美国胸科协会只列出了四个支气管镜检查的禁忌症。这些都是缺乏知情同意,手术者缺乏经验,设施不足、无法保证手术过程中足够的血氧饱和度。操作过程中长时间的低氧血症,可能会导致心律失常,心肌梗塞,精神状态的变化,呼吸衰竭。事实上,一些专家建议无法纠正的低氧血症、高血压病或颅内压力升高是支气管镜检查的相对禁忌症。任何手术相关事件，例如出血或灌洗后相关低氧血症可加重低氧血症。教科书里描述，对于近期或不稳定型心绞痛、高碳酸血症、上腔静脉阻塞、不稳定的哮喘、尿毒症、肺动脉高压、年老的患者行支气管镜检查是不安全的。关于这个"增长风险" 的具体数据是有争议的。

Bronchoscopy International copyright 2013

Answer I. 6 B

The originator of the scope was left-handed! It really does not matter where one stands while performing flexible bronchoscopy. The scope can be held in either the left or the right hand, depending on personal comfort, teacher biases, and where one places one's assistants.

If held in the right hand (as shown in the Figure and standing at the supine patient's right, the free left hand is closest to the patient's head, and comfortably holds the scope at the insertion site.

Similarly, if the bronchoscopist were standing to the patient's left, a scope held in the left hand would allow the free right hand to be closest to the patient's head.

答案 1.6 B

支气管镜的创始人是左撇子。当操作可弯曲支气管镜的时候站在哪个方向都不成问题。支气管镜也可以用左手或右手持镜,根据个人的舒适程度,老师意见的影响,以及某助手的位置而定。

如果以右手持镜(如图象并站在仰卧位病人右侧,可自由活动的左手是最接近患者的头部和在插入点较舒适地执镜位置。

类似地，如果支气管镜医生站到患者的左侧，左手持镜可让可自由活动的右手最接近患者的头部。

Created on 7/28/2011 12:09:00 AM

Bronchoscopy International copyright 2013

Answer I.7 B

Moving the thumb downwards will flex the bending tip maximally. Forceps or other instruments should never be advanced forcefully through a maximally flexed bronchoscope because this risks tearing the working channel. Maximum flexion may be necessary to enter the apical segments of the upper lobes, but is otherwise rarely needed because simple turning of the wrist will satisfactorily guide most movements of the bronchoscope.

The flexion-extension movement is particularly useful in order to examine first the middle lobe bronchus (slight flexion), then the superior segmental bronchus of the right lower lobe (slight extension), without moving the bronchoscope.

DOWN

UP

移动拇指向下弯曲,会使弯曲端最大化弯曲。镊子或其他仪器不应该用力地通过最大化弯曲的支气管镜，会有撕裂工作管道的风险。要进入上叶尖段时可能必须要最大弯曲，但这是很少有必要的,因为简单的把手腕转动将令人满意地完成大多数支气管镜操作动作。

内曲外伸动作是特别有用的，在基本的检查中叶支气管（轻微的内曲），然后伸展到达右下叶部分支气管（轻微外伸）而几乎不需要移动支气管镜。

Created on 7/28/2011 12:09:00 AM

Bronchoscopy International copyright 2013

Answer I.8: E

"Stay in the middle" is a favorite phrase of several teachers of bronchoscopy. This provides the bronchoscopist greater visibility inside the airway and avoids unnecessary mucosal trauma, minimizes gagging, deglutition, and cough, and maximizes flexion and extension capabilities. Twisting the insertion cord is inelegant and can damage the fragile fibers of either a fiberoptic or videobronchoscope.

Exerting excessive pressure onto the patient's nostril with the hand holding the distal extremity of insertion cord causes patient discomfort. One might cause nasal trauma and bleeding, insert one's gloved finger into the patient's eye, lacerate the former of the patient's lip, or dislodge a loose tooth. Attempting to forcefully pass an instrument such as a forceps through the fully flexed distal extremity of the bronchoscope is a big "no no", because of the great risk of damaging the working channel of the bronchoscope.

Advancing the bronchoscope by pushing down on the handle causes excessive bending of the instrument proximally. This prompts the bronchoscopist to bend over at the shoulders, which is very poor posture, and over time and hundreds of bronchoscopies can cause backache. In addition, it will be more difficult and potentially harmful to the bronchoscope to insert instruments through the working channel. This is especially the case for transbronchial needles! It is more elegant to lean back slightly, straightening the shoulders, and to straighten the insertion cord of the bronchoscope by stepping a bit away from the patient. The bronchoscope is advanced by moving the entire ensemble (insertion cord and control section).

Ideally, the bronchoscope can be advanced as the patient inhales, and, if necessary, pulled back when the patient exhales. Thus, the bronchoscopist, the bronchoscope, and the patient remain "in harmony" throughout the procedure.

"保持在中间"是一些支气管镜教师最常用的词语。这样能提供支气管镜医师在气道中视野更清晰，避免不必要的黏膜创伤、减低恶心感、吞咽动作和咳嗽，以及可以最大限度地弯曲和伸展。扭曲插入镜身是粗野的动作，并且会损坏软式支气管镜或可视像支气管镜脆弱的光导纤维。

用手握住插入的镜身末端在病人的鼻孔上施加过大的压力会导致病人不舒服。可能会引起鼻创伤和出血，用一只带有手套的手指进入病人的眼睛，割伤病人的嘴唇，或把一个松动的牙齿脱落了。试图把器具如钳子用力通过充分弯曲的支气管镜远端是必须避免的错误，因为这样有巨大的风险损坏支气管镜的工作通道。

通过压低手柄来推进支气管导致近端镜身的过度弯曲。这提醒了支气管镜医师用肩膀折转，这是一个很累人的姿势，随着时间推移，数以百计的支气管镜医师会产生背痛。此外,它将会使插入工具通过支气管镜工作通道更加困难和具有潜在的危害。在使用经支气管镜针穿刺时尤其!轻微向后倾斜的动作会更优雅舒适，矫正肩膀，并通过稍微后退支气管镜调直插入的镜身。移动整个支气管镜来进行操作，（包括插入的部分和控制部分)。

理想的情况是，在患者吸气时推进支气管镜，必要时在还债呼气时拉回插入段。这样操作者、支气管镜、病人三者可在操作过程中保持"和谐"。

Bronchoscopy International copyright 2013

Answer I.9: D

Anesthesia of the superior laryngeal nerve results in blocking sensory innervation to the base of the tongue, epiglottis, periform fossa, and valleculae. This is usually satisfactory after administration of nebulized topical anesthetic. The Glossopharyngeal nerve innervates the posterior third of the tongue, the tonsillar region and the oropharynx. A bilateral glossopharyngeal nerve block (performed by injection behind each posterior tonsillar pillar) can be used to completely abolish the gag reflex in selected patients. This can result in sudden respiratory compromise from rapid paralysis of the pharyngeal muscles and the base of the tongue.

Bilateral nasal administration of anesthetic provides partial posterior pharyngeal anesthesia by affecting the Sphenopalatine nerve fibers. The recurrent laryngeal nerve supplies sensory and motor innervation of the intrinsic muscles of the larynx. The second division of the trigeminal nerve supplies much of the sensory innervation to the nasal mucosa.

喉上神经麻醉导致阻断舌根、会厌、梨状窝的感觉神经支配。这通常通过雾化局部麻醉可以获得满意效果。舌咽神经支配舌头的后三分之一、扁桃体和口咽。双侧舌咽神经阻滞（通过注射双侧扁桃体柱后部）可用于对挑选的患者完全消除呕吐反射。这可以导致咽肌肉和舌根的快速麻痹出现突发呼吸窘迫。

双侧鼻腔麻醉通过作用于蝶颚骨神经使后咽部麻醉。喉返神经提供喉部固有肌肉神经的感觉和运动。第二组的三叉神经提供鼻粘膜主要神经支配的感觉。

Bronchoscopy International copyright 2013

Answer I.10: E

Swelling of the mucosal membranes can often be reduced through application of cocaine (using small cotton pledgets) and other vasoconstrictors (Lidocaine with epinephrine), which help to increase the diameter of the nasal passage and decrease the incidence of bleeding. If swollen membranes are noted, patients should be warned that they might experience discomfort during passage of the bronchoscope. Sufficient amounts of lubrication and topical anesthetic should be applied.

Patients with a deviated nasal septum, nasal polyps, and turbinate hypertrophy may also experience discomfort during nasal insertion of the flexible bronchoscope. Satisfactory anesthesia should be administered topically, and the bronchoscopist should not hesitate to attempt insertion in the contra lateral side. Repeated unsuccessful attempts should be avoided because of increased patient discomfort, risk for bleeding, and patient loss of confidence (bronchoscopy assistants don't like watching this either). It is preferable to change to a transoral approach.

Enlarged adenoid tissue (also known as the nasopharyngeal tonsils) in the mucous membrane of the posterior wall of the nasopharynx can cause partial airway obstruction that prevents nasopharyngeal insertion of an endotracheal tube, but usually does not prevent insertion of the flexible bronchoscope.

答案 1.10

常常可以通过应用的可卡因(使用小棉球)及其他血管收缩剂(利多卡因和肾上腺素) 减少粘膜水肿，这有助于增加鼻腔的直径，减少出血的发病率。如果粘膜肿胀明显，应提示患者在进气管镜的时候他们可能会感受不舒服。这时候应采用充分的润滑和局部麻醉。

具有鼻中隔偏曲、鼻息肉或鼻甲肥厚的患者可能在经鼻插入可弯曲支气管镜时出现不适。应该给予充分局部麻醉并且支气管镜医师应该毫不犹豫的尝试插入相对的健侧。应避免重复失败的尝试，因为这样会增加了病人不适、出血风险和使患者丧失耐心(支气管镜医师助手也同样不愿意看到)。可以考虑转变成经口插入的方法。

在咽喉壁粘膜的腺样体肥大(也称为鼻咽部扁桃体)能引起局部气道阻塞，阻碍直视鼻咽插入气管导管，但一般不能妨碍插入可弯曲支气管镜。

Bronchoscopy International copyright 2013

Answer I.11: A

There are two families of topical anesthetics; these are the Amides: Bupivicaine (Marcaine), Lidocaine (Xylocaine), Mepivicaine (Carbocaine), Ropivicaine (Naropin), and the Esters: Procaine (Novocaine), Cocaine, and Benzocaine, and Tetracaine (Pontocaine), One way to remember which drugs belong to which family, is to remember that drugs spelled with one "i" are Esters, whereas those spelled with two (ii) are Amides.

Allergic reactions (usually rash, urticaria, laryngeal edema, or bronchospasm) as well as anaphylaxis are common within a same family, but much less frequent between families. If a patient reports allergy to a drug belonging to one family, anesthesia using a drug from another family is usually safe. However, preservatives used in the manufacture of these drugs can have cross reactivities. Allergy can therefore occur when using different drugs, especially within the Ester class.

Because some preservatives are structurally similar to the allergen para-aminobenzoic acid (PABA), many allergic reactions are caused by antibody response to the preservative and not to the local anesthetic agent. Local anesthetics of the Ester class have metabolites related to PABA, and are therefore most likely to cause allergic reactions. If a patient has had an allergic reaction to a drug of the Ester class of local anesthetics, it is almost always safe to administer a drug from the Amide class. Some pharmacies carry "preservative free" drug preparations. True lidocaine allergies are extremely rare, and often the "allergic" reaction is actually an adverse response to epinephrine or phenylnephrine contained in the preparation. Allergic reactions and drug-related complications can be prevented by (1) always asking patients about medication allergies before performing the procedure, (2) using the least amount of anesthetic possible, especially in elderly patients or in those with significant comorbidities, (3) watching for drug reactions and adverse effects.

答案 1.11

局部麻醉剂有两个家族。分别是酰胺类：布比卡因（麻卡因）、利多卡因(赛罗卡因)，甲哌卡因(卡波卡因)，罗哌卡因(耐乐品)；酯类：普鲁卡因(奴佛卡因)、可卡因和苯佐卡因、丁卡因(潘妥卡因)，一个记住哪种麻醉剂属于哪家族的方法，是要记住药物的写法，一个“i”是酯类，两个（“ii”）是酰胺。

速发型过敏反应(通常是皮疹，风团，喉头水肿，或支气管痉挛)在同一麻醉剂家族内是很常见的，但在不同家族之间交叉过敏是不太常见的。如果病人报告药物过敏属于一个家族，从另一个家族选择麻醉药物通常是安全的。然而，用于制造这些药物的防腐剂可能会有交叉反应。过敏可能因此发生在使用不同的药物，特别是在酯类。

因为有些防腐剂的结构类似于氨基苯甲酸(PABA)，所以许多过敏反应是由于对防腐剂的抗体反应而不是局部麻醉剂的反应。酯类的局部麻醉剂的代谢产物与氨基苯甲酸类似，因此 PABA 最有可能引起过敏反应。如果病人已对的酯类局部麻醉剂有过敏反应，选择酰胺类麻醉剂一般是安全的。一些药品标签上注明“不含防腐剂”。真正的利多卡因过敏是极其少见的，通常是“过敏”的反应实际上是对含有肾上腺素或苯肾上腺素制剂的不良反应。过敏反应和麻醉剂相关的并发症可通过以下方法避免(1)在操作前总是询问病人药物过敏史(2)用尽可能少的麻醉剂，尤其是在老年患者和那些有严重合并症的患者(3)观察药物反应和副作用。

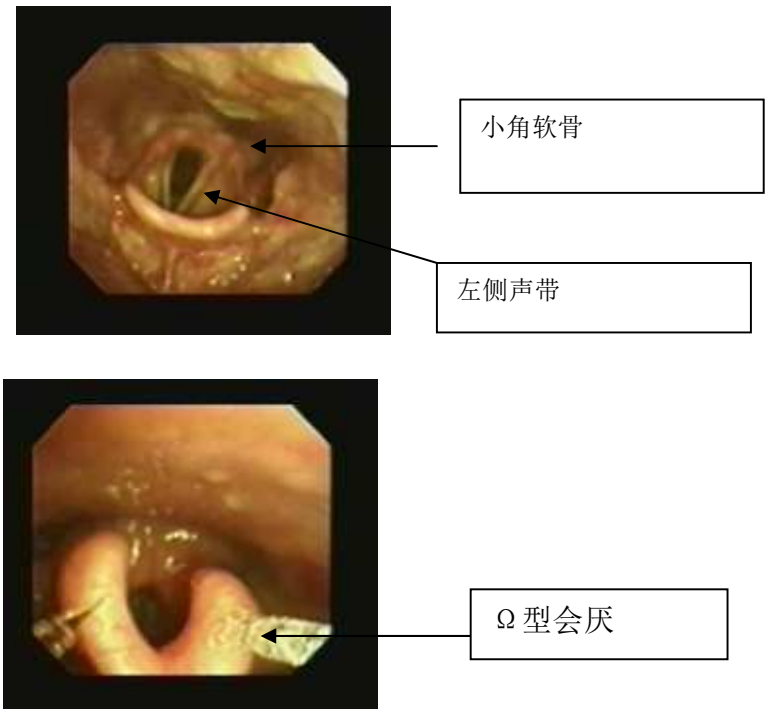
Bronchoscopy International copyright 2013

Answer I.12: D

This is a normal appearing epiglottis. In the adult male, the larynx is 5-7 cm in length and lies opposite the 4th, 5th, and 6th cervical vertebrae. It is usually shorter and smaller in women. The inferior margin of the cricoid cartilage is the most inferior portion of the larynx. The cricoid is the narrowest portion of the airway in children (whereas the glottic opening, or rima glottidis, is the most narrow portion of the upper airway in adults).

Two arytenoid cartilages are pyramid-shaped and articulate with the superior margin of the cricoid cartilage. On their superior aspects are the corniculate cartilages. True vocal cords, also called vocal ligaments, are attached posterior to the base of the arytenoids cartilages, whereas the false vocal cords, also known as vestibular ligaments, are attached higher on the vertical walls of the arytenoids.

The epiglottic cartilage is a single cartilage lying behind the base of the tongue. The epiglottic cartilage is attached to the tongue by a median and two lateral glossoepiglottic folds. The depressions between the lateral and median folds are called the valleculae. In children and in some adults, the epiglottis is elongated and curved. This is called an infantile, elongated, or omega epiglottis.



答案 1.12

这是一个正常的会厌。在成人男性，喉是 5 - 7 厘米长和正对第 4、5、6 颈椎。女性的会相对短和小。环状软骨的下缘是喉部最低的部分。环状软骨的是儿童气道最狭窄的部分(而声门开口或声门裂是成人上气道最狭窄的部分)。

Created on 7/28/2011 12:09:00 AM

双侧杓状软骨呈金字塔型与环状软骨上缘相连接。在他们的上方是小角软骨。corniculate 软骨。真声带，也被称为声韧带，附在杓状软骨的后方，而假声带,也被称为前庭韧带，附在杓状软骨更高的顶壁上。

会厌软骨是一个单一的软骨位于舌根的后方。会厌软骨是通过 1 个舌会厌正中襞和 2 个舌会厌外侧襞与舌头相连接。正中和外侧襞之间的凹陷被称为会厌窝。在儿童和在一些成年人，会厌延长和弯曲。这被称为婴儿会厌、细长会厌或欧米茄会厌。

Bronchoscopy International copyright 2013

Answer I.13: E

None of the above responses are ethically, morally, or medically justified. Were you uncertain, and, in doubt, answered the “lesser evil” E? To say that bronchoscopy is performed to keep the referring physician happy, even if the indication is unclear, is perhaps the most tenable position for one’s conscience, although not necessarily morally appropriate. Sometimes, a person might additionally justify this action on the grounds that bronchoscopy is safe and provides minimal or no discomfort for the patient. However, no person would want a surgeon to operate if it were not medically indicated and justifiable. The same holds true for minimally invasive procedures.

Although there are no scientific studies of this question, all of the above responses have been heard either jokingly or seriously in bronchoscopy circles. It is the bronchoscopist’s moral and ethical responsibility to provide a service when it is medically indicated and to help educate other health professionals about the indications for bronchoscopy, potential dangers, and about alternative procedures even if it means referral to other physicians.

In a training program, computer simulation, case studies, didactic teaching, guided reading, and video rounds can help trainees learn appropriate and justifiable indications for each procedure they perform or might perform in the future. If bronchoscopy is being performed for other reasons, such as to avoid possible litigation, or “because the patient wants to be certain that a diagnosis of cancer has been excluded”, trainees should be allowed to witness the conversation between the bronchoscopist and the patient so that misperceptions and misunderstandings about the medical justifications for the procedure are avoided.

答案 1.13

上述没有一种回答是在伦理上、道德上、医学上合理的。你会不确定并且有疑问在回答说“较小的罪恶感”E 吗？说支气管镜是用于满足诊治医生的快乐，即便迹象不清晰，也许是一个人的良知最站得住脚的理由，尽管不是在道德上是合适的。有时候，有人会认为另一个理由是支气管镜操作是安全的，不会或很少地引起病人不适。然而，没有人愿意要一外科医生实施一个医疗上不需要也不合理的手术。这同样适用于微创手术。

虽然没有科学研究这个问题，以上的回答也在支气管镜医师圈子里听到，或者是开玩笑的或者是认真的。它是支气管镜医师道德和伦理的责任在实施手术时，应该是医疗需要的并且帮助教育其他医疗工作者支气管镜检查的适应症，并指出潜在的危险，提供选择的权利，即使这意味着转诊给其他医师。

培训课程、计算机仿真、个案研究、书本教学、教材和视频导读交替可以帮助学员学习，在他们将来具备适当和合理的适应症完成每个操作。如果支气管镜检查是基于原因，例如为了避免可能诉讼、或“因为患者要知道被诊断为癌症已被排除”，实习生应被允许见证支气管镜医师与病人之间的对话，这样对医疗判断的误会和误解病人将可以避免。

Bronchoscopy International copyright 2013

Answer I.14: E

The impact of flexible bronchoscopy on cardiovascular function and oxygen saturation persists for several minutes, and, as in the case of oxygen desaturation, for several hours after the bronchoscope is removed from the airways. Most studies of the hemodynamic effects of bronchoscopy have been performed in critically ill, mechanically ventilated patients, and very little has actually been done in the awake nonintubated patient.

The effects of procedure duration and patient position have not been thoroughly examined. Potential concomitant factors that can potentially alter hemodynamic effects are underlying disease status, medication use, and conscious sedation.

答案 1.14

可弯曲支气管镜检查对心血管功能和血氧饱和度维持的影响可持续几分钟，至于血氧饱和度下降的情况，可在支气管镜离开气道几个小时后出现。大多数对支气管镜检查对血流动力学影响的研究，支气管镜检查大多数是对重症、机械通气的患者，而很少对清醒非气管插管的病人。

检查的持续时间和患者的体位的影响还没有完全检验。可能改变相伴的血流动力学效应的潜在因素是潜在疾病状态、药物的使用、和意识镇静。

Bronchoscopy International copyright 2013

Answer I.15: B

Resolution is defined as the number of lines per inch or line pairs per millimeter. In general, picture resolution is often referred to when describing the quality of an image. For fluoroscopic image intensifiers resolution is usually best in the center of the screen, where the image is also brighter and has less geometric distortion. For television and video, resolution can depend on the type of equipment used and design refinements. For example, a television receiver can generally reproduce 320 vertical black and white stripes, whereas more advanced designs can resolve over 560 lines.

A typical VHS (Video Home System) video recorder resolves about 250 lines, and an S-VHS (Separate, or Super VHS) recorder about 400 lines. In digital photography, resolution refers to the number of pixels per *linear* inch (ppi) in an image. A resolution of 72 ppi therefore, means there are 72 pixels horizontally and 72 pixels vertically, or 5,184 pixels for each square inch of image. With fewer pixels, more detail will be lost.

答案 1.15

分辨率被定义为每英寸线的数目或线组/毫米。一般来说，图片分辨率常被描述为一个图象的质量。对于荧光支气管镜的图像增强器分辨率，通常最好的是在屏幕中心，那里的图像更光和更少几何失真。电视和视频，分辨率可以依靠使用设备的类型和设计更加细致化。例如，一个电视机一般可以重现 320 垂直黑白相间的条纹，而更先进的设计可以解决超过 560 线。

一个典型的 VHS(家庭视频录像机系统)可解决大约 250 线图像，一个 S-VHS(独立的,或者超级 VHS)录像机可达大约 400 线。在数码照片，分辨率指在一个图像每线性英寸上的像素数(ppi)。一个 72ppi 的分辨率，意味着 72 像素水平和垂直等距排练或 5,184 72 像素像素每平方英寸的图像。更少的像素意味着更多的细节将会丢失。

Bronchoscopy International copyright 2013

Answer I.16: A

Radiation exposure rates are measured at the tabletop. They are excessively large if the x-ray tube, which is a standard rotating anode tube operated at currents that are much lower than those used in radiography, is closer than 12 inches (approximately 30 cm) to the table top. Shutters in the x-ray tube allow the operator to regulate the size and shape of the x-ray beam.

答案 1.16

在台面测量辐射照射的概率。如果 x 光管，是操作电流远低于放射学照片的标准旋转旋转阳极管，距离台面少于 12 英寸(大约 30 厘米)辐射将会很大。在 x 光管的百叶窗允许操作员调教它的大小和 x 射线形状。

Bronchoscopy International copyright 2013

Answer I.17: D

Most experts agree that the true incidence of bronchoscopy-related pneumothorax may not be known, although pneumothorax usually occurs during or immediately after bronchoscopy and bronchoscopic lung biopsy. This justifies chest radiographs or fluoroscopic examination within two hours after biopsies are taken, especially if patients are symptomatic. Late pneumothorax has been reported, but is very rare. Regardless, patients should be instructed to call their health care provider or go to the nearest emergency room for a chest radiograph in case of new-onset or increased shortness of breath or pain during the first 24 hours after a bronchoscopic lung biopsy.

When bronchoscopy-related pneumothorax occurs, it is often small. If the patient has symptoms, or if the pneumothorax increases on subsequent chest radiographs, drainage using a small-bore chest tube or simple aspiration is warranted. Many patients can be sent home with an indwelling chest tube and one-way valve if clinically stable. Indications for hospitalization should be individualized. Chest tubes should be available in every bronchoscopy procedure cart because in very rare instances, emergency chest tube insertion may be necessary and therefore life-saving.

The other possible responses have been documented by various investigators. The possible occurrence of fever or chills prompts many bronchoscopists to suggest use of acetaminophen as needed post procedure. Transient pulmonary infiltrates can be seen on chest radiograph or computed tomography scans, and should not be misinterpreted as new infection. Continuous suction has been shown to reduce tidal volumes, and obviously excessive sedation increases the risk for respiratory insufficiency, and in some cases, might even prompt bronchoscopists to electively intubate patients prior to procedure performance.

尽管气胸通常发生在支气管检查和肺活检当时或随后出现，但大部分专家认为支气管镜相关性气胸的真实发生率可能并不被获知。在活检之后的 2 个小时内通过胸片或透视下支气管镜检查发现，特别是在有症状的患者。晚发性气胸曾被报道，但非常罕见。无论如何，在支气管镜肺活检后的 24 小时，如出现新发的气促或者加重的呼吸困难和疼痛，应指示患者告知其保健医生或去最近的急诊室行胸片检查。

当支气管镜相关性气胸发生时，它往往是轻微的。如果病人有症状，或如果气胸在随后的胸片提示增加，使用小口径胸管或简单的抽气是必要的。许多患者如果临床上稳定可留置胸腔引流管和单向阀回家休息。住院治疗的指征应个体化考虑。胸管应在每一个支气管镜检查车配备，因为在非常罕见的情况下，紧急胸腔引流管插入可能是必要的，并可因此拯救生命。

其他可能的反应可被各种监护仪器记录。可能出现的发热或寒战提示支气管镜医师在检查后对乙酰氨基酚治疗。短暂肺浸润阴影可在胸片或 CT 扫描上看到，而不应被误解为新的感染。连续负压抽吸会减少潮气量，明显的过度镇静会增加呼吸功能不全的风险，并在某些情况下，甚至可能会提示支气管镜医师选择在操作过程中给病人插管。

Bronchoscopy International copyright 2013

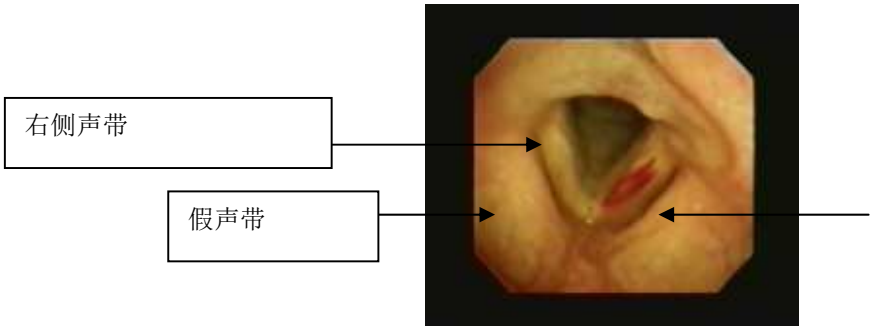
Van Sonnenberg, Cook,和 TruClose
三种用于医源性气胸引流的胸管

Created on 7/28/2011 12:09:00 AM

Answer I.18 A

This ecchymosis of the left vocal cord is the result of an unsuccessful attempt to pass the flexible bronchoscope past the vocal cords into the trachea. The Epiglottis is not visible in the photograph. Both cords are well seen, and both the anterior (point of the V), and posterior (wide commissures of the larynx are visualized. The arytenoid cartilages (which are not visible in the photograph) are at either end of the wide base of the V.

这左侧声带的瘀斑是一次以可弯曲支气管镜通过声带进入气管的不成功尝试的结果。会厌在这个图片中是不可见的。双侧声带都清晰可见，并且两者前联合(V 的端点)，后联合(喉头宽的联合直观可见。杓状软骨 (这在图片中不可见的)是在这 V 字宽底的两端。



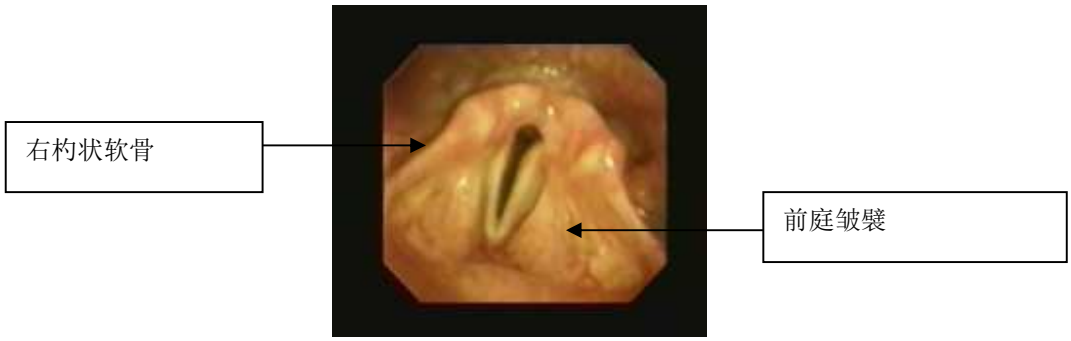
Created on 7/28/2011 12:09:00 AM

Answer I.19 B

The larynx shown belongs to a woman. The triangular-shaped anterior aspect of the “rima glottidis (the middle space between the vocal cords)” is well visualized. A man’s vocal folds are usually thicker than a woman’s, and in full abduction noticed if the patient is asked to inhale deeply; the man’s glottic opening is larger (on average about 19 mm). An adult woman’s glottis is usually smaller than that of a man (on average a woman’s rima glottidis is 12 mm in diameter with maximum abduction of the white vocal folds).

Vocal folds move with respiration, whereas the vestibular folds just above should not. In horses, a huge decrease in air pressures during inhalation would cause the larynx to collapse if it were not for the abductor cricoarytenoid muscle. During exercise, quasi-permanent contraction of this muscle dilates the larynx by pulling the arytenoid cartilage and vocal cord out of the airstream.

Some horses develop what is known as left recurrent laryngeal hemiplegia. In this case, paralysis of the dorsal cricoarytenoid muscle causes the arytenoid cartilage and vocal cord on the affected side to collapse into the larynx during inhalation and obstruct the airways. By the way, similar findings occur in humans! Unlike in horses though, where the cause is often hereditary, it is often from tumor, infection, or trauma.



答案 1.19

显示的喉头属于一个成年女性。“声门裂”前方的三角形(声带之间中间的空间)清晰可见。一个男性的声带通常比女性的更厚，如果病人作深呼吸会注意到更外展，男性的声带开放更大(平均约有 19 毫米)。成年妇女的声门裂通常小于男性(一般女性的声门裂外展最大的直径为 12 毫米)。

声带随着呼吸移动，而位于上方的前庭皱襞不会。例如马，吸气时如果没有环杓展肌的作用，显著降低压力会引起喉的塌陷。在运动的时候，由于气流，持续久收缩这些肌肉把环杓软骨和声带拉伸，使喉头扩张。

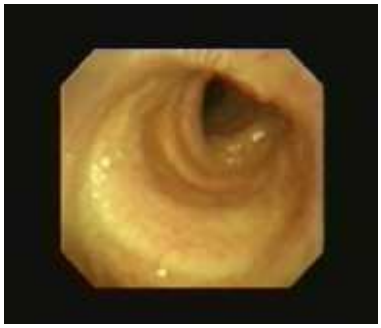
一些马匹发育被称为喉返偏瘫。在这种情况下，环杓背肌麻痹导致环杓软骨受影响的一侧塌陷到喉头，在吸气时阻塞气道。顺便提一下，人类也有类似的发现类!然而，不像马常常是遗传的，人常常由于肿瘤、感染、或外伤导致的。

Created on 7/28/2011 12:09:00 AM

Answer I.20 B

The cricoid is the narrowest part of the pediatric airway. The glottis is the narrowest part of the adult airway. If one is called to perform a bronchoscopy in a child, it is important to recall that the epiglottis and larynx are usually more anterior, that the trachea is more pliable and easily collapsible, and that tissues and mucous membranes are floppy in the mouth and pharynx.

If intubation is necessary, uncuffed endotracheal tubes should be used in children under age 8. The external diameter of the endotracheal tube should approximate the size of the size of the child's nares. Better still to use Broeslow tape measure available in most emergency rooms.



答案 1.20

环状软骨是儿童呼吸道最窄的一部分而声门是成人呼吸道最窄的部分。如果对一个儿童进行支气管镜检查，记得会厌和喉通常更前，气管更柔软、容易弯曲，口咽部组织和粘膜更柔软易损伤，这些是很重要的

如果必须插管，无接头的气管插管应该用在 8 岁以下的儿童。气管插管外径应该近似于儿童鼻孔的大小。多数的急诊室均具有 Broeslow 卷尺更好的测量。

Created on 7/28/2011 12:09:00 AM

Answer I.21: B

The average cross-sectional area of the male adult trachea is approximately 2.8 cm^2. The average cross sectional area, as well as tracheal length, diameter and volume correlate with body height. In adults, the average cross-sectional area at age 30 is about 2.8 cm^2, increasing to an average of approximately 3.2 cm^2 by age 60. The cross-sectional area of a female is about 40 percent less than that of a male.

The tracheal index (TI) is characterized by the ratio of transverse and sagittal diameters. Normally, the tracheal index is about 1 (the transverse diameter is usually a couple of millimeters less than the sagittal diameter). Saber sheath tracheas, for example, have a reduced tracheal index (TI is 0.6 or less), because the sagittal diameter is large and the transverse diameter is small.

答案 1.21

成人男性气管平均的横截面积男大约 2.8 平方厘米。平均的横截面积,以及气管长度、直径和体积与身高相关。在成人中，30 岁时气管平均截面积约 2.8 平方厘米，60 岁时增加到平均约 3.2 平方厘米。女性气管横截面积小于男性大约 40%。

气管指数(TI)是横向直径和矢状直径的比。通常，气管指数是接近 1(横向直径通常比矢状直径小几毫米)。例如刀鞘样气管气管指数较正常低，(0.6 或更少)，因为矢状直径大而横向直径小。

Bronchoscopy International copyright 2013

Answer I.22: B

This is a normal U-shaped trachea (although some might actually call it a triangular shape) in an elderly male with increased ossification of prominent cartilaginous rings and The adult tracheal diameter is usually reached by the age of 20.The trachea consists of a cervical extrathoracic segment (encompassing the first 6 tracheal rings and ending at the manubrium), and an intrathoracic segment that accounts for about 2/3 of tracheal length ending at the carina.

Length, diameter, volume, and cross-sectional area correlate with body height. Cross-sectional area increases with age, probably as a result of age-related loss in elastic recoil. The cross-sectional area of a male's trachea is about 40 % larger than that of a female. A transverse diameter of 25 mm and sagittal diameter of 27 mm are the upper limits of normal usually cited for males. The lower limit of normal for both transverse and sagittal diameters being about 13 mm in men and 10 mm in women.

The C-shaped trachea is the most common cross-sectional tracheal shape described in adults (49 %). The second most common shape is the U-shape (27%). Saber and Lunate shaped trachea may reflect chronic obstructive airways disease, and are also found in patients with other respiratory disorders.

U-shaped trachea

答案 1.22

这是一个在一个软骨环成骨显著增加的老年男性和通常 20 岁以上的成人气管的直径达到正常的 u 形气管(虽然也许有人称之为三角形)。气管包括颈段(包含前 6 个气管环和止于胸骨柄)，一个占总长三分之二的胸内段止于隆突。

气管的长度、直径、体积和横截面积与身高相关。横截面积伴随年龄增加，可能由于弹性力降低相关。男性气管横截面积比女性的大 40%。男性气管横向最大直径为 25 毫米，矢状面最大直径为 27 毫米。正常的最小横向和矢状面直径在男性是 13 毫米，女性是 10 毫米。

C 型的气管是成人最常见的横截面气管形状(49 %)。第二常见的形状是“u”型(27%)。军刀及新月形状的气管可能反映了慢性阻塞性气道疾病，也在其他呼吸系统疾病的病人中所见。

Created on 7/28/2011 12:09:00 AM

Answer I.23 D

Continuing the examination or attempting to dilate the stricture is potentially dangerous. Subglottic edema or reflex laryngospasm are potentially life threatening. Remember, “Never take away something you cannot give back”. Before preceding any further, one should be ready to perform an emergency tracheostomy. It might also be necessary to proceed with rigid bronchoscopy in case stenoses are at multiple levels inside the airway. Although limited Wegener’s may initially involve only the subglottis, usually causing firm subglottic narrowing, it may also involve the upper and even the entire trachea as well as lobar and segmental bronchi.

Thus, it is wiser to continue the evaluation in the hands of an experienced interventional bronchoscopist able to organize a multidisciplinary approach to this patient’s airway problem and systemic vasculitic disease. Less than 10 percent of patients with Wegener’s are believed to have tracheobronchial involvement. Response to cytotoxic agents and corticosteroids is variable. In patients with systemic Wegener’s combined therapy increases survival and decreases relapse compared to corticosteroids alone.

Response A is of course possible if one uses a small 3mm diameter bronchoscopy. In this case, hwoever, secretions beyond the stricture may easily occlude the working channel of the scope. It could be used, however, to document patent distal airways and to measure the length of the stricture. Dilating the stricture immediately can be dangerous unless all materials necessary for balloon dilatation (and other interventional techniques) are readily available. These strictures can be very firm, making accidental tracheal or bronchial rupture a possibility. In regards to passing and endotracheal tube through this stricture…such a maneuver is likely to be unsuccessful, even when using a #6 or #5 uncuffed tube. Regardless, introduction of the tube will not allow one to determine whether the stricture is complex or simple, which requires a careful assessment of cartilage involvement, inspection of airway mucosa, presence of absence of additional strictures, and presence of absence of malacia.

继续检查或试图扩张这种狭窄具有潜在的危险。声门下水肿或反射性喉痉挛可能危及生命。请记住，“永远不要带走你不能还回去的东西”。在任何进一步操作之前，应准备执行紧急气管切开术。在气道存在复合型狭窄的情况下可能有必要使用硬质支气管镜进行操作。虽然有限的韦格纳肉芽肿最初可能累及声门下，通常导致声门下坚韧的狭窄，同时它也可能累及到气管上段，甚至整个气管以及肺叶和肺段支气管。

Created on 7/28/2011 12:09:00 AM

因此，这是明智的做法继续由一名经验丰富的支气管镜介入专家掌握，能够为这名病人的呼吸道问题和全身系统性血管炎疾病组织一个多学科的解决方法。人们认为不到 10%的韦格纳肉芽肿的患者累及气管。细胞毒性药物和皮质类固醇的治疗反应是不确定的。与单独使用皮质类固醇激素相比，系统性韦格纳肉芽肿的综合治疗可增加生存和降低复发率。

若使用 3mm 直径细支气管镜，答案 A 当然是可能的。但是在这种情况下，狭窄部位的分泌物可以很容易地堵塞了工作通道。然而它可以用来观察狭窄远端气道情况和测量狭窄的长度。马上施行扩张治疗可能是危险的，除非所有球囊扩张术（和其他介入技术）必要的材料都是齐备的。这些狭窄可能非常坚韧，存在意外的气管或支气管破裂的可能性。关于使用气管插管通过这个狭窄部位，这样的尝试很可能是不成功的，即使是使用一个＃6 或＃5 的气管插管。无论如何，尝试插入气管插管将不能确定狭窄是否是简单的还是复杂的，需要仔细评估软骨的情况，检查呼吸道粘膜，没有额外的狭窄的存在，有没有软化的存在。

Bronchoscopy International copyright 2013

Answer I.24: B

A patient's left main bronchus, right main bronchus, and trachea make up ventilatory dead space. This structure can completely fill with only 150 ml of blood or fluid, causing hypoxemia and respiratory arrest. For this reason, patency of the contralateral airway must be maintained while the bronchoscopist attempts to stop the bleeding. Massive hemorrhage is rare, usually occurring only when large vessels or bronchial arteries are perforated during laser resection or bronchoscopic debulking. Tradition has it that bleeding is also feared in patients with uremia, thrombocytopenia, renal cell carcinoma, and carcinoid tumors.

答案 1.24

患者的左主支气管、右主支气管和气管构成通气的死角。该结构只能够注满 150 毫升血液或流体，即导致低氧血症和呼吸停止。因为这个原因，支气管镜医师尝试止血时必须保持对侧气道通气。大出血是一种罕见的并发症，通常只有当大血管或支气管动脉在激光治疗时或者经支气管镜肺减容术时发生穿孔出现。需惯例地慎防出血的患者如：尿毒症、血小板减少、肾细胞癌、良性肿瘤患者。

Bronchoscopy International copyright 2013

Answer I.25: C

Well, this is not a trick question, but this issue certainly comes up quite often. Although you might choose any of the possible responses, in this case it is probably safe to proceed with bronchoscopy after holding Warfarin the day of the procedure. If the INR were 4 or greater, 1-2.5 mg of Vitamin K orally should decrease the INR to 1.8-3.2 in at least 50% of patients. In general, intravenous administration of vitamin K is usually reserved for patients with INR >20 or active bleeding. Additional vitamin K and fresh frozen plasma transfusion can be repeated every ten hours as needed.

There is no "cookbook" approach to dealing with patients on Warfarin. Some bronchoscopists routinely hold medications and administer vitamin K. Others "ignore" the INR and proceed with bronchoscopic inspection (with washings or bronchoalveolar lavage). When in doubt, it is always safe to AVOID doing biopsies or brushings. If an abnormality is seen that requires biopsy, the patient can always be rescheduled after the coagulation abnormality is corrected, and normal coagulation profiles are noted on subsequent laboratory reports.

答案 1.25

嗯,这不是一个恶作剧的问题，但这个问题当然是经常遇到。虽然你可以选择任何可能的反应，但是在暂停华法林之后再行支气管镜检查这种情况下可能是安全的。如果 INR= 4 或更大，1 —2.5 毫克的维生素 K 口服至少 50%的病人 INR 应该减少到 1.8-3.2,。一般来说，静脉注射用维生素 K 的患者通常只有在 INR > 20 或活动性出血时使用。额外的维生素 K 和新鲜冷冻血浆输血可以每 10 个小时按需重复。

没有什么"食谱"的方法处理正在服用华法林治疗的病人。一些支气管镜医师常规地停药和给予维生素 k。另外的一些医师"忽视了"INR 并继续行支气管镜检查(例如支气管肺泡灌洗)。有疑问时，避免活检和或者刷检总是安全的。如果有异常需要活检时，病人应该在凝血功能纠正后重新安排检查时间，并在后续实验报告中注明正常的凝血功能结果。

Bronchoscopy International copyright 2013

Answer I.26: B

The sniff position is frequently the first step required to improve passage through the upper airways, glottis, and subglottis. The sniff position is reached by simply placing a small pad under the patient's head for adults. This allows proper opening of the mouth, and extends the cervical vertebrae at the atlantoaxial joint, as well as flexes the lower cervical vertebral joints. Additional jaw elevation results in extension of the head and forward projection of the base of the tongue. Placing a pad that is too large will hinder maximal mouth opening.

吸气位置通常是通过上气道、声门、声门下操作需要提高的第一步。吸气位置可通过简单地将一个枕垫放在成人患者的头部下完成。这样嘴巴可以适度张开，环枢关节的颈椎可适度伸展，以及使较低的颈椎关节适度弯曲。此外头部的伸展可以使下巴抬高和舌根前移。放置一个过大的枕垫将阻碍嘴巴的最大张开。

Bronchoscopy International copyright 2013

Answer I.27: D

Upper airway evaluation is crucial in patients with known or suspected inhalation or burn injury. Inhalation injury should always be suspected in burn victims, especially if the face, neck or chest are burned, or if there is presence of burned nasal hairs, or if soot is found in the nostrils, mouth or throat.

In burn and trauma victims the upper airway and tracheobronchial tree are frequently examined while other diagnostic and therapeutic measures are being instituted, central lines are being placed, and radiographs are being obtained. Oxygenation using nasal prongs or a facemask is always warranted. Special attention is necessary to avoid additional facial trauma in patients with burns to the face. Soot may additionally obstruct an already swollen and inflamed nasal passage. Examinations should be done gently in order to avoid hurting the patient, and to decrease the potential for bronchoscopically-induced laryngospasm and bronchospasm.

Conscious sedation should be used sparingly in the acute burn victim because the burn surgical team is interviewing the patient in order to discover additional symptoms, sites of injury, and mode of injury (enclosed environment, smoke exposure, heat exposure, chemical exposure, exposure to asphyxiant gases). After providing the patient gentle, confident reassurance, the bronchoscopist should be able to perform a thorough examination of the nasal passages, oral pharynx, larynx, and tracheobronchial tree.

An awake, bronchoscopically guided intubation avoids the dangers associated with muscle relaxation or paralysis. If injury is noted and intubation is warranted, an endotracheal tube can be inserted using bronchoscopic guidance. The burn surgeon and the bronchoscopist should discuss the advantages and disadvantages of oral or nasal intubation. Indications for each should be individualized based on extent of inhalation injury, potential for delayed injury, need for prolonged intubation or tracheostomy, and presence of comorbid diseases. Once intubated the patient can be thoroughly sedated.

在对已知或怀疑吸入或烧伤的患者，上气道的评价是至关重要的。对于烧伤的患者，都应该注意有否吸入性损伤，特别是在面部，颈部或胸部被烧伤，或是否有鼻毛烧毁，或如果是在鼻孔，口腔或咽喉发现烟尘。

在烧伤和创伤受害者的上呼吸道和支气管树通常在其他的诊断和治疗措施前得到检查，如放置中线和照胸片。使用鼻导管塞或面罩给氧通常是必要的。需要特别注意的是，应避免面部烧伤患者额外的面部创伤。此外烟尘可能使已经肿胀、发炎的鼻腔阻碍。检查应尽量轻柔，以避免损伤患者，并减少支气管镜诱导喉和支气管痉挛的潜在风险。

Created on 7/28/2011 12:09:00 AM

对急性烧伤的患者应谨慎使用镇静药物，以便外科治疗组问病史和及时发现其他症状、损伤部位、损伤模式（包括封闭的环境中，烟雾暴露，热暴露，化学品接触，毒性气体暴露）。当患者情绪稳定、情况平稳时应可进行完整的支气管镜检查，包括鼻腔，口咽，喉，气管，支气管树。

对一个清醒患者行支气管镜引导气管插管，可能避免肌肉松弛或麻痹相关的风险。如果损伤是明显的而插管是必要的，可以使用支气管镜引导插入气管插管。烧伤外科医生和支气管镜医生应该讨论经口腔或鼻腔插管的优点和缺点。两者的分别适应症需要基于患者个体化考虑，包括损伤的程度，潜在的晚发性损伤，需要长期插管或气管切开，并发疾病的存在。患者一旦行插管可予完全镇静。

Bronchoscopy International copyright 2013

Answer I.28: E

Although flexible bronchoscopy is commonly performed for each of the above indications, it has been shown to be of limited value in all except individuals with persistent asthma-like symptoms and chronic cough. In these patients, bronchoscopy might reveal tracheal stenosis or benign airway tumors such as carcinoids. If the past medical history includes tuberculosis, inhalation injury, foreign body ingestion, childhood lung infections, intubation, or tracheostomy, flexible bronchoscopy should be performed early in the course of the diagnostic evaluation and prior to instituting empiric therapy for hyperreactive airways disease. Percutaneous needle aspiration is favored over bronchoscopic lung biopsy in most patients with lung nodules 2 cm or less.

In patients with hemoptysis and a nonlocalizing or normal chest radiograph, approximately 5 % are ultimately found to have a malignancy. Clinical data do not support the routine use of bronchoscopy to exclude lobar obstruction, and therefore a cause for trapped lung, in patients with unexplained pleural effusion. Bronchoscopy should be considered in patients with recurrent malignant effusions or poor lung reexpansion after thoracentesis. Flexible bronchoscopy is also of limited value in community-acquired pneumonia unless patients have failed antibiotics.

答案 1.28

虽然可弯曲支气管镜检查在上述的情况中实施很常见，但是它已被证明除了在哮喘样持续状态和慢性咳嗽中，其他情况行支气管镜检查价值是有限的。在这些患者中，支气管镜可能显示气管狭窄或良性气道瘤，如类癌。如果患者既往史包括结核病、吸入损伤、吸入异物、儿童期肺感染、插管或气管切开术，支气管镜检查应该在早期诊断性评估阶段，在经验性治疗气道高反应性疾病前实施。在大多数肺部结节小于 2 厘米的患者中经皮针吸活检比经支气管镜肺活检受欢迎。

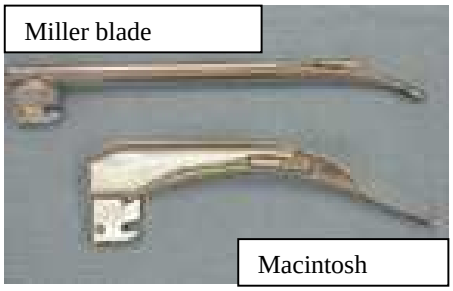
咯血、胸片正常或无定位症状的患者大约 5%是最终发现恶性肿瘤。临床资料不支持例行性使用支气管镜排除肺阻塞，由不明原因的胸腔积液受压的肺同样原因地也不支持。支气管镜检查应考虑复发性恶性积液患者或胸腔穿刺抽液后肺复张困难的患者。可弯曲支气管镜检查在社区获得性肺炎的病人也是有限的价值，除非是抗生素治疗失败的情况。

Created on 7/28/2011 12:09:00 AM

Answer I.29: C

Elevating and supporting the shoulders in addition to elevating the head with pillows or towels places the head of the obese patient more readily into the “sniff” position (neck flexion, head extension). The sniff position improves access to an upper airway otherwise hindered by fat and redundant tissues. The Miller blade is a straight laryngoscopic blade that is inserted past the epiglottis. The epiglottis is then lifted out of the way in order to visualize the vocal cords. Many experts advocate using this blade in patients with a large epiglottis or anterior larynx. The wider, curved Macintosh blade, on the other hand, is also frequently shorter. It is inserted into the valleculae immediately anterior to the epiglottis. The Macintosh blade exposes the vocal cords after lifting the tongue anterior, which keeps the tongue from obscuring the visual field.

Cricoid pressure, also known as the Sellick maneuver, when performed correctly, is often warranted in patients at risk for aspiration. This includes patients who are obese, have recently eaten, and patients with known diabetic gastroparesis, pregnancy, or bowel obstruction. Rapid sequence intubation should only be performed in patients who are not believed to be difficult intubations. Muscle relaxation and sedation hinder visualization of the vocal cords, even with the flexible bronchoscope. Bronchoscopic intubation can be even more difficult when blood, mucus, secretions, or vomitus collect in the hypopharynx.



答案 1.29

使用枕头或手巾提高和支撑肩膀进一步抬高头部可使肥胖病人更容易达到“深吸气”体位(颈部弯曲，头部拉伸)。“深吸气”体位有助于打开软组织肥厚阻挡的上气道。米勒式叶片是一种直的喉镜片，可以直接通过会厌。然后用喉镜片提起会厌从而暴露声带。很多专家主张大会厌或前位咽喉的病人用这种喉镜片。另一种麦金塔叶片是更宽、短、弯曲的。它可以很快地插入到会厌前方的喉窝。麦金塔叶片可提升舌头的前部从而暴露声带，并使舌头不会遮挡视野。

环状软骨加压，也被称为 Sellick 手法，当操作正确时，经常是具有窒息风险的患者吸气的保证。这些患者包括：肥胖、刚刚进食过、糖尿病胃轻瘫、怀孕、或肠阻塞。快速顺序插管法只应用于非困难插管的患者。即使在支气管镜下，肌肉松弛和镇静也会使声带可视受阻。经支气管镜插管会变得更加困难由于血、粘液、分泌物或呕吐物集中在下咽。

Bronchoscopy International copyright 2013

Answer I.30 D

Using a larger caliber endotracheal tube and a larger diameter bronchoscope facilitates bronchoscopic intubation in most patients. Bronchoscopy can be performed via the nasal or oral passage. When using an oral approach, a bite block should always be used. Nasal intubation may be necessary in patients wearing high riding cervical collars. Posterior displacement of the tongue and soft tissue edema should be expected. It may be necessary to grasp the swollen tongue with a gauze pad and pull it partially out of the mouth to help expose the larynx. Vomitus, blood, and thick secretions should be aspirated using a Yankaur suction catheter rather than the flexible bronchoscope. The mouth should be carefully examined with the gloved hand, and accessible foreign bodies or broken teeth removed. Agitation and anxiety are common, and usually warrant conscious sedation.

An awake intubation, might be easier than attempting intubation of a fully sedated patient. Intubation should be performed prior to examination of the lower airways. Once the patient is intubated, additional sedation can be administered. Rapid sequence anesthesia should be avoided prior to bronchoscopic evaluation and intubation because muscle relaxation and paralysis will cause collapse of muscle tone of the upper airway, making it more difficult to visualize the larynx. In addition, muscle relaxation before obtaining an adequate and secured airway increases the risks of hypoxemia and cardiac disturbances.

Other elements that make flexible bronchoscopic intubation more difficult in the trauma victim include known or suspected cervical spine injury, frequent need to keep the patient in the prone or supine position, and abundant carbonaceous material, secretions, inflammation, and pain caused from burns and inhalation injury.

答案 1.30

使用大口径的气管插管和直径较大的支气管镜可使大多数患者的经支气管镜气管插管便利。支气管镜检查可通过鼻或口的通道。当使用经口的方式，总是需要使一个咬口器。穿高领颈圈的患者可能必须经鼻插管。舌根后坠和软组织的水肿应该是可预见的。可能需要使用网垫抓住肿胀的舌头拉出嘴巴，从而使喉部暴露。呕吐物、血液、粘稠的分泌物应该用 Yankaur 虹吸导管而不是支气管镜吸引。应该用带手套的手仔细检查口腔，把可吸入的异物或断齿移除。不安和焦虑是很常见的，而且通常需保持意识清醒的镇静。

一个清醒的病人的插管会比完全镇静的病人容易。检查更低的呼吸道前应行气管插管。一旦病人插管，则可使用额外的镇静剂。在支气管镜评估和气管插管前应避免快速序列麻醉，因为肌肉松弛剂和麻痹会导致上呼吸道肌肉紧张性下降而塌陷，使喉部更难显露。此外，在建立人工气道前的上呼吸道肌肉放松增加了低氧血症和对心脏影响的风险。

其它导致经可弯曲支气管镜插管困难增加的损伤因素包括：已知的或可能的颈椎损伤、经常要保持病人俯卧或仰卧位、和丰富的含碳物、分泌物、炎症、烧伤和吸入性损伤导致的疼痛。

Bronchoscopy International copyright 2013

模块 I

阶段测试

Bronchoscopy International copyright 2013

阶段测试 模块 I

Post test instructions

The following test is designed to verify that you have completed and fully understood the 30 questions for Module I.

回顾性测试指引：

下列检测是为了证实你已经完成并充分理解了模块 I 的 30 个问题中所包含的所有知识内容。

Post module test questions and answers: Module 1

Question 1: In addition to Shigeto Ikeda and Gustav Killian, a critical figure in the history of bronchoscopy education and practice is

问题 1：除了池田医师和古斯塔夫·基利安外，另一个在支气管镜教学与实践历史上的关键人物是

A. Sir William Osler 威廉·奥斯勒爵士
B. Chevalier Jackson 薛瓦利·杰克逊
C. Laennec 雷奈克
D. William Harvey 威廉·哈维

Question 2: Which of the following should be required of every patient undergoing flexible bronchoscopy?

问题 2：应该对每位需要接受可弯曲支气管镜检查的病人进行以下哪些检查？

A. Coagulation profile
B. Serum chemistries, especially blood urea nitrogen and creatinine
C. Electrocardiogram
D. Review of known or suspected allergies to medications

A.凝血功能
B.生化分析，特别是血尿素氮和肌酐
C.心电图
D.复习已知或者可疑的药物过敏史

Question 3: Among which of the following settings has flexible bronchoscopy been shown to be of greatest value ?

问题 3： 下面的哪种情况可弯曲支气管镜检查具有最大价值？

A. Patient with hemoptysis and a nonlocalizing chest radiograph
B. Patient with smoking history, cough, weight loss, and lung mass on chest radiograph
C. Patient with a peripheral lung nodule less than 1 cm in diameter
D. Prior to thoracentesis in a patient with suspected malignant pleural effusion

A.患者有咯血并且胸片不能明确定位
B.患者吸烟史、咳嗽、体重减轻，胸片提示肺部团块
C.患者具有直径小于1厘米的肺外周小结节
D.怀疑具有恶性胸腔积液的患者行胸腔穿刺术前

Question 4: Scenarios where airway management might be difficult and could therefore warrant bronchoscopic assistance include each of the following except ?

问题 4：以下除外哪种困难气道可能出现的情况，支气管镜可保证辅助施行？

A. An 18 year old male with status asthmaticus and altered mental status who just vomited his dinner.
B. Pregnant 30 year old obese woman with third degree facial burns.
C. Edentulous male undergoing cardiopulmonary resuscitation
D. Elderly trauma victim wearing neck brace

A. 一个18岁的男性患者，哮喘持续状态并神志改变，刚刚呕吐晚餐。

B. 30岁的肥胖怀孕女性，面部3度烧伤。
C. 缺牙且进行心肺复苏的男性
D. 患颈部创伤戴有颈部托架的老人

Question 5: In regards to handling the flexible bronchoscope, which of the below is considered correct technique?

问题 5：以下哪种操作可弯曲支气管镜的技术是正确的？

A. Moving the scope between the left hand and the right hand during the procedure.
B. Keeping the scope in the middle of the airway lumen as much as possible during the procedure.
C. Twisting the scope at its insertion point at the mouth or the nares in order to direct it into an upper lobe bronchus.
D. Moving the thumb downwards to flex the distal aspect of the insertion tube.

A.在检查的过程中在左手和右手之间交换；
B.在检查的过程中尽可能保持在气道的中间范围；
C.在口腔或者鼻腔的插入点扭转支气管镜使其进入上叶支气管；
D.拇指向下压使插入的管道远端弯曲。

Question 6: Which of the following statements pertaining to local anesthetics is false ?

问题 6：下面哪种对局麻药的描述是错误的？

A. Lidocaine and Bupivacaine are both esters
B. Amides, as Mepivicaine, as well as esters, such as Tetracaine can cause laryngeal edema.
C. Bilateral nasal administration of anesthetic causes partial posterior pharyngeal anesthesia by affecting the Sphenopalatine nerve fibers.
D. Administration of lidocaine with epinephrine can decrease swelling of the nasal mucosal membranes.
E. Many side effects of topical anesthetics are dose related, but anaphylaxis is not.

A. 利多卡因和布比卡因都是酯类
B. 乙酰胺、甲哌卡因、以及酯类, 例如丁卡因能均引起喉头水肿。
C. 双侧鼻腔局部麻醉处理引起咽后壁麻醉是通过影响蝶颚骨的神经纤维。
D. 使用肾上腺素可以降低利多卡因引起的鼻粘膜肿胀。
E. 如许多局部麻醉药的副作用是剂量相关, 但是速发型过敏反应则不是。

Question 7: Which of the following statements about upper airway anatomy is incorrect?

问题 7：以下关于上气道解剖结构的描述是不正确的？

A. In adults, the glottic opening (also called the rima glottides) is more narrow than the cricoid.
B. An omega epiglottis is elongated , curved and is seen in adults but also in many infants.
C. The arytenoid cartilages lie superior to the corniculate cartilages at the posterior commissure of the larynx.
D. The adult trachea cross-sectional area, usually about 2.8 cm^2, increases with age
E. The recurrent laryngeal nerve supplies motor and sensory innervation of the intrinsic muscles of the larynx.

A. 在成年人, 声门开放(又称为声门裂)比环状软骨明显狭窄；

B. 欧米茄会厌是一种细长、弯曲的会厌可出现在成年人，但更多在婴儿可见；
C. 杓状软骨位于小角软骨的前方在喉头后连合处；
D. 成人气管横截面积通常约2.8平方厘米，随着年龄的增长而增加；
E. 喉返神经提供喉部固有肌肉的运动和感觉神经。

Question 8: Which of the following adverse effects of bronchoscopy is probably most frequent ?

问题 8：下面哪种是支气管镜检查最常发生的副作用？

A. Biopsy-induced pneumothorax
B. Bronchoalveolar lavage induced hypoxemia
C. Pain, discomfort or anxiety during insertion of the bronchoscope and passage into the lower airways
D. Cardiac arrhythmias

A. 活检导致气胸
B. 支气管肺泡灌洗导致低氧血症
C. 支气管镜插入并通过下气道时引起痛苦、不适、焦虑
D. 心律失常

Question 9: Which of the following statements about the trachea is incorrect?

问题 9：下面关于气管的描述哪项是不正确的？

A. The cervical segment (extrathoracic) ends at the manubrium and encompasses about the first six tracheal rings.
B. The U-shaped trachea is probably the most frequent shape found.
C. A man’s cross sectional tracheal area is usually about 40 percent larger than a woman’s.
D. Saber sheath tracheas have a small transverse diameter, which means that the distance between the left and right lateral walls of the trachea is short.
E. In women, the lower limit of normal for transverse and sagittal diameters is about 10 mm.

A. 颈段（胸腔外）在胸骨柄结束，包括前六个气管环。
B. U形气管可能是最常见的气管形状。
C. 男性的气管横截面通常大于女性气管横截面的40%
D. 剑鞘样气管横径较小，意味着左右气管壁的距离比较短。
E. 成年女性气管横向和矢状面的直径正常下限约为10毫米。

Question 10: Which of the following statements about radiation exposure during fluoroscopy is correct?

问题 10：下面哪种关于射线照射透视检查的陈述是正确的？

A. The patient’s radiation exposure is increased as the anode tube is placed closer to the patient.
B. The bronchoscopist’s radiation exposure makes wearing a protective lead garment unnecessary.
C. The patient’s radiation exposure increase when the anode tube is further from the patient.
D. Radiation exposure is a measure of resolution, and can be adjusted by changing the size of the image on the fluoroscopy screen.

A. 阳极管放置接近患者时，患者的放射线照射量增加。

B. 支气管镜医师的辐射照射使穿着铅保护服装变得不必要。
C. 阳极管放置远离患者时，患者的放射线照射量增加。
D. 辐射照射是一种可测量的分辨率, 可通过变换透视屏幕的图像大小调节。

Congratulations, you have completed Module I of the Essential Bronchoscopist©. The correct answers to the post test questions are listed below. We suggest that you review the questions and answer sets to Module I. You may do so by printing out the entire module as a PDF file.
恭喜！您已经完成模块 I 的学习。效果测试题的答案见下。我们建议您重温模块 II 中的问题和答案。您可以将整个模块用 PDF 文档的形式打印出来。

ANSWERS TO MODULE I POST-TEST
模块 I 答案：
Answer 1: B
Answer 2: D
Answer 3: D
Answer 4: C
Answer 5: B
Answer 6: A
Answer 7: C
Answer 8: C
Answer 9: B
Answer 10: A

恭喜您，您已完成全部课程。
祝愿您在介入肺脏病学习的道路上取得更大成绩！

Bronchoscopy International copyright 2013

模块 II

模块的目标

The Essential Bronchoscopist©（规范支气管镜医师©）的读者不应将模块中的测试图看成单纯一种测试，因为无论您能否回答这些问题，读了这些内容，您都可以从中获得非常有用的信息。也许您会发现：有些问题的正确答案不止一个，读者不应该将其看做是一种陷阱，而应该看作是帮助读者去思考某个问题的方式。每个模块含有 30 个问题及相应的答案，您大概需要 2 小时去完成。

当您完成后，您就可以进入后测试（post-test）的内容，其包含 10 个多项选择题，主要针对每个模块中学习目的所包含知识的特定要素。针对每个问题，您也许只能在答案部分或图示部分找到答案的相关信息，但不能直接找到答案。只有您百分之百答对后，才能准备进入下一级模块。当您回答错误，测试将回到后测试第一题，并重新开始作答。

如果这是您第一次进入 EB，您需要注册一个账号，这样您在下次进入 EB 时就可以直接连接到上次您离开的地方，然后顺利地完成六个模块课程。请注意：输入您的用户名(至少包含 6 个字符)，在"新用户"（"New User"）处点击进入系统，如您的用户名已有人使用，请重新提交新的用户名，如果可以使用，则点击"Login"，注册成功。

规范支气管镜医师©

规范支气管镜医师©（The **Essential Bronchoscopist©** ，EB）开设的主要目的是为了自学或指导学习支气管镜检查相关的理论知识。每个模块包含由易到难的支气管镜的相关知识，是线性学习及优化方法相结合，左、右脑信息处理的最佳结合。最重要的是，使学习者在学习中得到乐趣，“规范、不可不知”的理念适合任何专业的医疗卫生保健人员。

EB 为学习支气管镜检查相关的理论知识提供了一个标准化方式，这个方式是基于知识大众化的理念来设计的。标准化的问题-答案模式及即将面世的 BronchAtlas©的示例图、技术图，能使学习者能够接触到很多理念、图像及技术。每个模块后的后测试（post-test）要求百分之百的准确答案，确保学习者掌握每个模块中的知识点。

EB 是现有的教育项目、基于患者的学习经验、教科书学习、手把手培训和其他研究生或亚专业培训等方面的最佳补充。我们确信，支气管镜教师会使用这些学习模块使学生接触到各种意见、不同看法及各种替代方法。

EB 经过多年致力于对学习及感知的探索，将会发展出基于大家普遍接受的事实及注意事项的独特的支气管镜检查教学途径，而不是基于教条及习惯。请记住，“一个认为他一切都懂的人其实什么都不懂”。被启迪的支气管镜医师能以自信、对传统观点质疑好奇心、不断提高自我的愿望、为全体患者服务的激情进行支气管镜的实践。

致谢：EB 中问题及答案是基于世界各地的许多资深和年轻的支气管镜专家的贡献进行了修订和改进，没有他们的帮助，EB 中的模块无法完成，在此深表感谢！也特别感谢李时悦教授团队，包括陈愉、巨春蓉、吴璐璐、张建恒、陈小波、钟长镐、郭文亮等各位大夫所作出的贡献。

联系：有任何问题、评论和建议欢迎联系我们。

模块 II 学习目标

注意

Readers of The Essential Bronchoscopist© should not consider this module a test. In order to most benefit from the information contained in this module, every response should be read regardless of your answer to the question. You may find that not every question has only one "correct" answer. This should not be viewed as a trick, but rather, as a way to help readers think about a certain problem. Expect to devote approximately 2 hours of continuous study completing the 30 question-answer sets contained in this module.

规范支气管镜医师©（Essential Bronchoscopist©）的读者不应该将这个模块视为一个测试。每一个问题后面提供了各种可能的选项，虽然自己可能会倾向于某种选择，但为了最大程度地从这个模块所提供的信息中获益，读者们应该仔细阅读每一个选项。您可能会发现并不是所有问题都只有一个所谓"正确"答案。这不是故意刁难，而是帮助读者学会如何考虑问题的方法。完成这个模块中的 30 道问答题大概需要 2 小时。

When you are ready, you may choose to take the post-test. This ten multiple choice question test addresses specific elements of the learning objectives of each module. Questions pertain to information found in the answer paragraphs or figures in the module, but may not correspond directly with a question found in the module. A 100% correct answer score is expected on the post-test before readers can advance to the next module. If even one of your answers is incorrect, you must go back to the beginning of the post-test, and begin the entire test all over again. You may print out your test scores by hitting "print screen" on your monitor.

如果您已完成这些题并且准备就绪，您可以进入后测试（post-test）阶段。后测试中的 10 个选择题主要用于说明每个模块学习目标的特定元素。这些问题可能会就模块中的问题的答案或图片所提供的信息而提出，但不会在模块的那些问题直接找到答案。在效果测试中，读者只有正确回答所有问题，才可进行下一个模块的学习。即使是只有一个问题回答错误，您都应该退回到效果测试的起始部分，重新开始进行整个测试。您可以将您的测试得分打印出来，只需点击"打印屏幕"这个图标。

At the conclusion of this module, the learner should be able to:

1. Identify the different parts of a flexible bronchoscope.
2. State the current perceived role for atropine and other premedication.
3. Describe ethical and acceptable practices of bronchoscopy in critically ill patients.
4. Identify vocal cord dysfunction.
5. Define the term "dynamic bronchoscopy" and list its indications.
6. Compare and contrast at least THREE types of oral intubating airways.
7. Describe the advantages and disadvantages of ethylene oxide sterilization.
8. List at least FOUR different ways a bronchoscope may be damaged, and how such damage be avoided

9. Describe the advantages and disadvantages of the Montgomery T-tube.
10. Compare and contrast various drugs used as topical anesthesia and conscious sedation for bronchoscopy or awake intubations.

在这个模块Ⅱ的结论部分，读者应该能达到以下目标：

1．分辨出软式支气管镜的各个组成部分
2．说出目前所使用的阿托品等术前使用药物的作用
3．描述出对于病情相当危重的患者应该怎样进行支气管镜操作才合乎伦理且可被广泛接受
4．学习到如何诊断声带功能异常
5．能正确定义何为“功能性支气管镜检查”，并列举出该检查的适应症
6．了解至少 3 种口腔通气道的异同
7．描述使用氧化乙烯消毒纤支镜的优缺点
8．列举出至少 4 种可以损坏支气管镜的方式，并说出如何避免
9．描述出 Montgomery T 形管的优缺点
10．　说出在纤支镜检查中或清醒状态下气管插管时使用的各种表面麻醉和镇静药物的异同

Question II.1: Electrical contact, the venting connector, and light guide are all considered part of which section of the flexible bronchoscope.

A. Universal cord section
B. Control section
C. Light guide connector section
D. Eyepiece (or video) section
E. Insertion tube section

问题 II.1：电接头、用于测漏的通气口和通气帽、导光束插杆均属于可弯曲支气管镜的哪个部分？

A．导光软管

B．操作部

C．导光连接部

D．目镜部

E．插入部

Question II.2 What happened to the flexible bronchoscope shown in the Figure.

A. It was bitten
B. It was caught in the drawer of a procedure cart
C. It was squeezed by an angry bronchoscopist

问题 II.2 如图所示，以下那种情况可导致可弯曲支气管镜出现这种问题？

A．被咬到

B．被置物车（procedure cart）的抽屉卡到

C．被愤怒的纤支镜医生狠狠挤压

Question II.3: Most experts agree that which of the following is no longer routinely warranted before flexible bronchoscopy

A. Informed consent
B. Atropine
C. Fasting state for at least 6 hours
D. Electrocardiographic monitoring

问题 II 3：大部分专家已达成共识认为在进行可弯曲支气管镜检查前，以下哪一项不再是常规需要进行的项目？

A. 患者知情同意

B. 阿托品

C. 空腹至少 6 小时

D. 心电监测

Question II.4: Which of the following might prompt you to carefully reexamine the indications for outpatient bronchoscopy in your institution

A. Bronchoscopy is frequently performed for "surveillance" purposes every 4 months in most patients with indwelling airway stents
B. Bronchoscopy is frequently performed in patients with indwelling airway stents and new onset of respiratory symptoms such as hemoptysis, cough, or dyspnea.
C. Bronchoscopy is frequently performed in most patients with cough who have failed empiric therapy with antireflux or antihistamine medications
D. Bronchoscopy is being performed for diagnostic purposes in most patients with solitary pulmonary nodules 2 cm or smaller.
E. Bronchoscopy is performed for "exploratory" purposes in all patients referred for therapeutic bronchoscopic procedures even if they have been recently bronchoscoped at another institution

问题 II 4：在你的研究所，对于门诊患者，下面哪种情况会让你再一次仔细地考虑是否真的存在进行支气管镜检查的适应症？

A. 对于大部分留置气道支架的患者，每 4 个月需进行一次支气管镜检查以监测气道及支架的情况
B. 留置气道支架的患者如出现咯血、咳嗽或呼吸困难等新发呼吸道症状时，常需进行支气管镜检查
C. 对于大部分咳嗽患者，如果经典抗返流或抗组胺治疗失败，常需考虑进行支气管镜检查
D. 对于大部分肺内孤立性结节（直径小于等于 2cm）患者，需进行支气管镜检查明确诊断
E. 对于需要进行经支气管镜治疗的患者，即使患者最近在其它医疗机构进行过支气管镜检查，仍然有必要进行支气管镜检查以事先了解气道情况

Question II.5: Which of the following should be considered to be unacceptable practice

A. Performing bronchoscopy without routine administration of conscious sedation
B. Performing bronchoscopy in a patient who appears uncooperative despite having signed informed consent
C. Obtaining bronchoscopic biopsies from the healthy lung because chest radiographs were not reviewed prior to the procedure.
D. Allowing the patient's family members to observe the bronchoscopy
E. Using the words "bite", "blood", "dangerous", "cancer" or "bad" during the procedure when such words might startle the patient or promote greater anxiety and fear.

问题 II 5：下面哪一项操作是不合理的？

A. 没有行常规镇静就进行支气管镜检查

B. 对已签署知情同意书但不能配合操作的患者进行支气管镜检查

C. 由于操作前没有阅读患者的胸片，对正常肺组织进行支气管镜活检

D. 允许患者的家属参观支气管镜检查

E. 在操作过程中使用“钳”、“出血”、“危险”、“癌症”或“坏”等词语进行交流，而这些词语可能会导致或加重患者的焦虑和恐慌。

Question II.6: The lesion shown in the Figure below is

A. A small contact nodule on the left vocal cord near the posterior commissure
B. A small contact nodule on the right vocal cord near the anterior commissure
C. A small contact nodule on the right vocal cord near the posterior commissure
D. A small contact nodule on the left vocal cord near the anterior commissure

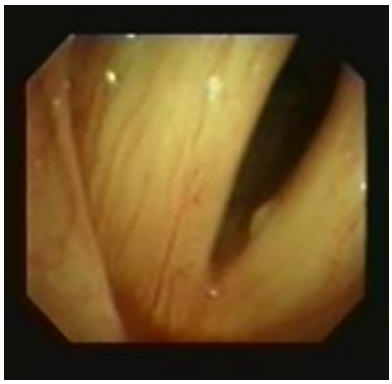
问题 II 6：下图中所示病灶是：

A．靠近左侧声带后联合的可触性小结节。

B．靠近右侧声带前联合的可触性小结节。

C．靠近右侧声带后联合的可触性小结节。

D．靠近左侧声带前联合的可触性小结节。



Question II.7 A 58-year old man smoker has noted voice change and increased coughing during and after meals. Flexible laryngoscopic examination reveals the findings shown in the Figures below. Which of the following might be expected on chest radiograph.

A. Subglottic narrowing
B. Left lower lobe atelectasis
C. Left perihilar mass with obliteration of the aortopulmonary window
D. Normal radiograph

问题 II 7：一名 58 岁老年男性吸烟者最近出现声音的改变，进餐时及餐后咳嗽频繁。可弯曲喉镜检查如下图所示。胸部 X 线检查可能表现为：

A. 声门下狭窄

B. 左下叶不张

C. 左肺门肿块，侵及主动脉肺窗

D. 胸片正常

Question II.8: Mechanical and chemical irritation of laryngeal mucosa, such as that which occurs during flexible bronchoscopy, elicits cough and bronchoconstriction. Which of the other normal responses to upper airway stimuli could be considered most dangerous for patients undergoing flexible bronchoscopy.

A. Hypertension from sympathetic stimuli
B. Bronchodilatation from nasal and epipharyngeal irritation
C. Cardiac arrhythmia and even cardiac arrest most likely resulting from irritation of the superior laryngeal nerve
D. Increased mucous secretions that prompt cough and prevent penetration of extraneous materials.

问题 II 8：

在进行支气管镜检查时，对喉粘膜的机械及化学刺激可引起咳嗽和支气管收缩。除此之外，进行支气管镜检查时，由于刺激引起下述上呼吸道的正常反应中，哪一种对患者来说是最危险的？

A. 交感神经兴奋导致血压升高。

B. 因鼻部和上咽部刺激引起支气管扩张。

C. 很可能因为刺激到喉上神经而引起心律失常甚至心跳骤停。

D. 粘液分泌增加引起咳嗽，阻碍支气管镜的继续深入。

Question II.9: All of the following are potential indications for performing a "dynamic" bronchoscopy **except**.

A. Spastic dysphonia due to adductor spasm
B. Bronchoesophageal fistula
C. Tracheal bronchomalacia
D. Circumferential subglottic tracheal stricture
E. Wide-based tumor obstructing the proximal aspect of a main bronchus

问题 II 9：在进行支气管镜检查过程中，以下除哪种情况之外均需要患者进行"功能性"配合？

A. 内收肌痉挛引起的痉挛性发声困难
B. 支气管食管瘘
C. 气管支气管软化
D. 声门下气管环形狭窄
E. 宽基底的新生物阻塞主支气管的近端

Question II.10 Which of the following positions is inelegant and risks damaging the flexible bronchoscope

A. Pushing downwards on the bronchoscope so that a bend forms in the insertion tube.
B. Standing up straight, shoulders back, weight equally distributed on both feet.
C. Sitting on a stool, keeping the insertion tube straight at approximately patient height.

问题 II 10：以下哪种不规范操作会增加损坏可弯曲支气管镜的风险？

A. 将支气管镜向下推，使插入部的形状变得弯曲

B. 直立位，肩朝后，体重平均分布于双脚

C. 坐在凳上，在与患者差不多高的位置保持插入部伸直

Question II. 11 What is most inelegant about the bronchoscopist shown?

A. He is scratching his beard
B. He is “flapping” his right elbow
C. He is holding the scope in the wrong hand
D. He is wearing blue

问题 II 11：下图中所示支气管镜操作者哪种动作最不雅观？

A．搔抓胡须

B．右肘部不停地左右晃动

C．持镜手法不合适

D．穿着蓝色衣服

Question II.12: Three months ago, you purchased two flexible bronchoscopes for your hospital. Today, your new bronchoscopy nurse informs you that the bronchoscopes had been stored in a haphazard way into small, padded procedure cart drawers. Visualization and light transmission is normal, yet she requests permission to install new full-length cabinets in which to hang the bronchoscopes. This is because she has noted which of the following in one of the scopes

A. The outer sheath is ruptured
B. The distal lens has turned yellow
C. Multiple black dots are visible when looking through the eyepiece
D. The steel components of the bronchoscope have corroded
E. The bronchoscope has a new, fixed C-shaped curve along its entire length

问题 II 12：3 个月前，您订购了两支可弯曲支气管镜。现在，护士告诉您，这两支新镜子一直被随意地储存在置物车的小抽屉里。虽然镜子的视频和光导是正常的，但是她要求置备新的标准长度的陈列柜，以悬挂支气管镜。这是因为她注意到支气管镜发生了什么：

A. 外鞘破裂了
B. 远端的镜片变黄了
C. 通过目镜观可看到许多黑点
D. 支气管镜的钢铁部分被腐蚀了
E. 支气管镜镜身变形为固定的 C 形弯曲状

Question II.13: The oral airway shown in the Figure below is the

A. Ovassapian airway
B. Williams airway intubator.
C. Berman pharyngeal airway.

问题 II 13：下图中所示口腔通气道是：

A．Ovassapian 口腔插管器

B．Wiliiams 口腔插管器

C．Bermann 口咽插管器

Question II.14: The appearance of the airway stricture seen in the Figure should be described as

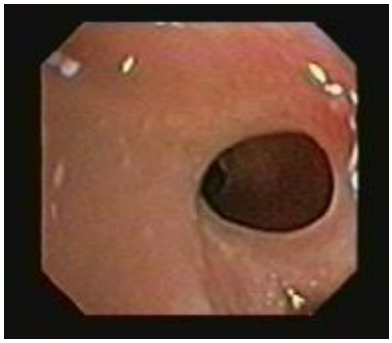
A. Simple
B. Hourglass
C. Complex

问题 II 14：下图所示气道狭窄应该描述为：

A. 单纯型

B. 沙漏型

C. 复合型



Question II.15
Which of the following best describes the airway device seen in the Figure.

A. Its popularity during the 1990s revolutionized interventional bronchoscopic practice
B. Best used for patients with subglottic and upper-mid tracheal stenosis, this device requires a tracheostomy. A small cap on the device can be removed to allow suctioning and airway access if needed.
C. Made of silicone, this device is usually inserted and removed using a rigid bronchoscope.

问题 II 15：关于下图中的气道装置，以下哪一项描述得最好：

A．在 1990 后该装置开始普遍应用，堪称经支气管镜介入治疗的里程碑。

B．对于存在声门下或气管中上段狭窄的患者，应用此装置最合适，使用这个装置需行气管切开。必要时可将装置上的小帽打开以方便吸痰管进入气道腔内进行吸痰。

C．这个装置由硅铜制成，通常需要在硬质支气管镜辅助下进行置入或移除。

Question II.16: All of the following statements regarding bronchoscopy-induced hypoxemia are correct **except**

A. Prebronchoscopy PaO_2 fails to predict the degree of fall in arterial PO2 during flexible bronchoscopy
B. Suctioning during bronchoscopy may contribute to a fall in alveolar PO_2, resulting in a decline in arterial PO_2.
C. Hypoxemia may occur even in the absence of respiratory depression from sedatives.
D. Hypoxemia has been associated with development of dysrhythmias.
E. Arterial PO_2 falls by about 5 mm Hg on average during bronchoscopy.

问题 II 16：关于支气管镜检查相关低氧血症的描述中，以下哪项表述不正确。

A．不能通过支气管镜检查前的 PaO2 来预测检查中的动脉血 PO2 的降低程度

B．支气管镜检查中持续负压吸痰可造成肺泡内 PO2 的下降，进而导致动脉血 PO2 下降

C．即使没有使用镇静剂造成呼吸抑制，低氧血症也有可能会发生

D．低氧血症与心律失常的发生有关

E．支气管镜检查中，动脉血 PO2 平均将下降 5mmHg

Question II.17: Patients with which of the following disease are most likely to develop acute central airway obstruction after general anesthesia is initiated in the supine position.

A. Posterior nerve sheath tumor
B. Hodgkin's lymphoma
C. Bronchogenic cyst

问题 II 17：以下哪种疾病的患者，在仰卧位全麻后最有可能发生急性中央气道堵塞：

A. 后神经鞘肿瘤

B. 霍奇金淋巴瘤

C. 支气管源性囊肿

Question II.18: All of the following statements pertaining to ethylene oxide gas (ETO) sterilization of flexible bronchoscopes are correct **except**

A. ETO sterilization penetrates all portions of the flexible bronchoscope
B. ETO sterilization is highly effective against all types of microorganisms
C. ETO sterilization without using an ETO venting cap will result in rupture of the outer polyurethane sheath of the flexible bronchoscope.
D. ETO sterilization usually takes about 4 hours, and requires up to 24 hours of degassing time during which the scope cannot be used.
E. ETO guarantees sterility and is therefore preferred over liquid chemical disinfection modalities.

问题 II 18：关于使用环氧乙烷气（ETO）消毒支气管镜的描述，下述选项中除哪一项之外均是正确的？

A. ETO 能够消毒支气管镜的所有部件

B. ETO 对所有类型的微生物都显著杀菌作用

C. 使用 ETO 消毒时如不将排出孔盖帽盖上，则支气管镜的聚氨酯外鞘很容易出现破裂

D. ETO 消毒通常耗时 4 小时左右，之后尚需 24 小时的排气时间，在这个期间支气管镜是不能使用的

E. ETO 消毒效果好，因此较其它化学消毒方式更具优势

Question II.19: When looking through the eyepiece of a flexible bronchoscope you notice that multiple small black dots are visible. This means that

A. Water has leaked into the bronchoscope
B. The bronchoscope has been excessively exposed to radiation
C. Multiple fiberoptic bundles are broken
D. The bronchoscope needs to be replaced

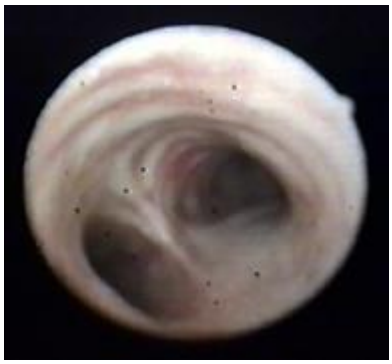
问题 II 19：透过支气管镜的目镜你看到视野里面许多小黑点，说明什么：

A. 水漏入了支气管镜

B. 支气管镜过度暴露于辐射

C. 数条光纤束发生了断裂

D. 需要更换支气管镜了



Question II.20: Which of the following pulmonary function disturbances can be seen when performing bronchoscopy in a mechanically ventilated patient

A. Increased airway resistance
B. Reduced positive end-expiratory pressure
C. Reduced functional residual capacity
D. Increased arterial oxygen saturations
E. Increased expiratory flow rate

问题 II 20：为机械通气的患者进行支气管镜检查时可出现下列哪一种类型的肺功能异常？

A. 气道阻力增加

B. 呼气末正压下降

C. 功能残气量下降

D. 动脉血氧饱和度增加

E. 呼气流速增加

Question II.21: In a tall adult male patient with normal airways, a standard flexible bronchoscope occupies approximately what percentage of cross-sectional area of the trachea.

A. 5 percent
B. 10-15 percent
C. 20-25 percent
D. more than 25 percent

问题 II 21：如患者是一名气道正常的高个成年男性，进行标准可弯曲支气管镜检查时，镜身占据了气道横截面的：

A．5%

B．10-15%

C．20-25%

D. 超过 25%

Question II.22: Which of the following "expressions" is most appropriate for flexible bronchoscopic examination

A. The middle way
B. Gentleness is a virtue
C. A bronchoscopist must have eyes on the tips of his fingers
D. Never give up
E. Feel the wall

问题 II 22：以下关于可弯曲支气管镜检查的表述最恰当的是那一项？

A. 取中庸之道
B. 温柔是一种美德
C. 支气管镜医生的指尖需要敏感，仿佛就像眼睛可以视物
D. 永不放弃
E. 感觉到胸壁

Question II.23: The best reason to not administer conscious sedation before or during bronchoscopy is

A. The patient is a military commando and his friends are watching
B. The bronchoscopist is a macho
C. The patient must drive immediately to work after the procedure
D. The patient is allergic to Lidocaine
E. The patient is critically ill and is a high risk intubation

问题 II 23：以下哪种原因，进行支气管镜检查前及检查中不能给予镇静药物：

A. 该患者是一名军队突击队员，他的朋友正在旁边参观支气管镜检查

B. 这名支气管镜医生很有男子气概

C. 患者在检查完之后必须立即驾车去工作

D. 患者对利多卡因过敏

E. 患者病情严重，很可能需要气管插管

Question II.24 The image shown demonstrates

A. Paralyzed vocal cords in abduction
B. Normal vocal cords seen from below
C. Subglottic tracheal stenosis
D. The anal canal during sigmoidoscopy

问题 II 24 下图提示

A. 声带麻痹，不能闭合

B. 从下至上观看的正常的声带

C. 声门下气管狭窄

D. 乙状结肠镜检查下所见肛管

Question II.25: Which of the following is usually an early complication of tracheostomy tubes

A. Tracheoinnominate artery fistula
B. Granulomas
C. Tracheomalacia
D. Suprastomal tracheal flap
E. Stenosis at the level of the stoma

问题 II 25： 以下哪项是气管切开插管所致早期并发症之一：

A. 气管-无名动脉瘘

B. 肉芽生长

C. 气管软化

D. 切开口以上气管扑动或活瓣形成

E. 切开口处气管狭窄

Question II.26: Which of the following drugs used for conscious sedation, consistently suppresses airway reflexes and is therefore most beneficial for awake tracheal intubation

A. Midazolam
B. Diazepam
C. Lorazepam
D. Fentanyl
E. Morphine

问题 II 26： 以下用于镇静的药物中哪种能持续抑制气道反射，因此对于清醒状态下气管插管最为适用？

A. 咪达唑仑
B. 地西泮
C. 劳拉西泮
D. 芬太尼
E. 吗啡

Question II.27: You and your assistants are called to the emergency room because the anesthesiologist and emergency room physicians are unable to intubate a 33-year-old obese woman in status asthmaticus. She has known acute and chronic sinusitis and a deviated nasal septum. She is fully sedated. Oxygenation has been maintained by manual ventilation using an ambu-mask. The patient is tachycardic, hypotensive, and severely hypercarbic. Central venous access is being attempted. You have just finished a bronchoscopy and your 6 mm diameter flexible bronchoscope is in the automatic washer. You had a 4.8 mm videobronchoscope, but it was damaged yesterday when one of your patients accidentally bit it (you have since transferred the pulmonary trainee who was doing the procedure without the use of a bite block to a clinic in Siberia). The only scope you have available is a 3.2 mm pediatric flexible bronchoscope with a 1.2 mm working channel. The intensivist tells you that she wants this patient intubated with a # 7.5 mm endotracheal tube. The patient's husband, who is a famous medical malpractice attorney, refuses to leave the bedside. Which of the following will most likely facilitate a successful and safe oral intubation using bronchoscopic guidance in this patient.

A. You remove the patient from the Trendelenburg position, and place her in the supine position before beginning bronchoscopically-guided intubation using a # 7.5 mm adult cuffed endotracheal tube via the oral route and through a bite block.
B. You ignore the request of the intensivist and you begin bronchoscopically-guided intubation intubation using a # 6 uncuffed endotracheal tube through the nares.
C. You ignore the request of the intensivist and you begin bronchoscopically guided intubation using an # 8.0 cuffed, endotracheal tube via the oral route and through a bite block.
D. You place a well-lubricated, uncuffed 5.0 mm internal diameter pediatric endotracheal tube inside a # 7.5 cuffed adult endotracheal tube and begin bronchoscopically-guided intubation via the oral route and through a bite block.
E. You ignore the request of the intensivists and begin bronchoscopically guided intubation using a # 6.0 cuffed endotracheal tube via the oral route and through a bite block.

问题 II 27：急诊室请您和您的助手去帮忙，因为麻醉师和急诊科医生无法为一名 33 岁哮喘急性发作的肥胖女性患者进行气管插管。这位患者曾经有急性和慢性鼻窦炎，以及鼻中隔偏曲。她已经被完全镇静了，目前通过球囊面罩人工通气维持着她的氧和。这名患者目前存在心动过速，血压偏低，以及严重的二氧化碳潴留，其他医生正在尝试进行中心静脉穿刺置管。您刚刚完成一台支气管镜检查，直径 6mm 的纤支镜正在自动清洗机里面消毒。您有一条内径为 4.8mm 的视频辅助支气管镜，但昨天那条镜子被一名患者咬坏了（一名实习医师操作失当所致，因事先对患者没有使用牙垫就进行支气管镜检查，此实习医师已经被发配到西伯利亚的一所医疗机构去了）。现在您手上仅有一条内径 3.2mm、工作槽直径为 1.2mm 的儿科用可曲式支气管镜。重症监护医生告诉您，她希望使用直径 7.5mm 的套管为患者进行气管插管。这名患者的丈夫是知名的医疗事故辩护律师，要求呆在患者的床边观看。请您考虑，利用支气管镜辅助插管，通过以下哪种方式可以成功且安全地经口进行气管插管？

A．将患者从头低脚高位转移至仰卧位，套上牙垫，然后在支气管镜引导下经口插入直接 7.5mm 带囊的气管套管

B．您忽略重症监护医生的要求，在支气管镜引导下经鼻插入直接 6mm 无囊的气管套管

C．您忽略重症监护医生的要求，套上牙垫，然后在支气管镜引导下插入直接 8.0mm 带囊的气管套管

D．您将一条润滑过的内径为 5.0mm 的无囊儿科用气管套管置入一条内径为 7.5mm 的带囊气管套管中，套上牙垫，在支气管镜引导下经口行气管插管

E．您忽略重症监护医生的要求，套上牙垫，在支气管镜引导下经口插入直径 6.0mm 带囊的气管套管

Question II.28: Your newly hired and inexperienced technician has finished sterilizing a flexible bronchoscope using ethylene oxide gas sterilization. He calls to say that he forgot to place the ETO venting cap onto the venting connector before sterilization. You immediately say &#@&*!. Upon examining the bronchoscope you notice that

A. The outer sheath is ruptured
B. The distal lens has turned yellow
C. Multiple black dots are visible when looking through the eyepiece
D. The steel components of the bronchoscope have corroded
E. The bronchoscope has a new, fixed S-shaped curve along its entire length

问题 II 28：您最近聘请的的技师经验不足，他使用氧化乙烯消毒了一条纤支镜后打电话来说，他忘了盖上排出孔连接器上的盖帽！您勃然大怒，接着您检查镜子时将会发现：

A. 外鞘裂开了
B. 末端镜头变黄了
C. 通过目镜查看时看到许多黑点
D. 支气管镜的钢铁部分被腐蚀了
E. 支气管镜镜身呈现出新形成的、固定的 S 型弯曲

Question II.29: You are asked to come to the operating room because a patient with a massive goiter is about to undergo general anesthesia. The anesthesiologist performed flexible bronchoscopy and informs you that when the patient was completely supine, he was unable to pass the bronchoscope beyond the subglottis. When referring to the subglottic larynx, which distance is the anesthesiologist referring to.

A. 1 cm beyond below the level of the vocal cords
B. 2 cm below the level of the vocal cords
C. 3 cm below the level of the vocal cords
D. 4 cm below the level of the vocal cords

问题 II 29：因为一个甲状腺肿大的患者即将进行全身麻醉，您被邀请去手术室。麻醉师进行可弯曲支气管镜检查时告诉您，当患者完全仰卧时，支气管镜未能通过声门下区。麻醉师提及的“声门下喉部”指的是：

A．声带下 1cm 以外
B．声带下 2cm 处
C．声带下 3cm 处
D．声带下 4cm 处

Question II.30: A 25-year-old woman with a bilateral micronodular infiltrate, ten pound weight loss, morning headache, and persistent low-grade fever undergoes flexible bronchoscopy with bronchoscopic lung biopsy and broncholaveolar lavage. Topical anesthesia is achieved using 2 puffs of 10% Lidocaine, and 4 cc of 2% Lidocaine instilled onto the main carina. In addition, 3 mg of Midazolam is administered for conscious sedation. The BAL is done within the right middle lobe bronchus. The bronchoscopic lung biopsy is obtained after wedging the flexible bronchoscope in the left lower lobe bronchus. The patient is asked to exhale, and at end expiration, the biopsy is taken. The patient has no pain. Shortly after the fourth biopsy, mild bleeding is noted. The patient begins to have a tonic-clonic seizure rapidly followed by respiratory arrest. Bleeding is stopped using a saline wash and suctioning. Cardiopulmonary resuscitation is successful. The patient is intubated and transferred to the intensive care unit. The biopsy sample showed miliary tuberculosis and small segment of pulmonary vein. What is the most likely cause of this patient's procedure-related complication?

A. Lidocaine toxicity
B. Midazolam toxicity
C. Cardiac arrhythmia and myocardial injury
D. Gas embolism
E. Procedure-related elevation of intracranial pressure in a setting of tuberculous meningitis

问题 II 30：患者为 25 岁女性，双肺小结节浸润影，近期体重减轻约 10 磅（1 磅=0.4536kg），伴有晨起后头痛及持续的低热。医生为这名患者进行支气管镜肺活检和支气管肺泡灌洗。首先，使用 2 喷 10%利多卡因进行了表面麻醉，用 4cc 2%利多卡因麻醉了隆突。并且使用 3mg 咪达唑仑进行镇静。在右中叶支气管进行了灌洗。当支气管镜插入左肺下叶后，让患者呼气，在呼气末进行活检，患者未诉疼痛。行第四次活检后不久，镜下看到少量出血， 这时患者突然出现强直性抽搐，随即呼吸停止。使用生理盐水冲洗和吸引后镜下出血停止，同时进行的心肺复苏也成功了，予以气管插管后将患者转入了重症监护病房。活检标本可见粟粒性肺结核和一小段肺静脉。这名患者出现操作相关并发症最可能的原因是？

A．利多卡因的毒副作用

B．咪达唑仑的毒副作用

C．心律失常和心肌损伤

D．气体栓塞

E．患者可能存在结核性脑膜炎并发症，支气管镜检查时引起颅内压升高

模块 II

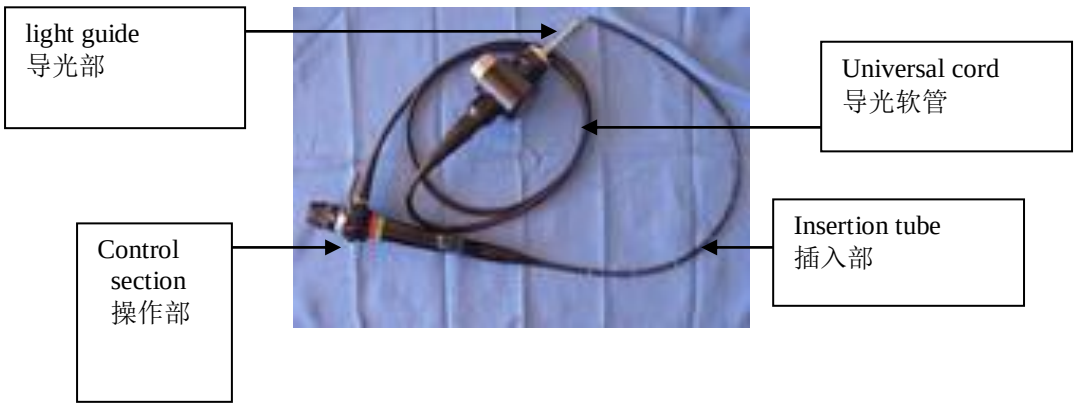
阶段测试答案

Answer II.1: C

The light guide section plugs into the light source via the light guide. Light is transmitted through fiberoptic bundles to the distal end of the bronchoscope via the universal cord, the control section (which includes the eyepiece section) and the insertion tube section. Each optic fiber is clad with glass in order to isolate it. Fibers are arranged into a coherent bundle, and are thus easily broken when the scope is knocked, banged against hard surfaces, twisted, or bent excessively.

答案 II.1 C

支气管镜的导光部（light guide section）通过光导（light guide）连接光源。光经由光纤束传导，依次通过导光软管、操作部（包括目镜部）以及插入部，最终到支气管镜的远端。每一条光纤均被玻璃被膜所包绕，使之与其它光纤隔离。光纤排列有序，并形成连续的光纤束。因此，当支气管镜受到外力撞击或与坚硬的物体碰撞、扭转、过度弯曲时，内部的光纤束就很容易断裂。



Answer II.2 A

This scope was bitten, but the same appearance occurs when a scope is caught in a drawer. When bronchoscopy is performed through the mouth, a bite block should always be used. Drawers of procedure carts should never be left open during a procedure. This way, they cannot be inadvertently closed onto a bronchoscope. Bronchoscopists should treat their scopes gently. Scopes should not be bent excessively, bitten, slammed against bedrails or carts, caught in procedure cart drawers, or dropped onto the floor. Treat your bronchoscope as you would like to be treated.

答案 II。2 A

图片中的支气管镜是被咬到才变成这样的，但是被抽屉卡到时也会发生同样的改变。经口进行支气管镜检查时，需常规使用咬口器。将纤支镜放在搬运车的抽屉中搬运过程中，抽屉绝不能敞开着，这样，抽屉就不会被不经意的关上而撞击到支气管镜。支气管镜医生应该温柔地对待自己的支气管镜。镜子不能被过度弯曲，不能被咬到，不能对着床栏杆或抽屉撞击，不能被卡到置物车的抽屉里，也不能掉到地上。您希望别人怎样对待您，就以同样的态度对待支气管镜。

Answer II.3: B

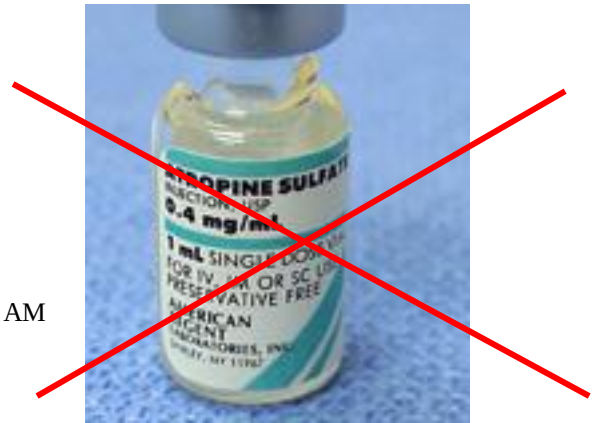
Several studies have now demonstrated that premedication with atropine or glycopyrolate is not beneficial in decreasing bronchoscopy-related cough or secretions. In addition, coagulation profiles, blood type and screen, serum electrolytes, platelet counts, blood count, and serum chemistry panels are not routinely warranted and should be individualized. Electrocardiograms are desirable in patients at risk for heart disease or when pertinent history or physical findings are discovered. During the procedure, pulse rate and oxygen saturation can be monitored by oximetry. Electrocardiographic monitoring is unnecessary.

Increasingly, a fasting state of 6 hours or greater appears to be unwarranted, and should be individualized. A number of institutions are studying this classic rule of anesthesia in the outpatient surgical arena. Informed consent is mandatory. Bronchoscopists should never begin a procedure without first reviewing the history and physical, speaking with the patient and family members about the procedure and its risks, and reviewing the radiology reports.

问题 II 3 B

现在有许多研究声明，操作前给予阿托品或胃长宁（glycopyrrolate）对于减轻支气管镜检查相关咳嗽或气道分泌没有益处。除此之外，凝血功能，血型（blood type and screen），血清电解质，血小板计数，血细胞计数，以及血生化等检查均不是必须要进行的，应根据个体情况决定。如果患者有发生心脏疾病的风险，或者有心脏疾病的相关病史及阳性体征，心电图检查是必须的。在操作过程中，需使用血氧饱和度计监测脉率及血氧饱和度。心电监测不是必要的。

空腹至少 6 小时逐渐变得不是那么绝对，可以根据具体情况个体化。许多医疗机构在外科门诊研究这一经典的常规麻醉。知情同意是绝对需要的。支气管镜医生在开始操作前必须熟知患者的病史和体征，须同患者和家属讨论操作的过程及存在的风险，且必须查看患者的胸部影像及报告。



Answer II.4: D

Most experts agree that diagnostic yield of bronchoscopy for solitary pulmonary nodules is extremely low, and that other diagnostic alternatives (percutaneous needle aspiration, thoracoscopic biopsy, wedge resection by open thoracotomy) are more likely to be effective. In patients with known bronchogenic carcinoma is unlikely that bronchoscopy will discover a synchronous or asynchronous ipsilateral or contra lateral metastasis that will change surgical management. Bronchoscopy is warranted in many patients with history of cough and who have not responded to therapy for reflux or postnasal drip. In these cases, problems that might be discovered include benign or malignant intraluminal tumors, airway strictures, tracheoesophageal or tracheomediastinal fistulas, tracheobronchomalacia, dynamic airway collapse, obstruction by inhaled foreign bodies, and vocal cord or laryngeal dysfunction.

The role for surveillance bronchoscopy in patients with indwelling airway stents is still unclear. Complications (granulation tissues formation, abundant secretions, stent migration) might be expected in as many as 20 percent of patients with stents. Most of these can be managed using the flexible bronchoscope. Some experts recommend a “surveillance bronchoscopy” even when patients are asymptomatic. Others prefer to intervene only when new or increased symptoms prompt consultation. In this regard, most stented patients with new or increased respiratory symptoms have been shown to have a stent-related problem.

答案 II 4： D

大部分专家认为：对于孤立性肺结节，经支气管镜检查的诊断阳性率非常低，其它可选择的诊断方法（经皮穿刺针吸活检、胸腔镜活检、开胸肺楔形切除活检）通常更有帮助。对于已知患有支气管肺癌的患者，企图经纤支镜检查发现病灶同侧或对侧肺同期或不同期的转移瘤，从而帮助决定外科治疗策略是不可能的。对于大多有咳嗽史、经抗返流和抗鼻后滴漏治疗效果不佳的患者，行纤支镜检查是必要的；这类患者通过支气管镜检查也许能发现以下问题：良性或恶性腔内肿瘤，气道狭窄，气管食管瘘或气管纵隔瘘，支气管软骨软化，气道功能性塌陷，吸入异物后导致的气道阻塞，以及声带或喉功能异常等。

对于留置气道支架的患者，定期行支气管镜检查的意义尚不明确。支架留置的相关并发症（肉芽组织形成，大量的分泌物，支架移位）可见于 20%的患者，而这些并发症大部分都能通过支气管镜检查处理。一些专家推荐即使患者

无自觉不适症状，“纤支镜定期复查”仍然是有必要的。另外一种观点则认为仅在出现新发症状或原有症状加重时才需要进行支气管镜检查，因为新发的呼吸道症状或原有症状加重，大多与留置支架有关。

Answer II.5: C

It is definitely unacceptable to perform a procedure on the "wrong" side, whether it is an amputation, or a bronchoscopic lung biopsy. Measures to avoid such an event should be instituted in every bronchoscopy suite. Nurses should be instructed to review radiograph reports and to personally interview and examine patients. Trainees should have x-ray reports and original imaging studies available at the time of the procedure. Informed consent should be specific. The other answers are debatable. In some institutions there is a bias against using conscious sedation. Medications should, however, probably be offered to the patient before and certainly, during the procedure. It is well recognized that health care providers inaccurately judge degrees of procedure-related anxiety and fear. Some patients are originally uncooperative at the time of bronchoscopy even though they had previously signed an informed consent. Most of these patients can be gently convinced to proceed with the bronchoscopy when the nurses and physicians provide greater reassurance, a calm and safe environment, an opportunity for conscious sedation, compassion and caring. If patients are still combative or reluctant to proceed, the procedure should be postponed. Coercion and force should be avoided, even if the health care providers believe that it is in the patient's best interests to undergo the procedure.

In many institutions, it is believed to be unwise for patient's family members to observe bronchoscopic procedures. Others believe that family members have a right to be present, since they are the true support services for the patient, and, after all, the proficient bronchoscopist should have nothing to "hide". Observers should be told, however, that complications could occur. Each bronchoscopist and health care team should do what they feel most comfortable with, and of course, abide by their institution's policy. Using words that might shock or traumatize patients cannot always be avoided during a bronchoscopy. Still, many experts advocate using the words "mitosis" instead of cancer, "heme" instead of blood, "close" instead of bite, and "interesting" instead of bad or dangerous.

答案 II 5： C

不管是肺叶切除，还是支气管镜肺活检，绝对禁止对非患侧肺进行任何操作。在任何一个位点进行支气管镜活检时，常规需采取一些措施以避免这类事件的发生。例如：医生应该指导护士阅读影像学报告，并对患者进行问病查体；不能对缺乏影像学资料的患者进行支气管镜检查；明确是否已签署知情同意书等。

其它选项都存在争议。某些医疗机构不认同镇静药物的使用。但是在操作前或操作过程中使用一些药物是合理的。对于患者在操作过程中产生焦虑和恐慌程度，医疗工作者事先是很难作出准确判断的。即使患者在操作前签订了知情同意书，但仍有可能在进行检查时变得不配合。如果护士和医生能更有力地消除患者的忧虑，提供安静、安全的环境，适当的时候使用镇静药物，对患者抱持怜悯之情，对其进行精心的护理，大部分情况下最终能温柔地说服患者接受支气管镜检查。如果患者仍然抗拒进行支气管镜检查，则应择期再进行检查，绝不能强迫患者接受支气管镜检查，即使这个检查可能对患者的诊断和治疗有很大帮助。

许多医疗机构认为让患者的家属参观支气管镜操作过程是不合适的做法。另外一种观点则认为家属有权利亲临现场，因为他们才是患者真正的支持者。其实，只要支气管镜医生事先将操作过程中可能出现的并发症告知予家属，支气管镜操作过程也没什么“见不得人”的。每一个支气管镜医生和医疗团队应该按他们觉得最舒服的方式工作，当然，要以不违反所属医疗机构的规章制度为原则。在支气管镜操作过程中，应该避免使用那些可能会对患者造成冲击或伤害的词语进行交流。现下许多专家提倡使用“有丝分裂”代替“癌症”，“血红素”代替“出血”，“关闭”代替“咬”，“有趣”代替“坏”或“危险”。

Answer II.6 D

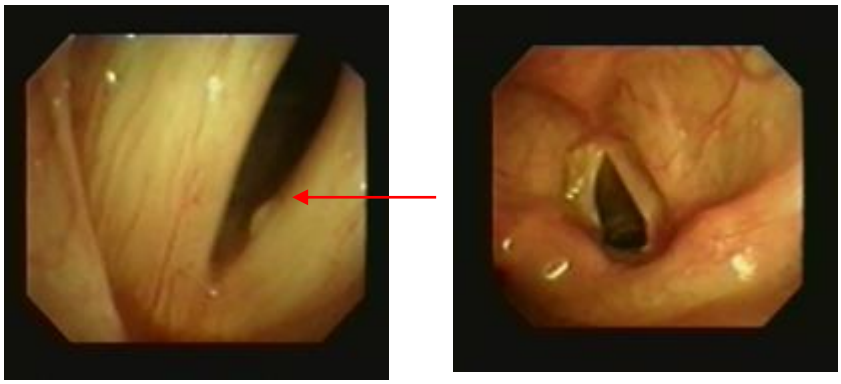
The abnormality is on the left vocal cord near the anterior commissure (located at the 6 o'clock position in the first figure below). It is probably of little or no consequence, but otolaryngology should be consulted for evaluation and possible removal. A hurried bronchoscopist easily overlooks laryngeal abnormalities. The larynx and hypopharynx (which extends from the tip of the epiglottis to the pyriform sinuses lateral to the aryepiglottic folds bilaterally) should be routinely examined during all flexible bronchoscopy.

Ahhhh, but look again!! Using the bronchoscope we were able to aspirate the small abnormality:it was just some mucus. Note the normal larynx in the second photograph. The view is different because the scope has been rotated such that the arytenoids cartilages are now seen in a 6 o'clock position and the V-shaped anterior commissure is at the 12 o'clock position.

答案 II 6 D

病灶位于左侧声带，靠近前联合（第一张图片的 6 点钟的位置）。病灶虽小，可能不会引起不适症状或症状很轻微，但应常规请耳鼻喉科医生进行评估，或许需要将病灶摘除。进行支气管镜检查时，应常规检查喉和下咽部（由会厌的尖部至杓状软骨平面会厌襞旁的梨状窝），因为在检查时最容易这些部位的病变。

但是，再认真看清楚！！这只是一些分泌物而已，因为通过支气管镜吸引后，小病灶不见了。注意第二张图片显示的是正常的喉部形态；而两张图片的喉的形态不相同，因为第二张图片中镜子被旋转过来了，杓状软骨现在位于 6 点钟的位置，而“V”型的前联合位于 12 点钟的位置。



Answer II.7 C

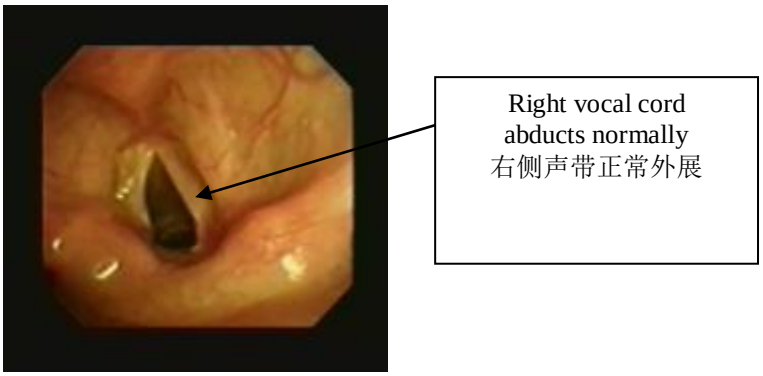
A mass filling the aortopulmonary could compress the left recurrent laryngeal nerve, causing the left vocal cord paralysis noted in the figures. Both the left and the right vocal cords are shown in adduction in the first figure, but only the right vocal cord abducts normally during phonation. The left vocal cord does not move. A careful inspection of laryngeal function is a routine part of any flexible bronchoscopic examination.

Patients should be asked to swallow, inhale, exhale, and speak. Vocal cord and arytenoids cartilage movements should be assessed and the aryepiglottic folds should be inspected. The left recurrent laryngeal nerve is a branch of the vagus nerve. It innervates the mucous membranes directly below the vocal cords, passing posterior within the superior mediastinum to hook around the aortic arch.

答案 II 7 C

侵及主动脉肺窗的肿块可压迫左侧喉返神经，造成左侧声带麻痹。第一张图片中双侧声带均位于内收状态，但是发声时只有右侧声带能够正常外展，而左侧声带没有移动。每位医师在进行支气管镜检查时应仔细评价喉的功能。

在进行支气管镜检查操作时，可要求患者进行吞咽、吸气、呼气和发声动作。通过这些动作来评估患者的声带及杓状软骨的运动情况，并且应检查杓状会厌襞的情况。左侧喉返神经是迷走神经的一条分支，在左迷走神经经过主动脉弓前方处发出，并绕主动脉弓返回至颈部，内脏感觉纤维分布于声门裂以下的喉粘膜。



Answer II.8: C

Laryngeal irritation has been shown to cause cardiac arrhythmias and even cardiac arrest in humans and in experimental studies. Repeated traumatic attempts at passing the flexible bronchoscope past the vocal cords should be avoided. During visualization of laryngeal function, vocal cord mobility, and during administration of topical anesthetic onto the larynx, the bronchoscope should be pulled back so that the larynx is clearly in view. Most experts agree that in a controlled setting, the tip of the bronchoscope should be kept above the epiglottis before intubating the trachea.

答案 II 8 C

在人体操作或动物模型中，刺激喉部均有可能引起心律失常甚至心跳骤停。进行操作时，应该避免反复以镜身穿过声带，导致声带创伤。观察喉部功能、声带运动，以及对喉部进行表面麻醉时，应将支气管镜退后一点，以方便能够清楚地看到喉部的结构。大多数专家认为，在进入气管前，支气管镜的镜头应该保持在会厌以上的部位。

Answer II.9: E

Dynamic bronchoscopy consists of asking the patient to perform specific maneuvers while the airways are being visualized with the bronchoscope. These maneuvers include forced deep breathing, forced exhalation, and hyper flexion or hyperextension of the neck. Airways are examined after moving the patient into the supine, lateral decubitus, and seated postures. Dynamic bronchoscopy might be accompanied by a dynamic examination of the larynx during phonation in patients with hoarseness, dysphagia, or with symptoms suggestive of recurrent aspiration (cough, recurrent bronchitis, or pneumonia). Dynamic bronchoscopy might result in distending the folds or cartilaginous rings to identify a fistula. It might also identify dynamic collapse of the pars membranosa, an occasional cause for persistent cough and shortness of breath.

In patients with subglottic strictures, the patency of the airway should be assessed in multiple positions. Sometimes, there is a tendency for the stricture to become more severe during exhalation, or when the patient assumes certain positions. When the trachea or bronchi are obstructed by tumor, dynamic bronchoscopy is usually not necessary. “Ball-valving” is usually evident during a routine bronchoscopic examination, and rarely requires specific maneuvers. This occurs most frequently when tumors are on a small stalk, membranes protrude into the airway lumen, and when elastic tumors such as sarcomas extend out of a segmental bronchus into a main bronchus.

答案 II 9: E

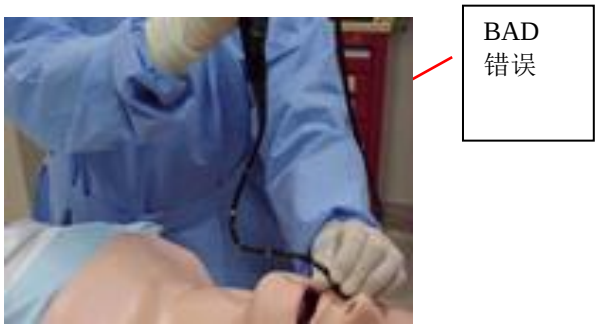
在进行纤支镜检查时，部分特殊情况下需要患者进行“ 功能性”配合，即指示患者做特定的动作。这些动作包括用力深吸气及呼气，使颈部过伸或过曲等。仰卧位、侧卧位或坐位进行气道检查。如果患者存在声音嘶哑、发音困难或提示误吸的可能（如反复咳嗽、反复发生支气管炎或肺炎）时，需检查喉的功能。在进行此类纤支镜检查时，患者的功能性的配合动作可诱导气管皱襞或气管软骨环扩张，从而使瘘口暴露出来，也可观察到气道壁膜部的功能性塌陷，而后者正是导致反复咳嗽和呼吸困难的原因。

如患者存在声门下气道狭窄，检查气道的狭窄程度常常需要变换多种不同的体位。有时在呼气过程中、或当患者处于某种体位时，狭窄程度会变得更严重。如果患者的气管或支气管被肿瘤阻塞，进行纤支镜检查时，通常无需患者

进行上述“功能性”配合。“球形瓣膜”在普通支气管镜检查下已很明显，通常不需要患者进行额外的动作来显示；这种情况最常见的是肿瘤生长在一条小茎上，膜部突向气道腔内，也可见有弹性的肿瘤比如肉瘤从段支气管延伸至主支气管。

Answer II.10 A

Pushing downwards on the bronchoscope is inelegant, bad for the posture, and risks damaging the scope. Standing straight with weight equally distributed is much more comfortable, as is flexible bronchoscopy in the seated position.



答案 II 10 A

将支气管镜用力向下推是不对的，这种姿势是粗野的，有损伤镜子的风险。采取直立位，身体重量均分于双脚，或者采取坐位操作均可以，这两种姿势操作起来会更加舒服。

Answer II. 11 B

Flapping the elbow is inelegant and appears clumsy. A more elegant posture is that shown in the Figures below. Here, the elbow can rest, if necessary, on the bronchoscopist's hip. The arm is held close to the body and the control section of the videobronchoscope is held directly in front of the body. There is no awkward body language, dancing or swaying from one foot to the other. The insertion tube is relatively straight throughout the procedure.

In order to maintain an upright posture, the bronchoscopist can move closer to the patient. Scopes can be held in either the left or the right hand, depending on operator comfort, preference, and use of ancillary instruments.

答案 II 11 B

Flapping the elbow is inelegant

肘部来回晃动不够优雅

肘部不停地晃动是不优雅的动作，显得很笨拙。下图中所示操作姿势更为优雅成熟。这样肘部处于放松状态，必要的话，可放于操作者的髋部。手臂尽量向身体靠近，视频支气管镜的操作部放置于身体的正前方，整个操作过程中插入部均保持顺直、不要弯曲。

为了保持直立姿势，操作者可以尽量靠近患者。可根据操作者的舒适程度、个人习惯及辅助设备的使用情况选择右手或左手握镜。

Answer II.12: E

Fixed “memory” curves occur when flexible bronchoscopes are not stored in a full-length cabinet where bronchoscopes can hang. This can occur when scopes are rolled, folded, or placed into drawers for extended periods of time. Cabinets should be padded so that the distal extremity of the scope does not bang up again cabinet walls. Folding bronchoscopes into drawers for storage increases the risk of breaking fibers and sheaths by excessive bending, banging, or other mishandling such as closing the drawer onto the bronchoscope.

Rupture of an outer sheath easily occurs if the venting cap of the bronchoscope is not placed prior to ethylene oxide gas sterilization. The distal lens may turn yellow if repeated cleaning with povidone-iodine (Betadine) occurs or if the scope is exposed to radiation. Steel components can erode if scopes are immersed for excessively long periods in Glutaraldehyde.

答案 II 12： E

如果将可弯曲支气管镜卷起来、折叠或装在抽屉里过长时间，而不是将镜子悬挂在标准高度的陈列柜里，支气管镜的镜身就会形成固定的弯曲状，被镜身“记忆”并保留。另外，陈列柜的侧壁必须装有衬垫，可以减轻镜子的末端对侧壁的强烈碰撞。如果将支气管镜折叠起来储存在抽屉里，镜身因为弯曲、撞击、或其它不当操作（譬如关抽屉时将支气管镜卡在缝隙里），会使光纤和外鞘很容易断裂。

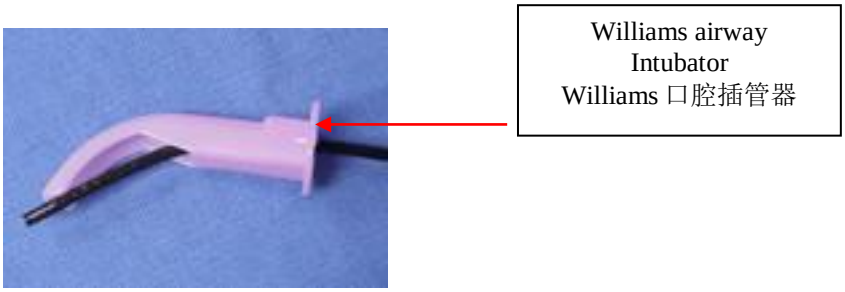
如果使用氧化乙烯消毒支气管镜之前没有盖上排出孔的帽子，很容易发生外鞘破裂。如果反复使用聚乙烯吡酮碘清洗镜子，或将镜子暴露于射线中，远端的镜头就可能会变黄。如果镜子长时间浸泡在戊二醛中，其中的钢铁成分可能会被腐蚀。

Answer II.13: B

Oral intubating airways help the bronchoscopist keep the flexible bronchoscope in the midline, expose laryngeal structures, and maintain an open pharynx. The Williams airway intubator was designed for blind orotracheal intubation. However, in order to remove the Williams airway after intubation, the endotracheal tube adaptor must be removed prior to intubation. The Ovassapian airway, on the other hand, can be removed without disconnecting the endotracheal tube adaptor. The length and tubular shape of the Berman airway hinders maneuverability of the flexible bronchoscope.

答案 II 13 B

口腔插管器可帮助支气管镜医生将气管镜保持在管腔中央，充分暴露喉部结构、维持咽腔开放。Williams 口腔插管器主要用于经口气管插管时的盲插。然而，为了在插管之后顺利去掉口腔插管器，就必须在插管前先拿掉气管内导管适配器。但是对于 Ovassapian 口腔插管器，则不需要事先撤除气管内导管适配器。Bermann 口腔插管器的管型及管道长度不利于可弯曲支气管镜的操作。



Answer II.14: A

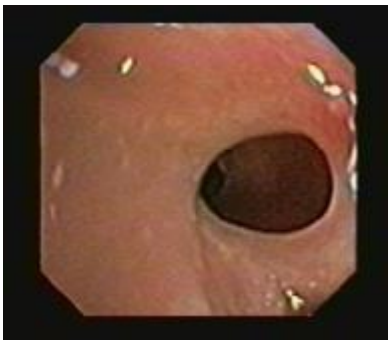
This is a simple circumferential membranous stricture. Tracheal stenosis can be congenital, acquired, or idiopathic. Histopathologically, there may be mucosal erosion, destroyed cartilage, granulation tissue formation, or full thickness dense fibrotic scar. It is important to understand the histopathologic process underlying the bronchoscopic abnormality when making management decisions regarding therapy.

A simple stenosis is defined as a partially or completely concentric, circumferential-type stricture in which a fibrous scar grows from the tracheal wall towards the center of the airway lumen. A bottleneck or hourglass stricture is characterized by localized collapse of tracheal cartilage. A complex stricture is one that includes a combination of other abnormalities, or extends for more than 5 cm or 6 cartilaginous rings.

答案 II 14： A

这是一种单纯的环形膜性狭窄。气管狭窄可分为先天性，获得性和特发性。组织病理学上可能表现为粘膜糜烂，软骨破坏，肉芽组织增生，或纤维疤痕形成。熟知支气管镜下的形态学异常及组织病理学改变对于决定治疗决策非常重要。

单纯型狭窄通常是指：向心性的、部分或完全性环形狭窄，主要是因为纤维疤痕组织从气管壁向气道腔中心生长而形成的。瓶颈形或沙漏型狭窄的特点则是气管软骨的局部塌陷。复合型狭窄的特点则是合并了其它类型的解剖异常，或者狭窄的范围长达 5cm 或 6 个软骨环以上。



Answer II.15 B

The Montgomery T-tube was introduced in the 1960s. It is extremely useful for treating patients with subglottic stenosis or strictures involving the upper and mid trachea. It can be left in place indefinitely, or used temporarily as part of an endoscopic or open surgical management of tracheal stenosis. The vertical limb of the T-tube exits the patient through the tracheostomy stoma.

Patients can speak normally when this vertical limb is closed with a cap. Patients should keep the cap on at all times to avoid drying airway secretions. If the patient becomes short of breath because of recurrent tracheal stricture or accumulated secretions, the cap can be removed. The proximity of the horizontal (and shortest) limb of the T-tube to the vocal cords favors granulation tissue formation. The two other responses apply to studded silicone stents used to palliate central airways obstruction.

答案 II 15 B

蒙哥马利 T 形管是 1960 年左右发明的。对于治疗声门下或气管中上段狭窄的患者非常有用。该管可被永久放置，也可在气道内镜检查时或在气道狭窄的开放性手术中临时使用。T 型管的垂直臂从气管切开口伸出来。

当患者需要讲话时，将位于 T 型管垂直臂上的小孔盖住即可。此小孔可持续地被盖住，以避免气道干燥。如果患者因反复气管狭窄或分泌物过多出现呼吸困难，可移除孔帽，打开小孔。T 型管的水平臂（最短臂）靠近声门处易出现肉芽组织生长。另外两个选项描述的均是用于缓解中央气道阻塞的硅胶支架。

Answer II.16: E

Bronchoscopy related fall in arterial PO_2 has been reported to be as high as 20 mm Hg on average. It has, for the most part, become standard of care to administer supplemental oxygenation to all patients undergoing flexible bronchoscopy and to monitor oxygen saturation, heart rate and blood pressure by pulse oximetry. One principle reason for this is to prevent hypoxemic events potentially related to respiratory depression when conscious sedation is administered..

Transient hypoxemia can occur duing bronchoscopy because of excess sedation, respiratory insufficiency, diminished airway caliber and poor ventilation, or because of excessive washing or suctioning. Bronchoalveolar lavage can cause persistent hypoxemia lasting up to six hours after the procedure in rare instances.

The exact mechanisms of bronchoscopy-induced hypoxemia are not clear, but are likely to reflect altered ventilation-perfusion relationships. Note that some older studies and some guidelines, such as those of the British Thoracic Society or Argentinian Society for Bronchesophagology suggest that supplemental oxygen be administered only if oxygenation cannot be monitored or if oxygen saturation falls to below 90 percent.

答案 II 16 E

据报道：支气管镜检查过程中，动脉血氧分压平均下降约20mmHg，所以在检查过程中，应为所有患者提供额外的氧疗，并且通过脉搏血氧仪监测血氧饱和度、心率和血压。这样做的主要目的是为了预防使用镇静剂后产生呼吸抑制继而引起低氧血症相关事件。

在支气管镜检查过程中，镇静过度、呼吸抑制、气道腔内径缩小或通气不足，过度的冲洗或负压吸痰，均可导致一过性低氧血症发生。在某些罕见情况下，支气管肺泡灌洗导致的低氧血症在可持续至检查结束后 6 小时。

支气管镜检查相关低氧血症的确切机制尚不明确，可能与肺通气-血流比例的改变有关。另外，那些既往的研究或指南也是值得注意，例如英国胸科学会或阿根廷胸科协会支气管镜分会建议：只有当血氧饱和度下降至 90%以下或测不出时，才予以吸氧。

Answer II.17: B

Patients with a mediastinal mass, especially those with Hodgkin's lymphoma, are most likely to develop severe airway obstruction when anesthetized in the supine position. In addition to compression of the airway by the mass, airway obstruction is increased because of loss of bronchial smooth muscle tone, loss of spontaneous ventilation, and loss of negative intrathoracic pressure on inspiration. Loss of the airway on induction of anesthesia can be life threatening. Anesthesiologists may frequently call a bronchoscopist for assistance in such cases.

答案 II 17： B

纵隔肿块、尤其是霍奇金淋巴瘤患者，全麻后处于仰卧位最容易导致严重气道堵塞。肿块本身对气道有压迫，全麻可导致支气管平滑肌张力消失、自主呼吸减弱，吸气时的胸腔内负压消失等进一步加重气道堵塞的 程度；这种全麻后出现的气道堵塞可能是致命的。当这种情况发生时，麻醉科医生往往需要支气管镜医生协助处理。

Answer II.18: E

Ethylene oxide (ETO) processing does not guarantee sterility. This and other disadvantages such as long degassing time and lengthy turnover make it impractical for busy bronchoscopy services. High- level disinfection, which inactivates all fungi, viruses, and vegetative organisms, but not all bacterial spores, is the modality used most frequently around the world. Disinfection for 45 minutes at 25 degrees Centigrade and using 2% Glutaraldehyde will also destroy all mycobacterial organisms.

After disinfection, scopes are rinsed with sterile water and dried using air suction. Any bronchoscope being cleaned must be "leak tested" first. If a leak is found coming from the working channel of the scope, or from a damaged exterior surface of the universal cord or extension tube, the scope should NOT be submersed in cleaning solution. Many services use older flexible fiberoptic bronchoscopes. An accessory "teaching head" is used to allow observation by a second person. The teaching head CANNOT be immersed or sterilized. It should, therefore, be kept as clean as possible, and wiped with alcohol after each use.

答案 II 18：E

ETO 并不能杀灭所有细菌。再加上脱气时间长，使得支气管镜周转所需时间变长，这对于工作繁忙的支气管镜室来说不太适合。目前世界上应用最广泛的消毒模式是高水平消毒法（high-level disinfection），可以让所有真菌、病毒和繁殖期微生物失活，但不一定能杀灭所有细菌的芽孢。使用 2%戊二醛在 25 摄氏度下消毒 45 分钟也能杀灭所有分支杆杆菌。

消毒后，镜子需使用灭菌水清洗，然后再以高压气枪吹干。清洗支气管镜前必须进行"漏液测试"。如果镜子的工作通道、导光软管或延长管的外壳等部位出现漏液的现象，则不能将支气管镜浸入清洗液中。许多医疗单位使用老式的可弯曲纤维支气管镜，常接有目镜头的分支用以示教，这样可允许第二者同时看到支气管镜下的视野。示教用的分支目镜头不能被清洗或消毒，应该尽量保持清洁，每次使用后以酒精擦拭即可。

Answer II.19: C

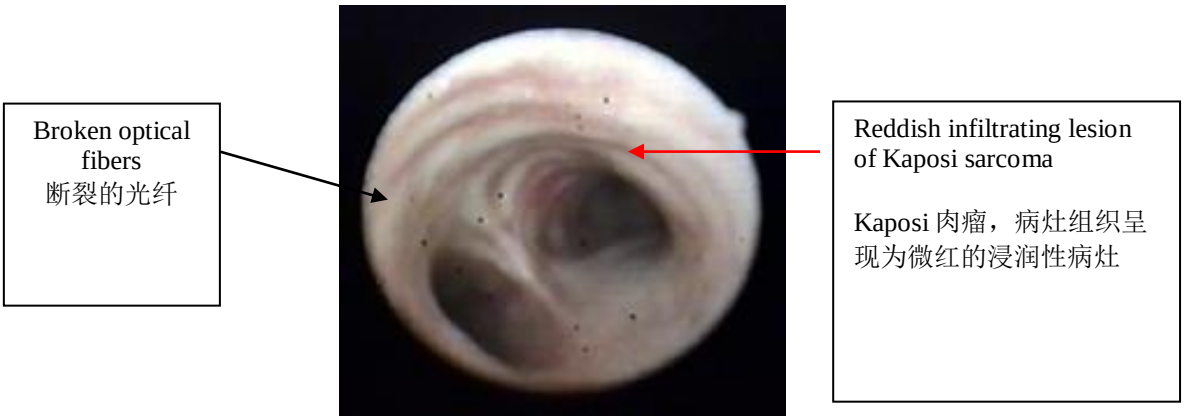
Multiple black dots are caused because light is no longer transmitted along individual or groups of glass optical fibers. As additional fibers are broken, dots multiply until they eventually fill a significant portion of the viewing field. Light transmission decreases and visualization eventually becomes unsatisfactory. Sooner or later, the bronchoscope will need to be replaced. A yellowish discoloration and darkening of the fiberoptic bundles occurs when a scope is exposed to excessive amounts of radiation.

When visualization is blurred, the lens should be wiped with saline or alcohol in order to remove a film caused by blood, secretions, or inadequate drying during the cleaning-disinfection process. If visualization does not improve, a leak-test should be performed because fluid may have entered the bronchoscope. No further washing and disinfection should be attempted. The bronchoscope needs to be sent out for repair.

答案 II 19 C

视野中出现黑点意味着该处一条或多条玻璃光纤不能再传递光，随着更多的纤维发生断裂，黑点逐渐增多，直到视野发生严重的缺损。如果镜子不能透过足够的光，视野就会变得模糊不清，则需要考虑更换支气管镜了。当镜子过度暴露于射线时，光纤束会变黄、变暗。

视野变得模糊时，应该使用生理盐水或酒精擦拭镜头，以去除血液、气道分泌物、或因清洗-消毒后干燥不当而在镜头表面形成的膜。如果上述处理后视野清晰度仍不能得到改善，应该进行漏液试验，因为可能有液体漏入了支气管镜。若发现液体漏入支气管镜中，则不能再进行清洗和消毒，应及时送去修理。



Answer II.20: A

Airway resistance is increased because the cross sectional area of the trachea, usually about 3 cm^2, is reduced by the endotracheal tube and by the flexible bronchoscope within the endotracheal tube. Oxygen saturations and expiratory flow rates are reduced, although saturations might actually increase if abundant mucous plugs or secretions are removed. End-expiratory pressure and functional residual capacity are increased because of the increase in airway resistance.

Most experts suggest increasing FiO2 to 100 percent during bronchoscopy. Procedures should be stopped if peak airway pressures increase significantly, or if bronchoscopy is causing hypertension, significant tachycardia or dysrythmias, or oxygen desaturation. However, in some cases, it is essential to remove mucous plugs or blood in order to restore adequate ventilatory function. In these cases, bronchoscopy should be judiciously performed while staying in the patient's airway as little time as possible.

答案 II 20 A

气管横截面积约 3cm^2，当气管内存在气管插管套管和进行检查的支气管镜时，通气的横截面积大大减少，所以气道阻力增加，血氧饱和度及呼气流速下降。而清除了大量痰栓及分泌物之后，血氧饱和度会有所增加。由于气道阻力增加，呼气末正压及功能残气量将会增加。

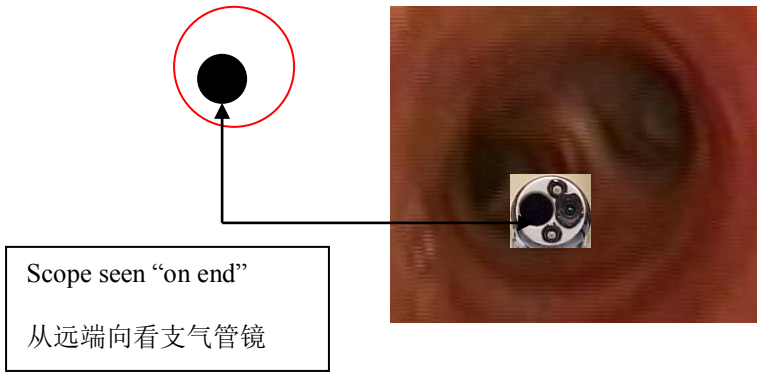
大部分专家都推荐为这类患者进行支气管镜检查时，应将吸氧浓度增加至100%。如果气道峰压升高显著，或出现严重血压升高、心动过速及心律失常，或氧饱和度下降明显时，应及时终止支气管镜检查。然而，某些情况下，为了使得通气功能保持正常，清除痰栓或气道内的积血是非常重要的。这种情况下行支气管镜检查需非常谨慎，并尽量缩短操作时间。

Answer II.21: B

In an adult male with a normal trachea 12-24 mm in diameter, the flexible bronchoscope occupies approximately 10-15 percent of the cross-sectional area of the tracheal lumen. Obviously, the area occupied by the bronchoscope is increased in the presence of tracheal strictures caused by benign or malignant processes, when there is an indwelling endotracheal tube, and in smaller patients. In these cases, the size of the bronchoscope contributes to increased airway resistance, decreased expiratory flow rates, and increased functional residual capacity. Occasionally, increased positive end-expiratory pressure has also been noted.

答案 II 21 B

成年男性的气管的直径正常情况下为 12-24mm，支气管镜镜身大约占据了气管腔横截面的 10-15%。当然，如果患者存在气管狭窄或留有气管内插管时，支气管镜所占据的比例将会有所增加。这些情况下，支气管镜将导致气道阻力增加，呼气流速下降，功能残气量增加。有时候也会出现呼吸末正压的增加。



Answer II.22: A

One of the secrets to performing a non traumatic and "gentle" examination is to always keep the flexible bronchoscope in the middle of the airway lumen (when using video, keep the image in the middle!). This improves overall visibility, decreases the likelihood to become lost, and avoids mucosal injury, cough and patient discomfort. This position within the airways also allows the bronchoscopist to maintain excellent posture and maneuverability no matter what hurdles may be encountered. Thus, harmony is maintained during the procedure.

答案 II 22： A

进行零创伤及"温柔"的支气管镜检查的秘诀是将支气管镜始终保持在气道的中央（使用视频辅助检查时，则应当使看到的图像始终保持在中心）。这样做能更好地看到整个视野，以免遗漏了某些异常，更可降低粘膜损伤，减轻咳嗽反射及患者的不适。支气管镜保持在气道中央也可以让支气管镜医生保持绝佳的姿势，不管遇到什么阻碍，都能够自如地操作。这样整个操作过程可以变得非常流畅。

Of course, the "middle way", is that of Chinese Tao and Japanese Zen Buddhism: A way in which one is not distracted by the objective world nor disturbed in one's own mind. The middle way is a way of inner peace, harmony, and transcendence of dualism. To quote Chuang Tzu, "when the shoe fits, the foot is forgotten".

当然，"中庸之道"原本的含义，源自于中国道教和日本的禅宗佛教的理念，指的是人不受外部世界的影响而思维被扰乱。中庸之道可使内心平静、和谐，超越身体和思维对立的二元论，达到神形高度统一（the middle way is a way of inner peace,harmony,and transcendence of dualism）。引用庄子的话说，此时"忘足，履之适也"（鞋子合适了，就忘了脚的存在）。

Another way to achieve bronchoscopic harmony is to perceive limitations, and to move beyond them. The expression "feel the wall" is attributed to Jean-Francois Dumon of Marseille, France. Dumon is perhaps the single most important personality in interventional bronchoscopy of recent years. Through his technical expertise, talent, and passion for endoscopy, this Frenchman from Marseille raised awareness about the usefulness of therapeutic bronchoscopy among extremely hesitant and skeptical pulmonary, oncology, and surgical communities. "Feel the wall" refers to

the techniques of pobing a tumor's surface with forceps or suction catheter in order to best recognize consistence, state of necrosis, vascularity, risk of biopsy and potential for debulking by rigid bronchoscopy.

另一种达到如此和谐之境界的方法是了解支气管镜的缺陷，然后试着去超越这些缺陷。“触摸边界”这一说法是法国马赛市的学者弗兰斯瓦 迪蒙（Jean-Francois Dumon）提出的。在近几年里，迪蒙在介入支气管镜学科领域发挥了举足轻重的作用。这个来自马赛的法国人用他的技术专长、天分和热情，让止步不前、犹犹豫豫的呼吸科、肿瘤科和外科医生认识到经纤支镜治疗的作用。“触摸边界”指的是使用镊子或吸引管探查肿物的表面，以更好地了解肿物的质地、坏死状态、血管分布、活检风险以及是否可以通过硬质支气管镜切除。

Undoubtedly, this expression also reflects a philosophy and a way of life. It represents a need to "feel" the boundaries of thought and the limitations of medical science. Those who question conventional wisdom in order to bathe in the realm of innovation and originality transcend these boundaries. There is, in fact, a way to "become One with the bronchoscope", but that is another story….

毫无疑问，“触摸边界”也是一种哲学，一种生活方式。它意味着“探索”思维的边界和医学的极限。怀着这种信念的人不断挑战传统思维以寻求创新，超越这些边界。事实上，还有另外一种方式即“成为仅拥有支气管镜的人”，不过那是另外一个故事了。。。

Answer II.23: C

Patients should be warned that conscious sedation may be administered, and therefore, they should have someone accompany them after the procedure, and they should NOT drive their own automobile or motorcycle after receiving such medication, even if their vital signs (blood pressure, heart rate, oxygen saturation, and level of consciousness) reflexes in case of need for emergency responses (like driving) are delayed for several hours.

答案 II 23 C

必须事先告知患者在接受支气管镜检查时可能会给予镇静药物，所以检查后需要有人陪伴，另外需要告知患者，使用这类药物后患者不可以驾驶汽车或摩托车，即使患者的生命体征（血压，心率，氧饱和度，以及意识状态）是平稳的；因为在检查结束后的数小时内镇静药物的作用仍在持续，因此，在需要应激反应的场合（例如驾驶），患者的反射是相对迟钝的。

Do you think conscious sedation should be a “negotiation” between yourself and the patient? Many studies have shown that physicians are poor judges of the anxiety levels and comfort levels of patients undergoing invasive procedures. Remember that small amounts of a sedative given orally or intravenously can help alleviate procedure-related anxiety. Thus the benefits of conscious sedation (anxiety relief, amnesia, analgesia, improved cooperation) should be weighed against the disadvantages of conscious sedation (need for additional monitoring, risk of respiratory depression, risk for decreased patient cooperation because of inhibitions or restlessness).

您是否认为：关于“镇静与否”应该征求患者的意见？许多研究表明，为患者进行有创性操作时，医生基本上不能准确估计患者的焦虑和舒适程度。应认识到，小剂量口服或静脉使用的镇静剂能够减轻患者检查时的焦虑状态。所以，应该谨慎权衡镇静药物所带来的利弊。镇静药物的益处主要包括减轻焦虑、消除恐惧记忆、镇痛、提高患者的合作度；镇静药物的弊端在于：需要加强监护、呼吸抑制、以及因药物对患者的抑制或不安而使其更难配合操作。

Decisions should also include the type of procedure being performed (is this a very short inspection or a longer procedure with biopsies, needle aspiration, washings, brushings). What is the risk of a procedure-related complication? What is the risk of a drug-induced adverse event? Is the patient clinically stable, ambulatory, or critically

ill? Whether to administer sedation, and which drug or drug to administer can and should be individualized based on the above scenarios.

是否使用镇静药物也与操作过程所需时间的长短有关。仅仅需很短的时间进行简单探查，还是需要更长的时间进行活检、细针穿刺、灌洗或刷检等复杂操作？操作相关并发症有哪些？药物引起的不良事件有哪些？患者病情稳定、不稳定、还是生命垂危？是否给予镇静药物、以及选用何种药物，均应根据上述情况的差异而个体化选择。

Of course, some patients do not desire conscious sedation because of other disadvantages: perceived loss of self-control, need to be observed until return to baseline mental status after the procedure, danger of driving an automobile, and fear of allergic reactions or other medication-related adverse events.

In case of a true allergy to lidocaine, a medication belonging to the Ester group, such as Tetracaine could be administered.

当然，部分患者不希望给予镇静药物是因为一些其它的原因：失去自控能力、操作结束后需要被监护直至神智恢复到正常、驾车存在危险、发生过敏反应或其它药物相关不良反应。

如果真正对利多卡因过敏，应该给予酯基药物例如丁卡因代替。

Although bronchoscopy has been shown to be safe in unsedated patients, most bronchoscopists today believe that short-acting sedation should be offered to patients in order to help improve patient comfort during the procedure. In certain instances, however, procedures might be warranted in a fully awake, but cooperative individual. This might include cases where the patient has hemoptysis or a foreign body (where conscious cough or breathing can prove advantageous), cases where a dynamic examination is warranted, and cases where loss of the airway might be irreversible.

虽然已经证实未予镇静的患者进行支气管镜检查是安全的，但现在大部分支气管镜医生认为，为增加患者的舒适感，操作过程中使用短效的镇静药是合理的。然而在某些情况，如患者存在咯血、气道异物、需接受功能性纤支镜检查，或当气道塌陷为不可逆时，则需要在患者完全清醒的状态下进行操作，因为这时需要患者进行主动咳嗽或者深呼吸等动作来配合。

Answer II.24 B

The image is that of the vocal cords seen from below. The flexible bronchoscope was introduced through the tracheostomy, after removing the tracheotomy tube. The scope is flexed caudally in order to examine the subglottis. The patient is asked to phonate. Here, normal vocal cords are seen in abduction. The subglottis is normal. Reason to perform this type of an examination are to exclude a subglottic or

peristomal source of bleeding, to inspect the subglottis for cartilaginous abnormality, stricture, or to fully evaluate laryngeal function in patients with tracheostomies prior to permanent removal of the tracheostomy tube.

答案 II 24 B

图片所示为由下至上观看的正常声带；是在移除气管切开套管后，支气管镜经气管切开口进入气道。为了检查声门下区，需要将支气管镜朝近端弯曲。嘱患者发声配合，可见看到声门下区未见异常，声带呈外展状态。这个检查的主要目的在于评估能否永久拔除气切套管。需要评估的内容包括：声门下及周围是否存在出血，有无软骨异常或声门缩窄，还有喉部功能等情况。

Answer II.25: A

Tracheoinnominate fistulas have been reported in as many as 0.7 % of patients with a tracheostomy. Tracheoesophageal fistula can occur early or late and has been reported in as many as 0.5 % of patients with a tracheostomy. Cough, hemoptysis, or dyspnea in a patient with a history of tracheostomy should prompt bronchoscopic examination in order to identify airway abnormalities responsible for the symptoms.

答案 II 25 A

气管-无名动脉瘘见于 0.7%的气管切开患者。气管食管瘘也可以在气管切开后早期或晚期出现，据报道见于 0.5%的患者。有过气管切开病史的患者，如出现咳嗽，咯血或呼吸困难，应立即进行支气管镜检查以了解导致上述症状的原因。

Answer II.26: D

Large doses of each of these drugs will produce general anesthesia and suppress all reflexes. Fentanyl is the preferred drug because of its faster action and shorter duration of action. From a pharmacological point of view, morphine is as good as Fentanyl for depressing airway reflexes. Propofol, a hypnotic agent that may also cause severe hypotension, especially in the elderly and in patients with known hypotension, also consistently suppresses airway reflexes. Propofol is an excellent choice for awake intubation, and certain bronchoscopic procedures. It is also useful for procedures in highly anxious patients and when a deeper level of anesthesia is desired.

答案 II 26 D

大剂量使用这些药物中的任何一种时均可诱导全身麻醉，抑制所有反射活动。这些药物中首选芬太尼，因为它起效快，作用时间短。从药理学角度来看，吗啡与芬太尼在抑制气道反射方面的效果相当。异丙酚也能持续抑制气道反射，但可引起严重低血压，尤其是对于老年人以及已知存在低血压的患者。但异丙酚对于清醒状态下插管和某些特殊情况下的支气管镜检查是很好的选择；对于高度焦虑的患者或需要更深程度的麻醉时，异丙酚可作为首选。

Answer II.27: E

This is one of those questions where the correct response is to do whatever you can to establish an airway quickly. Many experts would suggest using a small endotracheal tube that snugly fits over the 3.2 mm bronchoscope. Going through the mouth is often possible even as one ventilates and oxygenates the patient using the ambu mask. On the other hand, some would advocate first trying the nasal route anyway (if there are excessive secretions in the nares and oral pharynx one can always insert a nasal trumpet).

答案 II 27： E

在这种情况下做出正确决策的关键在于如何快速建立人工气道。许多专家认为此时应选用能合适地套住内径 3.2mm 支气管镜的小型气管套管。经口进镜通常是可能的，即使有人正使用急救面罩给患者进行人工通气和提供氧气。另一方面，有些专家则认为应首先尝试经鼻进镜，如果鼻腔或口咽部存在过多分泌物，可插入鼻导管。

Placing a pediatric endotracheal tube inside a larger endotracheal tube can allow the bronchoscopist to “close the gap” between the tube and the bronchoscope. This facilitates maneuvering within the airway. The pediatric bronchoscope should protrude beyond the distal extremity of the smaller endotracheal tube, which itself, protrudes slightly beyond the distal extremity of the large endotracheal tube. This technique also helps avoid accidental passage of the small caliber bronchoscope through the Murphy eye of the large endotracheal tube. The problem is finding the right endotracheal tube size “mix” to make this work, and having plenty of silicone lubricant available to make sure one tube can slide over the other. Beware…the pediatric endotracheal tube is frequently too short. If it has a cuff on it, it will not fit through the larger tube. Like all “emergency” techniques, this technique should be practiced in an inanimate model. It might be wiser to use other methods such as an intubating oral airway, a light wand or optical stylet, if you gain experience with these.

将一条直径稍大的气管套管套在管径较小的儿科用气管套管外面，而将后者套在纤支镜外面，这样可以消除套管与纤支镜之间的空隙，在气道里面操作起来会更加容易。纤支镜在长度上应超出中间那条直径较小的气管套管的末端，而这条小气管套管长度则应该超出其外的大气管套管的末端，这样能够避

免纤支镜镜身误入大气管套管的墨菲孔。但问题是要找到这样合适的气管套管“组合”很困难，而且需要涂抹许多石蜡油，以能够将一条套管顺利地滑入另外一条套管内。并且注意，儿科用气管套管通常都是很短的。另外，如果是带囊气管套管，则不可能套入大管中。像所有“急救”技术一样，这些操作应该事先在模型上面进行充分的练习。如果有相关经验的话，辅助使用口腔引导器、手电筒或可视喉镜会更好。

A variety of cuffed and uncuffed endotracheal tubes should always be available inside the airway procedure cart. Other intubation aids (tube changers, light wands, optical stylets, oral airways) should also be available. Bronchoscopic intubation without the use of an oral intubating airway increases the chance that the bronchoscope and endotracheal tube will deviate away from the midline. If the larynx is not seen before advancing the endotracheal tube, the endotracheal tube may get caught on the epiglottis, arytenoids, or in the hypopharynx.

One should attempt to make the first intubation attempt the last. Repeated attempts increase the risk for airway trauma, prolonged hypoxemia, and death.

气管插管准备车（airway procedure cart）里面应该常备各种型号的带囊及无囊气管套管。其它插管辅助物品（换管器，手电筒，可视喉镜，咬口器）也应备有。经支气管镜引导下行经口行气管插管时，如果没有咬口器及口腔引导器即可能导致支气管镜和气管套管偏离气道中心。如果不事先看清楚喉部情况就插入气管套管，套管有可能会卡在会厌，杓状软骨，或下咽部。

进行气管插管时应该尽量一次成功。反复插管会加重气道损伤，延长缺氧时间，增加了死亡的风险。

Answer I.28: A

Ethylene oxide gas is noncorosive and able to penetrate otherwise inaccessible components of the flexible bronchoscope. If the ETO venting cap is not placed onto the venting connector, however, pressures inside and outside the bronchoscope will not equalize, and rupture of the outer sheath of the bronchoscope can occur. ETO provides extremely satisfactory sterilization for bronchoscopes used in patients with AIDS or hepatitis. The ETO venting cap must be removed prior to immersing the bronchoscope into cleaning solutions of any kind otherwise fluid will enter the bronchoscope。

答案 I 28 A

氧化乙烯是非腐蚀性的，不具穿透性，因此不会到达支气管镜被保护起来的部分。如果排出孔连接器的 ETO 盖帽没有盖好，支气管镜内外将存在压力差，导致外鞘破裂。ETO 能够很好地消毒 AIDS 或肝炎患者使用过的支气管镜。使用清洁溶液或任何类似物清洗支气管镜前必须移除 ETO 盖帽，否则液体会进入支气管镜内部。

Answer I.29: B

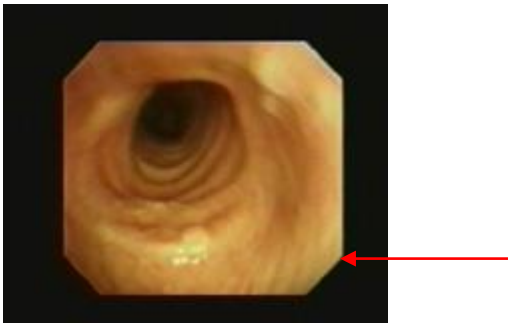
The trachea is a cylindrical tube that projects onto the spine from C6 to the level of T5. As it passes downwards, it follows the curvature of the spine, and courses slightly backward. Near the tracheal bifurcation, it deviates slightly to the right. The subglottis ends 2 cm below the level of the vocal cords. This corresponds cranially to the inferior margin of the cricoid cartilage, which forms the only complete cartilage ring in the airway.

The thyroid gland surrounds the cervical trachea anterolaterally at the level of the second to fourth cartilaginous rings. Mediastinal masses, goiters, and thyroid or other head and neck cancers can cause significant extrinsic compression resulting in tracheal obstruction. Occasionally, an awake intubation with the patient in the seated position may be warranted prior to surgical resection.

答案 II 29 B

气管是一个圆筒形管道，从 C6 椎体水平延伸至 T5 水平。向下延伸时，顺着脊柱的弯曲，气管轻微地朝向后方下行进。在气管杈附近，气管微微摆向右侧。声门下区终止于声带下 2cm 处，对应着环状软骨的下缘，环状软骨是气道软骨环中唯一完整的一环。

甲状腺在前、外侧环绕着颈段气管，对应第二至第四气管软骨环的位置。纵隔肿块、甲状腺肿、甲状腺肿瘤或其它头、颈部肿瘤均可对气管产生严重外压，导致气管堵塞。某些情况下，在进行甲状腺切除手术前，若仰卧位情况下支气管镜无法通过声门下区，导致插管困难，为患者行清醒状态下坐位气管插管是合理的。



Answer II.30: D

Wow…this patient had a cerebral gas embolism. It is likely that air entry occurred after laceration of a small pulmonary vein. Anecdotally, it has been taught that larger biopsy specimens are obtained when samples are taken at end-exhalation. This recommendation dates to the original descriptions of bronchoscopic lung biopsy by Dr. Donald Zavala from the University of Iowa back in the 1970s. On the other hand, because of a potential, although unproven increased risk for bleeding, pneumothorax, or air embolism, some experts do not advocate the end-exhalation biopsy technique.

Transbronchial lung biopsy (TBB or TBLB) is actually a misleading name for a procedure which is neither trans (across) nor bronchial (the goal is to obtain representative lung parenchyma containing bronchioles and alveoli, and an occasional blood vessel). Many experts today advocate the name bronchoscopic lung biopsy (BLB) instead. What do you think?

答案 II 30：D

哇！这名患者是因为意外发生了脑栓塞，栓子性质为空气。可能由于小的肺静脉撕裂伤后，空气从裂口进入了血管。20 世纪 70 年代艾奥瓦大学的唐纳德·萨瓦拉医生对纤支镜下肺活检的最早描述：在呼气末进行经支气管肺活检可以钳取更大的组织标本，因此应该在呼气末进行肺活检；但另一些专家认为不应该在呼气末进行肺活检，因为此时进行肺活检可能会增加出血、气胸、空气栓塞的危险性，虽然这些理论未经证实。

经支气管活检（transbronchial biopsy, TBB）或经支气管肺活检（transbronchial lung biopsy, TBLB）其实是一种会误导初学者的说法，事实上不是“trans（经过）”，而是“across（穿透）”，活检的真正目的也不是取“支气管”标本，而是为了获得具有代表性的肺实质，包括细支气管，肺泡及血管等组织标本。现在许多专家提倡使用“经支气管镜肺活检（BLB，bronchoscopic lung biopsy）”，您认为如何？

By the way, the only way to find out if you are obtaining representative samples of tissue (not necessarily diagnostic samples), is to review all specimens with the surgical pathologist, and to practice the various techniques described for obtaining bronchoscopic lung biopsies.

顺便提及的是：判断您所获取的组织标本是否能代表相关病灶（不一定是具有诊断意义的）的性质，只能同外科病理科医生一起仔细查看组织标本，并且不断练习各种经支气管镜肺活检的技术。

Regarding the other potential answers. Lidocaine does cause seizures. The appearance of serious adverse effects are not necessarily preceded by mild side effects especially if the patient has liver disease (lidocaine is metabolized in the liver).

至于其它可能的选项。利多卡因确实可以导致抽搐，特别当患者患有肝病时（利多卡因经肝代谢），并不一定出现轻微的副反应后才出现严重的副反应。

Had the surgical pathology of the biopsy sample revealed Lupus erythematosis. And had you answered cardiac arrhythmia and myocardial injury, you could have been correct, because Lupus can cause a vasculitis and thus, coronary arteritis. Regarding midazolam toxicity, respiratory depression and hypoxemia usually precedes any additional adverse events. The presence of the sudden neurologic event and the presence of the pulmonary vein in the biopsy sample are probably enough to suggest the diagnosis of gas embolism, making Tuberculous meningitis and elevated intracranial pressures an unlikely cause for her symptoms.

如果组织标本的病理结果提示红斑狼疮，选择“心律失常和心肌损伤”可能是正确的。因为系统性红斑狼疮可以导致血管炎，累及冠状动脉，从而导致心律失常和心肌损伤。至于咪达唑仑的毒副作用，可能性比较少。因为在其它严重副反应出现之前，通常会先出现呼吸抑制和低氧血症。突发性神经症状、活检的组织标本中能见到肺动脉可能已经能充分说明空气栓塞的存在，而结核性脑膜炎和颅内压升高不太可能是导致这些症状产生的原因。

模块 II

阶段测试

阶段测试 模块 II

Post test instructions

The following test is designed to verify that you have completed and fully understood the 30 questions for Module II.

回顾性测试指引：

下列检测是为了证实你已经完成并充分理解了模块 II 的 30 个问题中所包含的所有知识内容。

Post module test questions and answers: Module 2

Question 1: Which of the following parts of a bronchoscope is most easily damaged

A. The universal cord
B. The eyepiece or video control handle
C. The insertion tube
D. The control handle

问题 I：支气管镜的下面哪个部分最容易损坏？

A. 导光软管
B. 目镜或视频操作手柄
C. 插入部
D. 操作手柄

Question 2: Which of the following drugs can be safely used for effective topical anesthesia in a patient with an allergy to Lidocaine?

A. Atropine
B. Fentanyl
C. Tetracaine
D. Glycopyrolate（应该是 glycopyrrolate）

问题 2：如果患者对利多卡因过敏，以下哪种药物是安全有效的表面麻醉剂？

A. 阿托品
B. 芬太尼
C. 丁卡因
D. 胃长宁

Question 3: Dynamic bronchoscopy might be most helpful in patients with

A. Suspected tuberculosis and upper lobe infiltrates
B. Suspected tracheobronchomalacia
C. A large obstructing endobronchial lesion noted on computed tomography scan
D. Ipsilateral lung mass and pleural effusion

问题 3：需要进行功能配合的支气管镜检查对于下面哪种患者可能会有帮助：

A. 怀疑肺结核，肺上叶有浸润影
B. 怀疑气管支气管软化
C. CT 提示支气管内巨大阻塞性病灶
D. 肺内团块影及同侧胸膜渗出

Question 4: Which of the following best helps prevent obstruction by dried secretions in patients with indwelling Montgomery T-tubes ?

A. Placing the proximal part of the tube within 1 centimeter of the vocal cords
B. Keeping the external limb of the T-tube capped, except for suctioning.
C. Scheduling frequent and routine flexible bronchoscopy for suctioning
D. Keeping the external limb of the T-tube uncapped.

问题 4：对于长期留置 M 氏 T 形管的患者，为避免因分泌物干燥而导致气道阻塞，以下哪种方式最佳？

A. 将 T 形管近端放置在距声带 1cm 以内
B. 保持 T 形管外臂盖帽盖好，吸痰时才打开
C. 定期而且频繁地进行经支气管镜吸痰
D. 将 T 形管外臂的盖帽持续打开

Question 5: All of the following statements about flexible bronchoscopy in the intensive care unit setting are correct EXCEPT ?

A. Bronchoscopy can be helpful to remove secretions in mechanically ventilated patents.
B. Bronchoscopy can help resolve radiographic lobar atelectasis in mechanically ventilated patients.
C. Bronchoscopy should be routinely used instead of chest percussion and tracheal aspiration to remove secretions in intubated patients.
D. When scoping through the mouth, a bite block is essential to prevent scope damage, even in patients who are intubated orally.

问题 5：关于在重症监护病房进行纤支镜检查的描述，以下除哪项之外均正确？

A. 对于正在进行机械通气的患者，使用纤支镜吸痰非常有用
B. 对于正在进行机械通气的患者，通过纤支镜处理肺叶不张很有用
C. 对于气管插管的患者，应常规使用纤支镜清除分泌物，而不是使用拍背及普通吸痰等方式
D. 即使对于已经进行经口气管插管的患者，如经口进行支气管镜检查，仍有必要使用牙垫以避免损坏纤支镜镜身

Question 6: Which of the following anatomic descriptions is correct ?

A. The trachea extends from C6 to T5, in a downward and backward direction, and, near the tracheal bifurcation, deviates slightly to right.

B. The trachea extends from C6 to T5, in a downward and forward direction, and, near the tracheal bifurcation, deviates slightly to right
C. The trachea extends from C6 to T5, in a downward and backward direction, with the thyroid gland surrounding the anterolateral portion between the fourth and sixth cartilage rings.
D. The trachea extends from C6 to T5, in a downward and backward direction, with the thyroid gland surrounding the anterolateral portion between the first and third cartilage rings.

问题 6：以下解剖学描述哪项正确？

A. 气管始于 C6 平面、终至 T5 平面，其向下、向后走行，在气管杈附近向右微倾
B. 气管始于 C6 平面、终至 T5 平面，其向下、向前走行，在气管杈附近向右微倾
C. 气管始于 C6 平面、终至 T5 平面，其向下、向后走行，在第四和第六软骨环之间，甲状腺包绕了气管的前壁和侧壁
D. 气管始于 C6 平面、终至 T5 平面，其向下、向后走行，在第一和第三软骨环之间，甲状腺包绕了气管的前壁和侧壁

Question 7: Viewing the vocal cords from below might be useful in all of the following cases EXCEPT?

A. To exclude a peristomal or subglottic source of bleeding in a patient with a tracheostomy.
B. To fully evaluate laryngeal function in a patient with a tracheostomy being decanulated .
C. To examine the subglottis and vocal cord function in a patient with suspected tracheal stenosis and a tracheostomy.
D. To remove subglottic granulation tissue using laser

问题 7：在下述检查方面，由下至上观看声带，除以下哪项之外对检查均有帮助？

A. 对于已行气管切开的患者，为排除切开口周围或声门下出血
B. 已行气管切开的患者拔管前为了对喉部功能进行充分的评估
C. 怀疑患者出现了气管狭窄或气管瘘，为检查声门下区病变及声带功能
D. 拟使用激光清除声门下肉芽组织

Question 8: Once in the airway, the flexible bronchoscope

A. Occupies less than 5% of the normal airway diameter
B. Results in increased functional capacity, especially if there is also an endotracheal tube in place
C. Decreases airway resistance, especially if there is also an endotracheal tube in place
D. Occupies more than 20% of the normal airway diameter

问题 8：纤支镜一旦进入气道后：

A. 其镜身可占据正常气道直径的 5%以下

B. 患者的功能肺活量增加，特别是已行气管插管时

C. 患者的气道阻力减少，特别是已行气管插管时

D. 其镜身占据正常气道直径的 20%以上

Question 9: High level disinfection does all of the following EXCEPT ?

A. Inactivate all bacterial spores.
B. Inactivate all fungi
C. Destroy all viruses
D. Destroy all vegetative organisms.

问题 9：高水平消毒法除以下哪项之外均可达到：

A. 灭活所有细菌芽孢

B. 灭活所有真菌

C. 破坏所有病毒

D. 破坏所有有活力的微生物

Question 10: Which of the following best describes a complex tracheal stricture?

A. Circumerferential narrowing 3 cm below the vocal cords, extending along a distance of 2, without associated malacia.
B. Partially circumferential web-like stricture 3 cm below the vocal cords along the anterior wall of the trachea in a site of previous and well healed tracheostomy.
C. Bottleneck stricture 2 cm below the cords with asymmetric narrowing of the trachea and a second partial web at the distal margin of the bottleneck stenosis.
D. Circumferential narrowing of the trachea to 3 mm by fibrous tissue 2 cm below the vocal cords, extending along a distance of 0.5 cm.

问题 10：以下哪项描述最符合复合型的气管狭窄？

A. 位于声门下 3cm 的环形狭窄，狭窄范围约 2cm，不伴有软骨软化

B. 部分环形的蹼状狭窄，位于声门下 3cm，气管前壁气管切开愈合口处

C. 声门下 2cm 处气管瓶颈形不对称狭窄，在瓶颈形狭窄远端的边缘另有一处狭窄

D. 气管因纤维组织增生导致环形狭窄，位于声门下 2cm，最狭窄处管腔约 3mm，范围约 0.5cm

Congratulations, you have completed Module II of the Essential Bronchoscopist©. The correct answers to the post test questions are listed below. We suggest that you review the questions and answer sets to Module II. You may do so by printing out the entire module as a PDF file.

祝贺您！您已经完成模块 II 的学习。后试题问题的正确答案如下。我们建议您重新复习模块 II 中的问题和答案。您可以将整个模块用 PDF 文档的形式打印出来进行复习。

ANSWERS TO MODULE II POST-TEST

Answer 1: C
Answer 2: C
Answer 3: B
Answer 4: B
Answer 5: C
Answer 6: A
Answer 7: D
Answer 8: B
Answer 9: A
Answer 10: C

恭喜您，您已完成全部课程。
祝愿您在介入肺脏病学习的道路上取得更大成绩！

模块 III

Bronchoscopy International copyright 2013

模块的目标

EB（杰出气管镜专家）的读者不应该将其中的模块测试图看呈单纯一种测试，因为无论您是否或能否回答这些这些问题，读了这些内容，您都可以从中获得非常有用的信息。也许您会发现：有些问题的正确答案不止一个，这也许是一个善意的陷阱，而读者不应该将其看做是一种陷阱，而应该看做是帮助读者去思考某个问题的方式。一个模块含有 30 个问题及答案，您大概需要 2 小时去完成。当您完成后，您就可以去看考试后的内容，其包含 10 个多项选择题，主要针对每个模块中所包含知识的基础原理。针对每个问题，您也许只能在答案部分或图示部分找到答案的相关信息，但不能直接找到答案。只有在您阅读完考后的内容并准备进入下一级模块之前，您才能对您的答卷给出一个 100%准确率的判断。

杰出的支气管镜专家

EB 最初开设的主要目的是为了对支气管镜相关的理论知识进行学习。每个模块包含的有关支气管镜的知识由易到难呈阶梯状，线性学习及学习左右脑信息处理的最佳结合，而且最重要的是，使学习者在学习中得到乐趣，无论何种专业人员，都能将所学的知识应用到实践中对患者的关怀。

EB 为学习支气管镜相关的理论知识提供了一个标准化途径，适合用于现在的医学教育中本科生教育及研究生教育。标准化的问题-答案模式及与模拟支气管的示例图、技术图，能使学习者能够得到很多知识及启发。一个 100%准确的答卷及考后的内容回顾能使学者基本掌握每个模块中的知识点。

经过的 EB 理念的熏陶及多年支气管镜检查的经验，精英的支气管镜专家不仅获得了扎实的基础知识，并且积累了丰富的个体化经验，但并非教条的知识模式及习惯。“一个认为他一切都懂的人其实什么都不懂”的教育理念使杰出的支气管镜专家既有自信，又不断地探索新知识，打破旧传统，开辟新天地。

感谢李时悦教授团队，包括陈愉大夫、陈小波大夫、钟长镐大夫等各位所作出的贡献。

LEARNING OBJECTIVES TO MODULE III

IMPORTANT NOTE

Readers of The Essential Bronchoscopist© should not consider this module a test. In order to most benefit from the information contained in this module, every response should be read regardless of your answer to the question. You may find that not every question has only one "correct" answer. This should not be viewed as a trick, but rather, as a way to help readers think about a certain problem. Expect to devote approximately 2 hours of continuous study completing the 30 question-answer sets contained in this module.

When you are ready, you may choose to take the post-test. This ten multiple choice question test addresses specific elements of the learning objectives of each module. Questions pertain to information found in the answer paragraphs or figures in the module, but may not correspond directly with a question found in the module. A 100% correct answer score is expected on the post-test before readers can advance to the next module. If even one of your answers is incorrect, you must go back to the beginning of the post-test, and begin the entire test all over again. You may print out your test scores by hitting "print screen" on your monitor.

At the conclusion of this module, the learner should be able to:

1. Compare and contrast at least THREE maneuvers used when difficulty is encountered during intubation over the flexible bronchoscope.
2. Define the term "scattered radiation"
3. List at least THREE disadvantages of Glutaraldehyde disinfection.
4. Identify the Ovassapian oral intubating airway and list its advantages as compared to other oral airways.
5. List and describe various descriptive terms of airway mucosal abnormalities.
6. Describe a tracheal abnormality in relation to normal anatomic airway structures.
7. Describe different appearances of tracheobronchial secretions.
8. List at least THREE adverse effects related to bronchoalveolar lavage.
9. Compare and contrast the use of opiates with other drugs administered for conscious sedation.
10. Describe a systematic approach to bronchoscopic inspection and diagnosis.

模块 III 的学习目的

重要提示：

Essential Bronchoscopist©的读者不应该把这个模块作为考试。为了从这个模块里的内容中受益，每个人在阅读模块内容的时候都不要看问题的答案。你可能发现每个问题都有唯一的"正确答案"不要把这个当成一个考试，而应该是一个帮助读者思考问题的机会。希望可以花大约 2 小时时间左右的连续学习，完成这个模块的 30 个问题。当你准备好以后，你可以做测试后练习，这里有针对这个模块学习目标的

Bronchoscopy International copyright 2013

特殊知识点设计的 10 个多选题，问题的答案信息在模块的答案部分和图示里可以找到，但是不能在模块里直接找到答案。
读者进入下一个模块的之前，必须完全答对全部的测试后习题。即使你有一道题答错了，你也应该重新把模块学习一次，再重新做练习。你可以在屏幕上按”打印屏幕“把你的测试成绩打印出来。
在模块结束的时候，学习者应当能够
1、对比至少 3 个用纤支镜引导下气管插管遇到困难是可以应用的手法。
2、知道“散射”的定义
3、知道用“戊二醛”消毒的三个缺点。
4、认识 Ovassapian 经口插管气道，而且列出它相对其他气道的优点。
5、描述多种气道黏膜病变的名词。
6、对比正常气道结构来描述气管异常
7、描述不同气道分泌物的外观形态
8、列出支气管肺泡灌洗至少 3 个不良反应
9、比较阿片类药物和其他药物在清醒状态下镇静的用法
10、 有系统地介绍支气管镜检查和诊断的方法

Created on 7/26/2002 1:17:00 PM

Question III.1: All of the following are potential causes of confusion and seizures in an elderly man undergoing bronchoscopic biopsies of a large right upper lobe mass **except**.

A. Silent brain metastases from bronchogenic carcinoma
B. Hydration and paraneoplastic inappropriate SIADH-like syndrome
C. Lidocaine toxicity
D. Midazolam toxicity
E. Methemoglobinemia

问题 III.1

以下几项除了哪一项以外均是一个老年人行右上叶大肿块支气管镜活检时出现意识障碍或癫痫发作的潜在原因

A 无症状的肺癌脑转移

B 副癌综合征中的抗利尿激素分泌异常综合征或水代谢异常

C 利多卡因中毒

D 咪唑安定中毒

E 高铁血红蛋白症

Bronchoscopy International copyright 2013

Question III.2: During intubation over the flexible bronchoscope the endotracheal tube can become caught on laryngeal structures and not enter into the trachea. All of the following maneuvers are warranted **except**.

A. Partially withdrawing the endotracheal tube over the bronchoscope, rotating it 90 degrees clockwise and readvancing the tube.
B. Partially withdrawing the endotracheal tube over the bronchoscope, rotating it 90 degrees counter-clockwise and readvancing the tube.
C. Changing from a small 4.8mm diameter bronchoscope to a larger 6 mm diameter bronchoscope
D. Withdrawing the endotracheal tube over the bronchoscope and repeating multiple attempts at intubation

问题 **III.2**

用软式支气管镜引导的气管插管在通过喉头部分时会引起咳嗽，因此导致镜身及气管导管无法进入，以下各项手法除了哪一项外都可以

A、将支气管镜和气管导管退出一部分，顺时针旋转 90 度后重新插入气管导管。

B、将支气管镜和气管导管退出一部分，逆时针旋转 90 度后重新插入气管导管。

C、用直径为 6mm 的支气管镜代替原直径为 4.8mm 的支气管镜。

D、把套在支气管镜上的气管导管全部退出，反复多次直接插管。

Bronchoscopy International copyright 2013

Question III.3: Fentanyl is a short acting opioid 100 times more potent then morphine. Its onset of action is within 2 minutes of intravenous injection. In addition, its maximum respiratory depression effect occurs

A. Immediately upon injection
B. Within 2-4 minutes after injection
C. 5-10 minutes after injection
D. 11-15 minutes after injection
E. More than 15 minutes after injection

III.3 芬太尼是一种短效的阿片类药物，效价是吗啡 100 倍；在静脉注射 2 分钟后开始起效，芬太尼最大的呼吸抑制作用发生在

A 注射后马上发生

B 注射后 2-4 分钟发生

C 注射后 5-10 分钟发生

D 注射后 11-15 分钟后发生

E 注射后 15 分钟后发生

Bronchoscopy International copyright 2013

Question III.4: All of the following statements about Naloxan (Narcan) are true **except**

A. It reverses all effects and side effects of narcotics including sedation, respiratory depression, apnea, and pain control.
B. Standard practice is to dilute 1 ampoule (0.4 mg or 1 ml) in 10 ml volume to make 0.04 mg/ml.
C. In order to reverse respiratory depression and apnea, 1 ml of dilute solution (0.4 mg) is injected intravenously every 2-4 minutes until consciousness is regained.
D. In the intensive care unit or on the ward, it is best to immediately administer the entire ampoule (0.4 mg) if the patient is severely respiratory depressed and if expert airway management is not available.
E. No more than 5 ml total should be administered because of risk of narcotic withdrawal.

III.4:以下关于纳洛酮说法哪一项是错误的。

A 它可以对抗包括镇静、呼吸抑制、呼吸困难、和止痛等麻醉剂的所有作用和副作用。

B 标准的配剂量方法是用 10 毫升的溶剂稀释 1 支（0.4mg 或者 1ml）纳洛酮，配成 0.04mg/ml 的浓度。

C 为了对抗呼吸抑制和呼吸困难，每 2-4 分钟静脉注射 1ml（0.04mg）稀释溶液，直到意识恢复。

D 在 ICU 或者病房，如果患者已经严重呼吸抑制或者没有专人进行气管插管等处理时，最好马上注射 1 安倍的剂量（0.4mg）

E 注射总剂量不要超过 5ml，因为这样有麻醉效果消失的危险。

Bronchoscopy International copyright 2013

Question III.5 Bronchoscopy is performed in a patient with cough and partial unilateral atelectasis. Based on the findings shown below, bronchoscopic examination should proceed with

A. Examination of the left bronchial tree, then inspection and biopsy of the lesion on the right.
B. Inspection and biopsy of the lesion on the right, then examination of the left bronchial tree.
C. Examination of the right bronchial tree, then inspection and biopsy of the lesion on the left.
D. Inspection and biopsy of the lesion on the left, then examination of the right bronchial tree.

Bronchoscopy International copyright 2013

问题 III.5 在一个咳嗽而且单侧肺部分不张。有如下图的发现，应当继续行什么纤支镜检查

A 检查左侧支气管树，然后检查右侧的损伤并取活检。

B 检查右侧的损伤并取活，然后检查左侧支气管树

C 检查右侧支气管树，然后检查左侧的损伤并取活检

D 检查左侧的损伤并取活，然后检查右侧支气管树

Question III.6: While intubating a patient over the flexible bronchoscope, it suddenly becomes difficult to advance the bronchoscope. Although you are able to see the vocal cords, it is impossible to advance the endotracheal tube over the bronchoscope. What happened and what should you do next?

A. The bending tip of the bronchoscope broke. You remove the bronchoscope from the endotracheal tube.
B. The tip of the bronchoscope has accidentally passed through the Murphy eye of the endotracheal tube. You remove the scope and the tube together as an ensemble.
C. The polyurethane covering of the bronchoscope has slipped and intussuscepted over itself, occluding the endotracheal tube lumen. You remove the bronchoscope from the endotracheal tube.
D. The tip of the bronchoscope is flexed too much and the endotracheal tube is caught in the aryepiglottic fold. You partially withdraw the endotracheal tube over the bronchoscope.

III.6: B

给患者用纤支镜引导下进行气管插管时，突然发生进镜困难，虽然你可以看到声带，但套在支气管镜上气管导管却不能进入，这是什么原因，需要怎么处理呢？

A 支气管镜的可弯曲头损坏了，应该把支气管镜从气管导管中取出。

B 支气管镜尖端经过气管导管的侧孔穿出，可以把支气管镜和气管导管一起取出。

C 覆盖在支气管镜上的聚氨基钾酸酯滑脱并叠套，堵塞了气管导管腔，应该从气管导管内取出支气管镜。

D 支气管镜头过度弯曲而且气管导管碰到杓会厌皱襞，你应当把气管导管从支气管镜上部分退出。

Created on 5/5/2011 6:59:00 PM

Question III.7: Glutaraldehyde is frequently used for bronchoscope disinfection. All of the following side effects can be noted in persons exposed to this chemical **except**

A. Headache
B. Conjunctivitis
C. Dermatitis
D. Asthma-like symptoms
E. Diarrhea

III.7 戊二醛常用于支气管镜消毒，患者接触这种化学品后，发生的副作用下述除了那一项外都可以出现？

A 头痛

B 结膜炎

C 哮喘样症状

D 腹泻

Bronchoscopy International copyright 2013

Question III.8: All of the following statements pertaining to bronchoscope cleaning and disinfection are correct **except**.

A. High-level disinfection with 2% Glutaraldehyde for 45 minutes inactivates all fungi, viruses, and vegetative organisms.
B. High-level disinfection with 2% Glutaraldehyde for 45 minutes will not inactivate all bacterial spores.
C. Video bronchoscopes with a distal CCD chip are more likely to be damaged by Glutaraldehyde disinfection than fiberoptic bronchoscopes.
D. A positive leak test can indicate damage to the proximal polyurethane or distal rubber sheath of the insertion tube, or rupture of the integrity of the working channel of a flexible bronchoscope.

III.8 以下除了哪一项外均为清洗和消毒支气管镜的正确方法。
A 用 2%戊二醛浸泡 45 分钟灭活所有真菌、病毒、和有活力的病原微生物进行**高规格的消毒**
B 用 2%戊二醛浸泡 45 分钟的**高规格的消毒不能灭活所有的细菌芽孢。**
C 电子支气管镜的末端感光（CCD）元件比纤维支气管镜更容易被戊二醛浸泡消毒损坏
D 正泄漏实验可以发现（气管镜）管体近端的聚氨基甲酸乙酯或者远端的橡胶套，或者纤维支气管镜工作部分部分有破裂。

Created on 5/5/2011 6:59:00 PM

Bronchoscopy International copyright 2013

Question III.9: During fluoroscopy, x-rays that pass though the patient and strike the image detector or fluoroscopic screens is called

A. Scattered radiation
B. Remnant radiation
C. Primary radiation

III.9 在 X 线透视下进行（纤支镜操作时），射线穿过患者后感应到成像探测器，这个过程叫做：
A 散射
B 衰减
C 辐射

Bronchoscopy International copyright 2013

Question III.10: While using fluoroscopy, scatter of radiation is increased when

A. Allied voltage (kVp) is decreased
B. Wavelength is decreased
C. Tissue density is decreased
D. Tissue thickness is increased

III.10:在使用 X 光设备时，什么时候散射会增加。
A 电压(kVp)减少
B 波长减少
C 组织密度减少
D 组织厚度增加

Created on 5/5/2011 6:59:00 PM

Question III.11: Which of the following might prompt you to carefully reexamine the indications for bronchoscopy in the intensive care unit of your institution

A. Bronchoscopy is frequently performed in critically ill patients with copious secretions and elevated airway pressures while on mechanical ventilation
B. Bronchoscopy is frequently performed in critically ill patients without radiographic evidence of atelectasis, and has not prompted significant changes in medical management
C. Bronchoscopy is frequently performed in critically ill patients with new onset of hemoptysis
D. Bronchoscopy is frequently performed in critically ill patients with new or persistent radiographic pulmonary infiltrates despite use of empiric antibiotics

III.11:以下哪一情况会使你在你所在医院的 ICU 里仔细的重新考虑你的支气管镜的适应症

A 经常在有很多分泌物而且在机械通气过程中气道压上升的重症患者中使用支气管镜。

B 经常在没有肺不张的影像学证据，而且没有发生明显的医疗处理改变的重症患者中使用支气管镜。

C 经常在于新近咯血的重症患者使用支气管镜

D 经常在虽然经验性使用抗生素，但是仍有新近出现或者持续的肺渗出改变的影像学证据的重症患者中使用支气管镜。

Bronchoscopy International copyright 2013

Question III.12: Which of the following intubation-oral airways will most likely allow adequate visualization of the larynx and vocal cords, even if the airway is inserted too far?

A. Berman pharyngeal airway.
B. Williams airway intubator.
C. Ovassapian airway

III.12 以下哪种情况下最可能，即使在进入气道很深的时候，仍允许足够的咽喉和声门视野？

A Berman 咽喉气道
B Williams 气道插管器
C Ovassapian 气道

Created on 5/5/2011 6:59:00 PM

Question III.13: You are about to describe a tracheal abnormality to a surgeon. In which of the following might she be most interested

A. Distance of the abnormality from the carina
B. Whether the abnormality has a wide or narrow base
C. Location of the abnormality in relation to the bronchial wall
D. Size of the abnormality (length, diameter, degree of airway obstruction)
E. Distance of the abnormality from the inferior margin of the vocal cords

III.13:你要向外科医师描述一个气管（异常）病变，以下什么东西是她最感兴趣的。
A（异常）病变与隆突的距离
B 病变是否有宽或者窄的基底。
C 病变的大小
D 病变与声门下缘的距离。

Created on 5/5/2011 6:59:00 PM

Question III.14: A 76-year-old patient with chronic cough, difficulty swallowing and new onset hoarseness is referred for bronchoscopic evaluation. 1 mg of Midazolam is injected intravenously and abundant topical anesthetic is applied to the oropharynx and larynx. The vocal cords move normally, but a firm lesion resembling adenoid cystic carcinoma obstructing 20 percent of the subglottis is seen. Because of the lesion's proximity to the vocal cords, no biopsies are obtained. About one hour after the procedure the patient develops a bluish discoloration of the lips. Arterial oxygen saturation decreases from 98 percent to 88 percent despite administration of supplemental oxygen. The patient has become anxious and combative in the recovery area. Resting heart rate increases to from 110 to 150. The most likely cause for this patient's symptoms is.

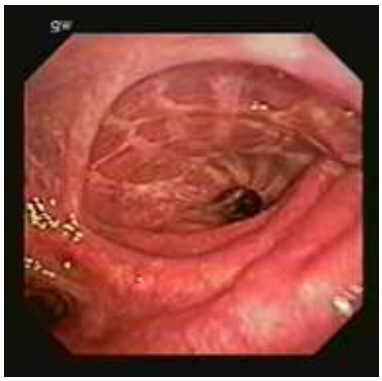
A. Cetacaine spray induced methemoglobinemia
B. Procedure-induced laryngospasm
C. Tetracaine toxicity
D. Myocardial infarction from prolonged hypoxemia
E. Lidocaine toxicity

III.14 一个 76 岁慢性咳嗽患者，有吞咽困难，而且新近出现了声嘶，需要支气管镜检查，1 毫克的咪达唑仑（咪唑安定？）静脉注射，而且口咽和喉头给予充足的局部麻醉。（气管镜下）见声带活动正常，但是发现一个类似囊腺瘤的硬肿块阻塞了声门下 20%。由于肿物离声门比较近，取不到活检。检查后一小时，患者出现口唇紫绀，虽然给予了氧疗，但是动脉氧饱和度还是从 98%降到 88%，患者在观察室表现得焦虑和烦躁不安。静息时心率增加到 110-150 次/分，这个患者的症状的最可能的原因是
A 西他卡因喷雾（局部浸润）引起的高铁血红蛋白症
B 操作过程引起的喉痉挛
C 丁卡因中毒
D 持续的缺氧引起的心肌梗塞
E 利多卡因中毒

Created on 5/5/2011 6:59:00 PM

Question III.15: Tracheomalacia is defined as a loss of longitudinal elastic fibers of the posterior tracheal membrane with or without destruction or damage to tracheal cartilage leading to loss of rigidity and tracheal collapse. During an airway examination, which of the following is seen.

A. Collapse of the malacic intrathoracic segment during expiration and/or collapse of the malacic cervical segment during inspiration
B. Collapse of the malacic intrathoracic segment during inspiration and/or collapse of the malacic cervical segment during expiration
C. Collapse of the malacic intrathoracic segment during expiration and/or collapse of the malacic cervical segment also during expiration
D. Collapse of the malacic segment during expiration or inspiration with substantial inward movement of the pars membranosa



Bronchoscopy International copyright 2013

III.15 气管软化的定义是气管后方的弹性纤维消失，伴或不伴有气管软骨破坏，使到气管软化而塌陷。在（气管镜）气道检查时，（如果碰到上述病例）下面哪一项可以在检查中出现。
A 呼气相时胸内部分的（软化的）气道塌陷，而/或吸气相时（软化）气道的胸外部分塌陷。
B 吸气相时胸内部分的（软化的）气道塌陷，而/或呼气相时（软化）气道的胸外部分塌陷。
C 呼气相时胸内部分的（软化的）气道塌陷，而/或呼气相时（软化）气道的胸外部分也塌陷。
D 呼气相时软化部分塌陷，吸气相时正常粘膜的过度向内运动。

Question III.16: All of the following reasons for immediate intubation of the inhalation injury victim are correct **except**

A. Intubation before the development of significant airway edema and respiratory compromise avoids an emergency procedure, the outcome of which may be disastrous.
B. Burn-related chest restriction and circumferential neck burn related airway obstruction further reduces ventilatory flow.
C. Noted airway abnormalities such as soot, charring, mucosal necrosis, edema, and inflammation below the level of the carina antedate blood gas and radiographic changes suggestive of parenchymal injury.
D. Parenchymal damage is frequently delayed.
E. Maximum upper airway edema occurs within the first 24 hours after injury

III.16:下列哪一项不是吸入性损伤患者紧急插管的原因:
A 在出现严重的气道水肿前插管，建立人工气道可以避免一些紧急的，有可能导致严重后果的情况发生。
B 烧伤导致的胸部限制性（障碍），颈部环形的烧伤导致气道阻塞更导致气流减少。
C（紧急插管）通常可以延缓肺实质的损害
D 最严重的上气道水肿发生在损伤后的头 24 小时。

Bronchoscopy International copyright 2013

Question III.17: All of the following statements about inhalation injury in burn victims are correct **except**

A. The use of bronchoscopy for diagnosis has resulted in a recognized increase of the incidence of inhalation injury from a 2-15 percent incidence (based on history, carbonaceous sputum, and facial burns) to as high as 30 percent incidence.
B. When inhalation injury is present, mortality is greater than when cutaneous burns alone are noted.
C. Bronchoscopic findings consistent with inhalation injury in burn victims are usually airway edema, inflammation, or carbonaceous secretions (presence of soot).
D. Erythema, hemorrhage and ulceration rarely occur within the tracheobronchial tree.
E. Gaseous and particulate products of incomplete combustion are associated with the tracheobronchial injury of smoke inhalation.

III.17:以下哪一项关于烧伤患者吸入损伤的说法是错误的。
A 使用支气管镜检查会增加吸入损伤的发生率 2%-15%（这是基于病史、痰碳含量、脸部烧伤情况判断的）到最高 30%左右。
B 当发生吸入性损伤，死亡率 比单纯的皮肤烧伤高得多。
C 给烧伤患者行支气管镜检查时发现气道水肿、炎症、分泌物含碳量增加（黑色痰）都提示吸入性损伤。
D 红斑、出血、溃疡等表现很少发生在支气管树。

Bronchoscopy International copyright 2013

Question III.18 A 63-year-old man comes to your office because of a three-year history of dyspnea. He is short of breath with minimal exertion. Asthma was diagnosed one year ago. He is using inhaled bronchodilators and oral corticosteroids occasionally. Physical examination reveals mild stridor. Laboratory tests are normal. Chest radiograph and computed tomography scan of the chest reveal a 3 cm intraluminal mass narrowing the midportion of the trachea to 5 mm. There is no evidence of extraluminal tumor or enlarged mediastinal adenopathy. Flexible bronchoscopy confirms the presence of the 3 cm intraluminal mass in the midtrachea. Airway lumen is narrowed but adequate. Biopsy reveals adenoid cystic carcinoma. Which of the following would you recommend next

A. Referral to radiation oncology for external beam irradiation
B. Referral to medical oncology for systemic chemotherapy
C. Referral to interventional Pulmonology for Nd:YAG laser resection
D. Referral to thoracic surgery for sleeve resection of the trachea

III.18 一个 63 岁的老人因“呼吸困难 3 年”来找你看病。他稍为运动就会感到气短。诊断哮喘 1 年，正使用支气管扩张剂和偶尔口服糖皮质激素，听诊可闻及轻度的哮鸣音，实验室检查正常，胸片和胸部 CT 发现有 3cm 的气管腔内肿物使中段气管狭窄到只有 5mm，没有气管外肿瘤和纵膈淋巴结肿大的证据。支气管镜在中段气管发现 3cm 的管腔内肿物。气管腔虽然狭窄，但是仍足够（操作），活检发现囊腺样肿瘤，以下哪一步你觉得应该继续进行

A 联系放疗科行放疗
B 联系肿瘤科行化疗
C 联系（肺）介入科行 Nd:行 YAG 激光切除
D 联系外科行气管“袖套样”切除术

Bronchoscopy International copyright 2013

Question III.19: It is most likely that the patient with this abnormal airway seen in the Figure has which one of the following disorders

A. Sarcoidosis
B. Relapsing polychondritis
C. Teratoma with extrinsic tracheal compression
D. Underlying chronic obstructive pulmonary disease
E. Pulmonary amyloidosis

III.19:如下图所示，患者的气道异常最可能属于哪一种疾病？
A 结节病
B 复发性多发性软骨炎
C 气管外畸胎瘤压迫气道
DCOPD
E 肺淀粉样变

Bronchoscopy International copyright 2013

Question III.20: You are asked to emergently bronchoscope a 33-year-old male in the intensive care unit. The patient has been intubated and mechanically ventilated for the past week. He was the victim of a motorcycle accident causing closed-head trauma and loss of consciousness. Respiratory therapy just noted fresh blood tinged secretions on suctioning. Some watery secretions and blood are in the endotracheal tube. The patient is hemodynamically stable, but hypertensive. Which of the following bronchoscopic appearances is most likely to account for this patient's problem?

A. Diffuse tracheobronchial erythema, purulent secretions, and tissue sloughing.
B. Diffuse swelling and erythema of bilateral airways.
C. Raised whitish plaques with surrounding erythema in the distal lower lobe bronchi.
D. Edema, erythema, and petechia in the right main bronchus and on the main carina.
E. Swollen airway mocosa and pink frothy secretions.

III.20： 你在 ICU 给一个 33 岁的男性行紧急气管插管，这个患者在上星期行气管插管然后机械通气。他是一个交通事故导致闭合性颅脑损伤而且已经丧失意识的患者，吸痰的时候发现气道分泌物有淡红色的鲜血。在气管导管发现一些水样的分泌物和血。患者血流动力学稳定，但是有高血压。以下哪一项支气管镜发现符合患者的病因。

A 弥漫性气管支气管红斑，浓性分泌物，组织脱落
B 弥漫性水肿和双侧支气管红斑
C 在下肺叶远端的支气管凸起的白斑伴有环绕的红斑
D 在右主支气管和隆突有水肿、红斑、瘀斑。
E 气道粘膜肿胀和粉红色泡沫分泌物

Created on 5/5/2011 6:59:00 PM

Question III.21: While performing a bronchoscopy in an adult patient with presumably normal airways, you ask the patient to inhale, exhale, and cough. Which of the following changes in airway anatomy would be abnormal

A. The tracheal length increased by 20 % (about) 1.5 cm) during normal inspiration
B. The tracheal transverse diameter decreased by 10% (about 2 mm) during normal expiration
C. The tracheal transverse diameter decreased by 30 % during cough
D. The tracheal sagittal diameter decreased to 30% during cough
E. The tracheal sagittal diameter decreased by 30 % during normal expiration

III.21:当给一个假定气道是正常成年人做支气管镜检查，你嘱患者吸气、呼气、咳嗽等，以下哪一项的气道解剖改变是不正常的。
A 在正常吸气时气管长度增加 20%（大概 1.5cm）
B 在正常呼气时气管横截面直径减少 10%（约 2mm）
C 在咳嗽过程中气道横截面直径减少大概 30%
D 在咳嗽过程中气道矢状面直径减少 30%
E 在正常呼气过程中气道矢状面减少 30%

Created on 5/5/2011 6:59:00 PM

Question III.22: All of the following “habits” can cause a bronchoscopist to miss a diagnosis or inadvertently harm a patient **except**.

A. Placing one hand under the chin while the other pushes downward on the top of the head while preparing to perform rigid laryngoscopic intubation.
B. Rapidly withdrawing the flexible bronchoscope without visualization and without careful attention to the subglottic larynx.
C. Repeatedly administering additional amounts of topical anesthetic to a coughing patient
D. Routinely performing the bronchoscopic airway inspection in the same sequence in all patients.

III.22:以下除了哪一项以外的习惯会导致支气管镜操作者漏诊或者不小心损伤到患者？
A 在准备插入硬支气管镜时，一只手托住患者下巴，另一只手按住额头。
B 在没有连接可视化屏幕的纤维支气管镜没有仔细检查喉头的声门下部分就迅速把气管镜退出来。
C 给一个咳嗽的患者重复给予额外的局麻药
D 对于所有患者进行支气管镜气道检查时都按相同的顺序进行。

Bronchoscopy International copyright 2013

Question III.23: The airway secretions seen in the Figure below should be described as

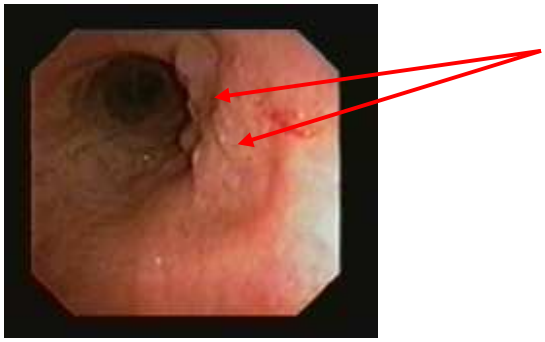
A. Clear
B. Viscous
C. Mucoid
D. Purulent

III.23:下图所见的气道分泌物的性状应该称为：
A 澄清
B 粘性
C 粘液性
D 浓性

Bronchoscopy International copyright 2013

Question III.24: The appearance of the bronchial mucosa along the lateral wall of the bronchus shown in the Figure below should be described as

A. Pale, raised, and granular
B. Thickened and erythematous
C. Erythematous, shiny and edematous
D. Thickened, red and swollen



Created on 5/5/2011 6:59:00 PM

III.24:下图所示的支气管侧壁的粘膜外观应该怎么描述
A 苍白的粒状隆起
B 红斑状的增厚
C 有光泽的肿胀的红斑
D 红色的增厚的肿物

Question III.25: The appearance of the airway abnormality shown in the Figure below should be described as

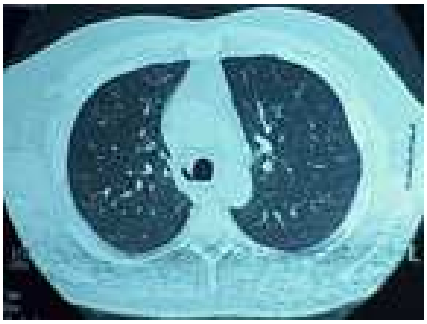
A. Polypoid
B. Nodular invasive
C. Superficial invasive
D. Intraepithelial neoplasia

III.25:下图所示的气道病变的外观应该怎么描述
A 息肉
B 淋巴结浸润
C 表面浸润
D 内皮瘤

Bronchoscopy International copyright 2013

Question III.26: The bronchial anomaly seen in the figures below is.

A. A subapical segment of a right lower lobe bronchus
B. A tracheal bronchus, extending downwards and laterally from the right tracheal wall
C. An accessory right upper lobe bronchus



III.26:下图所示的支气管异常是
A 右下叶支气管根部
B 一个气管支气管，在气管右壁向横向下延伸
C 右上叶小支气管

Created on 5/5/2011 6:59:00 PM

Question III.27: All of the following airway dimensions in the adult are correct **except**.

A. The left lower lobe bronchus beyond the origin of the superior segment is usually 1 cm in length before giving rise to the basal segmental bronchi.
B. The usual length of the trachea (distance from the cricoid cartilage to the main carina) ranges from 9-15 cm.
C. The usual internal caliber of the trachea ranges from 1.2 cm -2.4 cm.
D. The right upper lobe bronchus is usually located about 1.5-2.0 cm below the main carina.
E. The usual length of the bronchus intermedius ranges from 2-4 cm beyond the origin of the right upper lobe bronchus.

III.27 以下哪一项关于成人气道的描述是错误的。
A 左下叶支气管在上升到基底段支气管时通常距离上段肺叶起始处约 1cm
B 气管一般的长度（环状软骨与隆突的距离）为 9~15cm
C 气管内径一般为 1.2 cm -2.4 cm
D 右上叶支气管开口通常位于隆突下 1.5-2.0 cm
E 支气管中段距离右上叶支气管起始处约 2-4 cm

Created on 5/5/2011 6:59:00 PM

Bronchoscopy International copyright 2013

Question III.28. All of the following may damage a flexible bronchoscope **except**:

A. Forceps biopsy in the apical segment of the right upper lobe.
B. Bronchoalveolar lavage in the lingula
C. Bronchoscopy through an endotracheal tube in a mechanically ventilated patient.
D. Transcarinal needle aspiration
E. Catheter brushing within the medial basal segment of the right lower lobe.

III.28. 以下哪一项有可能损坏纤支镜
A 用镊子在右上叶尖段取活检
B 在一个小肺段中行肺泡灌洗
C 通过气管导管给一个机械通气患者行支气管镜检查
D 穿过隆突进行针吸（活检）
E 用导管在右下叶中（前？）基底段进行刷检

Created on 5/5/2011 6:59:00 PM

Question III.29: All of the following statements pertaining to the safety of bronchoalveolar lavage are correct **except**

A. BAL can cause cough, bronchospasm, and dyspnea
B. BAL can cause a temporary decrease in Forced Expiratory Volume (FEV 1) of up to 20 %.
C. BAL can cause transient hypoxemia persisting for up to 6 hours.
D. BAL can cause radiographic lobar consolidation or peripheral opacities that might be suggestive of new onset procedure-related infection.
E. BAL can cause transient fever, chills, and myalgias.

III.29 下列哪一项关于支气管肺泡灌洗安全的说法是错误的
A BAL 会导致咳嗽、支气管痉挛、还有呼吸困难
B BAL 会引起 FEV1 暂时下降大约 20%
C BAL 会引起暂时的持续大约 6 小时的低血氧
D BAL 后出现影像学的肺叶实变影或者外周不透明等都提示新近发生的灌洗相关性感染。
E BAL 后会出现暂时的发热、寒战、肌痛。

Bronchoscopy International copyright 2013

Question III.30: Each of the following airway findings adversely effect staging and prognosis in a patient with bronchogenic carcinoma **except**

A. Discovery of occult vocal cord paralysis
B. Discovery of contralateral endobronchial nodule
C. Discovery of main carinal involvement
D. Discovery of infiltrating mucosal involvement within 2 centimeters of the main carina
E. Discovery of a lesion obstructing the central airways

III.30:下面除了哪一项外（支气管镜下所见）气道表现，均为支气管肺癌分期有不利影响（使患者被划分为更严重的期）有预后不良的表现。
A 发现隐匿的声带麻痹
B 发现对侧支气管淋巴结
C 发现有隆突转移
D 发现隆突 2cm 内的粘膜受累
E 发现中央气道阻塞性损害

Created on 5/5/2011 6:59:00 PM

模块 Ⅲ

阶段测试答案

Bronchoscopy International copyright 2013

Answer III.1: D

Midazolam (Versed) is currently the most widely used agent for conscious sedation. It is a water -soluble benzodiazepine with rapid onset of action. It is four times more potent on a mg per mg basis than diazepam for sedation and amnesia. When 5 mg are administered intravenously, sedation and anxiolysis usually occurs within 2 minutes. Complete recovery of motor performance and consciousness occurs within one hour in most individuals.

Sedative responses are increased in patients who have received opioides or other benzodiazepines. In addition, level of sedation and risk for respiratory depression are increased in the elderly and in patients with pre-existing respiratory dysfunction.

Combining Midazolam and opioides increases the incidence of apnea. Large doses can produce prolonged drowsiness and cardio respiratory arrest.

Midazolam does not cause seizures. Central nervous system dysfunction, including confusion and seizures can be seen in patients with brain metastases and in patients with paraneoplastic syndromes.

Seizures can also occur from Lidocaine toxicity (especially if hepatic dysfunction results in increased plasma levels) and Benzocaine-induced methemoglobinemia.

答案 **III.1 D**

咪唑安定是目前对意识清醒的患者进行镇静的最常用药物。它是一种短效的水溶性苯二氮卓类药物。其每毫克的镇静作用及致记忆缺失的作用是等剂量地西泮作用的 4 倍。静脉注射 5mg 的咪唑安定，其镇静及抗焦虑作用通常在 2 分钟内出现。对于大多数人，自主意识和觉醒状态大概在 1 小时之内完全恢复。

同时使用阿片类药物或者其他的苯二氮卓类药物的患者，咪唑安定对镇静作用的维持时间会延长。另外，镇静的深度及呼吸抑制的风险在老年人和呼吸功能障碍患者中将会增加。

联合使用咪唑安定和阿片类药物将增加患者呼吸困难的发生率。大剂量使用（咪唑安定）会使昏睡时间延长和心跳呼吸骤停。

咪唑安定本身不会诱发癫痫发作，但在脑转移性肿瘤或者副癌综合征患者中通常会诱发中枢神经系统功能障碍：包括意识丧失和癫痫发作等。

利多卡因中毒（特别是由于肝功能障碍导致其在血浆中的浓度增加）可以诱发癫痫发作，而苯唑卡因引起的高铁血红蛋白血症也可以诱发癫痫发作。

Created on 5/5/2011 6:55:00 PM

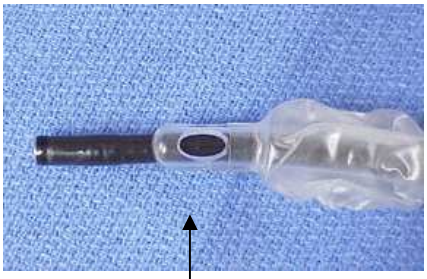
Bronchoscopy International copyright 2013

Answer III.2: D

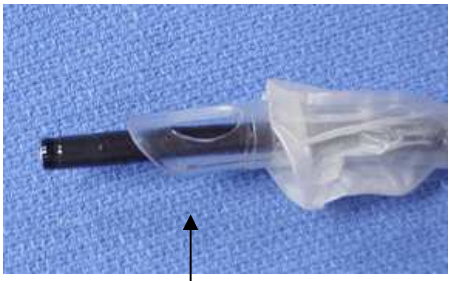
Although one might withdraw the scope and endotracheal tube once and try again as described in response D, such repeated attempts at intubation are often unsuccessful and traumatic. Precious time is wasted and the risks for hypoxemia are increased. Repeated trauma to the larynx can also prompt reflex laryngospasm, reflex arrhythmias and vomiting. Inadvertent esophageal intubation is a possibility, and tracheal esophageal fistulas have been known to occur.

If resistance is met during intubation, remember that the epiglottis or the arytenoids are a frequent encountered obstruction after passing an endotracheal tube over a bronchoscope through the nares or through the mouth. Endotracheal tubes can also inadvertently enter aryepiglottic folds. Sometimes it helps to grasp the patient's tongue with a gauze pad, and to ask an assistant to pull the tongue out of the mouth slightly. This creates more space to maneuver in the oropharynx.

If intubation is still unsuccessful, it is best to change techniques in order to facilitate passage of the endotracheal tube between the vocal cords. All the techniques described in responses A, B, and C should be considered. A larger diameter bronchoscope allows for better manipulation and control of the endotracheal tube than a small diameter bronchoscope. By filling up more of the space within the endotracheal tube, the larger-sized scope and endotracheal tube ensemble is more readily maneuverable. Although it is recommended to intubate with the largest size endotracheal tube possible, most experts agree that a 7,5 endotracheal tube is the largest diameter tube that should be inserted through the nares. Rotating the scope 90 degrees clockwise or counterclockwise will change the angles of the curved tip of the endotracheal tube and might facilitate laryngeal intubation.



No space with smaller caliber tube



Space between scope and 8.0 endotracheal tube

Created on 5/5/2011 6:55:00 PM

Bronchoscopy International copyright 2013

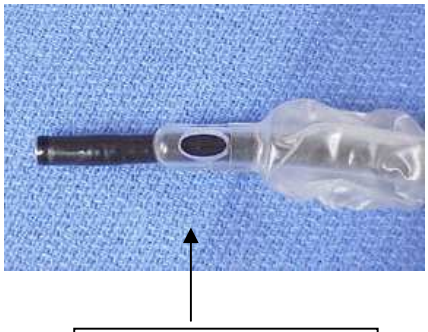
III.2: D

虽然操作者可以像 D 选项描述的那样把支气管镜和气管导管退出，然后重试一遍，但类似这样气管置管的操作经常都不会成功，而且会导致损伤。先前插管本身耽误了很多时间，导致患者缺氧的风险增加。对喉头重复的损伤会引起放射性喉头痉挛、反射性心律失常和呕吐。有可能不小心插到食道，或者有时候会引起气管食道瘘。

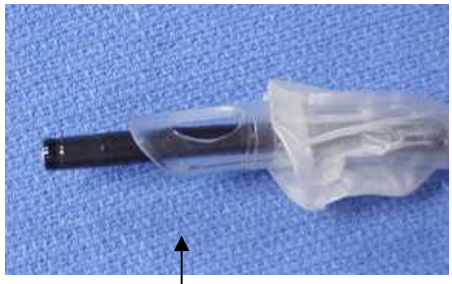
如果插管的时候阻力很大，记住在支气管镜引导气管导管经鼻或者口经过会厌或者 杓状软骨时会遇到阻力，气管导管不小心进入杓会厌皱襞。有时候用纱布拉住患者的舌头或者叫助手把患者的舌头轻轻拉出口腔对解决这个问题有点帮助，因为这样使口咽部有更多的空间进行操作。

如果插管仍然不成功，那最好改变操作使气管导管更容易通过声带。A.B.C.几项的做法都可以考虑。直径大一点的支气管镜相对小直径的更容易操作，而且更好控制气管插管。

通过占据气管导管内更多的空间，一个粗一点的支气管镜和气管导管套在一起，将更容易操作。 虽然推荐尽可能用直径大一点的气管导管，大多数专家都同意 7、5 号气管导管是可以通过鼻腔置入的最粗的导管。顺时针或者逆时针可以改变气管导管尖端弯曲的角度，这样可以更容易通过喉部。



纤支镜在小口径的气管导管中没有多余的空间



直径为 8.0 的气管导管和纤支镜之间有一定的空间

Created on 5/5/2011 6:55:00 PM

Answer III.3: C

Fentanyl is a synthetic opiate analog that is structurally different from morphine or meperidine. The usual adult dose is 50-100 micrograms. Given intravenously, its onset of action and maximum respiratory depression effect occurs about 5-10 minutes after administration, and lasts anywhere from 30-60 minutes. Given intramuscularly, the onset of action is within 7-15 minutes with duration of action lasting up to two hours. Fentanyl should never be used in patients receiving MAO inhibitors because of increased risk of respiratory depression and coma.

III.3: C

芬太尼是合成的鸦片类似物，结构和吗啡、哌替啶等不一样。一般剂量为 50-100 微克。如果静脉注射，它的药效和最大呼吸抑制作用在注射后 5-10 分钟出现，并药效持续约 30-60 分钟。如果肌肉注射，在注射后 7-15 分钟起效，药效维持约两小时。芬太尼禁用于使用单胺氧化酶受体抑制剂的患者，因为这样会增加呼吸抑制和昏迷的风险。

Created on 5/5/2011 6:55:00 PM

Bronchoscopy International copyright 2013

Answer III.4: E

Naloxone is a pure opiate antagonist that reverses all effects and side effects of opiates. Actually, no more than 10 mg should be administered because this might lead to increased activity of the sympathetic nervous system from acute termination of analgesia. Consequently, patients may develop hypertension, dysrhythmias, and pulmonary edema.

In case of over sedation with benzodiazepines, the benzodiazepine antagonist Flumazenil should be administered (0.2 mg iv over 15 seconds then repeated every minute up to a maximum of 1 mg). Low doses of Flumazenil will reliably reverse sedation within 2 minutes, but higher doses are needed to reverse benzodiazepine-related anxiolysis. Side effects include nausea, vomiting, tremors, seizures, tears and dizziness. Contrary to naloxone, it does not cause hemodynamic instability.

III.4: E

纳洛酮是一种纯阿片受体拮抗剂对抗阿片类药物的所有作用与副作用的。实际上，注射不应该超过 10mg 因为这样会激动交感神经系统，使到痛觉缺失终止。随后，患者有可能出现高血压、心律失常、和肺水肿。

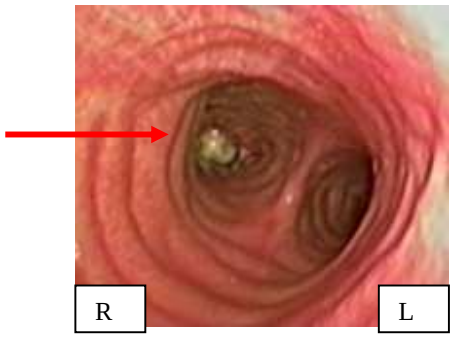
为了减少苯二氮平类药物镇静作用的时间，其拮抗剂氟马西尼（0.2mg）静脉注射 15 秒后每分钟重复给药一次，直到最大剂量 1mg，低剂量的氟马西尼肯定可以在 2 分钟之内拮抗镇静效应。但是拮抗苯唑地西泮相关性抗焦虑作用需要高剂量。（氟马西尼）副作用包括恶心、呕吐、癫痫发作、震颤、流泪、眩晕。和纳洛酮相比，它不会引起血流动力学的改变。

Created on 5/5/2011 6:55:00 PM

Bronchoscopy International copyright 2013

Answer III.5 A

The lesion is noted in the right main bronchus. The anterior cartilaginous rings and posterior membrane of the trachea are well visualized. It is prudent to proceed with an examination of the left bronchial tree before intervening in any way on the right side. This way, the presumed normal airway is examined and secretions are cleared. Should bleeding occur after biopsy of the lesion on the right, the bronchoscopist will know that the left airway is normal, able to assure respiration, and that there are no contra lateral abnormalities that might effect patient management.

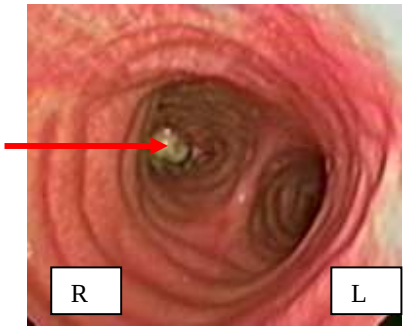


Created on 5/5/2011 6:55:00 PM

Bronchoscopy International copyright 2013

III.5 A

损伤发生在右主支气管。前面的软骨环合和后面的气管粘膜都清晰可见。在处理右侧之前，必须先非常小心地进行左支气管树的检查。这样，假定正常的气管先检查，清干净分泌物，如果在右侧行活检时出现，操作者就知道左侧是正常的，而且可以确保通气，而且没有不正常的情况影响患侧的处理。



Answer III.6: B

Each of the above problems can be encountered during intubation over a flexible bronchoscope. It is probably wisest to remove the bronchoscope and endotracheal tube together as a unit. If one withdraws one without the other, one risks damaging the bronchoscope. In addition, the problem may not be fixed.

Before intubating over a bronchoscope, one should fully load the endotracheal tube onto the bronchoscope under direct vision, taking care to identify the radio-opaque markers on the tube, as well as the Murphy eye and direction of the distal opening of the endotracheal tube. Some experts believe that the endotracheal tube should remain fully loaded onto the bronchoscope until the scope is passed beyond the vocal cords. The endotracheal tube is then fed into the trachea using the Seldinger technique.

Other experts recognize that on some occasions, such as when there is subglottic stenosis, laryngeal edema, tumor, blood or secretions, it might be preferable to keep the tip of the bronchoscope inside the endotracheal tube. The bronchoscope-endotracheal tube ensemble is then passed simultaneously past the cords. In case of severe tracheal stenosis, this technique avoids blind forceful dilation of the stricture as the bronchoscopist can see and feel the tube enter the stenotic area.

Each of the above techniques should be practiced on inanimate models. The bronchoscopist should use the technique with which he or she is most experienced, and always choose the safest technique based on the patient's underlying illness and ventilatory status.

Bronchoscopy International copyright 2013

III.6 B

以上的问题在可弯曲的支气管镜中都可能会碰到，最明智的做法是把支气管镜和气管导管一起取出。如果只取一个，而另一个不取出，那么其中一个风险就是损坏支气管镜。而且问题可能仍然得不到解决。

在支气管镜引导下插管前，应该在直视下把气管导管完全套在支气管镜上，注意确认导管上包括侧孔、气管导管远端开口处也有不透 X 线的标志物在。部分专家认为在气管镜没有通过声门之前，气管导管必须完全套在气管镜上。然后用 Seldinger 手法把气管导管送入气管。

另一部分专家认为在一些情况，比如当声门下狭窄，喉头水肿，肿瘤、血或者分泌物的时候，最好（在把气管导管送入气管过程中）保持支气管镜尖端在气管导管内。气管镜和气管导管一起通过声门，在声门狭窄时，这样做可以避免盲插时对气管结构的强烈扩张，因为操作者可以看到而且感觉到狭窄的区域。

以上的技术应当在人造模型上练习好。操作者应该用自己最熟悉的技术，而且要根据患者的基础疾病和通气状况选择最安全的操作手法。

Bronchoscopy International copyright 2013

Answer III.7 : E

Exposure to Glutaraldehyde may cause nasal irritation and all the other symptoms listed above except diarrhea. It is important that cleaning areas be well ventilated. Automated cleaning and disinfecting machines relieve personnel from the time-consuming manual disinfection process. They do not replace manual cleaning that is necessary before and often after machine disinfection. Specific infectious outbreaks have been reported with a variety of organisms, and cross infection has occurred between bronchoscopes and among patients.

For example, organisms have been found in the rinse water of automated machines. Fundamental errors in disinfection and cleaning regularly occur in many institutions. There is substantial intrahospital and interhospital variability regarding policies and procedures for bronchoscope decontamination, cleaning, disinfection, and maintenance.

Close collaboration between infectious disease specialists (hospital epidemiologists), bronchoscopists, nursing personel is advantageous. Learning sterilization and cleaning procedures and policies can help future bronchoscopists institute appropriate rules and regulations in their own hospitals later on.

Bronchoscopy International copyright 2013

III.7 E

接触戊二醛可以导致鼻部刺激症状，还有以上列出的除了腹泻以外的其他症状。清洗区保持良好通风是很重要的。自动清洗、消毒设备可以使免除烦琐的人工消毒过程。但是机器消毒不能代替人工消毒，所以经常机器消毒前或者消毒后进行需要进行人工消毒。已经有报道多种特殊病原体感染，病人和支气管镜操作者的交叉感染也时有发生。

比如，在自动冲洗机的冲洗水中发现病原体。很多机构的消毒和清洗规程是有原则性错误的。医院内和医院之间的关于支气管镜去污、清洗、消毒、维护的规则和过程是不一样的。

感染科专家（医院流行病学家）和支气管镜、护士的等专业人员的紧密合作是很重要的。学习灭菌和清洗的过程和方法可以帮助以后支气管镜操作者在他们的医院制定合适的（支气管镜清洗）指南。

Answer III.8: C

Video bronchoscopes are as likely to be damaged by Glutaraldehyde as fiberoptic scopes. The CCD (charge coupled device) is a solid-state imaging sensor that is able to produce higher resolution images than a purely fiberoptic system. Fiberoptic bundles are still used in the light guide and universal cord. High-level disinfection requires a 45 minutes immersion to inactivate all fungi, viruses, and vegetative organisms, as well as about 95% of bacterial spores. To eradicate all mycobacteria, a 45 minutes immersion is necessary.

In fact, the 10 minutes immersion time used in many institutions to accelerate bronchoscope turn around time eradicates 99.8 % of Mycobacteria. Glutaraldehyde-based chemicals such as Cidex or Sporicidin corrode the steel components of any bronchoscope after 24 hours of contact time. These chemical solutions can be toxic to exposed persons.

III.8: C

电子支气管镜和纤维支气管镜一样，很容易被戊二醛损坏。CCD（控制连接装置）是一种固体的影像感受器，可以生成比只有纤维支气管镜的系统更高分辨率的图像。纤维束仍然用于灯光引导和普通带。高规格的消毒需要 45 分钟浸泡去灭活真菌、病毒和有活力的病原微生物，还有大约 95%的细菌芽孢。要灭活所有的分枝杆菌，浸泡 45 分钟是必须的。

实际上，在很多机构里为了加快支气管镜的消毒时间，一般只浸泡 10 分钟左右，可以灭活 99.8%的分枝杆菌。以戊二醛为基本基团的化学品，比如 Cidex 或者

Bronchoscopy International copyright 2013

胶醛消毒剂会在接触 24 小时后腐蚀支气管镜。这些化学溶剂会对接触它的人中毒。

Bronchoscopy International copyright 2013

Answer III.9: B

Primary x-rays are those photons emitted by the x-ray tube, whereas scattered x-rays are those photons produced when primary photons collide with electrons in matter. Did you think this information is irrelevant? In the United States, many states or institutions require certification (by studying for and passing a special examination) in order to personally control a fluoroscopy machine!

III.9: B

原发辐射是 X 线管发出的光子，而散射是原发辐射的光子碰撞到物体的电子产生的。你觉得这些信息是无关紧要的吗？在美国，很多州和机构从事 X 光机器操作人员是需要认证的，这需要学习和通过特殊的检查。

Created on 5/5/2011 6:55:00 PM

Answer III.10: D

Scatter, also known as Compton scatter, is non-useful ionization of patient tissue caused by x-ray bombardment. Scatter occurs when an x-ray photon with increased energy strikes an electron and is deviated from its original path. This is potentially caused by increased voltage or decreased wavelength, and also when tissues thickness is increased and tissue density is increased. The x-ray photon thus travels in a different direction, but with less energy.

An increase in scatter diminishes the quality of the fluoroscopic image, and decreases the contrast of the image seen on the monitor by increasing what is referred to as quantum mottle. Quantum mottle looks like “crawling ants” on the screen. It results from an insufficient number of photons and can be reduced by increasing the milliamperage i.e. anode tube current.

III.10 D

散射，也叫做康普顿散射，是在原发 X 光束碰撞患者组织后产生的无用电离辐射。散射发生在 X 线的高能光子碰撞电子后偏离里原先的方向产生的。这个可以由产生 X 线的电压升高或者波长减少，还有组织厚度增加，组织密度增加等等。X 线的光子可以射向不同的方向，但是能量将会减少。

散射增加会使到 X 光形成的影响质量下降，而且会通过平时说的量子斑减少图像的在显示屏的对比度。量子斑看起来像在屏幕“爬行的蚂蚁”。可以通过增加阳极电流的来减少。

Created on 5/5/2011 6:55:00 PM

Bronchoscopy International copyright 2013

Answer III.11: B

Bronchoscopy is frequently indicated and performed in critically ill patients. For example, accepted indications include copious secretions that cannot be cleared by routine suctioning, persistent or acute unexplained hypoxemia, unexplained failure to wean from mechanical ventilation, new onset of hemoptysis, pulmonary infiltrates with suspicion for infection when the bronchoscopic procedure is likely to alter therapy, and persistent or hemodynamically significant radiographic atelectasis that is unresponsive to chest physical therapy or suctioning.

If it appears that numerous procedures are being performed without good evidence of radiographic abnormalities, impaired oxygenation or ventilation status, or difficulties with secretion management, indications for bronchoscopy should probably be closely examined to be certain that procedures are being performed in the appropriate circumstances.

Of course, the decision to perform bronchoscopy can often be based on a subjective assessment of the situation rather than on hard objective data. This can easily lead to bronchoscopy in the intensive care unit being easily be performed in excess. Practices can also vary according to available resources, staffing, and referring physician preferences.

III.11: B

支气管镜是经常用于重症患者。比如，一般的适应症包括了分泌物过多，不能用常规吸痰清除、持续性或者急性的缺氧，无法解释的脱机后出现的呼吸衰竭、新近出现的咯血、可疑为感染引起的肺渗出病变，纤支镜检查有可能改变治疗策略的时候，还有持续的、对胸部物理治疗和抽吸都没反应的、伴随严重血流动力学改变的有影像学表现的肺不张。

如果是在没有很好的影像学异常证据，氧合和通气的损伤状态，或者分泌物处理困难的时候行纤支镜检查，那么必须认真考虑支气管镜的适应症，确保检查是在稳妥的状态下进行的。

当然，做纤支镜的决定经常是基于对患者病情的主观估计而不是客观的硬指标。这样会使到 ICU 里过度使用支气管镜。使用率会随着可使用的资源，人员、还有相关医师的个人偏好而变化的。

Created on 5/5/2011 6:55:00 PM

Answer III.12: C

Oral intubating airways help the bronchoscopist keep the flexible bronchoscope in the midline, expose laryngeal structures, and maintain an open pharynx. The Ovassapian fiberoptic intubating airway provides an open space in the oropharynx and protects the bronchoscope from being bitten by the patient. The airway can be removed without disconnecting the endotracheal tube adaptor. The wider distal half of the airway prevents the tongue and soft tissues of the anterior pharyngeal wall from falling back and obstructing the view of the glottis. The proximal half has a pair of guide walls that provide a space for the bronchoscope and endotracheal tube. This airway accommodates endotracheal tubes up to 9 mm inner diameter.

The Berman airway is also recommended for bronchoscopic intubation, but its length and tubular shape hinder maneuverability of the flexible bronchoscope once it is inserted. If the distal end of this airway is not perfectly in line with the glottic aperture, the airway must be partially withdrawn in order to expose the vocal cords.

The Williams airway intubator was designed for blind orotracheal intubation. Its distal half has an open lingual surface, which makes lateral and anteroposterior maneuverability of the bronchoscope difficult. In order to remove the Williams airway after intubation, the endotracheal tube adaptor must be removed prior to intubation.

III.12: C

经口插管经常都可以帮助支气管镜操作者保持支气管镜在中线，暴露咽喉结构，保持咽喉开放。Ovassapian 纤支镜气道提供了一个口咽部开放的空间，防止支气管镜被患者咬烂。开口器可以在不断开气管插管连接头的情况下移除。更宽的远端的一半气道防止舌头和烟前壁的软组织后坠并且阻挡声门的视野。近端的一半有一对指示壁（扁桃体？）提供给支气管镜和气管插管空间。这种气道可以容纳内径是 9mm 的气管插管。

Berman 气道也是气管插管推荐的的，但是一旦插入这种气道，它的长度和管型会阻碍支气管镜的操作。如果远端气道和声门不是在一条直线上，那么这种气道需要部分退出，以保证暴露声门。

Berman 气道是为盲插时设计的。它的远端部分有舌板，会使到支气管镜侧面和前后的操作变得很困难。为了插管后拔出 Williams 气道，气管插管必须的接口拔出

Created on 5/5/2011 6:55:00 PM

Answer III.13: E

Well, you probably had to think about this one. In fact, when considering a tracheal lesion for surgical repair, all of the above should be well described. The reason the noted response is E, is because the distance from the inferior margin of the vocal cords, may, in many instances, be the deciding factor regarding evaluation of complexity of surgical resection.

Of course, other components of tracheal disease that should be described are length of the stricture in centimeters and number of cartilage rings involved, consistency (firm, rubbery, soft), appearance (glistening, vascular), fragility (oozing, actively bleeding, pus-filled), color (white, red, dark, yellow), shape (regular, round, irregular, elongated, bulging), dynamics (mobile with respiration or cough, ball-valving, immobile), degree of airway wall involvement, associated airway wall abnormalities (malacia, cartilaginous destruction, foreign body). Having a videotape of the examination available for review by surgical colleagues is always appreciated.

III.13: E

你很有可能要考虑到这些问题，实际上，当气管损害需要外科手术修复的时候，以上所有的因素都要好好的描述。而最需要重点描述 E 的原因是，在很多情况下，（病变部位）与声门下缘的距离是评估外科手术复杂程度的最重要的因素。

当然，其他需要描述的气管疾病的因素是描述狭窄部位的长度（具体多少厘米），一共涉及多少个软骨环，硬度（硬、有弹性、软），外观（光洁、血管丰富），(脆性）是否容易破溃（渗液、活动性出血、积脓），颜色（白色、红色、黑色、黄色），形状（规则、圆形、不规则、细长、膨隆）、动度（随呼吸或者咳嗽移动，带活瓣的球形、不移动）对气道壁的侵袭程度、相连气道壁的异常（软化、软骨破坏、异物）。给你的外科同事放一段该患者做支气管镜检查的录影做手术评估，通常都会得到对方的赞赏

Created on 5/5/2011 6:55:00 PM

Answer III.14: A

Methemoglobinemia can result from exposure to Benzocaine, the Esther family local anesthetic contained in Cetacaine and Hurricane, two aerosol sprays frequently used for topical anesthesia of the oropharynx. Risk is greatest in the elderly and in infants. Diagnosis should be suspected in patients who develop cyanosis with bluish discoloration of the skin, lips and mucous membranes. It is confirmed by Co-oximetry. Up to a methemoglobin level of 20 percent, oxygen saturation drops by about half the methemoglobin percentage. Patients develop a functional anemia because the ferrous hemes of hemoglobin are unable to bind oxygen. Treatment is by intravenous injection of 1-2 mg/kg Methylene blue.

Acute onset laryngospasm would cause stridor and respiratory distress. Tetracaine, a long-acting and potent topical anesthetic, is also a component of Cetacaine aerosol spray (2% Tetracaine, 14% Benzocaine, 2% butyl ester of *para*aminobenzoic acid). Tetracaine is a derivative of *para*aminobenzoic acid, and can thus cause allergic reactions. Its rapid rate of absorption and prolonged duration of action compared to Lidocaine are in part responsible for its narrow margin of safety when used for bronchoscopy. Systemic effects include convulsions and sudden death. Other symptoms include restlessness, numbness around the lips and mouth, tonic-clonic seizures, hypotension, and apnea. Lidocaine is an amide local anesthetic that is less potent and has a shorter duration of action than Tetracaine. It comes in various solutions ranging from 0.5% to 4%. The 4% solution provides about 15 minutes of reliable topical anesthesia. A 10% solution is available for spraying the oral and nasopharynx. Each spray delivers 0.1 ml (10 mg) of Lidocaine. A 2.5% and 5% gel is also available, and usually preferred by patients for anesthesia of the nasal passages. Peak concentration is usually reached within 30 minutes of airway application.

The maximum dose of Lidocaine recommended is 300 mg in adults. Blood concentration is directly related to total dose used regardless of the concentration of solution employed. When Lidocaine is administered by aerosol spray, it is absorbed less rapidly than if it is administered by ultrasonic nebulizer. In addition, when swallowed, less Lidocaine is absorbed into the bloodstream than when it is deposited onto the mucous membranes of the upper and lower respiratory tract.

Because Lidocaine is metabolized in the liver, patients with hepatic dysfunction or low cardiac output will have high Lidocaine plasma levels. Side effects include hyperactivity, restlessness, tingling of the lips, slurred speech and tremors. At higher blood levels, seizures and cardiorespiratory depression occur, including bradycardia, hypotension, and cardiac arrest.

III.14: A

苯坐卡因可以引起高铁血红蛋白症， Esther family 局麻药带有西他卡因和抛射剂，这两种喷雾经常用于口咽部的局麻。这对于老年人和小儿来说是很危险的，如果患者出现进行性的皮肤、嘴唇、粘膜的紫绀，这个可以用氧饱和度计来证实，当高铁血红蛋白水平达到 20%，氧饱和度只有一半左右。患者会出现功能性贫血，这是因为血红蛋白的含铁血红素不能结合氧了。治疗方法是按 1-2 mg/kg 静脉注射亚甲基蓝（美蓝）

急性的喉痉挛会引起喘鸣和呼吸窘迫。丁卡因是一种长效而且有效地局麻药，也是西他卡因气雾剂(2% 丁卡因, 14%苯坐卡因, 2% 对氨苯甲酸丁酯)的组成成分，丁卡因是从对氨苯甲酸中提取的，会引起过敏反应。它比利多卡因的吸收率高，作用时间长，这个部分弥补了它的在应用于支

Bronchoscopy International copyright 2013

气管镜检查时安全范围比较窄的缺点。全身的不良反应包括了抽搐和猝死。其他症状包括烦躁不安，口和嘴唇麻木，强直-痉挛性癫痫，低血压和呼吸暂停。利多卡因是一种氨基化合物类的局麻药，作用没有丁卡因那么强，而且作用时间比较短。它在不同的配剂中的浓度有 0.5%到 4%。4%的利多卡因可以局部麻醉大约 15 分钟。10%的制剂可以用于局部喷咽喉，从而达到麻醉效果。每一喷带有 0.1ml (10 mg)的利多卡因。也有 2.5% 和 5%的凝胶，在鼻部的麻醉中比较受患者欢迎。高浓度的制剂用于气道麻醉时作用时间可达到 30 分钟。

利多卡因推荐的成人最大剂量是 300mg。血药浓度与总剂量有关，和制剂的浓度无关。当利多卡因用于雾化时，用超声雾化器可以延缓它的吸收。在口服的时候，由于沉积在上呼吸道和下呼吸道的粘膜中，吸收入血的比较少。

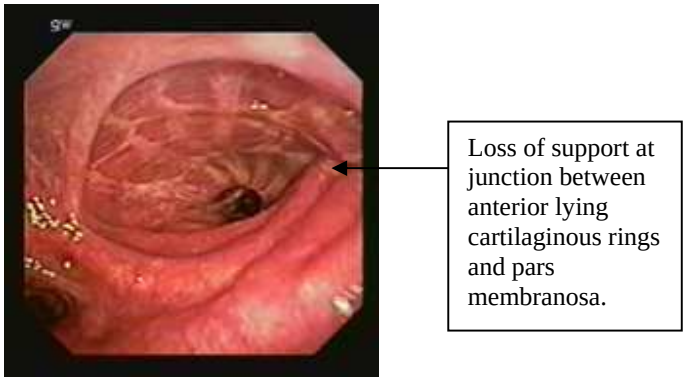
由于利多卡因在肝代谢，有肝功能不全或者心输出量低的患者会有较高的血浆浓度。副作用包括多动、烦躁不安、口唇麻木、语音模糊和震颤等。在更高的血药浓度时，会出现癫痫、心肺抑制，包括心动过缓、低血压、还有心跳骤停。

Bronchoscopy International copyright 2013

Answer III.15: A

Inspiratory collapse should be noted in a malacic cervical trachea when the malacic tracheal wall is sucked inwards by negative intratracheal pressure. During expiration, collapse of the intrathoracic malacic segment occurs when intrathoracic pressure exceeds intratracheal pressure. Tracheomalacia can be noted during bronchoscopic examination and electron beam computed tomography scanning. It should be suspected in patients after longstanding intubation, in patients with history of pneumonectomy and herniation of the remaining lung into the vacant hemithorax, and in patients with dyspnea, difficulty raising secretions, and chronic cough.

Usually, malacia is diagnosed when cartilaginous collapse is noted during airway inspection. Some experts believe that it should be differentiated from dynamic airway collapse where significant obstruction is due to inward movement of the pars membranosa, but without evidence of cartilaginous destruction or loss of rigidity and shape of cartilaginous rings. To avoid confusion or misunderstandings, one should be explicit in describing the extent, severity, location, and nature of all anomalies noted.



Created on 5/5/2011 6:55:00 PM

III.15: A

由于，软化的气道壁被胸内负压的吸引，从而使到胸外的软化气道会在吸气相塌陷。在呼气相，胸内的软化部分由于胸腔压大于气道压而塌陷。气道软化可以在支气管镜检查和 CT 检查中发现。在长期插管的患者，有肺切除病史而且剩余肺组织进入切除后患侧（空的）半胸腔形成疝的患者，呼吸困难、清除气道分泌物困难、而且有慢性咳嗽的患者中要高度怀疑这种病。

通常，在吸气相发现软骨塌陷可以诊断气道软化症。一些专家认为这个病要和严重的阻塞导致的正常粘膜向内运动产生的动态气道塌陷（但是没有软骨破坏和缺乏硬而且成型的软骨环的证据）相鉴别。为了避免混淆和理解错误，你应该把范围、严重程度、位置等所有的异常情况进行详细地描述。

Answer III.16: E

Actually, maximum upper airway edema peaks as late as 36-48 hours after injury! If a patient is intubated, extubation is frequently delayed until all edema has resolved. The absence of edema, stricture, or subglottic swelling during bronchoscopically-guided extubation, or a leak around the endotracheal tube are two indicators that are used to help determine the time for extubation.

When patients present with inhalation injury, chest radiographs and arterial blood gases are notoriously unhelpful in predicting whether parenchymal injury has occurred. In addition, findings may be delayed hours and even days. For these reasons, in many burn centers, all smoke exposed victims are bronchoscoped routinely. Presence of dyspnea, wheezing, laryngeal abnormalities, tracheobronchitis, and abnormal arterial blood gases or chest radiographs almost always warrants intubation. Delayed problems include tracheobronchial tissue sloughing, decreased mucociliary clearance, mucous plugging, atelectasis, impaired clearance of secretions, pneumonia, pulmonary edema and acute respiratory distress syndrome.

III.16: E

实际上，最严重的上气道水肿发生在损伤后 36-48 小时。如果给患者插管，拔管通常要到水肿完全消退才能进行。在支气管镜引导下拔管时，（气道）没有水肿、狭窄、声门下肿胀和气管导管周围有空隙等现象都提示（气道情况）已合适拔管。

当患者有吸入性损伤，胸片和动脉血气都不能准确地反映肺实质是否有损伤。而且（这些检查）有可能在损伤发生几小时甚至几天后才有阳性表现。由于上述原因，许多烧伤中心都把支气管镜检查作为接触烟雾患者的常规检查。呼吸困难、喘鸣、喉咙异常、气管-支气管炎、动脉血气异常、胸部影像学资料都不可以为插管提供依据。延误插管的后果包括气管-支气管组织的脱落，纤毛的清洁气道能力下降，粘液堵塞、肺不张、清除分泌物的能力下降、肺炎、肺水肿、ARDS 等。

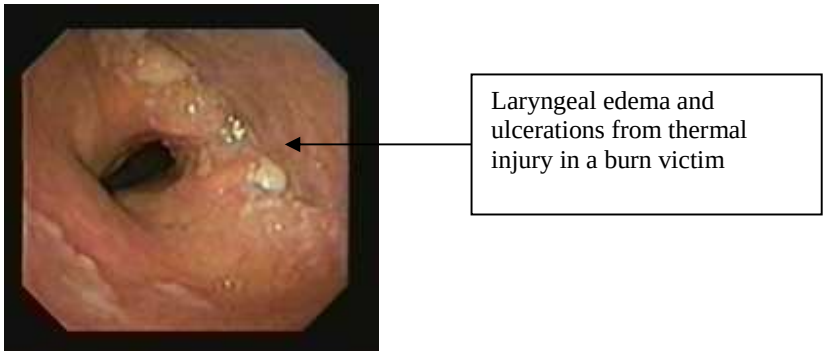
Created on 5/5/2011 6:55:00 PM

Bronchoscopy International copyright 2013

Answer III.17: D

Erythema, hemorrhage and ulcerations are frequently noted as a direct effect of thermal injury to the upper or lower airways. This occurs most frequently from hot smoke or steam inhalation, but can also result from direct heat injury during therapeutic bronchoscopic electrocautery and laser resection. Although the upper airway protects the lower airway and parenchyma, any exposures to hot air may cause reflex laryngospasm. Laryngeal complications can occur acutely, but also many hours after injury. They are frequently life threatening. Edema and inflammation are proof of upper airway injury and are often immediately visible to the bronchoscopist.

The presence of carbonaceous secretions in the oropharynx also suggests airway damage. Lower airway injury, however, is typically delayed. Many experts say that “if in doubt” about upper or lower airway injury, immediate intubation should be preferred to a ‘watch and wait” approach. The presence and extent of lower airway injury can be ascertained on follow-up flexible bronchoscopy. Extubation should be done carefully because of the risk of persistent laryngeal and subglottic edema as well as laryngeal swelling due directly to the endotracheal tube or prolonged intubation.



III.17: D

红斑、出血、还有溃疡都是提示上气道或者下气道的直接的热损伤。热烟雾或者吸入水蒸气、还有电子支气管镜治疗和激光切除术的直接热损伤都可以导致以上损害的发生。虽然上气道可以保护下气道和肺实质，热气体的接触都可能导致反射性的喉痉挛。喉头的并发症可以马上发生也可能在损伤几小时候发生。这些损伤通常都是致命的。水肿和炎症时上气道损伤的证据，通常可以马上被支气管镜检查发现。

口咽部分泌物含碳量增加也是气道损伤的一个标志。下气道损伤通常都是迟发型的。许多专家认为如果对诊断有怀疑，那么马上插管是“边治疗边观察”的一个不错的选择。随后的纤支镜检查可以探查是否有下气道的症状和程度。由于持续的咽喉和声门下水肿会影响气管导管（的拔除）而且会导致插管时间延长，所以拔管时必须非常认真。

Created on 5/5/2011 6:55:00 PM

Answer III.18: D

The major question here is whether this patient should be referred for laser resection or immediate surgery. Adenoid cystic carcinoma (previously known as cylindroma) accounts for about 0.1% of all primary lung tumors and 10% of bronchial adenomas (which also include carcinoid tumors and mucoepidermoid tumors). If the patient is clinically and hemodynamically stable, has no contraindications for surgery, and is willing to undergoing tracheal resection, referral for sleeve resection with removal of at least 6 tracheal rings (there are about two tracheal cartilages per centimeter) and reanastomosis is warranted.

Often, surgical margins reveal microscopic tumor. Many patients are subsequently referred for external beam radiation therapy. Despite resection, recurrence occurs in more than 50% of patients, and metastases are known to occur to the lung, brain, liver, bones and skin. Tumors usually grow very slowly. Even in case of tumor recurrence, survival can be 10 –15 years.

III.18: D

这里主要的问题是患者应该接受激光切除手术还是马上外科手术治疗。囊腺瘤（以前叫圆柱瘤）约占原发性支气管癌的 0.1%,占支气管腺瘤的 10%（包括了良性肿瘤和粘液上皮瘤）。如果患者病情和血流动力学稳定，无手术禁忌症，而且愿意行（部分）气管切除术。那么，行“袖套样”切除术会切除约 6 个气管软骨环（每厘米的气管大约有 2 个气管软骨环），而且行气管吻合术。

通常，微肿瘤是外科手术的盲区。许多患者随后接受放疗。即使切除了（肉眼见到）肿瘤，复发率仍然有 50%，癌细胞可以向肺、脑、肝、骨和皮肤转移。肿瘤通常生长很慢，即使肿瘤复发，仍然有 10-15 年的生存期。

Created on 5/5/2011 6:55:00 PM

Answer III.19: D

The figure is that of a saber-sheath or scabbard trachea. Saber-sheath trachea is defined as a trachea with excessive transverse narrowing and widened sagittal diameter of the intrathoracic portion of the trachea. This is very different from the C-shaped trachea seen in about 49% of normal adults. The saber has been described in up to 5 % of elderly men. In these instances, ossification of tracheal rings may also be found. Usually, the abnormality spares the cervical portion.

The majority of patients with saber-shaped trachea have chronic obstructive pulmonary disease, and it is believed that the narrowing is related to air-trapping in emphysematous upper lobes, chronic cough, and cartilaginous degeneration. When discovered, additional study by computed tomography scanning may be warranted. The differential diagnosis includes extrinsic compression by extratracheal mediastinal mass, tracheobronchopathica osteochondroplastica, amyloidosis, relapsing polychondritis, and saber-sheath trachea in patients with excessive kyphosis.

Saber-sheath trachea

C-shaped trachea

Horseshoe-shaped trachea

Created on 5/5/2011 6:55:00 PM

III.19: D

下图是剑鞘样气道或者叫鞘样气道。剑鞘样气道的定义是气管受到过度的横向压迫而导致狭窄，气管的胸廓内部分的矢状面增宽。这与大约 49%正常人的 C-型的气管不一样。5%的老年人的气管被称为“军刀”型，在这些情况下，会发现气管软骨钙化。通常，颈部（胸廓外的）气道没有不正常的软骨。

多数有“军刀”型气道的患者有 COPD 疾病，气道狭窄是因为上肺叶肺气肿、慢性咳嗽、和软骨变性等引起的气道塌陷导致的。当发现这些病变，最好再做 CT 检查。鉴别诊断包括了气道外纵膈肿物压迫、气管支气管软骨软化症（玻璃样变性）、淀粉样变性、复发性多发性软骨炎、还有过度脊柱后凸症有“军刀”型气道的患者。

Answer III.20. D

A frequent cause of hemoptysis during mechanical ventilation is suction trauma due to stiff suction catheters. The figures below shows petechia and erythematous swelling from aggressive suctioning with a stiff-tipped catheter. Underlying tracheal and bronchial mucosa is often erythematous, swollen and easily bruised.

Other causes of hemoptysis that must be excluded are necrotizing pneumonia (response A), severe tracheobronchitis (response B), tracheobronchial herpes (response C), pulmonary edema (response E), mycobacterial infection, pulmonary thromboembolism, pulmonary artery dissection from a pulmonary artery catheter, erosions from the endotracheal tube cuff, and innominate artery-tracheal fistula.

Of course, bleeding can also be due to underlying diseases such as Wegener’s granulomatosis, Goodpasture’s syndrome and other vasculitities, neoplasms, and disseminated intravascular coagulopathy.

III.20. D

机械通气咯血的通常的原因是用硬的吸痰管吸痰导致的损伤。下图所见的瘀斑和肿胀的红斑是由于用尖端比较硬的吸痰管插入气道吸痰的损伤。气管下和支气管粘膜通常都有红斑、肿胀、很容易擦伤。

咳血另外的原因要排除坏死性肺炎（A 选项）、严重的气管支气管炎（B 选项）、气管支气管疱疹（C 选项）、肺水肿（E 选项）、分支杆菌感染、肺栓塞、因肺动脉导管导致的肺动脉分流、（长期气管插管）气管导管口引起的气道溃烂，部位不明的气管动脉瘘。

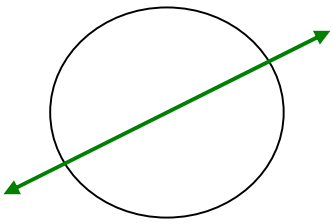
当然,以下疾病如韦格氏肉芽肿、肺出血-肾炎综合症、和其他血管炎、肿瘤，还有 DIC 等。

Created on 5/5/2011 6:55:00 PM

Answer III.21: E

The cross-sectional shape of the trachea is characterized by the ratio of transverse (separates trachea into front and back) and sagittal (separates trachea into left and right) diameters. Women tend to preserve a round configuration, while men tend to have some sagittal widening and transverse narrowing. The tracheal lumen changes dimensions depending on the phase of the respiratory cycle. For example, during coughing, intrathoracic pressure increases and becomes supra-atmospheric. This results in a narrowing of intrathoracic tracheal lumen as witnessed by decreased sagittal and transverse diameters.

The invagination of the posterior membrane can easily reduce the sagittal diameter to zero. Usually there should be no significant change in tracheal sagittal diameter during normal expiration because surrounding negative intrathoracic pressure supports airway patency. If there is intrathoracic tracheomalacia, expiratory collapse will occur, whereas extrathoracic tracheomalacia results in variable inspiratory obstruction, the major force opposing collapse being the upper attachment to the cricoid cartilage.



Transverse

Bronchoscopy International copyright 2013

III.21: E

气道的横断面是用横截面（从前后方向的气道切面）和矢状面（从左到右的气道切面）的直径。女性一般都保持圆形的结构，男性的气道一般是矢状面宽，横切面窄。气管腔面积随着呼吸周期改变。比如，在咳嗽过程中，气道内压增加，比大气压高。这导致镜下看到胸廓内气管腔变窄，表现为矢状面和横截面的直径减少。

后方（无软骨支撑）的薄壁凹陷很容易导致矢状面直径减少到 0。一般来说，在正常呼气过程中气道矢状面不会有很大的改变，因为气道周围的的胸腔负压可以使气道保持开放。如果胸内部分气道软骨软化就会导致气道呼气相塌陷，而胸外气道软化会导致可变性吸气相阻塞，对抗塌陷的主要力量来自于上气道软骨环。

Answer III.22: E

Routinely performing the bronchoscopic inspection in the same sequence in all patients is a good habit. The “normal” airways should be inspected first, leaving observations of abnormalities for last. By inspecting segmental bronchial anatomy in the same order, the bronchoscopist will never inadvertently overlook a segment. Many bronchoscopists leave the upper lobe bronchi for last because inspection of these segments can be more difficult, and because inspection of these segments often causes patients to cough. The habit of placing a hand on the chin while pushing down on the top of the head should be avoided because this maneuver can drive the odontoid process into the medulla oblongata. This is especially dangerous in patients with weakened C 1 vertebra such as that which occurs in trauma victims, in patients with bony erosion from metastases or primary tumor, and in patients with Paget’s disease, severe osteoporosis, or platybasia (softening of skull bones).

Rapid removal of the bronchoscope from the airway without a repeat inspection of the airways and subglottis is unwarranted. For trainees, it is great practice to remain in the midline up to and above the larynx. Lessons learned would come in handy the day one faces a difficult intubation! In addition, careful inspection may detect abnormalities not seen during bronchoscope insertion. These include subglottic strictures, vocal cord polyps or contact ulcers, small endobronchial abnormalities, and tracheosophageal fistulas. Administering additional topical anesthetic or conscious sedation agents because a patient is coughing or is increasingly anxious or combative can abolish any existing airway reflexes remaining for the patient. In addition, it may delay recognition of other problems such as drug reaction or mental status changes from hypoxemia, and prompt adverse events caused by excess medication.

Many patients can be “talked down” or soothed by a confident and gentle bronchoscopist and assistant. In others, it might be best to temporarily stop the procedure until the patient calms down. Improper bronchoscopy technique such as repeatedly scraping the bronchoscope against the bronchial wall, frequent suctioning, and repeated unsuccessful attempts to enter an upper lobe bronchus is often responsible for patient discomfort.

Bronchoscopy International copyright 2013

III.22: E

对于所有的患者进行气管镜检查都按相同的顺序是一个好习惯。先检查正常的气道，最后检查有异常的部位。按解剖结构，按相同顺序把每一部分的支气管都检查一遍，那么操作者不会漏掉每一个部分。许多操作者把上叶支气管留在最后检查，是因为检查这些部位通常都会引起咳嗽，因而检查比较困难。一只手托住患者下巴，另一只手按住额头的习惯必须改掉，因为这样会使到齿突碰到延髓，这种手法对于第一颈椎比较脆弱的患者尤其危险，比如那些有外伤的患者、原发肿瘤或者转移瘤引起骨质破坏的患者、Paget's 病的患者、严重骨质疏松的患者，或者颅底扁平症患者。

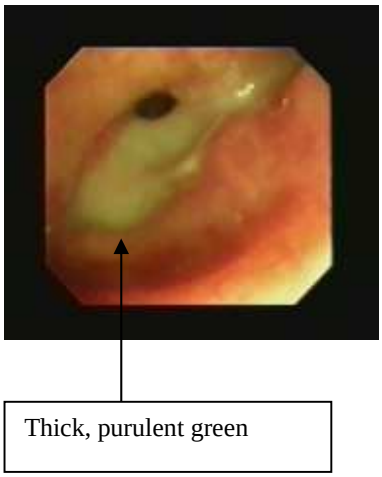
没有重复检查气道和声门下就很快地退出支气管镜是很不保险的。对于一个初学者来说，保持（气管镜）在喉头上方中线是需要练习很久的。这些练习会使你可以顺利地进行一个很难的进镜。另外，退镜时仔细的检查可以发现插入支气管镜时没有发现的异常，比如声门下狭窄、声带息肉、或者相关溃疡，小的支气管内膜异常、气管食道瘘等等。而因为患者咳嗽或者烦躁、焦虑而给予额外的局麻药和镇静剂会使患者仅有的气道反射也消失。而且这样会使延缓发现其他如药物反应、血氧不足引起的精神异常、药物过量引起的反转反应。

很多患者经过和耐心、温和的气管镜操作者及其助手交谈后可以增强信心并且安静下来。另外，可以暂停操作使患者安静下来。不熟练的气管镜操作技术，比如气管镜反复地摩擦气管壁，频繁地抽吸、反复尝试进入上叶支气管但是不成功都会使患者感到不适

Answer III.23 D

Purulent secretions can be yellow, green, white, or greenish-brown. Secretions can also be gray, blood-tinged, bloody, and black. As for all secretions, other descriptive terms include clear, milky, watery, thick, tenacious, scant, and abundant. Viscous means possessing viscosity, which is a property of a body by which flow occurs inside it. The term is inappropriately used in bronchoscopy reports.

Mucoid refers to a group of glycoproteins resembling mucin, as in normal secretions present in the cornea and in cysts. This is a descriptive term that is frequently used in bronchoscopy reports. Most readers understand that it describes secretions that are slightly tenacious, thick, and yet clear.



Created on 5/5/2011 6:55:00 PM

III.23 D

浓性分泌物可以是黄色、绿色、白色、褐绿色。分泌物可以是白色、淡红色、鲜红色、和黑色。对于分泌物，其他的描述词汇包括澄清、牛奶状、水样、稠的、粘稠、少量、大量等等。粘性是指具有粘度，是机体的组织（腐败物）经气流从身体内部（送到气管）。这个词用于支气管镜的报告是不合适的。

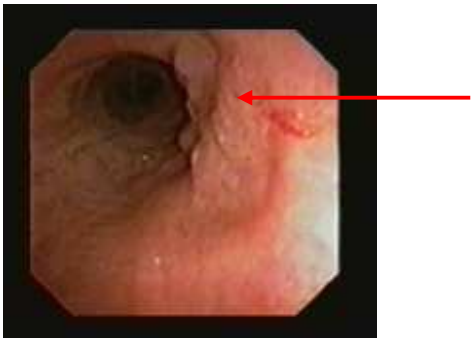
粘液状是指一团类似粘蛋白的糖蛋白，就像角膜和泪囊的正常分泌物。这个描述词汇经常用于支气管镜的报告。大多数阅读者都会理解它是描述分泌物比较粘稠、而且不澄清。

Answer III.24: A

The mucosa of the lateral wall of this bronchus is pale, raised and granular. It is difficult to assure a universal nomenclature for describing mucosal changes. The important thing is to develop a vocabulary for airway abnormalities that is constant, clear, and precise. As the operator, there should be a consistency in how you describe abnormalities. Misinterpretations should be avoided. Whenever possible, attach a photograph to the bronchoscopy report.

Use simple vocabulary. The location, size, and extent of each abnormality should be noted. Its impact on airway caliber and the degree of stenosis or airway narrowing should be estimated. Friability and texture (granular, waxy, shiny, thickened, swollen) should be noted, and concomitant findings (dynamic collapse, cartilaginous damage, focal, extensive or diffuse infiltration, or extrinsic compression) can be described. Lesions should be referred to as intraluminal (nodular, polypoid, or membranous) or extrinsic. Color might be important (pale, dark, brownish-black, white, yellow, greenish, red, purplish).

Airways might be inflamed, swollen or erythematous…but does not "inflamed," suggest swollen and erythematous? The bronchoscopy report should tell a story that everyone could read and understand the same way. Bronchial segments should be numbered and named. Lymph nodes sampled should be named and noted using the widely accepted ATS nodal station classification or the less widely accepted bronchoscopic classification system. In truth…it isn't easy.



Created on 5/5/2011 6:55:00 PM

III.24: A

这个支气管侧壁粘膜是苍白的粒状隆起，用一个普通的非医学术语来形容粘膜改变时很困难的。所以形成一套固定、清晰、准确的描述气道异常的词汇是很重要的。作为一个操作者，你需要固定你描述气道异常的词汇。这样避免一些误解。如果可以的话，最好在支气管镜报告单上附上检查时拍摄的图片。

用最简单的词汇，病变的部位、大小、范围都要描述。病变对气道内径的影响，还有气道狭窄、狭窄的程度等都需要估计。脆性和质地（粒状、苍白、有光泽、增厚、肿胀等等）也需要描述，还有伴随的症状（动态塌陷、软骨破坏、广泛或者弥漫性病灶，或者外在压迫等）也需要描述。还有描述病变在气管腔内（结节状、息肉、膜状的）还是管腔外。颜色的描述也是很重要的（苍白、黑色、黑褐色、白色、黄色、绿色、红色、紫色等等）。

气道可能是红肿、肿胀、有红斑，但是不能用“发炎”暗示肿胀和红斑。支气管镜报告单需要讲一个大家都看得懂而且都能理解的“故事”。段支气管都要排序而且命名。取活检的淋巴结要命名而且用被广泛认可的 ATS 淋巴结分类标准或者相对没那么广泛接受的支气管镜分类系统来描述。说实在，这是很不容易的。

Answer III.25: B

A generally accepted, but infrequently referred to classification of bronchoscopic findings is that of the Japan Lung Cancer Society. In this classification, bronchoscopic findings are described as mucosal or submucosal. Early stage cancer is a mucosal histopathologic change. Polypoid tumors are described as tumors attached to the bronchial wall at their base only: a typical lesion extends into the airway lumen and moves with respiration.

A nodular tumor has a mound-like shape and also extends into the bronchial lumen. The surface of both polypoid and nodular lesions may be granular, engorged with capillary vessels, or covered with necrotic material.

III.25: B

一个被广泛接受，但是很少在支气管镜报告中使用的标准时日本肺肿瘤协会分类标准。这个标准，支气管镜下所见的病变分为粘膜和粘膜下。早期肿瘤是粘膜组织病理改变。息肉样肿瘤可以描述为基底附着于气道壁：一个突出到气管腔而且随呼吸运动的局部病变。

一个淋巴结肿瘤形状像一个土墩样突出到支气管腔。息肉样肿瘤或者淋巴结病变的 表面都是粒状的，有毛细血管充血，或者覆盖着坏死物。

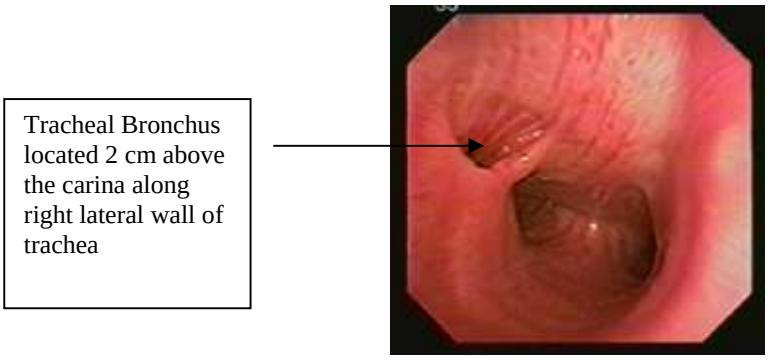
Created on 5/5/2011 6:55:00 PM

Answer III.26: B

The tracheal bronchus, also called “pig bronchus” because of its frequent presence in pigs, is usually a large developmental variation of the bronchial supply to an upper lobe, in this case, the right upper lobe bronchus. In humans, the tracheal bronchus is seven times more frequent on the right side of the trachea then the left. When it originates on the left, it is usually associated with other congenital abnormalities.

The tracheal bronchus can be seen in a many as 1% of individuals, although most authors cite a frequency of 0.25%. It is also seen in whales, giraffes, sheep, goats, and camels. In humans it is usually an incidental finding on bronchoscopy, chest radiograph, or computed tomography scan. When the orifice of the tracheal bronchus is relatively horizontal, recurrent episodes of aspiration, cough, bronchitis, and pneumonia may occur.

There are several types of tracheal bronchus. The rudimentary type is a blind pouch. There is the “displaced” bronchus, the most common variant, which supplies the apical segment of the right upper lobe. In this case, the segmental bronchi to this segment are missing within a regularly placed right upper lobe bronchus. The supernumerary supplies the right upper lobe in addition to a normal right upper lobe bronchus. Finally, there is the right upper lobe tracheal bronchus, which has three normal segmental bronchi, all arising above the main carina, but without a right upper lobe bronchus below the tracheal bifurcation.



Created on 5/5/2011 6:55:00 PM

III.26: B

气管性支气管也叫“支气管束”因为它们通常以束状出现的，是右上叶的支气管常见的较大的进展性的变异，下图的是右上叶支气管。在人类，右肺发生的气管支气管发生率比左肺多 7 倍。如果是左叶的变异，那么通常伴有其他先天性的异常。

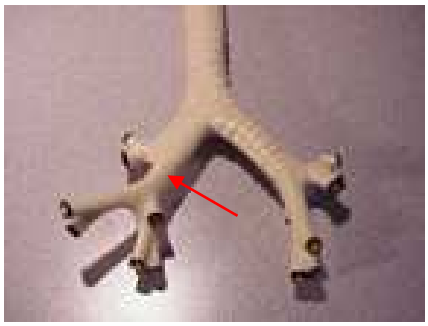
人类的气管性支气管大约有 1%是可以（肉眼）看到，但绝大部分作者都认为只能看到 0.25%。在鲸、长颈鹿、绵羊、山羊还有骆驼都可以看到。在人类这种异常通常在支气管镜检查、胸片、CT 检查时偶然发现的。由于气管性支气管的开口处是相对水平的。反复发作的误吸、咳嗽、支气管炎、肺炎都可能发生。

有 7 种气管-支气管变异。未发育完全的类型是一个（支气管）盲端。最常见的变异是“取代”支气管，连接右上叶根部。如下图的情况，段支气管消失，融合到右上叶气管性支气管中。在一个正常的右上叶上有一个多余的右上叶。最后，有一种气管性支气管，有三个正常的端支气管，（开口）均高于隆突，但是在气管分叉处没有右上叶支气管。

Answer III.27: E

The bronchus intermedius of the right bronchial tree is actually quite short, extending for 1.0-2.5 cm until its anterior wall extends into and becomes the middle lobe bronchus. Its posterior wall extends into and becomes the right lower lobe bronchus.

Volume loss caused by pleural effusion, radiation fibrosis, elevated right hemidiaphragm, as well as traction or torsion from a fibrotic or scarred right upper lobe often cause shortening of the bronchus intermedius.



Created on 5/5/2011 6:55:00 PM

III.27: E

右支气管树的中段支气管是比较短的，大约延伸 1.0-2.5 cm，在前壁分支为中叶支气管。它的后壁分支出右下叶支气管。

胸腔积液、放射性纤维化、右侧横隔抬高都会导致肺容量减少，而且由于右上叶的牵引和扭曲会导致支气管中段缩短。

Answer III.28: B

Bronchoalveolar lavage should never damage a bronchoscope. Passing a forceps, needle, or even a catheter, however, through the working channel of a flexible bronchoscope can easily damage it. The risk for damage increases when the instrument is forced through an acute angle formed by the bronchoscope as it enters the apical segment of an upper lobe bronchus. In these cases it is safer and easier to keep the tip of the bronchoscope at the entrance of the upper lobe bronchus, and to pass the forceps into the apical segment, watching it pass beyond the tip of the bronchoscope. If the bronchoscope needs to be wedged into the apical segment, it can be advanced gently over the forceps.

A bronchoscope can be damaged anytime it is inserted through an endotracheal tube, even when one assumes that a patient is paralyzed. Paralysis may be incomplete. Other times, bite blockers slip and the endotracheal tube becomes wedged between the teeth. Lubrication with silicone, xylocaine gel, or normal saline solution should be routine before inserting the bronchoscope into the endotracheal tube. Acute angles between the scope and the endotracheal tube at the scope's insertion site should be avoided. An assistant can be asked to hold the scope and endotracheal tube upright.

A bite block should be used whenever a flexible bronchoscope is inserted into the mouth, regardless of the patient's level of consciousness. Short, longitudinal bite blocks used to protect endotracheal tubes from patient biting slip easily. The full sized mouth bite block is a safer tool that can be firmly held in place by an assistant, or tied into place using an around-the-head Velcro strap. The bite block can usually be placed in the middle of the mouth, displacing the endotracheal tube to the corner of the mouth, or the bit block can be placed in the corner of the mouth, displacing the endotracheal tube towards the midline. On rare occasions, it might be necessary to untape the endotracheal tube in order to place the bite block over it inside the mouth.

Note that purple bite block is attached using Velcro bands

III.28: B

支气管肺泡灌洗从来不会损坏支气管镜。通过支气管镜的管道送入镊子、针、甚至导管，都会损坏支气管镜。当这些器具进入上叶的尖段时如果与支气管镜成锐角，损坏的机会会增加。在这

Bronchoscopy International copyright 2013

些情况下，保持支气管镜的尖端在上叶的开口，把镊子送入尖段，看着镊子通过支气管镜，这样会比较安全而且容易操作。如果支气管镜也要进入尖段，支气管镜要轻轻地经过镊子进入。

支气管镜在通过气管导管的时候是很容易损坏的，即使假定患者已经麻醉。即使麻醉的患者也是不够的。因为有时候防咬器滑脱，（你可以看到）牙齿之间的气管导管被咬成楔形。在支气管镜进入气管导管是要常规使用硅胶、利多卡因凝胶、一般的盐水润滑。应当避免支气管镜插入的部位，让气管导管和支气管镜成锐角。应该让助手扶镜，让支气管镜和气管导管保持竖直。

当纤维支气管镜进入口腔的时候，不管患者的意识水平如何，一定要使用防咬器。短的纵向的防咬器让患者没那么容易咬到气管导管。全尺寸的防咬器是更安全，助手可以把一个防咬器放在口中，并用胶布绕过枕部再连接防咬器，从而达到良好固定。防咬器可以放在口腔中部，气管导管放在嘴角，或者防咬器放在嘴角，气管导管放在中线上。有时需要用胶布把气管导管固定在防咬器中，一起放进口腔。

紫色的防咬器用胶布固定着

Created on 5/5/2011 6:55:00 PM

Answer III.29: D

BAL has not been shown to cause pulmonary infections, although radiographic infiltrates may be visible for up to 24 hours after a procedure. For this reason, experts advocate obtaining radiographic studies prior to BAL rather than afterwards, when the presence of an infiltrate within a lobar segment that has been lavaged may erroneously be considered pathologic.

Most experts keep patients under observation for up to 2 hours after BAL. In the presence of dyspnea or bronchospasm, inhaled bronchodilators are usually administered. Supplemental oxygen is routine until arterial saturation has returned to baseline or is normal on room air. Patients should be warned about the possibility of delayed onset fever, chills, or myalgias. In this event, Patients should be instructed to take an antipyretic or other anti-inflammatory for symptomatic relief.

III.29: D

BAL 没有发现过会导致肺部感染的，虽然灌洗后 24 小时会出现浸润等影像学改变。由于这个原因，专家推荐在 BAL 前就做影像学检查，而不是 BAL 之后，当一个灌洗后的肺段出现浸润影就有可能错误的认为是病理改变。

多数专家都会在 BAL 后继续观察患者 2 小时，在呼吸困难或者支气管痉挛的时候，通常要吸入支气管扩张剂。常规吸氧直到氧饱和度回到基线（灌洗前水平？）或者吸空气下饱和度正常。要事先告知患者会有迟发的发热、寒战或者肌痛。在这些情况下，要指导患者服退烧药或者其他的缓解症状的抗炎药。

Created on 5/5/2011 6:55:00 PM

Answer III.30 E

Bronchoscopy plays a major role in lung cancer staging. One of the reasons for performing an “inspection” bronchoscopy in all patients with diagnosed bronchogenic carcinoma is because discovery of occult vocal cord paralysis, an ipsilateral or contralateral endobronchial metastasis, or involvement of and near the main carina alters therapeutic management and prognosis.

Discovering a lesion that obstructs the central airways might prompt endoscopic resection in order to decrease chances for post obstructive pneumonia, improve symptoms such as dyspnea and cough, and increase ventilatory function and exercise tolerance.

Often, a lesion that appears to obstruct a main bronchus and require pneumonectomy is actually originating from within a lobar bronchus and extending into the main bronchus without main bronchial wall involvement. In these cases, lobectomy or sleeve resections are possible instead of pneumonectomy. In addition, clinical Tumor stage is affected since patients might no longer have a tumor “within two centimeters of the main carina”.

III.30 E

支气管镜对于肺癌分期有很重要的作用。要为所有的诊断支气管癌的患者行支气管镜检查的原因是如果发现声带麻痹、同侧或者对侧的支气管转移、侵犯隆突、或者隆突附近转移都会改变治疗方案和预后。

发现阻塞中央气道的病变要马上内镜下切除，以减少阻塞性肺炎的发生，改善呼吸困难、咳嗽等症状，提高通气功能和运动耐量。

通常，一个阻塞主支气管需要切除的病变实际上是起源于叶支气管，延伸到主支气管但是没有浸润到主支气管壁。在这种情况下，肺叶切除或者“袖套样”切除术就可以了，无需全肺切除。另外，在临床上如果患者有隆突下 2cm 内的浸润灶，那么分期将受影响。

Created on 5/5/2011 6:55:00 PM

模块 Ⅲ

阶段测试

阶段测试 模块Ⅲ

Post test instructions

The following test is designed to verify that you have completed and fully understood the 30 questions for Module Ⅲ.

回顾性测试指引：

下列检测是为了证实你已经完成并充分理解了模块Ⅲ的 30 个问题中所包含的所有知识内容。

Post module test questions and answers: Module 3

Question 1: Which of the following best describes Midazolam

A. Ten times more potent than diapepam
B. Sedation and anxiolysis usually occurs within 2 minutes of administration
C. Complete recovery of motor performance and consciousness often takes two hours
D. Risk for apnea is greatest when used alone compared to when used with other sedating agents.
E. Larger doses can cause seizures even in healthy patients

Question 2: Repeated trauma to the larynx during attempts at bronchoscopically-assisted endotracheal intubation most likely to cause which of the following?

A. Laryngospasm, vomiting, and cardiac arrhythmias
B. Hoarseness, vocal cord paralysis, and arytenoid luxation
C. Laryngeal edema, aspiration, and fever
D. Pain, gagging, and diarrhea

Question 3: When using Gluteraldehyde for high-level disinfection, a 10 minute immersion results in which of the following

A. 50% eradication of mycobacteria
B. 85% eradication of mycobacteria
C. 99.8% eradication of mycobacteria
D. Complete eradication of mycobacteria

Question 4: All of the following statements about scattered radiation are correct EXCEPT ?

A. It is caused by increased voltage
B. It can be reduced by decreasing the anode tube milliamperage
C. It decreases the quality of the fluoroscopic image.
D. It is caused by increased tissue thickness

Question 5: All of the following statements about topical Lidocaine are true EXCEPT ?

A. The maximum dose recommended for flexible bronchoscopy is about 300 mg.
B. Systemic effects include restlessness, seizures, numbness, and hypotension.
C. It is less potent but longer acting than Tetracaine.
D. Peak concentration is usually reached within 30 minutes of airway application.

Question 6: Which of the following statements best relates to patients with a saber-sheath trachea?

A. It may be found in up to 5 percent of elderly men.
B. The majority of patients with saber sheath trachea also have asthma
C. It is characterized by an increased transverse distance and decreased sagittal diameter of the trachea..
D. Differential diagnosis might include extrinsic compression, relapsing polychondritis, wegener's Granulomatosis, and Klebsiella Rhinoscleromata.

Question 7: All of the following statements describing the "proper" way to dictate or write a bronchoscopy note are correct EXCEPT?

A. Consistently use the same concise and precise terminology.
B. Tell a story that everyone can read and understand the same way .
C. Consistently comment on airway patency, mucosal appearances, secretions, and location of specimens obtained.
D. Referring to the amount and effects of conscious sedation can usually be avoided.

Question 8: The bronchus intermedius usually measures

A. Less than 1.0 cm.
B. More than 2.5 cm.
C. Between 1.0 and 2.5 cm.
D. It is a misnomer because it immediately becomes the middle lobe and lower lobe bronchus.

Question 9: All of the following statements about bronchoalveolar lavage are true EXCEPT ?

A. Delayed onset fever, chills and myalgias are best treated with an antipyretic or other anti-inflammatory medication.
B. Radiographic infiltrates in the area of lavage are rarely visible after the procedure.
C. BAL may cause or increase hypoxemia
D. Careful technique is essential to obtain a true alveolar sample rather than a simple bronchial wash.

Question 10: Which of the following statements about oral airways is MOST correct?

A. They help keep the scope in the midline, facilitating exposure of laryngeal structures.
B. They help maintain an open pharynx and larynx.
C. They prevent the patient from biting the bronchoscope.
D. They facilitate maneuverability of the scope and endotracheal intubation.

模块 3 模块后测试题
问题 1:下列哪一项对咪达唑仑的描述是正确的？

A 作用比地西泮强 10 倍
B 镇静和抗焦虑通常在使用后 2 分钟出现
C 功能和意识的完全恢复大约要 2 小时
D 与其他镇静剂相比，呼吸暂停的风险最高。
E 在健康人中大剂量会导致癫痫
问题 2 在支气管镜引导下气管插管引起喉头反复损伤最可能引起以下哪种情况
A 喉痉挛、呕吐、心律失常
B 嘶哑、声带麻痹和杓状软骨脱臼
C 喉头水肿、误吸、发热
D 疼痛、哽喉、和腹泻
问题 3 当用戊二醛进行高规格消毒时，10 分钟可以做到以下哪一项
A 消灭 50%的分枝杆菌
B 消灭 85%的分枝杆菌
C 消灭 99.8%的分枝杆菌
D 完全消灭所有的分枝杆菌
问题 4 以下关于散射的说法哪一项是正确的
A 由于电压增加而产生
B 减少阳极管电流可以减少
C 可以使透视图像的质量下降
D 由于组织厚度增加而产生
问题 5 以下哪一项关于局麻药利多卡因的说法是错误的
A 为纤支镜操作前局麻的推荐最大剂量为 300mg
B 全身症状包括烦躁不安、癫痫、麻木、低血压
C 效价比丁卡因差，但是作用时间比丁卡因长
D 高浓度的气道局麻作用时间达到 30 分钟
问题 6 以下哪一项关于剑鞘样气道患者描述是正确的
A5%的老年人有这种表现
B 大多数剑鞘样气道患者患哮喘
C 这种气道的特点是横断面直径增加，矢状面直径减少
D 鉴别诊断包括了气道外压迫、复发性软骨炎、韦格氏肉芽肿、克雷伯氏菌鼻硬结病
问题 7 以下哪一项关于正确口头报告支气管镜结果或者写支气管镜报告的说法是错误的
A 统一使用相同的简洁而且准确的词汇
B 用同样的方式去叙述每一个人都能读懂的“故事”
C 统一使用相同的词汇去描述气道通畅情况、黏膜外观、分泌物和取活检部位
D 关于镇静剂的剂量和效果通常可以略去。
问题 8 支气管中间段一般长度为
A 小于 1cm
B 大于 2.5cm
C 在 1cm 和 2.5cm 之间

D 这是一个错误的称呼，因为它马上就分支为中叶和下叶支气管。
问题 9 以下哪一项关于支气管肺泡灌洗的说法是错误的
A 迟发性发热，寒战、肌痛最好使用退热药和其他抗炎药治疗
B 灌洗后影像学检查很少发现灌洗区有渗出影。
C BAL 可能引起或者加重低氧血症
D 认真的检查对取得真正的肺泡标本比灌洗更重要的
问题 10 以下对于人工口咽气道的描述最准确的是
A 他们可以使气管镜保持在气道中线，方便暴露咽喉
B 可以帮助维持一个开放的咽喉
C 防止患者咬支气管镜
D 使支气管镜操作和气管插管更便利

Congratulations, you have completed Module III of the Essential Bronchoscopist©. The correct answers to the post test questions are listed below. We suggest that you review the questions and answer sets to Module III. You may do so by printing out the entire module as a PDF file.

ANSWERS TO MODULE III POST-TEST

Answer 1: A
Answer 2: A
Answer 3: C
Answer 4: B
Answer 5: C
Answer 6: A
Answer 7: D
Answer 8: C
Answer 9: B
Answer 10: A

恭喜你完成了 Essential Bronchoscopist©模块 III 的测试，以下的是测试后问题的正确答案，我们推荐你重新把模块 III 的问题和答案对一遍，你可以把整个模块用 PDF 文件的形式打印出来对答案。

答案 1: A
答案 2: A
答案 3: C
答案 4: B
答案 5: C
答案 6: A
答案 7: D
答案 8: C
答案 9: B
答案 10: A

恭喜您，您已完成全部课程。
祝愿您在介入肺脏病学习的道路上取得更大成绩！

Bronchoscopy International copyright 2013

模块 IV

Bronchoscopy International copyright 2013

模块的目标

EB（杰出气管镜专家）的读者不应该将其中的模块测试图看呈单纯一种测试，因为无论您是否或能否回答这些这些问题，读了这些内容，您都可以从中获得非常有用的信息。也许您会发现：有些问题的正确答案不止一个，这也许是一个善意的陷阱，而读者不应该将其看做是一种陷阱，而应该看做是帮助读者去思考某个问题的方式。一个模块含有 30 个问题及答案，您大概需要 2 小时去完成。当您完成后，您就可以去看考试后的内容，其包含 10 个多项选择题，主要针对每个模块中所包含知识的基础原理。针对每个问题，您也许只能在答案部分或图示部分找到答案的相关信息，但不能直接找到答案。只有在您阅读完考后的内容并准备进入下一级模块之前，您才能对您的答卷给出一个 100%准确率的判断。

杰出的支气管镜专家

EB 最初开设的主要目的是为了对支气管镜相关的理论知识进行学习。每个模块包含的有关支气管镜的知识由易到难呈阶梯状，线性学习及学习左右脑信息处理的最佳结合，而且最重要的是，使学习者在学习中得到乐趣，无论何种专业人员，都能将所学的知识应用到实践中对患者的关怀。

EB 为学习支气管镜相关的理论知识提供了一个标准化途径，适合用于现在的医学教育中本科生教育及研究生教育。标准化的问题-答案模式及与模拟支气管的示例图、技术图，能使学习者能够得到很多知识及启发。一个 100%准确的答卷及考后的内容回顾能使学者基本掌握每个模块中的知识点。

经过的 EB 理念的熏陶及多年支气管镜检查的经验，精英的支气管镜专家不仅获得了扎实的基础知识，并且积累了丰富的个体化经验，但并非教条的知识模式及习惯。“一个认为他一切都懂的人其实什么都不懂”的教育理念使杰出的支气管镜专家既有自信，又不断地探索新知识，打破旧传统，开辟新天地。

感谢李时悦教授团队，包括陈愉大夫、陈小波大夫、钟长镐大夫等各位所作出的贡献。

LEARNING OBJECTIVES TO MODULE IV

IMPORTANT NOTE

Readers of The Essential Bronchoscopist© should not consider this module a test. In order to most benefit from the information contained in this module, every response should be read regardless of your answer to the question. You may find that not every question has only one "correct" answer. This should not be viewed as a trick, but rather, as a way to help readers think about a certain problem. Expect to devote approximately 2 hours of continuous study completing the 30 question-answer sets contained in this module.

When you are ready, you may choose to take the post-test. This ten multiple choice question test addresses specific elements of the learning objectives of each module. Questions pertain to information found in the answer paragraphs or figures in the module, but may not correspond directly with a question found in the module. A 100% correct answer score is expected on the post-test before readers can advance to the next module. If even one of your answers is incorrect, you must go back to the beginning of the post-test, and begin the entire test all over again. You may print out your test scores by hitting "print screen" on your monitor.

At the conclusion of this module, the learner should be able to:

1. Compare and contrast airway dimensions of the right and left bronchial trees.
2. List FIVE causes of endobronchial metastases.
3. Describe "carinal" nomenclature.
4. List right bronchial anatomy nomenclature.
5. List at least THREE different characteristics of bronchoalveolar lavage.
6. Define "intraepithelial neoplasm" and related histopathologic terms.
7. Describe at least THREE different techniques used to help remove a blood clot from the airways.
8. Describe the Ikeda classification of bronchoscopic findings and what element might be added today.
9. Compare and contrast at least FOUR different interventional bronchoscopic therapeutic modalities.
10. State why and when bronchoscopy may be helpful in patients with suspected tuberculosis.

模块 **IV** 的学习目的
重要提示：

Created on 7/26/2002 1:23:00 PM

Essential Bronchoscopist©的读者不应该把这个模块作为考试。为了从这个模块里的内容中受益，每个人在阅读模块内容的时候都不要看问题的答案。你可能发现每个问题都有唯一的“正确答案”不要把这个当成一个考试，而应该是一个帮助读者思考问题的机会。希望可以花大约 2 小时时间左右的连续学习，完成这个模块的 30 个问题。当你准备好以后，你可以做测试后练习，这里有针对这个模块学习目标的特殊知识点设计的 10 个多选题，问题的答案信息在模块的答案部分和图示里可以找到，但是不能在模块里直接找到答案。

读者进入下一个模块的之前，必须完全答对全部的测试后习题。即使你有一道题答错了，你也应该重新把模块学习一次，再重新做练习。你可以在屏幕上按”打印屏幕“把你的测试成绩打印出来。

在模块结束的时候，学习者应当能够

1、对比和比较右侧和左侧支气管的形状
2、列出气道内转移的 5 个原因
3、列出“脊”的命名法
4、列出右侧支气管解剖结构命名法
5、列出支气管肺泡灌洗至少 3 个特点
6、（掌握）内皮下新生物的定义和相关的组织病理学名词
7、说出至少 3 种可以用于清除气道内血块的方法
8、说出“Ikeda”的支气管镜下表现的分类标准，还有目前应该加入哪一条标准
9、对比和比较 4 种不同的支气管镜介入治疗方法的特点
10、 说出为什么还有在什么时候支气管镜对于可疑结核患者有帮助

Created on 7/26/2002 1:23:00 PM

IV.1 当纤支镜引导下气管插管时，气管导管反复碰到右侧勺状软骨，支气管镜远端在气管中，哪一项手法最可能使你把气管导管从声门送入气管。
A 向气管导管施加恒定的压力直到导管瞬间通过勺状软骨进入气管。
B 顺时针或者逆时针旋转气管导管直到导管瞬间通过勺状软骨进入气管， C 把气管导管逆时针转 90 度，使其末端的斜面和侧孔转到另一个方向，然后轻轻地把导管再次往前推送。
D 把支气管镜从气管退回气管导管，然后重新尝试插管。
E 让你的助手把气管导管退出，而你保持支气管镜在声门以下，这样把导管弄直后，再次尝试插管。
IV.2: 以下哪一项给予气道大小的描述是错误的
A 左下叶支气管通常距离上段支气管的根部约 1cm
B 右上叶支气管一般长度为 1.0cm
C 左主支气管一般长约 4-5cm，它从气管中线与气管成 45 度角分支出去。
D 右主支气管一般长约 1.0cm，它从气管中线与气管成 25 度角分支出去
IV.3 如下图示支气管前壁的支气管粘膜的表现可以描述为：
A 苍白、粒状、凸起
B 红斑状增厚
C 红斑、有光泽、水肿
D 增厚、红斑、肿胀
IV.4 以下哪一种肿瘤不会发生支气管内转移
A 结肠癌
B 乳腺癌
C 肾上腺样瘤
D 霍奇金氏淋巴瘤
E 卵巢癌
IV.5:在支气管镜检查时，发现左上叶前段支气管和舌叶支气管之间的隆起增厚而且发红。怀疑是原位癌。但是不确定有没有遗漏其他病变，患者接受透视下纤支镜检查，当你像放射介入纤支镜操作者描述病变时，你应该说病变位于：

A. LC-1
B. LC-2
C. LC-3

IV. 6 如图所示的支气管镜所见是
A 粘液管口
B 炭末沉着病的色素
C 食道支气管瘘
IV.7:一个慢性咳嗽，一次咳血病史，胸片正常的 65 岁老年吸烟者马上进行支气管镜检查，没有发现支气管堵塞和浓性分泌物。没有发现导致咳血的原因。右下叶上段支气管分支支气管粘膜发现一个小的苍白、增厚区域。在此区域进行灌洗、刷检、活检。第二天病理科通知你标本有细胞增大、色素过多、多行、各个阶段的细胞有丝分裂旺盛的征象，是一些结构紊乱的上皮细胞。最可能是什么诊断：
A 鳞状细胞化生
B 鳞状细胞发育障碍
C 原位鳞状上皮癌

D 支气管神经内分泌细胞增生
E 鳞状细胞癌
IV.8:以下关于支气管镜治疗恶性肿瘤导致的中央气道阻塞的说法正确的是：
A 多数情况下效果不好
B 治疗相关的死亡率大约为 10%
C 中位生存期大约在 3 个月左右
D 患者的症状提示预后不良
E 操作需要全身麻醉

IV.9:以下关于支气管肺泡灌洗的说法哪一项是错误的
A 一个肺容积正常成年人的局部灌洗区域为 165ml
B 吸烟者和老人的液体回收量是相对低的
C 标本一般浸泡在利多卡因溶液里以防细菌和真菌污染
D10ml 盐溶液可以取 10 个肺泡的标本
E 如果没有很多浓性分泌物，抽出所有的肺泡液体可以取得最多量的标本。
IV.10: 以下各项关于接受干细胞移植患者的说法错误的是
A BAL 即使对于血小板减少症的患者来说是安全的。
B 由于出现的风险，一般选择经口进镜而不是经鼻道。
C 负压灌洗不能防止真菌感染。
D 负压灌洗不能确诊特发性间质性肺炎
E 为了诊断下气道感染，取 BAL 液做细菌、真菌、病毒培养，巨细胞病毒的细胞内包涵体、卡氏肺囊虫、还有免疫荧光单克隆抗体可以染色的呼吸道合胞病毒，腺病毒、副流感病毒、流感病毒等。
IV.11 如下图，气管内部当做一个钟面，用隆突作为 12 点，RB 6 在哪里？
A 在 3 点
B 在 9 点
C 在 5 点
IV.12:右肺动脉经常和右主支气管连接
A 隆突水平
B 右上叶支气管开口和中段支气管根部水平
C 右下叶支气管起始部
IV.13:在支气管镜检查的时候发现中叶支气管和右下叶支气管的隆脊上有异常淋巴结，伴有延伸到后基地段的红斑。当向你的胸外科和肿瘤科同事报告这个病例时，你需要描述下列哪一个发现
A RC-1 的异常淋巴结伴有延伸到 RB 10 的红斑
B RC-2 的异常淋巴结伴有延伸到 RB 10 的红斑
C RC-1 的异常淋巴结伴有延伸到 RB 8 的红斑
D RC-1 的异常淋巴结伴有延伸到 RB 7 的红斑
IV.14:支气管肺泡灌洗**不能**对以下哪一种疾病的诊断提供可靠的组织学证据？
A 慢性嗜酸性粒细胞性肺炎
B 细胞增多 X 症
C 肺肿瘤淋巴管转移
D 肺泡蛋白沉着症

E 侵袭性曲霉菌病

IV.15　下图所示的异常符合哪一项疾病

A 支气管肺癌

B 慢性支气管炎

C 支气管内（膜）结核

IV.16:支气管镜检查发现一个中段支气管侧壁稍低于右上叶支气管开口的表面黏膜有一个 1cm 大小的轻微肿胀的红斑。活检发现是鳞状细胞癌。患者拒绝开胸活检，下列哪一种支气管镜治疗比较合适？

A Nd:YAG 激光切除

B 气管内光动力学治疗

C 近距离放射治疗

D 电烧灼术

E 氩气冷冻术

IV.17 一个胸片显示上叶渗出而且已三次 AFB 取痰标本染色阴性的患者，以下哪一项不是再次行支气管镜检查的理由?

A 可以确定一个可以进行病因相关检查的器官的可能性增加

B 做另一个诊断的可能性增加

C 大约 40%早期诊断肺结核的标本染色阴性

D 支气管镜检查后收集痰标本可以帮助诊断

E 常规的支气管活检可以增加诊断率。

IV.18:下图所示的气道异常表现应当如何描述？

A 息肉

B 淋巴结浸润

C 表皮浸润

D 内皮瘤形成

IV.19:食道通常认为是紧贴着

A 隆突

B 左主支气管的始端 2cm

C 右上叶支气管

D 最接近右主支气管

IV.20:你准备向一个介入科的纤支镜医生描述一个支气管内异常病变，以下哪一项他也许最感兴趣？

A 与隆突的距离，还有其他同侧的肺段

B 病变的基地是宽还是窄的

C 病变和支气管壁的位置关系

D 病变的大小（长度、直径、气道阻塞程度）

E 病变与声门下的距离

IV.21 你被要求为一个因接近右主支气管和右上叶肿瘤，10 天前完成了疗程 3 周的高剂量近距离放射治疗的患者行支气管镜治疗。这个患者曾经行激光切除术，使到中央气道成功再通。现在患者主诉咳嗽、呼吸困难、偶尔咳血。哪一项支气管镜所见最符合这个情况。

A 右主支气管狭窄

B 在右主支气管和右上叶支气管之间有一个瘘管

C 右下叶支气管狭窄

D 肿瘤从右上叶支气管和延伸到中央气管。

IV.22:在 ICU 给一个气管插管进行机械通气的患者进行从气管插管和气管-支气管树中清除巨大血块的工作时，你应当

A 用小镊子

B 用 Nd:YAG 激光

C 把气管导管拉到近端

D 间歇吸引

IV.23:以下哪一项操作可以帮助纤支镜插入上叶难以进入的肺段。

A 用 V 型的可弯曲头代替 U 型的可与支气管镜同时弯曲的弯曲头，然后进镜

B 从肺段中退出支气管镜以便从工作通道插入一个细胞刷从而进入上叶的肺段。镜头可以由刷子引导下进入肺段。

C 在鼻腔和口腔插入处用食指和拇指扭动近端支气管镜从而旋转远端的支气管镜纤维头。

D 在转动患者下巴的时候，用在 X 线透视的引导下确定支气管镜远端位置

IV.24:一个胸外科同事送来一个需要支气管镜下切除在 RB2 异物的患者，在纤支镜下，你将会看到异物在哪里？

A 右下叶后基底段

B 右下叶中（外？）基底段

C 左上叶前段

D 右上叶后段

E 右上叶前段

IV.25:以下哪一项关于右上叶支气管的说法：

A 右上叶支气管后部和任何血管没有联系。

B 右上叶支气管前部和任何血管没有联系。

C 肺静脉和右上叶直接联系

IV.26:一个既往健康的 40 岁巴西内科医师在马瑙斯[巴西西北部城市]市外居住突然出现急性呼吸困难、发热、肌痛、干咳，10 天前他曾打扫过一个鸡舍，然后清除泥土然后铺上硬木地板作为一个日本茶馆。胸片示右中、上肺野实变影，在右和左上肺区可见几个小胸膜淋巴结钙化。PPD 实验阳性。支气管镜显示右中叶支气管中央狭窄伴有周围红斑。右主支气管受压迫。发现患者仰卧位呼吸困难和吞咽困难。下列哪一个诊断最有可能?

A 急性组织胞浆菌病

B 在慢性组织胞浆菌病基础上的流感样疾病

C 急性隐球菌感染

D 支气管肺癌

IV.27:一个在 ICU5 周的吸入性损伤患者。拔管后七天发现有几次胃内容物的误吸。在一次急性误吸，你被邀请做一次急诊纤维支气管镜。（进镜过程）中，你发现喉头水肿、声带增厚、左侧勺状软骨轻微瘫痪。这些发现预示着会重复误吸。你也发现双下叶充满黄色分泌物。奇怪的是，没有局部支气管感染的表现，支气管粘膜除了右下叶上段支气管有一些凸起的红斑块，其他看起来正常。异常的部分取活检。第二天病理科报告标本在嗜银染色下见圆形黑色酵母。患者最有可能是下列哪一项真菌感染。

A 过敏性支气管肺曲霉菌感染

B 白（毛）霉菌-接合菌病

C 侵袭性念珠菌
D 光滑假丝酵母菌感染

IV.28:在 1970 年，日本的 Shigeto Ikedo 创立的支气管镜下表现得分类方法到今天仍然非常有用。以下哪一项不是这个分类标准的内容？
A 支气管壁的组织异常改变
B 支气管内膜异常
C 支气管腔异常病变
D 动态异常
E 支气管镜和外科手术后遗症

IV.29:一个 39 岁有睾丸癌病史 3 年的男性患者新近胸片发现右下叶有 3cm 的阴影。CT 检查发现肿块带有钙化。肿块在右下叶，比较靠近中央的地方。影像学没有发现气道内病变和淋巴结病变。患者没有任何症状。这个病例被提交到胸科会诊。肿瘤科医师担心这个肿块是转移灶。放射科医师不是很肯定，但是认为应该做一个支气管镜检查。放射介入科医师认为如果只是在 X 线或者 CT 介导下进行经皮穿刺病变部位取活检，气胸的发生率达到 30%，胸外科医师认为应该立即进行开胸手术，如果开胸手术取得的病理组织冰冻切片后证实是恶性的，应立即进行肺切除术。在胸科会诊之前已经做了一次支气管镜检查。检查没有发现气道异常，收集的支气管灌洗液没有诊断意义。你现在打算怎么做？
A 下叶切除术
B 用电视胸腔镜进行针吸活检
CCT 引导下纤维支气管镜对异常组织进行活检或者针吸活检，还有原位细胞病理学检查。
D 支气管镜盲穿进行针吸活检

IV.30:一个 67 岁的肺癌伴中央气道阻塞在 5 天前进行光动力治疗的患者。他来找你跟进他的情况，而且马上要求放疗，你的建议应该是
A 放疗要推迟 4-6 周
B 放疗要马上开始
C 放疗要推迟到支气管镜下见气道症状缓解后才能进行。

模块 IV

阶段测试答案

IV.1: C

实际上面提到的技术都可以用，要助手操作气管导管通常都是有风险的。即使紧紧地握住支气管镜固定位置，但是仍然有可能会移位，并且移出气管。把支气管镜从气管退回到口腔或者鼻咽腔也是比较危险的，因为你不能再次看声门了。血、分泌物、脱落组织、或者反射性喉痉挛等都会损害（镜下）视野，使插管操作难以进行。

如果支气管镜在下气道内，即使插管延迟，氧可以通过支气管镜的工作通道直接进入气道，防止低氧血症。如果支气管镜退出气道，那么潜在的维持生命的通道就没有了。

持续向气管导管施与压力，有时候会瞬间把导管离开勺状软骨，但是有可能进入食道或者杓会厌的皱折。而且有勺状软骨骨折、杓状软骨脱臼。食道损伤的风险。把气管导管前后扭转也会有这样的风险。

所以，最稳妥的方法是保持支气管镜在气管内，轻轻地顺时针或者逆时针地旋转改变末端斜面和侧孔的方向。

IV.2: D

右主支气管平均长度是 2cm（不是 D 选项中说的 1cm），内径大约为 10-16mm。比左主支气管稍粗一点，由于右主支气管相对直，误吸进入右主支气管比左主支气管的机会要多。

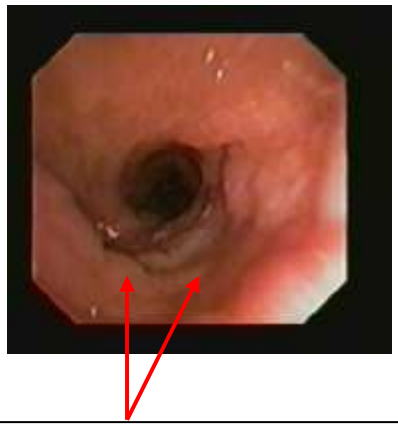
左主支气管比右主支气管长很多。一般长度为 4-5cm。由于它的管腔比较小，相对水平，在进行硬支气管镜、支气管镜激光切除术，扩张术，还有放置支架术等时，很多专家都认为风险比在右主支气管高。左下叶支气管通常距离上段支气管的根部约 1cm

IV.3: D

增厚、红斑、肿胀是称呼这些支气管前壁和侧壁的异常病变的一种方法。气管内活检发现时腺癌。

保证用统一的词汇描述气道异常是比较困难的。让 5 个气管镜操作者看这幅图会有 5 种不同的描述。这难道 不是一个中午讲座的有趣练习吗？

最重要的是从你打算选用的词汇中选择最简单的词来描述支气管镜下所见。这样你的描述就会很简洁而且可重复。

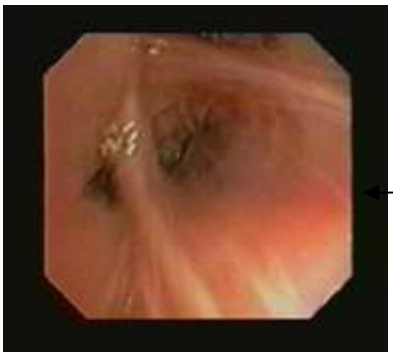


增厚、红斑、肿胀的粘膜

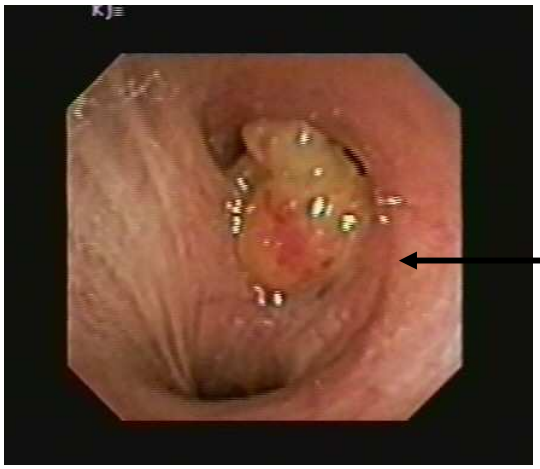
IV.4: E

结肠、乳腺癌、肾肿瘤、黑素瘤;都是恶性肿瘤而且很容易转移到气管支气管树。另外、霍奇金氏淋巴瘤和食道癌患者都可以发现气道异常。有人建议的助记口诀是：Even Henri Colt's Bronchoscope Reveals Metastases (EHCBRM).如果你还是记不住，最好自己

编一个你自己的记忆口诀。
卵巢肿瘤很少转移到气道，但是经常播散到胸膜。有恶性胸腔积液的患者会出现肺容量减少，下叶支气管狭窄、收缩和局部红斑等支气管镜表现。



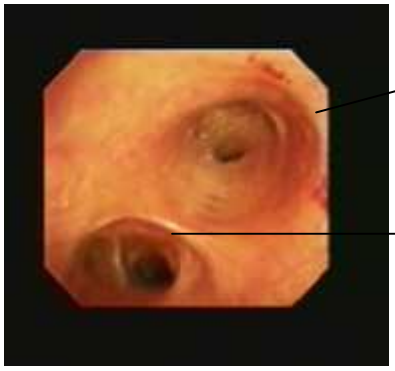
卵巢癌患者因为胸腔积液压迫下叶支气管导致肺容量减少



其他患者：肾癌支气管内转移

IV.5: A

在左方，把左上叶支气管前段和舌叶分开的隆起叫 LC-1，把左上叶支气管的舌叶和左下叶支气管分开的隆起叫 LC-2，隆起的命名是很重要的是因为肺整形术而不是肺切除术的潜在需要。只有 LC-1 异常，患者可能需要肺叶切除。另一方面，如果病变在 LC-2，那么可能需要肺切除术或者支气管成形术

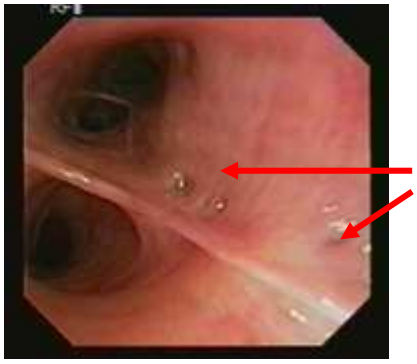


舌叶支气管

LC-1

IV. 6 A

粘液管口通常可以在支气管壁的中、后部分成对地出现。这些针尖样大小的凹陷可以在左或者右主支气管的后壁粘膜出现。也可以在上叶支气管的末端或者前壁发现。在支气管扩张的患者中特别明显。炭末沉着病的色素是黑色的，在支气管粘膜有黑色沉着，没有临床和生理学意义。



粘液管开口也称为支气管凹陷

IV.7: C

在色素过多、多形性和细胞核增大的基础上的有丝分裂旺盛是鳞状细胞发育障碍的表现。有很多关于鳞状细胞癌发展的争议，所以每一个病理标本都应该仔细检查，因为鳞癌是可以通过支气管镜还有外科开胸手术切除的。

鳞状上皮化生主要包括支气管上皮细胞、细胞桥结构的破坏等细胞非典型化生增加。

明确的鳞状细胞癌的诊断是当细胞化生伴随有细胞桥和角质化等表现。肿瘤沿着支气管腔纵向侵袭，或者穿透支气管粘膜。

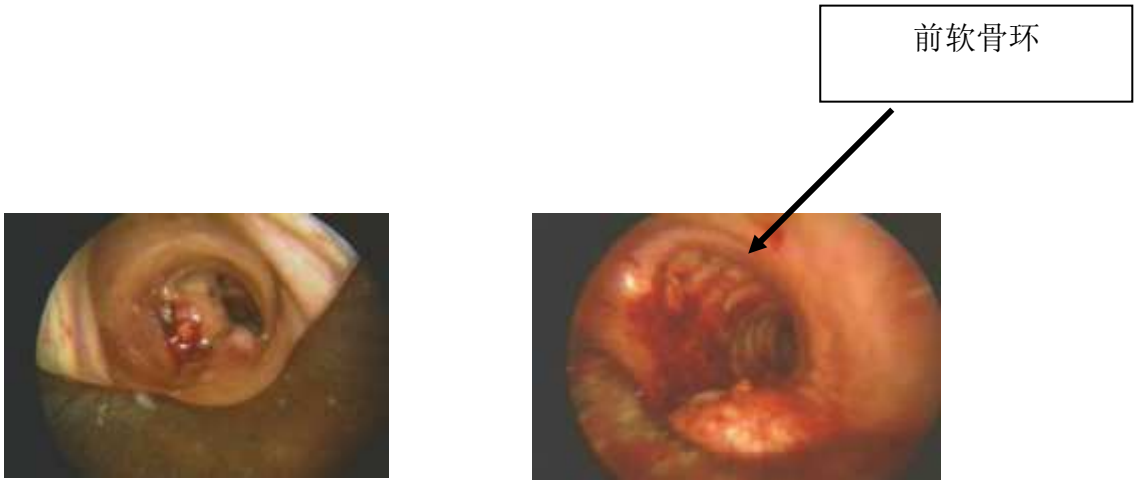
支气管神经内分泌细胞通常都出现在支气管上皮细胞基底部。这些细胞会刺激下增生，但不是恶性的。

IV.8: C

支气管镜治疗恶性肿瘤阻塞中央气道通常都很成功，可以延长生命，改善通气、增加运动耐量、改善生活质量。即使患者的预后很不好，但是仍然需要支气管镜治疗，因为治疗可以使气道阻塞缓解，改善生活质量，增加对放疗等治疗的耐受。治疗相关的死亡率大约 1%。很不幸的是，中位生存期很短，因为患者已经处于疾病的晚期。

姑息治疗可以在全麻或者镇静下进行。治疗包括了 Nd:YAG 激光切除、扩张术、烧灼术、氩气冷冻治疗、主体切除、气道置入硅胶支架、金属支架、或者混合支架（硅胶和金属），激光治疗、近距离放射治疗。

全麻下进行硬支气管镜



延气管左后壁侵袭肿瘤阻塞气管激光切除术前后。

IV.9: C

大多数研究都没有显示利多卡因常规剂量下对气道局麻，可以抑制细菌和真菌生长。BAL 需要收集下呼吸道细胞和非细胞组成部分回收液。BAL 和支气管冲洗不同，支气管冲洗液带有超过 3%支气管鳞状上皮细胞。

专家认为一个肺段的 100ml 灌洗液大概可以取得 10×10^6 个肺泡的灌洗液。大多数情况下，可以回收大约 50%的灌洗液。在吸烟者、老年人、和上叶肺段支气管灌洗时 BAL 液的回收量会减少。

专家推荐用适当的手法向一个肺段缓缓注入至少 100ml 液体以便取得足够的肺泡标本。这些手法包括了仔细地把支气管镜完全伸入肺段进行灌洗。

如果灌洗的技术得当，标本液没有被支气管分泌物污染而出现大量脓黄色，抽出的灌洗液和标本瓶里的液体混合仍可以提供一个很好的支气管肺泡灌洗标本。

IV.10: B

如果手法轻柔、操作认真，支气管镜操作对于中危(<50,000 血小板)和高危(<20,000 血小板)的血小板减少症患者也是安全的。如果进镜的时候感到阻力，可以尝试对侧鼻孔。如果仍然感到阻力，那么应当尝试经口进镜（记住要插入一个防咬器）应当询问患者最近是否有自发性出血或者医疗操作导致的出血，跟患者充分说明潜在的风险。有部分操作者只喜欢经口进镜。

干细胞移植患者在病程中需要多次进行纤支镜的操作。所以，需要对每一次操作对特别小心，保证操作过程是无风险、轻柔、体贴患者。

通常，都要问患者是否愿意在用镇静剂下保持清醒，必须使用大量的局麻药防止咳嗽，防止支气管镜伤及气道，达到无损伤地检查。

IV.11 B

RB 6 是右下叶上段，它直接横跨右中叶支气管(RB 4 和 RB 5).由于使用清晰地弹性纤维镜，粗大的右主支气管后壁和支气管中间段可以在照片中清晰辨认。在行纤支镜操作时，操作者可以通过辨认前壁的软骨环还有后壁的支气管树粘膜部分。

IV.12: B

在右上叶支气管开口水平，探针穿过右主支气管前壁有可能进入右肺动脉，右肺动脉刚好经过右主支气管这个水平面的前壁。注意右上叶支气管在这一段是更加垂直的。

IV.13: B

后基地段一般都是 B 10。在右边，在右中叶支气管和右下叶支气管之间的隆脊叫右隆脊 2 或者 RC-2，另外把右上叶和中段支气管分开的隆脊叫右隆脊 1 或者 RC-1.

下叶支气管可以分为支气管 B 6- B10.这些气道术语可以帮助支气管镜镜操作者描述赘生物的影响范围，早期肺癌的位置，描述外科切除的范围。

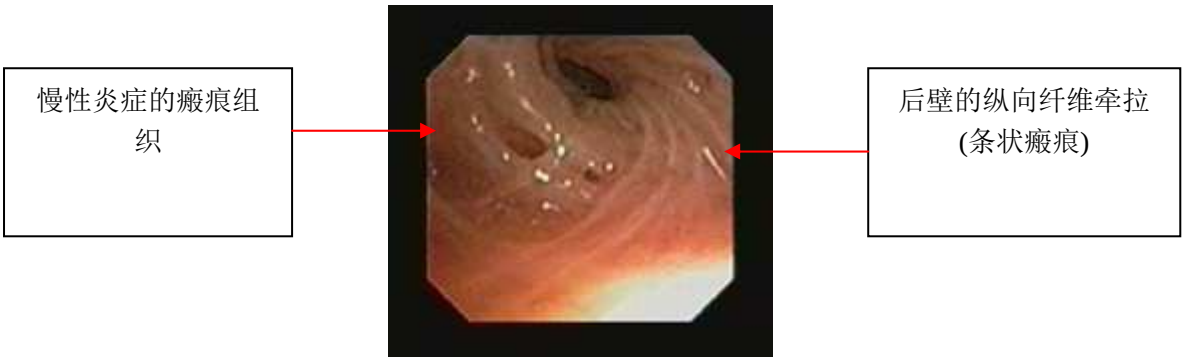
IV.14: E

侵袭性曲霉菌病患者 BAL 标本培养阳性率低于 30%，即使是阴性也不能对可疑病例进行排除诊断。

除了以上列出的疾病，BAL 还对不明原因的肺出血，脂肪栓塞和感染性肺疾病、比如分支杆菌、卡氏肺囊虫、还有巨细胞病毒肺炎。

IV.15 B

慢性支气管炎包括了红斑、苍白区、疤痕、扩大的支气管口。支气管炎是一个常见的改变，没有必要引起临床重视。支气管内（膜）结核会导致纤维性狭窄、红晕、肿胀、瘢痕形成。支气管肺癌的改变包括了管腔内淋巴结，息肉样改变、黏膜增厚、红斑、外源性压迫。



IV.16: B

（研究）表明光动力学治疗对于 80%浅表鳞癌患者有效。当病灶很小，总表面积小于 3cm，浸润支气管壁小于 4-5mm 的病灶疗效最好，复发率大约为 15%。

光动力学治疗需要在外周静脉注射一种血卟啉衍生物，这种物质可以在很多器官中提取，可以快速、选择性地聚集在肿瘤细胞、皮肤、肝脏、和脾脏。病变的支气管黏膜在非热能光（一般波长为 630 nm）照射后，发生光过敏和细胞死亡。这种光平均吸收深度为 5mm。（光照射）产生的氧自由基会导致细胞死亡。

局麻后，用支气管镜可以进行这项治疗。支气管镜治疗 72 小时内需要清除被治疗气道的坏事组织。其他疗法也许有用，但是缺乏确凿的临床证据证明它们在这一期肿瘤的疗效。

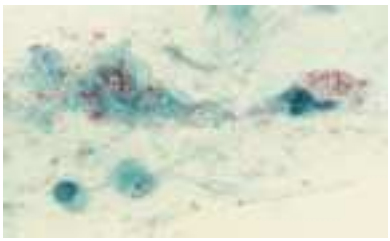
在光动力学治疗中，用于传送非热能光能量的圆形的传导纤维

IV.17 **E**

支气管镜检查对结核诊断非常有用。在疾病发生的时候，超过 70%的病例会取疾病相关的培养的证据

对于粟粒性肺结核患者，在使用支气管镜进行支气管肺泡灌洗和支气管镜肺活检的价值是很确定的，当痰标本染色阴性，仍可以为超过 70%病例提供诊断依据。如果活检发现肉芽肿，可认为可疑肺结核，标本发现分枝杆菌可以确诊肺结核。

有一些医院不管支气管镜下所见如何，常规把所有的支气管刷洗液送染色和培养。研究表面这样的常规送检的结核检出率范围是 0.8%到 6 %.



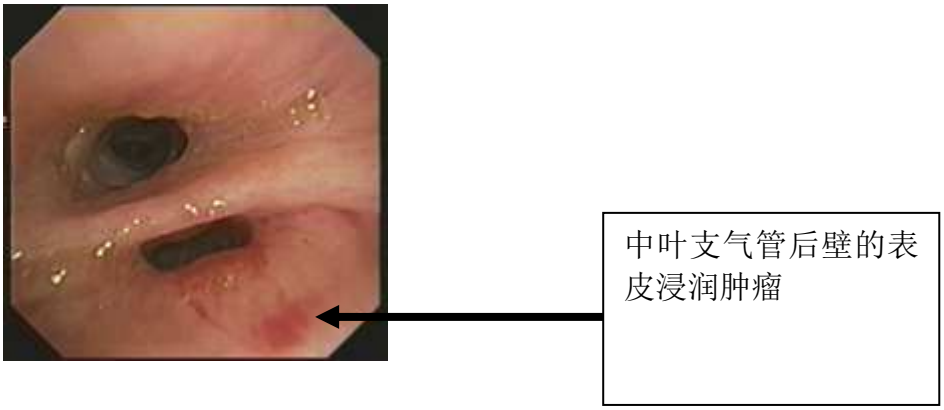
BAL 中的抗酸杆菌

IV.18: C

日本肺肿瘤协会的关于支气管镜镜下表现的分类标准是一个被普遍接受，但是运用的不是很广泛的标准。这个标准，把支气管镜镜下表现分为黏膜和黏膜下。

早期的肿瘤主要组织病理改变在黏膜。表皮浸润的病灶表现为没有光泽和黏膜皱褶的破坏。病灶通常为苍白、红晕或者粒状。由于脆性增加，触摸病灶容易导致出血。管腔狭窄不明显，但是病灶表面可能覆盖坏死组织。

内皮瘤是一种（内皮）包绕组织病理异常，比如轻、中、重度的发育障碍（被认为是癌前病变）、侵袭性(恶性)肿瘤、原位癌。这些异常可以在支气管分支发现。在这些部位发现黏膜增厚、红晕、肿胀都提示肿瘤可能。



IV.19: B

食道通常是紧贴着左主支气管始端 2cm 处。在恶性肿瘤和食道介入治疗（胃镜）、放疗、气道内近距离放射治疗、激光切除的患者中，在这个区域可以发现食道支气管瘘

IV.20: E

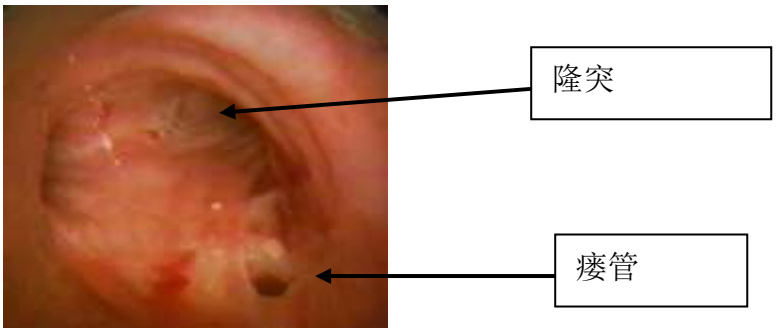
如果发现病变在支气管树，那么没有必要报告它与声门的距离。当然，如果病变在气管，那么这个距离就要报告。另外，支气管内疾病有几方面需要报告的，包括硬度（硬、有弹性、软），外观（光泽、血管供应）、脆性(渗出、活动性出血、积脓)、颜色（白色、红色、黑色、黄色），外型（规则、圆形、不规则、细长、膨隆）还有动度（吸气或者咳嗽时移动，球型活瓣、不动）

IV.21: B

近距离放射治疗在肿瘤引起的气道内病变或者气道外压迫的特定患者中疗效确定。当肿瘤浸润支气管壁小于几个毫米的时候预后最好。对于以往对放疗反应好的患者成功率最高。通过一条插在支气管镜中的尼龙导管把放射源的辐射传导到病灶。肿瘤放射剂量由治疗的肿瘤的长度和深度决定的。

近距离放射治疗导致在同时接受 Nd:YAG 激光治疗的患者组织坏死、局部水肿、出血、和瘘管等并发症增加。肺段的近距离放射治疗可能导致支气管狭窄的风险或者暂时增加其风险，但是不会引起治疗区域远端的支气管狭窄。

在以上所说的病例里，近距离放射治疗师不大可能继续给予支气管镜发现右主支气管和气管的明显的残余肿瘤的患者进行近距离放射治疗。



IV.22: C

把气管导管移到近端通常都可以使在气管导管侧孔附近的血块有所松动。大多数的血块都可以通过纤支镜清除，即使像下图所示的在支气管树形成的血块也没有问题。

为了方便清除血块，你可以：(1)尽可能用最粗的支气管镜(2)用无齿的镊子打碎血块(3)用充足的生理盐水洗涤，不断地间歇吸引(4)缓慢灌注链激酶(5)冷冻疗法也可以冷冻血块，以便马上取出。(6)当血块从气管取出时，如果需要可以移动支气管镜而且插入大口径的吸引导管使用高负压吸引对血块抽吸。如果这些方法不奏效，可以用硬镜取血块。

IV.23: A

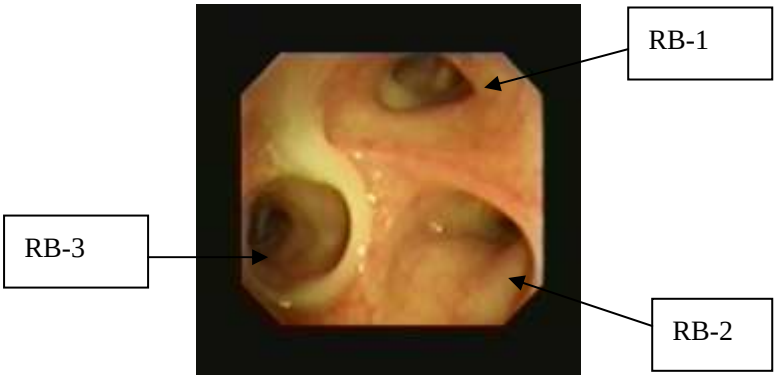
不是开玩笑，选项的每个技术都要用到。更换支气管镜的弯曲头，使其通过支气管壁反弹进目标肺段，似乎是最优雅而且最省时间的方法。所以，A 选项是最佳答案。

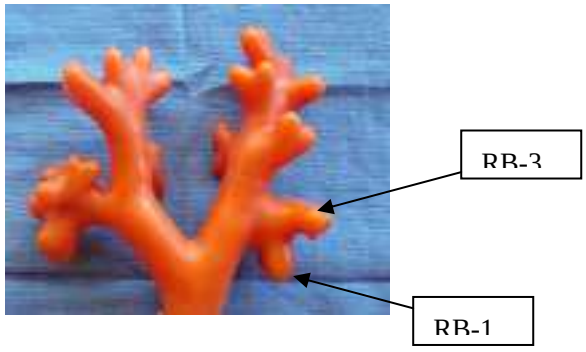
插入细胞刷是很费时间的，而且不是每次都可以奏效，而且如果刷子进的太深，一不小心有引起气胸的危险。很多专家说，虽然他们听说过这个手法，但是他们自己尝试过都没有做成功（个人私下交流）。

用透视指导定位，虽然常常有效，但是很多人不是很乐意用（辐射）。在鼻腔和口腔插入处扭动近端支气管镜从而旋转远端的支气管镜纤维头也很有效，但是动作不够优雅而且会损坏支气管镜。记住，用一只手握住支气管镜的控制部分来操纵镜头的手法才是最好的。另一只手在插入部位固定气管镜。当然，你实在会不解 •••••••，但是似乎所有的专家都认为纤维支气管镜应当由握住镜头的控制部分的手来操控的（无数次的专家之间私下讨论）

IV.24: D

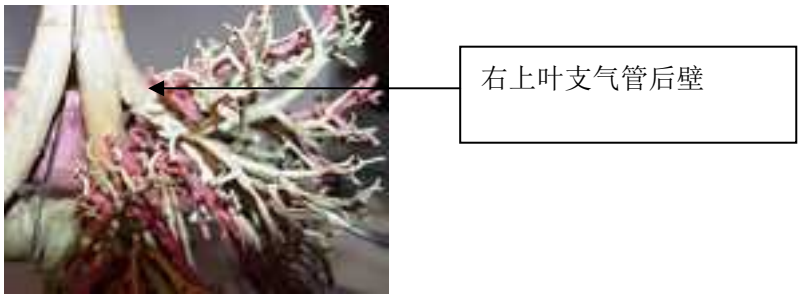
RB2 代表右上叶的后段。Rb1 和 RB3 分别代表右上叶的尖段和前段。不管什么命名方法，隆突、肺叶和基底肺段的命名法是相对固定的。支气管则从 1-10 命名(1-3 上叶, 4-5 中叶或者舌叶, 6-10 下叶)，同时隆脊命名为 C-1 或者 C-2.。统一的命名法方便和像外科同事一样的（支气管镜）外行交流。





Answer IV.25: A

没有血管结构与右上叶支气管的后面直接联系。其前面有肺静脉经过，但是它没有直接与支气管有联系。右肺动脉毗邻右上叶的前壁和中段支气管的根部。在这个部位进行针吸（活检）是很危险的。注意右上叶这一段是比较垂直的。



IV.26: B

这个患者的症状很像一个流感而且有慢性组织胞浆菌病基础。组织胞浆菌 capsulatum 是一种在土壤里生长的真菌，经常在鸡笼、地窖、洞穴中发现。城市居民接触相关的挖掘洞穴和建筑物等也会感染，特别是在美国密西西比河谷，而且在马来西亚、越南、巴拉圭、巴西和印度的肥沃河谷里的居民也有病例报道。对于没有免疫力的急性感染者在 10-16 天的潜伏期后会出现流感样疾病。

个别患者，潜伏期可能只有 3 天，肺部渗出，伴有胸片上肺门和纵隔淋巴结肿大还有淋巴结、肺部钙化小结节。扩大的淋巴结有可能压迫中叶支气管，引起右中叶并发症。在少数情况下，钙化会沿着支气管壁侵袭，形成腔内结石。当间质淋巴结融合为一个被坏死组织和纤维化组织包饶的大肿块，就会发生压迫上腔静脉、食道、主支气管（纵隔纤维化）。在发现坏死组织中发现游离生物或者一个圆形酵母伴有细胞质空泡时可以确诊。在有免疫力的患者中，坏死上皮和结核组织相似的巨细胞肉芽肿。

IV.27: D

光滑假丝酵母菌感染感染通常继发于胃内容物吸入。标本在嗜银染色下可以清晰地看到酵母样细菌，成黑色圆形或者成群的椭圆形孢子。虽然光滑假丝酵母菌感染可以侵袭血管组织，但是会伴有微小感染、肉芽肿的气道粘膜反应。这个题的主要教学目的就是提起的好奇心，激发求知欲（以后遇到这样的病例心中有数）

侵袭性念珠菌症被发现有疑似其感染的口腔炎。曲霉菌可以是寄生菌也可以是感染细菌，其感染也可以发现黄绿色分泌物，但是即使分泌物不是脓性的，也可能是这种感染。关于这种支气管镜下表现在白（毛）霉菌中出现。

IV.28: E

原来推荐使用以硬镜的检查下的气管镜表现为基础的分类标准的博士 Huzley 和博士 Stradling 都推荐使用 Ikeda 教授创立的分类标准。今天，很多支气管镜操作者都有意无意地使用 Ikeda 的分类标准来描述镜下所见，虽然不知道这个标准是 Ikeda 创立的。

掌握熟练的技术，而且记住这个分类标准的所有条文，可以保证支气管操作者可以发现气道内异常而且准确地把他们描述出来。为了便于记忆，标准的基本内容如下：(1)支气管壁的器官组织改变(2)气道内的异常(3)支气管腔内异物(4)动态异常

今天有人可以加一条：支气管镜和外科手术后遗症。这一条的基本内容包括的异常有：外科缝合口、支气管残端、气道吻合后　活检后、激光切除术后、冷冻疗法后、电烧灼后、光动力学治疗后、近距离放射治疗后的粘膜改变

IV.29:　　C

CT 引导下的纤维支气管镜检查是一个很容易想起的操作，但是在一些病例中需要慎重考虑。如果这个病变在 X 光下显影不是很明显，这个技术会比 X 线介导下的操作更优胜。

这个患者可能不是很适合进行探测性纤支镜检查，因为这个检查不能提供太多的供诊断材料（活检）或者对以后治疗决策有用的信息，但是会消耗患者很多体力，而且使患者不舒服。真的 不知道为什么，纤支镜肺活检或者针吸活检不尝试用 X 线引导。

一个不用纤支镜的选择是进行胸腔镜针吸活检。这样可以避免开胸手术。记住，特别是如果病变在中央比较靠近食道，或者左侧（这个病例不是这种情况）。内镜超声引导下针吸活检会帮助诊断。特别是如果有纵隔淋巴结肿大的证据时。确定诊断时还要考虑是否咨询一下胃肠方面的专家。

30:　　A

因为光动力治疗和放疗都会引起坏死和组织水肿，大多数专家都认为放疗应该在 PDT 后推迟 4-6 周进行。这个和 Nd:YAG 激光切除术不一样，由于支气管镜肿块大部切除术后，大多数组织都清楚了，这种手术后坏死和水肿比较轻微。即使患者有严重的中央气道阻塞，联合 PDT 和放疗可以使气道再通。

模块 IV

阶段测试

Bronchoscopy International copyright 2013

阶段测试 模块Ⅳ

Post test instructions

The following test is designed to verify that you have completed and fully understood the 30 questions for Module Ⅳ.

回顾性测试指引：

下列检测是为了证实你已经完成并充分理解了模块Ⅳ的 30 个问题中所包含的所有知识内容。

Post module test questions and answers: Module 4

Question 1: The average internal diameter of the left or right main bronchi, is about

A. 5 -10 mm
B. 10-16 mm
C. 14-18 mm
D. 12-20 mm

Question 2: Endobronchial metastases are unlikely in which of the following illness?

A. Colon cancer
B. Malignant melanoma
C. Gastric cancer
D. Breast cancer
E. Renal carcinoma

Question 3: LC-1 corresponds to which of the following

A. The minor carina between the lingula and the anterior segment of the upper division bronchus
B. The minor carina between the lingual and the apical segment of the upper division bronchus
C. The minor carina between the lingula and the lower lobe bronchus
D. The minor carina between the superior segment and the lower lobe bronchus

Question 4: All of the following statements about bronchoalveolar lavage are true EXCEPT ?

A. Cellular and noncellular components from the epithelial surfaces of the lower respiratory tract are recovered.
B. A 100 ml lavage samples approximately 10 x 10^6 alveoli
C. Fluid return is decreased in smokers and in the elderly
D. Procedures should be atraumatic, harmonious and result in no more than 10% bronchial squamous cells
E. It is appropriate to call BAL a “bronchioloalveolar lavage”.

Question 5: Generally accepted precautions for bronchoscopy in patients with thrombocytopenia include all of the following EXCEPT ?

A. Administration of IVIG infusions for patients with Idiopathic Thrombocytopenic Purpura.
B. Platelet transfusions to increase platelet count so that it is at least greater than 20,000, and higher if biopsies are being performed.
C. Considering passage through the mouth (using a bite-block of course).

D. Bronchoscopy, even without biopsy, should be avoided, especially if patients have severe thrombocytopenia (counts below 20,000 platelets)

Question 6: The nomenclature RC-2 corresponds to which of the following?

A. The minor carina between RB 2 and the Bronchus Intermedius.
B. The minor carina between RB 4, 5 and the lower lobe bronchus.
C. The minor carina between RB 6 and the bronchus intermedius.
D. The minor carina between RB 6 and the lower lobe bronchus.

Question 7: Which of the following airway abnormalites is least likely to be due to chronic bronchitis?

A. Mucosal pitting.
B. Band formation and traction of longitudinal fibers.
C. Erythema and pallor.
D. Raised red areas of mucosal thickening and edema.

Question 8: In a 62 year old patient with cough, weight loss, pleural effusion, volume loss, and a suspected history of tuberculosis, bronchoscopy might be helpful for which of the following

A. To discover possible bronchial strictures that might help explain the radiographic images.
B. To obtain specimens for diagnostic purposes .
C. To help exclude other potential diagnoses such as cancer.
D. All of the above.
E. None of the above. The patient should undergo thoracentesis or closed-needle pleural biopsy

Question 9: Which of the following endobronchial findings best decribes early superficial invasive cancer ?

A. Pale mucosa with lack of luster.
B. Red or granular lesions with increased friability.
C. Easy friability
D. Answers a and b
E. Answers a and c.

Question 10: Which of the following anatomic structures lies directly adjacent to the anterior wall of the bronchus intermedius at the level of the take off of the right upper lobe bronchus?

A. The right pulmonary artery.
B. The right pulmonary vein.
C. The right pulmonary artery and pulmonary vein.

D. The esophagus
E. The thoracic duct.

模块 4 模块后测试题
第一题：左或者右主支气管的平均内径大约是
E. A5 -10 mm
B10-16 mm
C14-18 mm
D12-20 mm
第二题：下列那一种疾病不可能发生支气管内转移
A 结肠癌
B 恶性黑色素瘤
C 胃癌
D 乳腺癌
E 肾癌
第三题：LC-1 与下面哪一项有关
A 舌叶和前段的分支的支气管之间的小脊
B 舌叶和尖段的分支的支气管之间的小脊
C 舌叶和下叶支气管之间的小脊
D 上段和下叶支气管之间的小脊
第四题：下列哪一项关于支气管肺泡灌洗的说法是错误的？
A 下呼吸道的细胞和非细胞成分可以恢复
B 一个大约 100ml 的灌洗液标本大概灌洗过 10×10^6 个肺泡
C 吸烟者和老年人的回收液的量较少
D 灌洗过程应该是无创、舒适、而且回收液中支气管上皮细胞（占总细胞量）小于 10%
E 支气管肺泡灌洗也叫 BAL
第五题：下面哪一项不是对于血小板减少症患者做支气管镜操作的公认预防方法
A 对于自发性血小板减少性紫癜患者可疑注射丙球
B 输入血小板以提高患者的血小板计数到大于 20,000，如果要活检还要更高一点。
C 考虑经过口腔进镜（当然要用防咬器）
D 即使不做活检，也要尽量避免做支气管镜检查，特别是对于严重的血小板减少症患者（血小板计数小于 20,000）
第六题：RC-2 与下列哪一项相关？
A RB 2 和中段支气管之间的小脊
B RB 4, 5 和下叶支气管之间的小脊
C RB 6 和中段支气管之间的小脊
D RB 6 和下叶支气管之间的小脊
第七题：下面哪一项最不像慢性支气管炎？
A 粘膜凹陷
B 带状结构和纵向纤维牵拉
C 红斑和苍白

D 粘膜增厚产生的红色凸出区域和水肿
第八题：一个 62 岁咳嗽患者，体重减轻，胸腔积液肺容量减少，还有可疑结核病史，支气管镜对其有帮助的原因是：
A 发现可能的气道病变，帮助解释影像学资料
B 取样本为诊断提供依据
C 帮助排除其他的一些可疑诊断，如肿瘤
D 以上各项均对
E 以上各项都不对，患者应该行胸腔穿刺术或者胸膜活检
第九题：以下哪一项支气管镜下所见最符合早期表面侵袭性肿瘤？
A 粘膜苍白缺失光泽
B 红色或者粒状病变，而且脆性增加
C 脆性增加
D a 与 b 均对
E a 与 c 均对
第十题：下面哪一项解剖结构与中段支气管前壁在分支右上叶支气管水平直接相毗邻？
A 右肺动脉
B 右肺静脉
C 右肺动脉和肺静脉
D 食道
E 胸导管

Congratulations, you have completed Module IV of the Essential Bronchoscopist©. The correct answers to the post test questions are listed below. We suggest that you review the questions and answer sets to Module IV. You may do so by printing out the entire module as a PDF file.

ANSWERS TO MODULE IV POST-TEST

Answer 1: B
Answer 2: C
Answer 3: A
Answer 4: D
Answer 5: D
Answer 6: B
Answer 7: D
Answer 8: D
Answer 9: D
Answer 10: A

恭喜你完成了 Essential Bronchoscopist©模块 IV 的测试，以下的是测试后问题的正确答案，我们推荐你重新把模块 IV 的问题和答案对一遍，你可以把整个模块用 PDF 文件的形式打印出来对答案。

答案 1: B
答案 2: C
答案 3: A
答案 4: D
答案 5: D
答案 6: B
答案 7: D
答案 8: D
答案 9: D
答案 10: A

恭喜您，您已完成全部课程。
祝愿您在介入肺脏病学习的道路上取得更大成绩！

Bronchoscopy International copyright 2013

模块 V

Bronchoscopy International copyright 2013

模块的目标

EB（杰出气管镜专家）的读者不应该将其中的模块测试图看呈单纯一种测试，因为无论您是否或能否回答这些这些问题，读了这些内容，您都可以从中获得非常有用的信息。也许您会发现：有些问题的正确答案不止一个，这也许是一个善意的陷阱，而读者不应该将其看做是一种陷阱，而应该看做是帮助读者去思考某个问题的方式。一个模块含有 30 个问题及答案，您大概需要 2 小时去完成。当您完成后，您就可以去看考试后的内容，其包含 10 个多项选择题，主要针对每个模块中所包含知识的基础原理。针对每个问题，您也许只能在答案部分或图示部分找到答案的相关信息，但不能直接找到答案。只有在您阅读完考后的内容并准备进入下一级模块之前，您才能对您的答卷给出一个 100%准确率的判断。

杰出的支气管镜专家

EB 最初开设的主要目的是为了对支气管镜相关的理论知识进行学习。每个模块包含的有关支气管镜的知识由易到难呈阶梯状，线性学习及学习左右脑信息处理的最佳结合，而且最重要的是，使学习者在学习中得到乐趣，无论何种专业人员，都能将所学的知识应用到实践中对患者的关怀。

EB 为学习支气管镜相关的理论知识提供了一个标准化途径，适合用于现在的医学教育中本科生教育及研究生教育。标准化的问题-答案模式及与模拟支气管的示例图、技术图，能使学习者能够得到很多知识及启发。一个 100%准确的答卷及考后的内容回顾能使学者基本掌握每个模块中的知识点。

经过的 EB 理念的熏陶及多年支气管镜检查的经验，精英的支气管镜专家不仅获得了扎实的基础知识，并且积累了丰富的个体化经验，但并非教条的知识模式及习惯。“一个认为他一切都懂的人其实什么都不懂”的教育理念使杰出的支气管镜专家既有自信，又不断地探索新知识，打破旧传统，开辟新天地。

感谢李时悦教授团队，包括陈愉大夫、陈小波大夫、钟长镐大夫等各位所作出的贡献。

LEARNING OBJECTIVES TO MODULE V

IMPORTANT NOTE

Readers of The Essential Bronchoscopist© should not consider this module a test. In order to most benefit from the information contained in this module, every response should be read regardless of your answer to the question. You may find that not every question has only one "correct" answer. This should not be viewed as a trick, but rather, as a way to help readers think about a certain problem. Expect to devote approximately 2 hours of continuous study completing the 30 question-answer sets contained in this module.

《支气管镜专家》的读者请不要将每个模块看做一个测试、为了能从每个模块所包含的信息中得到最大的获益，无论您的答案是什么，您都应该阅读每项内容、您会发现每个问题并非只有一个正确答案、这不应被视为一个诡计，而应看做是一种帮助读者正确思考一个问题的方式、连续完成本模块完整的30个问题预计需要2小时、

When you are ready, you may choose to take the post-test. This ten multiple choice question test addresses specific elements of the learning objectives of each module. Questions pertain to information found in the answer paragraphs or figures in the module, but may not correspond directly with a question found in the module. A 100% correct answer score is expected on the post-test before readers can advance to the next module. If even one of your answers is incorrect, you must go back to the beginning of the post-test, and begin the entire test all over again. You may print out your test scores by hitting "print screen" on your monitor.

当你准备好了，你可以选择参加测试、这十道多项选择题代表了每个模块的学习目标的具体内容、问题会与模块答案中的段落或图形相关，但也可能不是直接相关、直到答案 100％正确，读者才能进入到下一个模块、哪怕你只有一个问题打错了，都必须重新回答全部问题、你可以按"打印屏幕"打印出你的考试成绩、

At the conclusion of this module, the learner should be able to:

1. Describe left bronchial anatomy nomenclature
2. Compare and contrast bronchoscopic aspects of T2 and T4 nonsmall cell lung cancer
3. Define the "safety position". Discuss its advantages and disadvantages.
4. Describe areas of the tracheobronchial tree that might be most susceptible to trauma-related injury or fistula.
5. Describe the airway manifestations of endobronchial sarcoidosis.
6. List at least three advantages and disadvantages of airway stent insertion.
7. Describe what to do in case "red out" occurs after endobronchial biopsy.
8. List the indications and complications of bronchoscopic lung biopsy.

Bronchoscopy International copyright 2013

9. Compare and contrast at least FIVE different disease states that might cause bronchial obstruction.
10. Identify at least THREE specific scenarios where airway stent insertion, rather than bronchoscopic resectional techniques, should be considered.

在本单元结束时，学员应能够：
1、能描述左侧支气管及其以下分支的解剖术语
2、能够比较出 T2 期和 T4 期非小细胞肺癌在支气管镜检查方面的区别
3、能定义“安全体位”，讨论其优点和缺点、
4、能够描述气管支气管分支中最容易发生创伤相关的破损和瘘管的部位
5、能够描述支气管镜下结节病的气道表现。、
6、能够列出气道支架置入的至少三个优点和缺点。
7、能够描述通过支气管镜活检后发生出血应采取什么措施。
8、能够列举支气管镜肺活检的适应证和并发症、
9、能够认识并列举至少五种能引起支气管阻塞的疾病状态、
10、能够认识并列举至少 3 种疾病状态，对其我们应该考虑气道支架置入术，而不是支气管镜下的切除术。

Bronchoscopy International copyright 2013

Question V.1: A 54-year-old moderately obese man has been complaining of persistent cough and shortness of breath for the past year. He used to smoke, and has been in excellent health except for occasional esophageal reflux. Eight months ago, pulmonary function tests revealed mild ventilatory obstruction. An unsatisfactory response to inhaled bronchodilators, inhaled corticosteroids, and weight loss program prompted pulmonary consultation. His chest radiograph is normal but suggests a poor inspiratory effort. The patient gags after meals, and his voice has become hoarse. Flexible bronchoscopy reveals the abnormality shown below. Which of the following is the most likely diagnosis?

A. Tracheal amyloidosis
B. Tracheal Sarcoidosis
C. Tracheal lymphoma
D. Chronic aspiration and gastroesophageal reflux

选择题题干

5.1：一位 54 岁中度肥胖患者主诉持续咳嗽、气促一年。他一直抽烟，除了偶尔有食道返流外，平素体健。八个月前行肺通气功能检查，结果示轻度肺通气功能阻塞。吸入支气管扩张剂及糖皮质激素后效果欠佳，且伴有持续体重减轻，遂来呼吸科就诊。胸部 X 光片显示正常，但气促症状明显。病人饭后返流、打嗝，声音沙哑。纤维支气管镜检查的异常征像如下图所示，以下哪项是最可能的诊断？

A. 气管淀粉样变

B. 气管结节病

C. 气管淋巴瘤

E. 胃食管反流及慢性误吸

Created on 7/25/2002 7:18:00 PM

Bronchoscopy International copyright 2013

Question V.2: A non-English speaking colleague has referred a patient with an obstructing lesion in LB 4. The lesion is in

A. The anterior basal segment of the right lower lobe.
B. The superior segment of the left lower lobe.
C. The anterior segment of the left upper lobe.
D. The superior segment of the lingula.
E. The inferior segment of the lingula.

5.2：非英语系国家的同事说在 LB4 有阻塞性病变，病灶部位应在

A 右下肺叶前基底段。
B 左下肺叶上段。
C 左上肺叶前段。
D 舌叶上段
E 舌叶下段。

Created on 7/25/2002 7:18:00 PM

Bronchoscopy International copyright 2013

Question V.3: Which of the following should be classified as nonsmall cell lung cancer stage T4

A. A tumor involving the carina and proximal 1 cm of the medial wall of the right main bronchus
B. A tumor in the main bronchus within 2 cm of the carina, but not involving the carina
C. A tumor involving the main bronchus 2 cm or more distal to the carina
D. A tumor less than 3 cm in size within the right upper lobe bronchus but not extending into the main bronchus.

5.3：下列哪项应归为非小细胞肺癌 T4 期

A 肿瘤累及隆突以及肿瘤距离右主支气管内壁小于 1 厘米

B 肿瘤在主支气管隆突 2 公分内，但不累及隆突

C 肿瘤累及主支气管，但距隆突 2 厘米以上

D 右上肺叶一个直径小于 3 厘米的肿瘤，但未侵犯到主支气管。

Created on 7/25/2002 7:18:00 PM

Bronchoscopy International copyright 2013

Question V.4: Which of the following should be classified as nonsmall cell lung cancer stage T2

A. A tumor involving the carina and proximal 1 cm of the medial wall of the right main bronchus
B. A tumor in the main bronchus within 2 cm of the carina, but not involving the carina
C. A tumor involving the main bronchus 2 or more cm distal to the carina
D. A tumor less than 3 cm inside the right upper lobe bronchus but not extending into the main bronchus.

5.4：下列哪项应归为非小细胞肺癌 T2 期

A 肿瘤累及隆突以及肿瘤距离右主支气管内壁小于 1 厘米
B 肿瘤在主支气管隆突 2 公分内，但不累及隆突
C 肿瘤累及主支气管距隆突 2 厘米以上
D 右上肺叶一个小于 3 厘米的肿瘤大，但未侵犯到主支气管。

Question V.5: Flexible bronchoscopy reveals obstruction of 90 percent of the cross-sectional area of the right main bronchus by a large, wide-based tumor. The patient is dyspneic. Chest radiographs show a right lower lobe infiltrate. Which of the following bronchoscopic procedures is warranted to restore airway patency and provide immediate symptomatic relief.

A. Nd:YAG laser resection
B. Photodynamic therapy
C. Brachytherapy
D. Electrocautery
E. Argon plasma coagulation

5.5：纤维支气管镜显示一个大而基底较宽的肿瘤占据了右主支气管 90%的横截面积而造成气道阻塞。病人呼吸困难。胸部 X 光片显示右下肺叶肿瘤浸润。下列哪项操作可以立即解除气道阻塞、缓解症状。

A Nd：YAG 激光切除

B 光动力疗法

C 近距离放疗

D 电烧灼治疗

E 氩离子凝固

Created on 7/25/2002 7:18:00 PM

Question V.6 In the Figure below, the letters A, B, and C correspond to which of the following basal segments of the left lower lobe bronchus

A. The posterior-basal, lateral-basal, and anterior-basal segments (LB 10, LB 9- LB 8)
B. The lateral-basal, posterior-basal, and anterior-basal segments (LB 8, LB 10- LB9)
C. The anterior-basal, lateral-basal, posterior-basal segments (LB 8, LB 9- LB 10)
D. The lateral-basal, posterior-basal, and anterior-basal segments (LB 9, LB10- LB 8)

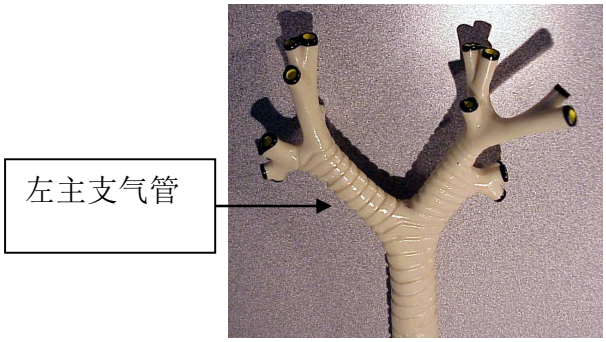
5.6 在下面的图中，字母 A，B 和 C 对应于左下肺叶支气管基底段的那一段？

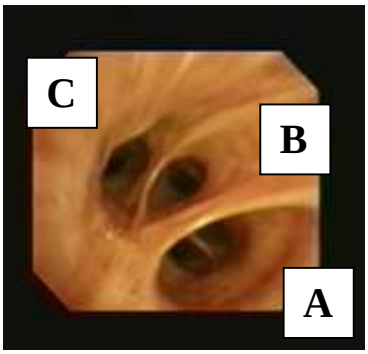
A 后基底段、外侧基底段、前基底段(LB 10, LB 9- LB 8)。

B 外侧基底段、后基底段、前基底段(LB 8, LB 10- LB9)。

C 前基底段、外侧基底段、后基底段、(LB 8, LB 9- LB 10)。

D 外侧基底段、后基底段、前基底段、(LB 9, LB10- LB 8)。





Created on 7/25/2002 7:18:00 PM

Question V.7: After taking an endobronchial biopsy, the forceps do not close. You try moving the forceps back and forth inside the airway but they still do not close. Your assistant straightens the forceps between the insertion site at the bronchoscope and the forceps handle, but they still do not close. Your next step is to

A. Pull the open forceps back firmly into the working channel to force the cups to close.
B. Straighten the bronchoscope. Pull the open forceps back to the distal tip of the insertion tube, and remove the scope-forceps ensemble together.
C. Complain to the forceps manufacturer.

5.7. 当您在做支气管镜下的组织活检时，活检后如果活检钳不能闭合，您尽力在气道内上下移动活检钳，其仍然不能闭合，您的助手在活检钳的插入位点与其手柄之间用力拉直活检钳，但其还是不能闭合，这时您该怎么办？

A 用力向后拉活检钳到内镜插入管的工作通道，硬性促使活检钳闭合。

B 拉直支气管镜， 将活检钳拉回至内镜插入管工作通道的末梢, 然后整体移动支气管镜及活检钳。

C 抱怨支气管镜活检钳的生产厂商。

Bronchoscopy International copyright 2013

Question V.8 Moderate bleeding has occurred during an endobronchial biopsy of a nodule lying in the left main bronchus. The patient was immediately moved into the position shown. This is commonly called the

A. Fetal position
B. Trigger position
C. The safety position
D. The awkward position

5.8 对左主支气管内一结节进行活检时发生中度出血，于是患者被立即移为以下体位，这通常被称为

A 胎方位
B 触发位
C 安全体位
D 被动体位

Created on 7/25/2002 7:18:00 PM

Question V.9: All of the following can be done to increase fluid return during bronchoalveolar lavage **except**:

A. Wedging the flexible bronchoscope deep within the bronchus.
B. Asking the patient to take a deep breath and hold it while instilling fluid and during suctioning.
C. Instilling aliquots of 20-50 cc only, very slowly. Intermittent or partial suction rather than continuous suction should be applied.
D. Hang the lavage fluid from an IV pole. Let gravity assist fluid instillation rather than using rapid and forceful instillation with a syringe.
E. Increase suction to its maximum on the wall outlet control.

5.9: 在对支气管肺泡灌洗液进行回收时，下列除外哪项措施可增加回收率:

A 将支纤镜插入细支气管的深部进行吸引。
B 在回收过程中让病人深吸气后屏气然后进行虹吸。
C 每次仅仅缓慢注入 20-50 cc 液体, 间歇进行虹吸而并非持续吸引。
D 将支气管肺泡灌洗液借助重力的作用通过孔型管道排向低处，而不是利用注射器用力抽吸。
E 将吸引器的电源开至最大功率进行吸引。

Created on 7/25/2002 7:18:00 PM

Bronchoscopy International copyright 2013

Question V.10: While performing bronchoscopy in a trauma victim, which of the following might only be noticed by changing patient position, manipulating an indwelling endotracheal tube, or changing inspiratory lung volumes.

A. Bronchial contusion
B. Aspirated material
C. Mucous plugging and thick secretions or blood clots
D. Ongoing distal hemorrhage secondary to pulmonary contusion
E. Tracheal or bronchial laceration

5.10: 对外伤患者进行支纤镜检查时, 下述哪种情况可能通过改善患者的体位而处理内置的气管内导管，并改变吸气容积?

A. 支气管挫伤
B. 异物吸入
C. 粘液、分泌物或气道内血凝块堵塞
D. 由肺挫伤导致的支气管远端持续性出血
E. 气管或支气管的挫裂伤

Created on 7/25/2002 7:18:00 PM

Question V.11: The appearance of the endobronchial abnormality shown in the Figure below is most consistent with

A. Carcinoid Tumor
B. Adenoid cystic carcinoma
C. Squamous papillomatosis
D. Sarcoma
E. Lipoma

5.11: 下图显示的支纤镜下的表现最可能属于哪种疾病？

A 类癌瘤
B 腺样囊性癌
C 乳头状瘤病
D 肉瘤
E 脂肪瘤

Created on 7/25/2002 7:18:00 PM

Question V.12 All of the following statements regarding chest trauma victims are correct **except**

A. Hoarseness, cough, dyspnea, stridor, and hemoptysis should prompt bronchoscopic examination.
B. Blow out injuries caused by sudden increases in intratracheal pressure usually involve the membranous portion of the trachea.
C. Shear forces such as those resulting from acceleration-deceleration can “widen” the carina and cause unilateral or bilateral main bronchial injury.
D. The majority of tracheobronchial lacerations are discovered 2 cm beyond the carina.
E. Sudden deceleration can cause high tracheal disruption because the trachea is tethered at the cricoid cartilage.

5.12 **关于**胸外伤患者，下述选项中除外哪项其它均正确？

A 声音嘶哑, 咳嗽, 呼吸困难, 喘鸣, 咯血，需要立即进行支纤镜检查
B 由于气道内压力突然急剧上升导致的气压伤，气管膜部通常受到损伤。
C 由于加速——减速后的剪切力而使隆突部“增宽”，导致单侧或双侧主支气管损伤。
D 大多数气管支气管的撕裂伤距离隆突达 2cm 以上。
E 突然的减速可导致上气道的撕裂伤，因为气管在环状软骨是固定的。

Created on 7/25/2002 7:18:00 PM

Question V.13: The abnormality shown in the Figure below is most consistent with

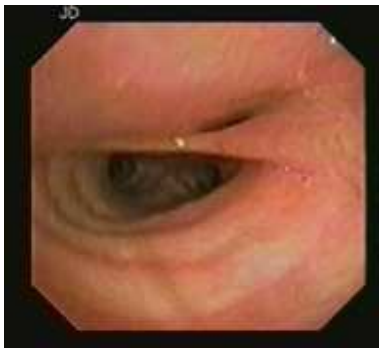
A. Segmental stenosis
B. Tracheocele
C. Tracheoesophageal fistula

5.13 下图显示的支纤镜下的表现最可能属于哪种疾病？

A 某一段狭窄

B 气管食管瘘。

C 气管膨出,气管粘膜疝样突出。



Created on 7/25/2002 7:18:00 PM

Question V.14: Which of the following statements about bronchoscopic treatment of benign central airway obstruction is correct.

A. Procedures are limited to nonsurgical candidates
B. Metal stents, rather than silicone, are warranted most of the time
C. Few critically ill patients benefit from intervention
D. More than one therapeutic attempt is usually necessary
E. Procedure-related mortality may be as high as two percent

5.14 关于良性中央型气道阻塞的支纤镜介入治疗，下述哪项正确？

A 仅限于无外科治疗适应症的患者。
B 最常选用的应该是硅酮类支架，而并非金属类支架。
C 支纤镜下的介入治疗对极度重症的患者疗效很差。
D 多种方案的综合治疗常常是必要的。
E 与支纤镜下介入治疗相关的病死率高达 2%。

Created on 7/25/2002 7:18:00 PM

Question V.15: You are on your way to the hospital when the emergency department physician calls you on your cellular telephone. She is examining a 28-year-old patient with limited Wegener's granulomatosis. The patient is increasingly short of breath, coughing, and using accessory muscles to breath. Stridor is audible, and breath sounds are present bilaterally. The patient has a history of airway stent insertion for right main bronchial and tracheal stenosis six months ago. You give the emergency room doctor each of the following instructions **except**.

A. Place the patient on supplemental oxygen and obtain a slightly over-penetrated chest radiograph.
B. Respiratory therapy and nursing should be called and asked to prepare for flexible bronchoscopy at the bedside in the emergency department.
C. Should the patient deteriorate further and immediate intubation become necessary, a # 6 uncuffed single lumen endotracheal tube should be used.
D. The emergency department staff should immediately set up a percutaneous tracheostomy tray and notify otolaryngology and anesthesia of the situation.
E. The interventional bronchoscopist should be immediately notified and the operating room should be called in case a bronchoscopic therapeutic procedure becomes necessary.

5.15 您正在往医院去的路途中，突然接到急诊科医生的手机电话，他急诊咨询的专业问题为：一个 28 岁的局限性韦根内肉芽肿病**患者呼吸困难逐渐加重，咳嗽，查体发现患者存在明显的辅助呼吸肌参与呼吸，肺部停止可闻及喘鸣音及双相哮鸣音，患者的既往因气管及右主支气管狭窄曾于 6 个月以前接受支架置入术。下列选项中您给予急诊科医生的建议中哪项不合理**？

A 予患者以吸氧并行胸片检查。

B 暂予以通气治疗，同时要求护士做准备工作，拟在急诊科予患者行床边支纤镜检查。

C 如果患者的情况进一步恶化，应立即予以气管插管，选择# 6 号单腔未带套管的气管插管。

D 急诊科的所有医生应该立即配合为患者进行经皮气管切开，并通知耳鼻咽喉科及麻醉科相关医生参加现场会诊。

E 如果需要支纤镜下介入治疗，则立即通知支纤镜下介入治疗的专家，准备在手术室进行相关介入治疗。

Created on 7/25/2002 7:18:00 PM

Question V.16: All of the following are indications for airway stent insertion **except**

A. Extrinsic compression of the right main bronchus
B. Intraluminal disease involving the left main bronchus and distal trachea, associated with extrinsic compression of the left main bronchus.
C. Benign tracheal stenosis that has recurred two months after laser resection and bronchoscopic dilatation.
D. Intraluminal tumor involving the right main bronchus
E. Tracheal-esophageal fistula in a patient with esophageal cancer and persistent cough

5.16 关于气道支架置入的适应症，下述选项除外哪项均正确？

A 右主支气管的外压性压迫狭窄。

B 管腔内疾病侵犯左主支气管及气管远端，与左主支气管的外压性狭窄有关联。

C 良性气管狭窄，经激光切除及支纤镜下气道扩张治疗术后 2 个月再次复发。

D 管腔内肿瘤侵犯右主支气管。

E 食管癌患者伴有气管食管瘘及持续咳嗽。

Created on 7/25/2002 7:18:00 PM

Question V.17: Bronchoscopy is performed four months after unilateral lung transplantation in a patient complaining of increased dyspnea and cough. The anastomotic site is friable, and there is evidence of dehiscence of the bronchial sutures. Thick greenish-yellow secretions are noted, and a felt-like membrane covers the anastomosis site. Fungal stain is shown. Which of the following is most likely.

A. Tracheobronchial aspergillosis
B. Tracheobronchial mucomycosis-zygomycosis
C. Tracheobronchial candidiasis
D. Tracheobronchial lymphoma

5.17　一位接受单侧肺移植的患者，术后 4 个月出现逐渐加重的呼吸困难及咳嗽症状，支纤镜检查发现吻合口组织脆弱易碎，有支气管吻合口裂开的迹象，可见厚厚的黄绿色分泌物犹如一层毛毡样的膜状物附着在吻合口周围的组织表面，真菌染色阳性，**下述选项哪项正确**？

A 气管支气管的曲霉菌病。

B 气管支气管的多粘真菌-接合菌病。

C 气管支气管的念珠菌病。

D 气管支气管的淋巴瘤。

Created on 7/25/2002 7:18:00 PM

Bronchoscopy International copyright 2013

Question V.18 A 50-year-old black woman is referred for increasing shortness of breath, and cough. A course of corticosteroids provided temporary relief but symptoms promptly returned when drugs were stopped. She is a lifelong nonsmoker. Physical examination reveals clear lung fields. Chest radiograph reveals bilateral interstitial infiltrates. There is no adenopathy. Flexible bronchoscopy shows a slightly erythematous granular mucosa with some small raised white lesions. Which of the following is the most likely cause of this patient's disease

A. Histoplasma capsulatum infection
B. Mycobacterium tuberculosis infection
C. Sarcoidosis
D. Sarcoma
E. Small cell carcinoma

5.18 一位 50 岁的黑人女性患者，以逐渐加重的呼吸困难及咳嗽就诊，予以口服糖皮质激素后症状缓解，但停药后症状再次复发。患者无吸烟史。查体双肺呼吸音清晰，胸片示双肺间质性渗出影。患者没有腺体疾病，支纤镜检查发现支气管粘膜有散在的红斑结节伴突起的白色损害，患者的表现符合**下述选项哪项疾病**？

A 夹膜组织胞浆菌病。

B 结核分枝杆菌病。

C 结节病。

D 肉瘤。

E 小细胞肺癌。

Created on 7/25/2002 7:18:00 PM

Question V.19: During bronchoscopy you become rapidly frustrated because of repeated slipping of your cup biopsy forceps off a small endobronchial abnormality located on the lateral wall of the lower lobe bronchus. You could now attempt all of the following **except**.

A. Switch to a biopsy forceps with a central impaling needle.
B. Open the biopsy cups and use one cup to "dig" into the lesion. Then close the forceps to obtain the biopsy.
C. Instruct the patient to hold their breath while you are obtaining the biopsy
D. Use an alligator forceps instead of a smooth cup forceps.
E. Twist the insertion tube in order to reorient the direction of the biopsy cups.

5.19 在为患者进行支纤镜检查时如果遇到下述情况，您会变得紧张，因为您发现下叶支气管后侧壁粘膜异常，但对其进行活检时活检钳却反复滑脱，这时应采取的处理措施下列哪项除外？

A 将活检钳改为针刺活检。

B 张开活检钳，先将活检钳的一侧硬性刺入组织，然后合起活检钳进行钳夹组织。

C 嘱患者屏住呼吸，然后进行活检。

D 选用鳄齿钳，不用普通平口活检钳。

E 转动内镜插入管，改变活检钳的方向后再次进行活检。

Created on 7/25/2002 7:18:00 PM

Bronchoscopy International copyright 2013

Question V.20: After taking an endobronchial biopsy, the video screen shows red. You should

A. Place the patient into the reverse Trendelenberg position because it is likely a major airway bleed has occurred.
B. Place the patient into the lateral safety position because mild to moderate bleeding will more easily cease and the contra lateral airway will remain protected.
C. Place a second pair of nasal prongs on the patient in order to maximize oxygen delivery in case substantial bleeding has occurred.
D. Irrigate with large amount of saline solution in order to wash away the blood and restore visualization.
E. Move the bronchoscope proximally into the trachea or contra lateral bronchial tree. Then flex the bending tip in order to wipe the distal lens against the airway wall.

5.20 在为患者行支气管粘膜活检后支纤镜下的整个视野变成一片红色，这时您应采取下述哪项处理措施？

A 让患者翻转体位，改为特伦德伦伯卧位，因为很可能发生了大气道出血。

B让患者翻转为安全的侧卧位，因为轻中度的出血更容易止住且中心大气道可得到保护，
C 改为双腔鼻导管予患者吸氧，尽量保证最大给氧，防止大出血。

D 用大量的生理盐水冲洗局部，吸干净局部的血液，恢复视野。

E 将支纤镜的远端退到中心气道或大气道，然后弯曲镜身末端，来回蹭支纤镜的镜头，以气道壁抹干净镜头。

Created on 7/25/2002 7:18:00 PM

Bronchoscopy International copyright 2013

Question V.21: Maximum yield from bronchoscopic lung biopsy reportedly occurs with which of the following optimal number of specimens.

A. 1 specimen
B. 2-3 specimens
C. 4-6 specimens
D. More than 6 specimens

5.21 **行**支纤镜下肺活检时，至少得到几块组织阳性率最高？

A 1 块组织。

B 2-3 块组织。

D 4-6 块组织。

E 6 块组织以上。

Created on 7/25/2002 7:18:00 PM

Question V.22: What is the reported frequency of pneumothorax after bronchoscopic lung biopsy

A. Less than 1 %
B. 1%-4 %
C. 5%-10%
D. Greater than 10%

E. More than 6 specimens

5.22 由支纤镜下肺活检导致气胸发生率的大多数报道的数据是多少？

A 不到 1 %。
B 1%-4 %。
C 5%-10%。
D 大于 10 %。

Created on 7/25/2002 7:18:00 PM

Question V.23: Bronchoscopic lung biopsies are frequently helpful in providing histologic diagnosis in each of the following **except**

A. Hypersensitivity pneumonitis
B. Desquamative interstitial pneumonitis
C. Sarcoidosis
D. Miliary tuberculosis
E. Diffuse pulmonary mycoses

5.23 支纤镜下肺活检对组织学诊断能提供有用的帮助，其中对下列哪项疾病的诊断意义最大？

A 过敏性肺炎。
B 脱屑性间质肺炎。
C 结节病。
D 弥漫性肺真菌病。

Created on 7/25/2002 7:18:00 PM

Question V.24: The “float sign” is often used to determine whether representative tissues sampled have been obtained after bronchoscopic lung biopsy. Most experts agree that this sign is

A. Reliable
B. Unreliable

5.24 “浮萍征”常用于决定支纤镜下肺活检得到的标本是否能代表组织特征，大多数专家认为此征？

A 可靠。
B 不可靠。

Created on 7/25/2002 7:18:00 PM

Question V.25: Which of the following factors most likely reduces diagnostic yield of forceps bronchoscopic lung biopsy

A. Use of alligator instead of cup forceps
B. Use of larger instead of smaller forceps
C. Unrepresentative tissue specimens or samples that do not contain alveoli
D. Using cup forceps instead of alligator forceps

5.25 支纤镜下肺活检对疾病的诊断能提供有用的帮助，其中对下列哪项因素可影响活检的组织标本对疾病的诊断？

A 以鳄口钳代替杯口钳得到的组织标本。

B 以大活检钳代替小活检钳得到的组织标本。

C 钳出的组织标本无代表性，不包含肺泡组织。

D 以杯口钳代替鳄口钳得到的组织标本。

Created on 7/25/2002 7:18:00 PM

Question V.26: Diffuse tracheal narrowing is commonly seen in all of the following illnesses **except**

A. Relapsing polychondritis
B. Amyloidosis
C. Tracheobronchopathica osteochondropastica
D. Klebsiella rhinoscleromatis
E. Saber sheath trachea

5.26 大气道广泛性狭窄常见于下列哪些疾病，其中哪项**除外**？

A 复发性多软骨炎。
B 气管淀粉样变性。
C 气管支气管骨软骨病。
D 鼻硬结克雷伯菌。
E 军刀样套状气管。E

Created on 7/25/2002 7:18:00 PM

Bronchoscopy International copyright 2013

Question V.27: Pulmonary veins are an important danger for an interventional bronchoscopist because

A. They are very close to the medial and posterior walls of the bronchial tree along the entire length of the middle lobe bronchus, and along the entire lengths of the lower lobe bronchi bilaterally.
B. Veins bleed more than arteries
C. They lie anterior to the lower lobe bronchial wall
D.

5.27 对于支纤镜介入治疗，靠近肺静脉是危险的，为什么？

A 肺静脉的解剖部位非常靠近支气管分支的中后壁，与中叶支气管的全长伴行，后与双侧下叶支气管的全长走行。
B 静脉血较动脉血丰富。
C 肺静脉位于下叶支气管的前壁 。

Created on 7/25/2002 7:18:00 PM

Bronchoscopy International copyright 2013

Question V.28 How many endobronchial lesions are present and visible in the Figure below.

A. 1
B. 2
C. 3

5.27 下图中支纤镜下的可视的病变有几处？

A 1。
B 2。
C 3 。

Bronchoscopy International copyright 2013

Question V.29: Which of the following "consequences of previous surgical or bronchoscopic therapies" would most likely be visible in a patient who had photodynamic therapy less than one day ago.

A. Suture dehiscence
B. Focal stricture
C. Charring and focal necrosis
D. Inflammation, swelling and bronchial segmental narrowing
E. Erythema and edema

5.29 Which of the following "以前的外科手术治疗或支纤镜下介入治疗的后果" 最可能在支纤镜下可视 likely be visible in a patient who had photodynamic therapy less than one day ago?

A 缝合口裂开。
B 碳化及局部坏死。
C 炎症、肿胀及支气管段狭窄。
D 肿胀红斑及水肿。

Created on 7/25/2002 7:18:00 PM

Question V.30: One French size equals

A. 0.2 mm
B. 0.3 mm
C. 0.4 mm
D. 0.5 mm

5.30 一法尺相当于

A. 0.2 mm
B. 0.3 mm
C. 0.4 mm
D. 0.5 mm

Created on 7/25/2002 7:18:00 PM

Bronchoscopy International copyright 2013

模块 V

阶段测试答案

Answer V.1: A

Tracheobronchial amyloidosis is most frequently due to Immunoglobulin or light chain derived amyloid submucosal deposition in and around bronchial glands, connective tissue and blood vessels. Occasionally ossification occurs, simulating tracheopathica osteochondroplastica. The bronchoscopic appearance is usually that of raised, shiny yellowish or pale multifocal submucosal plaques with scattered focal stenoses. Diagnosis is made on deep endobronchial or tracheal biopsies that bleed easily.

Histologic appearance is that of a pale waxy extracellular material deposited in a uniform longitudinal fashion. Specimens have an apple-green birefringence with polarized microscopy when stained with Congo red. Up to 30 percent of patients die as a direct result of their airway disease.

Amyloid deposition is progressive and relentless, involving the trachea, the bronchi, and the larynx. Laser resection is difficult, providing only temporary relief. Stents are of little value over the long term because thickened and inflamed amyloid-infiltrated mucosa continues to grow through or around the stents, as well as distally within segmental airways causing segmental stenosis.

If abnormal serum proteins are noted, systemic amyloidosis should be suspected. Localized tracheobronchial amyloidosis should not be confused with diffuse pulmonary amyloidosis in which patients have diffuse reticulonodular infiltrates on chest

radiographs and restrictive ventilatory impairment.

Endobronchial sarcoidosis can appear as hypertrophied pale yellowish raised lesions on the nasal septum or oral pharynx, and in the tracheobronchial tree can cause engorged bronchial mucosal blood vessels with possible lymph node enlargement. Other endoscopic findings include mucosal nodularity, hypervascularity, mucosal edema, and bronchial stenosis. Lymphoma is usually a more focal process that can also cause mucosal hypertrophy. Chronic aspiration and reflux can be suspected when cobblestoning, unilateral mucosal inflammation, and focal bronchial mucosal thickening, erythema and inflammation are noted, but these findings are nonspecific.

Bronchoscopy International copyright 2013

答案 5.1： A

支气管淀粉样变性常由于免疫球蛋白或其轻链产生的淀粉样蛋白在支气管粘膜下及其周围腺体、结缔组织和血管周围沉积而形成，偶尔发生骨化，类似气管骨软骨肉瘤。支气管镜下通常可见凸起的有光泽的淡黄色或苍白多病灶粘膜下斑块，伴多部位局灶性狭窄。诊断需依靠深部支气管内或气管活检，而这些检查易引起出血。

组织学表现为苍白蜡样的细胞外基质纵向均匀的沉积。刚果红染色后在偏光显微镜下可见标本显苹果绿色。高达 30%的患者直接死于气道疾病。

淀粉样蛋白的沉积过程呈持续进行性发展，逐渐侵犯气管、支气管以至咽喉。激光切除很困难，而且只能作为缓解症状的姑息性治疗措施。气管内支架的置入也不能作为永久性的治疗措施，因为淀粉样变的气道粘膜会持续增厚、发炎，并逐渐包裹支架，并引起远端气道节段性狭窄。

如发现患者血清蛋白异常，应怀疑其患有系统性淀粉样变。局部的气管淀粉样变与弥漫性肺淀粉样变不应混为一谈，后者胸部影像学显示有弥漫性肺网格状浸润影，肺功能检查显示限制性通气功能障碍。

支气管内结节病在支气管镜下表现为：鼻中隔或口咽部的肥大的淡黄或苍白色的隆起性病变，可引起气管支气管分支中的粘膜下血管充血，可伴淋巴结肿大。其它的镜下病变包括粘膜结节，血管增生，粘膜水肿，支气管狭窄。淋巴瘤常常是一个病灶更局限的疾病，也可引起粘膜增生。当发现鹅卵石样的、单侧的粘膜炎症和局灶性支气管粘膜增厚，应怀疑慢性胃-食道返流和误吸，但这些发现是非特异的。

Bronchoscopy International copyright 2013

Answer V.2: D

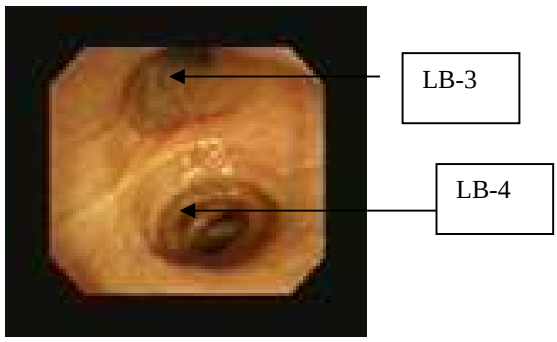
LB-4 is the superior segment of the lingual. A secondary carina separates LB-4 from LB-3, which is the anterior segmental bronchus of the left upper lobe upper division bronchus. Numerous nomenclatures have been proposed for bronchial lobar and segmental anatomy. These include those of Jackson and Huber, Boyden, Shinoi, Nagaishi and Ikeda.

There are small differences in these nomenclatures, particularly for distal anatomy and naming of subsegmental bronchi and beyond. Left is (L), and right is (R). Carinal, lobar, and proximal segmental anatomy nomenclature is relatively constant. Bronchi are classified from 1-10 (1-3 upper lobe, 4-5 middle lobe or lingula, 6-10 lower lobe). A Carina is classified as C-1 or C-2. An airway nomenclature helps bronchoscopists describe extent of neoplastic involvement and sites of early lung cancer, and delineate limits for surgical resection.

答案 5.2：D

LB – 4 位于上舌段，是左上叶支气管的前段分支。一个次级隆突将 LB – 3 与 LB – 4 分开。关于支气管肺叶和段的解剖命名提出了很多术语。其中包括 Jackson and Huber, Boyden, Shinoi, Nagaishi and Ikeda。

这些术语间存在小的差异，特别是远端的解剖学和亚段支气管及其以下分支的命名。左为（L），右为（R）；而隆凸、肺叶以及近端支气管的解剖学命名相对恒定。支气管分为 1-10（1-3 上叶，4-5 中叶或舌支，6-10 下叶）。隆突归类为 C - 1 或 C - 2。气道的命名有助于支气管镜检查者描述早期肿瘤的位置、肿瘤侵犯的范围，以及用于描述手术决定切除的范围。



Bronchoscopy International copyright 2013

Answer V.3: A

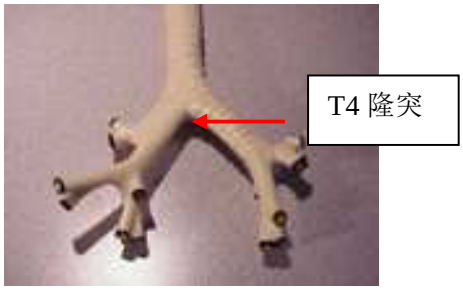
A tumor of any size involving the carina is classified as T4. In addition, any tumors involving the pericardium, great blood vessels, and vertebrae are also T4. All T4 lung tumors, regardless of nodal status are automatically classified as stage III B lung cancers. In the absence of distant metastases (M 0). Stage III B also includes tumors that are T1N3, T2N3, and T3N3.

The current recommended treatment of unresectable stage III B nonsmall cell lung cancer is combination chemotherapy and radiation. With combined modality therapy, five-year survival is ten to twenty percent.

答案 5.3： A

任何大小的肿瘤，凡是侵犯到隆突的，均归类为 T4。此外，任何侵犯到心包、大血管和椎骨的肿瘤也归为 T4。所有的 T4 期肿瘤无论淋巴结情况全部归为 III B 期肺癌。在没有远处转移的情况下归类为 M 0，III B 期肿瘤还包括 T1N3，T2N3，和 T3N3。

目前对于不能手术切除的 III B 期非小细胞肺癌的推荐治疗是化疗和放疗相结合。随着综合治疗的开展，五年存活率为 10%至 20%。



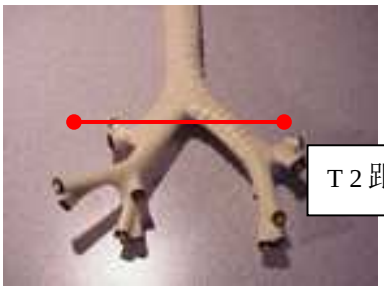
Bronchoscopy International copyright 2013

Answer V.4: C

T2 disease includes tumors that involve the main bronchus 2 cm or more distal to the carina, as well as tumors that are more than 3 cm in dimension, invade the visceral pleura, or are associated with atelectasis or postobstructive pneumonitis that do not involve the entire lung. T2 lesions with N 1 (positive hilar, interlobar, or subsegmental nodes), N 2 (ipsilateral mediastinal paratracheal, aortopulmonary, or subcarinal nodes), or N3 (contralateral hilar, mediastinal, scalene, supraclavicular nodes, or ipsilateral scalene or supraclavicular nodes) are classified as stage as respectively.

答案 5.4 C

T2 期肿瘤包括那些累及主支气管但距气管隆突 2cm 或 2cm 以上的；直径大于 3 cm；浸润脏层胸膜；引起肺不张及阻塞性肺炎但未累及全肺的肿瘤。T2 以及 N1（肺门淋巴结转移、叶间淋巴结转移或亚段淋巴结转移），N 2（同侧气管旁纵膈淋巴结转移、肺动脉淋巴结转移或隆突下淋巴结转移），N3（对侧肺门淋巴结转移、纵隔淋巴结转移、锁骨上淋巴结淋巴结转移、同侧斜角肌或锁骨上淋巴结转移者）分别被列 II B, III A 和 III B 期。



Bronchoscopy International copyright 2013

Answer V.5: A

Nd:YAG laser resection can be performed under general anesthesia or using topical anesthetic and conscious sedation. Laser energy is delivered as a 1,064 nm wavelength derived from a Neodymium yttrium-aluminum garnet crystal (Nd:YAG). Tissue effects include photocoagulation and necrosis. Survival benefits have been shown for patients undergoing emergency treatment compared to those receiving external beam radiation alone. Like all bronchoscopic therapies, laser resection does not preclude chemotherapy and external beam radiation therapy.

Symptomatic relief is usually immediate, with improvement in ventilatory flow, symptoms, and quality of life. Nd:YAG laser resection can also be done in addition to other bronchoscopic therapies, including airway stent insertion. In regards to the other modalities listed above, the effect of cryotherapy is not immediate, and usually requires additional intervention in order to remove tissues that became necrotic as a result of freezing.

Brachytherapy does not provide immediate relief. This intraluminal delivery of radiation is usually reserved for patients who have already received maximum doses of external beam radiation. Electrocautery and argon plasma coagulation both can effectively and immediately restore airway patency. In fact, indications are similar to those of Nd:YAG laser resection. However, most experts prefer using Nd:YAG in large bulky tumors because deep coagulation and treatment of bleeding is enhanced. Photodynamic therapy does not provide immediate restoration of airway patency.

答案 5.5：A

Nd：YAG 激光治疗可在全麻、表面麻醉和镇静下进行。钕钇铝石榴石晶体（Nd：YAG）可产生波长为 1,064 nm 的激光。该激光可使组织光凝固和坏死。对于急症救治方面，激光治疗较单独体外放射治疗能获得更高的生存率。像所有的支气管镜疗法一样，激光切除与化疗和体外放射治疗并不冲突。

Nd：YAG 激光治疗通常可立即缓解呼吸困难的症状，同时增加通气量，提高患者的生活质量。Nd：YAG 激光切除术也可与其它的支气管镜介入治疗一起使用，包括气道支架的置入。相对于 Nd：YAG 激光治疗，冷冻治疗并不能立即起效，并常需要其它的干预措施去除冷冻后的坏死组织。

近距离放射治疗并不能立即起效。这种腔内放疗往往只适合于给那些已经接受了最大剂量体外放疗的病人。电烙烧灼及氩离子凝固可以立即有效地恢复气道通畅。事实上，其适应症与 Nd：YAG 激光切除术相似。但是，大多数专家对于大体积的肿瘤的介入治疗倾向于采用 Nd：YAG 激光，因为其深部凝血和止血功能较强；而光动力疗法也不能立即恢复气道通畅。

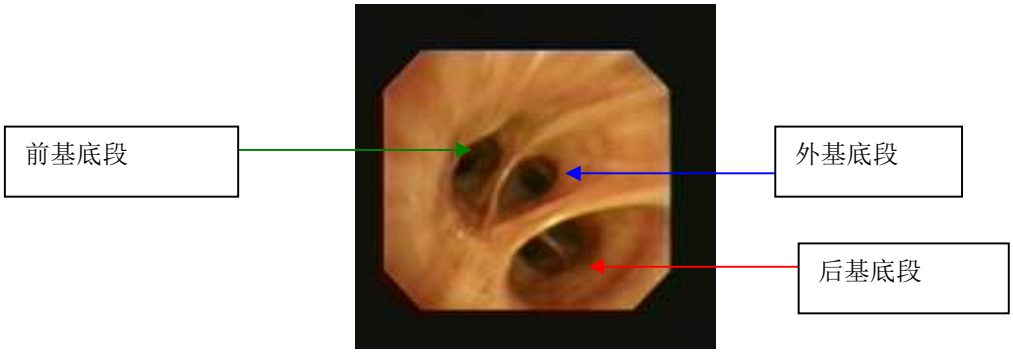
Bronchoscopy International copyright 2013

Answer V.6 A

Imagining the interior of the airway as a clock face and using the carina as the central reference point, orientation is possible by identifying the membranous posterior membrane located between 12 o'clock and 3 o'clock. The posterior-basal segment is usually the most medial of all the segments of the left lower lobe. It is therefore located at the 5 o'clock position in this view. The lateral-basal segment (LB 9) lies between the posterior-basal and the anterior-basal segments of the left lower lobe bronchus. Some bronchoscopists call these three basal segments the "basal pyramid". Others refer to them as the "three musketeers".

答案 5.6：A

将气道的纵切面想象为一个钟面，以隆脊作为参考点，将后基底膜定位在 12 点到 3 点之间的位置；后基节段通常位于左下叶的最内侧。因此，此视图中位于 5 点的位置。外基底段（LB9）介于左下肺叶前基底段和后基底段之间。有些支气管镜专家称这三个基节为 "基础金字塔"，而有的称他们为"三剑客"。



Bronchoscopy International copyright 2013

Answer V.7: B

The entire ensemble should be gently removed, and the forceps replaced. If it is difficult to pull an instrument back through the working channel of the bronchoscope, it is best to leave it inside and to send everything out for repair, rather than to force an instrument up through the channel by pulling on it strongly (See Figure below of a wire forceps that unraveled when pulled on with force because it would not come up through the working channel). Repair costs can be exorbitant!

There is no need to complain to the manufacturer..they already know that forceps are fragile instruments. They become stuck in the open or closed position easily and they also may break. Stubborn and persistent force used to close the forceps by ramming them into the working channel of the scope might sometimes be effective, but it is inelegant and can potentially damage the scope. A partially open forceps inside the working channel of a bronchoscope can cause as much damage as a needle.

答案 5.7 B

整套器械应该轻轻的移出来，然后更换钳子。如果活检钳难以通过支气管镜的工作通道，最好将其先留在支气管镜的镜身里面，然后将支纤镜及活检钳整套拉出来后送去修理，而不要强行将活检钳拉出支纤镜活检的工作通道。（下图就是一例由于不能通过支纤镜活检的工作通道而被强行拉出后致使活检钳的钳线扭结损坏），而这样的维修费非常昂贵！

没有必要抱怨活检钳制造商，他们已经知道钳子是脆弱易碎的工具：活检钳很容易被卡在开合的位置而导致损坏。强硬而持续的迫使钳子进入支气管镜的工作通道有时或许有用，但这种粗暴的操作很容易损伤支气管镜。而且，在支纤镜活检的工作通道内半张开的活检钳对镜身的危害犹如针刺镜身一样。

Bronchoscopy International copyright 2013

Answer V.8: C

The lateral decubitus position, bleeding side down, is commonly called the safety position. Blood pools in the dependent bronchial tree as gravity promotes clot formation. This position protects the contra lateral airway from blood spillage up and over the carina. In addition, blood is easily evacuated from the oropharynx. Because blood does not pool in the hypopharynx and oropharynx, patents do not gag or cough as much. Blood can be removed using a large-bore suction catheter.

The position might seem a bit strange at first for the bronchoscopist, especially when the dependent side is opposite to the 'working" space. If necessary, and so long as there is enough leeway between the light source and the patient, the bronchoscopist can "change sides".

The fetal position could be used by the bronchoscopist while sleeping and dreaming about bronchoscopy. The trigger position, also known as in French, or referred to as the plegaria mahometana in Spanish, is the position used by patients with pancreatic disease to diminish their abdominal pain. The awkward position is any position that might be uncomfortable to either the bronchoscopist or the patient!

答案 5.8 C

侧卧位，出血侧朝下，通常被称为安全体位。血液在重力作用下容易在支气管分支中形成血凝块，这一体位可以防止血液溢到对侧气道和越过隆突。并且，血液很容易从口咽流出。由于血液不在口咽和舌咽部聚集，所以不会引起患者呕吐和咳嗽。血可用大口径导管吸出。

乍一看这一体位对于支气管镜检查者来说有些奇怪，尤其是需要检查的患侧位朝下，不方便于支纤镜操作。如果有必要，只要患者与光源之间有足够余地，可以令患者转换体位为"相反的体位"。

对于支气管镜检查者来说，胎姿势只能在患者熟睡使用。触发体位，法语称为 chien de fusil，西班牙语 plegaria mahometana，胰腺疾病患者以此体位可缓解其腹痛症状。而被动体位使操作者和病人都不会舒服！

Created on **エラー! ブックマーク名が指定されていません。**

Answer V.9: E

Bronchoalveolar lavage should be atraumatic and gentle. Excessive coughing should be avoided because it leads to contamination of fluid with blood or mucus, and increases patient discomfort. Warming the lavage fluid to 37 degrees Centigrade may help prevent coughing or bronchospasm, especially in patients with known hyperreactive airways disease.

Careful wedging of the bronchoscope within the lavaged bronchial segment assures that lavage fluid does not spill out past the distal end of the bronchoscope, and avoids contamination with bronchial cells. Levels of suction greater than 50 mm Hg are known to cause distal airway collapse that hinders fluid collection.

5.9 答案 E

支气管肺泡灌洗是柔和且无创的操作。但应避免应用于严重咳嗽的患者，因为血液和粘液会使液体污染，而且增加患者的不适。将灌洗液加热到 37℃能避免引起咳嗽和支气管痉挛，特别是对一些明确有气道高反应性的病人。

将支气管镜柔和地楔入需要灌洗的支气管内以保证灌洗液不会淹没并超过支气管镜的远端末，并避免被支气管上皮细胞污染灌洗液。抽吸力不能过大，因大于 50 mmHg 水平的抽吸力即可导致气道末端塌陷，阻碍液体回收。

Bronchoscopy International copyright 2013

Answer V.10: E

The most difficult abnormalities to discover during bronchoscopy are lacerations of the trachea or bronchus. Sometimes there is simply a subtle disruption of posterior longitudinal elastic (often referred to as tramlines). Other times the disruption is difficult to see because the space has been filled with a forward-displaced esophagus.

Flexible bronchoscopy is helpful in patients with blunt or sharp chest trauma in order to exclude airway injury. Bronchoscopy is also helpful to treat related problems such as atelectasis by removing blood, foreign bodies, or mucous from the central and peripheral airways. Ongoing distal hemorrhage might require endotracheal intubation or other bronchoscopic therapies including electro coagulation or balloon tamponade.

Airway injury is not always clinically suspected so many practitioners perform bronchoscopy routinely in all cases of blunt chest trauma. Patients with symptoms such as flail chest, pneumothorax, hemothorax, subcutaneous emphysema, pneumomediastinum, stridor, or focal wheezing should undergo bronchoscopic examination.

In order to fully inspect the airways, each and every portion of the tracheobronchial tree, including the subglottis (there can be a tear at the level of the cricoid cartilage for example) should be repeatedly examined.

答案 5.10 E

支气管镜检查过程中最难发现的异常是气管或支气管撕裂伤。有时仅仅是一个细微的后纵向弹性膜的撕裂（常称为轨道征），其它的断裂由于前向移位的食管掩盖，很难检查到。

支纤镜检查有助于为胸部钝性或锐性伤的患者排除气道损伤。支纤镜检查也有助于相关疾病的治疗如去除气道内积血、异物、或气道分泌物，因此可治疗由上述因素导致的部分或完全肺不张。如支气管远端正在出血，可能需要气管插管，或其他支气管镜介入治疗，例如电凝或球囊填塞。

气道损伤在临床上并不少见，所以许多检查者对所有的胸部锐器伤病例实行常规的支气管镜检查。患者如有连枷胸，气胸，血胸，皮下气肿，纵膈积气，喘鸣，气喘等症状，均应接受支气管镜检查。

为了全面检查气道，每一个气管支气管树，包括声门下部分（例如环状软骨水平的撕裂伤）应反复检查。

Bronchoscopy International copyright 2013

Answer V.11: C

Recurrent respiratory papillomatosis is a chronic disease caused by human papilloma virus (HPV). Clinical manifestations range from hoarseness to complete central and peripheral airway obstruction. This disease affects both children and adults, and was first described in the 17th century as “warts in the throat”. The most frequent site of occurrence is the vocal cords. Often patients are erroneously treated for asthma for years before diagnosis is made by laryngoscopic or bronchoscopic examination.

Currently reported incidence is 1.8 per 100,000 population. The Recurrent Respiratory Papillomatosis Foundation (RRPF) regularly updates these statistics. Several different HPV subtypes have been identified. Mode of transmission remains unclear, but genital-oral sex has been a proposed mechanism. Disease is recurrent and persistent. Remission is variable and unpredictable.

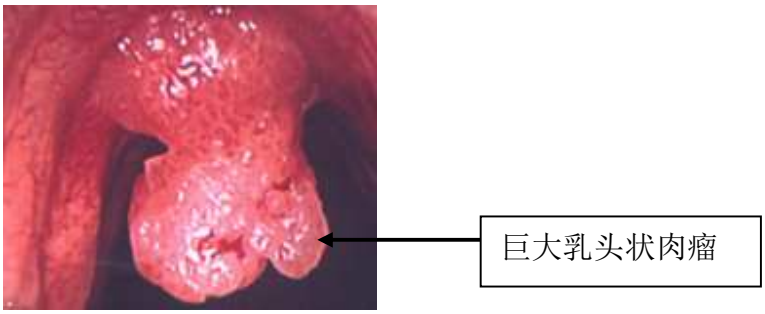
Proposed treatments include bronchoscopic laser resection, photodynamic therapy, and antiviral therapy. Malignant transformation has been reported.
Carcinoid tumors, adenoid cystic carcinoma, endobronchial sarcomas, and endobronchial lipomas have very distinct appearances. Check out the Bronchoscopy Atlas to learn more!!!

答案 5.11 C

复发性呼吸道乳头状瘤是由人类乳头状瘤病毒（HPV）引起的一种慢性疾病。临床症状轻者表现为声音嘶哑，重者表现为中央和外周气道完全阻塞。该疾病在 17 世纪被首次发现，并被描述为“喉咙中的疣”，儿童和成年人均可发病。最常见的发病部位是声带。在由喉镜或支气管镜检查确诊之前，患者往往被误诊为哮喘而治疗多年。

目前，该病的发病率为：每十万人口中 1.8 人发病。复发性呼吸道乳头状瘤基金会（RRPF）定期更新这些数据。几种不同的 HPV 亚型也已确定。传播途径尚不清楚，但口交被认为是可能的机制之一。该疾病迁延不愈，反复发作，缓解难以预测。

近年来提出的治疗方法包括支纤镜下激光切除术，光动力治疗，抗病毒治疗。有报道该疾病可恶变。类癌，腺样囊性癌，支气管内肉瘤，脂肪瘤等在支气管内的表现存在显著差异。可以查阅支气管镜图集以了解更多！



Created on **エラー! ブックマーク名が指定されていません。**

Answer V.12 D

The majority of tracheobronchial injuries are discovered within 2 centimeters of the carina. Injuries include bruising with focal or diffuse mucosal erythema and swelling, partial and total mucosal disruption, intrapulmonary hemorrhage with airway bleeding, tracheal or bronchial laceration with displacement, airway disruption with associated esophageal injury, and foreign body (teeth for example) inhalation.

Knowledge of the mechanism of injury can help the bronchoscopist plan an airway examination. Blunt injuries such as those from direct chest impact during a motor vehicle accident often cause pulmonary contusion with associated interstitial and alveolar hemorrhage or edema.

Trauma victims are at increased risk for acute respiratory distress syndrome. Tracheal or bronchial disruptions may be discovered immediately on arrival to the hospital or later during the course of hospitalization. The bronchoscopic examination must be done carefully. The adage “airway injury is present until I have proven to myself otherwise” is a good rule of thumb.

答案 5.12 D

大部分的支气管损伤发生在隆突 2 厘米内。损伤包括轻度擦伤，表现为局灶性或弥漫性粘膜红斑、肿胀；还包括局部和整体粘膜断裂、气道肺内出血、气管或支气管移位破裂、气管及食管损伤、异物（如牙齿）误吸。

对损伤机制的了解有利于支纤镜检查者进行气道检查。钝器伤如在机动车事故中对胸部的直接撞击往往导致肺挫伤，引起肺间质及实质出血、水肿。

胸外伤患者患急性呼吸窘迫综合征的风险增加。气管或支气管断裂可能在抵达医院后立即被查出或在住院治疗中被发现。支气管镜检查必须小心。 “气道损伤一定存在，直到我证明了自己”是很好的格言。

Bronchoscopy International copyright 2013

Answer V.13: C

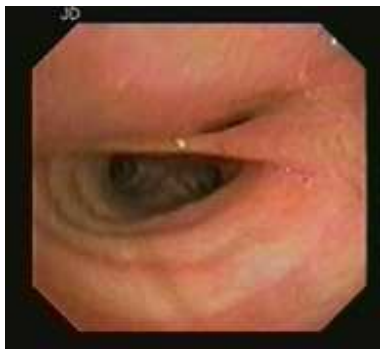
The abnormality shown along the posterior wall of the trachea is an H-fistula in a 30 year old woman who had been erroneously treated for asthma for several years. She reported recurrent episodes of pneumonia and bronchitis with wheezing and shortness of breath. She also had a history of several minor congenital defects, including an esophageal abnormality that required surgical correct shortly after birth.

The H-type fistula is the only congenital tracheoesophageal fistula without esophageal atresia. It comprises about 5-8 percent of all congenital tracheoesophageal fistulas (the most common type is that of complete esophageal atresia with a high blind esophageal pouch and a low tracheoesophageal fistula connecting the lower esophageal portion with the trachea at the level of the carina or left main bronchus).

In the H-type fistula, the esophagus is normal except for the high communication with the trachea. Surgical repair of the fistula can leave a blind pouch extending from the trachea, which was the case in this patient. The pouch would regularly fill airway secretions, which would become infected, prompting cough, bronchitis, and wheezing.

Segmental stenosis can occur anywhere along the length of the trachea, and may be funnel-shaped or consistently narrow along its entire length. It may accompany a tracheal bronchus to the right upper lobe bronchus, often arising directly below it.

Tracheoceles are an outpouching of the posterior membranous wall of the trachea, forming a true diverticulum. They are usually the result of structural weakness. Although usually asymptomatic, they can also cause recurrent aspiration pneumonia from retention of secretions.



答案 5.13 C

这个沿气管后壁的病变是一个 H 型瘘管，发生在一个 30 岁的女人身上，她被误诊为哮喘已经多年。患者有反复发作肺炎和支气管炎病史，每次发病主要症状为气喘及呼吸困难；既往史有一些小的先天性缺陷，如食道异常的病史，但其在出生后不久就接受了手术矫正。

H 型瘘管是先天性气管食管瘘中唯一不伴有食道闭锁的一种类型，其大约占所

Bronchoscopy International copyright 2013

有先天性食管气管瘘的 5-8%（最常见的类型是伴有完全性的食道闭锁，并在在隆突或左主支气管水平同时有一高位盲端和一低位食管气管瘘连接在一起）。

在 H 型瘘管中，食道除了与气管上段相通外，其余正常。瘘管修补术可以保留一个从气管引出的盲端，正如此例患者如今的情况。盲端会定期地被呼吸道分泌物填满，并诱发感染，引起咳嗽，支气管炎和喘息发作。

节段性狭窄可发生在支气管全长的任何地方，并可能形成漏斗状或沿着气管全程越来越窄。节段性狭窄可以随气管延续到支气管至右上叶支气管，常常到达右上叶支气管正下方。

气管粘膜疝样突出是气管后壁外翻形成一个真性的憩室，其通常发生在结构薄弱的地方。通常无明显症状，但常常也可以由于分泌物滞留引起反复发作的吸入性肺炎。

Answer V.14 D

Most patients with benign airway strictures require more than one therapeutic bronchoscopy. More than half the strictures treated by dilatation alone will recur. In addition, many patients treated by laser resection alone also recur. When airway stenting is warranted, stents are usually left in place for many months before removal is attempted. This allows a circumferential rim of scar tissue to form around the stent. When the stent is removed, this scar tissue helps maintain a patent airway lumen.

Stent related complications such as stent migration, granulation tissue formation and obstruction by thick secretions might require repeat procedures. These complications

盲端

Bronchoscopy International copyright 2013

have been noted to occur in as many as 20 percent of patients with indwelling airway stents. Most experts agree that silicone stents migrate more frequently than self-expanding metal or hybrid (metal and silcone) stents, but cause less tissue overgrowth.

答案 5.14 D

大多数良性气道狭窄病人需要支气管镜下多种介入治疗措施，良性气道狭窄经单纯的扩张治疗后复发率超过 50%。此外，单纯的激光切除术后复发率也很高，因此气道内支架置入术是非常必要的。在取出支架之前，通常需要使支架在植入部位保留很长一段时间，这使得支架周围的疤痕组织围绕支架生长而形成环状。当支架拆下时，这样的疤痕组织可以帮助保持气道管腔通畅。

关于支架植入术的并发症，例如支架移位、肉芽组织形成、粘稠的分泌物阻塞管腔等，可能需要重新置入术。已经发现：高达 20%的气管支架留置患者会出现上述这些并发症。大多数专家认为，虽然硅胶支架发生移位的几率高于自动膨胀金属型支架或混合型（金属和硅）支架，但其引起组织过度增生的副作用相对较少。

Although stent-related complications occur frequently, they are very rarely life-threatening. In addition, bronchoscopic therapy (dilatation, laser resection, or stenting) is frequently successful in appliating or curing the effects of benign airway stenosis. Therefore, bronchoscopic therapies should probably be considered in patients who are unsastisfactory surgical candidates because of poor respectability or poor operability, in patients who are temporarily too ill to undergo curative surgery, and in those patients who do not desire surgery for personal reasons.

Of course, in expert hands, most benign tracheal strictures can be repaired surgically. However, many expert bronchoscopists believe that bronchoscopic therapies such as dilatation, airway stenting, argon plasma coagulation and electrocautery, and Nd:YAG laser resection.should also be considered even if patients are surgical candidates. Procedure related mortality is less than 1 percent. If unsuccessful, surgical management remains possible so long as a potentially permanent foreign body (such as a metal stent) has not been inserted.

Nd：YAG 激光切除声门下狭窄

虽然气道内支架置入的相关并发症经常发生，但很少危及生命。此外，支气管镜介入治疗（扩张，激光切除，或支架置入术）通常在治疗良性气道狭窄方面效果理想。因此对那些不具备良好的外科手术治疗条件的患者如身体状态而不能承受外科治疗，或可手术性差，或或由于患者的个人因素而不愿手术者，可以考虑支气管镜介入治疗。

当然，在专家的手中，大多数良性气管狭窄可以手术修复。然而，许多支气管镜专家认为：即使病人符合外科手术治疗的适应症，也应该考虑支气管镜介入治疗，如气道支架置入术、氩离子凝固和电灼、 Nd：YAG 激光切除等。因支纤镜介入治疗的死亡率不到 1%。如果支气管镜介入治疗不成功，手术治疗仍然是可行的，只要永久性的异物（如金属支架）没有被植入。

Answer V.15 D

Percutaneous tracheotomy is not warranted and could be hazardous in this patient. Access to the trachea might be prevented because of the tracheal stent. In addition, the condition of the tracheal and bronchial stricture is not known.

All of the other behaviors described are possible warranted. It is most reasonable to provide supplemental oxygen, and to obtain a chest radiograph in order to identify the airway stent and assess the radiographic integrity of the tracheobronchial lumen. It is reasonable to prepare for flexible bronchoscopy in case a procedure needs to be performed urgently to establish an airway.

The interventional bronchoscopist should also be notified in case further intervention is required. In addition, an anesthesiologist with experienc in difficult airway management should probably be asked to come to the bedside until the patient is clinically and hemodynamically stable.

答案 5.15 D

经皮气管切开术是没有必要的，并且对病人可能是危险的，因为气管支架的存在会妨碍气管切开的顺利进行。此外，对气管和支气管狭窄的状况目前尚不清楚。

上述题目中其它选项所描述的措施都可能是必要的。吸氧是最合理的，拍胸部 X 光片以确定和评估气道支架和气管管腔的完整性也是正确的，当需要紧急建立人工气道时准备纤维支气管镜是合理的。

当需要进一步进行介入治疗时，应通知支气管镜介入治疗专家。此外，具有气管管理经验的资深麻醉师一直留在患者床边，直到患者的临床情况及血流动力学稳定。

Bronchoscopy International copyright 2013

Answer V.16: D

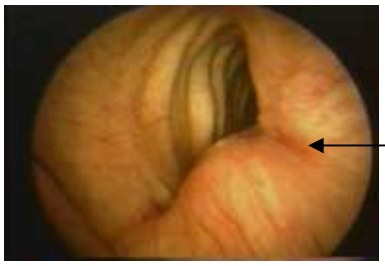
Patients with intraluminal disease only can usually be treated using bronchoscopic modalities other than stenting. Airway stents, however, have become a necessary adjunct to other bronchoscopic therapies in order to palliate extrinsic compression due to malignant and benign tumors, and to treat airway strictures in patients who refuse curative surgery, are not candidates for surgery because of underlying disease, and in patients who are unresectable because of extent of airway involvement.

Patients with tracheo-esophageal fistulas can receive airway stents as well as esophageal stents in an effort to palliate symptoms and improve quality of life. Airway stents are made of silicone, metal, of both. They may be self-expanding or require dilatation. Stents can be placed using rigid and flexible bronchoscopy.

答案 5.16 D

腔内疾病患者通常只适合于支纤镜介入治疗而并非气道内支架的置入。然而，气道内支架的置入作为支纤镜治疗的一项必要手段，可以缓解以下患者的呼吸困难症状：因恶性或良性肿瘤导致气道外压性狭窄的患者、拒绝手术治疗或不适合手术治疗的气道狭窄的患者，以及因气道受累范围广而无法进行手术切除的患者。

气管食管瘘的病人为了缓解症状和提高生活质量，可以接受气道支架以及食管支架植入。气道支架是由硅、金属或两者混合组成的，有的具有自我膨胀性能，有的需要人工扩张。硬质支气管镜和纤维支气管镜均可进行支架置入。



此例食道癌患者有食道内支架的置入，其气管上段的右后侧壁有一腔内肿物的膨出。如果患者有呼吸困难症状，应该考虑置入气管内支架。

Bronchoscopy International copyright 2013

Answer V.17: A

Aspergillus species are hyphae with narrow, parallel walls, frequent septa and dichotomous branching at 45-degree angles. Tissue invasion is noted on biopsy when aspergillus infection is tracheobronchial, or invasive. Bronchoscopically, aspergillus infections are suspected when a felt-like membrane is found covering the main stem or parts of the lobar or segmental bronchi.

Greenish–yellow thick exudates such as those seen in the figure below are found overlying an easily friable airway mocosa. Positive sputum or airway secretions, including BAL cultures in patients with severe neutropenia suggest an invasive form of the disease.

答案 5.17 A

曲霉菌属呈菌丝状，有细长、对称的细胞壁常在细胞内有中隔或呈 45 度角的二叉分枝。侵袭性曲霉菌感染气管支气管后经组织活检可确诊。曲霉菌感染在支纤镜下检查可发现一层毛毡样的膜状黄绿色分泌物附着在主支气管或叶、段支气管粘膜表面。

图中显示的为厚厚的黄绿色分泌物看起来犹如质脆易碎的气道粘膜层；痰液、支气管分泌物包括支气管肺泡灌洗液培养阳性以及严重的粒细胞缺乏提示侵袭性肺曲霉菌病。

Bronchoscopy International copyright 2013

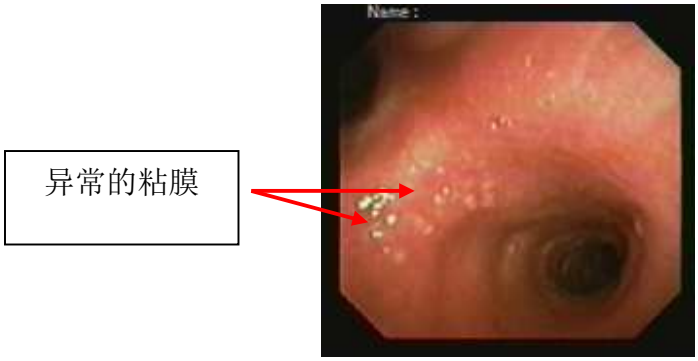
Answer V.18: C

Sarcoidosis remains a diagnosis of exclusion. Sarcoidosis may have several endobronchial appearances, none of which are specific: mucosal nodularity, hypertrophy hyperemia, edema, and bronchial stricture). Small raised whitish lesions can be seen, or mucosa may be granular, firm, erythematous or thickened. Other granulomatous diseases may also have these appearances. Greatest yield for diagnosis is from combined bronchoscopic and endobronchial biopsies. Endobronchial biopsies may contain disease even when the mocosa appears normal bronchoscopically. Transcarinal needle aspiration can also be helpful in patients with mediastinal adenopathy.

Histoplasma infection would usually appear as a hard, glistening mass with adjacent calcified adenopathy. Mycobacterial infection usually causes chronic strictures. During acute disease, caseous material from enlarged lymph nodes can penetrate through the bronchial wall, but this material is usually soft, gritty and white.

Small cell carcinoma is unlikely in a lifelong nonsmoker (women, and lifelong nonsmokers more frequently have adenocarcinoma). In addition, the bronchoscopic appearance of small cell carcinoma is usually that of an infiltrating mucosal and submucosal abnormality.

Sarcoma usually appears as a rubbery, difficult to grasp endobronchial abnormality. Sometimes, symptoms are not evident until complete bronchial obstruction occurs. The base of an endobronchial sarcoma is usually large. Tumors might extend into the main bronchus from an origin deep within a segmental bronchus. During bronchoscopic resection tumor must be removed down to their base in order to determine surgical respectability.



答案 5.18 C

Created on **エラー! ブックマーク名が指定されていません。**

结节病是一个非特异性诊断，其支纤镜下的表现多种多样，但每种表现均是非特异性的，（包括粘膜的小结节, 肿胀充血, 水肿以及支气管狭窄)。可见小的 隆起性白色损害及粘膜呈颗粒状、坚硬，红斑或增厚。其它肉芽肿性疾病也会有上述表现，支纤镜下支气管内活检对结节病的诊断至关重要。当支纤镜下表现正常时支气管内的活检也会发现许多疾病。 经环甲膜针吸活检对针对纵膈腺瘤病也有一定的帮助。组织胞浆菌属感染表现为一坚硬的, 白色的团块状阴影，周边有钙化。分支杆菌的感染常常导致气道慢性狭窄；在疾病的急性期, 干酪性的物质可 从肿大的淋巴结破溃穿透支气管壁，这些干酪性物质常常柔软，呈白色沙砾状。

从不吸烟者很少患小细胞肺癌 (妇女以及从不吸烟者常常患腺癌的机率较大)。而且，小细胞肺癌在支纤镜下的表现常常为粘膜的渗出性病变及粘膜下的异常。肉瘤质韧犹如橡胶样，支气管内肉瘤的早期往往很难发现其在支气管内的异常。有时在支气管腔完全堵塞之前，患者临床无明显异常症状。支气管内肉瘤的基底膜常常宽阔，因此，在进行支纤镜下肉瘤的切除时，常常必须切除宽阔的基底膜，以决定是否还需要外科进一步治疗。

Bronchoscopy International copyright 2013

Answer V.19: E

Rather than twist the insertion tube, which might damage the bronchoscope (and, by the way, is very inelegant), it is wiser to ask the assistant to rotate the handle of the forceps until reorientation of the distal biopsy cups occurs. One can also ask the assistant to hold the bronchoscope where it enters the nose or the mouth so that vertical motion of the bronchoscope is stopped.

Multiple submucosal passes with a bronchoscopic needle can be made to obtain cytology samples. Occasionally, the needle will make holes that are big enough for the biopsy forceps to "latch onto" in order to obtain a deeper submucosal tissue specimen.

Sometimes blood and secretions prevent block the view whenever a forceps is "pushed out" beyond the tip of the bronchoscope. In this case, consider removing the bronchoscope and preloading it with the forceps. The distal end of the forceps should be kept at the distal extremity of the bronchoscope's working channel, and the ensemble reinserted. This way, when the lesion is approached, the forceps can be advanced without any accompanying secretions or blood coming out from within the working channel.

The toothed forceps (see figure below) will sometimes anchor itself in the lesion, which can then be sampled in depth.

答案 5. 19　E

粗暴地转动内镜插入管很容易损坏支纤镜，明智的选择是让助手反复转动活检钳的手柄，直到其重新定位；也可以让助手在患者的鼻腔或口腔外（根据支纤镜经鼻或经口插入的不同）握住支纤镜用以固定，这样可以防止支纤镜的垂直移动。

对支气管粘膜下进行多点针吸活检可得到细胞学标本。有时，针吸穿刺后的穿刺口较大，可以使活检钳通过，因此可得到一个较深部位的组织标本。

有时侯当活检钳伸出支纤镜的工作通道时，血和分泌物却遮盖了视野，这种情况下，您可以考虑将活检钳连同支纤镜作为整体一起移开，移动时活检钳的远端

Bronchoscopy International copyright 2013

应该保持在支纤镜工作通道的最末端，这样的话，活检钳在接近损伤的部位移动时就没有血液或分泌物从支纤镜的工作通道流出来。

齿钳（如下图所示）可以在病变部位固定良好，这样就可以得到深部的组织标本。

Bronchoscopy International copyright 2013

Answer V.20: E

All of the proposed answers are correct in regards to response to bleeding. Most frequently, however, bronchoscopy-induced bleeding is slight, and the tip of the flexible bronchoscope is simply covered with a film of blood. This film is best removed by scraping the distal tip of the bronchoscope against the airway wall of a nonbleeding area. The examination can then be resumed.

Should such “red out” recur more than once during the course of an examination, this procedure can be repeated as often as necessary. A small amount of saline instilled through the bronchoscope might also help. Has anyone invented a “bronchoscopic windshield wiper yet”?

答案 5.20 E

对于支纤镜活检时的出血，下述所有的处理措施均是正确的。然而最常见的是，支纤镜活检时的出血是轻微的，出血可形成一层薄薄得膜遮盖支纤镜远端的镜头。这时，应该在不出血部位的支气管内壁蹭掉这次薄膜，然后才能重新进行检查。

如果在支纤镜检查的过程中这种“出血变红”的情况反复出现，上述这样的处理措施应该重复实施。少量的生理盐水注入也是有帮助的，难道至今还没有人发明一种 “支纤镜专用的风档雨雪刷”来处理这种情况吗?

Bronchoscopy International copyright 2013

Answer V.21: C

Results from most studies suggest that at least four biopsy samples are necessary for diagnosis of most illnesses. Yield increases with the number of samples up to 6 samples, but does not increase after that. Of course, if specimens are being sent for culture, additional specimens may be necessary. More samples may also be warranted in lung transplant recipients for diagnosis of lung rejection and other disease processes.

Whether large or smaller sized forceps should be used for tissue retrieval has been controversial. It appears that greater numbers of alveoli per piece of tissue increases the ability to make a diagnosis of infection if tissue is handled properly. There does not appear to be an increased risk of bleeding or pneumothorax based solely on forceps size.

答案 5.21 C

大多数研究结果显示：至少 4 块标本组织才能满足大多数疾病诊断的需要。标本数量增加到 6 块组织，诊断的准确率会随着提高，但超过 6 块组织，对诊断的帮助不再随着增大。当然，如果组织标本送去进行培养，增加标本量也许是必要的。对于肺移植术后的患者，如果怀疑排斥反应或其它病理过程，更多的标本量才对诊断有更大的价值。

活检钳的大小型号的不同对获得的组织标本对诊断的阳性率是否有影响目前尚有争议。如果组织标本处理得当，每块组织标本中包含的肺泡数量越多，那么对感染性疾病诊断的价值似乎就更大。活检钳大小型号的不同对气胸的发生率并无影响。

Bronchoscopy International copyright 2013

Answer V.22: B

The reported incidence of procedure related pneumothorax is 1 %-4 %. Not all of these require chest tube drainage, and not all of these are symptomatic. Conventional wisdom rather than clinical research suggests that fluoroscopic guidance, proper biopsy technique, and careful patient selection help decrease the risk of pneumothorax.

答案 5. 22 B

根据报道，与支纤镜活检相关的气胸的发生率为 1 %-4 %，但并非所有发生的气胸均需要胸导管引流，也并非所有的气胸均有气促等临床症状。普通的常识 而告诉我们：荧光引导，娴熟的技术以及仔细耐心的适应症的选择将大大减少气胸的发生率，这些常识无需临床研究来支持。

Answer V.23 B

There seem to be fewer and fewer reasons to obtain bronchoscopic lung biopsies. The yield for infectious lung disease using bronchoalveolar lavage alone is excellent, and little is gained by obtaining tissue specimens. In patients with miliary tuberculosis and in whom sputum smears are negative, the combination of brushing, BAL, and biopsy, however, are diagnostic in 80% of patients.

Tissue is also useful for diagnosing diffuse pulmonary mycoses, although biopsy is seldom helpful when lesions are focal and nodular. In patients with sarcoidosis, noncaseating granulomas may be found in endobronchial biopsies, transcarinal needle aspiration specimens, and bronchoscopic lung biopsy samples. It appears reasonable to obtain tissue using all methods in an attempt to increase diagnostic yield for this disease.

In patients with interstitial lung diseases, findings are too often nonspecific. A diagnosis of “fibrosis” is of little benefit. Patients are better served by careful evaluation of computed tomography scan results and clinical history. Bronchoscopic biopsy can be helpful to confirm hypersensitivity pneumonitis. Thoracoscopic lung biopsy is eventually required for satisfactory and definitive tissue diagnosis of many interstitial lung diseases other than Idiopathic pulmonary fibrosis.

答案 5. 23 B

对于支纤镜下肺活检，似乎对其支持的理由越来越少。对肺部感染性疾病的诊断，单独以支气管肺泡灌洗液即可得到较准确的诊断结果，而组织标本却对诊断的价值甚微。对于粟粒性肺结核或痰涂片阴性的肺结核患者，以刷检、支气管肺泡灌洗液、活检等手段联合，也只能确诊 80% 的患者。

虽然组织标本对诊断肺部真菌病有很大价值，然而当病灶是局部性的或结节性的, 纤支镜下肺活检的意义却不大。对于患有肉瘤样病 的患者，纤支镜下支气管内的组织活检标本，经气管软骨针吸活检的标本及纤支镜下肺活检的标本均可发现非干酪性的肉芽肿。为了明确对肉瘤的诊断，采用多种方法去设法得到组织标本是的 必要的。

Bronchoscopy International copyright 2013

Answer V.24: B

The use of the “float sign”…where a biopsy specimen is seen to float on the surface of liquid fixative because it contains aerated alveoli has been shown to be unreliable in predicting the presence of representative tissue.

答案 5. 24 B

“浮萍征”是指支纤镜下肺活检得到的标本漂浮在固定液上面，由于组织标本中含有充气的肺泡，因此其可浮在固定液上面。“浮萍征”并不能说明活检取得的组织标本能代表组织特征。

Bronchoscopy International copyright 2013

Answer V.25: C

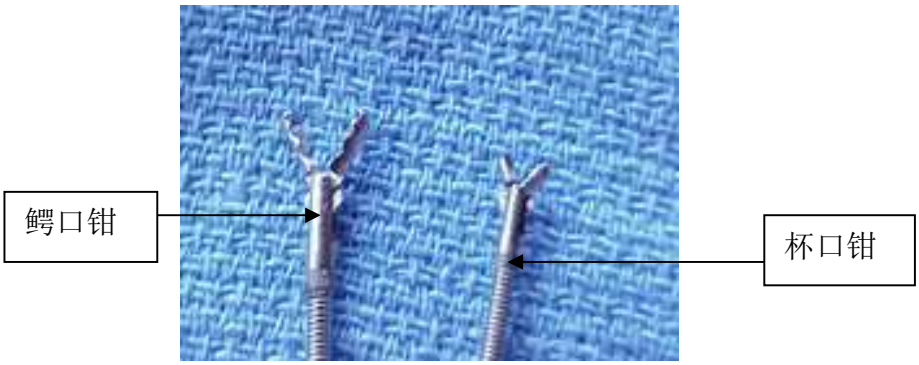
Most important in achieving a diagnosis is to sample a representative area and to obtain representative tissue. If only bronchial tissue is obtained, the procedure should not be called negative. Rather, one should recognize that the procedure was not diagnostic because nonrepresentative tissue samples were obtained. The procedure should be repeated unless physicians prefer to select a different diagnostic approach.

Although smaller sample size can make histologic interpretation more difficult, most studies have not shown that smaller samples significantly reduce diagnostic yield from bronchoscopic ling biopsy. In fact, at least one study has shown that small cup forceps, which are easily passed into the peripheral subsegmental bronchi, perform better in obtaining alveolar samples than larger alligator forceps. Alligator forceps have a greater tissue-tearing action than a cup forceps, but studies have not shown that the type of forceps blade effects diagnostic yield (See Figure of alligator and cup forceps).

答案 5.25 C

为了明确诊断而进行纤支镜下的组织活检时最重要的就是得到有阳性病变的组织标本。如果取得的组织仅仅是支气管组织，不应该认为是诊断是阴性，而应该认识到是由于取材失败才导致诊断无法明确。因此，重新或反复取材是必要的，直到内科医师决定选择其它的检测手段以明确诊断。

尽管活检得到的组织标本量较少时对辨别组织来源有一定的困难，但大多数研究显示：以鳄口钳活检取材，即使标本量少，也并不影响诊断。实际上，至少一项研究结果支持：小型号的杯口钳可以深入到亚段支气管的外周进行取材，因此，其优于大型号的鳄口钳之处在于：能更完整的得到肺泡组织。但鳄口钳对组织的撕裂作用优于杯口钳。尽管如此，目前尚无研究表明：选择不同型号活检钳取材会对疾病的诊断产生影响。(下图显示的是鳄口钳及杯口钳).



Created on **エラー! ブックマーク名が指定されていません。**

Answer V.26: D

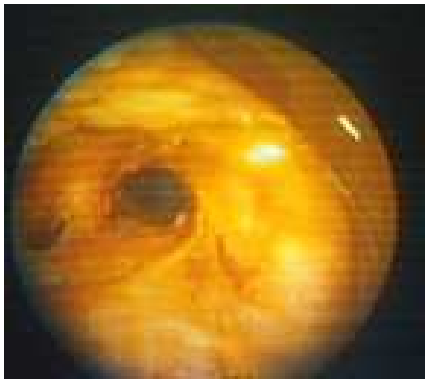
Diffuse narrowing of the entire tracheal is seen in all but Klebsiella rhinoscleromatis infection (although exceptions may occur!). This disease, which is endemic in parts of Mexico, can also involve the sinuses. Both short and long segments of trachea can be narrowed. Also known as Scleroma, this illness usually causes focal tracheal narrowing in the upper half of the trachea (see figure below).

Often, secretions and airway mucosa have a yellowish color. Scleroma is usually responsive to trimethoprim-sulfa antibiotics. Other diseases that frequently cause strictures in the upper half of the trachea are Wegener's granulomatosis (usually firm erthematous or pale stricture), squamous papillomatosis (single or multiple papillomas easily visible), and viral tracheitis (mocosa red and inflamed).

答案 5.26 D

整个大气道的广泛性狭窄常见于多种疾病，但应**不应该出现于**鼻硬结克雷伯菌病(虽然有个例除外)。此病曾部分流行于墨西哥，经常侵犯鼻窦。气管的长段及短段均可受侵犯而变窄。鼻硬结克雷伯菌病也被称为硬结病，此病常常导致气管的上段局限性狭窄（下图所示）。

硬结病的气道粘液及分泌物常常呈黄色，此病常常以磺胺甲氧苄氨嘧啶治疗有效。能导致气管的上段局限性狭窄的疾病还有 Wegener's 肉芽肿 (往往伴有坚硬的红斑及苍白色的狭窄)、鳞状乳头状肉瘤(镜下可见单个或多发的乳头状肉瘤)、以及病毒性气管炎 (粘膜充血及发炎)。



Bronchoscopy International copyright 2013

Answer V.27: A

The proximity of the pulmonary veins at the level of the middle lobe bronchus and lower lobe bronchi bilaterally increase the dangers of bronchial wall perforation during bronchoscopic debulking, laser resection, brachytherapy and stenting in these areas. The operating ‘angle” readily prompts one to work increasingly posterior and medially; thus directly threatening vascular structures such as the pulmonary veins that lie along the medial and posterior walls of the lower lobe bronchi.

答案 5. 27 A

肺静脉的解剖部位非常靠近中叶支气管及双侧的下叶支气管，因此在进行纤支镜下的的全长走行。在进行纤支镜下的斑块切除术、激光切除术、 短距离放射治疗术及支架置入术时，很可能导致支气管壁穿透。由于操作的‘角度” 旋转很容易促使操作者向中后方倾斜; 因此很容易直接波及到肺血管组织，尤其是肺静脉，因肺静脉在靠近支气管分支的中后壁与之伴随走形。

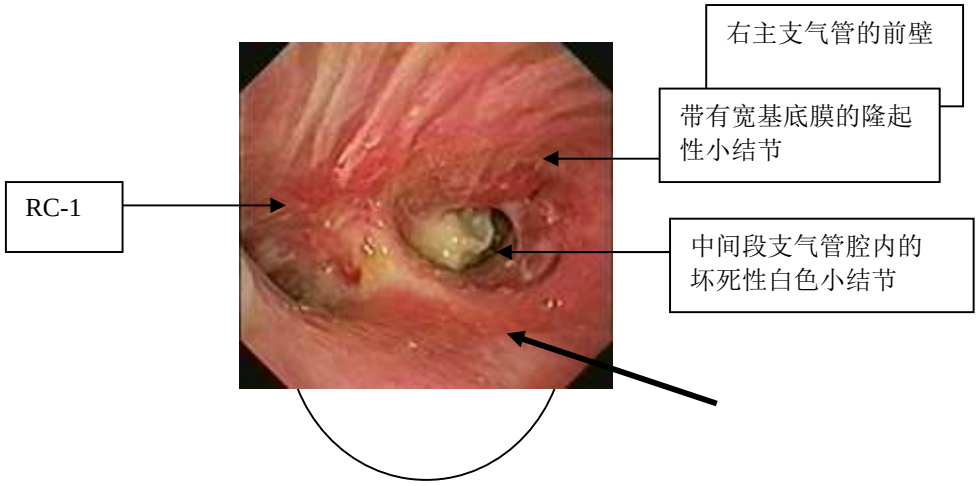
Bronchoscopy International copyright 2013

Answer V.28 C

Three endobronchial lesions are clearly visible. Imagining the airway as a clock face, and the carina as the central reference point, this is a photo of the right upper lobe bronchus (AT 9 O'CLOCK) and bronchus intermedius (AT 3 O'CLOCK). Bronchial thickening and probably intraepithelial carcinoma are present on the lateral wall of RC-1 at the entrance of the right upper lobe bronchus. The necrotic tumor is obstructing most the bronchus intermedius. In addition, a small, broad-based, raised erythematous nodule is present on the posterior-medial wall of the bronchus intermedius, directly above, but not attached to the white necrotic nodule below.

答案 5.28 C

三种支气管内的病变清晰可见。将气道的横断面想象成一个钟面，将隆脊作为参照点，下图显示的时右上叶支气管的横断面(定位于 9 点的位置) 和中间段支气管(定位于 3 点钟的位置)，在右上叶支气管的入口处的侧壁（RC-1）可见到管壁增厚或支气管上皮癌。肿瘤的坏死物堵塞了中间段支气管的大部分管腔。另外，中间段支气管的后内侧壁可见有一宽基底膜的红色小凸起，在其正上方，可看到白色的坏死性结节，此结节相对独立，与上述管腔内的白色坏死物并不相连。



Bronchoscopy International copyright 2013

Answer V.29: E

Photodynamic therapy causes erythema and edema shortly after treatment. This is followed by necrosis and sloughing of “dead” tissues, which requires flexible bronchoscopy for removal. Suture dehiscence can be a sign of local bacterial or fungal infection in patents that have undergone bronchial resection and reanastomosis for lung transplantation, tumor resection, or repair of benign strictures and traumatic injuries. Focal strictures can occur as a result of bronchoscopic therapies, but also following open surgical airway repair. Strictures may be firm or with associated malacia.

Charring and focal necrosis may be seen following laser resection, electrocautery or argon plasma coagulation. Inflammation, swelling and segmental narrowing may be the result of brachytherapy, endobronchial injection of chemotherapeutic agents, resectional modalities, but also of external beam radiation therapy.

答案 5. 29 E

光动力学治疗治疗后不久局部可出现红斑及水肿，随之即可出现组织坏死和腐烂，而后者需要纤支镜去清除掉。对于支气管切除术后的患者、肺移植术后的患者，气道良性狭窄修复后的患者及气道挫裂伤修复术后的患者，缝合口的裂开是细菌或真菌感染的标志，气道局部狭窄不仅发生于纤支镜治疗后，也常常发生于外科气道修复术后。气道狭窄局部可以是坚硬的，也可以与组织软化相关的。

激光切除术后、电烙术及氩气凝固术后均可导致局部组织的碳化及坏死。而短距离放射治疗, 支气管内化疗药物注射、切除成形术，外束线放射治疗等均可导致气道局部肿胀及段支气管狭窄。

Bronchoscopy International copyright 2013

Answer V.30: B

One French size corresponds to 0.333 mm, and 1.0 mm corresponds to 3 French. A 5 French balloon catheter, therefore, is about 1.65 mm wide. It is important to know the balloon size of any balloon catheter being used for bronchoscopic therapy. Usually, the deflated balloon size for most catheters is at least 1 French greater than the French size of the catheter itself.

The inflated balloon size is about double the French size of the catheter itself. Therefore, a 5 French catheter would have a deflated balloon measuring approximately 6 French (about 2.0 mm), and an inflated balloon size of about 10 mm.

Using a normal size diagnostic bronchoscope with a working channel diameter of 2.2 mm, a 7 French balloon catheter will not fit easily through the working channel. A 3 French catheter will not have a balloon big enough to fully occlude a proximal segmental bronchus or distal lobar bronchus. A tamponade balloon could be used, but this would oblige the assistant to search for another bronchoscope. Remember that an 8 French catheter will be too large for the working channel of even a larger 2.6 mm working channel bronchoscope.

Hah! And you thought balloon dilatation was easy!

答案 5. 30 B

一法尺相当于 0.333 mm, 而 1.0 mm 相当于 3 法尺。一个直径为 5 法尺的气囊，其直径大约为 1.65 mm。纤支镜治疗时熟知气囊导管及球囊的大小是非常重要的。一般情况下，大多数导管的球囊在未充气状态下其直径比导管本身的直径大 1 法尺。而球囊在充气状态下的直径是导管本身直径的 2 倍。因此，一个直径为 5 法尺的导管所带的气囊在未充气状态下的直径约 6 法尺 (大约 2.0 mm), 而在充气状态下的直径约为 10 mm。

Bronchoscopy International copyright 2013

模块 V

阶段测试

Bronchoscopy International copyright 2013

阶段测试 模块 V

Post test instructions

The following test is designed to verify that you have completed and fully understood the 30 questions for Module V.

回顾性测试指引：

下列检测是为了证实你已经完成并充分理解了模块 V 的 30 个问题中所包含的所有知识内容。

模块测试后的问题及答案：模块 5

Question 1: Which of the following nomenclatures pertain to the left lower lobe posterobasal segment, and to the carina between the left upper lobe and the left lower lobe bronchus.

A. LB 8 and LC-2
B. LB 10 and LC-2
C. LB 9 and LC-2
D. None of the above

问题 1;下列哪些术语用来表达左肺下叶后基底段？哪些术语用来表达左肺上叶和左肺下叶之间的隆脊？

A. LB 8 和 LC-2
B. LB 10 和 LC-2
C. LB 9 和 LC-2
D. 以上都不是

Question 2: A small malignant endobronchial abnormality is noted in the bronchus intermedius 0.5 cm beyond the right upper lobe bronchial orifice. Transcarinal needle aspirations are positive. Computed tomography scans reveal no other organ involvement. Which of the following best describes this patient's clinical TNM stage.?

A. T3 N1 M0
B. T3 N2 M0
C. T2 N2 M0
D. T1 N2 M0
E. None of the above

问题 2：在右侧中间段支气管内距离右上肺支气管开口 0.5 厘米处发现一个小的恶性病变，经支气管针吸活检提示阳性。CT 扫描未发现有其他器官受累。以下哪项最能说明这名病人的 TNM 临床分期？

A. T3 N1 M0
B. T3 N2 M0
C T2 N2 M0
D T1 N2 MD
E 以上都不是

Question 3: Which of the following best describes the safety position during bronchoscopy

A. Turning the patient unto the left position to facilitate suctioning.
B. Turning the patient onto the lateral decubitus position, bleeding side down in case of bronchoscopically-induced bleeding.
C. Turning the patient unto the lateral decubitus position, left side down, in case of vomiting during bronchoscopy.
D. Tilting the bed into the reverse Trendelenberg position in case of bronchoscopically-induced bleeding.

问题 3：下列描述的哪个体位是行支气管镜检查时最安全的体位？
A. 使病人左侧位以方便吸痰。
B. 如支气管镜操作引起出血，让病人侧卧使出血面向下。
C. 如支气管镜操作诱发呕吐，让病人左侧卧位。
D. 如支气管镜操作引起出血，倾斜床头使病人头低脚高仰位。

Question 4: Which of the following best explains why airway lacerations and tracheoesophageal fistulas are easily missed during bronchoscopic examination?

A. Airway mucosa might swell and easily obliterate the lesion.
B. The fistulous tract might be partially obliterated with esophageal wall mucosa
C. The bronchoscopist has failed to perform a careful and diligent inspection
D. The fistulous tract spontaneously opens and closes and can sometimes only be discovered after probing supicous appearing areas using forceps.
E. All of the above

问题 4：对于支气管镜检查中易漏诊气管撕裂和气管食管瘘，以下哪项解释最合理？
A. 气管粘膜水肿容易掩盖损伤。
B. 食管壁粘膜容易部分掩盖气管食管瘘的瘘道。
C. 支气管镜检查者没有认真细致的观察。
D. 瘘道自发开闭，有时只能在探查中用钳子探查可疑的区域使其暴露出来才能发现。
E. 以上都是。

Question 5: Which of the following best describes endobronchial abnormalities caused by sarcoidosis ?

A. Mucosal nodularity, bronchial strictures, or hyperemia.
B. Mucosal edema, hypertrophy, or small raised whitish lesions.
C. Both a and b
D. Both a and b are correct, but airway abnormalities are nonspecific and can also be seen with other diseases.

问题 5：以下哪一项最能描述支气管内肉瘤病的镜下异常征？
A. 黏膜结节，支气管狭窄，或充血。
B. 粘膜水肿，肥厚，小的白色隆起病变。
C. a 和 b 都是。
D. A 和 B 都是正确的，但都是非特异性的呼吸道病变，在其他疾病中也可以出现。

Question 6: A procedure is appropriately considered “nondiagnostic” when ?

A. Inspection and representative tissue samples and/or washings do not provide a diagnosis.
B. Tissue samples are obtained, but are not representative (for examples, bronchoscopic lung biopsies reveal no pathology, and contain only bronchial mucosa, but no bronchioles or alveoli).

问题 6: 支气管镜检查时“非诊断性”的操作是指：
A. 进行不能够提供诊断的检查、取样或灌洗。
B. 取到了组织样品，但不具有代表性（例如，支气管镜肺活检只取到支气管粘膜，而没有细支气管或肺泡的组织标本）

Question 7: Which of following statements about bronchoscopy-related pneumothorax (during bronchoscopic lung biopsy) is CORRECT?

A. Pneumothorax occurs more frequently when large alligator forceps are used rather than small cup forceps.
B. The overall incidence of bronchoscopy-related pneumothorax is about the same as that of percutaneous needle aspiration-related pneumothorax.
C. The reported incidence is 1-4 %.
D. Small-bore chest insertion is almost always warranted.

问题 7：下列哪些关于支气管镜相关气胸的陈述（在支气管镜肺活检中）是正确的？
A.使用大鳄鱼钳较小杯钳更容易发生气胸。
B.支气管镜相关气胸的发生率大约与经皮针吸活检气胸的发生率相当。
C 文献报道的发病率是 1-4%。
D.胸腔小孔引流是恰当的。

Question 8: The inflated balloon size of a balloon catheter is approximately
问题 8：6 Fr 气囊式导管的膨胀气囊大小大约是
A. 6 mm.
B. 7 mm .
C. 10 mm.
D. 12 mm.

Question 9: A transbronchial needle aspiration directed posteriorly and medially 1 cm beyond the origin of the right or left lower lobe bronchus risks entering which of the following anatomic structures ?
A. The pulmonary veins.
B. The pulmonary arteries.
C. The esophagus
D. The heart
问 9：支气管针吸时定位向后和向内超出右或左下肺支气管 1 厘米就有误入以下哪些解剖结构的风险？
A.肺静脉。
B.肺动脉。
C.食道。
D.心脏。

Question 10: Bronchoscopic airway stents should be considered in each of the following settings EXCEPT?

A. Severe extrinsic compression of the left main bronchus in a patient with fibrosing mediastinitis, dyspnea, and cough.
B. Severe extrinsic compression of the trachea in a patient with thyroid cancer.
C. Recurrent tracheal and right main bronchial obstruction in a patient with recurrent tumor three months after laser resection..
D. Central obstruction but no known functional airways distal to the obstruction as evidenced longstanding complete atelectasis on chest radiographs and absence of ventilation on nuclear imaging studies.
E. Complex benign tracheal stricture in a patient with significant comorbidities.

问题 10：以下情况需要考虑支气管气道支架，除了？

A .伴有呼吸困难、咳嗽、纵膈纤维化的患者，其左主支气管有严重的外压性狭窄。

B.甲状腺癌的患者，气管有严重的外压性狭窄。

C. 肿瘤患者，激光治疗三个月后复发，再次出现气管和右主支气管阻塞。

D.经胸片证实的有长期完全性肺不张、中心性气道阻塞，但不了解阻塞远端的功能性气道的情况，又缺少核素通气-灌注扫描所。

E.患者有复杂的良性气管狭窄，并有严重的并发症。

Congratulations, you have completed Module I of the Essential Bronchoscopist©. The correct answers to the post test questions are listed below. We suggest that you review the questions and answer sets to Module V. You may do so by printing out the entire module as a PDF file.
恭喜您已经完成了支气管镜要点的模块 1 测试。试题的正确答案如下。我们建议您重温这些问题再进入模块 V 回答问题，您可以打印出整个模块的 PDF 文件。

ANSWERS TO MODULE V POST-TEST

Answer 1: B
Answer 2: C
Answer 3: B
Answer 4: E
Answer 5: D
Answer 6: B
Answer 7: C
Answer 8: D
Answer 9: A
Answer 10: D

恭喜您，您已完成全部课程。
祝愿您在介入肺脏病学习的道路上取得更大成绩！

Bronchoscopy International copyright 2013

模块 VI

模块的目标

EB（杰出气管镜专家）的读者不应该将其中的模块测试图看呈单纯一种测试，因为无论您是否或能否回答这些这些问题，读了这些内容，您都可以从中获得非常有用的信息。也许您会发现：有些问题的正确答案不止一个，这也许是一个善意的陷阱，而读者不应该将其看做是一种陷阱，而应该看做是帮助读者去思考某个问题的方式。一个模块含有 30 个问题及答案，您大概需要 2 小时去完成。当您完成后，您就可以去看考试后的内容，其包含 10 个多项选择题，主要针对每个模块中所包含知识的基础原理。针对每个问题，您也许只能在答案部分或图示部分找到答案的相关信息，但不能直接找到答案。只有在您阅读完考后的内容并准备进入下一级模块之前，您才能对您的答卷给出一个 100%准确率的判断。

杰出的支气管镜专家

EB 最初开设的主要目的是为了对支气管镜相关的理论知识进行学习。每个模块包含的有关支气管镜的知识由易到难呈阶梯状，线性学习及学习左右脑信息处理的最佳结合，而且最重要的是，使学习者在学习中得到乐趣，无论何种专业人员，都能将所学的知识应用到实践中对患者的关怀。

EB 为学习支气管镜相关的理论知识提供了一个标准化途径，适合用于现在的医学教育中本科生教育及研究生教育。标准化的问题-答案模式及与模拟支气管的示例图、技术图，能使学习者能够得到很多知识及启发。一个 100%准确的答卷及考后的内容回顾能使学者基本掌握每个模块中的知识点。

经过的 EB 理念的熏陶及多年支气管镜检查的经验，精英的支气管镜专家不仅获得了扎实的基础知识，并且积累了丰富的个体化经验，但并非教条的知识模式及习惯。“一个认为他一切都懂的人其实什么都不懂”的教育理念使杰出的支气管镜专家既有自信，又不断地探索新知识，打破旧传统，开辟新天地。

感谢李时悦教授团队，包括陈愉大夫、陈小波大夫、钟长镐大夫等各位所作出的贡献。

模块 VI 的学习目标

重要说明

The Essential Bronchoscopist 的读者们不该将这个模块看作一种测试。为了从这个模块包含的信息中获取到最多的利益，不管你的回答是什么，每一个答案你都必须阅读，你会发现并非每个问题仅有一个“正确”答案。这个不应该被看成是一种诡计，而是一种帮助读者们思考某一问题的一种途径。希望你投入约 3 个小时的连续学习来完成这个模块中的 36 个问答题。

当你准备好了，你可以选择来参加课后测试。这 10 道选择题对应于每个模块学习目标的具体内容。问题的相关信息能够在模块中答案所在段落中找到，但可能与模块中所找到的答案不直接一致。在读者们进行下一个模块之前，希望课后测试能够 100%正确。即使你的答案有一个不正确的，你也必须重新回到课后测试的最开始部分，并再一次重新开始整个测试。你可以通过点击屏幕上的“打印屏幕”来打印出你的考试成绩。

在完成这个模块时，读者应该可以做到：

1.比较和对比 AST 和王氏对纵膈淋巴结取样的命名。

2.鉴别腺样囊性癌、类癌，并作出袖套切除术或支气管成形术的具体评估。

3.列出气管支气管增大症的 3 个原因。

4.描述经支气管镜针吸活检的 3 种不同的方法。

5.描述 3 种不同的方法以提高经支气管镜针吸活检的诊断率。

6.描述至少 3 种不同的方法以控制支气管镜检查导致的出血。

7.描述 3 种从气道移除阻塞的硅酮支架的策略。

8.描述漏气实验的重要性和后果。

9.描述左右支气管树相关的主要静脉和动脉。

10.辨别和描述 3 种“温柔是一种美德”的支气管镜检查情况。

问题 VI.1　一个无法行手术切除的鳞状细胞癌患者，为了减轻中心气道阻塞，于 4 月前放置了一个左主支气管支架。患者对体外放射疗法效果良好，CT 扫描提示肿瘤有所缩小。昨晚病人剧咳后出现严重气促，紧急行支气管镜检查，结果如下图所示，下一步最恰当的是：

A. 立即把病人送往介入支气管镜室，行硬质支气管镜检查，移除支架，评估支架重置的可能性。
B. 通过可弯曲支气管镜工作通道引入一个大动脉栓塞球囊导管。通过支架后，扩充气囊，把支架推向气管旁，向上越过声带从气管内移除支架。
C. 利用可用的最大的鳄鱼钳钳住支架近端边缘，把支架推向气管旁，向上越过声带从气管内移除支架。
D. 用缝合及导管技术，在可弯曲支气管镜旁引入一个气囊导管。在导管通过支架后，扩充气囊，把支架推向气管旁，向上越过声带从气管内移除支架。

问题 VI.2 一个病人两月前因良性肿瘤放置了一个支架，插管后气道狭窄。因突然声嘶及呼吸困难行紧急会诊。一下哪项最可能发生。

A. 肉芽组织阻塞了支架。

B. 支架向近侧移位。

C. 支架及下气道被黏稠分泌物阻塞

D. 支架向远侧移位。

E. 狭窄变的更严重，并已经压迫了支架。

问题 VI.3 一个 58 岁的矿工，反复咳黑色痰液，有类风湿关节炎和慢性支气管炎病史，三月前，咳出一小匙血，未戒烟。胸部 X 线发现双上肺野轻微空洞型肺结节，并有肺容积缩小，肺门上移，以下那个诊断能最好的解释上述所有症状。

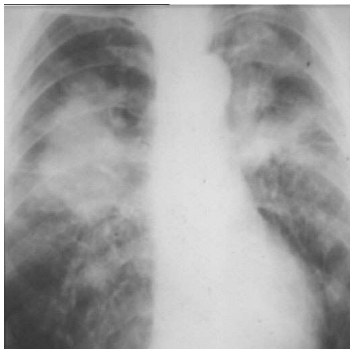
A. 恶性黑色素瘤转移到大气道。

B. 支气管肺癌，偶尔出血，并有陈旧性血块。

C. 活动、坏死性肺结核，通过支气管壁淋巴播散。

D. Caplan’s 综合征。

E. 粗球孢子菌感染引起的支气管结石病。



问题 VI.4 一个 35 岁男性患者，5 年前出现气促，由于胸痛、咳嗽以及渐进乏力不能工作，辞去了喷砂机的工作。体格检查:肺底呼吸音减弱，伴有啰音，有杵状指，外周淋巴结未见肿大。无发热及体重减轻，无感染 HIV 的危险因素。动脉血气分析：PaO2 54mm Hg，弥散功能及肺活量减低。胸片显示双侧肺浸润,CT 扫描示：双肺斑片状实变影。可弯曲支气管镜肺活检未发现异常，支气管肺泡灌洗提示嗜酸性物质密集，PAS 和脂肪染色阳性，银染阴性。下一步诊断性检查是：

A.高分辨 CT

B.胸腔镜肺活检

C.重复支气管镜肺活检

D．重复肺泡灌洗并行病毒培养

E.超声心动图

VI.5 下图支气管出现的异常最相符的疾病是：

A.类癌

B.腺样囊性癌

C.鳞状乳头瘤样增生

D.肉瘤

E.脂肪瘤

VI.6 两周前，你介绍了一个 58 岁的不能行手术治疗的鳞状细胞癌女性患者给同事，患者右主支气管阻塞，给予行 Nd: YAG 激光切除术，并放置硅酮支架，在与患者协商体外放射治疗时，患者问你放置支架的可能并发症，你将告诉她可发生以下所有情况，除了:

A.可能的并发症包括支架移位、痰液堵塞支架、肉芽组织或肿瘤

B.威胁生命的并发症少见，但有专家建议行可弯曲支气管镜监视

C.如果气道开放达到满意效果，可过正常的生活，包括旅游、运动、摄食。

D.当出现咳嗽、气促、声嘶、胸痛或发热时，应当联系你或到最近的急诊科就诊。

E.至少两周后才能行体外放射治疗，因为其可促进支架移位。

VI.7 一个 62 岁的癌症男性患者，2 周前在离他家 1000 英里的医院行光动力治疗，他打电话给你，问是否可以看电视，你告诉他

A.电视机的光以及任何人造灯光都是危险的。

B.光动力学的光敏感剂可持续 6 周，但接触电视的光线和人造灯光是安全的

C.在看电视时应穿防护衣及戴眼罩

D.打电话给行 PDT 的医生以了解情况

VI.8 当对 AST 4 组淋巴结（右气管旁）行经支气管针吸活检针时，在隆凸上 2cm，3 点钟位置旁（气管横断面作为时钟，以隆凸作为中心参照点）进针，以下哪一组织结构是更危险的

A.主动脉

B.右肺动脉

C.纵隔胸膜反折线及奇静脉

D.食管

VI.9 在对纵隔淋巴结行经支气管针吸活检针时，以下那一项最有利于提高诊断
A.在气道检查及获取其它样本前行针吸。
B.在针头从淋巴结收回时维持抽吸
C.在针头穿刺前冲洗支气管镜的工作通道
D.用组织学针，而不是仅使用小号的细胞学针
E.在检查标本时，有细胞病理学家在场

VI.10 44 岁男性患者，因 B 细胞淋巴瘤，两月前行自体干细胞骨髓移植，出现咳嗽、低热、气促，行可弯曲支气管镜检查。淋巴细胞、中性粒细胞数正常，血小板减少并定期输入血小板。胸片及 CT 提示：右肺中下肺野肺浸润影，无肺叶实变影。支气管镜检查见气管支气管黏膜出现弥漫性炎症及红斑，无脓性分泌物，支气管肺泡灌洗有大量血液及含铁血黄素巨噬细胞丰富。以下哪一项最符合支气管镜的检查结果？

A.特发性间质性肺炎

B.巨细胞病毒性肺炎

C.侵袭性肺曲霉菌病

D.急性肺水肿继发败血症

E.肺泡出血

VI.11 右气管旁淋巴结(AST 4R 组，王氏支气管镜淋巴结 3 组)在气管的哪个部位？

A.后外侧

B.前外侧

C.外侧

D.后侧

VI.12 行支气管镜肺活检时，以下哪一个肺段在胸膜可用钳子来作精确的定位？

A.双肺下叶外基底段

B.右下叶内基底段

C.双下叶后基底段

D.双上叶尖段

E.双下叶上段

VI.13 王氏支气管镜命名法（为行纵隔淋巴结针吸活检）的前隆凸（王氏 1 组）、后隆凸（王氏 2 组）、隆凸下（王氏 8 组）、左气管旁（王氏 4 组）、右气管旁（王氏 3 组）淋巴结与用 Naruke/ATS-LCSG 命名的以下哪些淋巴结组合相对应？

A. ATS 7 组, ATS 4L 组, ATS 4R 组.

B.ATS 6,组，ATS 4L 组, ATS 4R 组.

C. ATS 7 组, ATS 8 组，ATS 4L 组, ATS 4R 组.

VI.14 下图所示的支气管异常与以下哪一项最符合？

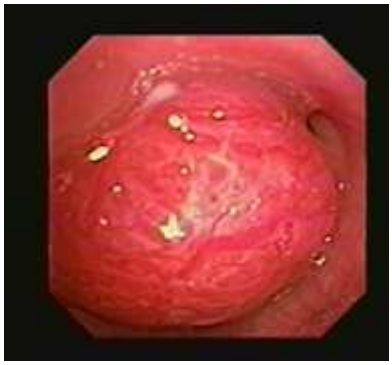
A.类癌

B.腺样囊性癌

C.鳞状乳头状瘤

D.肉瘤

E.脂肪瘤



VI.15 一个有肾性细胞癌及恶性黑色素瘤的病人，出现持续咳嗽，运动耐量下降，气促明显。支气管镜的异常如下图所示。下一步最好采取以下哪种措施？

A.在可弯曲支气管镜下用钳子对病灶行活组织检查

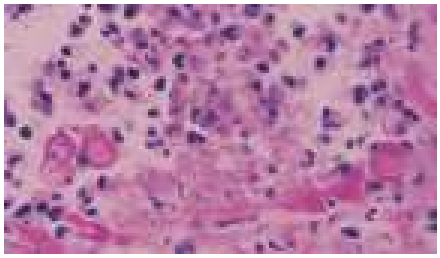
B.病变最符合转移性黑色素瘤，病人应该由介入性支气管镜专家行活组织检查并清除病灶。

C. 病变最符合转移性肾性细胞癌，病人应该由介入性支气管镜专家行活组织检查并清除病灶。

D.病人应该行体外放射治疗

E.病人应行临终关怀治疗，无需行积极的支气管镜治疗。

VI.16 53 岁女性，流浪 2 年，住在墨西哥西南部沿小河边，睡在铝墙板下，嗜烟。她因体重下降、湿咳（持续时间不明）收住入院，胸片示：外周巨大团块影。行支气管肺泡灌洗及活组织检查，组织病理学结果如下图所示。以下哪一项支气管镜的异常更有利于牙生菌病的诊断，而非肿瘤，并可解释她的症状和胸片表现？



A.右上叶支气管圆形狭窄，黏膜呈颗粒状及鹅口样白斑

B.右上叶支气管受外来压迫完全闭合，右主支气管压窄

C 下气道有大量白色黏膜斑点，右主支气管及右上叶支气管狭窄周围有小结节和水泡

VI.17 气管横断面作为时钟，隆突作为中心参照点，在邻近右中叶支气管开口处的中段支气管内侧壁 9 点方向行针吸活检，将检出

A.右下肺门淋巴结

B. 隆突远端淋巴结

C.右主支气管淋巴结

D. 隆突下淋巴结

VI.18 气管横断面作为时钟，隆突作为中心参照点，在下气道 1-2 肋软骨间隙水平，沿气管前壁朝 12 点方向行针吸活检，将检出

A.右下肺门淋巴结

B 隆突下淋巴结

C.后隆突淋巴结

D.前隆突淋巴结

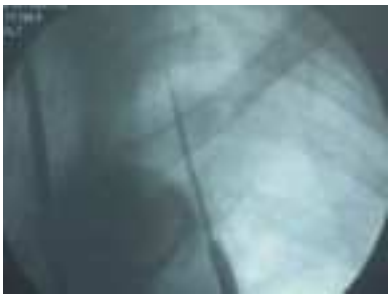
VI.19 下图所示病人行支气管肺活检，已有严重出血，以下哪一说法最正确

A.在上叶段支气管放入支气管镜是困难的，但仍有可能

B. 1:10.000 肾上腺素可引起血管收缩并止血

C.在左上叶支气管前段行活检是安全的

D.病人的异常出血时间预测了出血可能性，因此应行备好辅助设备。



VI.20 看起来像类癌的肿瘤患者，瘤体壁光滑，呈肉样外观。以下陈述与文献报道最相符的是

A.活检能使 80%的病人得到诊断，活检所致的出血危险性是 1%

B.活检不能使 80%的病人得到诊断，活检所致的出血危险性是 1%

C.不能对出血危险性及诊断几率作出分析

VI.21 邻近上叶支气管前壁行针吸活检，即在隆突上从上叶支气管把舌段分离，对进入以下哪种结构是危险的

A.左肺静脉

B.做肺动脉

C.主动脉

D.食道

VI.22 关于支气管镜导致的出血，以下哪一项说法被广泛接受并得到一致认可

A.把病人移到安全的位置，向出血一侧朝下侧卧

B.可弯曲支气管镜伸入出血的支气管部位并持续抽吸

C.支气管镜来回抽吸（没有伸入出血部位），并用大量生理盐水冲洗，保护对侧肺组织

D.活检前注射肾上腺素

E.出血时冷生理盐水冲洗

VI.23 行支气管针或隆突吸活检时，以下哪一项措施能最大的获取诊断收益
A.至少盲目的针吸 3-4 次
B.在操作间有病理细胞学专家在场，并立即检查每一个针吸样本
C.尽可能用最大最硬的针头
D.在支气管肺泡灌洗或活组织检查后获取针吸样本

VI.24 支气管镜检查引起的出血，以下哪一个陈述的正确的

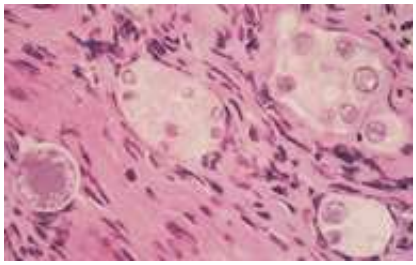
A. 通常情况下，支气管镜肺活检后出血超过 50 毫升整体风险约为 1-2％，但据报道，在尿毒症患者可高达 45％（血清肌酐>2，尿素氮> 25mg/dl）

B.出血一旦停止，应清除血块以确认远端有无活动性出血

C.支气管镜检查前，所有病人应该检测血小板数量及凝血功能

D. 大多数专家认为，血小板计数低于 50，000/ mm3，血液尿素氮 45 mg/dl 和血清肌酐为 3 行支气管活检是安全的

VI.25 45 岁的妇女，有乳腺癌病史 15 年，经常去圣地亚哥、加利福尼亚州的沙漠谷地旅游和露营，她的狗也经常伴随她露营旅行，她的狗最近病了，但给予抗生素和伊曲康唑后好转。现在，患者发热，前臂和腿部有红斑皮疹。PPD 皮试阴性，也无腮腺炎和念珠菌感染。双肺听诊可闻及捻发音，胸片示双肺浸润影，以右中下肺野明显。由于持续发热及肺部症状，患者已卧床休息及静脉滴注抗生素 3 天。已行支气管肺泡灌洗及支气管活检，组织病理学结果如下图所示。下列哪一个支气管镜的异常有利于急性球孢子菌感染的诊断。



A.右下叶支气管圆形狭窄，黏膜颗粒状，支气管内有坚固、凸起的息肉
B.右中叶支气管实质病灶狭窄，由光壁团块完全阻塞，周围有红斑
C.右下叶支气管柔软白色分泌物，周围支气管黏膜水肿和红斑

VI.26 下列疾病都可引起气管增大，除了
A. Ehlers-Danlos 综合征
B. Mounier-Kuhn 综合征
C. 毛细管扩张失调症
D.慢性阻塞性肺疾病
E.结核病

VI.27 支气管镜专家及其助手尽管受到正确和良好的培养，以下哪一种情况仍难于避免

A.活检针的不正确操作

B. 通过可弯曲支气管镜的伸缩远端时钳子用力过度

C.沿支气管镜插入管道进针时，支气管镜过度弯曲

D.碰及操作车上的齿轮、柜子、通道、轮子

E. 反复碰撞操作车旁或床拦上的插入管道远端

VI.28 以下关于置入气管支架的病人的陈述都是正确的，除了

A.与良性肿瘤的患者比较，支架相关的并发症在恶性肿瘤患者更少见

B.在支架植入后，需使用流速容量环及肺量计以评估患者临床和症状有无改善。

C.由于移位和阻塞的危险，许多专家建议在支架置入后的头三月，行支气管镜监测

D.置入支架后行支气管镜检查，经常可见痰液潴留，但感染很少发生，通常不必使用抗生素

VI.29 使用正确的方法，以下针吸活检并发症的哪一个是能避免的

A. 纵隔积血

B. 气胸

C. 支气管出血

D.针头导管断裂

E.细菌性心包炎

VI.30 在针吸活检过程中，下列哪一项操作对可弯曲支气管镜的损害性最大

A.突刺法针刺

B. 背驮式法针刺

C. 金属环贴近气管壁法针刺

D.使用不可回缩的针

E.咳嗽法针刺

（突刺法、推进法、咳嗽法、金属环贴近气管壁法为针吸活检的 4 个穿刺技术）

VI.31 在针吸后，穿刺针不能回缩到导管，此时，你应该

A. 把针拉入支气管镜的工作通道以撤出之

B. 拉直气管镜。保持针头及支气管镜在气道中央而不使针头进入可弯曲气管镜的工作通道，然后同时移出气管

C. 拉直气管镜。把穿刺针拉回支气管镜的工作通道以至于在可弯曲气管镜远端刚好看到针尖，然后从气道中心移出针头和支气管镜

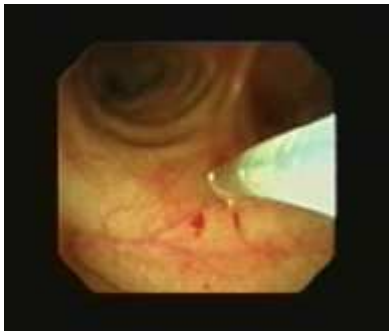
D.拉直气管镜。把针拉入支气管镜的工作通道，然后移出气管。

VI.32 用可弯曲光导纤维支气管镜对右肺下叶行肺活检时，有一个中等量的出血，用生理盐水冲洗及抽吸都不能止血。成年男性患者无呼吸窘迫，仍清醒，并且呼吸顺畅。你需要用一个动脉栓塞气囊导管，助手在操作室的小房间寻找 2 分钟后，拿给你一些不同型号的导管，并问你需要哪一种型号的导管。你将回答

A. 3F 导管
B. 5F 导管
C. 7F 导管
D. 8F 填塞气囊代替
E. 气管内导管代替，并插入右主支气管.

VI.33 隆凸下淋巴结肿大病人，行可弯曲支气管镜检查及针吸活检，病理细胞性专家在场，并告知第一次（如下图所示）取材不成功，第二次取材应该

A.隆凸下 3-5mm 的中下方向取材
B.其上的第一软骨间隙向前取材
C. 其上的第二软骨间隙向前外取材



VI.34 33 岁的获得性免疫缺陷综合症（AIDS）病人，行可弯曲支气管镜检查，并对左上叶病灶针吸活检。手术后，技术人员告知泄漏试验阳性，可弯曲支气管镜的表面漏气。他问你应怎样处理，你告诉他

A. 包装前用戊二醛消毒镜子，并送往生产厂家进行修复。

B. 仅用温水和清洁剂清洗工作通道，然后包装镜子，并送往生产厂家进行修复。

C. 不用清洗支气管镜，把支气管镜放入生物危害袋。包装镜子，并送往生产厂家进行修复，注明镜子的损害情况

D.手工清洗支气管镜，仅用温水和清洁剂清洗其内部管道，然后放入生物危害袋，并并送往生产厂家进行修复

VI.35 以下哪一个最适合支气管镜肺活检的表达
A.中庸之道
B.温柔是一种美德
C.手指尖端是气管镜检查者的眼睛
D.永不放弃
E.感受气管壁

VI.36 关于左支气管的解剖变异，以下哪一项是错误的

A. 左上叶上部支气管，通常有 2 个，有时也有 3 个，分成 3 个明显的支气管而不是 2 个。

B. 左上叶上部支气管有两部分是由于在胚胎发育期间，舌后支气管移位成为单一的起源

C.左下叶的后、外、前基底段支气管常反映右下叶基底段支气管的解剖结构，除了常缺少左内基底段

D. 左下叶基底支气管通常有三部分，二部分发出两个主要的基底分支，基底分支立即再次发出分支。

这一题很难读懂

模块 VI

阶段测试答案

答案

答案 VI.1　A

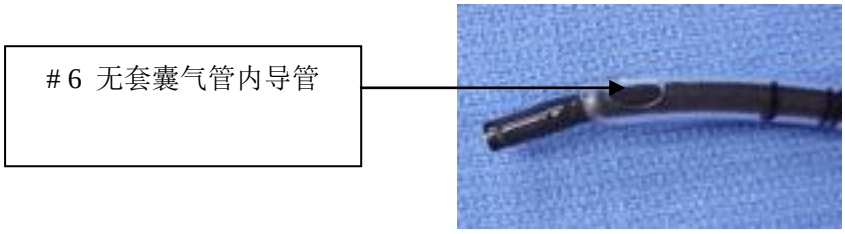
最保守的办法是把病人送往介入支气管镜室。似乎肿瘤缩小可导致支架移位。此时，另一支架可能不必使用。用硬质支气管镜来移动大型硅酮支架是最安全的，因为支架可向上拉入硬质管道，并从气道移除，而不损伤声带。然而，如果必要，其它技术也是可行的。如果试图用钳子来重新定位，必须避免撕裂或切割支架。鳄牙钳、带鳄鱼嘴的鼠钳、橡胶尖嘴钳均可，使用鲨鱼钳可能更好。当然，具体的技术的采用可能更依赖于支气管镜医师的经验和可利用的资源。

为了用缝合线-导管技术置入气囊导管，可放置不能完全通过可弯曲支气管镜工作通道的气囊导管。用钳子把 100cm 的 O 型缝合丝线通过支气管镜工作通道放入。紧急情况下，也可使用蜡牙线。导管放入线圈内，并拉紧缝线（见下图）。当支气管镜通过口腔进入气管时助手拉住收紧的缝线。导管进入到所需位置时，助手放松缝线。另一种方法是插入支气管填塞气囊（见下图）。用可弯曲支气管镜是危险的，因为支架可卡在声门下区，或者损伤声带。

答案 VI.2　B

近端气道支架移位可引起声音嘶哑，咳嗽，咽喉疼痛，吞咽困难，呼吸困难。有时，支架近端可碰到声带尾部表面。此外，支架可被咳出，并夹在声带之间。在这种情况下，通常声音完全丧失。已经移动的支架，可在全麻下用硬质支气管镜、可弯曲支气管镜、球囊导管，或用一个＃5 套囊气管导管移除。有时候，支架可用可弯曲支气管镜、镊子移除，或在支气管镜-支架同时向上拉出时用支气管镜的弯曲端移除。

如果需要插管，可使用 ＃6 无套囊气管导管，因为其可穿过支架。然而，可能由于气道狭窄的位置和程度，气管内导管可能不能通过狭窄处。远端支架移位也可产生明显的症状，但不会引起声嘶。黏稠分泌物可引起咳嗽和呼吸困难，但不会导致声音嘶哑或失声。肉芽组织可阻塞支架的任何部分。这种并发症更经常发生在置入金属支架的病人，而不易发生在置入硅酮支架的病人。气道狭窄的程度越严重，越容易引起咳嗽和呼吸困难，但不会导致声嘶。



答案 VI.3　D

这位患者可能有类风湿尘肺综合征，其包括多发肺结节、类风湿关节炎、吸烟史及煤矿环境接触史。咳黑痰，发生在复杂的煤工尘肺病人(CWP)。 此病表现为上肺野出现双肺大的或融合的结节。通常有一个简单煤工粉尘接触史。复杂 CWP 病人的预后较差。

此类病人，可弯曲支气管镜可排除有类似症状的其它病人。恶性黑色素瘤可转移到大气道，导致黑色结节性阻塞，容易出血，可能需行支气管激光切除术。然而，实质黑色素瘤结节，通常很小，不易产生空洞。如果存在气道阻塞，可观察到肺不张的影像征像。此外，黑色素瘤支气管转移，通常有恶性黑色素瘤病史。

坏死性肺结核患者，可能通过左或右主支气管播散形成干酪样物质侵蚀及纵隔淋巴结肿大。这可能需要置入支架。干酪样物质通常黄且厚，这不符合上面描述的情况。由支气管内肿瘤先前或活动性出血产生的陈旧性血凝块，可通过支气管镜检查清除。清除血块通常是困难的，因为用活组织钳钳夹时血块很容易碎裂。可能需要使用硬质支气管镜，其有专门取出异物的工具，或者可使用气囊导管来清除紧粘气道的血块。

支气管结石通常是白色、牢固、钙化的结节，其通过支气管壁或其它方式进入远端肺叶或段支气管腔造成损害。它们经常由肉芽组织包绕，容易出血。常无症状，也可引起咯血，咳嗽，局部喘息，阻塞性肺炎以及支气管阻塞的 X 线或支气管镜的征像。支气管结石的病因包括球孢子菌、组织胞浆菌、结核分枝杆菌。有时需要用 Nd:YAG 激光来打碎良性支气管结石，并用异物移除技术来逐个地清除它们。

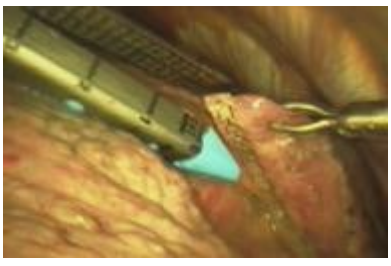
答案 VI.4　B

在这种情况下最主要的是进行胸腔镜肺活检，而不是重复气管镜肺活检或支气管肺泡灌洗。值得注意的是，支气管镜检不是“非诊断性的”，而是“非典型性的”。有人主张重复活组织检查。显然，如果从支气管肺泡灌洗可获得令人满意的物质，有助于作出诊断。鉴别诊断包括特发性肺泡蛋白沉积症、急性矽肺肺泡蛋白沉积症、血液恶性肿瘤、巨细胞病毒感染的 AIDS 以及矽肺病人的伴发右心衰竭。

这个病人为继发性肺泡蛋白沉积症。其在具有血液恶性肿瘤和肺部症状患者中的比例达5%以上，在骨髓障碍患者的比例达 10%以上。有免疫抑制的病人，包括 ARDS 或免[illegible]白缺失的患者，虽然表现有感染征象，也可能伴发肺泡蛋白沉积症。这些包括卡氏肺孢子虫病、隐球菌病、结核病以及病毒感染。右心衰和肺水肿也可有肺泡蛋白沉积症的影像学表现，但其水肿液缺乏嗜酸性物质。

急性矽肺患者也可能发展矽肺肺泡蛋白沉积症。持续暴露粉尘几年后可导致急性矽肺，通常发生在打砂工、隧道工及硅粉工。灌洗液也可出现双折光物质。特发性肺泡蛋白沉积症的预后差别较大。虽然肺泡浸润物偶尔自发的清除，但其常常更需要行双肺灌洗。在灌洗中出现大量的牛乳样液体有利于肺泡蛋白沉积症的诊断。大约 30%的个体最终将进展，进展为顽固性低氧血症、感染（尤其是诺卡氏菌），呼吸衰竭。

支气管结石



答案 VI.5　B

大约 80%的气管肿瘤是鳞状细胞癌或腺样囊性癌。大多数鳞状细胞癌发生在年龄大于 60 岁的吸烟男性，而腺样囊状癌无性别差异，年龄跨度较广。对腺样囊状癌，首选开放性外科手术治疗，虽然积极的手术只能使 40%的患者受益。有急性中央气道阻塞的病人可行支气管镜切除。

不能行手术切除的病人，可能需要支气管镜切除和置入气管支架。下图肿瘤显示向深部浸润。可能需要联合内镜综合治疗，包括置入气管支架。外科切除手术困难，切除的边缘可能（肿瘤细胞）阳性。尽管行单独局部手术或联合外放射治疗，但其局部复发率（伴或不伴同时远处转移）高达 25%，甚至可出现晚期复发。

答案 VI.6　E

外放射治疗或短距离放射治疗对置入的气管支架都无副作用。因此，放射治疗或全身治疗不能因气管支架而延迟。与良性中心气道阻塞的病人相比，支架相关并发症更少发生在恶性中心气道阻塞病人。这是由于生长的瘤组织可使支架保持在气管腔内。放疗或化疗可使这些组织缩小，易使支架移位。

如果发生支架相关并发症，需行紧急会诊。体格检查有呼吸音减弱、喘鸣。胸部 X 线可显示支架移位，肺不张及肺浸润。流量容积曲线可能提示通气流量减少。支气管镜检查可发现支架移位或由肉芽组织，肿瘤或分泌物造成的阻塞。

答案 VI.7　B

对行光动力疗法(PDT)的病人，光敏预防措施对避免副作用，尤其是皮肤过敏是重要的。静脉注射光敏感剂后大概六周左右，病人必须穿防护衣和特制眼罩。强光照射是危险的。然而，人造灯光或来自电视机的光是安全的。

答案 VI.8　C

气道远端 1/3 的右前方邻近上腔静脉或奇静脉。此处进针可引起气胸或出血。右肺动脉在右主支气管前面，并起于右上叶支气管。应避免通过右主支气管前壁的右上叶支气管起始部位进针。

食道紧贴（2-3mm）在气管或左主支气管后壁后面。无名动脉和主动脉弓位于气管前面、隆凸脊上方，稍横过远端气道的左边。此处，我们能看见轻微的压痕及微弱的搏动，显然，在这个位置进针的不明智的。

答案 VI.9　E

许多研究显示，由训练有素的细胞病理学家对 TBNA 样本现场检查，可得到更大的诊断收益。此外，可使支气管镜检查者进针次数更少，对额外样本如活组织活检或刷检需求更少。许多专家建议在行针吸之前冲洗工作通道。此外，为了避免假阳性结果，针吸应该在气道检查或气管内病灶活组织检查之前进行。一旦针通过气道壁进入肿瘤或淋巴结，立即抽吸以获得样本。在针头从肿瘤或淋巴结移出时应停止抽吸，以避免气管壁组织的污染。应在完全获得针吸样本时，支气管镜才可与气管壁连接。在大多数情况下，对纵隔淋巴结的针吸，用更大的组织学针可提高诊断率，尤其是淋巴瘤的诊断。

答案 VI.10　　E

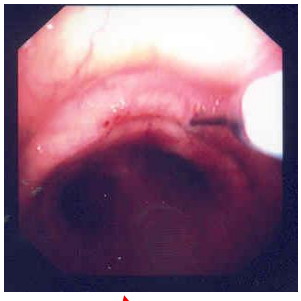
在气道见到血液意味患者正在出血。寻找出血的病因是困难的。然而，巨噬细胞内存在含铁血黄素表示肺泡内出血，但非特异性，此时可行支气管肺泡灌洗以证实。

肺泡出血常是血小板减少或凝血障碍病人肺部炎症的并发症。在肺移植数周内出现弥漫性肺泡出血综合征，常是致命的。弥漫性肺泡出血综合征在自体同源移植患者的发生率达20%以上，也可发生在凝血功能正常的患者，其原因未知。

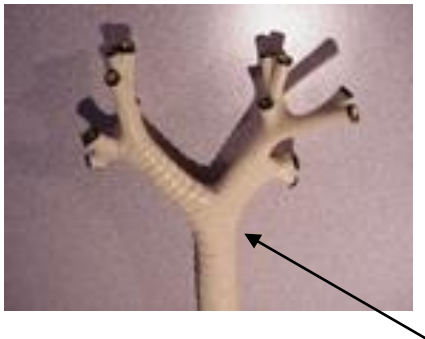
巨细胞病毒性肺炎、肺水肿和特发性间质性肺炎的影像学表现通常是弥漫性的，但它们也可引起肺泡出血。侵袭性肺曲霉病也可引起肺泡出血，但在中性粒细胞缺乏或不使用激素情况下少有出现。（激素经常用于治疗同种异体移植患者的移植物抗宿主病。由于这个病人是同源性移植，一般不使用激素，较少发生侵袭性曲菌感染。）

答案 VI.11　C

ATS 分类法的 4R 组淋巴结位于气管前外侧。在隆凸上 2-4 软骨间隙上可行针吸活检，使针朝时钟 1 或 2 点位置的前外侧方向进入（气管横断面作为时钟，以隆凸作为中心参照点）。针向奇静脉方向穿刺有更大的风险。气管旁淋巴结一般位于气管稍外侧，它们难于进针，因为需要针或可弯曲支气管镜尖端完全侧卧，尤其在左气管旁淋巴结（ATS 分类法的 4L 组淋巴结或主肺动脉窗淋巴结）。



隆凸

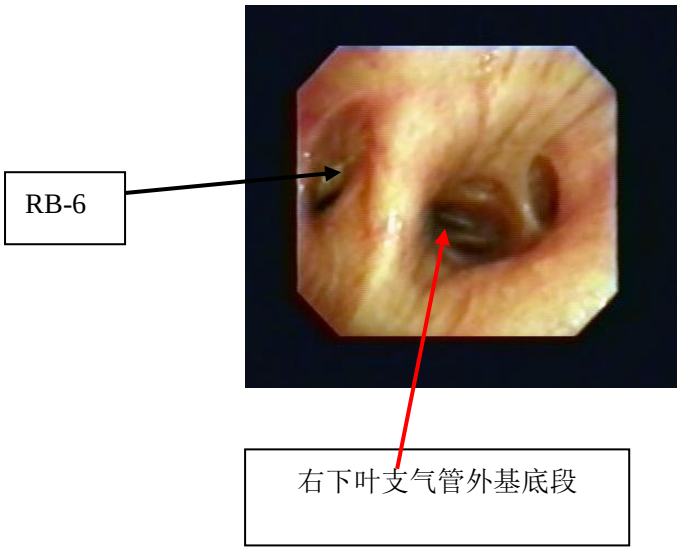


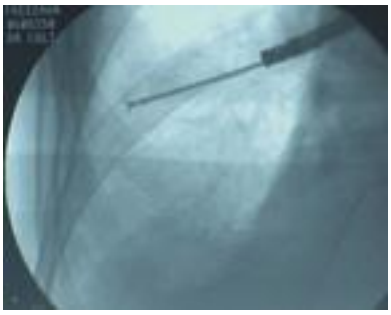
ATS 分类法的 4R 组淋巴结

答案 VI.12　A

双肺下叶外基底段延伸至肋膈沟，可使胸腔和胸膜的钳子能够有清晰的视野来精确定位。此外，活组织检查所致出血，可借助基底段的重力作用进行填塞止血。血液向下流动也将加速血块形成，并防止对侧气道的污染。

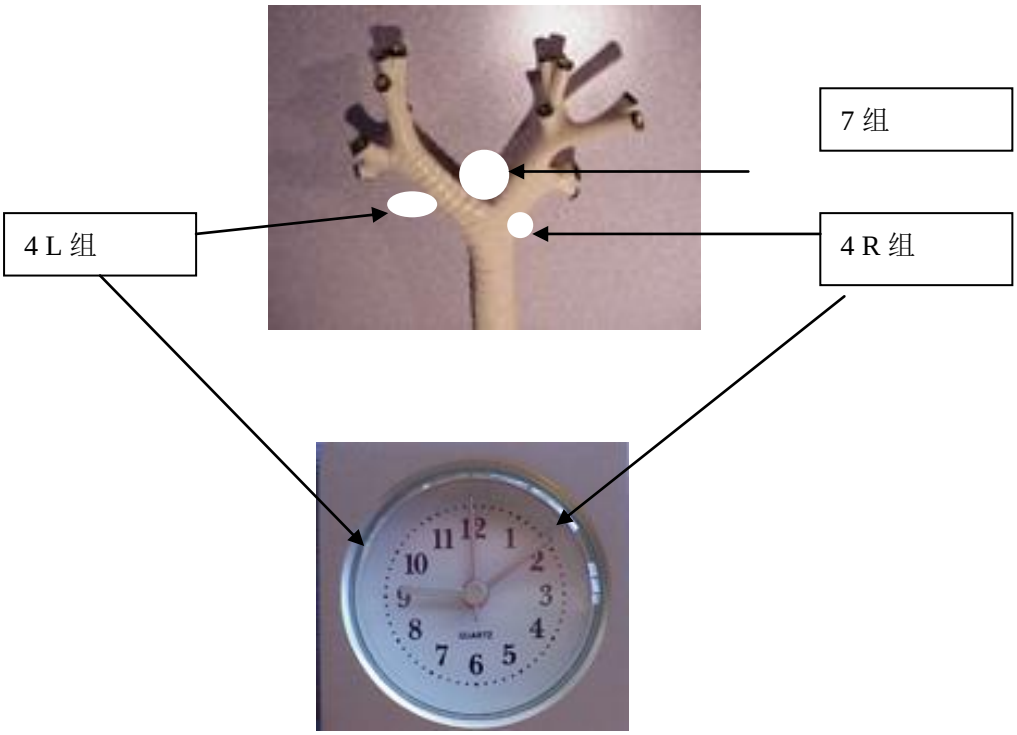
胸膜内的钳子对下叶后基底段、内基底段（部分被心脏掩盖）及上叶尖段（此处胸膜实际在锁骨上）的精确定位是困难的。通过背段支气管（RB-6）行活组织检查可增加气胸的风险，因为下叶背段邻近于肺叶间裂隙。





答案 VI.13　A

ATS 分离法的第 7 组淋巴结对应于前隆凸、后隆凸及隆凸下淋巴结。4L、4R 组对应于下气管旁淋巴结(5 组是主肺动脉窗淋巴结)。在隆凸上第二或第三软骨间隙或其上 2cm 进针，相当于时钟的 1 点或 2 点处，最易对右气管旁淋巴结取样（气管横断面作为时钟，以隆凸作为中心参照点）。左气管旁（主肺动脉）淋巴结可从左主支气管侧壁隆凸水平取样，从时钟 9 点位置进针。



答案 VI.14　A

类癌常为圆形、壁光滑、肉样及闪亮的肿块。它们可部分或完全阻塞气道。至少有一项研究表明，樱桃红色的非典型类癌更易出血。类癌分为典型及非典型两种，典型类癌的肺泡或腺体内有神经内分泌细胞。5-10 年的生存率大于 90%，仅有 10%的病人由于局部复发死亡，非典型类癌有丝分裂活动增加，坏死，缺乏组织结构。5-10 年的生存率为 60%左右，更多的病人有淋巴结转移。

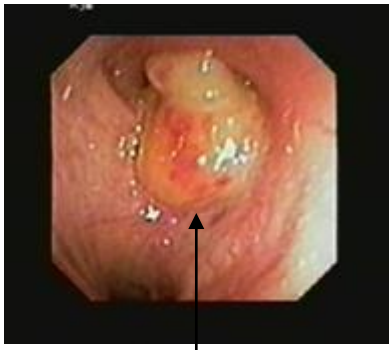
类癌可通过内镜切除或治疗（Nd:YAG 激光切除受益最长）。然而，传统的观念认为，最彻底的治疗是手术（肺切除术、肺叶切除术或保留肺组织手术，如肺段切除术、袖样切除术）。手术与否，取决于气管支气管疾病的范围，如气管壁内或外浸润，有无淋巴结转移，可由介入支气管镜专家及胸科手术专家基于病人健康状况及疾病的类型决定。

答案 VI.15　B

气道腔内大且黑色的团块提示转移性黑色素瘤。它可生长在左主支气管外面，而不粘附于气管前壁。这种病人应该立即由介入支气管镜专家行激光切除。病灶适合用硬质支气管镜切除，而不需放置支架。体外放射不能立即改善症状。

对晚期病人，除临终关怀外，还需行积极的支气管镜治疗及其它全身治疗。介入性支气管镜治疗可改善病人生活质量，提高肺功能及运动耐量，减轻症状，为病人争取时间和精力以行全身治疗。转移性黑色素瘤不同于转移性肾细胞癌，后者是红色的，表面相对平滑，容易出血。

恶性黑色素瘤

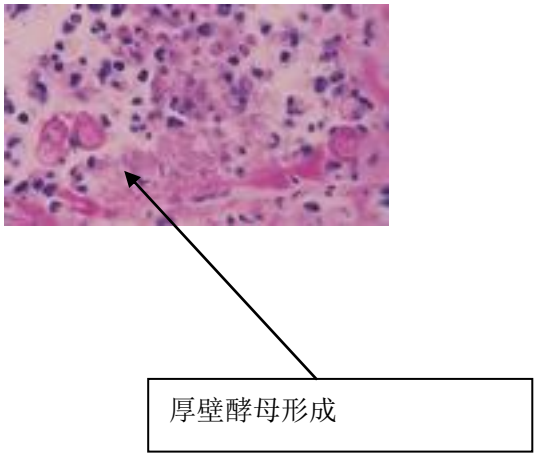


肾细胞癌

答案 VI.16　C

皮炎芽生菌是另一种双相土壤定植性真菌。在美国，大多数病例发生在密西西比河和俄亥俄河周围地区。在加拿大，委内瑞拉，墨西哥，非洲和中东地区也有发生。此病特征为出现流感样疾病的发热。其潜伏期目前尚不清楚。病人咳黏液脓性痰，胸部 X 线表现为肺叶实变，或多发的基底在胸膜的小圆形斑片状影。当病灶融合成大的团块影时，可形成支气管赘生物。经常产生气胸、胸腔积液、胸膜增厚。

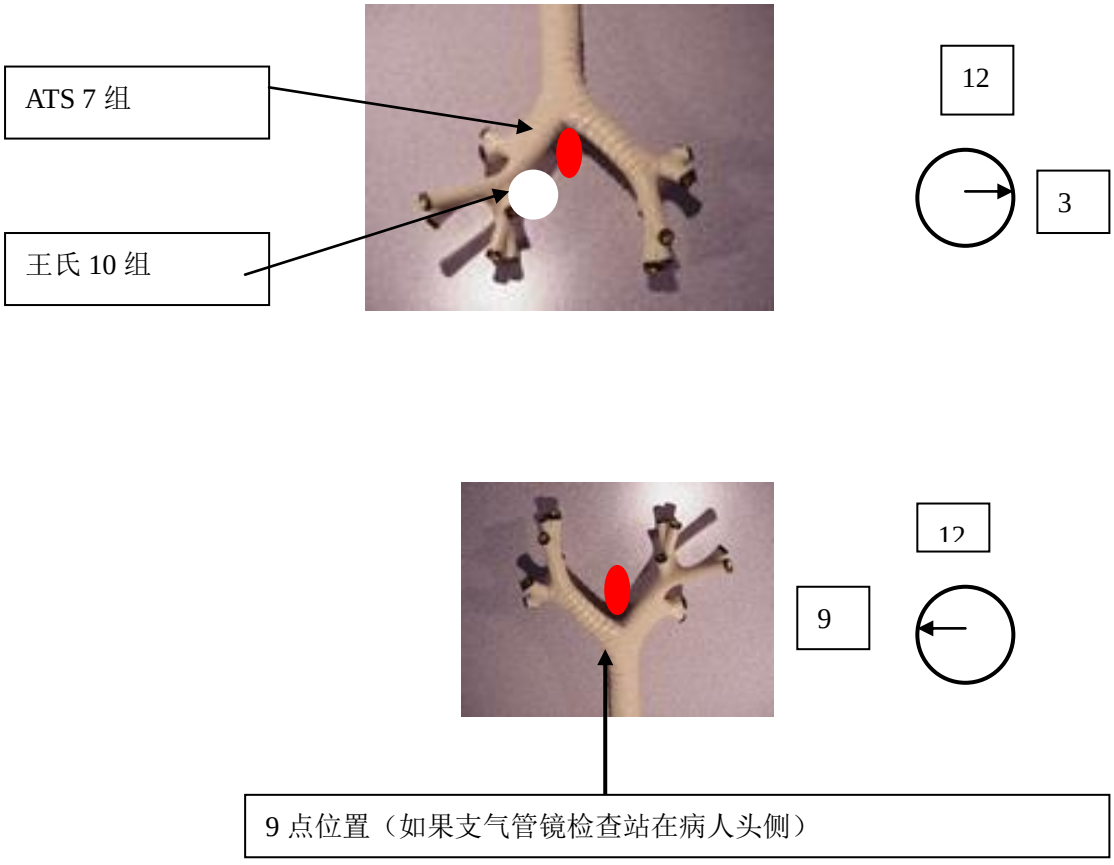
该疾病也可影响皮肤，中枢神经系统，泌尿生殖道和关节。在组织切片上见到有折光厚壁包绕的黑色、大基底、圆形孤立的酵母菌即可诊断。肺泡灌洗液涂片行 10%的氢氧化钾染色镜检也可呈阳性。皮试和补体结合试验不敏感和不可靠。



答案 VI.17　B

隆凸远端淋巴结（王氏分类法第 10 组淋巴结）常可在 CT 扫描时发现。其位于中间支气管和左主支气管之间，达到或接近右肺中叶支气管水平。另一个隆凸下淋巴结（ATS 分类法第 7 组淋巴结，王氏法 8 组）在左右主支气管之间，在 CT 扫描上达到或接近右上叶支气管水平。

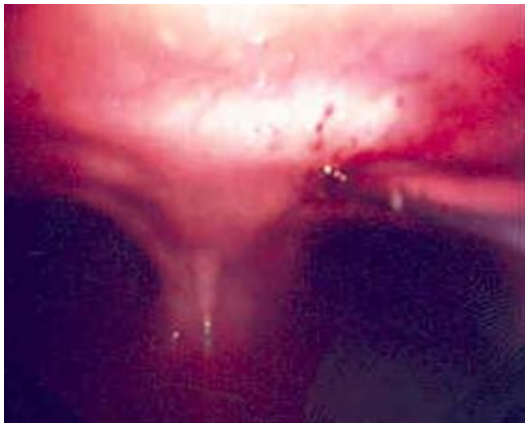
为了从隆凸下淋巴结取样，需沿右主支气管内侧壁朝 3 点方向进针，即邻近右上叶支气管开口水平（如果支气管镜检查者站在病人的前方或侧面）。王氏淋巴结分类方法还未普遍用于支气管镜的实践。



答案 VI.18　D

前隆凸淋巴结在 CT 扫描上邻近左右主支气管之间及前面。首先针尖进入黏膜，然后推进针管，使针管全长伸出支气管镜。例如，用另一只手，支气管镜检查者把导管末端固定在支气管镜上，可防止在遇到阻力时，针反冲回支气管镜内。

然后，针管和镜头同时朝病灶方向推进。当两者推进时，支气管镜及针管会稍向头部方向弯曲，使针尖垂直向病灶方向推进。这有利于避开软骨环，并可使针尖进针更深。为了从隆凸后淋巴结取样，针应该朝 6 点方向，向隆凸后部进针。



答案 VI.19　A

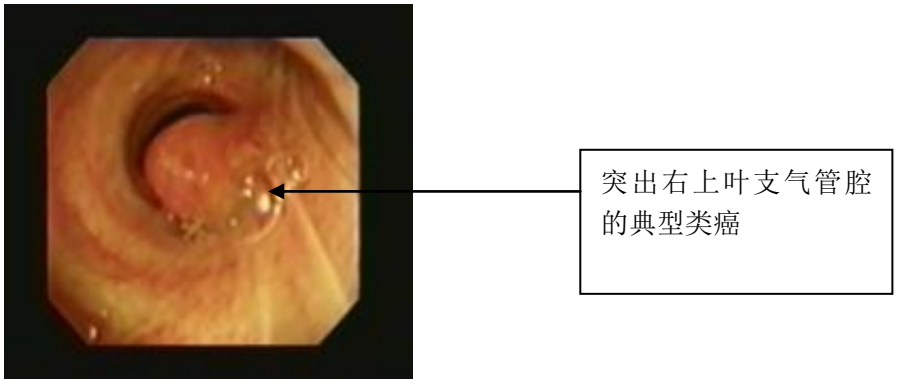
支气管镜嵌顿并抽吸对填塞出血的支气管是有效的，可加速血块形成，保持其余支气管树的气道通畅。病人也应放置在安全的位置（左下侧卧位），肾上腺素可通过血流及咳嗽向后倒流。无论如何，肾上腺素在给药时需用生理盐水稀释（1：1000 使用，1ml 肾上腺素用 10-20ml 液体稀释）。

对有潜在出血危险的病人，在重力依赖区域（如下叶支气管和上叶后段支气管）行活检是明智的。这可使对侧肺及其它肺段免受血液溢出时的影响。病人仰卧时，前段不是重力依赖区。异常出血时间（正常为 2-9 分钟）不能预测出血概率，也不能预测出血的安全。

答案 VI.20　A

传统观点认为类癌更易出血，故在行支气管镜活检时需小心。虽然这个事实可能是真的，但还没有前瞻性的研究结果。许多专家建议在活检前，可行肾上腺素于病灶局部应用以减少出血的危险。这种方法可能有效，但还未有前瞻性研究以验证。众所周知，当行活检时，通过支气管内活检对类癌的诊断率为 80%。

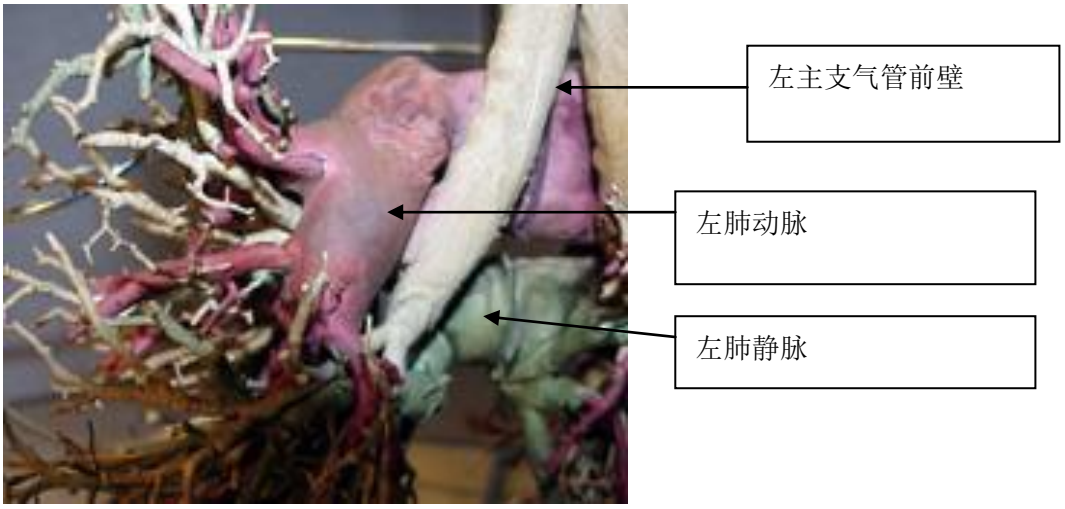
从以前的研究中，我们还认识到，严重出血的危险性是 1%左右。在术前（包括冰冻切片）鉴别典型和非典型类癌是困难的。而且，灌洗、针吸及刷检对也难于确定类癌的诊断。许多专家认为，支气管活检应该要深，因为有些肿瘤被正常支气管粘膜表面覆盖，如下图所示。许多情况下，活检的诊断可能被错误的报告为小细胞癌或者鳞状细胞癌。



答案 VI.21　A

左肺静脉紧粘于左主支气管和左上叶支气管的前方。对介入支气管镜专家来说，左肺动脉是一个危险的血管，因为其环绕左主支气管和左上叶支气管形成长“S”型。

主动脉弓在左主支气管的上、前方。为了对主肺动脉淋巴结（5 组，王氏支气管镜 4 组）行针吸活检，应该向后外侧朝时钟的 9 点方向（气道横断面作为时钟，以隆凸作为中心参照点），即在隆凸水平或者左主支气管侧壁下的软骨间隙进针。



答案 VI.22　A

当支气管镜检查出血时，把病人移到重力依赖的位置已被广泛的接受，并认为是常规的预防措施。这个位置可加速血块形成，保护对侧气道。也可采用其它方法，但都存在争议。有些专家建议支气管镜伸入出血部位，有些专家建议保持支气管镜来回移动。有的主张冷盐水冲洗，有人倡导活检前应用肾上腺素。当然，谁也未能说服彼此。当出血发生时，最重要的是保持病人安静，给助手予明确的指令，维持足够的氧供，保护对侧肺组织，并尝试用抽吸、支气管镜和其它辅助工具来填塞。

答案 VI.23　B

当有病理细胞学家在现场决定样本是否有代表性，针吸活检的诊断率会有明显提高。这已成为标准的做法，在行支气管镜针吸的机构应提倡这种做法。针吸活检应该在其它支气管镜样本收集前进行，以避免污染及形成假阳性结果。更硬，口径更大、双结构的组织学针吸对经隆突取样更有益，但更困难，有时难于进入末梢的气道。大多数学者认为，为了作出诊断，至少需要穿刺 3~4 次。

答案 VI.24　A

出血确实很危险，在尿毒症，血小板功能失调，肝功能衰竭（胆红素>1.5ml/dl，碱性磷酸酶> 110，谷草转氨酶> 25）和已知的凝血功能障碍的患者发生的几率更高。无需常规行血小板和凝血功能检查，除非病人有潜在出血危险性病史和体格检查结果。增加出血危险的情况包括抗凝病史，血小板功能障碍性疾病，遗传性疾病，如血管性血友病病或血友病遗传性疾病，药物，如磺胺类，噻嗪类，血小板数量减少的疾病，如白血病、骨髓瘤、淋巴瘤，与骨髓有关的继发性癌症，血小板功能障碍性疾病，如免疫（ITP，药物，系统性红斑狼疮）和非免疫（弥漫性血管内凝血，烧伤，创伤，TTP）紊乱的疾病。

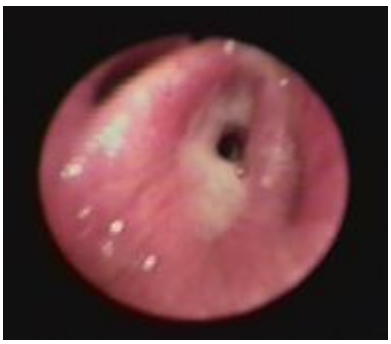
虽然有关出血危险的精确数字还未有研究，但必须避免对尿素氮及肌酐升高（BUN >45；Cr>3）的患者行活组织检查，如果血小板低于 $50{,}000\ mm^3$ 时，仅在有绝对需要时才能行活检。

然而，对这些病人行支气管镜检查及支气管肺泡灌洗是安全的。出血一般是容易控制的。新鲜血块不应立即清除，即使它们阻塞肺叶或肺段支气管，正如著名的表达“留下血块“。如果症状恶化或有肺不张的影像学证据时，第二天可容易地行支气管镜检查并清除血块。

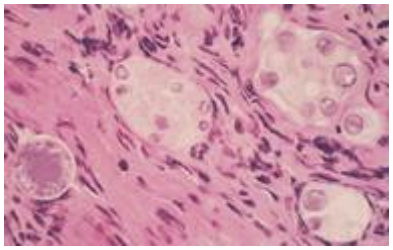
答案 VI.25　C

粗球孢子菌是一种双相性真菌，容易通过空气传播并吸入，多发生在半干旱地区的短暂而猛烈的多雨季节继而干燥天气的地区。这些情况发生在加利福尼亚州，墨西哥，中美洲和南美洲地区。虽然大多数感染是无症状的，但是在吸入病菌 1-3 周可引起肺部疾病症状。病人有咳嗽，发烧，胸膜炎样胸痛，肌痛，偶有细小的红斑疹，结节性红斑或多形红斑。甚至可在游客离开地方性疾病源地多年后疾病再发。在接触病菌 4 周内过敏原皮试阳性，对日常生活影响不大。补体结合抗体 IgG（在接触病菌 8 个月后仍可阳性）上升意味疾病进展或再发。

支气管镜下表现非特异性，形态与赘生物相似，虽然支气管息肉或结节不常见。为了确诊，必须钳取大而深的黏膜活检组织。真菌为大球形，其内有双折光壁及多形内孢子。与肺部结节的病人相比，有肺部浸润的病人，支气管肺部灌洗和经支气管肺活检的诊断率更高。



白色分泌物，黏膜红斑及水肿

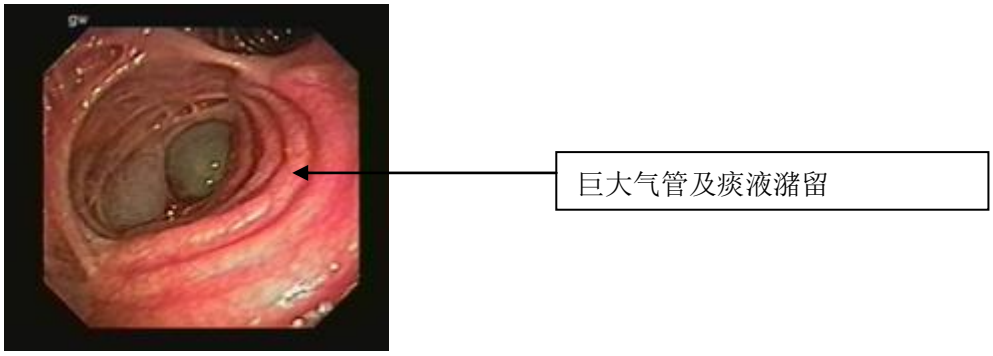


答案 VI.26　E

支气管结核病人常表现为局灶节段性狭窄。然而，也有一些病人出现气管支气管扩大，可能是由于牵拉和在肺、气管、纵隔、壁层胸膜之间有瘢痕形成。很明显，这种情况是罕见的。弥漫性气管支气管增大症可发生在上面提及的实体上。软化可伴或不伴支气管扩张。

在一些病人，动态支气管镜检查可发现松弛的气管。气管支气管巨大症指整个气管普遍扩张，可引起无效咳嗽，分泌物潴留，支气管肺炎反复发作，支气管扩张和肺气肿。双肺常过度膨胀。气管支气管巨大症的患者也可有反复的关节脱位、运动过度及肠道憩室。共济失调毛细血管扩张症指明显的皮肤毛细血管扩张和小脑共济失调

一些有 COPD 及囊性纤维化的病人由于慢性炎症及远端气道弹性纤维的破坏，导致气管松弛及软化，也可产生巨大气管。



答案 VI.27　E

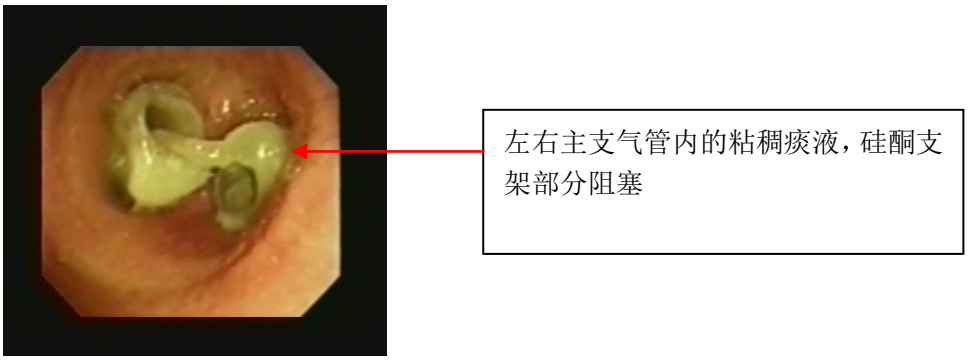
必须重视可弯曲支气管镜的合理使用教育和滥用的后果。当损坏时，大都可以给制造商或者第三方修理。零件容易置换，但价格昂贵。可弯曲支气管镜及显示器的维修费用常需数千美元，可迅速的耗尽内窥镜的预算。为了避免对支气管镜工作通道的损害，所有支气管针必须正确使用。如果看见锋利的针端，以及针已超出了保护鞘，则不该继续插入或取出。

当末梢尖端在锐角处弯曲时，通过可弯曲支气管镜时，仪器不该用力插入。支气管镜插入管道不应在指头间强行扭曲，当然，当支气管镜经口腔插入时，常需使用牙垫。仪器车上的所有抽屉应该关闭，确保支气管镜的插入管道不在里面。这些问题都可以而且必须避免。然而，偶尔支气管镜头碰到床栏或仪器车上的围栏是难于避免的。当这种情况发生时，应提醒操作者，让他们知道购买镜头的价格可能会比购买他们驾驶的汽车还贵……而维修费用肯定比保险费更贵。

答案 VI.28　B

大多数病人在置入支架后症状明显改善，并且症状易于观察。因此，肺功能的监测没有必要，除非要进行科学研究。支气管镜的监测仍是一个有争论的话题。目前还不清楚是否留置支架的患者应定期进行可弯曲支气管镜检查，还是仅在患者出现新的与留置支架有关的症状时才行支气管镜检查。

置入支架相关的症状包括咳嗽，呼吸困难，咳血，肺不张 X 线征像或局部肺浸润，声音嘶哑，失声，运动耐力降低。在支气管镜检查后，虽然存在分泌物潴留及有潜在的致病微生物感染危险，支架相关感染是罕见的，很少应用抗生素。



答案 VI.29　D

正确的技术，培训和实践可防止在使用针头过程中使针管断裂。此外，适当的技术，也可防止突出针尖对支气管镜工作通道的损害。在不能保证针头在导管内的时候，针头不应插入支气管镜或从支气管镜取出。除了以上列举的针吸并发症，其余并发症很少发生，并且难于避免。在针吸后的大量出血很少发生，即使在针吸时，血管刺破，血液流入注射器或导管。

答案 VI.30　D

使用不能回缩的针头或者已经损坏的穿刺针，以致针头不能回缩进套管，这很有可能损坏可弯曲支气管镜的工作通道。其它的方法对穿过支气管壁是有用的。在尽可能保持支气管镜伸直及弯曲端在中央气道前提下，可回缩针管才能通过支气管镜工作通道向前进入。当看到金属尖端超过支气管镜末端后，针头向前推进并定好位置，然后套管回缩，镜头朝目标区域向前推进。

关于“突刺法”，当镜子在鼻子或者口的时候，针尖通过软骨间隙用一个快速坚固的戳刺入导管。

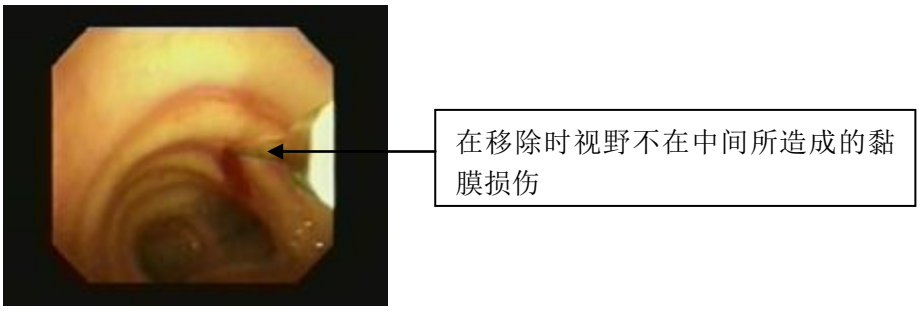
这个中心法用针头放在可以回缩的位置，以致导管的远端（金属中心）直接放在与气管壁接触的位置，当针头从导管推出时紧紧握住，然后通过气管壁。

“背驮式方法”是把导管固定在支气管镜工作通道的开口（在食指或助手的帮助下）。这是在导管向前并固定在目标位置后进行。然后支气管镜和针套同时向前直至整个针刺入气管壁。

关于“咳嗽法”，支气管镜专家首先应尝试用背驮式或戳刺技术。针头直接放置在目标区域，然后嘱病人咳嗽，咳嗽使针头刺入支气管壁。一旦针头刺入目标区域，在抽吸的同时向前向后移动，以致获取细胞。然后停止抽吸，如有必要，拉直支气管镜尖端，针头退出目标位置，退回导管，针套同时从镜子退出。

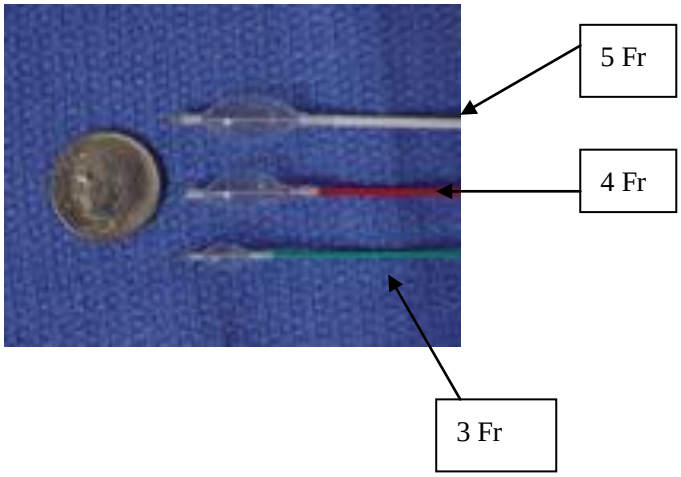
答案 VI.31　C

拉直支气管镜是最安全的，同时保持针尖在视野范围内，同时整个拉出。维持视野及针尖在气道中间，不会有损伤气道黏膜的危险。唯一的危险是划伤喉或鼻黏膜。如果视野是直的，并且末端不弯曲或过伸，以及只看到有一小部分的针尖超出了支气管远端，这种危险性很小。



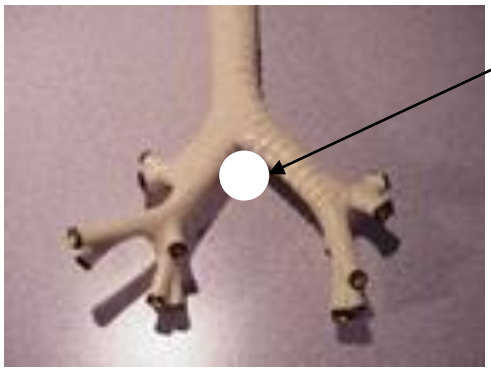
答案 VI.32　B

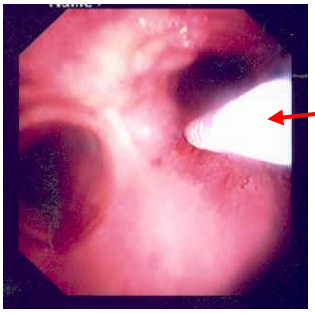
5F 导管宽 1.5mm，能够容易的通过诊断的可弯曲支气管镜或电视支气管镜的工作通道。不充胀时球囊约 2mm、扩张时球囊约 10mm。应备有各种型号的扩张球囊导管。存放熟悉和常用的仪器。你和你的助手应该知道你们所拥有的所有可弯曲支气管镜工作通道的直径及支气管镜的外径。测量值应写在你的操作车上，以免忘记或与无经验的助手一起操作。使用不同的支气管镜，其工作通道可能不同。自写这本书为止，大多数可视支气管镜的的外径为 4.9mm 或 6.0mm，长度为 60cm。软性光导纤维支气管镜的外径为 4.0mm 或 6.0mm，长度为 55cm。光导或可视支气管镜工作通道的直径是 2.2mm 或 2.8mm。记住插管仅在无法控制出血时进行。

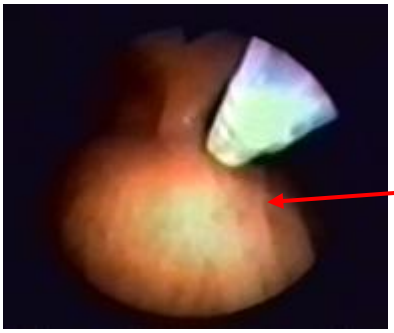


答案 VI.33　A

可直接通过隆凸向下的方向对隆凸下淋巴结（AST 7 组，王氏分类法 1 和 2 组）行针吸取样，或在两侧隆凸下 3-4mm 使针头向下、向内侧行针吸取样。如果针头朝上、朝前、朝旁进针（答案 C），可对气管旁淋巴结进行取样。如果针头朝上、朝前进针，可对隆凸前淋巴结进行取样（答案 B）。如果针头朝后进针，可对隆凸后淋巴结进行取样（但这也会引起气胸，因为邻近奇静脉食管隐窝。







答案 VI.34　C

在测漏实验完成之前，支气管镜不应放入液体中。如果测漏试验阳性，支气管镜浸入水或液体中，可引起严重的损害，支气管镜将需送去维修。为了防止感染的播散，一般的预防措施应常规进行。已知 AIDS 感染的病人与此无关。

答案 VI.35　C

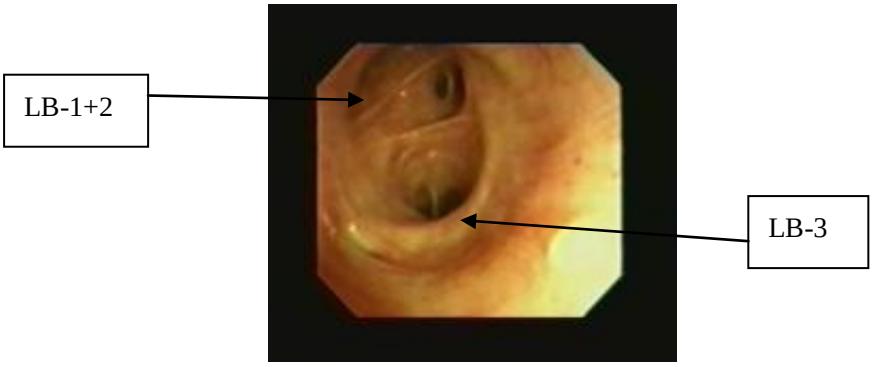
这种表达，最初是归功于 Chevalier Jackson，他是一个著名的耳鼻喉专家和教师，来自费城，他认为人们应该在打开活检钳和获取肺组织时，应该“感到”活检钳能达到的最外周支气管，而不会引起气胸。在 X-光的引导下，支气管镜肺活检是容易的。但 “眼睛在指头上”的说法仍然适用。

当然， “温柔是一种美德”的说法也是正确的，因为大多数专家主张活检组织时应抓住然后轻轻地拉，而不是从呼吸道黏膜或肺实质迅速地撕裂组织。一种技巧是在 X-光的引导下，把钳子插入外周支气管，钳子进入到距胸壁 1-2cm 内，继续在荧光的引导下，钳子退出 2-3cm，打开活检钳并进入 1-2cm，钳子夹闭并轻轻的取出。在操作的任何时间，如果病人感到痛，表明钳子进入太深了。此时，应该把钳子撤回，再次小心地使钳子进入并钳夹。因此，“温柔是一种美德”也适用于支气管镜专家和病人的关系。

“永不放弃”是池田医师的生活格言，他是日本的支气管镜专家，在 20 世纪 60 年代，把可弯曲支气管镜向世界推广。池田随后毕生致力于支气管病学的技术创新和科学研究。他也创建了世界支气管镜学会，这个协会现在还很活跃。

答案 VI.36　B

在胚胎发育期间，前段支气管成为一个单一的起源，实际上可引起两个变化，其被分成尖-后支气管(LB 1 and 2)及前支气管(LB 3)。左下叶常仅有 4 个基底段支气管（LB 6, 8, 9，10)，而内基底支气管(LB 7)通常不能形成。然而，当左下叶支气管分成两部分时，大多数前支产生内及前基底支气管，而大多数后支产生后及外基底支气管。



模块 VI

阶段测试

阶段测试 模块Ⅵ

Post test instructions

The following test is designed to verify that you have completed and fully understood the 30 questions for Module Ⅵ.

回顾性测试指引：

下列检测是为了证实你已经完成并充分理解了模块Ⅵ的 30 个问题中所包含的所有知识内容。

模块测试的问题和答案：模块 6

问题 1： 74 岁老年患者，声门下气管狭窄，近期行气管内支架植入术（硅酮支架直径 14mm，长 50mm），表现为呼吸困难和咳嗽。胸片显示有远端移位。病人处于严重急性呼吸窘迫而需行气管插管。以下除了哪项都可被接受：

A 通过喉镜置入 6 号无卷边袖状气管内导管。

B 应用支气管镜辅助插管，导管口径大小取决于气道直径。

C 清醒状态下支气管镜辅助插管处理，管口口径大小取决于气道直径。

D 立即麻痹病人，通过喉镜插管置入 6 号无卷边袖状气管内导管。

问题 2：下面关于气道支架的陈述是哪一种错误的？

A 在一般情况下，大部分良性气道狭窄病人，应避免放置金属支架。

B 硅酮支架易于移位和因分泌物潴留而致阻塞。

C 放射治疗对气道支架有不良影响，不能应用。

d.一个留置气管支架的病人，出现新的症状如发烧，咳嗽，或呼吸困难等，应快速评估是否有支架有关的并发症。

E 支架相关的肉芽组织通常采用激光或电切除术。

问题 3：关于光动力疗法以下说法哪个是错的：

A 该疗法已被 FDA 批准用于治疗早期肺癌。

B 治疗后，患者必须至少 6 周免受人工光源照射。

C 坏死组织可导致气道阻塞，往往需要应用纤维支气管镜对肺进行清理。

D 治疗后，可通过穿防护衣或眼罩至少 6 周以避免皮肤光过敏。

问题 4：食道通常位于？

A 位于气管和左主支气管后壁的后面 3mm 以内。

B 直接位于右主支气管起点的后方

C 直接位于气管后方，但位于左主支气管起点的前方

D 气管远端三分之一的右后方

问题 5：最能提高支气镜针吸活检诊断率的是：

A 多点取材并通过专门的病理细胞学家现场检查

B 侥幸

C 当针头从淋巴结离开时抽吸。

D 使用刺推技术

问题 6：以下是经支气管针吸活检技术，哪个除外？

A 突刺法

B 背驮法

C 咳嗽法

D 中心靠壁法

E 盲插法

问题 7：ATS 分期法中 4R 点从哪进？

A 气管后外侧 2-4 软骨间隙行支气管针吸活检
B 气管前外侧 2-4 软骨间隙行支气管针吸活检
C 气管外侧 2-4 软骨间隙行支气管针吸活检
D 在隆突水平处气管后外侧行支气管针吸活检

问题 8：下列哪解剖结构紧邻左主支气管前壁及左上叶支气管？

A.左肺动脉
B.主动脉
C.左肺静脉
D.食管

问题 9：对 ATS 第 7 组淋巴结行针吸活检最好由哪种途径进行？
A 在右主支气管内侧壁的对面及邻近右上叶支气管起始处以相对水平的方向进针
B 在右主支气管内侧壁的对面及邻近右上叶支气管起始处以相对垂直的方向进针
C 在隆凸水平气管下三分之一的后壁处进针
D 在隆凸处垂直方向直接进针

问题 10：在经支气管针吸活检中，以下除了哪项都有利于避免支气管镜损坏？

A 确保在针鞘回缩到支气管镜前将针回缩到针鞘里面
B 在针移除前使支气管镜转直
C 实践
D 避免在针通过支气管镜的任何时候过度屈曲或伸展支气管镜的尖端。
E 避免使用组织学针

恭喜！你已经完成了模块 VI 部分涉及到的支气管镜医师应该掌握的基本知识。后面测试问题的正确答案在下面列出。我们建议您开始模块 VI 时，复习问题和答案。你可用 PDF 格式打印整个模组。

模块 VI 测试的答案

答案 1: A
答案 2: C
答案 3: B
答案 4: A
答案 5: A
答案 6: E
答案 7: B
答案 8: C
答案 9: A
答案: 10. E

恭喜您，您已完成全部课程。

祝愿您在介入肺脏病学习的道路上取得更大成绩！

杰出气管镜专家

Officially endorsed by the World Association for Bronchology and Interventional Pulmonology

Translated by Professor Shiyue Li, Guangzhou Institute of Respiratory Disease, China

From the original: The Essential Bronchoscopist© By Henri Colt, MD, FCCP, FAWM

rake press

Laguna Beach, CA, USA