American Thoracic Society International Conference

2017 American Thoracic Society
MOC STUDY GUIDE

Where today's science meets tomorrow's care™

ATS 2017
Where today's science meets tomorrow's care™

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Washington, DC
conference.thoracic.org

CONTENTS

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May 2017

Welcome to the ATS 2017 International Conference in Washington, DC!

On behalf of the Education Committee of the American Thoracic Society (ATS), I would like to welcome you to the 2017 ATS International Conference. With more than 13,000 attendees from more than 100 countries, ATS 2017 is one of the largest gatherings of pulmonary, critical care, and sleep medicine professionals in the world.

In an effort to help busy clinicians with the increasing demands of recertification, the ATS Education Committee has provided 2017 conference attendees with the opportunity to earn up to 46.5 American Board of Internal Medicine (ABIM) MOC (Maintenance of Certification) Medical Knowledge Points and 10 American Board of Pediatrics (ABP) Part 2 MOC Self-Assessment credits through the Adult and Pediatric Core Curriculum modules and 21 additional Symposia. All MOC modules are free for attendees with full conference registration for up to two months post-meeting. The Society is excited to be able to offer MOC opportunities in conjunction with the clinical and scientific content that attendees have come to expect from the International Conference. For those not seeking MOC credit, the questions support learning in key clinical areas. A list of Symposia that are eligible are listed on the next page and are labeled in the Final Program.

This MOC Study Guide is intended to provide you with essential information needed to earn MOC at ATS 2017. This Study Guide is intended a resource only and cannot be submitted for credit; in order to obtain ABIM Medical Knowledge Points or ABP Part 2 Credits, you must complete the post-test online at **https://www.xpressreg.net/register/thor0517/evaluations.asp**.

Over the past five years, ATS has also developed an extensive MOC portfolio outside of the International Conference, including companions to a number of clinical practice guidelines and selected post-graduate courses. You can learn more about ATS MOC opportunities, by visiting http://store.thoracic.org/continuingeducation/moc.php .

If you have any questions about the ATS MOC portfolio, please don't hesitate to contact ATS staff at moc@thoracic.org.

Once more, welcome to ATS 2017!

Debra Boyer, MD, MPHE
Chair, ATS Education Committee

About MOC at ATS 2017

The American Board of Internal Medicine and the American Board of Pediatrics have changed how Maintenance of Certification points can be awarded so that MOC points are equivalent to the amount of CME. Attendees at the ATS 2017 International Conference can still earn at least as many points as in past years.

The ATS Education and the International Conference committees have collaborated on a plan where 21 symposia as well as adult and pediatric core curriculum symposia are eligible for MOC. Under the plan, ATS 2017 attendees will be able to earn a total of 46.5 ABIM MOC points—up from 30 points in 2016—and 10 ABP MOC points—the same number in 2016. The symposia will cover adult pulmonary, critical care, and sleep medicine as well as pediatric pulmonary symposia. The list of Adult and Pediatric Symposia eligible for MOC at the conference is at conference.thoracic.org/program/moc.php.

Successful completion of this CME activity, which includes participation in the evaluation component, enables the participant to earn up to 46.5 MOC in the American Board of Internal Medicine's (ABIM) Maintenance of Certification (MOC) program. It is the CME activity provider's responsibility to submit participant completion information to ACCME for the purpose of granting ABIM MOC credit.

Successful completion of this CME activity, which includes participation in the activity, with individual assessments of the participant and feedback to the participant, enables the participant to earn 10 MOC points in the American Board of Pediatrics' (ABP) Maintenance of Certification (MOC) program. It is the CME activity provider's responsibility to submit participant completion information to ACCME for the purpose of granting ABP MOC credit.

How to Earn MOC at ATS 2017

- Early-May: Look for announcements in ATS communications and on the International Conference website about the ATS 2017 sessions offering ABIM and ABP MOC points.
- Before ATS 2017: Take the pre-test for each core curriculum session and MOC eligible symposium you want to attend.
- During ATS 2017: Attend any and all of the MOC symposia you are interested in. These symposia will be highlighted in the Final Program and the ATS 2017 App, as well as in signage throughout the convention center.
- After ATS 2017: Take the post-session test. All the tests will be available at the end of the International Conference, and attendees can take the tests at no cost through July 31, 2017. Those who took the pre-test will receive notification that the post-test is online. Please note: audience response during a session does not count at the post-test.

Reporting MOC to Boards

In the past, completion of MOC exams was real time. In 2017 completion of MOC activities is uploaded on a weekly basis to the ABIM and ABP. Please allow up to 15 business days for your score to be reported.

If you have any questions contact ATS staff at moc@thoracic.org.

MOC Eligible Symposia

Session ID	Title	Pillar of Focus
A4	Determinants Of Long-Term Outcomes Among Critically Ill Older Adults: From Cell To Population	Critical Care
B84	Chronic, Persistent, Prolonged, And Just Plain Stuck: Insights In Chronic Critical Illness	Critical Care
C4	A Stitch In Time: Controversies In Critical Care Best Practices And Their Effect On Patient Centered Outcomes	Critical Care
CC1	Critical Care Core Curriculum: Acute Liver Failure, Acute Pancreatitis, Hematology/Oncology	Critical Care
CC3	Critical Care Core Curriculum: Oxygenation, Right Heart Failure, Volume Responsiveness, Early Goal Therapy	Critical Care
A88	Sex, Sugar, Salt And Stress: Neurohormonal Signaling As A Novel Therapeutic Target In Right Ventricular Failure	Critical Care
B4	Humanizing The Intensive Care Unit: New Perspectives On An Old Problem	Critical Care
D4	Balancing Personalization And Protocol In The ICU	Critical Care
A11	Lung Cancer Screening And Tobacco Cessation: The Teachable Moment?	Pulmonary
B1	Clinical Year In Review 2: • ILD • Asthma • COPD • Pulmonary Vascular Disease	Pulmonary
C1	Clinical Year In Review 3: • TB/NTM • Microbiome • Non-CF Bronchiectasis • Lung Transplantation	Pulmonary
CC2	Pulmonary Core Curriculum: Venothromboembolic Disease, Pleural Disease, Smoking Cessation	Pulmonary
CC5	Pulmonary Core Curriculum: Lung Cancer	Pulmonary
D1	Clinical Year In Review 4: • Thoracic Oncology • Thoracic Imaging • Health Disparities • Palliative Care	Pulmonary
D3	Diagnostic Dilemmas In Hypersensitivity Pneumonia And The Clinical-Radiologic-Pathologic Multidisciplinary Standard	Pulmonary
D82	Putting The 2017 Gold COPD Recommendations Into Clinical Practice	Pulmonary
B2	The Long-Term Oxygen Treatment Trial (Lott):Implications For COPD Patient Care	Pulmonary
A86	The Sleep State Of The Union: Taking OSA Management To Washington	Sleep
C10	Positive Pressure + Negative Adherence = High Priority Future Research Need	Sleep
CC4	Sleep Core Curriculum: Insomnia, Psychiatric Diseases	Sleep
CC6	Sleep Core Curriculum: OSA	Sleep
D6	Sleep And Health: A Public Health Call To Action	Sleep
A1	Clinical Yeariln Review 1: • New Tools For Acute Respiratory Failure • General Critical Care • Neuro Critical Care • Sleep Disordered Breathing	Sleep
C3	Obesity And Lung Disease	Sleep
B6	Mechanical Ventilation In The NICU, PICU And At Home: What The Pediatric Pulmonologist Should Know	Pediatric
B81	Pediatric Year In Review	Pediatric
C83	Pediatric Chest Rounds	Pediatric
PCC1	Severe Asthma	Pediatric
PCC2	Interstitial Lung Disease	Pediatric
PCC3	Bronchopulmonary Dysplasia	Pediatric
PCC4	Pulmonary Hypertension and Rheumatologic Diseases	Pediatric

Questions for SUNDAY Sessions

PCC1: Pediatric Core Curriculum 1: Asthma

#1

A 12-year-old male presents for evaluation of severe asthma. He is on fluticasone/salmeterol diskus 500/50 1 puff BID and montelukast 5mg daily. He reports a daily, wet cough, which does not usually respond to albuterol. Spirometry reveals a moderate obstructive defect. There is no improvement following administration of bronchodilator.

Which of the following is the most appropriate next step?

A. Determine eligibility for omalizumab
B. Further work-up for suppurative lung disease
C. Change from fluticasone/salmeterol to budesonide/formoterol
D. Administer IM triamcinolone followed by repeat spirometry testing
E. Perform a home assessment

#2

Following her third hospitalization for an asthma exacerbation in the last 6 months, a 17-year-old female is referred for evaluation of severe asthma. On review of systems, she is also reporting frequent headaches and purulent nasal discharge. Spirometry reveals reversible airway obstruction. She demonstrates excellent medication technique in the office. You review her pharmacy records and determine that she has picked up 90% of her prescriptions in the last 6 months, which include high dose mometasone/formoterol and montelukast. She has already had a home assessment performed, and has appropriate allergen control measures in place.

What is the appropriate next step?

A. Start daily oral corticosteroids
B. Flexible bronchoscopy
C. Refer for evaluation of vocal cord dysfunction
D. Assess for sinus disease and consider treatment
E. Start omeprazole for possible asymptomatic GERD

#3

A 14-year-old female with eczema, seasonal allergies, and asthma presents to clinic for evaluation of severe asthma. She is on high dose inhaled corticosteroids and montelukast and continues to have nighttime cough, exercise intolerance, and frequent hospitalizations for asthma exacerbations. Spirometry reveals a reversible obstructive defect.

Prior to treatment escalation, what is least appropriate in the next steps in your evaluation:

A. Objective evaluation of medication adherence and administration technique
B. Environmental assessment
C. Screening for comorbid conditions
D. Total and specific IgE
E. Chest CT

#4

A 12 year old girl with asthma presents to the emergency room with tachypnea, increased work of breathing, and diffuse wheezing that has not responded to treatments with albuterol every 4 hours at home. She has been on combination therapy for the last 3 months that was started after a 2 day stay in the pediatric intensive care unit for her most recent asthma exacerbation. The only change since her last admission is that they recently moved to low income housing in the city where there is some mold in the bathroom.

Which of the following patient characteristics is the strongest risk factor for a severe, life-threatening asthma exacerbation?

A. Under-recognition of symptoms
B. History of recent ICU stay for severe asthma exacerbation
C. Taking a combined ICS/LABA
D. Low socioeconomic status
E. Exposure to allergens

#5

A 7 year old female with moderate persistent asthma was admitted to the pediatric intensive care unit in status asthmaticus. She has been on continuous albuterol for 3 hours and was started on IV methylprednisolone. She still has only fair-poor air entry with subcostal and intercostal retractions, prompting the medical team to initiate additional interventions.

Which of the following would be the next best adjunctive pharmacologic intervention?

A. IV Aminophylline
B. IM Epinephrine
C. IV Magnesium
D. Inhaled Magnesium
E. IV Terbutaline

#6

After one day of cough, sneeze, runny nose, and wheezing, an 8 year old boy is admitted to the hospital with a severe asthma exacerbation despite excellent adherence to his prescribed inhaled corticosteroid therapy. After receiving oral steroids and frequent albuterol, he significantly improved, now requiring albuterol every 3 hours. The trigger for his exacerbation was not clear.

Which of the following studies should you order next in an effort to optimize control and minimize risk prior to discharge?

A. Respiratory Allergen Panel
B. Chest Radiograph
C. Arterial Blood Gas
D. Lung Volumes with DLCO
E. Nasal Nitric Oxide (NO)

A1: Clinical Year in Review

#1

A 29 year-old woman, BMI 26, with no significant past medical history presented initially after a roll-over motor vehicle accident. Her injuries were notable for a left femur fracture, multiple bilateral rib fractures and a right lung contusion. She underwent endotracheal intubation in the field and developed moderate acute respiratory distress syndrome on hospital day one.

Which of the following best reflects the real-world use of interventions for the acute respiratory distress syndrome (ARDS)?

A. Prone positioning is used in over 75% of patients with severe ARDS
B. Neuromuscular blockade is used in less than 10% of patients with severe ARDS
C. A low-tidal volume ventilation strategy (less than 8ml/kg predicted body weight) is used in less than 65% of all patients with ARDS.
D. Positive end-expiratory pressure (PEEP) is set above 15cm of water in 50% of all patients with ARDS.

#2

A 57 year old man with urinary tract associated septic shock requiring vasopressors has developed progressively worsening acute kidney injury (AKI) and is currently Kidney Disease: Improving Global Outcomes stage 2. The ICU team plans to initiate renal replacement therapy (RRT).

Based on recent studies, which of the following is correct regarding RRT and AKI in this clinical context?

A. If his vasopressor requirement persists he should be started on continuous as opposed to intermittent RRT.
B. Timing of RRT initiation will not impact the probability of developing a central line associated blood stream infection.
C. His chances for spontaneous renal recovery will decrease if RRT initiation is delayed.
D. Randomized trials have found conflicting results regarding the importance of timing of initiation of RRT on patient mortality.
E. His probability of renal recovery is decreased because he has a urinary tract source for his septic shock as compared to other sources for sepsis.

#3

A 52 year old female with a long history of asthma presents with increasing episodes of asthma exacerbations. She reports increased wheezing and shortness of breath, requiring increased use of rescue medications. One week earlier, she presented to an emergency room with dyspnea and was diagnosed with an asthma exacerbation, prescribed a course of oral corticosteroids, and referred for further evaluation. At that time, you observed that her weight had increased 20 pounds over the last two years, which she associated with menopause. She also reported recent problems sleeping, with frequent awakenings, snoring/gasping, and kicking at night. She reports more fatigue during the day.

Which of the following conditions is most likely contributing to exacerbations of her asthma?

A. Gastro-esophageal reflux
B. Periodic movement disorder
C. Obstructive sleep apnea
D. Menopause
E. Insomnia

#4

A 68 year old male with a 20 year history of hypertension and diabetes and 10 year history of heart failure presents with daytime sleepiness. Over the last 3 months he frequently dozes when reading or watching TV. He typically sleeps for 8 or more hours per night. He has been a loud snorer for many years without recent change. His last echocardiography study showed an ejection fraction of 58%, increased left atrial volume and left ventricular hypertrophy. He has chronic atrial fibrillation with an average heart rate of 68 PBM. An overnight sleep study was ordered and showed an apnea hypopnea index (AHI of 45), with more than 50% of events classified as central apneas. He spent 10% of the sleep period at an oxygen saturation of < 90%. He has a body mass index of 35 and 2+ peripheral edema.

Which of the following treatments is most appropriate?

A. Adaptive servoventilation
B. Nocturnal oxygen supplementation
C. Phrenic nerve stimulation
D. Hypoglossal nerve stimulation
E. Electrical cardioversion

A4: Determinants of Long-Term Outcomes among Critically Ill Older Adults: from Cell to Population

#1

A 70 year old previously healthy man is admitted to your ICU with sepsis and respiratory failure secondary to pneumococcal pneumonia. On ICU day seven, he begins working with physical therapy. He has difficulty raising his arms above his head, requires the help of two persons to stand, and can only walk five steps before needing to sit down. The only identifiable cause of his new muscle weakness is his critical illness.

Which one of the "hallmarks" of aging biology has recently been implicated as one unifying mechanism for this patient's muscle weakness?

A. Cell senescence
B. Stem cell exhaustion
C. Telomere attrition
D. Genomic instability

#2

Ms. Floyd, a 67 year old woman, is admitted to your ICU for acute hypoxemic respiratory failure secondary to pneumococcal pneumonia. Her family notes that for the last year she has been "slowed down", and has, at times, needed help with housework and shopping. Compared with a similar patient whose family reports no functional limitations prior to critical illness, Ms. Floyd has a greater risk of which of the following in the twelve months following her illness:

A. Impaired cognitive function
B. worse disability in activities of daily living (ADLs)
C. More severe post-traumatic stress disorder (PTSD)
D. Better health-related quality of life (HRQOL)

#3

Mr. Boyd is a 70 old man with a past medical history of COPD, CKD, hearing impairment, and a recent hospitalization for a COPD exacerbation who is now admitted to the ICU with respiratory failure requiring mechanical ventilation. His APACHEII score was 18 on admission. His family mentions that he has been increasingly unable to perform household and self-care activities over the past year, so they have hired a home care aid to help him "get around," keep his house in order, and bathe. Assuming that he survives his ICU stay, which factors are most strongly associated with his post-ICU functional recovery, mortality, and hospital use?

A. His APACHEII score of 18
B. The patient's age
C. His need for mechanical ventilation during his ICU stay
D. The patient's pre-ICU factors (comorbidities, recent hospitalization, and worsening disability in the year prior to admission)

#4

Mrs. Hernandez is a 78 year old woman whose past medical history includes hypertension, osteoarthritis, dyslipidemia, mild cognitive impairment and recently diagnosed Type Two Diabetes Mellitus who was admitted to your medical ICU with pneumococcal pneumonia, bacteremia, and complicated pleural effusion. In the past year she sold her house and moved in with her daughter because of increasing difficulty with mobility. She developed septic shock with respiratory failure requiring intubation and mechanical ventilation as well as vasopressor therapy. She spent five days on the ventilator, eight days in the ICU, and seventeen days in the hospital. Her hospital course was complicated by delirium and severe generalized weakness, and she was discharged to a skilled nursing facility (SNF), where she has remained severely dependent in ADLs and severely cognitively impaired. Her daughter, who is her power of attorney for healthcare, asks if she is likely to recover from this illness and regain independence. You can tell her that

A. There is no information to help prognosticate at this time
B. Her risk of hospital readmission is no different than any other patient hospitalized with sepsis and respiratory failure.
C. Her history of some functional decline prior to hospitalization has no impact on her prognosis at this point.
D. Mrs. Hernandez has a >50% risk of dying in the next 6 months

A11: Lung Cancer Screening and Tobacco Cessation: The Teachable Moment?

#1

Regarding the impact of low dose CT (LDCT) screening on smoking abstinence, which of the following statements are supported in the literature?

A. Two recent systematic reviews show that undergoing LDCT screening in-and-of-itself is sufficient to achieve long-term smoking abstinence.
B. There is clear evidence to suggest that positive LDCT screening results are associated with increased smoking rates.
C. Screening may have paradoxical effects on intention to quit: while some smokers with a screen-detected lung nodule are more likely to quit, others with a normal screening LDCT may feel little urgency to quit.
D. Among all persons screened, 80% to 86% have a high risk result (Lung-RADS category three or four)
E. Offering self-help quit materials for patients undergoing LDCT screening significantly improves quit rates.

#2

Which of the following statements regarding lung cancer is correct?

A. Cigarette smoking causes about 60%-70% of lung cancers.
B. LDCT screening is the most effective intervention to reduce lung cancer mortality.
C. Quitting smoking is the most effective intervention to reduce lung cancer mortality.
D. Individuals with low socioeconomic status (SES) are equally likely to die from lung cancer as those who are not of low SES status.
E. Lung cancer is the second leading cause of cancer death in the United States.

#3

The existing literature provides a rationale for studying smoking cessation interventions in specific populations that have a higher prevalence of tobacco use and suffer a disproportionate burden of smoking-related morbidity and mortality.

Within the National Lung Screening Trial (NLST), which of the following groups had a higher risk of death?

A. Former smokers
B. Those with greater than a high school education
C. Black individuals
D. White individuals
E. Hispanics

#4

In the LDCT setting, there is lack of agreement on whether to target smokers for smoking cessation interventions based on patient factors such as motivation to quit, levels of dependency, or self-efficacy.

Within the NLST, which of the following participant factors predicted smoking abstinence after one year of screening?

A. Higher nicotine dependency
B. Higher motivation to quit at baseline
C. Lower perceived advantages of quitting
D. Lower self-efficacy
E. Younger age

#5

Which of the following statements regarding lung cancer screening is correct?

A. The National Lung Screening Trial (NLST) demonstrated a 10% relative reduction in lung cancer mortality with annual low-dose computed tomography (LDCT) screening of current and former smokers.
B. Within the NLST trial, current smokers who achieved smoking abstinence derived the greatest benefit from screening.
C. Smoking cessation counseling is not one of the essential components of a lung cancer screening program.

D. It is estimated that doubling the quit rate in screening-eligible patients would decrease the cost of LCDT screening nearly by 5% (based on cost per quality-adjusted life-year [QALY] gained).
E. The Center for Medicare and Medicaid Services (CMS) requires a shared-decision making discussion, but not smoking cessation counseling, in order to receive reimbursement for LDCT screening.

#6

Identifying effective approaches to tobacco dependence treatment in the context of LDCT screening has been identified as a priority by the NIH, the National Academy of Science, the Society for Research on Nicotine and Tobacco, and the American Thoracic Society.

Which of the following statements regarding the effectiveness of smoking cessation interventions in the LDCT setting is correct?

A. Little data exists on the effectiveness of smoking cessation interventions in the LDCT screening setting.
B. Quit rates among smokers undergoing LDCT screening have been estimated to be as high as 25%.
C. Ample research has been done to explore the barriers to, facilitators of, and most effective implementation strategies for delivering smoking cessation interventions in the context of LDCT screening.
D. Studies testing the effectiveness of smoking cessation interventions within the LDCT context have included comparisons of various pharmacologic agents for smoking cessation.
E. Most LDCT screening programs offer guideline-based tobacco dependence treatment.

CC 1: Critical Care Core Curriculum Part 1: Acute Liver Failure, Acute Pancreatitis, Hematology/Oncology

#1

A 42 year old woman is being treated in the ICU for acute hepatic failure due to autoimmune hepatitis. She was intubated for somnolence and has since become comatose. Her labs have been stable since admission and include an INR of 7.2, bilirubin of 6.5mg/dL, and creatinine of 3.2mg/dL. She is being treated with N-acetylcysteine, 1.5mg/kg of methylprednisolone, and omeprazole. She receives surveillance blood and sputum cultures every other day.

Which of the following interventions is likely to increase her overall survival?

A. Discontinuation of steroids
B. Placement of an intracranial pressure monitor
C. Initiation of prophylactic antibiotics
D. Transfer to a liver transplant center
E. Trial of extubation

#2

A 45 year old man is admitted to the ICU for acute liver failure with grade II encephalopathy secondary to diclofenac use. His INR is 1.8, bilirubin of 4.2mg/dL, AST of 750u/L, ALT of 680u/L.

Which of the following is the most appropriate next step in management?

A. Administer fresh frozen plasma to INR <2.0
B. Place an intracranial pressure monitor
C. Administer methylprednisolone 2mg/kg/day
D. Initiate N-acetylcysteine infusion
E. Administer prophylactic antibiotics

#3

A 43 year old previously healthy woman presents to the Emergency Department with progressively worsening abdominal pain over one-week. She does not smoke and drinks two alcoholic drinks daily. She was in her usual state of health until two weeks ago when she developed an upper respiratory infection, which she treated with acetaminophen, pseudoephedrine and Nyquil. Her upper respiratory symptoms improved but she developed right upper quadrant pain and constant nausea. Her current vital signs are: temperature 38.4 C, HR 92 bpm, BP 105/75 mm Hg, RR 18, oxygen saturation 98% without supplemental oxygen. Laboratory values are notable for AST 2200U/L, ALT 1900U/L, Alkaline phosphatase

105U/L, bilirubin 9μmol/L, INR 1.7, and creatinine 0.89 mg/dL. Acetaminophen level is undetectable, and blood alcohol level is 0. A liver ultrasound shows a normal sized liver without nodularity, and a normal sized gallbladder and common bile duct without stones. Her wife tells you that she has seemed forgetful and lethargic over the past few days, but has continued her usual activities of daily living.

What is the most likely diagnosis?

A. Acute Liver Failure
B. Ascending cholangitis
C. Decompensated cirrhosis
D. Sepsis
E. Acute hepatitis A infection

#4

A 47 year old man with diabetes presents to the Emergency Department with 3 days of severe abdominal pain, nausea and vomiting. On arrival, his temperature is 38.2oC, heart rate is 135 bpm, blood pressure is 79/42 mm Hg, respiratory rate is 29 breaths/minute and oxygen saturation is 99% breathing air. Laboratory evaluation is remarkable for a creatinine of 2.9 mg/dL, lactic acid of 5.1 mmol/L, lipase of 930b U/L, AST of 290, ALT of 320 U/L, total bilirubin of 2.1 mg/dL and alkaline phosphatase of 190 IU/L. Right upper quadrant ultrasound reveals no evidence of biliary ductal dilation or cholelithiasis.

Which of the following is the most appropriate next step in the management of this patient?

A. Volume resuscitation with lactated ringer's
B. Intravenous insulin infusion
C. Broad-spectrum antibiotics
D. Endoscopic retrograde cholangiopancreatography
E. Norepinephrine infusion

#5

A 37 year old woman was admitted to the intensive care unit one day ago with severe pancreatitis. She received 4L IVF and is now requiring norepinephrine to maintain a mean arterial pressure > 65 mmHg. Her urine output has been 35-50 cc/hr. After she was intubated for acute hypoxemic respiratory failure, an orogastric tube was placed, but could not be advanced to the duodenum. Intermittent suction has yielded < 100 cc of gastric aspirate.

Which of the following is the most appropriate nutrition strategy at this time?

A. Avoid enteral feeding until the feeding tube is in a post-pyloric position
B. Avoid enteral feeding until the patient is extubated and free of abdominal pain
C. Initiate total parental nutrition (TPN)
D. Initiate orogastric feeding and advance as tolerated
E. Initiate partial parental nutrition (PPN)

#6

After receiving volume resuscitation and vasopressor infusions following admission for severe pancreatitis, a 54 year old man developed hypoxemic respiratory failure and required invasive mechanical ventilation. A right upper quadrant ultrasound performed prior to intubation demonstrated no evidence of biliary ductal dilation or cholelithiasis. Over the ensuring hours, he develops severe abdominal distension, progressive hypotension and anuria and is noted to have increased peak inspiratory pressure on the ventilator. A bladder pressure is measured at 42 cmH2O.

Which of the following is the most appropriate next step in the management of this patient?

A. Pancreatic biopsy to assess for bacterial infection
B. CT of the abdomen to assess for pancreatic necrosis
C. Repeat right upper quadrant ultrasound.
D. Repeat labs including arterial blood gas, BUN, serum creatinine, serum calcium and hematocrit.
E. Urgent surgical consultation

#7

A 64 year old woman is admitted to the ICU with hypoxemic respiratory failure and confusion. Her husband notes that she has been increasingly fatigued over the last 6 weeks with intermittent low-grade fevers. Her chest radiograph shows bilateral opacities. Laboratory studies are notable for a total white blood cell count of 114,000 cells/mm3 with 60% blasts, 20% young unidentified cells, and 2% metamylocytes, a hemoglobin of 6.5 g/dL, and a platelet count of 20,000/mm3.

What is the next best step in management?

A. Transfuse one unit of packed red blood cells
B. Administer furosemide 80 mg intravenously
C. Transfuse platelets
D. Administer one liter of isotonic crystalloid
E. Perform a lumbar puncture

#8

A 55 year old man is transferred to the ICU from the oncology ward with fevers and hypotension. He is 14 days post allogeneic hematopoietic stem cell transplant for leukemia, and his total white blood cell count is 0.1 cells/mm3, with an absolute neutrophil count (ANC) of 0 cells/mm3. He has been neutropenic for 12 days. Vital signs are notable for a temperature of 39 °C, blood pressure of 75/50 mm Hg, and heart rate of 120 beats/min. He has had fevers >38.0 °C for the past two days, and has been receiving cefepime 2 grams intravenously every 8 hours. He has a dual lumen tunneled catheter for central venous access. He has no allergies, and renal and hepatic functions are normal.

What is the most appropriate antibiotic regimen for this patient?

A. Meropenem, vancomycin, and caspofungin
B. Cefepime and vancomycin
C. Piperacillin-tazobactam and vancomycin
D. Cefepime, azithromycin, and vancomycin
E. Gentamicin and caspofungin

#9

A 30 year old woman presents to the Emergency Department with headache and confusion. Her only medication is an oral contraceptive. She denies abdominal pain, nausea, diarrhea, shortness of breath, upper respiratory symptoms, and chest pain. Neurologic exam is non-focal, and a computed tomography scan of the brain demonstrates no acute abnormality. Laboratory evaluation reveals a platelet count of 10,000/mm3, a creatinine of 1.7 mg/dL, and hemoglobin of 8 g/dL. Urine HCG is negative. The peripheral blood smear demonstrates thrombocytopenia and a large number of schistocytes.

What is the most appropriate next step in the management of this patient?

A. Platelet transfusion.
B. Plasma exchange
C. Eculizumab.
D. High-dose corticosteroids
E. ADAMTS13 activity assay

A86: The Sleep State Of The Union: Taking OSA Management To Washington

#1

There has been a passenger bus crash with fatalities in your area and media attention has been given to the fact that the bus driver had sleep apnea. You are approached as a pulmonology consultant to give an interview on the public health aspects of sleep apnea.

Which one of the following statements is correct?

A. There is strong evidence from randomized, controlled trials that treatment of sleep apnea reduces car crashes and workplace accidents.
B. Based on recent epidemiologic data, an estimated 15.5 million men (13% of adult males) and 7.1 million women (6% of adult females) in the U.S. suffer from moderate-severe sleep apnea.
C. A majority (>65%) of individuals with sleep apnea in the U.S. have had their condition diagnosed by a physician and have been offered sleep apnea treatment at least once.
D. Recent economic studies indicate that it is more cost-effective to recommend lifestyle changes only for suspected sleep apnea, rather than to incur to the high costs of diagnostic testing and CPAP treatment.
E. With the growing use of portable sleep testing and automated PAP treatment, racial and geographic disparities in sleep apnea diagnosis and treatment have largely resolved.

#2

A 35 month old boy with moderate persistent asthma has a history of loud snoring every night for the past year. He has not had any behavioral changes during wakefulness. Weight has remained constant at the 25th percentile. He has had 2 asthma admissions over the past year. Physical examination is remarkable for an adenoidal facies and 2+ tonsils. Medications include albuterol, inhaled fluticasone (110 mcg) and montelukast. The waiting time for a polysomnogram in his hometown is 2 months.

What is the next best step in the management?

A. Obtain a home pulse oximetry study
B. Refer to an otolaryngologist for adenotonsillectomy
C. Obtain a lateral neck Xray to assess tonsil and adenoid size
D. Obtain an in-laboratory polysomnogram
E. Observe the patient for 6 months to see if symptoms improve

#3

A 36 year old woman is admitted to the hospital with acute dyspnea and acute pulmonary embolism diagnosed by CT angiography. She denies fever, chest pain, and cough. Past medical history is significant for hypertension, active tobacco use, DVT and PE, acute respiratory distress syndrome two years ago with tracheostomy and prolonged weaning followed by decannulation after 3 months. Her BMI is 35, respiratory rate is 25/minute, and other vital signs are within normal limits. Arterial blood gas is pH 7.38/PaCO2 58/PaO2 56 mm Hg in room air. She is noted to be drowsy during the day by her nurse. A pulmonary consult is requested and patient admits to long-standing history of snoring and witnessed apnea reported by multiple family members. She thinks she has recently lost weight. An unattended diagnostic type 3 sleep apnea test is obtained in the hospital for suspected sleep apnea. The valid recording time is 4.9 hours, apnea hypopnea index (AHI, based on 4% oxygen desaturation criteria) is 4 per hour and time <90% oxygen saturation is 16 minutes. Respiratory disturbance index (RDI, based on flow limitation with 1-3% oxygen desaturation) is 17 per hour.

What is the next best step in her management?

A. Patient does not have obstructive sleep apnea, no follow-up needed.
B. Initiate Autoadjusting positive airway pressure treatment based on RDI.
C. Recommend smoking cessation and weight loss for upper airway resistance syndrome.
D. Patient should follow-up as outpatient if she gains weight.
E. Recommend split-night polysomnography immediately after discharge.

#4

A 55 year old man with medication controlled hypertension was recently diagnosed with obstructive sleep apnea and prescribed CPAP with a pressure of 9 cmH2O.

When should follow up to assess CPAP adherence and promote usage occur?

A. Week one of treatment
B. Month one of treatment
C. Month three of treatment
D. Month six of treatment
E. Follow up as needed

A88: Sex, Sugar, Salt and Stress: Neurohormonal Signaling as a Novel Therapeutic Target in Right Ventricular Failure

#1

You are seeing one of your long-term pulmonary arterial hypertension (PAH) patients in clinic. She is very data driven and has been doing some research and is concerned about her current medication regimen. She specifically wants to know if she should be on bisoprolol.

According to the current evidence, what is the best response to her question about bisoprolol?

A. She should start it as bisoprolol improves right ventricular ejection fraction measured by cardiac magnetic resonance imaging.
B. She should not start it as bisoprolol was poorly tolerated in all IPAH patients and had no effect on heart rate.
C. Bisoprolol has not been tested in clinical trials in PAH.
D. She should not start it as bisoprolol decreased cardiac index and may have decreased six-minute walk distance, suggesting bisoprolol should not be used in PAH.
E. Any beta-blocker would be appropriate to recommend to her.

#2

Female sex is a risk factor for PAH, yet women are more likely to survive than men with PAH. This has been dubbed the "estrogen paradox" of pulmonary vascular disease.

Which of the following observations related to the estrogen paradox is correct?

A. Estrogen has a clear detrimental effect on the pulmonary vasculature based on experimental models of pulmonary hypertension.
B. A genetic variant in estrogen metabolism has been identified which causes human PAH.
C. Estrogen may have beneficial effects on right heart function.
D. Therapies aimed at reducing estrogen exposure (e.g., anastrozole) are approved for the treatment of PAH.

#3

Aldosterone is a steroid hormone that plays a key role in sodium and water handling and systemic blood pressure regulation. Aldosterone antagonists reduce mortality in left heart failure, making aldosterone an appealing target for study in pulmonary vascular and right heart function. During an office visit you determine a patient of yours has PAH as well as signs of right heart dysfunction, and decide they need an additional diuretic.

Based on current evidence, it may be reasonable to consider adding an aldosterone antagonist to your patient's regimen because:

A. Aldosterone promotes experimental pulmonary hypertension via nitric oxide and endothelin-1 signaling, so blocking it could be detrimental to your patient.
B. It has been shown that pulmonary arterial endothelial cells do not produce aldosterone.
C. Preliminary data suggests synergistic effects between an aldosterone antagonist (spironolactone) and approved agents in PAH (endothelin receptor antagonists), and is currently being tested in clinical trials.
D. Lower aldosterone levels have been associated with greater hemodynamic burden in human PAH.

#4

Insulin resistance and altered fatty acid metabolism have been implicated in the pathogenesis of PAH. Patients with heritable PAH exhibit evidence of lioptoxicity in their right ventricles (RV), making insulin resistance and altered fatty acid metabolism possible therapeutic targets in PAH.

A clinical study of metformin in PAH is based on the following rationale:

A. Observational data suggests metformin use in diabetics with PAH is associated with improved RV function.
B. Treatment with metformin results in reduced RV lipid deposition in experimental PAH.
C. Treatment with metformin would be expected to result in promotion of insulin resistance in PAH.
D. Treatment with metformin decreases high blood sugar levels, which have been shown to be cytotoxic in the right ventricle of PAH patients.
E. Metformin therapy has been poorly tolerated in individuals with heart failure.

#5

Activation of the renin-angiotensin-aldosterone system (RAAS) in PAH has long been established in PAH. However, until recently, research in this area was sparse. Recent data established a paradigm where the RAAS is activated in PAH and directly contributes to disease progression. RAAS inhibition is currently being explored as a therapeutic intervention in PAH.

A patient of yours has idiopathic PAH and right heart failure and her husband has left heart failure. She wants to know why she is not on losartan, which she knows is beneficial in her husband.

What should you tell your patient as a correct explanation for why this is the case?

A. Chronic inhibition of RAAS with losartan had no effect on experimental pulmonary hypertension.
B. Levels of renin, angiotensin (Ang) I and Ang II are associated with less severe disease and survival in idiopathic PAH.
C. Local RAAS activity is increased in pulmonary arteries of patients with idiopathic PAH and is associated with decreased pulmonary vascular remodeling and increased cardiac output.
D. Therapeutic benefit of losartan in PAH has not been demonstrated in a prospective, randomized control trial.

#6

The study of sex hormones and neuroendocrine factors in animal models and cell culture systems may be confounded by multiple factors that need to be considered when designing experiments and interpreting results.

Which of the following observations regarding the study of sex hormones and neuroendocrine factors in animal models and cell culture systems is correct?

A. Phenol red in cell culture media does not interfere with sex hormone signaling.
B. Diurnal variations in the release of hormones may affect results.
C. The sex of the animal handler has no effect on the results.
D. Animal chow contains neglible amounts of phytoestrogens.
E. Expression patterns of sex steroid receptors and activity of the renin-angiotensin-aldosterone system are stable throughout the life span.

Questions for MONDAY Sessions

PCC2: Pediatric Core Curriculum 2: Interstitial Lung Disease

#1

You are asked to consult on a 2 week old infant with respiratory failure in the neonatal intensive care unit. She was born full term via normal spontaneous vaginal delivery. In the delivery room, the patient was grunting, tachypneic, and had an oxygen saturation of 80% on room air. Initially CPAP was applied, but due to continued increased work of breathing and retractions, the patient was intubated in the delivery room and exogenous surfactant was given. Despite these interventions, hypoxemia persisted. Chest radiograph demonstrated diffuse granular hazy opacities. She was treated with IV antibiotics without improvement. A chest computed tomography done at 1 week of age showed diffuse ground-glass opacities and interlobular septal thickening. An echocardiogram was normal. The baby is currently maintained on mechanical ventilation at high settings, with FiO2 0.65. Upon further questioning, the parents reveal that the infant's older sibling passed away at 2 months of life from breathing problems that began shortly after birth.

Which of the following is the next best step?

A. Genetic testing for surfactant dysfunction mutations
B. Lung biopsy
C. Flexible bronchoscopy with bronchoalveolar lavage (BAL)
D. CT of the chest with contrast
E. Infant pulmonary function testing

#2

You are asked to consult on a 6 month old child with tachypnea. He was born at term and was sent home without any breathing difficulty at 2 days of life. At 2 months of age, he was admitted to the hospital for RSV-negative bronchiolitis and hypoxemia. He was discharged after 2 weeks; however, he continued to be tachypneic with retractions. An echocardiogram, obtained due to his prolonged oxygen requirement, is normal. At 4 months of age, he was readmitted for a presumed viral infection and hypoxemia, but again his viral panel is negative. Mom reports he rarely coughs and does not wheeze. On exam in your office, he is afebrile, tachypneic with a respiratory rate of 80, has subcostal retractions, and oxygen saturation of 91% on room air. You appreciate diffuse crackles on auscultation but no wheezing. He is currently 3rd percentile for weight, 30th percentile for height.

Which of the following Is the most appropriate next step?

A. Genetic testing for a disorder of surfactant metabolism
B. Infant pulmonary function testing
C. Lung biopsy
D. Controlled ventilation, high-resolution chest computed tomography (CT)
E. Start bronchodilators for likely asthma

#3

You are consulted to see a 13 year old boy admitted to the general pediatric service with hypoxemia and diffuse infiltrates on chest radiograph. He reports dyspnea, fatigue, and exercise intolerance for a month. Just a week ago, he was admitted to the hospital for presumed pneumonia and hypoxemia with an oxygen saturation of 85% on room air. He was also noted to have anemia with a hemoglobin level of 6 g/dl and a hematocrit of 24%. Family history is unremarkable. He has an elevated CRP of 10 mg/L, and an elevated ESR of 45 mm/hr. A chest radiograph obtained at admission has diffuse infiltrates, and chest CT shows diffuse ground glass opacities with septal thickening. ANA and ANCA testing are negative, and coagulation studies are normal. In addition, sputum cultures are negative, and he has had a negative work-up for tuberculosis. You perform a bronchoscopy with bronchoalveolar lavage (BAL), which reveals 75% of macrophages staining positive for hemosiderin. Cultures from the BAL grow only normal respiratory flora.

What is the best next step?

A. Repeat BAL with bronchoalveolar lavage

B. Treatment with high dose corticosteroids and hydroxychloroquine
C. Lung biopsy
D. Pulmonary function testing
E. Repeat serologic testing

#4

A 6-month old female has been diagnosed with surfactant protein C deficiency. She currently requires supplemental oxygen at night. Her most recent sleep study showed no evidence of hypercapnia, and her examination shows only minimal tachypnea without increased work of breathing. She is maintained on hydroxychloroquine with intermittent pulse steroids for exacerbations. Her height and weight are less than 3rd percentile. She is currently taking 22kcal/oz formula.

What is the next appropriate therapeutic intervention?

A. Tracheostomy and chronic mechanical ventilation
B. Nutrition consultation and caloric supplementation
C. Trial of therapy with azithromycin
D. Whole lung lavage
E. Treatment with inhaled budesonide

#5

A 3-month old male has been found to have ABCA3 deficiency with null/null mutations. He is currently chronically mechanically ventilated via tracheostomy. He is receiving pulse steroids monthly with daily low dose steroids, azithromycin, and hydroxychloroquine. He is enterally fed with normal growth; weight, length, and weight-for-length are all above the 50th percentile. He has frequent desaturations. You have had to increase his ventilator settings several times to maintain ventilation and oxygenation.

What is the next step in management of this patient?

A. Evaluation for lung transplantation
B. Discontinue hydroxychloroquine due to lack of response
C. Continue with chronic mechanical ventilation with an expectation of eventual improvement as a response to current therapies
D. Increase enteral feed volume to maximize growth
E. Increase daily oral steroid dosing

#6

An 11 month old male with tachypnea, failure to thrive, and crackles on exam is found to have a chest CT consistent with neuroendocrine cell hyperplasia of infancy (NEHI). An overnight oximetry study reveals an average oxygen saturation of 88% with desaturations to 72%. He has no evidence of aspiration. He is otherwise developmentally normal. He is not currently taking any medications.

What is the most appropriate next step in treatment/management for this patient?

A. Gastrostomy tube placement and initiation of enteral feeding
B. Treatment with systemic steroids
C. Start treatment with azithromycin
D. Start chronic supplemental oxygen
E. Obtain echocardiogram to rule out pulmonary hypertension

B1: Clinical Year in Review 2

#1

A 45 year old woman with systemic sclerosis presents with new shortness of breath walking for a block and a half, along with dry non-productive cough. Physical examination is notable for telangiectasias on her face and chest, sclerodactyly, and bibasilar crackles. A chest x-ray shows bilateral linear markings. Her forced vital capacity is 55%; and a high resolution CT scan shows bilateral ground-glass opacities and reticular markings. Her resting saturation is 94%.

What is the next best step in the management?

A. Observe with regular pulmonary function tests as there is no evidence for treatment with immunosuppression in systemic sclerosis associated lung fibrosis.
B. Commence anti-fibrotic therapy (pirfenidone or nintedanib) without delay.
C. Further evaluation including surgical lung biopsy is necessary to ascertain the subtype of interstitial lung disease prior to treatment.
D. Exclusion of pulmonary hypertension is important before treatment of the pulmonary fibrosis.
E. Treatment with either mycophenolate mofetil or cyclophosphamide is indicated.

#2

A 67 year old man with a 40-plus year smoking history presents for a routine physical examination. He denies shortness of breath, cough, or wheeze. He continues to smoke one pack of cigarettes per day. His 70 year old sister has COPD and his father died from respiratory failure due to COPD at age 75. On examination, his oxyhemoglobin saturation is 97 percent breathing room air at rest. He has normal vesicular breath sounds bilaterally with no crackles, wheezes, or rhonchi. Heart sounds are normal. He has no peripheral edema, and the remainder of his examination is normal.

According to the US Preventive Services Task Force (USPSTF), which of the following clinical features in this case should prompt screening for COPD with spirometry?

A. Age greater than 65
B. Greater than 20 pack years smoking history
C. Current smoking status
D. Screening is not indicated
E. Family history of COPD

#3

A 59 year old woman and former 60-plus year smoker with a past medical history of COPD presents to your office for routine follow-up. She reports a slight increase in exertional dyspnea over the past six months, with her exercise tolerance decreasing from two blocks to one block. Her chronic daily productive cough is unchanged. She has no hemoptysis, chest pain, pedal edema, or weight loss. On examination, her oxyhemoglobin saturation is 90% breathing room air at rest. She has diminished breath sounds bilaterally with no crackles, wheezes, or rhonchi. Heart sounds are distant. She has no peripheral edema, and the remainder of her examination is normal. FEV1 is 32% predicted; GOLD Stage III. During six minute walk testing, her oxyhemoglobin saturation drops to 85%.

Based on clinical trial data, which of the following benefits of long term supplemental oxygen can this patient expect?

A. Oxygen therapy will reduce mortality because she has moderate resting desaturation (89%-93%)
B. Oxygen therapy will reduce mortality because she has moderate exertional desaturation (Spo2 ≥80% for ≥5 minutes and<90% for ≥10 seconds)
C. Oxygen therapy will reduce hospitalizations because she has moderate resting desaturation (89% to 93%)
D. Oxygen has not definitively been demonstrated to provide benefit to COPD patients with moderate resting desaturation (89% to 93%) who also have moderate exertional desaturation (Spo2 ≥80% for ≥5 minutes and <90% for ≥10 seconds)
E. Supplemental oxygen would improve exercise tolerance because she has GOLD Stage III disease.

#4

A 56 year old woman with a history of diabetes mellitus is evaluated for pulmonary hypertension. She has a high probability ventilation-perfusion lung scan. A pulmonary angiogram right heart catheterization confirms the diagnosis of chronic thromboembolic pulmonary hypertension. She is referred to a Pulmonary Hypertension Care Center for evaluation of her candidacy for pulmonary thromboendarterectomy.

Which of the following statements regarding this procedure is true?

A. Survival is similar at three years between patients treated medically or surgically with pulmonary thromboendarterectomy for chronic thromboembolic pulmonary hypertension
B. Pulmonary thromboendarterectomy is contraindicated in patients who are NYHA functional class IV
C. Bridging therapy with PAH drugs is associated with higher two-year mortality after pulmonary thromboendarterectomy
D. In both operated and non-operated patients, the most important predictor of mortality is 6 minute walk distance <300m
E. Pulmonary thromboendarterectomy is only appropriate in patients with a history of acute pulmonary embolism

#5

A 68 year old woman with dyspnea on exertion has normal pulmonary function testing and normal chest imaging. An echocardiogram demonstrates an estimated right ventricular systolic pressure of 30mm Hg with normal left and right ventricular function and, other than mild tricuspid regurgitation, has no valvular heart disease. She is referred for right heart catheterization that shows normal right atrial pressure, mean pulmonary arterial pressure of 22mm Hg and pulmonary arterial wedge pressure of 14mm Hg.

Which of the following statements regarding her pulmonary arterial pressure is true?

A. She meets criteria for pulmonary hypertension.
B. Treatment with a ambrisentan and tadalafil should be started.
C. She is more likely to be Caucasian than African American.
D. There is no association between BMI and mild elevations in pulmonary artery pressure.
E. She is at increased risk for mortality.

B2: The Long Term Oxygen Treatment Trial (LOTT): Implications for the COPD Patient Care

#1

A 69-year-old woman complains of increased shortness of breath, cough and sputum production. She has an FEV1 28% of predicted and gets short of breath walking up a slight grade. She is morbidly obese and takes multiple inhaled therapies for diagnosis of COPD which includes long acting bronchodilators (LAMA/LABA), and an inhaled corticosteroid. She has never undergone pulmonary rehabilitation. She was recently discharged from the hospital for a COPD exacerbation 4 months ago. She does not use supplemental oxygen; her resting saturation is 91%. She has been treated for another exacerbation by her primary care doctor with a short course of oral glucocorticoids and an oral antibiotic about 2 months ago. She is asking you what else can be done to prevent future exacerbations that require hospitalization and improve survival?

Which of the following treatments may be helpful and decrease the frequency of future exacerbations and avoid repeat COPD hospitalization?

A. Pulmonary rehabilitation
B. Supplemental oxygen
C. Azithromycin
D. Chronic prednisone therapy

#2

Long-term oxygen treatment is approved by Medicare for patients with COPD and exercise desaturation (SpO2≤88%).

Oxygen is approved for treatment in COPD patients with exercise induced desaturation because it:

A. Reduces mortality
B. Improves exercise performance
C. Avoid hospitalization
D. An expert panel recommended it

#3

A 68-year-old female with moderate COPD has been prescribed oxygen in the past by her primary care doctor. She has an FEV1 of 35% predicted and a resting oxygen saturation of 90% and during ambulation on a 6-minute walk test at your facility her oxygen saturation goes down to 85%. She now comes to you and wants your advice whether she should return to using oxygen.

You tell the patient that based on her condition:

A. Oxygen reduces mortality
B. Oxygen improves walk distance
C. Oxygen improves quality of life
D. Oxygen has no benefit on mortality, hospitalization or sustained benefit on lung function, sleep or quality of life

#4

A 75-year-old male with moderate COPD has been prescribed oxygen to use 24 hours daily by his primary doctor. The patient has an FEV1 of 25% predicted and a resting oxygen saturation of 92% and during ambulation on a 6-minute walk test his oxygen saturation goes down to 84%. He was prescribed 2 liters of oxygen to increase his oxygen saturation during the 6 minute walk to > 90% throughout the walk. He states that despite using the oxygen he feels no better, but he only uses it for 12 hours daily.

You tell the patient that he should:

A. Increase oxygen use to 24 hours daily
B. Increase his oxygen to 3L at rest and exercise
C. Make sure that he uses oxygen during sleep
D. Stop using the oxygen and reassess the patient's condition and treatment regime

#5

Which of the following was an exclusion for enrollment in LOTT?

A. Absence of COPD exacerbation within 60 days
B. Oxyhemoglobin saturation below 80% for more than 1 minute during a six-minute walk test
C. pO2 on arterial blood gas of <60 torr
D. Age greater than 60 yr
E. Payment for oxygen other than Medicare

B4: Humanizing the Intensive Care Unit: New Perspectives on an Old Problem

#1

Mrs. Young, a 60 year old female is being discharged from the hospital after 10 days in the ICU (8 of which she was on mechanical ventilation.) Mr. Young, her 57 year old husband, who was at her bedside during most of her ICU stay, is now forced to take time off of work to help care for his wife.

Mr. Young is at risk to develop which of the following?

A. Myocardial Infarction
B. Depression and Post Traumatic Stress disorder
C. Increased Risk of Death
D. Upper Respiratory Tract Infection

#2

Mr. Dee is a 63 year old male in the ICU with shock and respiratory failure. Mr. Dee's son, Jake, is a marine who has many friends with PTSD. He has been doing a lot of reading about PTSD that can occur in patients who survive an ICU stay. Jake asks the ICU team if there is anything that can be done to try to improve PTSD for his dad, if he were to survive this ICU stay.

Which of the following should you recommend to Jake to improve post-traumatic stress disorder in his dad?

A. Having his dad participate in physical rehabilitation now.
B. Making sure his dad avoids places that remind him of the ICU after discharge.
C. Making an appointment for his dad in ICU follow-up clinic after discharge.
D. Utilizing ICU diaries to log events happening during the ICU stay.

#3

Mr. B is a 63 year old man with oxygen-dependent COPD and poor functional status at baseline admitted to the ICU with a large subarachnoid hemorrhage (Fisher grade 4, Hunt & Hess grade 5). He was intubated in the field for airway protection. Upon admission, he had no purposeful movements and did not respond to commands or withdraw to pain. He remains unresponsive after an intraventricular drain is placed. His legal next-of-kin (LNOK) is his daughter. He is described by her as a fiercely independent and private man. She does not feel that he would want to go through a prolonged course of treatment and dependence.

What is the best next step?

A. Ask additional questions to both elicit the daughter's understanding of prognosis and better understand the patient's values and goals.
B. Advise her that "withdrawal of care" and comfort measures are the best next steps.
C. Defer talking with family for now as it is too early in his course to make any decisions.
D. Advise her to continue aggressive treatment.

#4

Ms. S arrives in the intensive care unit. She is a 65 year old, freshly retired school principal with obesity, diabetes, and coronary artery disease and a history of anxiety. She has multilobar pneumonia by chest x-ray, with a small right pleural effusion. She is hypotensive with a serum lactate of 3.2 mmol/L. Her oxygen saturation by pulse oximetry is 80% while breathing 100% oxygen (40L/min flow rate) by high-flow nasal cannula; her respiratory rate is 38/min. She is awake and alert and although she is obviously dyspneic, her vocal quality is clear. Her husband has gone home after a long emergency department stay but lives 15 minutes away. She was hospitalized 1 year ago, and at that time, she was designated Do Not Resuscitate/Do Not Intubate (DNR/DNI) in the History and Physical document, and she completed a living will that was compatible with a DNR/DNI status.

Your next intervention should be?

A. Initiate non-invasive ventilation.
B. Administer intravenous narcotics for dyspnea.
C. Perform immediate endotracheal intubation.
D. Perform immediate tube thoracostomy drainage.

#5

Mrs. Jones has been at the bedside of her husband Al every day all day for most of his ICU stay. Al was admitted four days ago with respiratory failure. Mrs. Jones has no other relatives in the area and her children live over one hundred miles away. She appears easily frightened and hypervigilant, even rocking at times. She asks the same questions repeatedly, and appears 'lost' in the situation.

According to Facilitated Sensemaking, which of the following is indicated?

A. Encourage Mrs. Jones to go home to rest; her strength will be needed for caregiving after discharge.
B. Close the door when rounds are held so that she is not further rattled by the noise and discussion.
C. Provide Mrs. Jones with bedside activities she can do to give her purpose in crisis.
D. Encourage Mrs. Jones to step out of the room while clinicians provide care.

#6

Mr. Peterson is a 65 year old man admitted to an Intensive Care Unit for respiratory failure and septic shock. He is on a ventilator and requiring vasopressor support. His wife and three adult children are very concerned about him and would like to have one member of the family at his bedside throughout the night.

Regarding their request to have a family member present at all times, you should kindly tell the family which of the following:

A. Nurses perceive visitors as more satisfied with care when visiting hours are restricted
B. Family satisfaction is improved when visiting hours are not restricted
C. More psychological distress is present in family members when ICU visiting hours are not restricted
D. Family members do not feel the need to be present at the bedside outside of visiting hours
E. Restricting visiting during rounds or bedside nursing report improves patient satisfaction.

B6: Mechanical Ventilation In The NICU, PICU And At Home: What The Pediatric Pulmonologist Should Know

#1

Lung protective strategies for ventilator treatment of acute respiratory distress in the newborn differ from current approaches to mechanical ventilation of infants with severe, established BPD.

Strategies that are initially preferred for infants with severe BPD include:

A. small tidal volume breaths (roughly 4-6 ml/kg) with rapid ventilator rates (> 40 bpm) and short inspiratory times (0.3 sec)
B. low or no positive end-expiratory pressure (PEEP)
C. larger tidal volume breaths (roughly 10 -12 ml/kg), longer inspiratory times (> 0.4 sec) and slow ventilator rates
D. high PEEP (> 8 cm H2O) with rapid ventilator rates (> 40 bpm)
E. High frequency oscillatory ventilation

#2

A full-term new-born infant whose mother had no prenatal care develops acute respiratory distress at birth with tachypnea, chest wall retractions and cyanosis. On examination his abdomen has a scaphoid appearance. An arterial blood gas on FiO2 of 1.0 demonstrates pH of 7.1, a PaCO2 of 12Kpa (90 mmHg) and a PaO2 of 6 Kpa (45 mmHg). A chest radiograph revealed a large left sided congenital diaphragmatic hernia.

What is the next best form of respiratory support?

A. Humidified high flow nasal cannula oxygen
B. Nasal continuous positive airways pressure
C. Synchronized non-invasive positive pressure ventilation
D. Pressure limited invasive ventilation
E. High frequency oscillatory ventilation

#3

A fifteen month old ventilator dependent infant with a history of prematurity and congenital diaphragmatic hernia (repaired) is ready for discharge from the hospital.

What specific recommendation needs to be met before the child is sent home?

A. A home apnea monitor should be provided at discharge.
B. An awake, trained caregiver should be present at all times.
C. Two days of respite for the mother are suggested per week.
D. Night shifts should be covered by parents on alternate nights.
E. Medical home management should be by the primary care physician.

#4

Mechanical ventilation in infants with acute respiratory failure requires different ventilator strategies depending on their age, size and type of illness.

Which of the following statements is correct regarding mechanical ventilation in infants?

A. High Frequency Oscillatory Ventilation (HFOV) is the most lung protective mode of ventilation for infants.
B. Pressure Support is necessary to overcome the resistance of their small endotracheal tubes.
C. Selective beta2 agonists should be used for management of ventilated patients with RSV-associated bronchiolitis.
D. Increase in the applied PEEP (Positive End-Expiratory Pressure) can overcome intrinsic PEEP and reduce the work of breathing in children with obstructive lung disease.
E. Cuffed endotracheal tubes should be avoided at all costs in infants and young children.

#5

A 17 year old boy with Duchene Muscular Dystrophy (DMD) complains of morning headaches. His forced vital capacity (FVC) is at 45 % predicted, EtCO2: 45 mmHg and pulse oximetry 97% in room air. A sleep study showed mild obstructive sleep apnea without significant hypoxemia and elevated CO2. He is placed on non-invasive positive pressure ventilation with pressures of 14/6 cmH2O. In a follow-up visit, the patient continues to complain of similar symptoms.

What is the next best step in his management?

A. Referral for migraine work up
B. Change the nasal mask to a naso-oral mask.
C. Set up a backup rate on the ventilator.
D. Increase the Inspiratory Positive Airway Pressure (IPAP) and the Expiratory Positive Airway Pressures (EPAP).
E. Brain MRI

CC2: Pulmonary Core Curriculum

#1

A 49-year-old previously healthy man develops acute chest pain and dyspnea after a recent trip overseas. On presentation, he is alert and oriented. His vitals are as follows: temperature 37.8°C, heart rate 118 beats per minute, blood pressure 99/62, respiratory rate 28 breaths per minute, SpO2 89% with the patient breathing room air at rest. He underwent a computed tomographic angiogram (CTA) revealing a saddle pulmonary embolism (PE) extending into bilateral segmental and subsegmental arterial branches, with right ventricle-to-left ventricle diameter ratio > 1. Troponin I is 0.15 (normal < 0.1 ng/mL).

Which of the following best describe the risk stratification for this PE patient?

A. Low-risk PE
B. Intermediate-low risk (submassive) PE
C. Intermediate-high risk (submassive) PE
D. High-risk (massive) PE
E. Unable to determine based on available information

#2

A 61-year-old man with a history of hypertension, hypercholesterolemia and type 2 diabetes presents with acute PE. His vitals are as follows: temperature 37.8°C, heart rate 118 beats per minute, blood pressure 82/48, respiratory rate 30 breaths per minute, SpO2 95% with the patient breathing oxygen at 6 L/minute via nasal cannula. His CTA reveals extensive bilateral acute pulmonary emboli in the main left and right pulmonary arteries extending into the segmental and subsegmental arteries. Patient denies any history of recent bleeding or surgery.

Which of the following interventions is the recommended treatment approach based on most recent guidelines?

A. Unfractionated heparin (UFH)
B. UFH and inferior vena cava filter
C. Systemic thrombolytic therapy followed by UFH
D. Catheter-directed thrombolysis followed by UFH
E. Surgical embolectomy followed by UFH

#3

A 52-year-old woman is being evaluated in clinic for persistent dyspnea following 6 months of anticoagulation for her acute PE. She was previously an avid jogger but now can walk only one mile before feeling dyspneic. She undergoes a ventilation-perfusion scan which demonstrates peripheral mismatched perfusion defects in several segments and an echocardiogram which demonstrates a mildly dilated right ventricle with estimated pulmonary artery systolic pressure (PASP) of 66. A CTA reveals chronic pulmonary emboli in proximal segmental and subsegmental arteries. She then undergoes a right heart catheterization demonstrating pulmonary artery pressures of 59/18, a mean pulmonary artery pressure of 32, and a pulmonary capillary wedge pressure 12.

Which of the following is the appropriate initial therapeutic option to consider in this patient?

A. Pulmonary thromboendarterectomy
B. Sildenafil
C. Balloon pulmonary angioplasty
D. Riociguat
E. Anticoagulation alone

#4

A 49-year-old Caucasian man with stage IV colon cancer and good performance status currently completing cytotoxic chemotherapy is referred for consideration of talc pleurodesis. His only other medications include omeprazole for gastroesophageal reflux disease and non-steroid anti-inflammatory medications which he takes daily to relieve his back pain caused by bone metastases. He has already undergone four large volume right-sided thoracenteses within the previous 3 weeks and has experienced significant improvement in his breathlessness. However, the relief has only been temporary and he is now interested in a more definitive approach.

The best approach should include which of the following?

A. Non-steroidal anti-inflammatory medications interfere with talc pleurodesis, and an indwelling pleural catheter should be preferred.
B. Indwelling pleural catheters should be avoided in patients actively treated with cytotoxic chemotherapy due to increased infectious complications.
C. Pleurodesis may occur with indwelling pleural catheters alone, but only in 10% of the cases, and is not influenced by drainage frequency.
D. Talc pleurodesis is contraindicated given this patient's limited life expectancy.
E. Because talc pleurodesis is often performed on an inpatient basis, the cost of talc pleurodesis and indwelling pleural catheters appear equivalent.

#5

A 29-year-old previously healthy woman is admitted with a 2-week history of generalized malaise, shortness of breath, fever, night sweats and right-sided pleuritic chest pain. Physical examination reveals decreased breath sounds on the right with dullness to percussion. Bedside thoracic ultrasound examination demonstrates a large right-sided, anechoic pleural effusion with few septations. An ultrasound-guided thoracentesis is performed which yields 1000 mL of slightly clouded pleural fluid. Initial pleural fluid analysis reveals negative Gram stain, pH of 6.9, LDH of 1100 U/L, protein of 4.3 g/dL and glucose of 29 mg/dL. Post-thoracentesis chest radiograph and ultrasound show a small residual pleural effusion with no septation or loculations.

The best approach should include which of the following?

A. Broad spectrum antibiotics with aerobic coverage alone.
B. Large-bore chest tube placement (> 28 French)
C. Immediate bedside blood culture bottle inoculation
D. Intrapleural instillation of deoxyribonuclease and tissue plasminogen activator
E. Immediate surgery

#6

A 52-year-old retired plumber, never smoker, is referred for work-up and management of a recurrent large left-sided pleural effusion with pleuritic chest pain. He reports fatigue and a 20-lb. weight loss over the previous 6 months. He is otherwise healthy and takes no medications on a regular basis. Three previous large volume thoracenteses have been performed and pleural fluid analysis has been consistent with an exudative lymphocytic pleural effusion, but three consecutive cytological examinations have been negative. The chest CT reveals circumferential pleural thickening with pleural based nodules.

The most appropriate next step is:

A. Positron emission tomography, as the high sensitivity in this situation would virtually rule out malignancy if negative.
B. Platinum-based chemotherapy with pemetrexed, given the high likelihood of mesothelioma.
C. Medical thoracoscopy with consideration of concomitant talc pleurodesis.
D. Ultrasound-guided fine needle aspiration of the parietal pleura.
E. No further investigations are required, and a palliative care consultation should be obtained.

#7

A 57-year-old man with a history of hypertension, hypercholesterolemia, and a 50 pack-year smoking history presents with intermittent dyspnea. He has also noted intermittent cough with sputum production over the past several years. Pulmonary function tests are consistent with a diagnosis of COPD. You assess his readiness to quit smoking and he seems motivated to quit and ready to make a quit plan.

Which of the following would be most effective for smoking cessation?

A. Nicotine patch and nicotine gum
B. Nicotine gum
C. Electronic cigarettes
D. Fluoxetine
E. None of the above

#8

A 40-year-old woman with a history of severe asthma that is currently well-controlled presents for her annual visit to refill her medications. She has felt well since her last clinic visit and has no new complaints. When you ask about her smoking history, she reports that she continues to smoke 1 pack of cigarettes daily, but has recently been looking into ways to quit smoking. She asks your opinion on whether you recommend using electronic cigarettes to help her quit.

Which of the following is true regarding the use of electronic cigarettes as a smoking cessation strategy?

A. Electronic cigarettes are a safe and effective smoking cessation strategy.
B. Electronic cigarettes are more effective than nicotine replacement therapy.
C. Electronic cigarettes may contain carcinogenic compounds.
D. The long-term safety of electronic cigarettes is well established.
E. Electronic cigarettes have not been linked to any respiratory diseases.

#9

A 56-year-old man with a history of depression and hypertension presents to discuss lung cancer screening and smoking cessation. He has a 46 pack-year smoking history and currently smokes 1 pack of cigarettes daily. He was diagnosed with depression 5 years ago and has been well controlled on fluoxetine for the past 3 years. He tried using nicotine gum to quit smoking 2 years ago but was not successful. He is motivated to quit and asks for your recommendation regarding the best smoking cessation strategy.

Which of the following would be the best smoking cessation option for this patient?

A. Nicotine gum as needed
B. Electronic cigarettes
C. Sertraline
D. Varenicline
E. Buspirone

B81: Pediatric Year in Review

#1

The Amish and Hutterites are U.S. agricultural populations whose lifestyles are remarkably similar but whose farming practices differ; the Amish follow traditional farming practices whereas the Hutterites use industrialized farming practices. Despite the similar genetic ancestries and lifestyles of Amish and Hutterite children, the prevalence of asthma and allergic sensitization was 4 and 6 times as low in the Amish.

When comparing house dust in Amish and Hutterite homes, what differences were observed?

A. Common allergens (from cats, dog, house-dust mites, and cockroaches) were detectable only in Amish homes.
B. Common allergens (from cats, dog, house-dust mites, and cockroaches) were detectable only in Hutterite homes.
C. Endotoxin levels in Amish homes were 6.8 times as high.
D. Endotoxin levels in Hutterite homes were 6.8 times as high.
E. No detectable differences in endotoxin levels were observed.

#2

Asthma incidence has more than doubled in Westernized countries in recent decades. Because the onset of asthma is in early childhood, a number of studies have examined whether dietary changes in the West impact the development of asthma.

Supplementation of which oil during pregnancy has resulted in an improvement in asthma in the offspring?

A. Essential oils
B. Fish oil
C. Olive oil
D. Fish oil and Vitamin D3
E. Olive oil and Vitamin D3

#3

Risk for the development of asthma may be modified by environmental and early-life exposures. Lower respiratory tract infection (LRTI) with respiratory syncytial virus (RSV) has been linked with asthma, and recent studies have suggested that preventing RSV LRTI decreases recurrent wheezing in the first year of life. Whether immunoprophylaxis in premature infants at high risk for severe RSV decreases childhood asthma has not yet been demonstrated.

Studies of RSV immunoprophylaxis on the development of asthma have been inconclusive due to what limitation?

A. Only children in state Medicaid databases from lower socioeconomic status (SES) were studied.
B. No randomized control trial of RSV immunoprophylaxis has been conducted.
C. The American Academy of Pediatrics (AAP) recommendations on RSV immunoprophylaxis keep changing.
D. The outcome of early childhood asthma has been poorly defined.
E. The sickest premature infants at highest risk to develop asthma were more adhered more to immunoprophylaxis.

#4

Cystic fibrosis (CF) is a disease due to genetic variants in Cystic Fibrosis Transmembrane Regulator (CFTR). However, patients with the same CFTR variants exhibit substantial variation in severity of lung disease. Although the identification of small molecules targeting specific CFTR variants has brought new treatments for CF, optimal treatment will require identification and targeting of disease modifiers.

How are genetic modifiers of CF lung disease best characterized?

A. > 50% of the variation in CF lung disease is explained by non-CFTR genetic variants.
B. 100 patients with cystic fibrosis have been contributed to genome-wide association studies (GWAS).
C. A recent meta-analysis of genome-wide studies identified 1 loci that has been associated with severity of CF lung disease.
D. Putative genes associated with CF lung disease have unknown biologic relevance to CF pathophysiology.
E. CF-affected siblings are excluded from studies of genetic modifiers.

B84: Chronic, Persistent, Prolonged, and Just Plain Stuck: Insights in Chronic Critical Illness

#1

A 61 year old male with COPD is admitted to the intensive care unit with influenza and bacterial pneumonia. He was intubated on hospital day 2, and he failed to wean from mechanical ventilation by hospital day 16. On hospital day 12, he received a percutaneous tracheostomy to facilitate prolonged mechanical ventilation. He was discharged to a long-term acute care hospital for ongoing ventilator weaning 21 days after admission.

At what point did this patient meet criteria for the transition to chronic critical illness?

A. On day 12 when he received a tracheostomy.
B. On day 21 when he was transferred to a long-term acute care hospital.
C. After 14 days of mechanical ventilation
D. There is no clear consensus among researchers on the best way to measure the transition to chronic critical illness.
E. On admission to the ICU

#2

Ms. J, a 67 year old female with ischemic cardiomyopathy and diabetes, is admitted to the ICU with septic shock due to pyelonephritis. She is intubated, and her hospital course has been complicated by acute renal failure, a ventilator-acquired pneumonia, ICU delirium and persistent shock.

The ICU team and the patient's family meet on hospital day 9 to discuss her current conditions and what to expect for her long-term outcome.

At this juncture, which clinical factors are all independently associated with one year mortality for Ms. J?

A. Age, persistent shock requiring vasopressors, renal failure receiving renal replacement therapy, thrombocytopenia
B. Age, admission diagnosis, ICU length of stay
C. Age, number of chronic comorbidities, admission diagnosis, thrombocytopenia
D. Age, sex, functional status prior to admission, admission APACHE score
E. Age, number of organ failures, ICU length of stay

#3

Mr. Lee is a 69 year old male with a history of diabetes and peripheral vascular disease who presented with septic shock, ARDS, and acute renal failure as a result of pneumococcal pneumonia and bacteremia. He was managed with vasopressors, lung protective mechanical ventilation and continuous renal replacement therapy. Ten days after presentation, he has not passed a spontaneous breathing trial and still requires vasopressors and renal replacement therapy. The ICU team is not optimistic about his outcome and wants to communicate this to his family.

Which of the following communication interventions has been shown to reduce PTSD symptoms in family surrogate decision-makers for patients like Mr. Lee?

A. Simulation-based communication skills training for physician and nurse practitioner trainees
B. Palliative-care led family meetings to discuss prognosis and provide family support
C. A bereavement brochure provided to the family in the context of a structured family meeting
D. A communication facilitator to summarize family concerns and needs to the physicians and nurses and provide emotional support

#4

A 79 year old female with a history of chronic-obstructive lung disease is admitted to a long-term acute care hospital for care of respiratory failure requiring invasive mechanical ventilation. 26 days ago she underwent video-assisted thoracosopic surgery to remove a 2 cm non-small cell lung cancer. Her post-operative course was complicated by pneumonia. A percutaneous tracheostomy was performed on post-operative day 15, and she remains on a mechanical ventilator today on post-operative day 26.

Ventilator and respiratory parameters include:

Mode: assist control

Tidal volume: 355 mL

Set respiratory rate: 18 breaths per minute
Patient respiratory rate: 18 breaths per minute
PEEP: 5 cm H20
FiO2: 0.40
What is the next step that should be trialed for ventilator weaning?

A. Perform a metabolic evaluation to determine oxygen consumption and carbon dioxide production on and off the ventilator.
B. Change the ventilator mode to pressure support of 20 cm H2O with a PEEP of 5 for up to 12 hours.
C. Change the ventilator mode to pressure support and adjust the support to target a respiratory rate <30.
D. Change the ventilator mode to synchronized intermittent mandatory ventilation with a set rate of 10 for up to 12 hours.
E. Disconnect the patient from the ventilator allowing her breath through a t-piece for up to 12 hours.

Core Curriculum 3: Critical Care Core Curriculum Part 2: Oxygenation, Right heart Failure, Volume Responsiveness, Early Goal Therapy

#1

A 72 year old man with advanced cirrhosis and widely-metastatic hepatocellular carcinoma develops severe ARDS with refractory hypoxemia after aspirating during upper endoscopy for management of variceal hemorrhage. His blood pressure is 95/60 mm Hg and his heart rate is 106 beats/min. Bedside ultrasound demonstrates a hyperdynamic left ventricle. He is ventilated in the prone position with an FIO2 1.0 and PEEP 18 cm H2O while receiving neuromuscular blockade and inhaled epoprostenol. With this support, his PaCO2 is 38 mm Hg and PaO2 49 mm Hg.

Which of the following is the next best step in the management of this patient?

A. Veno-venous extracorporeal membrane oxygenation (ECMO)
B. Change inhaled epoprostenol to intravenous epoprostenol
C. Veno-arterial extracorporeal membrane oxygenation (ECMO)
D. Continue current measures while discussing goals of care with family
E. Extracorporeal carbon dioxide removal (ECCO2R)

#2

A 24 year old woman developed severe ARDS following a near-drowning event and is started on veno-venous extracorporeal membrane oxygenation (ECMO) with initial settings that included blood flow of 4 L/min and fresh (“sweep”) gas flow of 2 L/min. Prior to ECMO, her mechanical ventilation had been managed with a lung protective strategy that included permissive hypercarbia. Her current arterial blood gas is pH 7.28, PaCO2 70 mm Hg, PaO2 55 mm Hg, and bicarbonate 34 mEq/L.

Which of the following is the most appropriate strategy to lower the PaCO2?

A. Decrease the ECMO blood flow
B. Decrease the ECMO fresh (“sweep”) gas flow
C. Increase the ECMO blood flow
D. Increase the ECMO fresh (“sweep”) gas flow

#3

A patient with COPD collapses from severe alcohol intoxication on his way home from the bar. The ambient temperature is -9°C. He is found unresponsive several hours later and, upon evaluation by the paramedics is noted to be in ventricular fibrillation with a core temperature of 24°C. After initiation of cardiopulmonary resuscitation, he is transported to a tertiary care hospital and cannulated for veno-arterial ECMO to facilitate rewarming and circulatory support.

Which of the following statements regarding this patient’s ECMO circuit is correct?

A. The return cannula (returning oxygenated blood from the circuit to the patient) is located in a large artery
B. It is the preferred extracorporeal modality for patients with hypercarbic respiratory failure
C. Systemic anticoagulation is generally not required

D. Recirculation sometimes affects the efficiency of the circuit
E. It is the preferred extracorporeal modality in patients with severe aortic valve insufficiency

#4

A 32 year old woman presents to the Emergency Department following the abrupt onset of chest pain and dyspnea one day after returning from a 12-hour car trip. Her vitals include HR 115 bpm, BP 85/60 mm Hg, RR 22 breaths/minute and SpO2 90% breathing air. On exam, she has distended neck veins and asymmetric lower extremity edema. Her labs demonstrate a troponin of 1.5 µg/L and BNP of 550 pg/mL. EKG shows ST depressions and T wave inversions in V1-V3. Bedside echo reveals right ventricular and right atrial dilatation and akinesia of the right mid-free wall with normal motion of the right apex. Following a 250 mL bolus of normal saline her blood pressure continues to fall and is now 70/30 mm Hg.

What is the most appropriate next step in the management of this patient

A. 1 liter normal saline bolus
B. Packed red blood cell transfusion
C. Unfractionated heparin infusion
D. tPA followed by a heparin infusion
E. Dabigitran

#5

A 53 year old woman with a history of scleroderma, hypertension, and diabetes presents to the Emergency Department with increased dyspnea on exertion and ankle swelling over a several week period. A recent echocardiogram showed mild left ventricular concentric hypertrophy, mild bi-atrial enlargement, and right ventricular pressure and volume overload. Her left ventricular ejection fraction was estimated at 55% while her TAPSE was 1.4 cm. The estimated pulmonary artery systolic pressure was 55 mmHg.

What is the most appropriate next step in management?

A. Sildenafil 20mg three times per day
B. Right heart catheterization
C. Repeat echocardiogram in 3 months
D. Follow up in clinic in one week
E. Epoprostenol infusion

#6

A 67 year old female with a heart failure with reduced ejection fraction due to ischemic cardiomyopathy, chronic obstructive pulmonary disease and pulmonary hypertension was sent to the Emergency Department from clinic with hypotension and hypoxemia. During a trip to Michigan 2 weeks ago she ran out of her furosemide and since returning she has been short of breath with minimal exertion and gained 6 kg. Her vitals include HR 110 bpm, BP 80/60 mm Hg and SpO2 85% breathing air. On exam, she has jugular venous distention, a prominent S3, bilateral crackles in the lower lung zones and 3+ bilateral lower extremity pitting edema. A chest radiograph reveals bilateral alveolar opacities with perihilar predominance.

Which of the following interventions is warranted at this time?

A. Milrinone
B. Dobutamine and furosemide
C. Norepinephrine
D. Phenylephrine and furosemide
E. Furosemide

#7

A 75 year old woman with a history of heart failure presents to the emergency department with altered mental status and fever. Her temperature is 101° F, HR 115 bpm, BP 85/40 mm Hg, RR 16 breaths/minute, oxygen saturation 94% breathing air. Her lab results are notable for a WBC 17 x 103 cells/uL, creatinine 1.2 mg/dL, and lactic acid of 4 mmol/L. Antibiotics are started and a central line is placed. She is given 2 liters of intravenous crystalloid without significant improvement in blood pressure. The central venous pressure (CVP) is measured at 11 cm H2O and central venous saturation is 60%. Upon arrival to the ICU, another 500cc of IV fluids are administered; her CVP increases from 11 to 13 cm H20 without

improvement in blood pressure.

Which of the following statements is correct regarding the determination of volume responsiveness in this patient?

A. A CVP of 11 cm H2O indicates she is fluid replete
B. The lack of improvement in blood pressure following the initial 2L of IVF indicates she is not volume responsive.
C. The increase in CVP of 2 cm H2O after volume administration indicates the fluid challenge was adequate.
D. The central venous saturation indicates she has cardiogenic shock and will not benefit from further fluid administration.

#8

A 65 year old woman with chronic kidney disease is admitted to the ICU with fever, diarrhea, and hypotension after a recent hospitalization for pneumonia. After receiving 3L of intravenous fluids with improvement in her blood pressure improves to 85/50 mm Hg but she is now requiring 3L/minute of supplemental oxygen to maintain an oxygenation saturation > 90%.

Which of the following is the most appropriate maneuver to assess whether her cardiac output will improve with fluid administration?

A. Passive leg raise test
B. Pulse pressure variation
C. IVC distensibility
D. Central venous oxygen saturation

#9

A 58 year old man develops severe ARDS during an admission to the trauma ICU for pelvic and femur fractures following a motor vehicle collision. He is put on low tidal volume ventilation with 6 cc/kg and a PEEP of 12 cm H20 and started on a cis-atracurium infusion. On the third day of his admission, he develops hypotension and despite receiving one liter of normal saline has a blood pressure of 75/40 mm Hg and lactate 4 mmol/L. An ultrasound of his IVC is performed and it is noted that during inspiration his IVC diameter is greater than IVC diameter during exhalation (percent difference 30%).

Which of the following is the most accurate statement regarding assessment of volume responsiveness in this patient?

A. Increased IVC diameter during inhalation is due to increased venous return from increased intrathoracic pressure.
B. A change in IVC diameter of 30% indicates that this patient is likely to be volume responsive
C. CVP is a good predictor of volume responsiveness in this patient population
D. Pulse pressure variation will be more sensitive in the setting of low tidal volume ventilation
E. Passive leg raise would be a better predictor of volume responsiveness in this patient

#10

A 69 year old woman with a history of COPD presents to the Emergency Department with 2 days of shortness of breath and cough productive of green sputum. Her vitals include a temperature of 38.2 C, mean arterial pressure of 50 mm Hg and heart rate 105 bpm. Labs are notable for a WBC 18,000 cells/mm3 with a left shift, hemoglobin 9 g/dL lactate mmol/L, creatinine 1.2 mg/dL. A chest radiograph reveals a right middle lobe opacity.

In addition to administering empiric antibiotics, what is the next best step in management of this patient?

A. Norepinephrine infusion
B. Bolus with 30 mL/kg normal saline
C. IV hydrocortisone
D. Packed red blood cell transfusion

#11

A 75 year old man with ischemic cardiomyopathy and diabetes mellitus is admitted with septic shock due to lower extremity cellulitis. Despite receiving antibiotics and 2 liters of crystalloid, his MAP is 56 mm Hg. Physical exam reveals a warm erythematous left leg, but no crepitus. Both feet are cool, with a delayed capillary refill. Pulse pressure variation is measured at 8%. Norepinephrine and vasopressin are initiated. On repeat assessment, his serum lactate is 6 mmol/L which is increased from his admission value and his urine output is 20 mL/hr. CT scan of the leg shows no evidence of fluid collections or gas.

Which of the following is the next best step in management of this patient?

A. Administer 1 liter of lactated ringer's solution
B. Change norepinephrine to dopamine
C. Dobutamine infusion
D. Increase MAP goal to 80 mmHg
E. Urgent surgical consultation

#12

A 73 year old woman is admitted with septic shock secondary to cholecystitis. In the Emergency Department she received 4 liters of normal saline, piperacillin/tazobactam, and vancomycin and was started on a norepinephrine infusion. Upon arrival to the ICU, she is breathing spontaneously on supplemental oxygen with a blood pressure of 83/40 mm Hg and MAP of 54 mm Hg.

What is the next best step in her management?

A. Passive leg raise maneuver
B. Pulse pressure variation assessment
C. Increase the rate of norepinephrine infusion
D. Bolus with normal saline
E. Intravenous hydrocortisone

Questions for TUESDAY Sessions

PCC3: Pediatric Core Curriculum Bronchopulmonary Dysplasia

#1

Some have proposed that the clinical phenotype provides more information about bronchopulmonary dysplasia (BPD) than the current consensus definition.

The clinical phenotype of BPD correlates most closely with which of the following?

A. Abnormal chest radiograph at 36 weeks gestation
B. The need for oxygen at 28 days of life and at 36 weeks corrected gestational age
C. Length of time on supplemental oxygen
D. Length of time on mechanical ventilation
E. The developmental state of the airway at birth

#2

While the clinical phenotype of bronchopulmonary dysplasia derives largely from the timing of injury, disease progression derives from a variety of genetic, endogenous and exogenous factors.

Which of the following factors is least likely to influence the development of BPD?

A. Quality of neonatal resuscitation
B. Presence or absence of infection/inflammation
C. Duration of positive pressure ventilation
D. Fetal growth restriction
E. Use of antenatal steroids

#3

While the management of bronchopulmonary dysplasia depends on the clinical phenotype, underlying the clinical approach is the knowledge that once BPD is established it is too late to prevent it.

Which pharmacologic strategy has been shown to prevent bronchopulmonary dysplasia?

A. Caffeine
B. Bronchodilators
C. Loop diuretics
D. Inhaled corticosteroids
E. Inhaled nitric oxide

#4

A 3-month-old was born at 26 weeks gestation and required mechanical ventilation for the first 21 days of life. During her NICU stay, a moderate-sized patent ductus arteriosus (PDA) was discovered and treated with a course of indomethacin. After being liberated from mechanical ventilation, she required 0.25 LPM supplemental oxygen. She is being fed a 27-calorie formula by nasogastric tube every 3 hours. She has not had coughing or wheezing, but she demonstrates subcostal retractions on physical examination. Furosemide was added to her regimen because of intermittent crackles on auscultation accompanied by an increased supplemental oxygen requirement. You have been asked to monitor her diuretic regimen as she is discharged from the hospital.

Which of the following is a complication that should be monitored in this patient?

A. Persistence of patent ductus arteriosus
B. Hypercalcemia
C. Ocular toxicity
D. Bronchoconstriction
E. Hypoglycemia

#5

A 6 month old delivered at 26 weeks gestation was intubated and mechanically ventilated for 1 month. After weaning from mechanical ventilation, she continued to require supplemental oxygen by nasal cannula. At the time of her discharge from the NICU 1 month ago, she has remained on 0.125 LPM nasal cannula oxygen continuously. On that therapy, reported oxyhemoglobin saturations measured at home are between 92-96% when she is awake and at rest. She is receiving fortified formula by mouth that affords her 115 cal/kg/day. On examination, her respiratory rate is 56 bpm and her heart rate is 130 bpm. She has moderate subcostal retractions and fine crackles in both lower lobes but there are no wheezes. You notice that her weight has been falling off her gestational-age-corrected growth curve.

Which of the following is the best intervention to address her slowing growth velocity?

A. Pulmonary function testing to assess for bronchodilator responsiveness
B. Echocardiogram to assess for pulmonary hypertension
C. Overnight polysomnography to assess for oxyhemoglobin desaturation
D. A basic metabolic panel to assess for acid-base and electrolyte abnormalities
E. A pH impedance probe to assess for gastroesophageal reflux

#6

An 8 month old with bronchopulmonary dysplasia has had multiple episodes of cough and wheeze in the setting of viral infections. He was started on a bronchodilator and inhaled corticosteroid in the emergency room and the parents have questions about the medications.

What is known about the long-term use of inhaled corticosteroids in patients with established bronchopulmonary dysplasia?

A. Their use allows for earlier weaning off supplemental oxygen
B. No change in the measured fraction of exhaled nitrogen
C. Reduced incidence of exercise induced bronchoconstriction at age 10
D. Increased incidence of cardiac arrhythmias
E. Increased risk of mortality

C1: Clinical Year in Review 3

#1

Recent studies have identified asthma-associated differences in the composition of airway bacterial microbiota, even in subjects with allergic asthma not on chronic corticosteroid therapy.

Which of the following information is likely to be most useful in aiding interpretation of the data?

A. Age of asthma diagnosis
B. Number of immediate family members with asthma
C. Blood neutrophil numbers
D. Airway microbiota data from allergic subjects without asthma
E. Frequency of short-acting bronchodilator use in the month prior to collection of airway samples

#2

Recent studies of the BAL microbiome in idiopathic pulmonary fibrosis patients have revealed associations between particular bacterial groups and peripheral blood expression of innate and adaptive immune responses.

Which of the following bacteria has been associated with gene expression profiles for innate immune responses in IPF studies to date?

A. Stenotrophomonas
B. Capnocytophaga
C. Acinetobacter
D. Staphylococcus
E. Mycobacterium

#3

A 69 year old female presents with cough that is non-productive and associated with malaise and breathlessness on exertion. She has a 10 plus year history but is an ex-smoker for 20 years. She has an FEV1 of 67% predicted with an FEV1/FVC ratio of 59%. She was previously diagnosed with COPD and is treated with an inhaled corticosteroid/long acting beta-agonist combination. A high resolution CT scan is performed and shows cylindrical bronchiectasis in the right middle and lower lobes.

She had two COPD exacerbations in the previous year requiring antibiotic therapy.

What is the next most appropriate step in management?

A. Addition of a long acting muscarinic antagonist
B. Commence a long term macrolide such as azithromycin
C. Bronchoscopy
D. Evaluation by a specialist physiotherapist to learn chest clearance techniques
E. Sputum culture, Measurement of immunoglobulins and screening for allergic bronchopulmonary aspergillosis

#4

A 70 year old woman with a history of bronchiectasis is referred for a second opinion. She has a daily cough productive of purulent sputum and had 3 exacerbations in the previous year. She is a lifelong never smoker and has had bronchiectasis since childhood. She developed rheumatoid arthritis at the age of 40 years. CT scan shows bronchiectasis in both lower lobes.

Her sputum culture has grown Pseudomonas aeruginosa on 3 occasions in the past year when clinically stable. She has had one hospital admission for a course of intravenous antibiotics due to a lack of response to oral antibiotics. Her FEV1 is 56% predicted with evidence of airflow obstruction. She is treated with oral azithromycin.

Which of the following statements regarding prognosis and outcomes in bronchiectasis are correct?

A. Lower lobe disease is associated with a higher rate of exacerbations than upper or middle lobe disease.
A. Patients with rheumatoid arthritis have increased mortality and more severe disease.
B. Azithromycin treatment is associated with reduced mortality and severe exacerbations.
C. Exacerbations are associated with quality of life but not with risk of mortality or other future outcomes.
D. Pseudomonas aeruginosa infection is associated with an increased risk of exacerbations, but not with mortality rate.

#5

A 32 year old female presents to outpatient clinic for evaluation of a drop in her home spirometry readings. She received a bilateral lung transplant for cystic fibrosis 10 months earlier. One week ago, she noticed a drop in her FEV1 from 3.2 L to 2.4 L and subsequent FEV1 readings have ranged between 2.2 and 2.5 L. She describes mild shortness of breath on exertion. She has not had any fever or cough.

Which of the following is a feature of definite or probable clinical antibody-mediated rejection (AMR)?

A. Decreased TLC on lung volume testing
B. Bile acids detectable in bronchoalveolar lavage fluid
C. Elevated ferritin level
D. Abnormal pH probe testing
E. C4d positive staining on transbronchial biopsies

C3: Obesity and Lung Disease

#1

A 69 year old female with COPD and a 45 year-plus smoking history presents to your clinic for evaluation of worsening dyspnea. She notices that her exercise capacity has been markedly reduced in the last year. She denies any changes to her cough or sputum production. Most recent FEV1 is 64%, mMRC is 3. Today her 6MWT is 455 feet with no desaturations and was mostly limited by severe dyspnea. Her BMI is 37. She is on tiotropium 18 mcg twice a day and budesonide-formoterol 160-4.5 mcg twice daily.

Which of the following statements regarding the relationship between obesity and COPD is true?

A. Approximately half of the COPD individuals are overweight or obese.
B. Weight loss interventions are recommended for COPD individuals with BMI >30.
C. COPD individuals with normal weight are less responsive to guideline recommended escalation in inhaled therapies than their obese counterparts.
D. Obese COPD individuals are more likely to be misdiagnosed with COPD and receive inappropriate medications.
E. Obese individuals with COPD have more severe obstructive disease, more symptoms and worse health-related quality-of life.

#2

A 35 year old obese woman is recently diagnosed with advanced pulmonary arterial hypertension with right heart failure. Treatment with IV epoprostenol is recommended and screening laboratories are performed, by which elevated plasma glucose is identified.

Which of the following statements regarding the relationship between diabetes mellitus, insulin resistance, and pulmonary arterial hypertension are true?

A. Insulin resistance is present in more than half of patients with pulmonary arterial hypertension.
B. If pulmonary arterial hypertension patients have a normal body mass, they are unlikely to have insulin resistance.
C. Treatment of diabetes mellitus or insulin resistance in pulmonary arterial hypertension has been shown to improve six minute walk distance.
D. Bariatric surgery is considered safe in patients with pulmonary arterial hypertension.
E. Insulin resistance is due to reduced physical activity in pulmonary arterial hypertension.

#3

A 55 year old woman with severe persistent asthma complains of increasing shortness of breath and wheezing, slowly progressing over the last few years.

You diagnosed her with asthma approximately 5 years ago when she presented with similar symptoms, had spirometry showing mild airflow obstruction, and a significant improvement in airflow with bronchodilator.

Prior allergy evaluation was negative, and she has consistent low eosinophils and Immunoglobulin E in her peripheral blood. Her medications include a long acting inhaled corticosteroid, a long acting bronchodilator, and long acting anti-cholinergic. She suffers with hypertension and hypercholesterolemia, and steatohepatitis. Her BMI is 45.

Which would be the most appropriate next step in the management of this patient?

A. Start long term oral corticosteroids.
B. Start a leukotriene modifier medication.
C. Obtain induced sputum to evaluate for undiagnosed Type-2 inflammation.
D. Evaluate for undiagnosed reflux disease.
E. Referral to a weight loss program.

#4

A 34 year old man with a BMI of 45 kg/m2 is intubated for hypoxemic respiratory failure secondary to influenza A pneumonia. He meets the definition for severe ARDS. He is mechanically ventilated with a tidal volume of 5 cc/kg, a respiratory rate of 30 breaths/min, PEEP of 14 cmH2O and a FiO2 of 0.6. On these settings, his plateau pressure is 30 cmH2O and his arterial blood gas reveals a pH of 7.14, PaCO2 of 73 mmHg and a PaO2 of 65 mmHg. In order to increase his pH, you increase his tidal volume to 6cc/kg which results in a plateau pressure increase to 34 cmH2O.

Why is this change unlikely to cause ventilator-induced barotrauma?

A. Circulating adipokines in obese patients attenuate epithelial injury in ARDS.
B. Elevated pleural pressures in obesity reduce transpulmonary pressures.
C. The new ventilator settings are compliant with recommended lung protective ventilation strategies.
D. His PEEP level is optimized to prevent end-expiratory over-distention.

#5

Obesity is characterized by a reduction in lung volumes.

Which of the following lung volume subdivisions exhibits the most consistent reduction related to an increase in the Body Mass Index (BMI)?

A. Total lung capacity (TLC)
B. Residual volume (RV)
C. Vital capacity (VC)
D. Functional residual capacity (FRC)
E. Tidal volume

C4: A Stitch in Time: Controversies in Critical Care Best Practices and Their Effect on Patient Centered Outcomes

#1

Ms. T is a 65 year old female with a history of heart failure with preserved ejection fraction (HFpEF) presents with a three day history of productive cough, fevers, and chills. On presentation, her blood pressure is 73/54 and lactate is 5.3 mmol/L. A chest radiograph demonstrates a left lower lobe infiltrate. She is given broad spectrum antibiotics and a 30 cc/kg fluid bolus with lactated ringers. Your resident asks you how you will know if this is enough fluid for Ms. T.

What is the best response to your resident regarding the assessment of Ms. T's fluid responsiveness?

A. If her central venous pressure is less than 8 mm Hg she is likely to be fluid responsive.
B. If she has no variation in her IVC diameter on ultrasound she is unlikely to respond to fluids.
C. Monitoring and documenting her hemodynamics during passive leg raise is the best way to assess her fluid responsiveness.
D. Pulse pressure variation of an arterial waveform can reliably predict fluid responsiveness in Ms. T, since she is spontaneously breathing.
E. None of the above

#2

J.T. is a 55 year old man admitted to your ICU with middle lobe PNA. His vital signs in the ED prior to intubation were: temperature 102°C, heart rate 120, blood pressure 92/54 (mean arterial pressure (MAP) 65), respiratory rate 32 and oxygen saturation 78% in ambient air. His chest radiograph showed a right middle lobe consolidation and patchy bilateral opacities. Upon arrival to the ICU an arterial blood gas on 100% FiO2 shows a PaO2 of 80. He continues to maintain a MAP ≥ 60 mm Hg and urine output > 0.5mL/kg/hour over the first 6 hours of ICU admission. An echocardiogram shows normal left ventricle function. You decide to initiate a conservative fluid management strategy consisting of limiting intravenous fluids and administering furosemide to achieve a target central venous pressure of < 4mm Hg.

Following this conservative strategy is expected to lead to which outcome in J.T.?

A. Increased risk of renal failure requiring dialysis
B. Increased risk of shock requiring vasopressors
C. Decreased risk of mortality at 60 days
D. Increase in number of ventilator-free days during hospitalization
E. Increased risk of severe hypokalemia (serum potassium concentration ≤ 2.5 mmol/L)

#3

In which of the following conditions is the muscle mass loss the greatest over the first 3-4 days in humans and animal models?

A. Bedrest/limb immobilization
B. ARDS
C. Denervation
D. Sitting in a chair for 3 days of symposia at ATS
E. Humans in space, performing 5 days/week exercise

#4

A 54 year old man with diabetes and obesity hypoventilation syndrome is admitted to your ICU with shock and respiratory failure. He is currently on mechanical ventilation requiring and FiO2 of 0.7 and a PEEP of 10. He has a femoral venous catheter in place infusing norepinephrine. His labs are notable for a bicarb of 9 and a pH of 7.1 for which he was started on CRRT. Other significant lab findings are a rising troponin (2.25 from 1) and a lactate of 7.

Which of the following is an absolute contraindication to early mobilization in the patient?

A. Femoral venous catheter
B. Norepinephrine infusion at 5mcg/min
C. Continuous renal replacement therapy
D. Ongoing myocardial ischemia
E. Positive end-expiratory pressure at 10cm H2O

C10: Positive Pressure + Negative Adherence = High Priority Future Research Need

#1

Mary is a 65 year old white female with hypertension recently diagnosed with obstructive sleep apnea and prescribed CPAP treatment with a pressure of 10 cm H2O. She lives with her husband who motivated her to seek treatment for her snoring, which has affected their relationship. At her first follow-up visit, a device download showed that she used her treatment for only 3 hours per night on average. She also complained of skin irritation from the mask.

Which of these factors have been shown to be a significant predictor of adherence during the first week of PAP use?

A. Age
B. Interference with intimacy
C. Mask side effects
D. CPAP pressure

#2

There is a large body of work investigating the impact of various interventions designed to promote CPAP adherence.

Which of the following predictors of CPAP use could be modified with an intervention to promote use?

A. Claustrophobia
B. Race
C. Spousal insistence on treatment
D. Patient perception

#3

It is commonplace for providers to use CPAP tracking systems which utilize a variety of technology, including data card downloads and/or wireless transmission of data.

Which of the following statements regarding CPAP tracking systems is true?

A. Adherence metrics reported through tracking systems do not take into account the hours per night a patient slept without CPAP.
B. The definition of air leak is consistent across different CPAP manufacturers and devices.
C. Self-reported adherence demonstrates a high level of agreement with objective adherence data obtained through tracking systems.
D. The Centers for Medicare and Medicaid Services requirement for ongoing coverage of CPAP is based solely on objective adherence data.

#4

In September of 2016, the largest randomized trial conducted in the sleep apnea field was published: the Sleep Apnea cardioVascular Endpoints (SAVE) trial (McEvoy et al., New England Journal of Medicine.

Based on data from the SAVE trial, which of the following statements is correct?

A. Patients with severe hypoxemia (SpO2 <80% for >10% of the night) are more likely to experience benefit from CPAP in terms of cardiovascular risk, compared to those without severe hypoxemia.
B. There is solid evidence that CPAP should be prescribed solely for reducing future cardiovascular events in asymptomatic OSA patients.
C. In a pre-specified analysis of propensity-score matched patients, those using CPAP >4 hours/night had a statistically significantly lower risk of a cerebrovascular event compared to those with adherence <4 hours/night.
D. In an intent-to-treat analysis, the CPAP group demonstrated a statistically significantly lower rate of cardiovascular events/death.

CC4: Sleep Core Curriculum Part 1: Sleep: Insomnia, Psychiatric Diseases

#1

An 82 year old man has difficulty staying asleep most nights. He sometimes wakes up in the middle of the night and cannot fall back asleep for 1-2 hours. He has a history of hypertension and GERD. His only medication is Lisinopril.

Which sleep aid should be avoided in this patient?

A. Suvorexant
B. Triazolam
C. Melatonin
D. Trazodone
E. Ramelteon

#2

A 45 year old female underwent a recent rotator cuff repair. She was prescribed oxycodone post-operatively and is having difficulty falling asleep at night.

Which medication in conjunction with oxycodone can increase the risk of respiratory depression and thus should be avoided in this patient?

A. Diphenydramine
B. Doxepin
C. Lorazepam
D. Gabapentin
E. Ramelteon

#3

A 52 year old female reports having difficulty falling asleep for more than 2 years. She usually does not have trouble returning to sleep subsequently if she awakens in the middle of the night. She has a history of hypothyroidism and diabetes without neuropathy. She has no history of anxiety, depression or nightmares.

Which of the following medications may be most appropriate for her insomnia along with cognitive behavioral therapy?

A. Eszopiclone
B. Zaleplon
C. Clonazepam
D. Doxepin
E. Mirtazepine

#4

A woman in her mid-forties reports during her annual physical that she struggles with sleep at night. She says it takes her hours to fall asleep and she is getting fewer than 6 hours of sleep on average. She has a very busy schedule and is not interested in a treatment that requires her to come to her doctor's office on a regular basis, nor is she willing to take medications because she is worried about side effects.

What is the most appropriate recommendation for this patient?

A. Provide the patient with information about internet-based CBT-I.
B. Due to the lack of effective alternatives, recommend delaying treatment until the patient's schedule allows her to attend in-person CBT-I sessions.
C. Inform the patient that sleep problems often go away on their own once the precipitating events/stressors have abated.
D. Offer pharmacologic therapy and reassure the patient that sleep medications are safe and effective.

#5

A 45 year old man presents to your clinic with mild insomnia symptoms, which occur 2-3 nights per week. He reports daytime fatigue and feels as though he cannot ever "catch up" on sleep. No one in your practice offers behavioral sleep treatment, and there are no other local behavioral sleep practitioners to whom you can refer.

What is the best way to proceed with this patient to help address his insomnia symptoms?

A. Ask some more specific questions about the patient's sleep, and select one or two targeted behavioral strategies that the patient can implement at home.
B. Encourage the patient to nap on weekends to help improve total sleep time.
C. Advise the patient to get into bed earlier to help give him more time in bed, and thus more opportunity for sleep.
D. Spend some time working with the patient on motivational techniques to help him try harder and put more effort into getting to sleep.

#6

A 50 year old woman presents with the complaint of disturbed sleep with frequent awakenings and less than 4 hours of sleep per night. You consider implementing sleep restriction therapy, where time in bed is limited to the amount of time the individual typically spends sleeping.

What information about your patient should you consider before deciding to implement sleep restriction therapy?

A. Gender
B. Age
C. Medication list
D. Medical History

#7

A 58 year old woman presents to your clinic due to snoring and apneic events noticed by her husband during sleep. She complains of poor quality sleep, and occasionally waking up gasping for air. She also complains of sleepiness during the day. She has been feeling depressed for the past 3 months and has experienced two episodes of depression over the past decade. She has taken antidepressants in the past, but is not currently taking them. On physical exam, she is an obese female (BMI=31) with a class III mallampati score. Her score on a depression screening measure (PHQ-9) is suggestive of depression (score of 18), and her score on the Epworth sleepiness scale is 13, suggesting daytime sleepiness. She completes a home sleep apnea test, which shows an AHI of 27 events per hour. You recommend PAP therapy to treat her sleep disordered breathing and refer her to a psychiatrist for assistance with her depression.

Which of the following is true about the relationship between depression and treatment of sleep apnea?

A. Depression should be treated before sleep disordered breathing because improvement of depression symptoms makes sleep apnea treatment unnecessary.
B. Patients with comorbid depression and sleep apnea do not benefit from PAP.
C. Patients with comorbid depression show improvement in sleep apnea and depressive symptoms if adequate PAP adherence is achieved.
D. Treatment with antidepressants is contraindicated in patients with untreated sleep apnea as improvements cannot be achieved without treating the underlying sleep disorder.

#8

A 69 year old man with previously diagnosed major depressive disorder, poorly controlled hypertension and obesity presents because his bedpartner noticed breathing pauses and snoring during sleep. He complains of excessive sleepiness during the day. The day of his visit, his score on the Patient Health Questionnaire-9 (PHQ-9) was 22, indicating significant depression, and his Epworth Sleepiness Scale score was 13. He completed a home sleep apnea test (HSAT), which showed

a respiratory event index of 35 and a minimum saturation of 84%. He was then provided with an autoPAP machine with initial pressure setting of 5-15cm.

Which of the following is the strongest predictor of poor adherence to autoPAP?

A. Depressive symptom severity
B. The presence of comorbid conditions
C. Severity of sleep disordered breathing based on HSAT
D. Higher autoPAP pressures

#9

A 56 year old women presents to your clinic complaining of sleep problems that began 6 months ago. It takes her 2 hours to fall asleep 5-7 nights per week, and she feels tired and stressed during the day because she can't get a good night of sleep. She also noted feeling depressed for the past year, and her scores on the Patient Health Questionnaire is 20, indicating a high likelihood of a depressive disorder. The patient has a BMI of 22, and has not been told that she snores. Blood pressure is normal.

What is the best next step for this patient?

A. Begin cognitive behavioral therapy for insomnia first
B. Begin antidepressant medication first
C. Initiate concurrent treatment of depression and insomnia with antidepressant medication and refer the patient for cognitive behavioral therapy for insomnia
D. Complete an overnight in-laboratory polysomnogram to establish her true sleep onset latency prior to beginning treatment.

C83: Pediatric Clinical Chest Rounds

#1

Which of the following would be the most likely finding on computed tomography of the chest in this patient with inflammatory bowel disease (IBD)?

A. Necrobiotic nodules
B. Tracheal stenosis
C. Bronchiectasis
D. Enterobronchial fistulae
E. Hilar adenopathy

#2

A 19 year old boy with a history of Crohns disease (CD) presents to clinic with new onset of shortness of breath and productive cough for 3 weeks. It is associated with intermittent low-grade fever and poor appetite. He denies hemoptysis or chest pain. He had been evaluated at an urgent care where chest radiograph had shown a new right lower lobe infiltrate. He was treated with oral antibiotics at the time for community acquired pneumonia, however his symptoms have not improved. You obtain a computed tomography of his chest which shows a new right lower lobe infiltrate and scattered bronchiectasis which is unchanged from his prior CT. He was diagnosed with Crohns disease two years ago and began treatment with Azathioprine. However due to poorly controlled gastrointestinal (GI) symptoms, began treatment with Infliximab 6 months ago with which his abdominal pain and diarrhea are much improved.

What is the next step in management of this patient's respiratory symptoms?

A. Increase immunosuppression
B. Bronchoscopy with bronchoalveolar lavage to look for opportunistic infections
C. Discontinue Infliximab
D. Obtain lung biopsy

#3

A 10 month old female presents for evaluation of recurrent croup. She was born full term via normal spontaneous vaginal delivery and required no respiratory support at birth. She is reported to have had 5 episodes of croup requiring admission over the past several months. In the emergency department she is found to be in respiratory distress with tachypnea, subcostal retractions, and hypoxia of 83% in room air. Physical exam is notable for stridor and mild wheezing bilaterally. Diagnostic investigations reveal the presence of complete tracheal rings.

Of the following, the MOST appropriate statement you can make regarding interventions is that:

A. Her symptoms will likely improve over time without intervention.
B. The use of inhaled bronchodilators is likely to be helpful.
C. Surgical intervention is likely to improve clinical outcome.
D. The use of daily inhaled corticosteroids may decrease the frequency of admissions.
E. Placement on nighttime positive pressure ventilation may be helpful

#4

A CT scan of the chest obtained during the course of an admission to rule out foreign body aspiration reveals abnormal tracheobronchial branching whereby the right lower lobe of the lung is supplied by a bridging bronchus arising ectopically from the left mainstem bronchus.

Of the following, which diagnostic modality should be obtained next?

A. Flexible Bronchoscopy
B. CT angiogram
C. Bubble echocardiogram
D. CT neck soft tissue
E. Rigid bronchoscopy

#5

Chest radiography is most often normal in patients with follicular bronchiolitis, but high resolution chest computed tomography (HRCT) scan can be useful.

Which of the following are the most common HRCT findings noted in children with follicular bronchiolitis?

A. Small centrilobular nodules associated with bilateral patchy ground glass opacities
B. Peripheral sub-pleural small nodules associated with cysts
C. Bronchial wall thickening and mild interlobular septal thickening
D. Bronchiectasis associated with mosaic attenuation pattern
E. Honeycombing and peribronchovascular consolidation

#6

Primary follicular bronchiolitis is far less common than secondary causes and this finding can be the initial manifestation of immunodeficiency, immune dysregulation or auto-immune conditions. Therefore, further evaluation is essential when this diagnosis is made.

An 8 year old girl presents with children's interstitial lung disease (ChILD) syndrome and is found to have histopathologic diagnosis of follicular bronchiolitis on lung biopsy. Which of the next options would be the least helpful in finding a secondary cause for the disease?

A. Autoimmune profile
B. Immunoglobulin levels and lymphocyte subsets
C. HIV testing
D. Testing for adenovirus, Legionella, mycoplasma and hepatitis
E. Eosinophil count

CC5: Pulmonary Core Curriculum

#1

The following patients are referred to your office to discuss lung cancer screening.

Based on the results of the National Lung Screening Trial, which of the following patients is most likely to benefit from lung cancer screening?

A. A 50-year-old male current smoker with a 50 pack-year history.
B. A 74-year-old female current smoker with a 28 pack-year history.
C. A 65-year-old male former smoker with a 75 pack-year history who quit 10 years ago.
D. A 70-year-old male former smoker with a 45 pack-year history who quit 20 years ago.
E. A 60-year-old male current smoker with a 60 pack-year smoking history and a history of COPD requiring home oxygen (DLCO 30%).
F. A 53-year-old female current smoker with a 24 pack-year smoking history and a family history of lung cancer in her father.

#2

A 60-year-old man originally from Tennessee presents to your office to discuss lung cancer screening. He has a 30 pack-year smoking history, ongoing tobacco abuse, and COPD.

Which of the following must be addressed during the shared decision making lung cancer screening visit?

A. Exposure to Histoplasmosis
B. Patient preference of a chest radiograph vs. chest CT
C. Smoking cessation
D. Inhaler technique

#3

A 65-year-old former smoker (35 pack-year) with a history of COPD presents to your office after being enrolled in a lung cancer screening program.

According to the National Lung Screening Trial, how should patients be screened for lung cancer?

A. Chest radiograph every 4 months
B. Chest radiograph and sputum cytology every 4 months
C. Annual low dose Chest CT
D. Annual low dose Chest CT yearly with chest radiograph and sputum cytology every 4 months

#4

A 55-year-old man with a history of a thoracic aortic aneurysm followed by serial computed tomography (CT) scans is incidentally noted to have a new 7 mm solid pulmonary nodule in the right lower lobe. He is a life-long non-smoker with no other significant past medical history. He has no known exposure to asbestos, radon or uranium. His maternal uncle died of a squamous cell lung cancer 2 years ago at the age of 70. A thorough history and physical examination are otherwise unrevealing.

What is the next best step in the management of the pulmonary nodule?

A. No follow up
B. Follow-up CT at 12 months; if unchanged, no further imaging
C. Initial follow-up CT at 6-12 months
D. Initial follow-up CT at 3-6 months
E. Positron emission tomography

#5

A 62 year-old woman with a history of breast cancer and upper lobe-predominant emphysema is referred to your clinic for investigation of a 1.9 cm right upper lobe solitary lung nodule found on computed tomography scan (see image), 2 months after the completion of adjuvant chemotherapy. Pulmonary function tests reveal an FEV1 of 50% predicted, FVC of 68% predicted (FEV1/FVC ratio 62%), and a DLCO of 40% predicted. She is an active smoker. A position emission tomography shows a high uptake value for this nodule but is otherwise negative for mediastinal and extra-thoracic disease.

Which of the following should be ordered next?

A. Repeat mammography
B. Flexible bronchoscopy
C. Transthoracic needle aspiration (TTNA)
D. Radial endobronchial ultrasound (EBUS)
E. Surgical excision

#6

A 63-year-old male smoker with a history of hypertension, diabetes and gastric cancer successfully treated 5 years ago is being followed for a slowly growing right lower lobe ground-glass opacity on chest CT. Navigational bronchoscopy with forceps biopsy and needle aspiration is performed. Cytology from the needle aspiration reveals glandular cells and immunohistochemistry stains are positive for TTF-1 and mucin.

Which of the following is the most likely pathological diagnosis?

A. Gastric adenocarcinoma with lung metastasis
B. Lung adenocarcinoma
C. Squamous cell lung carcinoma
D. Lymphoma
E. Unable to say – would need another biopsy to confirm

#7

A 67-year-old woman with hypertension and a 40 pack-year smoking history presents for evaluation of an 18 mm nodule found on chest radiograph. A chest CT scan shows a peripheral 18 mm solid nodule in the right upper lobe with a 14 mm lymph node in the right hilum. There are no enlarged mediastinal lymph nodes and the adrenal glands are normal. PET CT shows high uptake 18F-fluorodeoxyglucose (FDG) in the right upper lobe nodule. There are no hypermetabolic lymph nodes in the hilum or mediastinum and no evidence of distant metastasis on PET-CT.

What is the next best step in this patient's management?

A. Obtain a chest CT in 3 months
B. Obtain a PET-CT in 3 months
C. Cervical mediastinoscopy
D. Endobronchial ultrasound (EBUS)
E. Right upper lobectomy

#8

A 78-year-old man presents with a new onset of voice hoarseness. A chest x-ray shows a left upper lobe mass. Chest CT shows a 4 cm left upper lobe mass with multiple enlarged bilateral mediastinal lymph nodes reaching 2 cm. PET-CT shows high FDG uptake in the left upper lobe mass and in the enlarged mediastinal lymph nodes. There is no evidence of extrathoracic disease. A transthoracic needle biopsy of the left upper lobe mass is positive for lung adenocarcinoma.

What is the next best diagnostic test to confirm the stage of this patient's lung cancer?

A. Brain MRI
B. Endobronchial ultrasound
C. Endoscopic ultrasound
D. Mediastinoscopy

#9

A previously healthy 65-year-old man presents with a 3 cm mass in the right lower lobe. Chest CT shows no enlarged hilar or mediastinal lymph nodes. PET-CT shows high FDG uptake in the right lower lobe mass. No other evidence of abnormal FDG uptake is noted on the study. Head CT is normal. Mediastinal staging with EBUS was performed and lymph node stations 4R, 4L and 7 sampling showed no malignant cells. Pulmonary function tests were within normal limits. The patient underwent a right lower lobectomy by thoracotomy. The final pathology report indicated a 32 mm adenocarcinoma in the right lower lobe with visceral pleural invasion and diaphragmatic invasion. Hilar and mediastinal lymph nodes are all negative for malignant cells.

What is the final pathological stage of this patient's lung cancer according to the 8th edition of the American Joint Committee on Cancer TNM classification?

A. IIA
B. IIB
C. IIIA
D. IIIB
E. IIC

#10

A 59-year-old male smoker with a history of Stage IV squamous cell carcinoma of the lung and a right-sided malignant pleural effusion who has failed second-line chemotherapy is visiting with his oncologist. He is able to complete his activities of daily living independently and would like to discuss other potential treatment options. His oncologist discusses potential benefits of the immunotherapy agent, nivolumab.

Which of the following statements regarding nivolumab is correct?

A. The most common immune-related adverse events of nivolumab are related to the cardiovascular system and bone.
B. Targeted immunotherapy using nivolumab has replaced surgical resection in stage I adenocarcinoma of the lung.
C. The clinical benefit of nivolumab is more pronounced D when adenocarcinoma is the underlying histology.
D. Nivolumab results in better progression-free survival in advanced, previously treated squamous-cell NSCLC than docetaxel.
E. Nivolumab is a monoclonal antibody directed against the programmed death-ligand 1 (PD-L1) receptor.

#11

A 54-year-old man returns to clinic to discuss the results of a biopsy of a right lower lobe mass that showed non-small cell lung cancer. He quit smoking 6 months ago after developing dyspnea on exertion. His father and uncle both died of lung cancer. He has many concerns and questions about the treatment options for non-small cell lung cancer.

Which of the following statements regarding treatment of non-small cell lung cancer is correct?

A. Radiation to the primary tumor does not alter the survival rate in non-oligometastatic stage IV NSCLC.
B. Wedge resection remains the treatment of choice for operable stage 1 NSCLC.
C. Stereotactic radiation therapy remains the treatment of choice for stage IIIA NCSLC.
D. A small percentage of patients with epidermal growth factor receptor (EGFR) mutations develop disease progression due to the development of resistance to tyrosine kinase inhibitors.
E. Following development of resistance to an EGFR tyrosine kinase inhibitor, cytotoxic chemotherapy is the most appropriate next line of therapy.

#12

A 57-year-old male smoker with a mediastinal mass on chest CT scan is diagnosed with small cell lung cancer and found to have a solitary metastatic lesion to his brain.

Which of the following statements regarding the management of small cell lung cancer is correct?

A. The dual kinase inhibitor, sarcatanib, has shown durable survival benefit.
B. Sunitinib, a receptor tyrosine kinase inhibitor, has shown a beneficial effect as maintenance therapy.
C. A topoisomerase inhibitor in combination with a platinum-based agent remains the standard of care.
D. Sub-lobar resection has shown a survival benefit in management of small cell lung cancer.
E. Thoracic radiation therapy after induction therapy has not shown significant improvement in survival.

Questions for WEDNESDAY Sessions

Pediatric Core Curriculum 4: Pulmonary Hypertension & Pulmonary Manifestations of Rheumatologic Diseases

#1

A 4 year old with Down Syndrome and a history of obstructive sleep apnea (OSA) presents with concerns of pulmonary hypertensive vascular disease (PHVD). He underwent tonsillectomy and adenoidectomy for OSA treatment and follow up polysomnogram shows a normal apnea-hypopnea index. An echocardiogram done 6 months following tonsillectomy and adenoidectomy suggests elevated right ventricular pressure.

What is the next best step in management of this child?

A. Begin long-term pulmonary vasodilator therapy
B. Cardiac catheterization with pulmonary vasodilator testing
C. Initiate nocturnal continuous positive airway pressure (CPAP) therapy
D. Repeat echocardiogram in 6 months
E. Repeat polysomnography in 12 months

#2

A four month old, term infant with a history of tachypnea and intermittent desaturations since birth comes to you for evaluation. Swallow study shows no signs of aspiration, and impedance probe testing is negative for gastroesophageal reflux. A chest radiograph reveals an enlarged cardiac silhouette and normal appearing lung fields. Echocardiogram suggests systemic right ventricular pressures. The child is referred for cardiac catheterization, confirming the diagnosis of pulmonary hypertension.

Which of the following etiologies for pulmonary hypertensive vascular disease is more likely to present in the pediatric population rather than in the adult population?

A. Developmental lung disease
B. Heritable disease associated with bone morphogenetic protein receptor type 2 (BMPR2) mutations
C. Infectious etiology, such as HIV or schistosomiasis
D. Left sided heart disease
E. Thromboembolic disease

#3

You are counseling a family of a 2 month old who presents for recurrent apneic spells. During your discussion of possible etiologies for these spells, you mention pulmonary hypertension. The mother relates that her sister recently died from pulmonary hypertension, but she uncertain of the cause of her sister's disease. The parents are quite anxious that their child may have pulmonary hypertension and ask you about genetic diseases that can cause pulmonary hypertensive vascular disease.

Which of the following is the most common genetic variation associated with the development of pulmonary hypertensive vascular disease, regardless of subtype?

A. 22q11.2 deletion (DiGeorge Syndrome)
B. Bone Morphogenetic Protein Receptor type 2 (BMPR2) mutation
C. TBX4 gene mutation (Small Patella Syndrome)
D. Trisomy 21 (Down Syndrome)
E. VHL gene mutation (Von Hippel-Lindau Syndrome)

#4

You are evaluating a patient with newly-diagnosed juvenile dermatomyositis referred by their rheumatologist for pulmonary evaluation. The parents deny any pulmonary symptoms and ask what could influence the long-term pulmonary outcomes.

Which disease feature is most likely to increase the risk of lung disease in this patient with JDM?

A. Extent of skin disease
B. Severity of myositis
C. Duration of treatment
D. Specific myositis autoantibodies
E. Presence of pulmonary hypertension

#5

You are referred a 14-year-old female with complaints of chronic cough and recurrent sinus infections. She has intermittent fever, but denies night sweats, weight loss or hemoptysis. On examination, you note nasal mucosal ulcerations and decreased breath sounds over the lung bases but no other abnormalities. You consider a diagnosis.

What additional testing would be highly important to perform in this patient with possible vasculitis?

A. Antinuclear antibodies (ANA)
B. Pulmonary function testing
C. Urinalysis
D. Testing for latent TB
E. Testing for latent histoplasmosis

#6

A 10-year old girl is referred for complaints of exertional dyspnea, chronic cough and weight loss over a one-year period. She endorses a dry cough intermittently throughout the day without wheezing, dyspnea or chest pain. She fatigues easily compared to her peers at school, but otherwise has good energy levels. She denies recurrent infections or fever. On exam, she is underweight and appears malnourished. Her lung exam is unremarkable. Her extremity exam does not show clubbing, but does display mildly edematous skin in her hands and digital pitting. You suspect scleroderma or overlap connective tissue disease.

What other disease feature most commonly contributes to pulmonary disease in pediatric patients with systemic scleroderma?

A. Myositis
B. Gastrointestinal dysfunction
C. Arthritis
D. Opportunistic infection
E. Recurrent otitis media

D1: Clinical Year in Review 4

#1

A 70 year old ex-smoking male patient visits his primary healthcare provider complaining of relentless progressive dyspnea over the past six months. On physical examination, he has basal fine crepitation (crackles). He is referred for a high-resolution computed tomography (HRCT) scan, which demonstrates basal predominant reticular abnormalities with traction bronchiectasis, which is mild. There was no evidence of honeycombing, nodules, consolidation or air trapping. There was no relevant exposure history and serology is negative for an underlying autoimmune disease.

Which of the follow statements regarding interpretation of this patient's HRCT scan is true?

A. The HRCT presentation is that of usual interstitial pneumonia (UIP).
B. The HRCT presentation is inconsistent with UIP.
C. This patient does not meet Inpulsis criteria for trial enrollment.

D. Surgical lung biopsy would be needed to secure a guideline-based diagnosis of idiopathic pulmonary fibrosis in this case.
E. Idiopathic pulmonary fibrosis is an unlikely diagnosis in this case.

#2

A 65 year old male non-smoker has an HRCT to investigate symptoms of dyspnea. Lung function tests and routine serologic investigations are within the normal range. Although there is no evidence of diffuse lung disease, the reporting radiologist indicates that there are several subtle and very limited subpleural interstitial lung abnormalities.

Which of the follow statements regarding interstitial lung abnormalities (ILA's) are true?

A. ILA's are present in 2% of smokers.
B. ILA's have increased prevalence in smoke.
C. ILA's progress to IPF in 25% of cases.
D. The prevalence of ILA's is similar to the prevalence of IPF.
E. ILA's typically cause dyspnea.

#3

A 70 year old male with chronic obstructive pulmonary disease (COPD) that requires home oxygen is admitted to a hospital with an exacerbation. Besides receiving standard exacerbation therapy with medications, respiratory therapy, and non-invasive ventilation, the care team is considering involving specialty palliative care services as recommended by various guidelines.

Which of the following statements correctly characterizes trends in the use of palliative care for patients with COPD relative to cancer diagnoses?

A. COPD patients receive palliative care at approximately one-half the rate that cancer patients receive palliative care.
B. Compared to patients with cancer, patients with COPD are less likely to receive cardiopulmonary resuscitation before death.
C. Patients with COPD are less likely to have discussions about prognosis than patients with cancer.
D. Patients with COPD have shorter hospital and ICU lengths of stay when compared to patients who die with cancer.
E. Race and socioeconomic status are not associated with palliative care use.

#4

A 48 year old woman with extensive history of smoking was recently diagnosed with diabetes and COPD, and was recommended to follow up with her primary care physician. She has no medical insurance, but has learned that she can obtain coverage through the Affordable Care Act (ACA).

What has been the impact of the ACA?

A. Under the ACA, fewer Americans have Medicaid coverage.
B. The implementation of the ACA has been associated with a meaningful reduction in outpatient healthcare utilization.
C. ACA implementation is associated with reductions in emergency department use.
D. The ACA has improved healthcare coverage in only 21 states as of January 1, 2017.
E. Use of preventative care services by Americans has remained unchanged under the ACA.

#5

A 58 year old African American male with tobacco-related COPD was admitted to the hospital with pneumonia. Previously, a new pulmonary nodule had been identified which was suspicious for lung cancer, but the patient did not follow-up with her doctor and this was not evaluated. Within 48 hours of admission, the patient developed worsening bilateral pulmonary infiltrates, severe hypoxemia, and respiratory failure requiring mechanical ventilation.

How does race/ethnicity impact the diagnosis and prognosis in this patient?

A. Although disparities exist in death rates by sex and race/ethnicity in general, no disparities exist within groups of racial/ethnic minorities.
B. Blacks and Hispanics exhibit lower in-hospital sepsis-related respiratory failure-associated mortality when compared

with non-Hispanic Whites. Thus, this patient has a better prognosis when compared to age-matched non-Hispanic Whites.

C. Smokers with COPD are at risk for lung cancer and post-obstructive pneumonia and this incidence risk is similar when black and white men are compared.

D. As the use of personalized genomic medicine becomes generalized, genetic misdiagnosis are possible and have the potential for increasing health disparities.

D3: Diagnostic Dilemmas in Hypersensitivity Pneumonia and the Clinical-Radiologic-Pathologic Multidisciplinary Standard

#1

Which of the following histologic features is the most significant predictor of mortality in patients with hypersensitivity pneumonia?

A. Cellularity
B. Ratio of CD4 to CD8 T cell subsets
C. Extent of granulomatous inflammation
D. Presence of organizing pneumonia
E. Fibrosis and honeycomb change

#2

A 29 year old female employee of an aquatic facility reports dyspnea, cough, and myalgia with low grade fevers for 3 weeks. She recently began working in the hot-tub area at the aquatic facility. She has a resting room air oxygen saturation of 91%, and chest examination reveals inspiratory crackles and scattered expiratory squeaks. A chest CT shows diffuse ground glass opacities with centrilobular nodules.

What is the most likely pattern to be identified at BAL fluid cellular analysis?

A. Lymphocyte proportion > 50% total cells with CD4:CD8 ratio > 2
B. A normal fluid cell count and differential with a predominance of macrophages
C. Lymphocyte proportion > 50% of total cells with CD4:CD8 ratio < 1
D. Elevated fluid cell count with a neutrophilic predominance

#3

Which of the following CT features is most predictive of hypersensitivity pneumonitis?

A. Lobular mosaic attenuation and air trapping
B. Centrilobular nodules
C. Honeycombing
D. Cysts
E. Lower lung predominance

#4

A 66 year old female has returned to the pulmonary clinic for follow up after undergoing a surgical lung biopsy for undifferentiated fibrotic interstitial lung disease. She originally presented for evaluation of 12 months of progressive dyspnea on exertion. The histopathology showed UIP-like fibrosis, along with patchy areas of cellular NSIP pattern, lymphocytic bronchiolitis, and loosely formed granulomas. She has received a tentative diagnosis of hypersensitivity pneumonia. Upon further questioning, she reveals that she has kept a parakeet in her home for the last 10 years.

What is the first step in treatment?

A. Initiate prednisone at a tapering dose
B. Advise removal of the parakeet from the home and thorough cleaning of the environment
C. Initiate azathioprine and prednisone at a tapering dose
D. Recommend pulmonary rehabilitation exercise program
E. Recommend close follow up and monitoring of pulmonary function every 3 months, with reconsideration of treatment strategy if she declines physiologically

#5

Bronchoscopy with bronchoalveolar lavage (BAL) and transbronchial lung biopsy (TBLB) is an established diagnostic procedure that can provide diagnostic evidence for suspected interstitial lung diseases (ILDs). However, in case of idiopathic pulmonary fibrosis (IPF) BAL is not recommended as a standard part of investigation and is not performed routinely in many countries. While TBLB is mostly helpful in the diagnosis of sarcoidosis, its contribution to diagnosis of other ILDs, namely fibrosing ILDs, is limited.

Can bronchoscopy with BAL and TBLB be recommended and utilized to provide supportive histopathologic evidence in patients in which HP is a suspected diagnosis?

A. No, bronchoscopy is not recommended as a standard in patients with ILDs where HP is one of potential diagnoses.
B. Yes, bronchoscopy with BAL and TBLB should be performed in all patients with ILDs where HP is one of the suspected diagnoses, unless contraindicated.
C. Yes, bronchoscopy should be done as a standard procedure in patients with ILDs where HP is one of potential diagnoses, but with BAL only. TBLB does not contribute to the diagnosis of HP.
D. Yes, bronchoscopy should be done, but only in patients with inflammatory HRCT patterns (nodules, infiltrates, ground glass opacities).

#6

A 55 year old man presents to you for a second opinion on how to manage his IPF. He has 5 year history of nonproductive cough with mild breathlessness on exertion. He is a lifetime nonsmoker. His medical history is significant for hypertension, which is controlled on a beta-blocker. His family history is only significant for hypertension and hyperlipidemia. He has recently been prescribed an anti-fibrotic medication, but has not yet started it. He denies Raynaud's symptoms, skin rash, joint pain/stiffness, muscle pain or weakness, or sicca symptoms. He works in a manufacturing plant. His home was built in the early 1900's. He keeps no pets.

On physical examination, pulse rate is 79/min. and resting respiratory rate is 20/min; BMI is 29. Pulmonary examination reveals bibasilar inspiratory crackles. The rest of the exam is unremarkable. FVC is 72% of predicted. Oxygen saturation is 94% at rest and on the 6minute walk test, the lowest oxygen saturation is 89% breathing ambient air. High resolution CT scan only shows a possible UIP pattern.

What is the next best step in the management?

A. Refer the patient to surgical lung biopsy.
B. Advise to start taking the anti-fibrotic medication.
C. Obtain myositis-specific antibodies.
D. Obtain an occupational and environmental history.

D4: Balancing Personalization and Protocol in the ICU

#1

An 82 year old woman with hypertension and diabetes presents to the emergency room with the chief complaint of facial and arm weakness. Exam reveals a right sided facial droop, eyes deviated to the left with a right sided neglect, and diminished strength in the right arm and, to a lesser extent, right leg. The patient is alert and nods appropriately to questioning but struggles to answer questions. The patient's daughter is relatively certain that her mother's symptoms began 3.5 hours previously.

Which of the following statements is correct?

A. Intravenous alteplase is contraindicated because more than 3 hours has passed since the onset of symptoms.
B. The effect of intra-arterial treatment with mechanical devices (mechanical thrombectomy) is the same regardless of time since symptom onset as long as the procedure begins within 6 hours of symptoms.
C. Patients older than 80 have a higher risk of bleeding with intravenous alteplase for stroke.
D. Patients with mild strokes have a smaller treatment benefit from intra-arterial therapy for stroke.
E. The patient's likelihood of a favorable neurologic score is improved with intra-arterial therapy compared to intravenous alteplase, but the benefit is smaller than that of patients who are reperfused within 3 hours of symptom onset.

#2

An 83 year old man is admitted to the medical intensive care unit with a urinary tract infection which is complicated by septic shock and acute respiratory distress syndrome (ARDS) for which he is receiving invasive mechanical ventilation and continuous intravenous sedation medication.

Which of the following should you employ in a protocolized way based on the best available evidence?

A. Early goal-directed therapy to manage his shock within the first 6 hours of diagnosis.
B. Tight glycemic control targeting blood glucose of ≤110 mg/dL.
C. Low tidal volume ventilation with 8cc/kg predicted body weight.
D. Daily interruptions of sedation paired with spontaneous breathing trials.
E. Interruption of enteral feeding when gastric residual volumes are >250cc.

#3

A 52 year old female (height 5 ft (152.4 cm), weight 90 kg) is admitted for community-acquired pneumonia and acute hypoxemic respiratory failure. Initial chest x-ray demonstrates patchy bilateral infiltrates. She requires intubation and mechanical ventilation. An arterial blood gas obtained 3 hours after intubation finds pH of 7.30, PaCO2 of 50 mmHg, and PaO2 of 75 mmHg on FiO2 0.8 and PEEP 8. The ventilator is set to volume-cycled assist-control mode with set tidal volume of 500 mL, resulting in peak inspiratory pressure of 25 cmH2O. The patient is moderately sedated on propofol and fentanyl but continues to make strong inspiratory muscle efforts. Ventilator waveforms demonstrate two consecutive machine inspiratory cycles occurring for each patient effort with expiratory flow only after the second machine cycle.

Which of the following is true regarding this patient's ventilator management?

A. Tidal volume should be increased to 540 mL according to the NIH ARDS Network protocol.
B. Neuromuscular blockade is likely to decrease the exhaled tidal volume.
C. The volume-cycled assist-control mode guarantees and limits the total insufflation volume delivered with each patient effort.
D. The ventilator mode should be changed to pressure regulated volume control because it limits both the volume and pressure delivered, minimizing risk of both hyperinflation and barotrauma
E. The peak inspiratory pressure indicates the patient is at low risk of ventilation-induced lung injury.

#4

A previously healthy 19 year old female (weight 100 kg) is admitted with urosepsis. Her temperature is 39°C (102.2°F), BP is 70/45, heart rate 145. She is anxious and agitated. Her lactate is 6 mmol/l (54 mg/dl) and gas exchange is satisfactory. After receiving two litres of iv fluid, her blood pressure rises to 80/47, heart rate falls to 100, and lactate falls to 1.2 mmol/l (10.8 mg/dl). Urine output was 70 ml in the hour prior. Her conscious level also improves to GCS 15 and she feels better.

Which of the following is true regarding this patient's circulatory management?

A. She requires at least one more litre of fluid as she has not received 30 ml/kg as a minimum.
B. She requires norepinephrine to raise her mean BP to at least 65 mmHg.
C. She requires a central venous line to ensure her CVP is at least 8 cm H2O. If not, more fluid should be given.
D. She has been adequately resuscitated and requires no further aggressive treatment.
E. She requires a central venous line and further fluid if her central venous saturation is below 70%

#5

A 62 year old patient with pancreatic cancer experiences acute respiratory failure from aspiration pneumonia. She has been managed with ongoing fentanyl and propofol infusions and now briefly opens her eyes to your voice but does not make eye contact. She otherwise lies still and remains passive on volume assist control mechanical ventilation.

When assessing pain, agitation and delirium in this patient, which of the following is true?

A. Delirium assessments cannot be reliably conducted at this level of arousal.
B. Because she is not able to communicate pain, minimization of the fentanyl drip is not appropriate.
C. A bispectral index (BIS) monitor should be considered as the primary modality for accurate sedation assessments.
D. Interruption of the propofol and fentanyl infusions may modify the outcome of the delirium assessment.
E. The presence of delirium prevents an accurate application of behavioral pain scores.

#6

Which of the following statements about sepsis and precision medicine are correct?

A. The host immune response in sepsis is homogeneous across different patients and a single immunomodulatory
B. The Food and Drug Agency (FDA) has approved multiple immunomodulatory drugs for sepsis, similar to rheumatoid arthritis.
C. A prognostic biomarker is a biomarker that predicts which patients are most likely to benefit from a drug.
D. Precision medicine offers the promise of matching the right drug to the right patient for sepsis, but remains unproven for sepsis patients.

D6: Sleep And Public Health: A Wake Up Call

#1

Several guideline documents provide recommendations for habitual sleep duration. These documents have been published by the American Thoracic Society, American Academy of Sleep Medicine, Sleep Research Society, National Sleep Foundation, American Heart Association, and others. All of these documents are in agreement that sleep duration is an important risk factor, marker or indicator of health and functioning.

What do all of these documents have in common?

A. They all indicate that habitual sleep of less than 6 hours is not advised for adults
B. They all indicate that habitual sleep of less than 7 hours is not advised for adults
C. They all indicate that habitual sleep of less than 8 hours is not advised for adults
D. They all indicate that habitual sleep of 9 hours or more is not advised for adults

#2

Many previous studies have demonstrated sleep disparities in the US population. One striking finding is that Blacks/African-Americans are at greater risk for less sleep.

Based on the available evidence, what is the most likely cause of this?

A. Blacks/African Americans exhibit genetic vulnerabilities that are associated with less sleep need. This may be due to selection for less sleep need over many generations.
B. Blacks/African-Americans are more likely to have medical comorbidities that reduce sleep time and this difference is largely a function of differences in health status.
C. Blacks/African-Americans are more likely to experience poor mental health, and differences in depressed mood largely explain differences in sleep.
D. Blacks/African-Americans are more likely to be subjected to a long list of social-environmental stressors, such as racism, shiftwork, and other stresses, which largely explain group differences.
E. Blacks/African-Americans seem to sleep less than Non-Hispanic Whites even after adjustments for factors such as health, depression, and social stress; therefore, the source of these differences is still unclear.

#3

Many children begin school at a very early time, to accommodate parental work schedules, bussing schedules, and after-school activity schedules. These early start times require children and young adults to function at high-levels at a time that is sub-optimally early in their circadian phase and also lead to reduced sleep time at night.

Which of the following situations would likely be a result of later school start times in these schools where classes start early?

A. Students falling asleep in late afternoon classes.
B. Students eating more at lunch time.
C. Students shifting their sleep schedule earlier
D. Students experiencing improved mental health.
E. Students experiencing a reduced work ethic.

#4

A patient arrives in clinic for an issue unrelated to sleep, stating that they sleep for about 5 hours on a typical night. They do not have a history of sleep apnea or insomnia or any other sleep disorders. They do not endorse depressive symptoms. They say that they feel great and that they don't experience much daytime impairment. They note that, "I'm a great sleeper – I fall asleep as soon as my head hits the pillow!"

Based on the available scientific evidence, which of the following is likely true?

A. This individual likely has a genetic predisposition for needing less sleep. Despite sleeping less, they do not show signs of sleep deprivation.
B. Irrespective of what this individual's sleep needs are, they are clearly able to tolerate less sleep without any signs that their sleep is insufficient. The patient should be told that they are fine.
C. Since the patient can only sleep for about 5 hours, it is almost certain that they have insomnia or a circadian rhythm disorder that explains this.
D. The individual shows signs of increased homeostatic sleep pressure, indicating sleep deprivation. They are likely at increased risk for adverse outcomes associated with insufficient sleep. They may not have insight regarding their level of impairment.
E. Since 5 hours is below the recommended amount of sleep for a healthy adult, this patient should be given a hypnotic medication or some other sedative to increase their sleep duration.

D83: Putting The 2017 Gold COPD Recommendations Into Clinical Practice

#1

A 45 year old sedentary man presents to the office with a history of intermittent dyspnea precipitated by "colds", worsened during the winter months and accompanied by noise in his chest when the episodes occur.

He works as a "dry goods" store manager, is married, has 3 children and smokes approximately 10 cigarettes a day since age 19. As a child he had a history of asthma and so does one of his children. His physical exam is unremarkable except for minimal bilateral rhonchi on forced exhalation.

Which of the following tests would help you confirm a diagnosis of Asthma-COPD-Overlap.

A. Complete blood count showing blood eosinophil level of >2%
B. Two peak flow rate values of < 280 /min measured in different days
C. An FEV1 increase of 400 ml after bronchodilators
D. A chest X-ray consistent with lung hyperinflation
E. Result of a serum IG-E of 385 mg/L

2

A 68 year old woman presents with complaints of cough, increasing shortness of breath while walking up a slight grade and sputum production-about a tablespoon of white mucous on most days for the past 2-3 years. She had two episodes in the past year when her primary doctor treated her with oral antibiotics and prednisone for about 5- 7 days. She started smoking at the age of 15 and continues to smoke about ½ pack of cigarettes daily. She is retired but used to work as an accountant. Her physical exam is remarkable for scattered rhonchi, increased tympany to percussion and rare wheezes best heard in the posterior bases of both lungs.

Which of the following are necessary to diagnose or develop a general treatment plan for COPD?

A. Age
B. Severity of airflow limitation
C. Modified Medical Ressearch Council (mMRC) dyspnea score
D. Chest CT

#4

COPD is characterized by persistent airflow limitation. Which of the following mechanisms contribute to persistent airflow limitation in COPD?

A. Increased airway resistance
B. Increased elastic recoil
C. Normal lung development
D. Increased chest wall elastance

5

A 75 year old man complains of increasing dyspnea on exertion. He states that he can't walk more than 30 yards on the level or 6 steps without stopping because of shortness of breath. He has no significant cough or mucus production. He's had no exacerbations that have required treatment over the last year. He had lung function studies that showed an FEV1 35% of predicted and a residual volume 200% of predicted. Resting room air oxygen saturation is 94% and with ambulation during the 6-minute walk test oxygen saturation decreases to 88%. A recent CT scan of his chest shows more emphysematous destruction in both upper lobes compared to both lower lobes. The patient is on maximal medical treatment (e.g., LABA, LAMA, short acting SABA for rescue) and has completed a course of outpatient rehabilitation without significant improvement in his complaints. What therapies which you consider next to improve this patient's clinical condition?

Which of the following treatments may improve this patient's lung function, symptoms of dyspnea and quality of life?

A. Roflumilast
B. Supplemental oxygen
C. Theophylline
D. Lung volume reduction surgery
E. Lung transplantation

6

A 69 year old woman complains of increased shortness of breath, cough and sputum production. She has an FEV1 32% of predicted and gets short of breath walking up a slight grade. She is on multiple inhaled therapies for her diagnosis of COPD which includes long acting bronchodilators (LAMA/LABA), an inhaled corticosteroid, and supplemental oxygen. She underwent pulmonary rehabilitation in the past 6 months. She was recently discharged from the hospital for a COPD exacerbation 6 months ago. She does not use supplemental oxygen, her resting saturation is 92%. She has been treated for another exacerbation by her primary care doctor with a short course of oral glucocorticoids and an oral antibiotic about 2 months ago. She is asking you what else can be done to prevent future exacerbations.

Which of the following treatments may be considered to add to the patient's therapy to decrease the frequency and severity of future acute exacerbations of COPD?

A. Rosuvastatin
B. Supplemental oxygen
C. Roflumilast
D. Chronic prednisone therapy
E. Daily guaifenisen

CC6: Sleep Core Curriculum Part 2: OSA

#1

A 40 year old male is referred for evaluation regarding possible obstructive sleep apnea. He has been treated for hypertension for 1 year. He notes excessive daytime somnolence for 3 years, non-refreshing sleep and 3 episodes of nocturia per night. His Epworth Sleepiness Score is 14/24. His partner gives a history of loud snoring, witnessed apnea and choking during sleep. On examination, he is found to have a BMI of 36 kg/m2, a crowded oropharynx, clear lungs and minimal bilateral pre-tibial pitting edema.

Which of the following tests is not recommended for the diagnosis of obstructive sleep apnea in this patient?

A. Laboratory diagnostic polysomnography.
B. Home sleep apnea test with EEG.
C. Home sleep apnea test with a device measuring nasal pressure, chest and abdominal respiratory inductance plethysmography, and oximetry.
D. Home sleep apnea test with a device measuring pulse oximetry only.
E. Home sleep apnea test with a device using peripheral arterial tonometry with oximetry and actigraphy.

#2

A 50 year old female with a history of ischemic cardiomyopathy (an ejection fraction of 35%) and moderate COPD, presents with fatigue and excessive daytime somnolence for the last 3 years. Her Epworth Sleepiness Score is 16/24. She has been noted to snore loudly and to occasionally stop breathing in her sleep and reports early morning headaches. On examination, her BMI is 35 kg/m2, and her oxygen saturation is 91%. Cardiac auscultation reveals a loud P2 with a soft systolic murmur. A few crackles can be heard in both lung bases, and air entry is globally reduced.

What is the most appropriate next step for the management of sleep disordered breathing in this patient?

A. Perform a home sleep apnea test using a device measuring nasal pressure, chest and abdominal respiratory inductance plethysmography, and oximetry.
B. Perform home sleep apnea test using a peripheral arterial tonometry device with oximetry and actigraphy.
C. Perform laboratory diagnostic polysomnography.
D. Immediately initiate treatment with auto-CPAP.
E. Perform laboratory CPAP titration.

#3

A 30 year old male with hypertension presents with excessive daytime somnolence, non-restorative sleep, choking at night, witnessed apneas and loud snoring. He underwent a home sleep apnea test with a device measuring nasal pressure, chest and abdominal respiratory inductance plethysmography, and oximetry, which showed a Respiratory Event Index (REI) of 10. The data integrity was complete and scoring was done using the AASM criteria with 4% desaturations to define hypopneas.

Regarding these results, which of the following is true?

A. The respiratory event index (REI) reported from this home sleep apnea test includes apneas, hypopneas and respiratory effort-related arousals (RERAs).
B. The home sleep apnea test will in general overestimate the AHI because the monitoring time is greater than the total sleep time.
C. Based on these results, this home sleep apnea test is not diagnostic and further testing is required in this patient.
D. Scoring of this home sleep apnea test using AASM criteria with 3 % desaturations to define hypopneas would have likely resulted in a higher Respiratory Event Index (REI).
E. Based on these results, this patient should be diagnosed with obstructive sleep apnea regardless of symptoms.

#4

Which of the patients described below is most likely to benefit from CPAP therapy?

A. A 60 year old male with ALS and a 6 month history of progressive generalized weakness is evaluated for chronic dyspnea. A daytime room air ABG shows pH 7.37, PaCO2 65, PaO2 70, bicarbonate 35mmol/L, and oxygen saturation of 92%. Nocturnal pulse oximetry shows oxygen desaturation to 85%.
B. A 51 year old obese female complains of excessive daytime sleepiness, and her partner reports nocturnal snoring and abnormal breathing pattern including episodes of breathing cessation lasting 20s. Over the last 6 months, she has been taking oxycodone 40mg BID due to refractory chronic pain from hip osteoarthritis.
C. A 65 year old female reports disrupted sleep, weight gain, increased daytime fatigue, and increased daytime sleepiness. She was recently diagnosed with pre-diabetes.
D. A 37 year old male who is otherwise healthy reports unsatisfactory sleep. He reports difficulty with initiating sleep due to racing thoughts. His wife denies snoring. On exam, the patient is thin and nervous appearing.
E. A 40 year old female with BMI of 23 kg/m2 presents to clinic with her partner who reports the patient snores at night, especially when she is supine. The patient denies daytime sleepiness, but wants to pursue treatment per her partner's wishes.

#5

A 66 year old male is diagnosed with moderate obstructive sleep apnea with an AHI of 20. He reports daytime sleepiness and his Epworth Sleepiness Scale score is 16/24. His medical history includes obesity (BMI 33 kg/m2), CAD s/p PCI, HTN, and diabetes on insulin therapy. He reports that his symptoms are tolerable, and he doesn't think he needs any treatment including CPAP.

What should you tell the patient regarding the best available evidence as to why he should use CPAP therapy?

A. CPAP therapy improves objective and subjective daytime sleepiness and quality of life measures such as mood.
B. In patients with diabetes and OSA, CPAP therapy can reduce dosing for pharmacological treatment.
C. CPAP therapy improves learning and memory in patients with OSA.
D. CPAP therapy will help him lose weight.
E. In patients with established cardiac disease and OSA, CPAP is an important secondary prevention measure.

#6

A 57 year old obese male with BMI 35 kg/m2 is diagnosed with severe OSA. A split-night study shows an AHI of 40 and resolution of respiratory events with CPAP at 12 cm H2O using a full-face mask. After using CPAP for 6 months, he still reports daytime sleepiness and un-refreshing sleep. His download shows: 1) usage of CPAP >4hrs for 30% of nights; 2) large leak out of tolerant range for 1 hour per night; 3) persistently elevated AHI of 12.

Which of the following is the next best step for intervention?

A. Repeat a CPAP titration study.
B. Refer him for repeat mask fitting.
C. Increase the CPAP setting by 2 cm H2O.
D. Start a trial of a sedative-hypnotic to improve sleep quality.
E. Given the patient's poor compliance, stop CPAP therapy and recommend weight loss as an option for fully effective therapy for OSA.

#7

You are seeing a 40 year old male in your sleep clinic with hypertension, dyslipidemia, and moderate OSA with an Apnea-Hypopnea Index (AHI) of 23 treated with Continuous Positive Airway Pressure (CPAP) therapy. He has had multiple visits in the past 6 months to improve his CPAP tolerance but has not had much success despite multiple efforts to adjust his therapy. He continues to snore loudly and constantly feels tired. His Epworth Sleepiness Score (ESS) is 14/24.

His physical exam is remarkable for a BMI of 29 kg/m2, patent nasal passages and a class 3 Mallampati score, without tonsillar enlargement.

You discuss alternative therapies for his OSA management. In evaluating this patient's surgical options, what is the role of Drug-Induced Sleep Endoscopy (DISE)?

A. DISE provides a 3-dimentional airway examination under conscious sedation, potentially improving patient selection for surgery.
B. A concentric collapse pattern observed during DISE predicts the best outcome after hypoglossal nerve stimulation surgery.
C. DISE is a safe and reliable procedure that alters the choice of surgery in more than half of the patients.
D. Although DISE is a useful tool in evaluating the pattern of obstruction at the palate and retroglossal level, it may not reliably assess the role of epiglottis in obstruction.

#8

A 29 year old woman with a history of hypertension and severe, non-positional OSA with an AHI of 43, requests a referral for Inspire hypoglossal nerve stimulation. The patient has been unable to tolerate CPAP despite successful titration of CPAP to 12 cm H2O with a residual AHI of 4. She describes extreme claustrophobia and has undergone multiple mask refits and CPAP habituation attempts since her diagnosis 4 months ago. She has severe temporomandibular joint pain and has declined oral appliance fitting. Her Epworth sleepiness score (ESS) is 14/24. She has a body mass index (BMI) of 35 kg/m2, a class 4 Mallampati score, and her hypertension is well controlled on two anti-hypertensive medications. She is otherwise healthy with good exercise tolerance and no contraindications to surgical intervention. Drug-induced Sleep Endoscopy (DISE) demonstrates lateral wall collapse at the level of the soft palate.

Which of the following is a relative contraindication to Inspire hypoglossal stimulation implantation therapy in this patient?

A. The presence of lateral wall collapse on DISE
B. Her AHI is > 40
C. Her BMI is > 32 kg/m2
D. Her failure to attempt bi-level positive airway pressure (BiPAP) prior to referral for surgical evaluation
E. Her severe claustrophobia

#9

A 50 year old male patient with snoring and excessive daytime sleepiness (Epworth sleepiness score of 15/24) was recently diagnosed with OSA and started on CPAP therapy at 14 cm H2O. Over the last 4 months, he is unable to tolerate treatment and feels claustrophobic despite all efforts to find the best mask fit. He denies any nasal congestion or dry mouth.

On a physical exam, he is found to have a BMI of 35 kg/m2, mild retrognathia, normal temporomandibular joint mobility, patent nasal passages and a class 3 Mallampati score. His split night-PSG is significant for an AHI of 16, supine AHI of 28, and a nadir oxygen saturation of 81%. The PAP titration portion shows improved AHI to 1 on CPAP pressure of 14 cm H2O.

What is the next best treatment option?

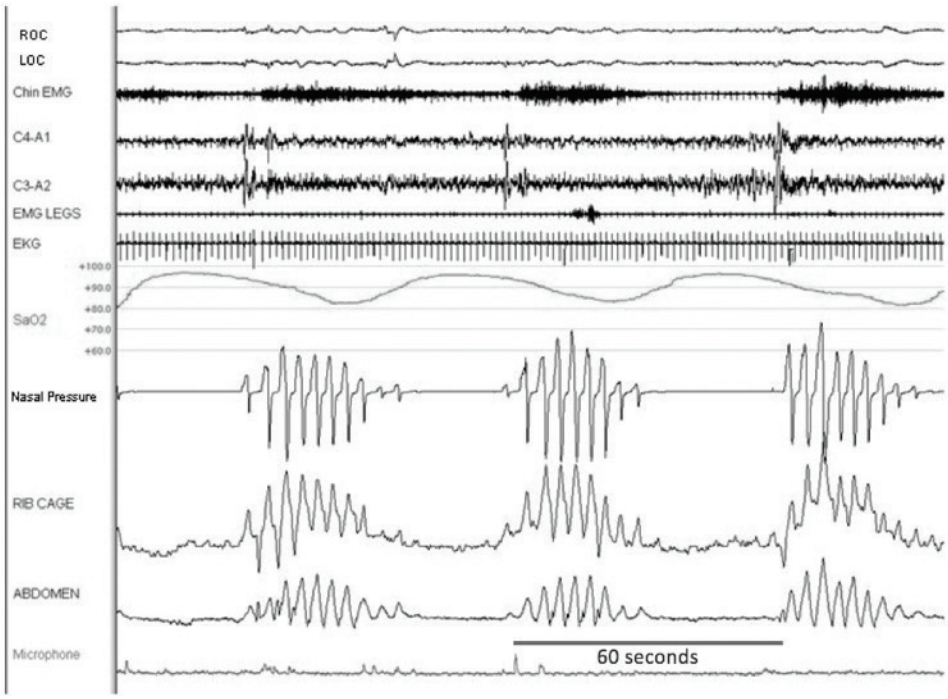
A. Initiate Auto-titrating CPAP.
B. Refer to dentist to get a custom-fit mandibular advancement device.
C. Refer to ENT to evaluate for a mandibular advancement surgery.
D. Refer to ENT to evaluate for hypoglossal nerve stimulator implantation.
E. Recommend positional therapy.

#10

A 65 year old female presents with daytime sleepiness, unrefreshing sleep, and her bed partner reports witnessed apneas during sleep. Her past medical history is notable for ischemic cardiomyopathy, and due to recent symptoms of exertional dyspnea she underwent an echocardiogram which demonstrated a left ventricular ejection fraction of 35%. An in-lab sleep study is performed and is notable for an overall apnea-hypopnea index (AHI) of 30, with a central apnea index of 25 and an obstructive AHI of 5. Figure 1 depicts a representative image from the sleep study.

Figure 1:

Which of the following is the best initial therapy recommendation for this patient?



A. Optimization of heart failure therapy
B. Acetazolamide
C. Bilevel positive airway pressure (BPAP)
D. Transvenous diaphragmatic pacing

#11

A 65 year old female presents with daytime sleepiness, unrefreshing sleep, and her bed partner reports witnessed apneas during sleep. Her past medical history is notable for ischemic cardiomyopathy, and due to recent symptoms of exertional dyspnea she underwent an echocardiogram which demonstrated a left ventricular ejection fraction of 35%. An in-lab sleep study is performed and is notable for an overall apnea-hypopnea index (AHI) of 30, with a central apnea index of 25 and an obstructive AHI of 5. Figure 1 depicts a representative image from the sleep study.

Which of the following therapies is absolutely contraindicated in this patient?

A. Continuous positive airway pressure (CPAP)
B. Bi-level positive airway pressure (BIPAP)
C. Adaptive servo-ventilation (ASV)
D. Supplemental oxygen

#12

A 50 year old male presents for evaluation of newly diagnosed sleep apnea. Due to symptoms of daytime sleepiness and witnessed apneas, he underwent an in-lab sleep study which documented an overall apnea-hypopnea index (AHI) of 20, all of which were noted to be obstructive respiratory events. However, during positive airway pressure titration, central respiratory events were noted to emerge (see Table 1). He has no significant medical history and he takes no medications.

Table 1:

	CENTRAL APNEA INDEX	OVERALL AHI
DIAGNOSTIC	0.0	20.0
CPAP 5 cm H_2O	1.2	17.2
CPAP 6 cm H_2O	4.2	14.8
CPAP 7 cm H_2O	3.9	12.2
CPAP 8 cm H_2O	6.1	8.2
CPAP 9 cm H_2O	13.9	14.4
CPAP 10 cm H_2O	15.9	15.9
CPAP 11 cm H_2O	25.0	25.0
CPAP 12 cm H_2O	28.2	28.2

Which of the following is recommended as initial therapy for this patient's complex sleep apnea syndrome?

A. Continuous positive airway pressure therapy (CPAP)
B. Bi-level positive airway pressure with a backup rate (BIPAP ST)
C. Adaptive servo-ventilation (ASV)
D. Zolpidem therapy

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- Critical Care Core Self-Assessment 2016 Exam Module and Educational Summary
- Sleep Medicine Core Self-Assessment 2016 Exam Module and Educational Summary
- Pediatric Core Self-Assessment 2016 Exam Module and Educational Summary
- Pulmonary Core Self-Assessment 2015 Exam Module and Educational Summary
- Critical Care Core Self-Assessment 2015 Exam Module and Educational Summary
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- Sleep Medicine Core Self-Assessment 2014 Exam Module and Educational Summary
- Pediatric Core Self-Assessment 2014 Exam Module and Educational Summary

Other MOC Modules

- Treatment for Idiopathic Pulmonary Fibrosis Exam Module and Educational Summary
- Responding to Requests for Potentially Inappropriate Treatments in Intensive Care Units Exam Module and Educational Summary
- Severe Asthma Self-Assessment Exam Module and Educational Summary
- Pulmonary Hypertension in Sickle Cell Diseases Self-Assessment Exam Module and Educational Summary
- Exercise-induced Bronchoconstriction Self-Assessment Exam Module and Educational Summary
- Bronchiolitis Obliterans Syndrome Self-Assessment Exam Module and Educational Summary
- Field Walking Tests in Chronic Respiratory Disease Self-Assessment 2015 Exam Module and Educational Summary
- Hot Topics in Pediatric Rare Lung Disease Self-Assessment 2014
- Pediatric Respiratory Physiology in Health and Disease Self-Assessment 2014

MOC AT ATS 2017

In order to receive MOC credit from the ABIM or ABP you must pass the post-test. To access the post-test go to https://www.xpressreg.net/register/thor0517/evaluations.asp and log in using your conference badge number. Core MOC modules are completely free of charge to ATS 2017 attendees with full conference registration (one day registration, postgraduate only and guests excluded).

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