

# Central Sleep Apnea Problem Based Learning Module

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# Case – Section I

A 75 year old obese male with chronic systolic heart failure, recalcitrant hypertension, and end-stage renal disease presented to the emergency department of your hospital with sudden onset of shortness of breath and palpitations for the last 2 hours.

Prior to this episode, the patient reports no chest pain, palpitations or dyspnea at rest. He does report dyspnea when walking up 2 flights of stairs. He has been compliant with his medications and his cardiologist reported NYHA 2 heart failure at his last visit 2 months prior. He has developed lower extremity edema over the last 24 hours.

# Case – Section II

PMH: chronic systolic heart failure, hypertension, ESRD, chronic lower back pain

PSH: arteriovenous graft of left upper forearm

Medications: metoprolol, lisinopril, furosemide, spironolactone, oxycodone

Allergies: none

Social history: no smoking, alcohol, or illicit drug use history

Family history: both parents with HTN

# Questions – Section I

I.A) In general, what risks for sleep disorders are in the presentation of this patient?

I. B) Specifically what are known risk factors for Central Sleep Apnea?

# Case – Section II

He had an irregularly irregular heart rhythm with a II/VI holosystolic murmur at the apex, and heart rate of ~120 beats per minute. Blood pressure was maintained around 130/70 mm Hg (close to his baseline). Lung exam revealed crackles at the bases of the posterior lung fields bilaterally. His oropharynx exam showed a Modified Mallampati of I, with normal tongue and jaw.

The 12-lead electrocardiogram is consistent with atrial fibrillation with a rapid ventricular rate. Echocardiogram from 4 months prior revealed an enlarged left atrium, left ventricular hypertrophy and left ventricular ejection fraction of 35%. His body mass index (BMI) is 34.

# Questions – Section II

II. A. What is central sleep apnea?

II. B. Would your assessment for central sleep apnea risk alter with the given information?

II. C. What are the syndromic presentations of central sleep apnea? What type of central sleep apnea might you expect to see on a sleep study in this patient at this time?

# Case – Section III

He was admitted for management of atrial fibrillation with rapid ventricular rate. He was given one dose of metoprolol IV and his usual home dose of metoprolol was increased from 25mg twice a day to 75mg twice a day. His usual dose of oxycodone for chronic back pain was continued during his hospital stay.

His heart rate was controlled to ~80bpm, and the patient spontaneously converted to normal sinus rhythm. However, pulmonary exam and CXR were still consistent with pulmonary edema. SpO<sub>2</sub> is 85% on room air and 92% on 4Lpm O<sub>2</sub> by nasal cannula. The ABG on 4Lpm O<sub>2</sub> is 7.38/28/60

# Questions – Section III

III. A. How can pulmonary edema and hypoxemia affect the patterning of breathing during sleep?

III. B. How does the respiratory alkalosis affect sleep (and wake) disordered breathing?

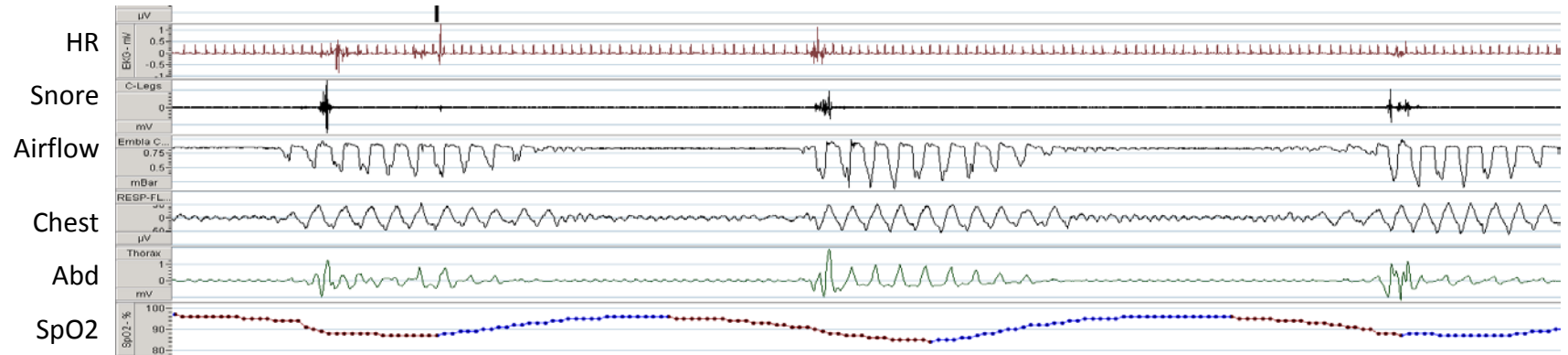


# Case – Section III

Overnight, the ICU nurses noted an abnormal breathing pattern, and called you into the room to observe these witnessed pauses in breathing. The patient had a period of tachypnea and deep breaths, followed by slower and shallower breaths, followed by a period of complete cessation of breathing for approximately 30 seconds. There was no apparent respiratory effort during these witnessed pauses in breathing. The O<sub>2</sub> saturations were oscillating from 92-94% to 85-87% while he was sleeping.

# Case – Section III

A limited channel sleep study was available to the unit. A representative 3-minute screen of the study is presented.



# Questions – Section III

III. A) Are the nurse descriptions and the portable monitoring example consistent?

III. B) What potential causes of sleep apnea does the patient have?

III. C) How would you treat this patient at this time?

III. D) What are the management issues upon discharge from the MICU?