**COPD AHD 11/16/2023**

**Agenda**

1:10-1:30 Theory Burst

1:30-2:15 Small groups – Part 1

2:15-2:30 Expert questions + break

2:30-3:20 Small groups – Part 2

3:20-3:30 Expert questions

**GOLD 2023**



**Part 1**

Ms. Puff is a 62 yo female with a PMH of HTN who presents to the clinic with a chief concern of shortness of breath. She feels winded with activity and had to give up her hobby of playing pickleball a few months ago. She has noticed this shortness of breath for about 1 year. She does not have any chest pain with exertion, but has noticed her ankles swell up at the end of the day. She sleeps on 2 pillows at night. She has had a chronic productive cough for “years” which is unchanged.

Social history: Currently smokes 1 ppd (40 pack year hx), rare EtOH. No other drug use.

Medications: multivitamin and amlodipine 5 mg daily

Physical Exam:

Vitals: T 98.6, BP 132/84, HR 86, POX 95% on RA, BMI 29

Gen: well-appearing, no acute distress

CV: RRR, nl S1/S2, no murmurs, normal PMI, no JVD

Pulm: reduced breath sounds throughout, clear to auscultation. No wheezing, crackles, or rhonchi. Prolonged expiratory phase noted.

MSK: 1+ pitting edema of ankles bilaterally. No joint swelling or tenderness.

Skin: no rashes

**1. What is your differential diagnosis and what would support each diagnosis (list at least 5)? What additional history and examination findings would help you build or narrow your differential?**

**2. What work-up do you want to do?**

**3. Which set of PFTs do you expect her to have and why? What disease script matches with each PFT?**

**A.**

|  |  |  |
| --- | --- | --- |
|  | Baseline | Post Bronchodilator |
| Actual | Pred | %Pred | LLN | Actual | %Chg | %Pred |
| FVC (L) | 3.1 | 4.05 | 77 | 3.23 | 3.2 | 3 | 79 |
| FEV1 (L) | 2.6 | 3.05 | 85 | 2.34 | 2.75 | 6 | 90 |
| FEV1/FVC (%) | 84 | 75 | 113 | 65 | 86 | 2 | 115 |
| TLC (Pleth) (L) | 4.73 | 6.31 | 75 | 4.91 |  |  |  |
| DLCO | 23.20 | 24.04 | 97 | 16.05 |  |  |  |

**B.**

|  |  |  |
| --- | --- | --- |
|  | Baseline | Post Bronchodilator |
| Actual | Pred | %Pred | LLN | Actual | %Chg | %Pred |
| FVC (L) | 3.92 | 4.05 | 97 | 3.23 | 4.28 | 9 | 106 |
| FEV1 (L) | 1.70 | 3.05 | 62 | 2.34 | 1.87 | 10 | 61 |
| FEV1/FVC (%) | 43 | 75 | 65 | 65 | 44 | 0 | 58 |
| TLC (Pleth) (L) | 9.32 | 6.31 | 148 | 4.91 |  |  |  |
| DLCO | 26.20 | 24.04 | 109 | 16.05 |  |  |  |

**C.**

|  |  |  |
| --- | --- | --- |
|  | Baseline | Post Bronchodilator |
| Actual | Pred | %Pred | LLN | Actual | %Chg | %Pred |
| FVC (L) | 3.92 | 4.05 | 97 | 3.23 | 4.18 | 7 | 103 |
| FEV1 (L) | 2.9 | 3.05 | 95 | 2.34 | 2.82 | 4 | 92 |
| FEV1/FVC (%) | 74 | 75 | 98 | 65 | 67 | 2 | 89 |
| TLC (Pleth) (L) | 6.5 | 6.31 | 103 | 4.91 |  |  |  |
| DLCO | 25.20 | 24.04 | 105 | 16.05 |  |  |  |

**Case continued:**

**CXR: (scan QR code to review)**



**Ms. Puff returns for her follow up visit to discuss her test results.**

**4. How is COPD currently defined based on the new GOLD 2023 guidelines? How do you explain the diagnosis to Ms. Puff?**

**5. You ask Ms. Puff to tell you more about her symptoms, what a typical day looks like for her, and she tells you the following: “I cough a moderate amount but I don’t have much phlegm. I do not have significant chest tightness, but I am winded going up the flight of stairs from my basement to do my laundry. Otherwise, I can take care of my daily activities around the house and do not have issues leaving my home. I sleep pretty well and I have not had issues with energy level.”**

**Based on the information available how would you classify and grade the severity of and classify COPD in this patient?**

**6. Broadly, what are your goals for treatment of stable COPD? What medication(s) would you start for this patient, and why?**

**7. Ms. Puff asks if there is anything she can do in addition to medications because she wants to do everything she can to start playing Pickleball again. What do you tell her about adjunctive and non-pharmacological options?**

**8. Ms. Puff wonders if her tobacco use could have anything to do with her COPD. How do you counsel her? What tools do we have to help with smoking cessation?**

**9. She returns for follow-up a few weeks later and continues to complain of shortness of breath. Her CAT score is 15. What do you do?**

**Part 2**

A few months later, you are on an emergency medicine rotation and to your dismay, you see that Ms. Puff has checked in with shortness of breath! You learn that Ms. Puff had noted worsening SOB at home for the past four days along with increased sputum production and sputum that was more yellow/green than her normal. She says she was taking her Tiotropium + Formoterol as prescribed but she has also been needing her rescue inhalers every 2 hours for the last day.

1. **What is on your differential? What clarifying questions might you ask?**
2. **How is a COPD exacerbation defined? How is severity defined?**

**3. What set of vitals, exam findings, lab results, and imaging findings would:**

 **a. Reassure you that Ms. Puff can go home?**

 **b. Concern you enough that you would admit Ms. Puff to general medicine?**

 **c. Make you call the MICU fellow?**

**4. What are the common triggers of COPD exacerbations? What is the time course for recovery?**

**Case Continued**

Physical Exam:

Vitals: 98.9, HR 92, RR 24, BP 121/98, SpO2 86% on RA

GEN: Sitting on edge of bed, appears a little uncomfortable/anxious, seems short of breath after speaking

CV: Nml rate, reg rhythm, normal S1, S2, no M/R/G

Pulm: Distant breath sounds, prolonged expiratory phase accompanied by expiratory wheezes throughout, scant crackles at the bases with some clearing when asked to cough

Extremities: 1+ pitting edema to ankles bilaterally



CBC: WBC 8.8, Hb 14.8, Hct 44.5, Plt 185

Renal: Na 140, K 3.9, Cl 98, HCO3 32, BUN 20, Cr 1.2, Glu 127

BNP: < 15

CXR: no acute cardiopulmonary disease, stable compared to prior

VBG: 7.34/60

**5. What sort of acid-base disturbance does this patient have? If you need**

**help refer to the acid-base AHD guide with the QR code:**

**6. You decide to admit Ms. Puff. What orders do you place? What do you do with her home inhalers? How will each of your therapies help Ms. Puff?**

**Case Continued**

**2 hours later Ms. Puff’s nurse calls you. She reports that Ms. Puff is still feeling quite SOB and appears more tired than before. You go and evaluate Ms. Puff.**

Physical Exam:

Vitals: 98.9, HR 102, RR 26, BP 121/98, POX 85% on 4L

GEN: Is drowsy and seems much more tired and sleepy, dozes off but easily arousable. Follows commands. AAOx4

CV: Tachycardic, regular rhythm, normal S1, S2, no M/R/G

Pulm: Distant breath sounds, prolonged expiratory phase accompanied by expiratory wheezes, no gurgling or drooling

**7. What concerns do you have? What do you do from here?**

**Case Continued**

Ms. Puff ultimately improves under your team’s care and feels almost back to normal. You are preparing to discharge her, but she has remained on 2 liters O2.

**8. Does she need supplemental oxygen? How will you evaluate for this?**

**9. Do you need to make any changes to her medications before discharge? What resources will you provide her in the outpatient world?**

**Bonus question**:

A 62 year old female with moderate-severe COPD, HTN, and OA is brought to the ED with acute onset of shortness of breath that started this morning. He was discharged 3 days ago for a COPD exacerbation treated with steroids, antibiotics, and BiPAP on admission, which was subsequently weaned off to supplemental O2 per nasal cannula. He finished antibiotics yesterday. He was discharged to a SNF due to being largely non-ambulatory during his admission. He complains of productive cough with white sputum and mild right-sided chest pain.

Vitals: 98.8 deg, BP 118/76, pulse 112, respirations 23, SpO2 89% on RA JVD

Exam is notable for end expiratory wheezing, mild tachypnea, b/l lower extremity edema (which he says is chronic), and JVD to 8 cm H2O.

Labs: WBC 14k, Hgb 15, Plt 100k

Na 135, K 4.2, HCO3 29, Cr 1.1

Trop 0.3
ABG pH 7.4, PaO2 57, PaCO2 41

EKG sinus tach with non-specific TW changes.

CXR hyperinflated lungs with linear densities at the RL base c/w atelectasis.

**What is your next best step in management?**

1. IV antibiotics and steroids
2. V/Q scan
3. NIPPV
4. CT angio chest
5. Monitor troponin trend and EKG trend