**Question 1 (18 marks)**

A 57 year old male presents to your Emergency Department by ambulance. The ambulance officers state that he has a past history of COPD and asthma. He has been a smoker for 40 years and continues to smoke. The ambulance officers found him to be severely short of breath and have been treating him with continuous oxygen continuous nebulised salbutamol en route.

The ambulance reports the following most recent observations:

BP 160/80 mmHg

 HR 140 bpm

 RR 40 bpm

 Sats 86% high flow oxygen

 GCS 15

1. State six (6) factors that you would consider in deciding if this man needs intubation. (6 marks)
* **Patient’s wishes/ advance directive**
* **Avoid intubation if at all possible (mechanical ventilation for COPD has high mortality)**
* **Reversibility to current disease process- clear picture of pneumonia/ bronchodilator or steroid response on previous PFT**
* **Failure to respond- worsening of ABG**
* **Failure to tolerate less invasive Rx (eg NIV)**
* **↓ GCS, fatigue**
* **Previous response to ventilation**
* **Previous difficult airway/ previous history/ need for assistance**

**An ABG is taken: see props booklet**

**(pH 7.12 pCO2 91 HCO3 30 pO2 271 BE -1 )**

1. State your interpretation of this ABG in this clinical setting. Include four (4) points in your answer. (4 marks)
* **Moderate acidaemia**
* **Severe, acute respiratory acidosis as expected HCO3 29 but with pCO2 91 if entirely acute would expected decrease in GCS. As pt GCS 15 likely acute on chronic Resp acidosis.**
* **Expected Bicab 29 if acute or 44 if chronic Resp acidosis**
* **Oxygenation satisfactory (expect higher if on 100%) but indicates increased A-a gradient/ VQ mismatch for pt on high flow O2**
* **BE -1 indicates no significant/additional Metabolic acidosis but for chronic Resp acidosis in this pt expect HCO3 of 44 , the HCO3 of 30 may indicate an additional metabolic process.**
1. Would you intubate him on the basis of these gases? (1 mark)
* **No (remember its very rare to ever intubate based purely on an ABG)**
1. State three (3) points of justification for your decision. (3 marks)
* **On basis of whole picture ( Intubation in COPD high mortality/pt GCS 15**
* **On basis of changes in gases eg wind back the FIO2 with aim to keep sats 86-89% ( aim to optimise hypoxic vasoconstriction & improve gas exchange)**
* **On basis of response to therapy eg trial NIV/BIPAP/ongoing Rx eg maximal bronchodilators/steroids/aminophylline etc**
1. If the patient were to progress on to intubation, what pattern of ventilation would you initiate? State four (4) points in your answer. (4 marks)

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| **Mode (1 mark)** | **SIMV** |
| **I:E ratio (1 mark)** | **Low I:E ratio- 1:5 or >** (inspiratory time titrated to keep peak airway pressures < 55 mmHg/ Permissive hypercapnia) |
| **TV (1 mark)** | **4-8 ml/kg** |
| **PEEP(1 mark)** | **0-5** |