Case Study # 3: Respiratory

Please read the following shift report from the night RN (23/05/20, 19-07):

Sebastian Abdul is an 82-year-old male who was admitted to the Medicine (admit: 23/05/15) unit under the care of Dr. Khan five days ago with the diagnosis of pneumonia and acute exacerbation of COPD.

He is a Full Code and has an allergy to sulfonamides. Droplet contact precautions are in effect.

With respect to his current admission, Sebastian was brought to the Emergency Department five days ago by his partner, Mohammed, who was concerned due to Sebastian's increased difficulty breathing, wheezing, and worsening cough. Leading up to his admission, Sebastian had a productive cough with thick yellow-green phlegm that started four days prior to his admission. He was also experiencing difficulty breathing, audible wheezing, and was using his rescue inhaler every 1-2 hours with minimal effect. Respiratory assessment in the ED was presented as:

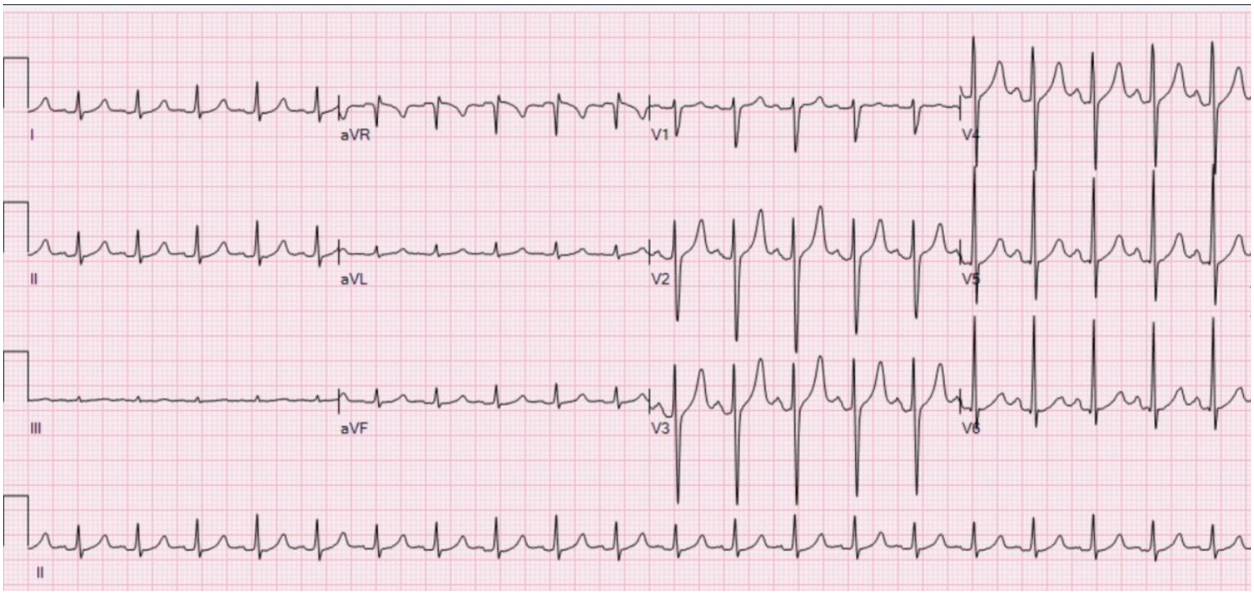
- Increased work of breathing and accessory muscle use visible. Use of the tripod position was noted.
- Expiratory wheezing auscultated bilaterally. Coarse crackles auscultated in bilateral lower lobes. Diminished air entry to bases noted.
- RR was 32, SpO2 was 84% on room air. Patient did not have any pallor or cyanosis but was quite diaphoretic due to the increased work of breathing.

For his past medical history, Sebastian has COPD. He smoked cigarettes, about a pack-a-day for 20 years and recently quit smoking 1 year ago. Sebastian currently uses nicotine patches. He is not on any home O2 at baseline. He also has a history of Type 2 Diabetes that is typically controlled with oral medications. Sebastian also had an echocardiogram in 2021 which showed left ventricular hypertrophy and a left ventricular ejection fraction of 40%. He was subsequently diagnosed with CHF.

Radiologist Report re: Chest X-Ray

Interpretation:
-Left lower lobe patchy infiltrate in keeping with left lower lobe pneumonia
-Coarsened lung markings in keeping with COPD
-Left-sided cardiomegaly is noted in keeping with left-sided CHF
-No lobar collapse or pulmonary masses/nodules
-The trachea, mediastinal contours, and hila appear normal
-No skeletal or soft tissue abnormalities are noted
-There is no free subdiaphragmatic gas
Dr. Rad, MD
Department of Interventional Radiology

Admission 12-lead ECG (23/05/15)



Interpretation: sinus tachycardia with a heart rate of 108, normal upright P waves preceding every QRS complex.

In terms of assessments, he is A&O x 3. The patient was noted to have some mild confusion with respect to his medications last night. His partner states that he normally does not have any difficulty in remembering to take his medications at baseline. He is typically independent in ambulation with a walker but is currently a 1-person assist and a moderate falls risk due to current lower extremity weakness. Physiotherapy is currently consulted to assist Mr. Abdul with his mobility with the goal of return to his baseline, independent with a walker by discharge.

His blood sugar at 1700 the night before was 15.6 and he required 6 units of insulin Lispro as per the sliding scale. His morning POCT blood sugar at 0655 was 18.6. His HbA1C on admission was 7.5%. Dr. Khan has just been called and he wrote an order for insulin Lantus 0.2 units/kg/day administered QHS. He also adjusted the sliding scale to the high dose sliding scale in response to his elevated blood sugars. Mr. Abdul's blood sugars have been steadily increasing throughout his admission and his partner notes that they are typically pretty well controlled under 10 mmol/L on the oral medication he is on.

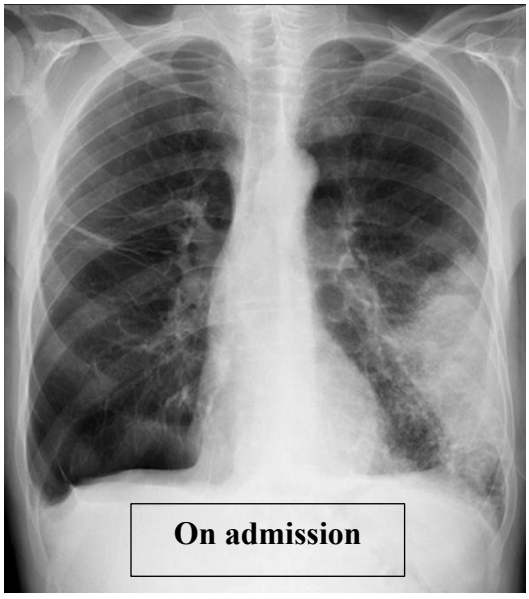
Blood Glucose	Insulin Lispro (units) S/C High-Dose
0-3.9	Call MD, follow hypoglycemia protocol
4.0-7.9	0
8.0-9.9	2
10.0-11.9	4
12.0-13.9	6
14.0-15.9	8
16.0-17.9	10
18.0-19.9	12
>20.0	14 – call MD

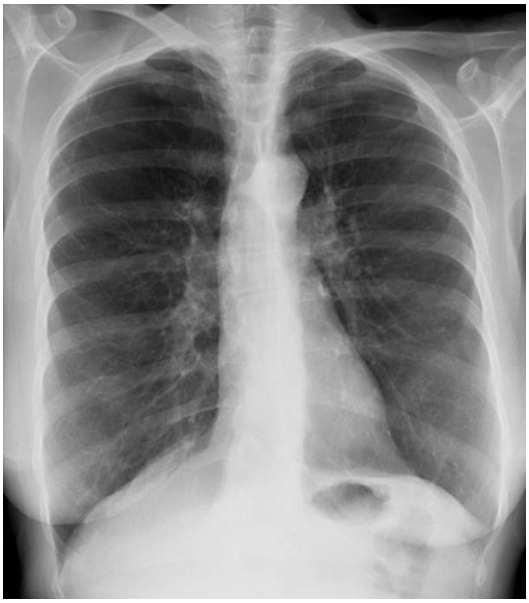
He is on a healthy heart, diabetic diet. His partner has brought him in some meals and desserts from home to bring him some comfort while in the hospital. I did provide some education to Sebastian and Mohammed on diet and blood pressure control. When assessing their understanding of health teaching, Sebastian was able to identify foods that would increase his blood sugar. He stated, “I know what you want me to eat, but I am not interested in living like that - I would rather die sooner than eat crappy food.” He also shared that sometimes he doesn’t bother to check his blood sugar. I made a referral to the dietician for further teaching and evaluation of his dietary needs.

He has a peripheral IV inserted into his right forearm and is receiving 0.9% N/S at 75 mL/hr. The IV site is patent with no redness or swelling. The MD has written orders to keep his sats between 88-92%.

When I came on shift, his SpO2 was 86% on 2 L NP. I increased his oxygen flow rate to 4L via NP, encouraged him to take his Ventolin, and he is now satting 90% consistently. His most recent vital signs are T 38.2 C, P 92 (regular), R 22 (non-laboured), BP 143/86, O2 90% on 4L NP. I noticed that he does still have diminished breath sounds to bilateral bases, but he is no longer wheezing, and I did not hear any crackles. He has +2 pitting edema in his lower extremities. He wears compression stockings during the day. His temperature has decreased steadily from admission at 39.1 C, and he has not required Tylenol since 1500 yesterday.

Comparative CXR shows his lungs at admit (left) versus day 4 (right). Yesterday, his CXR showed hyperinflation of the lungs and a flattened diaphragm consistent with COPD but did not reveal any areas of consolidation.





We are also monitoring his blood pressure closely. His trends since admission are as follows:

	Admission	**Day 1**	**Day 2**	**Day 3**	**Day 4**	**Day 5**
BP	147/89	141/85	145/87	139/82	142/79	143/86

He put out 1100 mL of dark yellow urine overnight. I noticed a pungent smell to the urine. He also reported some burning and mild discomfort in his lower back. I sent his urine for testing and expect to receive urinalysis results this morning and C&S results tomorrow. Given his CHF, he knows that we are monitoring his ins and outs closely and uses the urinal at the bedside. His 12-hour fluid balance is -200mL. Mr. Abdul's serum creatinine was 200 which is up from 160 yesterday. Additionally, his BUN was 30, which was up from 26 yesterday. We are monitoring his BUN/Cr clearance very closely. The GFR was 45.

The current plan of care is to monitor his recovery from this acute pneumonia infection and return his mobility to baseline. Once he is more well, we will coordinate a visit with the Diabetic Nurse Educator related to blood sugar management. At this time, it is expected that the client will not return to baseline related to their respiratory status and will be discharged on home oxygen and a new inhaler regimen. The plan is for him to return home once his conditions stabilize with referrals to appropriate community supports (diabetes clinic, home care to assist with oxygen, etc.).

Medications

Salbutamol 1-2 puffs Q2H PRN
Salmeterol 1 puff BID
Spiriva Respimat 2.5 mcg 2 puffs OD
Pulmicort 200 mg BID
Dalteparin 5000 units SC QHS
Perindopril 8 mg PO OD
Metoprolol 25 mg PO BID
Rosuvastatin 10 mg PO OD
Metformin 500 mg PO BID
Azithromycin 500 mg IV Q12H
Hydralazine 10 mg PO Q6H PRN for SBP >160 mmHg
Acetaminophen 500 mg PO Q6 PRN for T > 38.5

ELECTROLYTES PANEL + Blood Sugar

	DAY 2 (23/05/17)	DAY 3 (23/05/18)	DAY 4 (23/05/19)	DAY 5 (23/05/20)	(23/05/21) - pending -
Sodium	130 mmol/L	133 mmol/L	135 mmol/L	136 mmol/L	
Potassium	3.4 mmol/L	3.6 mmol/L	3.5 mmol/L	3.6 mmol/L	
Chloride	95 mmol/L	97 mmol/L	101 mmol/L	102 mmol/L	
BUN	24 mg/dL	25 mg/dL	26 mg/dL	30 mg/dL	
Creatinine	138 µmol/L	156 µmol/L	160 µmol/L	200 µmol/L	
Fasting Blood Glucose	9.9 mmol/L	11.5 mmol/L	13.4 mmol/L	16.9 mmol/L	

CBC PANEL

	DAY 2 (23/05/17)	DAY 3 (23/05/18)	DAY 4 (23/05/19)	DAY 5 (23/05/20)	(23/05/21) - pending -
Leukocytes	18.1 x 10^9/L	16.2 x 10^9/L	14.5 x 10^9/L	11.3 x 10^9/L	
RBCs (x10^{12})	4.02	4.11	4.18	4.32	
MCH (pg)	41.0	39.7	38.5	37.0	
Hemoglobin	165 g/L	163 g/L	161 g/L	160 g/L	
HCT	0.42 L/L	0.39 L/L	0.40 L/L	0.38 L/L	
MCV (fL)	104.5	94.9	95.7	88.0	
RDW	15.2	15.2	15.4	15.3	
MPV	11.3	11.2	11.4	11.4	
Thrombocyte	330	327	320	318	
Neutrophil	11.4	12.5	12.9	13.9	
Immature Granulocyte	0.51	0.47	0.50	0.50	
Lymphocyte	1.7	1.5	1.4	1.4	
Monocyte	2.2	1.8	1.6	1.3	
Eosinophil	0.2	0.3	0.2	0.2	
Basophil	0.1	0.1	0.1	0.1	
INR	0.9	-	-	-	
aPTT	22	-	-	-	

Urinalysis (23/05/20)	**Urine Culture and Sensitivity** (23/05/20)
Colour, urine = Dark amber Clarity, urine = Cloudy Specific gravity = 1.000 pH, urine = 7.0 Leukocytes, urine = moderate (275) Nitrates, urine = negative Protein, urine = negative Glucose, urine = 2+ Ketones, urine = negative RBCs = negative	- pending -

ABGs on Admission (23/05/15)	**Repeat ABGs on Day 3** (23/05/18)
pH = 7.30 PaCO2 = 58 mmHg HCO3 = 30 mEq/L PaO2 = 50 mmHg SpO2 = 86%	pH = 7.37 paCO2 = 40 mmHg HCO3 = 25 mEq/L paO2 = 80 mmHg SpO2 = 90%