Reference Acknowledgement: 2024 NHSN Annual Training

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Part 1- PNEU

Mr. Brown, a 52-year-old man, is admitted to the hospital on February 20, 2024 with upper gastrointestinal bleeding. He is admitted to the medical ICU due to hemodynamic instability. Two central lines and a urinary catheter are placed on February 20. The patient's most recent previous hospitalization was in March 2023. He has no recent surgeries. His medical history is significant for hypertension and alcoholism. The patient is afebrile on admission. Blood products and intravenous fluids are administered, and an upper endoscopy is performed on February 20. Chest x-ray on admit shows lungs are clear.

The patient's blood pressure stabilizes on February 21. He remains afebrile. On February 23, the patient experience copious hematemesis (vomiting of blood), aspirates gastric contents, and develops respiratory distress. He is placed on a nonrebreather mask, and maintains stable oxygenation overnight. Chest x-ray on February 23 includes findings of infiltrate in the right lung base.

Question 1

Is the chest x-ray performed on February 23 eligible for use to meet a PNEU definition?

A. Yes
B. No
C. Maybe

Part 2

On February 24, he has a fever to 38.4°C at 5am and has developed a new cough. A chest x-ray at 6am shows infiltrates in the right lower lung field. Antibiotics are started (vancomycin and piperacillin/tazobactam). February 24 at 8am, he develops increasing shortness of breath, and his oxygen saturation drops from 92% to 84% while on the non-rebreather mask. He is intubated and placed on mechanical ventilation at 8:45am. A chest x-ray done immediately after intubation shows worsening right lower lobe infiltrates.

On February 24, urine, blood, and endotracheal aspirate cultures are collected. The urine culture is negative. Blood and endotracheal aspirate cultures are positive for *Enterococcus faecalis*. On February 25, the patient is febrile to 39oC. Antibiotics are continued. On February 26, the patient's maximum temperature is 37.9oC. Antibiotics are continued. A chest x-ray is performed and shows improved right lower lung infiltrate with atelectasis. On February 27, the patient is afebrile and chest imaging shows stable right lower lung infiltrate.

Question 1

Do the subsequent chest imaging results demonstrate findings that are eligible to meet a PNEU definition?

A. Yes

B. No
C. Maybe

Question 2

Are the blood culture and/or endotracheal cultures eligible to use to meet the laboratory component of a PNEU (PNU2 or PNU3) definition?

A. Yes
B. No

Question 3

Is a PNU1 event met in this case?

A. Yes
B. No

Question 4

What is the date and the diagnostic test used to set an Infection Window Period (IWP) for the PNEU event?

A. Feb. 20 chest x-ray
B. Feb. 23 chest x-ray
C. Feb. 24 chest x-ray
D. Feb. 24 blood and endotracheal culture

Question 5

What is the DOE?

A. Feb. 22
B. Feb. 23
C. Feb. 24
D. Feb. 25

Question 6

What is the IWP?

A. Feb. 21 – 27
B. Feb. 20 – 26
C. Feb. 22 – 28
D. Feb. 19 – 25

Part 3: VAE

The patient presents to the ED at 9pm on 2/1 with an admitting diagnosis of influenza with a suspicion of a complication related to bacterial pneumonia. The patient experiences respiratory distress and is intubated and placed on the ventilator in the ED.

The patient remains in the ED for a couple of hours before admission to an inpatient unit. The patient is admitted to an adult inpatient location (ICU) at 2330 on 2/1

VAE surveillance is performed in the monthly reporting plan for the adult ICU.

Question 1

What are the daily minimum FiO2 and PEEP values for the patient on 2/1?

Date and Time	February 1 2100	2200	2330	February 2 2400 (midnight)	0300	1200	1500	2000	2200
Location	ED	ED	ICU	ICU	ICU	ICU	ICU	ICU	ICU
FiO_2	0.40	0.40	0.60	0.70	0.40	0.40	0.75	0.75	0.75
PEEP	5	8	10	10	8	8	5	8	8

A. 0.40 and 5
B. 0.40 and 8
C. 0.40 and 10
D. 0.60 and 10

Question 2

Is a VAE identified for this patient?

Case Example

Vent Day	PEEP min	FiO_2 min	Temp min	Temp max	WBC min	WBC max	ABX	Spec	Polys /Epis	Org
1	10	60								
2	5	40					Ceftriaxone			
3	5	40	36.9	37.6	12.1	12.1	Ceftriaxone			
4	5	55	38.1	39.2	14.5	16.8	Ceftriaxone	BAL		3+ *P. aeruginosa*
5	8	50	38.4	38.9	12.6	15.9	Ceftriaxone			
6	8	40	36.5	37.8	11.1	13.6	Ceftriaxone			
7	8	40								
8	5	30								

A: Yes
B: No

Question 3

What level of the VAE algorithm does this patient meet?

Vent Day	PEEP min	FiO_2 min	Temp min	Temp max	WBC min	WBC max	ABX	Spec	Polys /Epis	Org
1	10	60								
2	5	40					Ceftriaxone			
3	5	40	36.9	37.6	12.1	12.1	Ceftriaxone			
4	5	55	38.1	39.2	14.5	16.8	Ceftriaxone	BAL		3+ *P. aeruginosa*
5	8	50	38.4	38.9	12.6	15.9	Ceftriaxone			
6	8	40	36.5	37.8	11.1	13.6	Ceftriaxone			
7	8	40								
8	5	30								

A. VAC
B. IVAC
C. PVAP