Acute Respiratory Distress Syndrome

Simulated Clinical Experience (SCE™) Overview

Location: Surgical Intensive Care Unit (SICU)

History/Information:
A 55-year-old woman was admitted to the Emergency Department (ED) after being struck by a motor vehicle while crossing a busy downtown intersection. On arrival to the ED the patient was alert and oriented times three, receiving 100% oxygen per non-rebreather mask, and vital signs were BP 80/56, HR 130, RR 28-32, and SpO2 88%. Her cardiac rhythm was sinus tachycardia. She had one peripheral 20ga IV catheter with 1000mL 0.9%% NS infusing wide open. The paramedics stated that eyewitnesses reported that the woman had landed on the windshield of the car after being thrown into the air by the impact. On admission to the ED, the patient was electively intubated and oxygenated on 100% oxygen and was typed and cross matched for four units of packed red blood cells (PRBC). In addition, multiple x-rays and CT scans were obtained. These studies revealed no head trauma or cerebral bleed. However, the extensive studies did reveal bilateral pulmonary contusions, kidney contusions, a perforated bowel, and a left open humerus fracture. Despite multiple transfusions and fluid resuscitation, the patient was unable to sustain a systolic blood pressure greater than 90mm Hg. The patient was transferred to the Operating Room for an emergent exploratory laparotomy and repair of her fracture. After surgery, the patient was transferred to the Surgical Intensive Care Unit. She is receiving mechanical ventilation. She has a right nasogastric tube to low wall suction draining a small amount of pink tinged drainage. She has a urinary catheter with bloody urine. Despite frequent blood transfusions, the patient remains hemodynamically unstable. A left femoral arterial line and pulmonary artery catheter were inserted for more accurate hemodynamic and blood pressuring monitoring. The patient has advanced directives on the chart.

Healthcare Provider's Orders:
Hourly vital signs
Pulmonary artery readings every hour; call surgical resident if pulmonary capillary wedge pressure (PCWP) greater than 18mmHg
Hourly Intake and Output; call surgical resident if urine output less than 30mL/hour
Continuous pulse oximetry; call surgical resident if less than 88%
Ventilator settings: Vt 600, RR 10, PEEP 10cm, FiO_2 70%, mode assist control ventilation
IV 0.9% NS at 150mL/hour
Document Peak Airway Pressure (PAP) every hour; call surgical resident if PAP greater than 45cm H_2O
ABG, CBC, Electrolytes, BUN, Creatinine, Magnesium, Calcium, Glucose, PTT, PT, Lactic Acid level on admission to SICU
Hgb, Hct, Blood Glucose, Potassium level every four hours
ABG with each ventilator change and prn
Metronidazole 500mg IVPB every 6 hours
Clindamycin 750mg IVPB every 8 hours
Ciprofloxacin 400mg IVPB every 12 hours
Sucralfate 1g per nasogastric tube every six hours. Clamp tube for 30 minutes after each dose
Portable Chest x-ray and 12-lead ECG on admission to SICU
Daily morning portable Chest x-ray while on mechanical ventilator support
Nasogastric tube to low wall suction and irrigate with 30mL normal saline every four hours
Dry sterile dressing to abdominal wound daily
Morphine 2mg IVP every hour prn for pain
Daily morning weight

Learning Objectives

1. Identifies the direct and indirect causes of acute respiratory distress syndrome (ARDS) for this patient (COMPREHENSION).
2. Utilizes the appropriate underlying principles associated with refractory hypoxemia in planning and implementing care of the trauma patient with ARDS (APPLICATION).
3. Correlates positive end expiratory pressure (PEEP) with changes in cardiac, neurologic and pulmonary assessment findings (ANALYSIS).
4. Analyzes the event history, assessment findings and arterial blood gas results to anticipate the complications associated with ARDS (ANALYSIS).
5. Formulates and implements an individualized plan of care for the patient experiencing ARDS (SYNTHESIS).
6. Communicates effectively with the family of the dying patient (APPLICATION).

Questions to Prepare for the Simulated Clinical Experience

1. Identify the clinical findings that support the diagnosis of Adult Respiratory Distress Syndrome (ARDS).
2. Describe pathophysiology and potential complications of ARDS.
3. Define refractory hypoxemia.
4. Define the PaO_2/FiO_2 ratio in the diagnosis of ARDS.
5. Define the role of Positive End Expiratory Pressure (PEEP) as an adjunct with mechanical ventilation in ARDS particularly in bi-level ventilation.
6. Define the potential adverse effects of PEEP.
7. Define the rationale for using less than 6mL/kg predicted body weight when ordering the tidal volume to be delivered to the patient during mechanical ventilation.
8. What are the benefits of rotational sleep surface therapy?
9. What are the indications for blood transfusions?
10. Determine pharmacokinetics and dosage requirements for dexmedetomidine and norepinephrine for the adult patient.
11. What would need to be assessed to determine a sedation score in a patient based on a Sedation Agitation Scale (SAS)?
12. What is the nursing responsibility for post mortem care?

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