

Sepsis and MODS : From Lewis 11th Edition – Teach for nurses

Patient Profile

W.A. is a 70-year-old black woman who presented to the emergency department with fever, severe nausea, vomiting, and diarrhea. She is admitted to the intensive care unit (ICU) with a diagnosis of kidney failure and septicemia. Her previous medical history includes glaucoma, chronic kidney failure, hypertension, and insulin-dependent diabetes. She had a left above-the-knee amputation 1 year ago.

Subjective Data

- W.A.'s daughter states she was able to do her daily chores at home independently, but for the last few days it was getting difficult for her to get around and that she needed to take frequent breaks because of shortness of breath and no energy. Her daughter also reports that W.A. had been having headaches with nausea and dizziness for the past few days.
- Goes to hemodialysis 3 days a week

Objective Data

Physical Examination

- Blood pressure 172/92, pulse 110, temperature 101.5°F, respirations 28
- Oxygen saturation 86% on 15 LPM via mask
- Oriented to name only
- Crackles in bilateral lower lobes
- 2+ edema bilateral lower extremities and hands
- Abdomen is distended with hypoactive bowel sounds x4 quadrants

Diagnostic Studies

- CBC: Hemoglobin 7 g/dL, hematocrit 23.8%, RBC 2.57 million/mm³, WBC 14.8 mm³
- Chemistry Panel: Serum sodium 132 mEq/L, serum potassium 6.0 mEq/L, calcium 9.3 mg/dL, phosphorus 6.0 mg/dL, glucose 197 mg/dL, albumin 2.4 U/L, serum blood urea nitrogen 77 mg/dL, serum creatinine 7.30 mg/dL, eGFR African American 10, BNP 182 pg/mL
- Urinalysis: Dark yellow and cloudy, protein 28 mg/dL, positive for casts, positive for red blood cells and white blood cells, positive for glucose and ketones
- Blood cultures pending

Discussion Questions

1. What is multiple organ dysfunction syndrome (MODS)? After reviewing W.A.'s presentation, what organ systems do you suspect are involved and why?

Answer: MODS is the failure of two or more systems in the body.

- o Respiratory: crackles in lower lung lobes, hyperventilation, decreased oxygen saturation, history of increasing dyspnea
- o Renal: laboratory results consistent with kidney failure (BUN, creatinine, electrolytes, and eGFR)
- o GI: hypoactive bowel sounds, abdominal distension
- o Cardiac: presence of peripheral edema, elevated blood pressure, acute change in neurologic status with confusion

Rationale: MODS is defined as the failure of two or more organ systems in an acutely ill client as result of a systemic inflammatory response.

2. What do you think is the origin of W.A.'s septicemia?

Answer: A urinary tract infection.

Rationale: The client was experiencing nausea, vomiting, headache, and malaise for the past few days. These, coupled with the increase in WBC count, presence of fever, and results of the urinalysis, support a UTI as the origin.

3. What additional tests would you anticipate for W.A.?

Answer: Additional tests that may be ordered include a hepatic panel, bleeding times, chest radiography, and arterial blood gases to evaluate respiratory status.

Rationale: The client must be assessed and evaluated to determine the extent of organ failure involvement.

4. What are the interprofessional care goals for W.A.?

Answer: The interprofessional care for patients with MODS focuses on the treatment of the underlying infection, maintenance of tissue oxygenation, providing nutritional and metabolic support, and appropriate support of the individual failing organs.

Rationale: An interprofessional approach can ensure a better outcome as MODS is a complex disease to treat.

5. Describe interprofessional care that would be appropriate for W.A.

Answer:

- Infection: broad-spectrum intravenous (IV) antibiotics
- Maintaining oxygenation: mechanical ventilation for oxygenation and ventilation
- Nutritional and metabolic support: IV insulin, stress ulcer prophylaxis, TPN or enteral feedings
- Support for individual organs
 - Kidney: hemodialysis
 - Cardiovascular: continuous cardiac monitoring, vasopressors, hemodynamic monitoring, venous thromboembolism prevention (low-molecular-weight heparin or unfractionated heparin if appropriate and mechanical compression devices)

Rationale: An interprofessional approach can ensure a better outcome as MODS is a complex disease to treat. Respiratory therapists, nutrition, endocrinologist, infection control, ICU specialist, cardiologists and renal specialists may all have input that would benefit the client.

6. W.A.'s urine output over the past 4 hours is 20 mL, and her latest potassium level is 7 mEq/L. The provider is ordering a continuous renal replacement therapy machine (CRRT). Why would a CRRT be ordered for W.A.?

Answer: The use of a CRRT helps to maintain fluid, electrolytes, and acid base balance to prevent further damage to kidneys. The treatment is for acutely ill and hemodynamically unstable patients who cannot handle quick fluid and electrolyte shifts.

Rationale: Client had a history of requiring dialysis three times a week. Using CRRT allows the health care team to manage fluid, electrolytes, and acid-base balance better as the body's systems are often labile and require frequent monitoring during MODS. Dialysis is one of the few interventions that can lower a high potassium level.

7. Outline a care plan for W.A., describing nursing interventions that would be appropriate for promoting oxygenation, maintaining fluid volume, and promoting tissue perfusion.

Answer:

- Oxygenation: Frequently reposition her. If she is able, keep in a semi or high Fowler's position. Provide frequent pulmonary hygiene, suctioning her with aseptic technique. Perform ongoing assessment for signs of hypoxia. Monitor arterial blood gas (ABG) results when available.
- Fluid volume: Keep her on strict I&O with daily weights. Administer ordered IV fluids and nutritional replacement therapy. Obtain glucose levels and administer insulin as ordered. Assess bowel sounds, Perform ongoing assessment of fluid volume status.
- Tissue perfusion: Monitor vital signs and maintain continuous electrocardiographic and hemodynamic monitoring. Administer ordered vasopressors. Perform ongoing assessment for signs of decreased perfusion.

Rationale: The goal is stabilizing the client hemodynamically while protecting the client's airway and improving the client's breathing by reducing the fluid accumulating within the body.