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Comprehensive Sepsis Management in Medical–Surgical Nursing: An Integrated Multidisciplinary Perspective

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Abstract

Sepsis is a life-threatening syndrome resulting from a dysregulated host response to infection, leading to organ dysfunction and high mortality. Early recognition and protocolized interventions are critical for improved outcomes. This narrative review synthesizes current evidence-based strategies relevant to medical–surgical settings, focusing on early detection, fluid resuscitation, antimicrobial stewardship, hemodynamic support, source control, and nursing-led monitoring. It emphasizes the importance of multidisciplinary collaboration among nurses, physicians, pharmacists, respiratory therapists, and dietitians, in alignment with the Surviving Sepsis Campaign guidelines. Persistent challenges such as antimicrobial resistance, delayed diagnosis, and resource limitations are discussed, alongside future directions including novel biomarkers, personalized care pathways, AI-driven early warning systems, and strengthened antimicrobial stewardship programs. Optimized nursing protocols, enhanced interprofessional communication, and advanced monitoring strategies can significantly reduce sepsis-related morbidity and mortality.

Keywords: Sepsis; septic shock; early recognition; fluid resuscitation; antimicrobial stewardship; nursing interventions; multidisciplinary care.

INTRODUCTION

Sepsis is a systemic, dysregulated inflammatory response to infection that can progress to multi-organ dysfunction and death if untreated. Globally, it affects millions annually, contributing significantly to hospital morbidity and mortality. In medical–surgical nursing, early recognition and timely intervention are essential to preventing deterioration. This review outlines evidence-informed management strategies and the pivotal role of multidisciplinary teams in sepsis care.

METHODS

This narrative review integrates recommendations from the 2021 Surviving Sepsis Campaign guidelines and recent literature (2018–2024) from PubMed, CINAHL, and WHO databases. Literature was reviewed for clinical interventions, nursing responsibilities, and multidisciplinary collaboration in sepsis management.

Pathophysiology of Sepsis

Sepsis develops when infection triggers an uncontrolled host immune response, leading to widespread inflammation, endothelial injury, coagulation abnormalities, and cellular energy failure. Pathogen-associated molecular patterns (PAMPs) activate pattern recognition receptors (PRRs), resulting in excessive cytokine release (e.g., TNF-α, IL-1β, IL-6). This cascade causes vascular leakage, microthrombosis, mitochondrial dysfunction, lactic acidosis, and, in severe cases, septic shock characterized by persistent hypotension despite adequate fluids.

Risk Factors and Early Recognition

Risk Factors

- Advanced age, immunosuppression
- Chronic comorbidities (diabetes, renal or hepatic disease)
- Recent surgery, invasive procedures, or indwelling devices
- Prolonged hospitalization and multidrug-resistant organisms

Recognition Tools

- **qSOFA:** altered mentation, respiratory rate ≥22/min, systolic BP ≤90 mmHg
- **NEWS:** detects early clinical deterioration in hospitalized patients
- **Biomarkers:** elevated lactate and procalcitonin support severity assessment

MANAGEMENT STRATEGIES

Fluid Resuscitation

- Initial crystalloid bolus (~30 mL/kg within 3 hours)
- Use dynamic measures (passive leg raise, stroke volume variation) to guide further fluids

Antimicrobial Therapy

- Administer broad-spectrum antibiotics within 1 hour of recognition
- Obtain cultures before antibiotics when possible
- De-escalate based on culture results and clinical progress

Hemodynamic Support

- Norepinephrine as first-line vasopressor
- Consider inotropes for myocardial depression

Source Control

- Remove infected devices, drain abscesses, or perform surgery as needed

Nursing Interventions

- Monitor vital signs, urine output, oxygenation, and neurological status
- Track fluid balance and lactate trends
- Maintain strict infection-control measures
- Educate patients and caregivers on sepsis warning signs

Role of the Multidisciplinary Team

- **Nurses:** Rapid recognition, initiate sepsis bundles, continuous monitoring, patient/family education
- **Physicians:** Confirm diagnosis, lead antimicrobial and hemodynamic management, coordinate source control
- **Pharmacists:** Optimize antibiotic selection/dosing, monitor drug safety, lead stewardship
- **Respiratory Therapists:** Support oxygenation and ventilation, prevent ventilator-associated complications
- **Dietitians:** Provide early nutritional assessment and tailored feeding plans

Challenges and Future Directions

Challenges:

- Antimicrobial resistance
- Delayed recognition due to non-specific symptoms
- Resource limitations in diagnostics and staffing

Future Priorities:

- Development of novel biomarkers for rapid diagnosis
- Individualized patient care pathways
- Integration of AI-based early warning systems
- Expansion of antimicrobial stewardship programs
- Global training initiatives for early recognition and treatment adherence

CONCLUSION

Sepsis management in medical–surgical nursing demands swift recognition, evidence-based interventions, and coordinated multidisciplinary efforts. Nurses are critical in initiating care, maintaining vigilance, and ensuring patient safety. Strengthened protocols, better communication, and technological innovations will be pivotal in reducing sepsis mortality.

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