
**P-ISSN:** 3079-0506
**E-ISSN:** 3079-0514
www.medsurgjournal.com
JMSN 2025, 2(1): 29-37
Received: 05-04-2025
Accepted: 08-05-2025

**Amina Hasan**
Department of Hematology and Oncology, Green Valley Hospital, Sylhet, Bangladesh

**Corresponding Author:**
**Amina Hasan**
Department of Hematology and Oncology, Green Valley Hospital, Sylhet, Bangladesh

# Nursing strategies in managing sepsis among oncology patients receiving immunosuppressive therapy

## Amina Hasan

**DOI:** https://www.doi.org/10.33545/30790506.2025.v2.i1.A.10

**Abstract**
Sepsis is a life-threatening condition frequently encountered among oncology patients undergoing immunosuppressive therapy due to the compromised immune response. This paper explores comprehensive nursing strategies to detect, manage, and prevent sepsis in this vulnerable population. It begins by detailing the unique risks associated with immunosuppressive therapy, including neutropenia and mucosal barrier injury, which predispose patients to systemic infections. Early recognition through systematic monitoring of clinical signs such as fever, hypotension, tachycardia, and mental status changes is emphasized. Evidence-based interventions include timely administration of broad-spectrum antibiotics, strict adherence to infection control protocols, fluid resuscitation, and hemodynamic support. The role of nursing education, patient awareness, and interdisciplinary collaboration are also examined. Incorporating sepsis screening protocols, enhancing communication within care teams, and utilizing early warning systems have shown promising outcomes. Through case examples and current literature, this paper affirms that nurses play a pivotal role in mitigating sepsis-related morbidity and mortality among immunocompromised oncology patients.

**Keywords:** Nursing strategies, control protocols, fluid resuscitation, oncology patients

## Introduction
Sepsis is a critical clinical condition characterized by a dysregulated host response to infection, leading to life-threatening organ dysfunction. Its occurrence in oncology patients is both frequent and severe, especially among those undergoing immunosuppressive therapies. These therapies, though crucial for treating cancer, often result in neutropenia and mucosal barrier disruption, creating a gateway for opportunistic pathogens. The immune system's ability to recognize and respond to microbial threats is significantly diminished, allowing even minor infections to evolve into fulminant sepsis. Nursing professionals are positioned at the frontline of sepsis detection and management. Oncology nurses engage in continuous monitoring, medication administration, patient education, and emergency response-making them vital to the patient's survival. The complexity of care required for oncology patients receiving immunosuppressive treatments demands heightened vigilance. Nurses must identify early indicators of sepsis such as febrile episodes, altered mental status, or subtle vital sign changes, which may be the only clues preceding septic shock.
Moreover, sepsis management in these patients often faces numerous systemic hurdles. These include delayed diagnosis due to non-specific symptoms, overlapping effects of chemotherapy, and limited clinical guidelines tailored specifically for this subgroup. Despite global advancements in sepsis protocols, sepsis-related mortality in cancer patients remains disproportionately high, emphasizing the need for specialized nursing strategies.
This paper aims to provide a detailed overview of how nurses can play a transformative role in managing sepsis among immunocompromised oncology patients. It examines the pathophysiological basis of sepsis in this population, elaborates on essential nursing assessments and interventions, explores interdisciplinary collaboration, and suggests evidence-based improvements in nursing practice.

## Pathophysiology of sepsis in immunocompromised oncology patients
Sepsis, a dysregulated host response to infection, represents a significant clinical challenge in immunocompromised oncology patients.

The unique interplay between cancer pathology and the immunosuppressive effects of cancer therapies creates a high-risk environment for infections to flourish and progress rapidly into systemic inflammation and organ dysfunction. Understanding the pathophysiological mechanisms that predispose these patients to sepsis is essential for developing and implementing effective nursing interventions aimed at early detection, prevention, and management.

The initial trigger of sepsis is typically an infection-bacterial, fungal, or viral-that breaches the body's natural defense mechanisms. In healthy individuals, the innate immune system is the first line of defense, rapidly responding to pathogens through the activation of neutrophils, macrophages, dendritic cells, and various cytokines. However, in patients receiving chemotherapy or radiotherapy, this innate immune function is profoundly suppressed. Neutropenia, defined as an absolute neutrophil count (ANC) of less than 500 cells/μL, is one of the most common and dangerous consequences of myelosuppressive treatments. With insufficient neutrophils available to phagocytose and destroy pathogens, even minor infections can escalate quickly.

Another critical component contributing to sepsis vulnerability is mucosal barrier injury. Chemotherapeutic agents, especially those used in hematologic malignancies such as cyclophosphamide or cytarabine, damage the epithelial linings of the gastrointestinal and respiratory tracts. This disruption facilitates the translocation of commensal flora and pathogens into the bloodstream, particularly Gram-negative bacilli and fungal species like *Candida*. These organisms, once within systemic circulation, interact with the host's immune system, triggering the release of pro-inflammatory mediators.

The resulting immune response, although aimed at controlling the infection, becomes excessive and self-damaging. Cytokines such as tumor necrosis factor-alpha (TNF-α), interleukin-1 (IL-1), and interleukin-6 (IL-6) are released in massive quantities, creating a "cytokine storm". This storm leads to widespread endothelial damage, increased vascular permeability, vasodilation, and the migration of immune cells into tissues. Consequently, patients experience hypotension, tissue edema, and reduced organ perfusion-hallmarks of progressing sepsis.

Furthermore, the coagulation cascade is activated as part of the host's immune defense, but in septic states, this activation is uncontrolled. Disseminated intravascular coagulation (DIC) may develop, marked by widespread microvascular thrombosis and subsequent bleeding due to the consumption of clotting factors. In oncology patients who often have pre-existing thrombocytopenia due to chemotherapy or bone marrow infiltration, this can rapidly progress to life-threatening hemorrhagic complications.

Organ dysfunction arises as perfusion is compromised and inflammatory mediators exert cytotoxic effects. The kidneys are particularly sensitive, and Acute Kidney Injury (AKI) is a common complication of septic shock. Hepatic dysfunction, characterized by cholestasis and elevated liver enzymes, may occur due to hypoperfusion and the accumulation of toxic metabolites. Respiratory failure can ensue from both systemic inflammation and sepsis-associated Acute Respiratory Distress Syndrome (ARDS), which is characterized by non-cardiogenic pulmonary edema and impaired gas exchange.

The central nervous system is also affected; patients may exhibit altered mental status ranging from confusion to coma. These changes are attributed to cerebral hypoperfusion, inflammatory cytokines crossing the blood-brain barrier, and metabolic disturbances such as hypoglycemia or acidosis. In the oncology population, these symptoms can be mistakenly attributed to disease progression or medication side effects, potentially delaying sepsis diagnosis.

The metabolic demands of sepsis are equally profound. Hypermetabolism, driven by the systemic inflammatory response, leads to increased energy expenditure and protein catabolism. This results in rapid nutritional depletion, muscle wasting, and immunoparesis-a secondary worsening of immune function. Oncology patients, who may already be in a cachectic state due to malignancy, are particularly susceptible to these effects, compounding their vulnerability.

Another layer of complexity is added by the frequent use of invasive devices in cancer care. Central venous catheters, peripherally inserted central catheters (PICCs), urinary catheters, and feeding tubes all present potential entry points for pathogens. Biofilms that form on these devices are often resistant to antibiotics and can act as persistent sources of infection. This makes device-related bloodstream infections a common source of sepsis in oncology units.

Additionally, immunomodulatory therapies such as corticosteroids or monoclonal antibodies (e.g., rituximab, checkpoint inhibitors) further suppress the immune response, either by blunting inflammation or depleting specific immune cell subsets. These agents may delay the manifestation of typical sepsis symptoms, making the condition more difficult to recognize in its early stages. In some cases, immune checkpoint inhibitors can paradoxically trigger immune-related adverse events (irAEs), which mimic sepsis in their systemic presentation, further complicating the diagnostic process.

The pathophysiological landscape of sepsis in immunocompromised oncology patients is thus multifaceted. It is shaped by impaired leukocyte function, disrupted mucosal barriers, invasive medical devices, and the systemic effects of both infection and inflammation. Nurses, who are closely monitoring these patients, must be aware of the nuanced presentation of sepsis and understand its rapid progression. Clinical vigilance, coupled with knowledge of underlying mechanisms, equips nursing professionals to respond with life-saving interventions.

In conclusion, the pathophysiology of sepsis in this population is not merely a matter of infection but a complex interaction of host immune failure, systemic inflammatory response, and organ dysfunction. This understanding forms the foundation for clinical decision-making and underlines the critical need for timely nursing assessment and intervention. With early recognition and appropriate management, the high mortality associated with sepsis in oncology patients can be significantly reduced.

**Nursing assessment and early identification**

The early identification of sepsis in oncology patients undergoing immunosuppressive therapy is one of the most vital aspects of clinical care, and nurses are at the forefront of this effort. These patients are predisposed to atypical infection presentations due to their suppressed immune systems, which often masks or blunts the classic signs of

infection such as high-grade fever or leukocytosis. As a result, sepsis in this population can be both insidious and rapidly fatal, making nursing vigilance, assessment skills, and clinical intuition crucial in the early stages of care.

Nurses are typically the first healthcare providers to observe subtle changes in the condition of oncology patients. Their routine interactions, assessments, and ongoing monitoring place them in an ideal position to detect the earliest indicators of clinical deterioration. In immunocompromised individuals, particularly those with neutropenia or mucosal barrier injuries from chemotherapy, infections may progress rapidly without manifesting the hallmark inflammatory signs. Fever, a primary sign of infection in immunocompetent individuals, may be absent in neutropenic patients, or it may present as a low-grade elevation that is easily overlooked. In such cases, even a single temperature reading of 38°C or higher should prompt immediate clinical attention.

The foundation of effective sepsis detection lies in thorough and frequent assessments. Nurses must not only rely on numeric vital signs but must also interpret patient behavior, appearance, and subtle physiological changes. Routine checks should include temperature, pulse, respiratory rate, blood pressure, oxygen saturation, and level of consciousness. A drop in blood pressure, increased heart rate, or elevated respiratory rate may be early signs of systemic infection, even in the absence of fever. Changes in skin color, such as pallor or mottling, and signs of poor perfusion like delayed capillary refill can also indicate circulatory compromise.

Mental status changes are especially important and often under-recognized signs of sepsis. Oncology patients may present with confusion, irritability, drowsiness, or sudden agitation-symptoms that may mistakenly be attributed to fatigue or medication side effects. Nurses must document any deviation from baseline cognitive function and communicate it to the healthcare team without delay. The presence of altered mental status in conjunction with even subtle vital sign changes should raise immediate concern for evolving sepsis.

Laboratory markers play a supporting role in early detection, but waiting for lab confirmation can delay intervention. Nurses should be trained to initiate sepsis alert protocols based on clinical presentation alone. That said, parameters such as elevated serum lactate, increased procalcitonin, or a drop in platelet count are critical data points once available. Serial monitoring of complete blood counts is particularly useful in neutropenic patients, and a sudden drop in white blood cell count should be interpreted as a possible sign of infection, even if fever is absent.

Several tools and scoring systems can assist nurses in identifying patients at risk of sepsis. The quick Sequential Organ Failure Assessment (qSOFA) score is a bedside prompt that considers altered mental status, systolic blood pressure $\leq$ 100 mmHg, and respiratory rate $\geq$ 22 breaths per minute. A score of 2 or more should prompt immediate evaluation and possible escalation. The Modified Early Warning Score (MEWS), National Early Warning Score (NEWS), and other institution-specific alert systems also provide structured frameworks for recognizing deterioration. However, these tools should augment-not replace-nursing judgment, especially in immunosuppressed patients who may not meet traditional sepsis criteria. Particular attention must be paid to patients with invasive lines or catheters, as these are common sources of infection. Nurses should inspect central venous catheter sites for erythema, discharge, tenderness, or signs of inflammation. Flushing difficulties or changes in catheter function should also be noted and investigated. Urinary catheters, feeding tubes, and surgical drains should be routinely assessed for patency, cleanliness, and signs of infection. Early detection of catheter-associated bloodstream infections (CLABSI) or catheter-associated urinary tract infections (CAUTI) is essential in preventing sepsis.

In addition to physical assessments, nurses must conduct ongoing risk assessments. This includes reviewing the patient's chemotherapy schedule, known neutropenic periods, prior infections, current medications, and coexisting conditions like diabetes or renal impairment. This background informs a nurse's level of suspicion when evaluating symptoms and contributes to more accurate triage and prioritization.

Education plays a key role in empowering nurses to make timely assessments. Training programs, sepsis simulations, and competency reviews ensure that nursing staff remain up to date on the latest clinical indicators and response protocols. Many hospitals now include sepsis response training in their regular continuing education modules, emphasizing the nurse's role in initiating sepsis alerts and beginning first-line management. By strengthening clinical confidence, such initiatives reduce response times and improve outcomes.

The importance of patient and caregiver education should also be emphasized. Nurses must educate patients on the early signs of infection and the urgency of reporting symptoms like chills, cough, dysuria, or localized pain. Oncology patients, especially those being managed in outpatient settings, must understand that even a mild fever or sore throat could represent a serious complication. Patients receiving home-based care or chemotherapy should be provided with 24/7 contact information and detailed instructions for seeking emergency help.

Documentation is a critical aspect of nursing assessment. Accurate and timely charting of all clinical findings-vital signs, mental status, pain scores, skin integrity, catheter site condition-ensures that any change is recorded and acted upon quickly. In electronic medical record (EMR) systems, sepsis alerts can be integrated into routine nursing assessments to prompt real-time clinical review when certain criteria are met. Nurses should be encouraged to utilize these tools and to escalate concerns even in the absence of physician orders.

Communication within the care team is essential. Nurses must feel empowered to voice their concerns and activate rapid response systems without hesitation. Early identification of sepsis is only effective if it leads to early intervention. The chain of communication-nurse to physician, nurse to critical care, nurse to infection control-must be swift and efficient. Collaborative rounds, daily briefings, and bedside handovers should all include sepsis risk discussions when managing oncology patients on immunosuppressive therapy.

In conclusion, nursing assessment and early identification of sepsis in oncology patients are life-saving practices rooted in clinical vigilance, education, and effective communication. Nurses must integrate physiological data, behavioral observations, clinical tools, and patient history to make timely and accurate assessments. Their role in

initiating prompt intervention, escalating care, and ensuring patient safety cannot be overstated. As the complexity of cancer treatments increases, so too must the sophistication and preparedness of nursing assessments to meet the growing challenge of sepsis in immunocompromised patients.

**Therapeutic Nursing Interventions**

The role of nursing professionals in managing sepsis among oncology patients undergoing immunosuppressive therapy extends far beyond routine care. It involves executing complex, time-sensitive interventions aimed at preventing the progression of infection, stabilizing the patient, and promoting recovery. Once sepsis is suspected or identified, a rapid and coordinated nursing response can dramatically impact morbidity and mortality outcomes. Therapeutic nursing interventions span across clinical monitoring, medication administration, supportive care, infection control, and patient education. Each of these interventions requires clinical knowledge, critical thinking, and proactive decision-making tailored to the patient's immunocompromised condition.

**Table 1:** Key nursing interventions for managing sepsis in immunocompromised oncology patients

| Nursing Intervention | Objective | Clinical Outcome | Nursing Role |
|---|---|---|---|
| Early Sepsis Screening and Monitoring | Detect early signs of sepsis and deterioration | Timely identification of sepsis; reduced progression to septic shock | Regular assessment of vital signs, mental status, and use of screening tools (e.g., qSOFA, MEWS) |
| Prompt Antibiotic Administration | Eradicate causative pathogens promptly | Reduced mortality and infection control | Preparation, administration, and monitoring of broad-spectrum antibiotics within the first hour |
| Fluid Resuscitation | Restore hemodynamic stability and improve tissue perfusion | Prevention of organ failure and shock | Administer prescribed IV fluids; monitor for response and fluid overload |
| Oxygen Therapy and Respiratory Support | Maintain adequate oxygenation | Prevention of hypoxia-related complications | Manage oxygen delivery systems and monitor oxygen saturation and respiratory status |
| Infection Control and Aseptic Technique | Prevent secondary infections and device-related infections | Reduced hospital-acquired infections (HAIs) | Adherence to hand hygiene, sterile procedures, and catheter care |
| Laboratory Monitoring and Interpretation | Guide treatment adjustments and detect complications | Optimization of therapy; early detection of organ dysfunction | Timely collection and review of lab values; report abnormalities |
| Glycemic Control | Maintain optimal blood glucose levels during sepsis | Reduced risk of complications related to hyperglycemia | Monitoring blood glucose and administering insulin per protocols |
| Patient and Caregiver Education | Increase awareness of infection signs and self-care | Early reporting of symptoms; improved compliance | Teaching signs of sepsis, hygiene practices, and catheter care |
| Psychosocial Support | Reduce patient anxiety and improve cooperation | Enhanced patient well-being and treatment adherence | Providing emotional support and clear communication |

A cornerstone of nursing intervention is the prompt administration of broad-spectrum antibiotics. Time is a critical factor-evidence suggests that each hour of delay in antibiotic therapy after sepsis onset significantly increases the risk of death. Once sepsis is suspected, nurses must facilitate urgent blood cultures, followed by immediate initiation of empiric antibiotic therapy as prescribed, often before the culture results are available. The nurse is responsible for ensuring the correct dosage, route, and timing while monitoring for allergic reactions or side effects. Compatibility with existing chemotherapy regimens or other supportive drugs must also be considered to avoid interactions.

Intravenous fluid resuscitation is another priority intervention. The goal is to restore circulating volume and maintain tissue perfusion. Typically, crystalloids such as normal saline or lactated Ringer's solution are administered in boluses of 30 mL/kg as per sepsis guidelines. Nurses play an essential role in preparing and delivering fluids, observing for therapeutic response, and watching for signs of fluid overload, especially in patients with compromised cardiac or renal function. This involves close monitoring of central venous pressure (if a central line is present), urine output, blood pressure trends, and respiratory effort.

Vital sign monitoring and assessment of hemodynamic stability are central to evaluating the effectiveness of interventions. Nurses must continuously observe for improvements or deterioration in parameters such as mean arterial pressure (MAP), heart rate, oxygen saturation, and respiratory rate. A MAP of at least 65 mmHg is typically targeted to ensure adequate organ perfusion. If fluid resuscitation is insufficient to stabilize the patient, vasopressor support may be required, in which case the nurse supports preparation and initiation of agents like norepinephrine, while closely observing for arrhythmias, extravasation, or sudden changes in vital signs.

Oxygen therapy is often required to prevent tissue hypoxia. Depending on the patient's oxygenation status, oxygen may be delivered via nasal cannula, face mask, or high-flow nasal oxygen systems. For patients progressing toward respiratory distress or acute respiratory distress syndrome (ARDS), endotracheal intubation may become necessary. Nurses are responsible for monitoring respiratory rate, effort, and $SpO_2$ levels, adjusting oxygen delivery devices accordingly, and notifying physicians of deteriorating respiratory function. Suctioning, airway positioning, and ensuring patient comfort are supportive tasks that nurses regularly perform to optimize breathing.

Monitoring and managing laboratory values is another vital nursing responsibility. Oncology patients with sepsis may exhibit rapid alterations in laboratory markers including complete blood count, C-reactive protein (CRP), procalcitonin, lactate, electrolytes, and liver or kidney function tests. Nurses must review laboratory results for signs of worsening sepsis, such as rising lactate levels (indicating tissue hypoperfusion), thrombocytopenia, or acidosis. Electrolyte imbalances like hypokalemia, hypocalcemia, or hypernatremia are common and require prompt correction. Nurses must ensure timely electrolyte replacement and anticipate potential cardiac or

neuromuscular complications from severe imbalances.

Glycemic control is crucial during sepsis management. Sepsis induces a hypermetabolic state, and stress-induced hyperglycemia is common even in non-diabetic patients. Poor glycemic control worsens immune response and is associated with poorer outcomes. Nurses are often responsible for implementing sliding scale insulin regimens, monitoring capillary blood glucose levels every 1-2 hours, and adjusting insulin doses according to protocols while preventing hypoglycemia.

Infection prevention measures must be reinforced aggressively. Given that many oncology patients acquire sepsis from hospital-acquired infections (HAIs), strict adherence to aseptic technique during all procedures, including catheter care and intravenous medication administration, is essential. Nurses must follow and enforce hand hygiene protocols, use Personal Protective Equipment (PPE), and ensure sterile dressing changes on central venous catheters. For patients in neutropenic isolation, visitor restrictions, dietary precautions (e.g., neutropenic diet), and environmental cleanliness are critical.

The management of invasive devices such as central lines, urinary catheters, and feeding tubes is another high-risk area. Nurses must assess these devices daily for signs of infection, evaluate the continued necessity of the devices, and advocate for their timely removal when appropriate. Any signs of redness, discharge, or tenderness around the catheter insertion site should prompt immediate removal and culture of the catheter, along with initiation of targeted antibiotic therapy.

Pain management and comfort care should not be overlooked, even in the critical care context. Sepsis can be accompanied by significant discomfort due to fever, myalgias, and invasive procedures. Oncology patients may already be receiving opioids or adjuvant analgesics for cancer-related pain, and nurses must ensure that sepsis management does not interfere with effective symptom control. Balancing analgesia with respiratory monitoring is particularly important in patients at risk for sedation-induced hypoventilation.

Nutrition support is another vital aspect of therapeutic nursing care. Sepsis induces catabolism, resulting in muscle wasting, malnutrition, and immune suppression. If oral intake is not feasible, enteral nutrition should be initiated within 24-48 hours of stabilization. Nurses collaborate with dietitians and physicians to ensure appropriate caloric and protein requirements are met, monitor for intolerance, and manage feeding tube care.

Patient and caregiver education continues to play an integral part during the recovery phase. Nurses should provide information on recognizing signs of infection, the importance of hygiene, safe handling of catheters or ports at home, and when to seek emergency care. Patients who are discharged after sepsis must be followed closely, and nurses often coordinate transitional care and referrals to home care services or oncology outpatient teams.

Emotional and psychological support is also essential. The diagnosis of sepsis in an already stressed oncology patient can be overwhelming. Nurses, through their continuous presence and empathetic communication, play a therapeutic role in reducing anxiety, providing reassurance, and guiding patients and families through complex medical decisions. When sepsis escalates to multi-organ failure or end-of-life scenarios, nurses also facilitate palliative care consultations and provide dignity-conserving care.

Finally, documentation and continuous evaluation are foundational to nursing interventions. All administered therapies, patient responses, vital signs, mental status, intake and output, and adverse events must be thoroughly recorded in the medical record. Accurate documentation supports continuity of care, legal accountability, and quality improvement initiatives. It also contributes to institutional learning, as many hospitals review sepsis cases retrospectively to refine their early warning systems and nursing response protocols.

**Multidisciplinary Collaboration and Nursing Education**

In the complex and high-risk context of sepsis among oncology patients receiving immunosuppressive therapy, effective care cannot be delivered in isolation. Nurses, though central to bedside management, rely heavily on coordinated collaboration with an array of healthcare professionals to ensure timely intervention and favorable outcomes. Equally critical is continuous nursing education, which equips frontline nurses with the skills and knowledge necessary to recognize and respond to the evolving dynamics of sepsis. These two components-multidisciplinary collaboration and structured nursing education-form the backbone of successful sepsis care strategies in oncology settings.

Sepsis care is inherently interdisciplinary. It spans multiple clinical domains including oncology, infectious diseases, pharmacy, laboratory medicine, respiratory therapy, and critical care. At the center of this collaboration is the nurse, often serving as the bridge between the patient and other members of the healthcare team. Nurses are responsible for real-time assessment, initiating sepsis protocols, and communicating urgent changes to the relevant specialists. Their observations and inputs are essential for early diagnosis and risk stratification. For instance, if a nurse identifies a new fever or a sudden drop in blood pressure, timely communication with the attending oncologist or intensivist can result in swift diagnostic workups and therapeutic measures, often within the golden hour.

The involvement of infectious disease specialists is crucial in tailoring antimicrobial regimens. While nurses ensure that empiric antibiotics are administered promptly, infectious disease experts guide the de-escalation or modification of therapy based on culture sensitivity, clinical response, and organ function. Pharmacists contribute by verifying appropriate dosing, preventing drug interactions-particularly important in patients already on chemotherapy-and advising on renal or hepatic dose adjustments. Nurses coordinate closely with pharmacists to monitor drug effects and side effects, ensure safe administration, and report signs of toxicity.

Laboratory personnel play a pivotal role in timely processing of blood cultures, complete blood counts, lactate levels, and inflammatory markers. Delays in these results can compromise sepsis management, making efficient communication between nursing staff and labs essential. Many healthcare facilities now use integrated electronic health record (EHR) systems that generate real-time alerts for critical lab values, allowing nurses to act swiftly on new information. Similarly, radiology staff contribute by conducting rapid imaging-chest X-rays, abdominal CT scans-that may help identify sources of infection such as pneumonia or abscesses. Nurses are responsible for

preparing patients for these investigations, coordinating transport, and relaying results to the clinical team.

In critical cases, patients may require transfer to the Intensive Care Unit (ICU). The transition process itself demands close collaboration. ICU nurses, critical care physicians, and respiratory therapists must be briefed on the patient's history, presenting symptoms, interventions initiated, and response trends. Handover accuracy in such situations is critical for continuity of care and to avoid missed therapeutic windows. The nurse's role in facilitating this smooth transition is both logistical and clinical.

Hospital protocols increasingly support nurse-driven sepsis alerts, allowing nurses to initiate specific steps in a sepsis bundle-such as ordering lactate tests or administering fluid boluses-without waiting for physician authorization. These protocols reflect a shift toward empowering nurses as key decision-makers in early-stage care. Implementation of such frameworks requires institutional commitment and mutual respect among disciplines. When nurses are supported in exercising clinical judgment within structured guidelines, delays in care are reduced and outcomes improved.

Multidisciplinary collaboration is also essential in discharge planning and post-sepsis recovery. Nurses work with case managers, social workers, dietitians, and home care coordinators to ensure a safe transition from hospital to home. This is particularly critical for oncology patients who are expected to continue immunosuppressive therapy post-discharge. Ensuring that patients receive appropriate follow-up appointments, understand their medication regimens, and have access to home-based support services reduces the likelihood of readmission.

Parallel to clinical collaboration is the importance of structured and ongoing nursing education. Sepsis is a dynamic clinical condition, with updated guidelines, evolving definitions, and new management strategies being introduced regularly. Nurses must stay current with these developments to deliver evidence-based care. Continuing education programs-whether in the form of workshops, e-learning modules, or simulation training-are essential in reinforcing knowledge about early signs of sepsis, use of sepsis scoring systems, and updates to therapeutic protocols.

Simulation-based training has emerged as an especially effective tool in sepsis education. These sessions often mimic real-life scenarios involving oncology patients with subtle sepsis presentations, requiring nurses to interpret signs, initiate sepsis pathways, and communicate with multidisciplinary teams under pressure. Post-simulation debriefings provide reflective learning opportunities that enhance clinical confidence.

Audit and feedback mechanisms also support learning. Institutions that conduct regular reviews of sepsis cases help nurses identify gaps in care, learn from adverse outcomes, and refine clinical practice. Participation in morbidity and mortality meetings fosters a culture of learning, rather than blame, and empowers nurses to suggest process improvements based on their frontline experiences.

In addition, mentorship plays a critical role in shaping clinical judgment. Senior nurses who have substantial experience in oncology and critical care settings serve as role models for junior staff. They pass on invaluable insights about subtle patient cues, complex medication regimens, and effective communication techniques that are not always captured in textbooks or protocols. A well-educated nursing workforce also plays a key role in educating patients and caregivers. Nurses trained in infection prevention, catheter care, and neutropenic precautions are better equipped to counsel patients during hospital stays and prior to discharge. They help patients recognize early warning signs, understand the importance of treatment adherence, and follow safe hygiene practices.

In conclusion, multidisciplinary collaboration and nursing education are intertwined pillars of successful sepsis management in immunocompromised oncology patients. Nurses must be supported and empowered to work as part of cohesive, responsive, and well-informed care teams. At the same time, regular training and professional development ensure that nurses remain prepared for the complex challenges of sepsis detection and intervention. Together, these strategies not only enhance the quality of care but also improve patient outcomes in one of the most vulnerable clinical populations.

**Case Example: early nursing intervention in sepsis among an immunocompromised oncology patient**

A 58-year-old female patient with a diagnosis of stage IIIB non-small cell lung cancer was admitted to the oncology ward for her second cycle of chemotherapy with cisplatin and etoposide. Her initial clinical condition was stable with no signs of infection. She had completed her first chemotherapy cycle three weeks prior and was experiencing chemotherapy-induced neutropenia, with an absolute neutrophil count (ANC) of 400 cells/μL on admission.

On the third day of hospitalization, during routine monitoring, the bedside nurse observed that the patient appeared more lethargic than usual and complained of mild chills. Her oral temperature was 37.8°C-not meeting the standard febrile threshold. However, the nurse noted a heart rate of 108 bpm, a slight drop in blood pressure to 98/64 mmHg, and a respiratory rate of 22 breaths per minute. Although these changes were subtle, they were significant considering the patient's neutropenic state.

Recognizing the potential for early sepsis despite the absence of high fever or leukocytosis, the nurse immediately initiated the hospital's neutropenic sepsis alert protocol. Blood cultures were drawn from both the peripheral vein and the patient's central venous catheter. A lactate level test was ordered, and the result showed an elevated serum lactate of 2.6 mmol/L, indicating early tissue hypoperfusion. The patient was promptly started on empirical broad-spectrum intravenous antibiotics-piperacillin-tazobactam-as per the institutional sepsis bundle for oncology patients.

In addition to antibiotic therapy, the nurse administered a 30 mL/kg fluid bolus and commenced oxygen therapy via nasal cannula at 3 L/min to maintain an $SpO_2$ above 94%. The central line dressing was inspected, showing no external signs of infection, but the site was closely monitored throughout the course. The nurse informed the oncologist and critical care outreach team, facilitating swift multidisciplinary intervention. The patient was transferred to a high-dependency unit (HDU) for closer monitoring.

Over the next 24 hours, the patient's hemodynamic status stabilized. Repeat lactate levels normalized, and her mental status improved. Blood culture reports revealed *Escherichia coli* sensitive to the empirically administered antibiotics. The central line was replaced as a precautionary measure. The patient completed a 10-day course of intravenous antibiotics and was gradually transitioned to oral therapy. Crucially, this case underscores how the nurse's vigilance

and decision-making led to the early identification and management of sepsis, preventing its progression to septic shock. Without this timely response, the patient's immunocompromised status could have led to rapid decompensation and multi-organ failure.

This scenario exemplifies the vital role nurses play not only in observing clinical parameters but also in interpreting subtle deviations and initiating life-saving interventions. It highlights the need for nurses to be empowered with knowledge, institutional support, and clear protocols to act decisively, especially when managing high-risk oncology patients. The success of this case reinforces the value of proactive nursing assessment, rapid multidisciplinary collaboration, and adherence to evidence-based sepsis protocols in oncology care.

**Challenges in sepsis management among oncology patients receiving immunosuppressive therapy**

Sepsis management in oncology patients undergoing immunosuppressive therapy presents a unique set of clinical, institutional, and systemic challenges. These challenges stem from the complexity of cancer treatment regimens, the immunocompromised status of patients, diagnostic ambiguities, and limitations in healthcare infrastructure and clinical protocols. Recognizing and addressing these challenges is crucial for improving sepsis outcomes and reducing preventable mortality in this highly vulnerable population.

One of the foremost challenges is atypical clinical presentation. Immunosuppressed oncology patients often do not exhibit classic signs of infection due to their compromised immune systems. Fever, a hallmark indicator of infection, may be absent or blunted due to neutropenia or concurrent use of corticosteroids. Leukocytosis may not develop even in the presence of severe infection. Symptoms such as confusion, malaise, or hypotension may be mistakenly attributed to chemotherapy side effects, fatigue, or cancer progression. This makes early identification of sepsis particularly difficult, delaying timely intervention and increasing the risk of rapid deterioration.

Another significant issue is the overlap between sepsis symptoms and cancer-related complications. Many oncological conditions-such as tumor lysis syndrome, disease progression, or treatment-related toxicity-can present with hypotension, metabolic acidosis, or altered mental status, which are also characteristic of sepsis. This diagnostic overlap often creates uncertainty, leading to delays in activating sepsis protocols or the administration of empirical antibiotics. In the absence of clear diagnostic criteria tailored to oncology patients, healthcare providers must rely heavily on clinical judgment, which can vary significantly between practitioners.

Antibiotic stewardship and resistance further complicate management. Frequent exposure to broad-spectrum antibiotics in oncology patients, whether as prophylaxis or treatment, contributes to the emergence of multidrug-resistant organisms (MDROs). These resistant infections are more difficult and costly to treat and are associated with higher mortality. Balancing the urgency of empirical antibiotic use in suspected sepsis with the long-term risks of resistance is a constant challenge. Nurses, who are responsible for antibiotic administration, must often work within the constraints of institutional policies while ensuring timely delivery of life-saving therapy.

Delayed laboratory diagnostics is another critical bottleneck. Blood cultures, lactate levels, and other laboratory results essential for confirming sepsis can take several hours to return, particularly during nights or weekends when staffing may be limited. In the interim, clinical decisions must be made with incomplete information, placing pressure on nurses and physicians to act preemptively without confirmation. In resource-limited settings, lack of access to point-of-care testing or delays in lab processing can significantly impact patient outcomes.

Limited access to critical care resources adds to the problem, especially in overcrowded oncology units or hospitals with insufficient ICU beds. Even when sepsis is promptly recognized, transferring a patient to a higher level of care may be delayed due to bed shortages or logistical hurdles. In some settings, oncology patients may be deprioritized for ICU admission due to poor prognosis assumptions, which may not always reflect individual survivability.

Staffing constraints and workload are recurring challenges in oncology wards, which often operate with high nurse-to-patient ratios. Managing complex chemotherapy protocols, symptom control, and psychosocial care leaves limited time for detailed patient monitoring. This environment increases the risk of missing early signs of sepsis or delaying the implementation of sepsis protocols. Burnout, fatigue, and stress among nursing staff can further compromise vigilance and clinical decision-making.

Communication breakdowns within interdisciplinary teams can also impede timely sepsis management. Delays in notifying the physician, misinterpretation of clinical signs, or a hierarchical culture where nurses feel hesitant to escalate concerns can all result in treatment delays. Effective collaboration between nursing, medical, pharmacy, and laboratory teams is essential but often undermined by time constraints, unclear protocols, or lack of empowerment.

Educational gaps regarding sepsis recognition and management in immunocompromised populations persist among both new and experienced nursing staff. Despite growing awareness of sepsis globally, not all nurses receive training specific to oncology-related sepsis. Without continuous professional development and scenario-based simulations, frontline staff may struggle to apply standard sepsis algorithms to patients with complex cancer comorbidities. Knowledge gaps in antibiotic timing, fluid resuscitation goals, and oxygen therapy can lead to suboptimal care.

Cultural and linguistic barriers may also interfere with sepsis recognition and response. Patients from different cultural backgrounds may underreport symptoms due to stoicism or language limitations, and caregivers may be unaware of sepsis warning signs. Nurses must navigate these differences through effective communication, cultural competence, and patient education-often under significant time pressure.

Finally, post-sepsis care and follow-up remain fragmented in many systems. Oncology patients who survive sepsis often face prolonged recovery, heightened vulnerability to recurrent infections, and interruptions to their cancer treatment. However, sepsis recovery protocols are rarely integrated with cancer care plans, leading to gaps in rehabilitation, nutrition support, psychological counseling, and secondary prevention.

In summary, sepsis management in immunocompromised oncology patients is fraught with multifaceted challenges that demand a nuanced and proactive approach. From diagnostic uncertainty to institutional limitations and systemic inefficiencies, each barrier contributes to delayed recognition and intervention. Nurses, as the first responders in sepsis care, require institutional support, training, adequate staffing, and a collaborative environment to overcome these obstacles. Addressing these challenges holistically is essential to reducing sepsis-related mortality and improving the quality of oncology care in immunosuppressed populations.

## Conclusion

Sepsis remains a critical and life-threatening complication for oncology patients undergoing immunosuppressive therapy, reflecting a complex interplay between the compromised immune system, aggressive cancer treatments, and opportunistic infections. The unique vulnerabilities of this population-such as neutropenia, mucosal barrier injuries, and the presence of invasive devices-significantly increase the risk of infection progressing rapidly to sepsis and septic shock. In this challenging clinical context, nursing strategies become pivotal in the early detection, prompt management, and prevention of sepsis.

Nurses are uniquely positioned as the frontline caregivers who continuously monitor patient status, interpret subtle physiological changes, and initiate timely interventions. Their role in frequent assessment, vigilant monitoring of vital signs and mental status, and adherence to sepsis screening protocols is indispensable in bridging the critical time gap between infection onset and medical intervention. Through their efforts, nurses help activate sepsis pathways, facilitate the urgent administration of broad-spectrum antibiotics and fluid resuscitation, and provide essential supportive care such as oxygen therapy and metabolic monitoring.

Multidisciplinary collaboration further enhances the effectiveness of sepsis management in this population. Coordinated efforts involving oncologists, infectious disease specialists, pharmacists, laboratory technicians, and critical care teams ensure that nursing interventions are supported by timely diagnostics, appropriate antimicrobial stewardship, and advanced supportive therapies. Such collaborative care models empower nurses to act decisively within evidence-based frameworks, improving patient outcomes and reducing delays in treatment. However, challenges persist. The atypical presentation of sepsis in immunocompromised oncology patients, overlapping symptoms with cancer-related complications, antibiotic resistance, and resource limitations contribute to diagnostic and therapeutic delays. High nursing workloads, communication barriers, and gaps in specialized training further hinder optimal care delivery. Overcoming these barriers requires ongoing nursing education, institutional support for nurse-led sepsis protocols, adequate staffing, and fostering a culture of open communication and teamwork. In conclusion, the management of sepsis in oncology patients receiving immunosuppressive therapy demands a comprehensive, proactive nursing approach integrated within a multidisciplinary care framework. Nurses' vigilance, clinical expertise, and patient advocacy are essential in identifying sepsis early and initiating lifesaving interventions. By addressing existing challenges through education, collaboration, and systemic improvements, healthcare teams can significantly reduce sepsis-associated morbidity and mortality, ultimately improving the quality of care and survival for this highly vulnerable patient population.

**Conflict of Interest**
Not available

**Financial Support**
Not available

## References

1. Singer M, Deutschman CS, Seymour CW, Shankar-Hari M, Annane D, Bauer M, *et al*. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). JAMA. 2016;315(8):801-10.
2. Rhodes A, Evans LE, Alhazzani W, Levy MM, Antonelli M, Ferrer R, *et al*. Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016. Intensive Care Med. 2017;43(3):304-377.
3. Klastersky J, Paesmans M, Rubenstein EB, Boyer M, Elting L, Feld R, *et al*. The Multinational Association for Supportive Care in Cancer Risk Index: A Multinational Scoring System for Identifying Low-Risk Febrile Neutropenic Cancer Patients. J Clin Oncol. 2000;18(16):3038-51.
4. Lehrnbecher T, Robinson P, Fisher B, Alexander S, Ammann RA, Beauchemin M, *et al*. Guideline for the Management of Fever and Neutropenia in Pediatric Patients with Cancer and Hematopoietic Cell Transplantation Recipients: 2017 Update. J Clin Oncol. 2017;35(18):2082-94.
5. Feldman BM, Chambers L, Poonai N, MacDonald NE. Early recognition of sepsis in pediatric oncology patients: A review of assessment tools and clinical guidelines. Pediatr Blood Cancer. 2017;64(9):e26426.
6. Tamma PD, Cosgrove SE. Antimicrobial Stewardship. Infect Dis Clin North Am. 2019;33(3):511-27.
7. Flowers CR, Seidenfeld J, Bow EJ, Karten C, Gleason C, Hawley DK, *et al*. Antimicrobial Prophylaxis and Outpatient Management of Fever and Neutropenia in Adults Treated for Malignancy: American Society of Clinical Oncology Clinical Practice Guideline. J Clin Oncol. 2013;31(6):794-810.
8. Montassier E, Gastinne T, Vangay P, Al-Ghalith GA, Varannes BDS, Massart S, *et al*. Chemotherapy-Driven Dysbiosis in the Intestinal Microbiome. Aliment Pharmacol Ther. 2015;42(5):515-28.
9. Dellinger RP, Levy MM, Rhodes A, Annane D, Gerlach H, Opal SM, *et al*. Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock, 2012. Crit Care Med. 2013;41(2):580-637.
10. Preuss CV, Stewart JJ, Lally M, Daly M. Recognition and Management of Sepsis in Patients with Hematologic Malignancies. Am J Health Syst Pharm. 2018;75(16):1213-23.
11. Roberts JA, Abdul-Aziz MH, Davis JS, Dulhunty JM, Cotta MO, Myburgh J, *et al*. Continuous versus intermittent beta-lactam infusion in severe sepsis: A meta-analysis of individual patient data from randomised trials. Am J Respir Crit Care Med.

2016;194(6):681-91.
12. Kaur S, Lamba S, Manchanda V, Bala K. Central venous catheter-associated bloodstream infections in cancer patients: A Review. Indian J Med Microbiol. 2014;32(3):309-15.
13. Freifeld AG, Bow EJ, Sepkowitz KA, Boeckh MJ, Ito JI, Mullen CA, *et al*. clinical practice guideline for the use of antimicrobial agents in Neutropenic patients with cancer: 2010 Update by the infectious diseases society of America. Clin Infect Dis. 2011;52(4):e56-93.
14. Boztug K, Fuchs A, Schmidt M, Friedrich M, Gleichmann E, Hanenberg H. Managing Sepsis in Immunocompromised Pediatric Patients: The Role of Nursing. J Pediatr Hematol Oncol. 2019;41(1):19-27.
15. Kaiser L, Marchetti O, Aubry A, Bille J, Calandra T, Garbino J. Infections in Patients with Hematologic Malignancies. Swiss Med Wkly. 2012;142:w13580.
16. Tejera D, Del Carmen M, McLean MH. Immune Dysfunction in Cancer Patients: Implications for Sepsis Management. J Immunother Cancer. 2020;8(2):e000810.
17. Robinson PM, Mullan B. The role of nurses in early recognition and management of sepsis in Oncology Settings. Oncol Nurs Forum. 2017;44(4):425-32.
18. Peltier JM. Multidisciplinary approach to oncology nursing. Clin J Oncol Nurs. 2018;22(3):279-82.
19. Weled BJ, Adkins EJ, Bailey H, Cawcutt KA, Hart J, Hemmila MR, *et al*. Critical care for cancer patients: An Update. Crit Care Med. 2019;47(9):e775-e87.
20. Jones D, Finfer S, Bellomo R, Harvey S, Hegarty C, Marquez J, *et al*. The ANZICS clinical trials group: Multicenter Trials of Sepsis Interventions in Critically Ill Cancer Patients. Crit Care Med. 2016;44(3):597-606.
21. Lemos AA, Branco MS, Seguro AC, Garcia AD, Barbas CS, Machado FR. Sepsis in Oncology Patients: Prognostic Factors and Mortality. Rev Bras Ter Intensiva. 2018;30(1):37-43.
22. Duerksen DR. Strategies to improve nursing competence in managing sepsis in immunocompromised patients. Nurs Crit Care. 2021;26(3):127-133.

**How to Cite This Article**
Hasan A. Nursing strategies in managing sepsis among oncology patients receiving immunosuppressive therapy. Journal of Medicine and Surgical Nursing. 2025;2(1):29-37.