

Theory-Guided Nursing Care of a patient Undergoing Above-Knee Amputation for Dry Gangrene Associated with Newly Diagnosed Diabetes and Severe Anaemia: A Case Report from Sierra Leone

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Abstract

Introduction: Diabetic foot complications remain a major cause of lower-limb amputation in resource-constrained settings. This case demonstrates the contribution of theory-guided nursing care to perioperative management of a patient.

Case: A 64-year-old woman presented with a non-healing left-leg ulcer following a domestic burn, complicated by gangrene, infection, severe anaemia (Hb 4.3 g/dL), hyperglycaemia (7.2 mmol/L), and severe wasting. Nursing assessment identified impaired tissue integrity, reduced activity tolerance, inadequate nutritional intake, pain, and risk of infection.

Guided by Roy's Adaptation Model, Neuman's Systems Model, Kolcaba's Comfort Theory, and Orem's Self-Care Deficit Theory, the nursing interventions prioritised stabilisation, wound surveillance, transfusion support, nutrition, pain management, infection prevention, mobilisation, psychosocial support, and discharge education. Following above-knee amputation, the stump remained clean and dry, pain was controlled, and rehabilitation was initiated.

Conclusion: Theory-guided nursing processes can organise perioperative care and support recovery despite resource limitations.

Keywords: Above-Knee Amputation; Case Report; Diabetic Foot Ulcer; Dry Gangrene; Perioperative Nursing Care; Resource Constraint Setting; Sierra Leone.

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INTRODUCTION

Background

Diabetic foot ulceration is the most common precursor to lower-extremity amputation in patients with diabetes mellitus, particularly in low- and middle-income countries where access to podiatry, vascular surgery, and structured diabetes care is limited (El-Shaibany et al, 2026; IDF, 2025).

In sub-Saharan Africa, patients often present late with advanced complications, including gangrene necessitating major limb amputation (Abbas, 2020).³ Severe anaemia and malnutrition significantly increase perioperative risk (He et al., 2025; Marsicano et al., 2018), yet emergency surgery cannot always be deferred in established infected dry gangrene. In such contexts, nursing care becomes the cornerstone of patient stabilisation, surgical preparation, and post-operative recovery (Schaper et al., 2024).

The complexity of caring for such patients extends beyond the surgical procedure itself, as nurses must simultaneously respond to physiological instability, nutritional deficits, pain, altered body image, functional limitations, self-care needs, and the psychosocial consequences of major limb loss. In resource-constrained settings, these demands may be further intensified by limited diagnostic and therapeutic resources and restricted access to specialised perioperative services.

A theory-guided nursing approach can provide a coherent framework for identifying interacting patient needs, prioritising nursing interventions, coordinating care across the perioperative trajectory, and supporting adaptation and recovery despite such constraints. However, there remains limited published case-based evidence demonstrating how theory-guided nursing care can be operationalised in the management of patients undergoing major amputation with multiple coexisting vulnerabilities in resource-limited African surgical settings.

Although individual nursing theories have been applied to specific aspect of patient care, there is limited case-based evidence from Sierra Leone and perhaps comparable resource-constraint African surgical settings showing how multiple complementary nursing theories can be deliberately integrated within a single perioperative episode of care. The novelty of this case report therefore lies in demonstrating how four established theoretical perspective can be differentiative and operationalised within one patient case and how these theoretical views were translated through the nursing process in a setting where advanced diagnostic and specialist resources are limited.

This case report is in accordance with CARE guidelines (Riley et al., 2017) for case reports and describes the perioperative nursing management of a patient with dry gangrene, newly diagnosed diabetes, severe anaemia, and malnutrition who underwent above-knee amputation in a resource-limited surgical ward, highlighting nursing interventions that supported a positive outcome.

This case report aims to describe how theory-guided nursing care was applied across the perioperative period and to illustrate how coherent nursing assessment and interventions can contribute to positive patient outcomes despite limited resources and the absence of advanced or sophisticated technology.

Theoretical Framework

This case study is guided by an integrative theoretical framework in which four nursing theories for distinct but complementary purposes of the same clinical problem were applied. These theories included: Roy's Adaptation Model (RAM) as the primary grand theory, complemented by Neuman's Systems Model, Kolcaba's Theory of Comfort, and Orem's Self-Care Deficit Nursing Theory (SCDNT).

Roy's Adaptation Model (RAM) provided the overarching organising perspective for the patient's response to illness, major limb loss and changing functional circumstances. Roy conceptualises the patient as a bio-psycho-social system that responds to stimuli through four adaptive modes namely: physiologic, self-concept, role function, and interdependence (Roy, 2011; 1974). In this case, the physiologic mode was applied to the patient's gangrenous limb, newly diagnosed diabetes, severe anaemia, nutritional depletion, infection related wound changes and surgical recovery from above-knee amputation. The self-concept mode informed psychological preparation for limb loss, disturbance and emotional distress following new chronic diagnosis and the need to support adjustment to altered body-image. The role function mode directed attention altered mobility, activities of daily living (ADLs) and changing family responsibilities; while the interdependence mode examines the patient- family-caregiver relationship within a resource-limited ward where family support substitutes for scarce nursing staff (Alligood, 2013). Thus, RAM was used to organise the patient's adaptive responses across the perioperative period.

Neuman and Fawcett systems model (Neuman& Fawcett 2011) served a different function by organising nursing care around stressors and the prevention or limitation of resource constrained surgical ward. Ambushe and colleagues (Ambushe, et al., 2023) extended this organisation through three levels of prevention namely; primary, secondary and tertiary prevention. Primary prevention was reflected in measures intended to reduce or strengthen resistance to anticipated stressors including nutrition support, anaemia correction, and preoperative diabetes education and patient preparation before surgery; secondary prevention encompasses intraoperative and immediate postoperative nursing observation and care including wound surveillance, pain control, wound care, and haemodynamic monitoring to prevent further system breakdown. Tertiary prevention supports postoperative reconstitution through rehabilitation, discharges preparations and self-management education to support recovery and reduce subsequent complications.

Kolcaba's theory of comfort was applied specifically to the patient's immediate nursing interventions as measurable comfort outcomes across physical, psychospiritual, environmental, and sociocultural contexts, ensuring perioperative care transcends biomedical reductionism. Physical comfort was addressed through positioning, stump elevation, wound care and pain management; psychospiritual comfort was addressed through explanation and reassurance and psychological preparation for amputation from grief and fear; environmental comfort was addressed through organisation of care in the resource limited surgical ward; and sociocultural comfort respected beliefs about amputation. Through family involvement and patient's social circumstances.

Finally, Orem Self Care Deficit Theory (Orem, 2001) addresses the patient ability to participate in activities required for recovery and longer-term self-management. self-care deficits through a partially compensatory system during acute recovery, transitioning to a supportive-educative system for lifelong diabetes management and prosthesis adaptation. During the acute perioperative period, nursing assistance was required for wound care, mobility, medication

administration and other activities that exceeded the patient's immediate self-care capacity. As the patient's condition stabilised, nursing care shifted towards a supportive-educative approach through education on diabetes management, stump hygiene, protection of the remaining limb, medication adherence and follow-up. Orem's therefore provided the framework for understanding the movement from dependence on nursing assistance towards greater patient and family participation in self-care (Yip, 2021). This is consistent with Esmailzadeh's study on Nursing care of an elderly woman with type II diabetes according to Orem's self-care deficit theory (Esmailzadeh, 2024)

The integrated theoretical framework (Fig. 1) of the four perspectives was applied at different points across the perioperative period and in the nursing process. For example, severe anaemia and impaired mobility were interpreted through RAM as physiological adaptation problems, and through Newman as threats to system stability, addressed through transfusion monitoring and activity management, and evaluated through changes in physiological observations and mobilisation. Post operative pain was addressed through Kolcaba's comfort perspective and evaluated only to the extent that pain response was documented. Education on wound care, medication adherence and protection of the remaining limb was informed by Orem's self-care perspective and evaluated through documented patient and family participation in education.

Gordon's Functional Health Pattern organised the assessment data but was not considered part of the theoretical framework. The nursing process provided the operational link between these perspectives by connecting assessment findings to nursing problems, interventions and documented outcomes. This integration demonstrates how theory-guided nursing produced a positive outcome despite resource constraints.

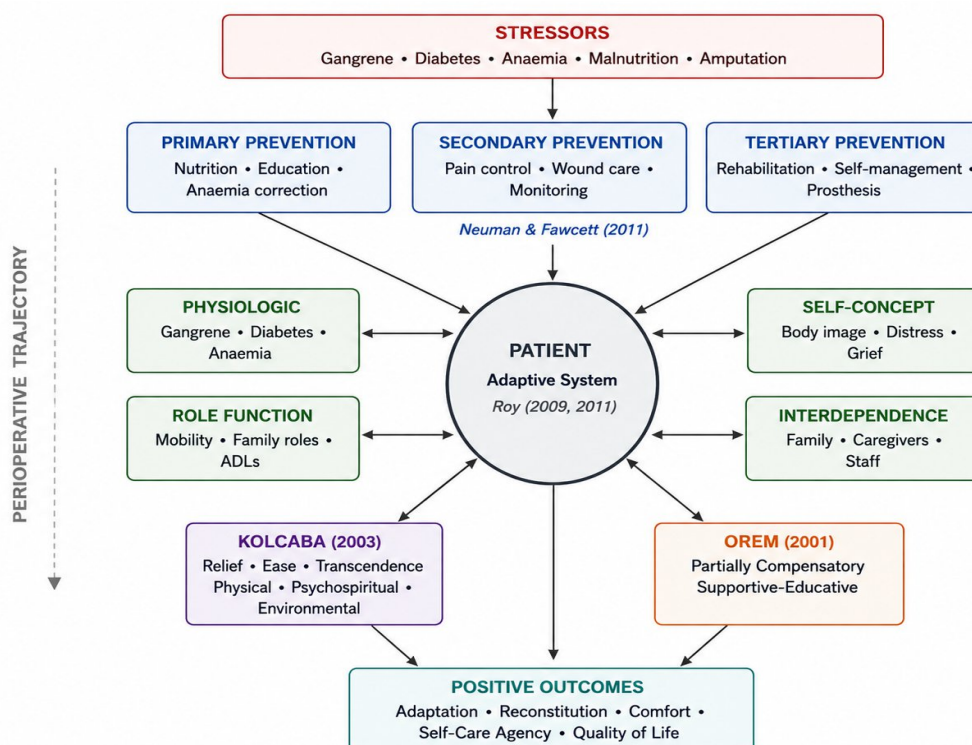


Figure 1: Integrated Theoretical framework for perioperative nursing management of above-knee amputation. Stressors penetrate Neuman's lines of defence, requiring adaptive responses across Roy's four modes, supported by Kolcaba's comfort

interventions and Orem's self-care systems. These theories collectively guided the progression from compensatory care towards self-care and patient/family education.

CASE PRESENTATION

Patient information

A 64-year-old female housewife from a rural community in eastern Sierra Leone was admitted to the surgical ward of a government hospital with a painful, non-healing left leg ulcer and inability to walk. The ulcer had developed several years previously following a domestic burn injury sustained when her leg contacted a container of hot coals after cooking. She had received repeated dressings at peripheral health facilities without improvement and reported no prior known medical conditions. She was married, had four children, and lived in a rural dwelling with limited access to healthcare.

Clinical findings and diagnostic assessment

On examination, she was alert, oriented, and communicative but unable to ambulate. The left lower limb showed a chronic ulcer with surrounding dry, black necrotic tissue consistent with dry gangrene, along with erythema and purulent discharge suggesting superimposed infection. Peripheral pulses were not assessable. The abdomen and other systems were unremarkable.

Laboratory investigations revealed haemoglobin 4.3 g/dL (severe anaemia), packed cell volume 35% post-transfusion. a random blood sugar (RBS) of 13.2 mmol/L, the HbA1c was 7.4% with the samples obtained on admission and fasting blood glucose was subsequently recorded at 7.2 mmol/L. No imaging or vascular studies were available. A chest X-ray was performed pre-operatively and was unremarkable. Microbiology culture was ordered but could not be obtained because the patient could not afford the cost. Based on clinical findings, the chronic non-healing nature of the ulcer, visible signs of infection, and fasting hyperglycaemia; these findings were consistent with diagnosis of diabetes mellitus (WHO, 2006). After thorough lab result and clinical assessment data, a diagnosis of infected dry gangrene secondary to diabetic foot ulceration was made. Severe acute malnutrition was diagnosed based on markedly reduced body mass index, visible severe wasting, and clinical judgment. Oral antidiabetic medication was prescribed as documented in the patient's medication chart, and glycaemic monitoring was incorporated into the nursing care plan.

Timeline of care and vital signs (Table 1 below)

Table 1: Timeline of Care from Admission to Discharge

Day	Event	Average 24-hour vital signs
Day 0 (Admission)	Admitted to surgical ward. IV access, catheterisation, Hb and cross-match ordered. Fasting blood glucose 7.2 mmol/L, random blood sugar (RBS) of 13.2 mmol/L, the HbA1c was 7.4% Commenced IV Augmentin 625 mg BD, IV metronidazole 500 mg BD, IV paracetamol 1.2 g QID. Blood was collected and cross matched, Hb 4.3g/dl, transfuse 2 units of whole blood; above-knee amputation awaiting surgery.	T 36.4°C, P 109/min, R 22/min, BP 126/89 mmHg, SpO ₂ 99%

Day 1	Diagnoses confirmed: infected dry gangrene, severe anaemia, infection, severe acute malnutrition. First units of blood transfused at 8: a.m. with monitoring for transfusion reaction Tetanus toxoid 0.5 mL given. IV antibiotics continued. Anaesthetic review and chest X-ray performed.	T 36.5°C, P 98/min, R 20/min, BP 122/82 mmHg, SpO ₂ 98%
Day 2	Second unit of blood transfused at 4p.m. and post transfusion reaction were recorded as skin rash. IV dexamethasone 8 mg given. Patient and family prepared psychologically for surgery. Post-operative expectations explained.	T 36.6°C, P 92/min, R 20/min, BP 120/80 mmHg, SpO ₂ 98%
Day 3 (Operation)	Above-knee amputation performed under general anaesthesia by a surgical team comprising the consultant surgeon, surgical trainee practitioners, community health officers, and nurses. Fish-mouth incision, vascular bundle ligated with Vicryl 1.0, femur transected, fascia apposed, skin closed. Post-op meds: IV Augmentin 625 mg BD, IV metronidazole 500 mg TDS, IV paracetamol 900 mg QID, IV omeprazole 40 mg BD, IV tramadol 50 mg PRN. Returned to ward at 16:50.	T 36.5°C, P 96/min, R 22/min, BP 128/82 mmHg, SpO ₂ 96%
Day 4 (POD 1)	Alert, afebrile. Complained of pain at operative site. Stump dressing stained with blood but intact. Pain assessment, stump elevation, neurovascular monitoring, and diabetic education commenced.	T 36.8°C, P 102/min, R 24/min, BP 132/84 mmHg, SpO ₂ 97%
Day 5 (POD 2)	Alert, afebrile. No new complaints. Stump clean, dry, and well dressed. Systemic observations settling.	T 36.4°C, P 88/min, R 20/min, BP 124/78 mmHg, SpO ₂ 98%
Day 8 (POD 5)	Converted to oral medications. Mild oedema on right leg. Stump clean and dry. Dressing changed. Physiotherapy contacted for mobilisation. Discharge planning with diabetic foot education.	T 36.5°C, P 86/min, R 20/min, BP 122/76 mmHg, SpO ₂ 99%
Day 25 (POD 22)	Outpatient review. No new complaints. Stump dressing soiled; changed. Continued oral antibiotics, analgesia, omeprazole, aspirin, and metformin. Diabetic education reinforced.	T 36.6°C, P 84/min, R 20/min, BP 120/78 mmHg, SpO ₂ 99%

Therapeutic Interventions and Nursing Care

Pre-operative nursing care included haemodynamic stabilisation with close transfusion monitoring and observation for transfusion reactions; glycaemic monitoring with regular blood glucose checks and commencement of metformin; infection control using aseptic technique during catheterisation and wound dressings; psychosocial support through explanation of the

need for amputation to patient and family; and nutritional support coordinated with the hospital nutritionist and through family engagement to optimise protein and caloric intake.

Antimicrobial therapy-regimen was initiated empirically Based on the documented clinical evidence of wound of infection, including erythema and purulent discharges, while microbiological culture could not be obtained because the patient could not afford the associated cost. The initial regimen comprised of IV Augmentin 625 mg BD and IV metronidazole 500 mg TDS, as prescribed by the attending clinical team. The therapy was continued to postoperative day 4 and changed to oral therapy on day 5 for up to day 14.

Post-operative nursing care focused on stump elevation and regular inspection for haematoma, infection, or dehiscence; pain management through regular assessment and administration of analgesics; early mobilisation through physiotherapy referral to prevent hip flexion contractures; diabetic education on foot hygiene, blood glucose monitoring, medication adherence, and warning signs in the remaining limb; and discharge planning with education on stump hygiene and infection signs.

Follow-Up and Outcomes

At outpatient review on post-operative day 22, the patient was alert with no new complaints. The stump was clean and the dressing was changed. She remained on oral antibiotics, analgesia, omeprazole, aspirin, and metformin. Interviews with the patient and her relatives revealed gratitude for the nursing care received and an expressed need for continued support to adapt to life after amputation, including access to a prosthetic limb and ongoing diabetic monitoring.

APPLICATION OF THE NURSING PROCESS IN THEORY-GUIDED PERIOPERATIVE CARE

The patient's care was organised around the nursing process of assessment, nursing diagnosis, planning, implementation and evaluation, providing a systematic basis for individualised clinical decision-making throughout the perioperative period (*Table 4*). The nursing process is a structured, patient-centred approach in which subjective and objective information is assessed, nursing problems are prioritised, outcomes are established, interventions are implemented, and responses to care are evaluated and revised as necessary (NMC, n.d.).

In this case, the process was particularly important because the patient presented with multiple interacting vulnerabilities including; a chronic non-healing ulcer with gangrenous tissue and clinical evidence of infection, severe anaemia (Hb 4.3 g/dL), severe malnutrition, impaired mobility, newly identified Diabetes, and the anticipated functional and psychological consequences of major limb loss. The absence of vascular imaging, inability to obtain microbiological culture because of cost, limited access to specialised services, and the patient's rural background further constrained conventional diagnostic and therapeutic options.

Assessment

Assessment extended beyond the surgical wound to the patient's physiological, nutritional, functional, psychological, social and educational needs. Subjective information included the history of a longstanding non-healing ulcer, inability to walk, and the patient's and family's concerns about the proposed amputation and subsequent adjustment. Objective assessment identified the chronic necrotic wound, erythema and purulent discharge, severe anaemia, low nutritional status, impaired mobility and perioperative physiological status.

These assessment data were organised using Marjory Gordon's 11 Functional Health Patterns as an assessment framework and provided a holistic structure for identifying actual and potential nursing problems (Table 2). Gordon's framework specifically organised assessment data across health management, nutrition, elimination, activity and rest, cognition, self-concept, role relationships, coping and values, and other relevant domains thereby supporting a comprehensive view of the patient and subsequent nursing management decisions (de Lima Araújo et al., 2026).

Table 2: Selected Gordon's 11 Functional Health Pattern Assessment Relevant to the Case

Gordon's Functional Health Pattern	Case-derived assessment findings	Nursing significance
1. Health perception–health management	Longstanding ulcer following a domestic burn; repeated dressings at peripheral facilities without healing; no previously known medical condition; limited access to healthcare; newly identified hyperglycaemia; required education regarding diabetes, wound/stump care and remaining-limb protection.	Indicates delayed/limited health management and need for education and continuity of care.
2. Nutritional–metabolic	Severe malnutrition with visible wasting and markedly reduced BMI; Hb 4.3 g/dL; chronic infected wound; fasting glucose 7.2 mmol/L; random blood sugar (RBS) of 13.2 mmol/L, the HbA1c was 7.4%, nutritional support required.	Major perioperative vulnerability; nutritional and metabolic optimisation became a priority.
3. Elimination	Urinary catheterisation was performed on admission. No bowel or urinary abnormality was documented.	Requires monitoring of urinary output and catheter-related infection risk.
4. Activity–exercise	Unable to ambulate because of the affected limb; postoperative physiotherapy referral; need for progressive mobilisation after amputation.	Indicates impaired mobility and increased risk of deconditioning and functional dependence.
5. Sleep–rest	No specific sleep disturbance documented. Although pain and hospitalisation represented potential threats to rest.	Requires further monitoring.
6. Cognitive–perceptual	Alert, oriented and communicative; experienced operative-site pain postoperatively; able to receive education.	Supports participation in decision-making, education and self-care preparation.
7. Self-perception–self-concept	Major limb loss was anticipated; psychological preparation was provided. Need for continued support with adaptation to life after	Identifies risk for altered body image and psychological adjustment problems.

	amputation was expressed at follow-up.	
8. Role–relationship	Married with four children; family involved in psychological preparation and nutritional support.	Family constituted an important source of practical and psychosocial support.
9. Sexuality–reproductive	No sexuality/reproductive concerns were documented.	No diagnosis was generated without assessment evidence.
10. Coping–stress tolerance	Patient and family required psychological preparation for amputation; expressed gratitude and continued need for support after discharge.	Indicates need for psychosocial support and ongoing adaptation assistance.
11. Values–beliefs	No specific spiritual/religious beliefs were documented.	Should be further assessed

Nursing Diagnosis and Prioritisation

The assessment findings were clustered into nursing problems according to their immediate threat to physiological stability, risk of perioperative complications, impact on recovery and implications for longer-term adaptation. This resulted in prioritisation of problems associated with *tissue integrity/infection, oxygen-carrying capacity and activity tolerance, nutritional status, pain, and postoperative recovery and self-management*. The prioritisation was never fix but that is, problems requiring immediate attention before surgery were reassessed after transfusion and stabilisation, and the postoperative priorities shifted towards wound/stump protection, pain control, mobilisation, diabetes education and preparation for discharge.

Priority Nursing Diagnoses Across the Perioperative Continuum

Pre-Operative Phase

Based on the patient assessment data, the following priority nursing diagnoses emerged:

1. Acute pain related to tissue injury and inflammatory process, as evidenced by patient verbal report of pain.
2. Impaired tissue integrity related to prolonged tissue destruction and compromised wound healing, as evidenced by chronic non-healing ulcer, black necrotic tissue, erythema and purulent discharge.
3. Activity intolerance/decreased activity tolerance related to impaired oxygen-carrying capacity and lower-limb pathology, evidenced by inability to ambulate, severe anaemia and tachycardia.
4. Imbalanced Nutrition: Less than body requirement related to severe nutritional depletion and chronic illness, evidenced by marked wasting and markedly reduced BMI.
5. Risk for unstable blood glucose level related to newly identified hyperglycaemia and newly initiated diabetes management.

The nursing prioritisation was based on stabilisation and transfusion monitoring before surgery.

Intra-Operative Phase

The principal intra-operative nursing concerns were:

1. Risk for perioperative bleeding, given major limb surgery and the patient's severe preoperative anaemia.
2. Risk for infection, associated with the infected wound, invasive procedures and surgical incision.
3. Risk for perioperative hypothermia, associated with major surgery and anaesthesia.
4. Risk for positioning-related injury, associated with prolonged immobility under general anaesthesia.
5. Risk for unstable blood glucose level, given newly identified hyperglycaemia and the physiological stress of surgery.

The intra-operative priority shifted from correcting pre-existing problems to maintaining physiological stability and preventing additional perioperative injury.

Post-Operative Phase

Postoperatively, the priorities became:

1. Acute pain related to surgical tissue trauma, evidenced by reported operative-site pain.
2. Impaired tissue integrity related to surgical incision and altered tissue integrity following amputation.
3. Impaired physical mobility/decreased activity tolerance related to limb loss, pain and deconditioning.
4. Risk for infection related to surgical wound, diabetes/hyperglycaemia and nutritional compromise.
5. Deficient knowledge/ineffective health management concerning diabetes, stump care, remaining-limb protection, medication adherence and long-term follow-up.

This progression demonstrates why a care-continuum approach is more appropriate than a single static nursing diagnosis list.

Planning

For each priority problem, realistic outcomes were established according to the patient's clinical condition and the resources available. Planning included physiological stabilisation before surgery, prevention of avoidable complications, maintenance of wound and stump integrity, adequate pain control, nutritional support, progressive mobilisation, patient and family education, and preparation for continued care after discharge. The nursing process supports this type of continuous adjustment because the patient's response to interventions provides new assessment information that can modify subsequent nursing priorities.

Implementation

Implementation combined independent nursing interventions with collaborative and prescribed interventions. Independent care included systematic monitoring of vital signs, pain assessment, aseptic wound care, positioning and stump observation, psychological preparation, health education and discharge teaching. Collaborative interventions included consultation with the surgical team, anaesthesia, nutrition and physiotherapy services. Dependent interventions included administration of prescribed antibiotics, analgesics, blood transfusion, antidiabetic therapy and other medications.

Table 3. summarises how each theoretical perspective contributed a distinct function to the nursing process and links the theoretical perspective with the documented patient problem, nursing response and available outcome evidence.

Table 3: Application of the Integrated Nursing Theories to the Patient's Care

Theoretical Perspective	Patient Problem/Need	Application To Nursing Care	Documented Outcome
Roy's Adaptation Model	Severe anaemia, impaired mobility, major limb loss and anticipated psychological adjustment	Physiological monitoring, transfusion support, mobilisation, psychological preparation and family involvement	Pulse decreased from 109/min on admission to 92/min by Day 2; mobilisation was initiated; continued psychosocial support was required
Neuman's Systems Model	Physiological and environmental stressors including infected wound, severe anaemia, surgery and nutritional depletion	Prevention and early detection through transfusion monitoring, infection prevention, wound surveillance, physiological monitoring and discharge planning	No documented postoperative systemic infection; stump remained clean and dry during documented follow-up
Kolcaba's Theory of Comfort	Pain, operative discomfort, psychological distress and environmental needs	Prescribed analgesia, positioning, stump elevation, explanation, reassurance and organisation of care	Pain was identified and treated; however, serial pain scores were not documented and magnitude of improvement cannot be quantified
Orem's Self-Care Deficit Nursing Theory	Reduced ability to perform wound care, mobility and long-term self-management independently	Assistance during acute recovery followed by education on stump care, medication adherence, remaining-limb protection and follow-up	Patient and family participated in education; continued support for post-amputation adaptation was identified at follow-up

Evaluation

Evaluation occurred through repeated observation of physiological and wound status, pain, mobility, medication response and readiness for discharge. Following transfusion, the patient's pulse decreased from 109/min on admission to 92/min by Day 2. Following surgery, she remained afebrile, oxygen saturation remained 96–99%, the stump remained clean and dry after the immediate postoperative period, and progressive mobilisation was initiated through physiotherapy referral. By postoperative Day 22, she had no new complaints and continued follow-up and diabetes education.

Table 4: Nursing Care Plan with Five Highest-Priority Problems

No.	Date/Time Started	Assessment Data	Nursing Diagnosis	Goal / Expected Outcome	Nursing Interventions	Scientific Rationale	Evaluation	Date/Time Ended	Sign.
1	Day 0 – Admission Exact time not documented	Subjective: History of a longstanding non-healing left-leg ulcer following a burn injury, with repeated dressings without healing. Objective: Chronic ulcer with black necrotic tissue, erythema and purulent discharge; inability to ambulate; above-knee amputation planned.	Impaired tissue integrity related to prolonged tissue destruction and compromised wound healing as evidenced by a chronic non-healing ulcer, necrotic tissue, erythema and purulent discharge.	Within the perioperative period, the patient will have no further avoidable tissue or wound complications, maintain clean and intact wound/stump tissue, and demonstrate progressive healing without documented wound dehiscence or systemic deterioration.	Independent: Assess the wound/stump at each dressing change and document colour, odour, drainage and surrounding tissue. Maintain aseptic technique during wound care. Monitor temperature and vital signs. Protect the operative stump from trauma. Educate the patient and family regarding wound hygiene and warning signs requiring urgent review. Collaborative: Liaise with the surgical team regarding wound	Regular wound assessment facilitates early recognition of deterioration. Aseptic technique reduces avoidable contamination. Nutritional optimisation supports tissue repair and surgical recovery. Appropriate analgesia facilitates participation in wound care and rehabilitation.	Met during documented follow-up: The stump remained clean and dry after the immediate postoperative period. No wound dehiscence or systemic deterioration was documented. Continued wound surveillance was indicated after discharge.	Day 25 review Exact time not documented	_____

					status. Collaborate with the nutritionist to address factors affecting healing. Refer to physiotherapy for safe mobilisation.			
					Dependent: Administer prescribed antibiotics and analgesics. Perform prescribed dressings and postoperative wound care.			
2	Day 0 – Admission	Subjective: Patient reported inability to walk. Objective: Unable to ambulate; Hb 4.3 g/dL; pulse 109 beats/minute on admission; chronic painful lower-limb pathology.	Decreased activity tolerance related to imbalance between oxygen supply and physiological demand and lower-limb pathology as evidenced by inability to ambulate and severe anaemia.	Within 24–48 hours after stabilisation, the patient will maintain haemodynamic stability and participate progressively in appropriate activities. Following surgery, the patient will commence safe mobilisation with physiotherapy when clinically stable.	Independent: Monitor pulse, respiratory rate, oxygen saturation and physiological response to activity. Assist with activities of daily living. Provide adequate rest periods. Reposition regularly. Gradually increase activity according to tolerance. Collaborative: Coordinate transfusion management with the	Monitoring physiological responses to activity helps determine tolerance and prevents excessive oxygen demand in a patient with severely reduced oxygen-carrying capacity. Gradual mobilisation promotes functional recovery and reduces	Partially met initially; subsequently improved: The patient was unable to ambulate at admission because of severe anaemia and lower-limb pathology. Following stabilisation and surgery, physiotherapy was involved in mobilisation. Continued	Day 25 review

					medical/surgical team. Refer to physiotherapy for postoperative mobilisation and prevention of contractures. Involve family members in safe assistance.	complications associated with prolonged immobility.	rehabilitation was required at discharge.	
					Dependent: Administer prescribed blood products and medications. Implement prescribed postoperative mobilisation orders.			
3	Day 0 – Admission	Subjective: No detailed dietary history was documented; family members were involved in supporting nutritional intake. Objective: Severe acute malnutrition, marked wasting, markedly reduced BMI, chronic wound and severe anaemia.	Inadequate nutritional intake related to increased metabolic demands and nutritional depletion associated with chronic illness and wound burden as evidenced by severe wasting and markedly reduced BMI.	During admission, the patient will have an individualised nutritional support plan, maintain adequate oral intake as tolerated, and receive continued nutritional follow-up after discharge.	Independent: Assess food intake and tolerance. Monitor weight and available nutritional indicators. Encourage prescribed nutrient-dense meals. Involve family in provision of culturally acceptable foods. Monitor for feeding intolerance. Collaborative: Refer to the nutritionist. Coordinate the nutritional plan with	Early identification and management of nutritional risk are important in patients undergoing major surgery. Adequate nutritional intake supports wound healing, immune function and recovery. Early appropriate oral	Partially met: Nutritional support was initiated through nutritionist involvement and family engagement. However, serial weight, BMI and biochemical nutritional measurements were not available to	Day 25 review

					the surgical and medical teams. Review nutritional intake during follow-up.	feeding is generally preferred when clinically feasible.	demonstrate complete nutritional rehabilitation. Continued nutritional monitoring was therefore required.	
					Dependent: Implement prescribed nutritional therapy and nutritional supplements where available.			
4	Day 0 / Postoperative Day 1	Subjective: Pain in the affected limb was reported at presentation; operative-site pain was reported on postoperative Day 1. Objective: Chronic gangrenous wound, major limb surgery and postoperative wound requiring monitoring.	Acute pain related to tissue injury associated with the gangrenous wound and surgical intervention as evidenced by reported operative-site pain.	Within 30–60 minutes following analgesic administration, the patient will report whether pain has improved or remains troublesome and will demonstrate ability to participate in necessary care activities as tolerated	Independent: Assess pain regularly using an appropriate pain scale. Observe behavioural indicators of pain. Position the patient comfortably. Elevate the stump when clinically appropriate. Provide reassurance and explain procedures. Coordinate nursing activities to minimise unnecessary disturbance. Collaborative: Report inadequate pain control to the medical/surgical team. Coordinate	Regular pain assessment allows analgesia to be individualised and its effectiveness evaluated. Effective pain management promotes rest, facilitates wound care and improves participation in rehabilitation and mobilisation.	Postoperative pain was identified and managed with prescribed analgesics. No persistent uncontrolled pain was documented. Continued pain assessment was indicated during rehabilitation and follow-up.	Day 25 review

					analgesia with physiotherapy and wound-care activities.				
					Dependent: Administer prescribed paracetamol, tramadol and other analgesics. Monitor therapeutic response and adverse effects.				
5	Day 0 – Admission	Risk factors: Existing infected wound with purulent discharge; hyperglycaemia/diabetes; severe malnutrition; compromised tissue integrity; invasive procedures; major surgical incision; urinary catheterisation.	Risk for infection related to compromised tissue integrity, hyperglycaemia, severe malnutrition, invasive procedures and surgical wound.	Throughout admission and follow-up, the patient will remain clinically stable and demonstrate no documented evidence of postoperative wound infection or systemic infection, as indicated by stable vital signs, absence of progressive wound inflammation and appropriate stump healing.	Independent: Monitor temperature and vital signs. Inspect the wound/stump regularly. Maintain strict hand hygiene and aseptic technique. Monitor the catheter site and remove the catheter when no longer clinically necessary. Educate the patient and family about wound hygiene and signs of infection.	Early recognition of wound and systemic changes allows prompt intervention. Aseptic technique reduces healthcare-associated contamination. Management of nutritional and metabolic risk factors supports wound healing and postoperative recovery.	Met during documented hospital course: The patient remained afebrile, and the stump was subsequently described as clean and dry. No postoperative systemic infection was documented. Continued infection surveillance was recommended after discharge.	Day 25 review	
					Collaborative: Report wound changes promptly to the surgical team. Coordinate microbiological				

investigations when clinically indicated. Collaborate with nutrition and diabetes-care providers.

Dependent:

Administer prescribed antibiotics.
Implement prescribed wound-care and catheter-management orders.

DISCUSSION

This case illustrates intersecting challenges common to surgical nursing in resource-limited settings. The patient presented with infected dry gangrene after years of neglect, revealing the gap between rural communities and specialised diabetic foot care. From the perspective of Roy's Adaptation Model, the patient's presentation can be understood as involving substantial physiological demands (Roy, 2011; 1974) associated with the multiple stressors (dry gangrene, undiagnosed diabetes, severe anaemia, and malnutrition) simultaneously overwhelming her coping mechanisms, producing the classic signs of septic deterioration and tissue death. The absence of podiatry, vascular imaging, and multidisciplinary diabetic clinics meant that diagnosis was clinical and definitive treatment was surgical.

Neuman and Fawcett (2011) would characterise this as a breach of both the flexible and normal lines of defence; by the time of admission, the patient had already crossed into the zone where secondary prevention (symptom treatment and system stabilisation) was particularly relevant to the documented nursing response at the stage of care.

The combination of severe anaemia (haemoglobin 4.3 g/dL) and severe malnutrition in a patient requiring major amputation was striking. In well-resourced settings, such a patient might undergo extensive pre-operative optimisation including parenteral nutrition and specialist anaesthetic review (He et al., 2025; Marsicano et al., 2018). Here, the short interval between admission to amputation (three days) required intensive nursing monitoring and coordination of Neuman's (2011) primary prevention (nutrition correction, diabetes education, anaemia optimisation and support, infection prevention and psychological preparation) into a brief, nurse-led stabilisation phase (Alligood, 2013).

These interventions align with Kolcaba's (2003) physical comfort dimension including maintaining haemodynamic stability, preventing hypothermia, and ensuring pain relief and at the same time supporting Roy's (2011) physiologic adaptive mode. During the acute phase, the nursing team provided great support with wound care, mobility, medication and other activities that the patient could not independently perform. This can be interpreted through Orem's compensatory nursing perspective.

The nursing team, working alongside the surgical team of surgeons, trainee practitioners, community health officers, and fellow nurses, adapted standard protocols to available resources. This interdisciplinary coordination exemplifies Roy's (1974) interdependence mode, wherein the patient-family-caregiver-staff relationship becomes the vehicle through which adaptation is achieved. Stump elevation and frequent visual inspection substituted for Doppler monitoring and advanced wound diagnostics. These environmental and physical adjustments reflect Kolcaba's (2003) environmental and physical comfort contexts, representing practical adaptations to the available resources while addressing the patient's documented holistic needs (Kolcaba, 2003). Pain management relied on nurse-led assessment and as-required tramadol rather than patient-controlled analgesia. During this acute phase, Orem's partially compensatory nursing system was operative where the patient lacked the physical and cognitive capacity for self-care, so the nursing team wholly compensated for wound care, mobility, and medication administration. Diabetic education was delivered verbally with family involvement, as printed materials and glucometers were unavailable. Even here, Orem's (2001) supportive-educative system was initiated prospectively, planting the seeds for later self-care agency once the patient's condition permitted. Early physiotherapy referral, often neglected in similar settings, was initiated to prevent contractures and promote independence. This anticipatory action supported Roy's role function mode by preserving the patient's potential to resume activities of daily living and family responsibilities. The mild oedema in the contralateral leg documented on post-operative day 5 prompted continued observation and mobilisation efforts and consider dependent oedema versus early venous insufficiency, a reminder that new amputees require surveillance of the remaining limb. Within Neuman's framework, this observation represents secondary prevention in action detecting a new stressor before it penetrated the patient's reconstituting lines of defence and triggered further system breakdown. And simultaneously, it activated Roy's physiologic mode, redirecting nursing attention toward preserving the viability of the remaining limb.

This case demonstrates how established nursing theories can be operationalised through the nursing process in a resource-constrained surgical settings. through disciplined application of the nursing process. The absence of advanced diagnostic technologies and specialised services did not eliminate the need for sophisticated clinical reasoning; instead, it increased the importance of systematic assessment, prioritisation, close observation, timely intervention, multidisciplinary coordination and continuous evaluation. Gordon's Functional Health Patterns provided a comprehensive assessment structure, while the integrated nursing theories guided interpretation of the patient's physiological, adaptive, comfort and self-care needs. The nursing process translated these theoretical perspectives into individualised actions before, during and after surgery. The patient's documented postoperative stability, clean stump, pain management, initiation of mobilisation and preparation for continued diabetes and stump care demonstrate the practical value of this approach. Although a single case cannot establish effectiveness or causality, it provides a clinically grounded example that coherent, theory-guided nursing care is feasible and potentially valuable where sophisticated technology and specialised services are limited.

Lessons for practice are threefold. First, community health workers and peripheral clinics need training to recognise chronic non-healing wounds as possible diabetes complications, enabling earlier referral. This recommendation is consistent with the preventive orientation of Neuman's (2011) systems model, particularly the importance of addressing potential stressors before they result in further system disruption, thereby strengthening the flexible line of defence at the community level before the stressor of uncontrolled diabetes produces irreversible gangrene. Second, surgical wards in low-resource settings must prioritise nursing protocols for high-risk amputation patients, including transfusion safety checklists, stump care bundles, and mandatory physiotherapy referral. These protocols could provide a practical context in which comfort-focused care and stressor prevention are systematically incorporated into perioperative nursing. Third, patient and family education should begin pre-operatively and continue through discharge, with emphasis on protecting the contralateral limb. This longitudinal educational strategy is consistent with Orem's (2001) emphasis on progression towards self-care agency; an extending Roy's (2011) role function and interdependence adaptation.

For nursing education, the case supports greater emphasis on integrated clinical reasoning rather than disease-specific task performance. Nursing curricula and continuing professional development in comparable settings should therefore strengthen competency in theory-informed assessment, wound surveillance, perioperative nursing, nutritional support, diabetes education, rehabilitation and family-centred self-care preparation.

Implications for Future Research

Future research should examine whether such theory integrated nursing pathways improve measurable patient outcomes using prospectively defined indicators for high-risk surgical patients in hospitals with limited diagnostic and rehabilitation resources; and particular attention should be given to outcomes that were clinically relevant in this case.

A major strength of this case report is its longitudinal presentation of nursing care across the perioperative continuum, coordinated under resource constraints and the explicit integration of four complementary nursing frameworks. Their combined application gives the case a stronger conceptual basis than a purely descriptive account of interventions.

The principal limitation is that this is a single-patient case report, and the findings therefore cannot be generalised to all patients undergoing major amputation or to all resource-constrained surgical settings. Even though physiotherapy and self-care preparation were incorporated into the management, extended outcomes relating to prosthetic rehabilitation, community reintegration and long-term adaptation were not sufficiently documented and therefore the favourable early postoperative outcome should not be interpreted as evidence of complete recovery or successful long-term rehabilitation.

An additional limitation is that some potentially relevant clinical outcomes were not measured using standardised instruments. In particular, serial pain scores and detailed longitudinal nutritional and glycaemic measurements were not consistently documented. Consequently, the case supports description of the nursing interventions and documented clinical course but does not permit quantitative attribution of individual outcomes to specific theoretical approaches or interventions.

CONCLUSION

This case demonstrated the feasibility of providing coherent, individualised and theory-guided perioperative nursing care for a high-risk patient undergoing major amputation in a resource-constrained environment. The patient's severe anaemia, malnutrition, undiagnosed diabetes and chronic infected limb pathology created substantial perioperative challenges. Nevertheless, systematic nursing assessment and prioritisation supported haemodynamic stabilisation, infection prevention, wound surveillance, pain control, nutritional support, mobilisation and preparation for self-care leading to the successful outcome.

The principal conceptual contribution of the case is the demonstration that complementary nursing theories can be assigned distinct functions within a single care trajectory rather than being presented as interchangeable theoretical explanations. In this case, Roy informed adaptation, Neuman informed stressor prevention, Kolcaba informed comfort-focused care, and Orem informed progression towards self-care, while Gordon's Functional Health Patterns structured assessment.

The case therefore reinforces a central lesson for nursing practice in similar settings: resource limitation does not remove the need for systematic nursing care; rather, it makes clinical reasoning, structured assessment, continuous evaluation and effective coordination even more consequential.

Patient Perspective

During follow-up interviews, the patient expressed appreciation for the nursing support and reported that explanations about the need for amputation helped her understand and accept the procedure. Her relatives noted that the education provided on diabetes and foot care was the first they had received and requested that such teaching be extended to community settings.

Patient Consent

Written informed consent for publication of this case report and any accompanying images was obtained from the patient. The patient was informed that this case would be used for academic publication and that identifying information would be protected. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Ethics Statement

Ethical approval for reporting this case was obtained from the Kenema Government Hospital Management and Ethics Committee and the Eastern Technical University of Sierra Leone Institutional Review Board on the 10th June 2026. The ethical approval was applicable to the preparation and reporting of this case, while written informed consent for publication was obtained separately from the patient.

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AI use Declaration: Generative AI tools were used to support development of the conceptual model diagram and to assist with locating potentially relevant scholarly literature. The authors independently reviewed, verified, edited, proof read and approved the manuscript content, citation and final organisation of the report.

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