

Nursing Interventions for a Patient With Sudden Cardiac Arrest in the Operating Room: A Case Report

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Abstract

Introduction. Intraoperative sudden cardiac arrest is a rare, life-threatening event requiring immediate recognition, coordinated resuscitation, and structured perioperative nursing care. This case report describes the application of standardized NANDA International (NANDA-I), Nursing Outcomes Classification (NOC), and Nursing Interventions Classification (NIC) terminology to nursing management of an intraoperative cardiac arrest.

Case Presentation. A 62-year-old man with a history of myocardial infarction, coronary stent placement, hypertension, hypercholesterolemia, and hypothyroidism underwent total left knee arthroplasty. Following tourniquet release, the patient developed severe hypotension that rapidly progressed to pulseless electrical activity and subsequently ventricular fibrillation.

Intervention. Advanced life support was initiated, including high-quality cardiopulmonary resuscitation, epinephrine administration, endotracheal intubation, defibrillation, continuous physiological monitoring, and subsequent transfer to intensive care. Nursing care was structured according to Carpenito's Bifocal Model and the NANDA-I–NOC–NIC framework, with particular emphasis on cardiovascular surveillance, emergency management, airway management, defibrillation, and continuity of care.

Outcome. Return of spontaneous circulation was achieved, although a subsequent cardiac arrest required further resuscitation. Coronary angiography identified an anterior ST-elevation myocardial infarction requiring percutaneous coronary intervention. The patient subsequently recovered neurological and functional capacity and regained independence in activities of daily living.

Conclusion. Standardized nursing terminology provided a structured framework for documenting clinical reasoning, interventions, and measurable outcomes during a complex intraoperative emergency, while supporting continuity of care across perioperative and critical care settings.

Keywords: Cardiac Arrest, Perioperative Nursing, Operating Rooms, Cardiopulmonary Resuscitation, Nursing Process, Standardized Nursing Terminology

Introduction

Sudden Cardiac Arrest (SCA), defined as death of presumed cardiac etiology occurring within 1 hour of symptom onset or 24 hours following the last observed healthy status, remains the third leading cause of mortality in Europe (Andersen et al., 2019). Extensive research has been conducted to elucidate the etiologies and contributing factors underlying cardiac arrest (CA), as well as to quantify variations in incidence both within and across nations. While the factors influencing outcomes following Out-of-Hospital Cardiac Arrest (OHCA) and In-Hospital Cardiac Arrest (IHCA) are well-established, significant national variability persists regarding both incidence and patient outcome (Gräsner et al., 2021).

Cardiac arrest is mechanistically defined as the abrupt cessation of cardiac mechanical activity, leading to hemodynamic collapse. Post-mortem examinations may identify a cardiac etiology, although not all SCA cases have an identifiable cause (ESC Scientific Document Group, 2023).

Coronary Artery Disease (CAD) accounts for over 75% of SCA cases in developed countries. Despite a concurrent increase in CAD incidence over recent decades, there has been a notable decline in overall cardiovascular mortality (Italian Resuscitation Council, 2021). Early intervention for CAD represents the most effective preventive measure against SCA. Studies suggest that CA and SCA may be the initial presentation of CAD in genetically predisposed individuals, with acute myocardial infarction or ischemia being the typical underlying diagnosis. Consequently, the prompt identification of CAD and aggressive management of atherosclerotic cardiovascular disease risk factors constitute the optimal strategy for minimizing the risk of CA and SCA. Prompt Cardiopulmonary Resuscitation (CPR) is critical for improving outcomes in patients who experience IHCA (Yow et al., 2025).

The annual incidence of IHCA in Europe ranges from 1.5 to 2.8 per 1,000 hospital admissions. Factors associated with survival include the presenting rhythm, the location of the arrest, and the level of patient monitoring at the time of collapse. Survival rates to 30 days or hospital discharge range widely, from 15% to 34% (Gräsner et al., 2021).

In European countries that routinely practice Withdrawal of Life-Sustaining Treatment (WLST), a favorable neurological outcome is observed in over 90% of surviving patients, with most able to return to work. Conversely, in regions where WLST is not a common practice, adverse neurological outcomes are more frequent (50%, with 33% of patients remaining in a persistent vegetative state). Even among survivors with a favorable neurological status, residual neurocognitive deficits, chronic fatigue, and emotional issues are prevalent, leading to diminished quality of life. Furthermore, both patients and their relatives are at risk for developing post-traumatic stress disorder (Haywood et al., 2018).

Multiple factors determine the outcome for patients suffering an IHCA. These are broadly categorized as non-modifiable factors, such as patient age, sex, and comorbidities (Bircher et al., 2019), and modifiable factors.

A modifiable factor of considerable clinical importance is the in-hospital location of the cardiac arrest. When CA occurs in a general medical ward, patients are typically not adequately monitored, and the arrest may be unwitnessed. These circumstances are consistently associated with a lower probability of survival (Al-Dury et al., 2017).

Electrocardiogram (ECG) monitoring at the time of collapse is associated with a 38% reduction in the risk of death following IHCA. The presence of Ventricular Fibrillation (VF) as the initial rhythm is predictive of a higher survival probability. The faster the ECG is recorded, the greater the likelihood of detecting a shockable rhythm such as VF (Thorén et al., 2020). Furthermore, a

shorter time interval to the initiation of treatment is associated with increased survival in both defibrillable and non-defibrillable IHCA rhythms (Italian Resuscitation Council, 2021).

Finally, an essential factor influencing post-resuscitation survival is the hospital's policy regarding the decision to initiate CPR. Timely CPR significantly enhances the likelihood of successful defibrillation and subsequent IHCA recovery (Thorén et al., 2020).

Cardiac arrest rhythms are broadly classified as either defibrillable (VF or pulseless Ventricular Tachycardia - VT) or non-defibrillable (Asystole or Pulseless Electrical Activity - PEA). The primary difference in management for defibrillable rhythms is the immediate requirement for attempted defibrillation. However, other interventions including high-quality chest compressions with minimal interruptions, advanced airway and ventilation management, vascular access, adrenaline administration, and the identification and treatment of reversible causes are standard components of resuscitation for all CA rhythms (Soar et al., 2021).

The Advanced Life Support (ALS) algorithm (Figure 1) provides a comprehensive framework for all these key interventions.

ABCDE indicates Airway, Breathing, Circulation, Disability, Exposure/Environment; CPR Cardiopulmonary Resuscitation; ECG Electrocardiogram; PEA Pulseless Electrical Activity; PaCO₂ partial pressure of arterial carbon dioxide; ROSC Return of Spontaneous Circulation; SpO₂ Arterial oxygen saturation; VF Ventricular Fibrillation; VT Ventricular Tachycardia. Source: Italian Resuscitation Council (2021).

Methods

Study Design

This study was conducted in accordance with the Case Report methodological design, adhering strictly to the international reporting criteria defined by the CARE (CAsE REport) guidelines to ensure transparency, accuracy, and completeness of the clinical reporting.

Theoretical and Methodological Framework

The nursing process was structured and

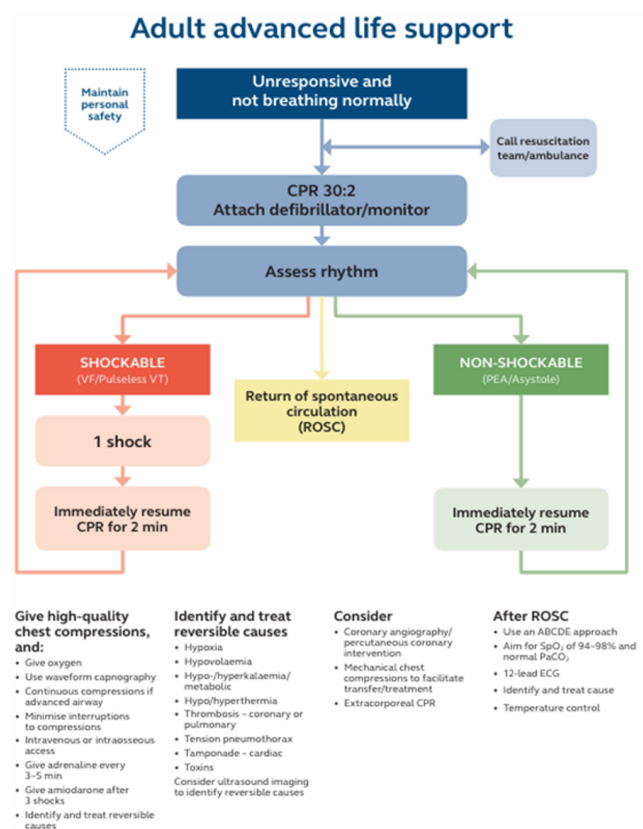


Figure 1. Advanced Life Support Algorithm

operationalized through the integrated application of standardized taxonomies: NANDA-I (North American Nursing Diagnosis Association International), NOC (Nursing Outcomes Classification), and NIC (Nursing Interventions Classification). To guide clinical reasoning within a high complexity emergency setting, Carpenito's Bifocal Model of Clinical Practice (Carpenito, 2021) was adopted. This approach facilitated a clear distinction between:

- Collaborative Problems: pathophysiological complications (such as sudden cardiac arrest) that the nurse monitors to detect onset or changes in status. These require interdependent (medical-nursing) interventions based on the rigorous application of advanced protocols (ALS/ILCOR).
- Nursing Diagnoses: human responses and clinical judgments falling within the domain of professional autonomy, specifically focused on proactive surveillance, risk management and the evaluation of nursing sensitive outcomes.

Ethical Considerations

This case report was based on routine clinical

care. Written informed consent was obtained from the patient for the use and publication of clinical information. Patient privacy and confidentiality were maintained throughout the study.

Case Presentation

Preoperative History and Assessment

A 62 year old male underwent total left knee arthroplasty and a Lipogems procedure on the right knee. The patient's medical history included a prior myocardial infarction in 2019, treated with the placement of two stents, as well as arterial hypertension, hypercholesterolemia and hypothyroidism, all of which were pharmacologically stable at the time of surgery. Preoperative cardiological evaluation confirmed clinical stability (ECG: sinus rhythm, intervals within normal limits). Laboratory findings revealed a hemoglobin level of 10.4 g/dL attributed to chronic hemorrhoidal disease; consequently, two units of packed red blood cells (PRBCs) were cross matched for the procedure. Physical examination showed a Mallampati score of 2; the patient was classified as ASA Physical Status II.

Timeline of Events

The patient was admitted to the holding area at 15:30. Following counseling regarding the anesthetic and surgical procedures, premedication consisting of 2 mg of midazolam and 100 mcg of fentanyl was administered. Plexus anesthesia was performed via a saphenous nerve block, followed by spinal anesthesia.

The patient was transferred to the operating room at 16:30. A pneumatic tourniquet was applied to the left thigh and inflated to 300 mmHg, followed by skin disinfection and surgical draping.

At 17:30, following tourniquet release, vessel hemostasis and wound closure, the patient developed marked hypotension. This condition proved refractory to vasopressors (etilefrine) and rapidly progressed to a lipothymic episode (Table 1). The patient was transferred to the Intensive Care Unit (ICU) and placed on mechanical ventilation in CPAP/ASB mode. An Arterial Blood Gas (ABG) analysis and a 12 lead Electrocardiogram (ECG) were performed.

Table 1. Cascade of events in the Operating Room Following the Lipothymic Episode.

Estimated Time Post-	Clinical Event/Monitoring	Therapeutic Intervention	Key Notes and Details
T0	Rhythm present on monitor, Pulse absent (PEA)	Call for support staff.	Diagnosis of Pulseless Electrical Activity (PEA) - a form of cardiac arrest
T0 + 30 sec	PEA continues	Initiation of CPR (Chest Compressions). Arrival of support staff, preparation of medications and defibrillator	Adherence to advanced life support protocols
T0 + 1 min (approx.)	PEA	Administration of 1 ampoule of Epinephrine (Adrenaline)	First vasopressor drug per CA guidelines
T0 + 1 min and 30 sec (approx.)	Transformation into Ventricular Fibrillation (VF)	Ootracheal Intubation (OTI) performed and mechanical ventilator connected	VF is a shockable rhythm Airway security ensured
T0 + 2 min (approx.)	VF	1st SHOCK (150 J)	First defibrillation (Biphasic at low Joule setting if machine allows)
T0 + 3 min (approx.)	Post-shock	Resumption of CPR	Necessary to maintain cerebral and coronary perfusion
T0 + 3 and 30 sec (approx.)	Post-shock	Administration of 1 ampoule of Epinephrine (total 2 ampoules)	Second dose of vasopressor
T0 + 4 min (approx.)	Persistence of VF	2nd SHOCK (200 J)	Second defibrillation with energy escalation.
T0 + 4 min and 30 sec (approx.)	ROSC (Return of Spontaneous Circulation)	CO2 waveform present (EtCO2 > 10 mmHg)	Return of spontaneous circulation confirmed by palpable pulse and capnography
Post-ROSC	Hemodynamic stability	Recovery of spontaneous respiratory activity Absence of consciousness	Observation of Miotic Pupils (likely post-hypoxia or residual)
CA Time	Total Resuscitation Duration	4 minutes	Total duration of cardiac arrest, from PEA to ROSC
Immediately Post-ROSC	Stabilization	Transfer to Intensive Care Unit (ICU)	Requirement for post-resuscitation care and temperature control (Targeted Temperature Management - TTM)

At 17:50, a new episode of Cardiac Arrest (CA) occurred. The patient was ventilated in Intermittent Positive Pressure Ventilation (IPPV) mode (FiO 21%), and resuscitation efforts were initiated with External Cardiac Massage (ECM) and adrenaline infusion. After the third ampule of adrenaline combined with ECM, a hemodynamically stable cardiac rhythm was recovered, and central and peripheral pulses reappeared (CA time: 8 minutes).

The on-call cardiologist decided to proceed with a hemodynamic study.

At 18:10, the patient was taken to the Cardiac Catheterization Laboratory. The patient was hemodynamically supported by an adrenaline infusion 0.3 mcg/kg/min with a maintained Mean Arterial Pressure (MAP) > 60 mmHg but remained tachycardic HR >100 bpm. Electrolyte imbalances were corrected.

The patient was diagnosed with an anterior ST-Elevation Myocardial Infarction (STEMI). Two coronary stents were deployed to treat a thrombotic occlusion within a prior periosteal stent in the Left Anterior Descending (LAD) artery and a thrombotic occlusion at the LAD bifurcation.

During the night, the patient presented with hypotension and tachycardia despite ongoing vasoactive amine infusions. Lactate levels were increasing, despite bicarbonate correction. Arterial saturation, pH, and urine output remained relatively stable.

The interventional cardiologist was contacted and placed an Intra-Aortic Balloon Pump (IABP).

Intraoperative Nursing Assessment

The patient is admitted to the operating room at 4:30 PM, awake and oriented. The assisted person's state of consciousness and vital signs, oxygen saturation, and ECG were monitored, as the patient was premedicated with 2 mg of Midazolam and 100 mcg of Fentanyl.

BP 105/59 mmHg, HR 55 bpm, SpO₂ 98% with 2 L/min oxygen therapy via nasal cannula.

At 5:30 PM, after removing the tourniquet, 1000 mL of crystalloids and 2 mg of Effortil were infused, with a blood loss of 250 mL.

Within a few minutes, we observed a hypotensive collapse (pressure drop) resistant to vasopressors (Effortil), followed by a syncopal episode (lipothymia).

The Rationale for the NNN Linkage (NANDA-I, NOC, NIC)

The NANDA-I, NOC and NIC (NNN) taxonomies provide a standardized framework that enables nurses to rigorously evaluate a patient's health status. This taxonomic linkage serves as a clinical roadmap to identify both expected and actual outcomes throughout the six phases of the nursing process:

- Phase 1: comprehensive initial assessment (Holistic assessment phase).
- Phase 2: formulation of the nursing diagnosis (Diagnostic statement phase).
- Phase 3: establishment of expected health outcomes, collaboratively determined with the patient and their family (Planning of expected outcomes).
- Phase 4: planning of nursing interventions and specific activities (Intervention planning phase).
- Phase 5: implementation of nursing interventions and clinical activities (Execution phase).
- Phase 6: evaluation of clinical results leading to definitive changes in the patient's health status (Outcome evaluation phase) (Herdman et al., 2024).

Nursing Care Plan

In alignment with Carpenito's Bifocal Model, the cardiac arrest was managed as a "Collaborative Problem", as it represents a pathophysiological complication requiring interdependent (medical-nursing) interventions. Conversely, the NANDA-I taxonomies were utilized to describe human responses and to structure clinical reasoning and surveillance.

Table 2 presents the nursing diagnosis, interventions, and activities of the care plan according to the NANDA-I and NIC classifications. Figure 2 illustrates the Likert scale used to evaluate the outcome indicators of the implemented interventions. Table 3 delineates the linkage between NANDA-I, NOC and specific outcome indicators.

Identified NANDA-I Diagnoses

00311 Risk for Compromised Cardiovascular

Function

Methodological Note: this risk diagnosis served as the framework for proactive clinical surveillance during the preoperative phase and for intensive post ROSC monitoring. It does not define the arrest in progress, but rather the patient's vulnerability, which guides both preventive and post acute planning. The acute arrest event itself was managed as a physiological complication (Collaborative Problem).

Identified NIC

- Vital Signs Monitoring (6680): continuous assessment of HR, heart rhythm, SpO₂ and EtCO₂. The documentation of baseline values allowed for the early detection of subtle physiological shifts that preceded the collapse.
- Emergency Management and Defibrillation (6200, 4095): during the collaborative problem (SCA), the nurse ensured high quality CPR, minimizing pre-shock pauses and coordinating safety protocols during defibrillation.
- Airway Management and Electrolyte Monitoring (3120, 2020): assistance during endotracheal intubation (ETI) and monitoring of electrolyte imbalances (K⁺, Ca⁺⁺) associated with prolonged resuscitative efforts.
- Health System Guidance and Transport (7960, 7892): management of the critical clinical handoff to the Intensive Care Unit (ICU).

Identified NOC

The effectiveness of the interventions was measured through the outcome Cardiopulmonary Status (0414). Key indicators (BP, HR, Rhythm) progressed from a score of 1 (Severe deviation from normal range) during the event to 5 (No deviation from normal range) during the post-operative stability phase.

In the perioperative setting, particularly during a SCA event, the nursing role evolves rapidly from clinical surveillance to the active management of advanced life support.

Vital Signs Monitoring and Surveillance (NIC 6680)

The nurse's primary responsibility involves the continuous monitoring of vital signs. This activity encompasses not only the assessment of heart rate, rhythm, and oxygen saturation but also the critical analysis of end-tidal carbon dioxide (EtCO₂) and core body temperature. Vigilance regarding peripheral pulses and skin hydration status (e.g., diaphoresis) is essential for the early identification of hemodynamic instability. Systematic documentation of baseline values enables the nursing team to recognize subtle physiological shifts that may precede cardiovascular collapse.

Emergency Management and Defibrillation (NIC 6200, 4095)

Upon the onset of SCA in the operating room or Post-Anesthesia Care Unit (PACU), the nurse initiates emergency management protocols. This involves the immediate activation of the emergency response system and the commencement of cardiopulmonary resuscitation (CPR) in accordance with current BLS/ALS guidelines (30:2 compression to ventilation ratio). A crucial nursing intervention is "Defibrillator Management": the nurse ensures rapid pad placement, minimizes the pre-shock pause, and guarantees safety by coordinating the "clear" command prior to shock delivery. The nurse's ability to minimize interruptions in chest compressions is directly correlated with improved clinical outcomes during the perioperative phase.

Airway Management and Metabolic Support (NIC 3120, 2020)

Advanced airway support requires close collaboration between the nurse and the anesthesiologist. The nurse assists in the endotracheal intubation procedure by preparing the equipment, pre-oxygenating the patient, and confirming correct tube placement through auscultation and capnography. Simultaneously, "Electrolyte Monitoring" is vital; the nurse monitors the ECG for rhythm alterations associated with potassium or calcium imbalances and assesses signs of acid-base disturbances, which are frequent during prolonged resuscitative efforts.

Table 2 (part 1). Nursing Diagnoses, Interventions, and Activities according to the NANDA-I and NIC Classifications.

NANDA-I Diagnosis	Nursing Interventions (NIC)
00311 Risk for Compromised Cardiovascular Function (Susceptibility to an alteration in the transport of substances, body homeostasis, removal of metabolic waste products from tissues, and/or organ function, which may compromise health)	6680 Vital Signs Monitoring • Monitor blood pressure, pulse, temperature, and respiratory status, as appropriate • Monitor level of consciousness (LOC) • Document baseline and significant vital sign changes • Initiate and manage continuous core temperature monitoring, as appropriate • Monitor and report signs and symptoms of hypothermia and hyperthermia • Monitor presence and quality of peripheral pulses • Simultaneously palpate apical and radial pulses and note any differences, as appropriate • Monitor heart rhythm and rate • Monitor oxygen saturation • Monitor skin color and moisture • Identify possible etiologies for vital sign changes
	6200 Emergency Management • Activate the Emergency Medical Services (EMS) system • Retrieve the Automated External Defibrillator (AED) or ensure that someone is retrieving the AED • Perform interventions to support vital functions (Basic Life Support/Advanced Life Support) • Assess for signs and symptoms of cardiac arrest • Call for help in the event of absence of breathing or abnormal breathing (agonal gasps) and unresponsiveness • Utilize appropriate infection control precautions while rendering care • Connect the AED and follow specific prompts/actions, as appropriate • Ensure rapid defibrillation • Initiate Cardiopulmonary Resuscitation (CPR) with 30 chest compressions at the recommended rate and depth, allowing for full chest recoil between compressions, minimizing interruptions to compressions, and avoiding excessive ventilation • Minimize the interval between the cessation of chest compressions and the electrical shock (pre-shock pause) • Implement vital function support actions tailored to the most probable cause of arrest (e.g., cardiac or respiratory etiology) • Ensure airway patency • Deliver two rescue breaths after completing the first 30 chest compressions
	4095 Defibrillator Management • Initiate Cardiopulmonary Resuscitation (CPR) • Prepare equipment for immediate defibrillation in the absence of a pulse and consciousness, concurrent with CPR • Continue CPR when external defibrillation is not being performed. • Apply the electrodes/pads as recommended by the defibrillator instructions • Place the automated monitoring devices on the patient (Automated External Defibrillator (AED) electrodes or monitor sensors) • Position the pads and electrodes avoiding clothing or linen, as appropriate • Charge the defibrillator to the appropriate energy level (appropriate Joule setting) • Employ safety precautions before delivering the shock (e.g., verbalize "I'm clear, you're clear, everybody clear," ensuring that no one, including yourself, is touching the patient) • Assess the outcome and repeat defibrillation if indicated • Minimize interruptions in chest compressions for the unconscious patient • Document all events appropriately
	3120 Airway Management – Intubation • Select the correct type and size of oropharyngeal airway (OPA) tube • Collaborate with the physician/anesthesiologist in the selection of the type and size of the endotracheal tube (ETT) • Pre-oxygenate with 100% oxygen • Suction the mouth and oropharynx • Insert the oropharyngeal airway, ensuring it reaches the base of the tongue to prevent the tongue from falling backward (posterior displacement) • Monitor for the potential onset of dyspnea, snoring sounds (stertor), or inspiratory stridor once the oropharyngeal airway is in place • Assist with the endotracheal intubation procedure by preparing the necessary materials and equipment, administering prescribed medications, and monitoring for the potential onset of complications during the maneuver • Auscultate the chest after intubation • Auscultate for bilateral breath sounds before inflating the cuff of the esophageal obturator airway (if applicable/used) or ETT • Observe for systematic chest wall movement/rise • Monitor oxygen saturation (SpO₂) with a non-invasive pulse oximeter and CO₂ detection (Capnography/Capnometry) • Secure the endotracheal tube with tape, tie, or other commercially available securing devices

Table 2 (part 2). Nursing Diagnoses, Interventions, and Activities according to the NANDA-I and NIC Classifications.

NANDA-I Diagnosis	Nursing Interventions (NIC)
00311 Risk for Compromised Cardiovascular Function (Susceptibility to an alteration in the transport of substances, body homeostasis, removal of metabolic waste products from tissues, and/or organ function, which may compromise health)	2020 Electrolyte Monitoring • Monitor for the onset of potential acid-base imbalance • Identify possible causes of the electrolyte imbalance • Recognize and report the presence of electrolyte imbalance • Monitor for blood loss/hemorrhage • Monitor the degree of ventilation adequacy • Monitor the Electrocardiogram (ECG) tracing for any changes correlated with potassium, calcium, and magnesium levels • Observe for changes in peripheral sensation such as numbness and tremors • Monitor for the presence of nausea and vomiting
	7960 Health Information Exchange • Identify current nursing and medical diagnoses • Describe ongoing nursing interventions/care provided • Identify necessary equipment and supplies for patient care/support • Coordinate care with other healthcare professionals
	7892 Intra-facility Transfer • Facilitate coordination and communication prior to transport • Determine the quantity and type of assistance required • Provide adequate personnel to assist with the transport • Provide the appropriate equipment to execute the transport • Ensure that the patient's new destination is ready • Move the patient utilizing the required equipment • Monitor the patient during transport • Provide a clinical report/handoff regarding the patient to the receiving unit/department

Care Coordination and Interfacility Transport (NIC 7960, 7892)

Effective healthcare information exchange is fundamental during the transition from the operating room to the PACU or the ICU. The nurse coordinates the "Interfacility Transport", ensuring the provision of a comprehensive and detailed clinical handoff. This includes an analytical description of the interventions performed, medications administered, and the patient's response to treatment. Ensuring that the receiving unit is fully operational and equipped with the necessary resources (e.g., ventilators, monitors) represents the final, critical step in guaranteeing continuity of care and patient safety following a cardiac event.

Scale used to assess the outcome indicators:	
1.	Severe deviation from the standard range
2.	Substantial deviation from the standard range
3.	Moderate deviation from the standard range
4.	Mild deviation from the standard range

Figure 2. Likert Scale Used to Evaluate the Outcome Indicators of the Care Plan.

Evaluation of Nursing Outcomes and Cardiopulmonary Status

The efficacy of nursing interventions was quantitatively evaluated using the Nursing Outcomes Classification (NOC), focusing the analysis on the outcome Cardiopulmonary Status (0414). This outcome provides a structured framework for monitoring the patient's transition from a state of critical instability during Sudden Cardiac Arrest to physiological stabilization.

Hemodynamic Recovery and Perfusion

Indicators for Systolic Blood Pressure (041401), Diastolic Blood Pressure (041402), and Apical Heart Rate (041404) were employed to track the effectiveness of resuscitative maneuvers. During the acute phase of the SCA, these parameters exhibited a "Severe deviation from normal range" (Score 1). Following the implementation of the ALS protocol and effective defibrillation, the nursing team monitored the progressive improvement of these values toward a state of "No deviation from normal range" (Score 5), signaling the Return of Spontaneous Circulation (ROSC). The presence and quality of Peripheral

Table 3. Relationship between NANDA-I, NOC, and outcome indicators.

Relationship between NANDA-I, NOC, and outcome indicators					
NANDA-I 00311: Risk for Compromised Cardiovascular Function					
NOC 0414: Cardiopulmonary Status					
Outcome Measure	Severe deviation from the standard range 1	Substantial deviation from the standard range 2	Moderate deviation from the standard range 3	Mild deviation from the standard range 4	No deviation from the standard range 5
INDICATORS					
041401 Systolic Blood Pressure (SBP)	1	2	3	4	5
041402 Diastolic Blood Pressure (DBP)	1	2	3	4	5
041403 Peripheral Pulses	1	2	3	4	5
041404 Apical Heart Rate	1	2	3	4	5
041405 Heart Rhythm	1	2	3	4	5
041406 Respiratory Rate	1	2	3	4	5*
041407 Respiratory Rhythm	1	2	3	4	5*
041411 Cardiac Index	1	2	3	4	5
041412 Oxygen Saturation (SpO2)	1	2	3	4	5*

Note. NOC outcome and indicators based on Moorhead et al. (2020). *Intubated and mechanically ventilated patient.

Pulses (041403) and the normalization of Cardiac Rhythm (041405) served as the primary clinical markers for the restoration of adequate tissue perfusion and cardiac output.

Respiratory Management in the Intubated Patient

As detailed in Table 3, indicators for Respiratory Rate (041406), Respiratory Rhythm (041407) and Oxygen Saturation (041412) were assessed within the context of an intubated and mechanically ventilated patient. In the immediate post ROSC phase, maintaining an SpO2 score of 5 (No deviation) was achieved through precise nursing management of ventilator settings and continuous capnography monitoring. The nurse's role was pivotal in ensuring that mechanical ventilation effectively compensated for impaired respiratory function, thereby preventing secondary hypoxic organ damage.

Clinical Significance of Standardized Monitoring

The use of a 5 point Likert scale to measure Cardiac Index (041411) and other hemodynamic variables allowed the surgical and anesthesia teams to maintain a real-time assessment of the patient's status. For the professional nurse, these NOC indicators are not merely numerical data

but essential tools for clinical decision-making. By identifying early "Substantial" or "Moderate" deviations (Scores 2–3), the nurse can initiate immediate corrective actions, such as the titration of vasoactive infusions or alerting the anesthesia team, ensuring patient safety during the high risk transition from the operating room to the PACU or ICU.

Follow-up and Functional Recovery

In the subsequent days, following ventilator weaning, the discontinuation of vasopressors (amines), and the removal of the Intra-Aortic Balloon Pump (IABP), the patient regained phonatory capacity, which was initially delayed. In the following weeks, the patient resumed mobilization to a chair, demonstrating full motor recruitment across all four limbs and the absence of neurological deficits. Ultimately, the patient achieved a complete recovery of Activities of Daily Living (ADLs).

Discussion

The identification of the NANDA-I nursing diagnosis "Risk for Compromised Cardiovascular Function (00311)" proved to be pivotal in the perioperative context. In accordance with

current literature (Herdman et al., 2024), "risk-type" diagnoses empower nurses to implement proactive clinical surveillance. In the present case, diagnostic accuracy facilitated the anticipation of the SCA event, allowing for a seamless transition from routine nursing care to active emergency management. Previous studies (Lopes et al., 2020) emphasize that the implementation of standardized nursing languages reduces clinical ambiguity in high-complexity environments, such as the operating room.

The fundamental principles of cardiac arrest management, such as early defibrillation and the delivery of high-quality CPR, remain constant requirements in both IHCA and OHCA settings. Within the hospital environment, the immediate availability of qualified personnel and specialized equipment provides a critical window for rapid arrest recognition and the timely initiation of treatment (Soar et al., 2021). In this scenario, the swift transition from recognizing vital sign derangements to commencing high-quality CPR and initiating etiological treatment (identifying the "4 Hs and 4 Ts") is not merely desirable but absolutely essential for patient survival (Al-Dury et al., 2017; Bircher et al., 2019; Haywood et al., 2018; Italian Resuscitation Council, 2021; Soar et al., 2021; Thorén et al., 2020; Yow et al., 2025).

The implementation of the NIC interventions Emergency Management (6200) and Defibrillator Management (4095) aligns with the international gold standards established by the American Heart Association (AHA) and the European Resuscitation Council (ERC). However, the NIC taxonomy adds significant value by operationalizing specific nursing activities, such as "minimizing interruptions in chest compressions" and "ensuring safety during shock delivery." The standardization of these activities ensures coordinated action within the perioperative team, thereby reducing response times a critical factor in achieving the Return of Spontaneous Circulation (ROSC) (Soar et al., 2021).

The surgical suite represents an ideal environment to maximize every link in the Chain of Survival, provided that the first link - "recognition" - is robust. Mere monitor activation is insufficient; instead, the proactive interpretation of clinical trends is essential. Unlike a general ward, the operating room benefits from the immediate presence of a highly qualified team. The challenge lies in transforming

this personnel into a cohesive and reactive crisis team whose objective is to act within the "Golden Minute" of the arrest. If the rhythm is shockable, the defibrillator must be immediately accessible and pads applied within seconds (Bircher et al., 2019; Italian Resuscitation Council, 2021; Soar et al., 2021; Thorén et al., 2020; Yow et al., 2025), despite the objective challenges of the surgical field, where patient positioning and surgical access may hinder high-quality CPR.

The proposed nursing care plan serves as a streamlined management tool, allowing nurses to standardize interventions for patients experiencing intraoperative SCA, which are subsequently evaluated based on the criteria established by the plan itself.

The use of the outcome "Cardiopulmonary Status (0414)" enabled a quantitative and objective evaluation of patient recovery. The sensitivity of the NOC indicators, measured via a 5-point Likert scale, proved effective in tracking hemodynamic fluctuations in real time. The progression of scores from 1 (Severe deviation) to 5 (No deviation) transcends mere numerical data; it represents a validated outcome measure documenting the effectiveness of nursing care. Research by Moorhead et al. (2020) confirms that NOC indicators are robust tools for measuring patient safety and the efficacy of mechanical ventilation during the post-resuscitation phase.

A notable strength of this work lies in its originality within the Italian scientific landscape. To date, there are no published case reports in Italy that have systematically and integrally employed the NANDA-I, NOC, and NIC taxonomies for the management of perioperative cardiac arrest. This study, therefore, serves as an innovative contribution aimed at filling a methodological gap in the nursing documentation of intraoperative emergencies within the national context. Such an approach moves beyond the simple description of technical maneuvers, instead highlighting clinical reasoning and the measurability of Nursing Sensitive Outcomes (NSOs).

Study Limitations

Despite the clinical relevance of this case, several methodological and operational limitations were identified:

- Deviation from Advanced ALS Protocols: first, it is noted that the "three shock

strategy" was not implemented. This approach is recommended by international guidelines for witnessed cardiac arrests with documented ventricular fibrillation in patients already under continuous monitoring (Al-Dury et al., 2017; Bircher et al., 2019; Haywood et al., 2018; Italian Resuscitation Council, 2021; Soar et al., 2021; Thorén et al., 2020; Yow et al., 2025).

- **Nature of the Case Report:** as this is a single case study within a specific perioperative setting, the findings describe an individual clinical progression. Therefore, the results cannot be statistically generalized to a broader population or different clinical contexts.
- **Subjectivity in Outcome Measurement (NOC):** although the Nursing Outcomes Classification provides a standardized framework, the assignment of scores on the 5-point Likert scale is partially influenced by the clinical judgment and expertise of the evaluating nurse. This element introduces a potential degree of inter-observer variability that could not be rigorously controlled in this study.
- **Training Gap and Simulation:** there was an absence of prior specific high fidelity simulation training within the operating room for crisis scenarios. Simulation based education remains a crucial investment to ensure team cohesion and patient safety during low frequency, high acuity events (Zanini, 2015).

In addition to the points raised above, it is necessary to emphasize that, according to Carpenito's Bifocal Model, the management of Sudden Cardiac Arrest falls within the domain of Collaborative Problems. In this context, the nurse does not operate with full diagnostic autonomy, as the event is a clinical complication requiring interdisciplinary management and prescriptive medical protocols.

The adoption of the nursing diagnosis "Risk for Compromised Cardiovascular Function (00311)" was not intended to define the cardiac arrest itself an event that falls outside the NANDA-I taxonomies as it is a medical diagnosis but rather served as a methodological tool to structure "proactive clinical surveillance."

The implementation of the NNN system allowed the "autonomous component" of nursing care to be rendered visible: while the

team managed the collaborative problem of the arrest, the taxonomic structure guided the nurse in monitoring premonitory signs, preventing recurrence and quantitatively evaluating the patient's functional recovery. This distinction is fundamental to understanding how standardized language does not limit nursing action to the mere execution of protocols but instead elevates it to a critical and documentable decision-making process.

Implications for Nursing Practice

Despite the identified limitations, this clinical case underscores the significant clinical utility of the NNN linkage in enhancing the safety and quality of perioperative care. The primary implication for practice lies in the capacity of standardized terminologies to operationalize complex clinical reasoning during life-threatening events. By providing a structured "common language", this framework bridges the communication gap between various surgical units, ensuring that critical patient data are not lost during clinical handoffs.

Furthermore, the systematic use of NOC indicators allows the clinical nurse to transform subjective observations into objective, measurable outcomes, thereby rendering the impact of nursing interventions "visible" to the entire multidisciplinary team. Finally, this model serves as a valuable tool for nursing education and simulation, training operating room nurses to transition seamlessly from the surveillance phase to active resuscitation within a scientifically validated methodological framework.

Conclusions

The effective management of an intraoperative SCA requires not only rapid technical proficiency but also a structured framework for clinical reasoning. This case report illustrates how the strategic integration of the NNN taxonomies provides a robust and comprehensive roadmap to guide nurses in managing high risk emergencies, both in the operating room and the PACU.

Through the application of this triple linkage, the nursing process transcends mere task-oriented interventions, operationalizing the nurse's complex cognitive workload and making

their unique contribution to patient survival measurable. The outcome indicators employed in this care plan reflected significant physiological stabilization of vital functions following the resuscitative phase, documenting the transition from severe clinical deviation to hemodynamic stability. This case demonstrates that a standardized nursing knowledge framework optimizes continuity of care and enhances decision-making during critical transitions.

In conclusion, this case represents one of the first contributions within the Italian context to document the efficacy of the NNN standardized language in managing critical intraoperative events. The originality of this methodological approach provides a benchmark for the standardization of advanced nursing care and for future research on nursing sensitive outcomes in Italy.

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References

- Al-Dury, N., Rawshani, A., Israelsson, J., Strömsöe, A., Chapman, M. G., Herlitz, J., & Djärv, T. (2017). Characteristics and outcome among 14,933 adult cases of in-hospital cardiac arrest: A nationwide study with the emphasis on gender and age. *The American Journal of Emergency Medicine*, 35(12), 1839–1844. <https://doi.org/10.1016/j.ajem.2017.06.012>
- Andersen, L. W., Holmberg, M. J., Berg, K. M., Donnino, M. W., & Granfeldt, A. (2019). In-hospital cardiac arrest: A review. *JAMA*, 321(12), 1200–1210. <https://doi.org/10.1001/jama.2019.1696>
- Bircher, N. G., Chan, P. S., & Xu, Y. (2019). Delays in cardiopulmonary resuscitation, defibrillation, and epinephrine administration all decrease survival in in-hospital cardiac arrest. *Anesthesiology*, 130(3), 414–422. <https://doi.org/10.1097/ALN.0000000000002563>
- Butcher, H. K., Bulechek, G. M., Dochterman, J. M., & Wagner, C. M. (2020). *Classificazione NIC degli interventi infermieristici* (L. A. Rigon, Ed.; 3^a ed. it.). Casa Editrice Ambrosiana.
- Carpenito, L. J. (2021). *Diagnosi infermieristiche: Applicazione alla pratica clinica* (7^a ed. it.). Casa Editrice Ambrosiana.
- ESC Scientific Document Group. (2023). 2022 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death. *Giornale Italiano di Cardiologia*, 24(3 Suppl 1), 1–132. <https://doi.org/10.1714/3973.39515>
- Gräsner, J. T., Herlitz, J., Tjelck, M. S., Wnent, J., Masterson, S., Lilja, G., Bein, B., Böttiger, B. W., Rosell-Ortiz, F., Maurer, H., & Bossaert, L. (2021). European Resuscitation Council Guidelines 2021: Epidemiology of cardiac arrest in Europe. *Resuscitation*, 161, 61–79. <https://doi.org/10.1016/j.resuscitation.2021.02.007>
- Haywood, K., Whitehead, L., Nadkarni, V. M., Achana, F., Beesems, S., Böttiger, B. W., Brooks, A., Castrén, M., Ong, M. E. H., Hazinski, M. F., Koster, R., Morley, P., Perkins, G. D., Scanlon, N., Scholefield, B., Skrifvars, M., Smyth, M., Tjelmeland, I., & Nolan, J. P. (2018). COSCA (Core Outcome Set for Cardiac Arrest) in adults: An advisory statement from the International Liaison Committee on Resuscitation. *Circulation*, 137(22), e783–e801. <https://doi.org/10.1161/CIR.0000000000000562>
- Herdman, H. T., Kamitsuru, S., & Lopes, C. T. (2024). *NANDA-I diagnosi infermieristiche: Definizioni e classificazione 2024–2026* (13^a ed.). Casa Editrice Ambrosiana.
- Italian Resuscitation Council. (2021). *ALS - Advanced Life Support: Edizione italiana linee guida ERC 2021*.
- Lopes, C. T., Jensen, R., & Herdman, T. H. (2020). Standardized nursing terminologies: Use in clinical practice. *Revista Brasileira de Enfermagem*, 73(Suppl 5), e20190547. <https://doi.org/10.1590/0034-7167-2019-0547>
- Moorhead, S., Swanson, E., Johnson, M., & Maas, M. L. (2020). *Classificazione NOC dei risultati infermieristici: Misurazione dei risultati di salute* (L. A. Rigon, Ed.; 3^a ed. it.). Casa Editrice Ambrosiana.
- Soar, J., Böttiger, B. W., Carli, P., Couper, K., Deakin, C. D., Djärv, T., Lott, C., Olasveengen, T., Paal, P., Pellis, T., Perkins, G. D., Sandroni, C., Skrifvars, M. B., Smith, G. B., Sunde, K., & Nolan, J. P. (2021). European Resuscitation Council Guidelines 2021: Adult advanced life support. *Resuscitation*, 161, 115–151. <https://doi.org/10.1016/j.resuscitation.2021.02.010>
- Thorén, A., Rawshani, A., Herlitz, J., Engdahl, J., Kahan, T., Gustafsson, L., & Djärv, T. (2020). ECG-monitoring of in-hospital cardiac arrest and factors associated with survival. *Resuscitation*, 150, 130–138. <https://doi.org/10.1016/j.resuscitation.2020.03.002>
- Yow, A. G., Rajasurya, V., & Ahmed, I. (2025). *Sudden cardiac death*. In StatPearls. StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/books/NBK507854/>
- Zanini, L. (2015). *Fare formazione nei contesti di prevenzione e cura*. Pensa MultiMedia.