

Role of medical-surgical nurses in emergency situations: Cardiac arrest, shock, or trauma. Including quick decision-making, teamwork, and use of emergency protocols

Manmeet Kaur^{1*}, Navdeep Singh², Shiwani Kumari³

^{1*}Associate Professor, University College of Nursing Faridkot, Punjab, India

²Principal, Indus College of Nursing, Khanda Kheri, Hansi, Haryana, India

³Nursing Tutor, Indus College of Nursing, Khanda Kheri, Hansi, Haryana, India

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Abstract:

Medical-surgical nurses play a pivotal role in managing emergency situations such as cardiac arrest, shock, and trauma, where timely interventions and clinical expertise are essential for improving patient outcomes. This article explores the multifaceted responsibilities of nurses in acute care settings, emphasizing rapid assessment, prompt decision-making, and adherence to standardized emergency protocols. Effective management of cardiac arrest requires immediate initiation of resuscitation measures and coordinated team response, while shock management demands early identification and targeted interventions to restore tissue perfusion. Trauma care involves systematic evaluation and stabilization using structured approaches such as primary and secondary surveys. The article further highlights the importance of interprofessional teamwork, communication strategies, and the integration of advanced technologies in enhancing emergency care delivery. Challenges such as high workload, stress, and resource limitations are also discussed, along with strategies to improve nursing practice through continuous education, simulation training, and evidence-based approaches.

Keywords:

Medical-Surgical Nursing, Emergency Care, Cardiac Arrest, Shock Management, Trauma Care, Clinical Decision-Making, Teamwork, Emergency Protocols, Acute Care Nursing, Patient Outcomes.

1. Introduction:

Medical-surgical nurses play a critical role in managing emergency situations such as cardiac arrest, shock, and trauma, where rapid clinical judgment, coordinated teamwork, and strict adherence to emergency protocols significantly influence patient survival and recovery outcomes. Contemporary evidence highlights that timely interventions and structured care pathways are directly associated with improved resuscitation and post-event outcomes (AHA et al., 2022). These nurses function as frontline responders who continuously monitor patient status and detect early deterioration, enabling immediate escalation of care and prevention of irreversible complications (Weegenaar et al., 2024). Their role extends to integrating advanced clinical reasoning with rapid prioritization in high-pressure environments where seconds determine outcomes, especially in cases of cardiac arrest where early recognition and initiation of life-saving interventions significantly increase survival rates (Schober et al., 2024). In addition, medical-surgical nurses contribute to the management of shock by identifying hemodynamic instability and implementing targeted interventions such as fluid resuscitation, vasopressor administration, and continuous monitoring, which are essential to restoring tissue perfusion and preventing multi-organ failure (Jung et al., 2024). Their involvement in trauma care includes rapid assessment, airway stabilization, hemorrhage control, and coordination with multidisciplinary teams to ensure timely surgical or critical care interventions (Perkins et al., 2024). The complexity of these emergency scenarios requires nurses to exhibit not only technical competence but also cognitive flexibility, as they must interpret evolving clinical data and make quick, evidence-based decisions under uncertainty (Martínez León et al., 2024). Furthermore, effective communication and teamwork are fundamental components of emergency response, as nurses act as central

coordinators who facilitate information exchange among healthcare professionals, ensuring seamless and synchronized care delivery (Weegenaar et al., 2024). Adherence to standardized emergency protocols such as advanced life support algorithms enhances consistency and reduces variability in care, thereby improving patient safety and clinical outcomes (Schober et al., 2024). Nurses also play a pivotal role in identifying reversible causes of deterioration, particularly in trauma and cardiac arrest scenarios where targeted interventions can significantly alter prognosis (Perkins et al., 2024). The integration of technology such as real-time monitoring systems and decision-support tools further supports nurses in delivering accurate and timely interventions in emergency settings (OpenStax et al., 2023). Despite these advancements, emergency nursing practice is often challenged by high workload, emotional stress, and resource limitations, which can impact performance and patient outcomes if not adequately addressed (StatPearls et al., 2023). Therefore, ongoing education, simulation-based training, and adherence to evidence-based guidelines are essential to enhance the preparedness and competence of medical-surgical nurses in emergency care (Puryear et al., 2023).

2. Overview of emergency nursing responsibilities:

Emergency situations require immediate recognition of life-threatening conditions and prompt intervention to prevent irreversible damage or death, and evidence indicates that early identification of patient deterioration significantly improves clinical outcomes and reduces mortality in acute care environments (Oh et al., 2024). Medical-surgical nurses are trained to assess vital signs, identify abnormalities, initiate emergency protocols, and collaborate with multidisciplinary teams, with research emphasizing that clinical decision-making in emergency nursing integrates knowledge, experience, and situational awareness to ensure patient safety (Saharuddin et al., 2024). They must maintain situational awareness while prioritizing care based on severity and available resources, and this integrated process is visually represented in Figure 1, where assessment, intervention, communication, and evaluation are interconnected within an acute care response system (Saharuddin et al., 2025). The ability to manage high-acuity patients requires competence in triage systems and rapid prioritization, which are essential for determining the urgency of care and allocating resources effectively (Considine et al., 2024). Furthermore, emergency nursing practice demands resilience and adaptability, as studies demonstrate that nurses working in high-pressure environments must maintain performance despite stress, workload, and emotional challenges (Vaisi-Raygani et al., 2025). Rapid assessment techniques such as structured trauma evaluation allow nurses to quickly identify life-threatening injuries and initiate immediate interventions within critical time frames (Pollak et al., 2022). In addition, the development of clinical reasoning skills enables nurses to make accurate judgments under uncertainty, ensuring that interventions are both timely and evidence-based (Sari et al., 2024). Effective emergency care also depends on adherence to established protocols and guidelines, which standardize care processes and reduce variability in clinical practice (Marett et al., 2024). Nurses play a central role in coordinating care, communicating critical information, and ensuring that all team members are aligned in their response to emergencies, which enhances efficiency and patient outcomes (Saharuddin et al., 2024).

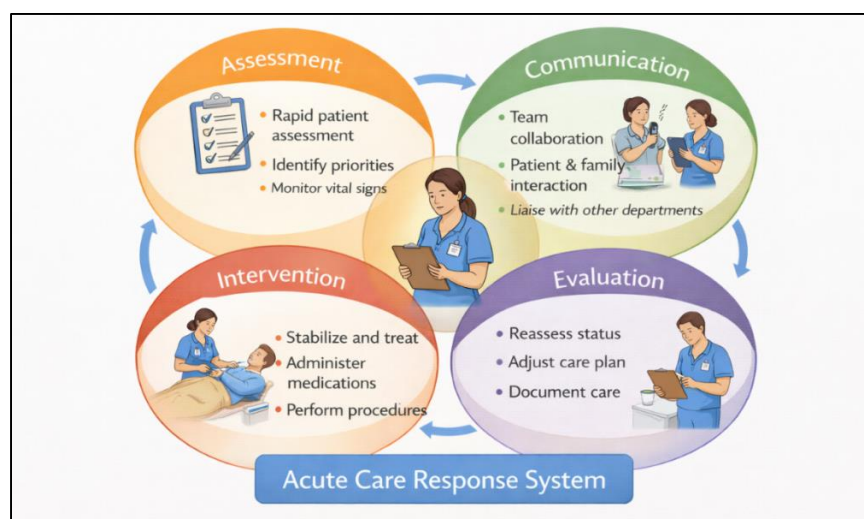


Figure. 1: Conceptual overview of emergency nursing responsibilities illustrating assessment, intervention, communication, and evaluation processes integrated within acute care response systems

The increasing complexity of healthcare systems further necessitates the optimization of nursing roles in decision-making processes, highlighting the importance of continuous training and policy support in emergency settings (Saharuddin et al., 2025).

Additionally, advanced practice nurses contribute significantly to emergency care through their ability to manage complex cases and make independent clinical decisions that influence patient disposition and treatment pathways (Jennings et al., 2024). The integration of technology and monitoring systems supports nurses in detecting subtle physiological changes, enabling earlier interventions and improved patient outcomes (Oh et al., 2024). Moreover, the dynamic nature of emergency situations requires continuous reassessment and adjustment of care plans, ensuring that interventions remain aligned with the patient's evolving condition (Considine et al., 2024). Nurses must also demonstrate strong communication skills to effectively convey patient status and coordinate with healthcare teams, which is critical for maintaining continuity of care during emergencies (Saharuddin et al., 2024).

3. Cardiac Arrest Management:

Cardiac arrest represents a critical emergency where cessation of cardiac activity leads to loss of circulation and oxygen delivery to vital organs, and it is widely defined as a sudden event characterized by unresponsiveness, absence of normal breathing, and lack of circulation requiring immediate intervention to prevent death (Patel et al., 2023). Medical-surgical nurses are responsible for early recognition of cardiac arrest through monitoring changes in heart rhythm, responsiveness, and breathing patterns, and recent studies highlight that timely identification and rapid response significantly improve survival outcomes in both in-hospital and out-of-hospital settings (Turra et al., 2024).

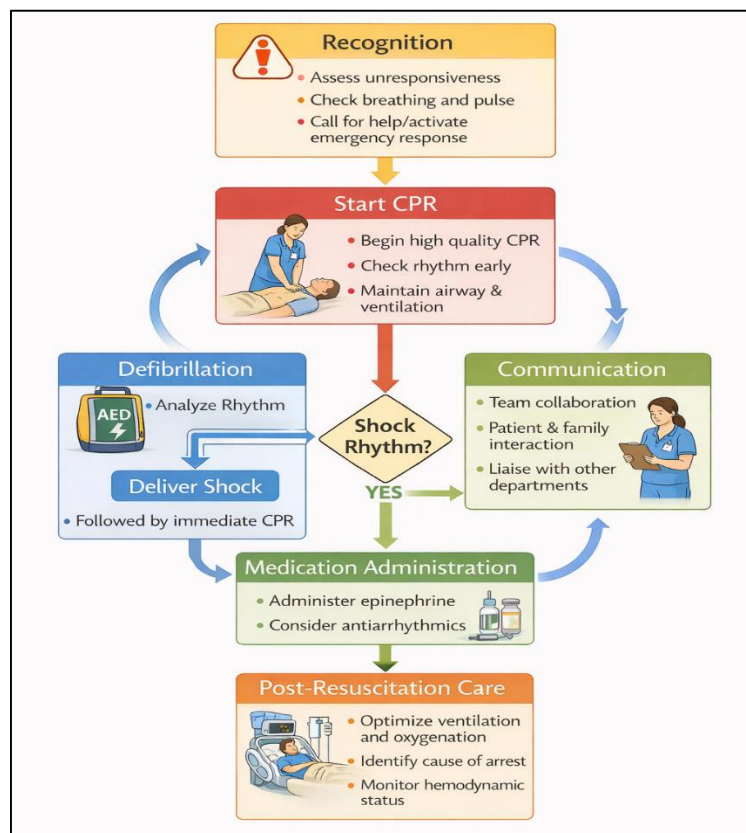


Figure 2: Algorithmic representation of cardiac arrest management including recognition, CPR initiation, defibrillation, medication administration, and post-resuscitation care phases

Immediate initiation of cardiopulmonary resuscitation and activation of code blue protocols are essential components of nursing intervention, as high-quality chest compressions and early defibrillation are strongly associated with increased return of spontaneous circulation and survival rates (Hirsch et al., 2024). The structured sequence of these actions is outlined in Figure 2, which demonstrates the progression from recognition to post-resuscitation care, reflecting current evidence-based algorithms used in clinical practice (May et al., 2024). Nurses

must also operate defibrillators effectively, ensuring correct pad placement and timely delivery of shocks in shockable rhythms, which plays a crucial role in restoring cardiac rhythm and improving patient prognosis (Memenga et al., 2024). In addition, the administration of medications such as epinephrine and antiarrhythmics is a key responsibility, and pharmacological management remains a vital component of advanced life support aimed at optimizing cardiac output and perfusion (Singh et al., 2024). Accurate and timely documentation during resuscitation is equally important, as it ensures continuity of care, supports clinical decision-making, and provides legal and quality assurance records for healthcare institutions (Hirsch et al., 2024). Furthermore, post-resuscitation care requires nurses to monitor neurological status, maintain hemodynamic stability, and prevent secondary complications such as hypoxia and organ dysfunction, which are critical determinants of long-term outcomes (Southern et al., 2024). The complexity of cardiac arrest management also demands strong teamwork and communication skills, as nurses collaborate with physicians and other healthcare professionals to coordinate interventions efficiently and reduce delays in treatment (May et al., 2024). Continuous education and simulation training have been shown to enhance nurses' competence and confidence in managing cardiac arrest scenarios, thereby improving adherence to protocols and patient outcomes (Turra et al., 2024). Technological advancements, including monitoring devices and decision-support systems, further assist nurses in detecting early signs of deterioration and guiding interventions during resuscitation efforts (Memenga et al., 2024).

4. Shock Management:

Shock is a life-threatening condition characterized by inadequate tissue perfusion and oxygenation resulting in cellular hypoxia and organ dysfunction, and it is widely recognized as a state of circulatory failure that can rapidly progress to irreversible damage if not managed promptly (Koya et al., 2023). Medical-surgical nurses must identify different types of shock including hypovolemic, cardiogenic, distributive, and obstructive shock, each of which has distinct causes and management strategies that guide targeted clinical interventions (Blumlein et al., 2022). Hypovolemic shock results from significant fluid or blood loss, cardiogenic shock arises from impaired cardiac function, distributive shock involves abnormal vasodilation, and obstructive shock occurs due to mechanical blockage of circulation, all of which require rapid differentiation for effective management (Nursing Science et al., 2024). Continuous monitoring of hemodynamic parameters such as blood pressure, heart rate, and oxygen saturation is essential in evaluating the severity of shock and guiding therapeutic decisions (Oxford et al., 2024).

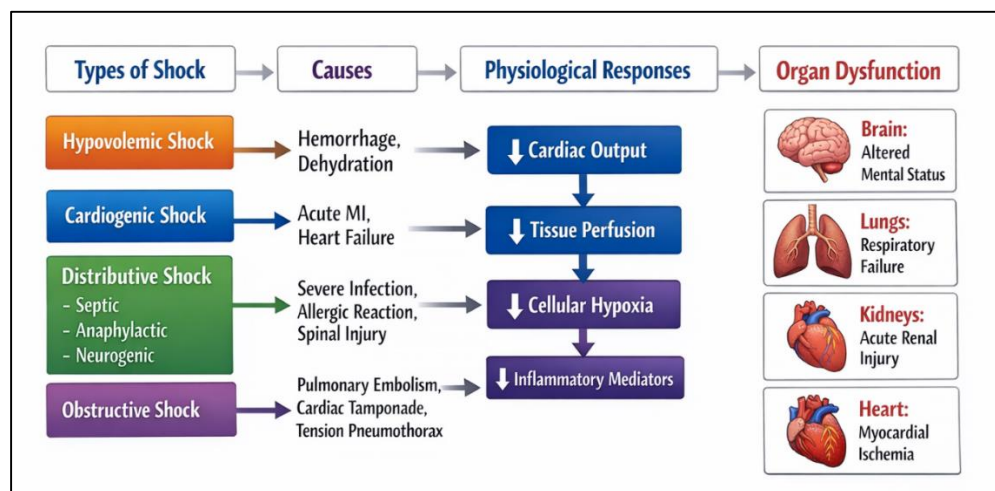


Figure. 3: Classification and pathophysiology of shock demonstrating types, causes, and physiological responses leading to organ dysfunction

Fluid resuscitation remains a cornerstone of treatment, particularly in hypovolemic and distributive shock, where restoring circulating volume is critical for improving tissue perfusion (IEM et al., 2023). Oxygen therapy is also fundamental in managing shock, as it enhances oxygen delivery to tissues and helps prevent further cellular damage and organ failure (Anaesthesia Intensive Care et al., 2023). Medication administration, including vasopressors and inotropes, plays a vital role in stabilizing patients by improving vascular tone and cardiac output, particularly in severe or refractory cases (Amato et al., 2025). The classification and underlying pathophysiological mechanisms are depicted in Figure 3, which helps in understanding how different forms of shock lead to organ

dysfunction through mechanisms such as decreased cardiac output, altered vascular resistance, and impaired oxygen utilization (StatPearls et al., 2023). Nurses also play a key role in preventing progression by recognizing early warning signs such as hypotension, tachycardia, and altered mental status, which are indicators of compensatory mechanisms and impending decompensation (Nursing Science et al., 2024). Early recognition and timely intervention are critical, as shock progresses through stages from compensated to irreversible, with increasing risk of multiorgan failure and death if untreated (Koya et al., 2023). In emergency and critical care settings, nurses are integral members of the multidisciplinary team, contributing to assessment, intervention, and continuous monitoring to ensure optimal patient outcomes (Turkish Journal Emergency et al., 2023). The complexity of shock management requires nurses to integrate clinical knowledge, technical skills, and critical thinking to deliver effective and timely care in high-pressure environments (Labrague et al., 2024).

5. Trauma care in emergency situations:

Trauma patients require systematic assessment and immediate stabilization to prevent mortality, and early structured evaluation has been shown to significantly reduce preventable deaths in acute trauma settings by ensuring rapid identification of life-threatening conditions (Planas et al., 2023). Medical-surgical nurses play a central role in trauma care by applying standardized frameworks that prioritize life-saving interventions and ensure no critical injuries are overlooked during initial assessment (Waseem et al., 2023). The primary survey approach, commonly structured as airway, breathing, circulation, disability, and exposure, is widely adopted in trauma care to guide rapid and organized clinical evaluation (American College of Surgeons et al., 2022). This structured evaluation is illustrated in Figure 4, which outlines both primary and secondary survey steps and demonstrates how systematic assessment improves clinical efficiency and patient outcomes during emergency management (Medscape et al., 2022). The airway assessment is the first priority, as airway obstruction remains one of the leading causes of preventable death in trauma patients, requiring immediate intervention to maintain patency and ensure adequate oxygenation (Victorian Trauma System et al., 2023). Following airway stabilization, breathing assessment focuses on identifying respiratory compromise such as pneumothorax or impaired ventilation, which can rapidly lead to hypoxia if not promptly managed (Miao et al., 2025). Circulation assessment involves identifying and controlling hemorrhage, which is a major contributor to trauma-related mortality, and includes monitoring pulse, blood pressure, and signs of shock to guide resuscitation efforts (Royal Children's Hospital et al., 2023). Nurses are actively involved in hemorrhage control measures such as applying pressure, using tourniquets, and assisting with fluid resuscitation to restore circulating volume and prevent further deterioration (Trauma ICU et al., 2023).

Assess symptoms, threats & identify, and address the life threats for remost steps.

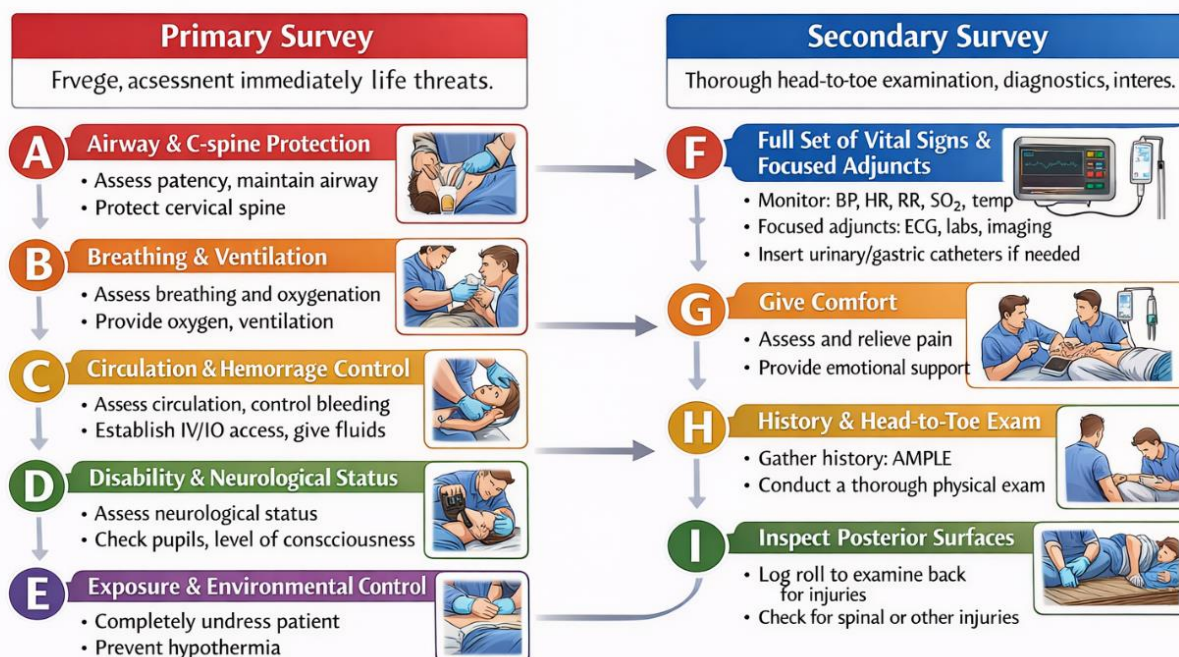


Figure 4: Trauma assessment framework showing primary and secondary survey steps for systematic evaluation and intervention

Disability assessment focuses on neurological status using tools such as the Glasgow Coma Scale, which helps determine the extent of brain injury and guides further interventions (Planas et al., 2023).

Exposure involves fully examining the patient to identify hidden injuries while simultaneously preventing hypothermia, which can worsen outcomes by impairing coagulation and increasing the risk of complications (Waseem et al., 2023). In addition to the primary survey, the secondary survey provides a comprehensive head-to-toe assessment that identifies less obvious injuries once the patient is stabilized, ensuring a thorough evaluation of all body systems (American College of Surgeons et al., 2022).

Medical-surgical nurses assist in controlling hemorrhage, maintaining airway patency, and preparing patients for surgical interventions when necessary, highlighting their essential role in both initial stabilization and ongoing care (Medscape et al., 2022). Effective trauma management also requires strong teamwork and communication, as nurses collaborate with physicians and other healthcare professionals to coordinate care and ensure timely interventions (Victorian Trauma System et al., 2023). Continuous reassessment is a key component of trauma care, as patient conditions can change rapidly, requiring nurses to adapt interventions based on evolving clinical findings (Miao et al., 2025).

Trauma care also involves psychological support for patients and families during critical situations, as emotional distress and anxiety are common in emergency scenarios and can impact recovery (Royal Children's Hospital et al., 2023). The integration of clinical knowledge, technical skills, and rapid decision-making enables medical-surgical nurses to provide effective and timely care in high-pressure environments, ultimately improving patient survival and outcomes in trauma situations (Trauma ICU et al., 2023).

6. Quick decision-making in emergencies:

Rapid decision-making is a cornerstone of emergency nursing practice, requiring nurses to process complex clinical information within seconds to initiate timely and life-saving interventions, and research consistently demonstrates that effective decision-making directly influences patient safety and quality of care in high-acuity environments (Saharuddin et al., 2025). Nurses must interpret clinical data quickly and accurately to initiate timely interventions, and this process involves recognizing cues, analyzing patient information, prioritizing needs, and implementing appropriate actions under pressure (Connor et al., 2022).

The key influencing factors are summarized in Table 1, which integrates elements such as clinical experience, knowledge, communication, and protocol availability within emergency contexts, and studies indicate that these factors significantly shape the quality and speed of clinical decisions (Oh et al., 2024).

Decision-making in emergency settings is inherently dynamic and iterative, as nurses continuously reassess patient conditions and adjust interventions accordingly to ensure optimal outcomes (Mendonça et al., 2026). Clinical experience plays a crucial role in enhancing decision-making abilities, as experienced nurses are more adept at recognizing subtle changes in patient conditions and anticipating potential complications (Levy-Malmberg et al., 2024). Knowledge and evidence-based practice further support decision-making by providing a scientific foundation for selecting appropriate interventions and minimizing errors (Azizi-Fini et al., 2022).

Communication is another critical component, as effective information exchange among healthcare team members ensures coordinated and efficient responses during emergencies (Saharuddin et al., 2024). Protocol availability and adherence also enhance decision-making by offering structured guidelines that standardize care and reduce variability in clinical practice (Alkouri et al., 2023). Furthermore, situational awareness enables nurses to maintain a comprehensive understanding of the clinical environment, allowing them to prioritize interventions based on urgency and available resources (Mousavi Shabestari et al., 2024).

The integration of these factors allows nurses to make rapid and accurate decisions even in highly stressful and unpredictable situations, ultimately improving patient outcomes and reducing complications (Saharuddin et al., 2025). Continuous education and training are essential for enhancing decision-making skills, as they help nurses develop critical thinking, clinical reasoning, and confidence in handling emergency scenarios (Azizi-Fini et al., 2022). In addition, simulation-based learning and real-world experience contribute to the development of intuitive decision-making abilities, enabling nurses to respond effectively to complex clinical situations (Levy-Malmberg et al., 2024).

Table. 1: Factors influencing quick decision-making including clinical experience, knowledge level, communication skills, and availability of protocols integrated within emergency care settings

Factor	Description	Impact on Decision-Making	Clinical Example
Clinical Experience	Practical exposure and hands-on involvement in managing emergency cases	Enhances intuitive judgment and rapid recognition of critical conditions	An experienced nurse identifies shock early and initiates immediate fluid resuscitation
Knowledge Level	Theoretical understanding and awareness of evidence-based practices and guidelines	Improves diagnostic accuracy and selection of appropriate interventions	Application of advanced cardiac life support during cardiac arrest
Communication Skills	Ability to exchange clear, concise, and timely information among healthcare team members	Ensures coordinated care, minimizes errors, and improves response time	Effective handover enables continuity of life-saving interventions
Availability of Protocols	Access to standardized guidelines, algorithms, and institutional policies	Promotes structured and consistent decision-making under pressure	Use of triage protocols during mass casualty incidents to prioritize patients

9. Teamwork and interprofessional collaboration:

Effective teamwork is essential in emergency situations where multiple healthcare professionals work together to achieve optimal outcomes, and strong interprofessional collaboration has been consistently linked to improved patient safety and reduced clinical errors in high-risk environments (Chae et al., 2024). Medical-surgical nurses coordinate with physicians, respiratory therapists, and other team members to ensure seamless care delivery, and studies show that clearly defined roles and shared responsibilities significantly enhance efficiency and clinical performance during emergencies (Kiessling et al., 2022). This collaborative interaction is depicted in Figure 5, which highlights the roles and interconnections among team members in coordinated emergency response, reflecting structured teamwork models used in acute care settings (Alnakhli et al., 2024). Communication tools such as SBAR enhance clarity and reduce misunderstandings, and evidence indicates that standardized communication frameworks improve information transfer, continuity of care, and patient safety in emergency departments (Chaica et al., 2024). Effective teamwork also relies on mutual respect, trust, and shared goals among team members, which are essential for maintaining coordination and preventing breakdowns in communication during critical situations (Williams et al., 2025).

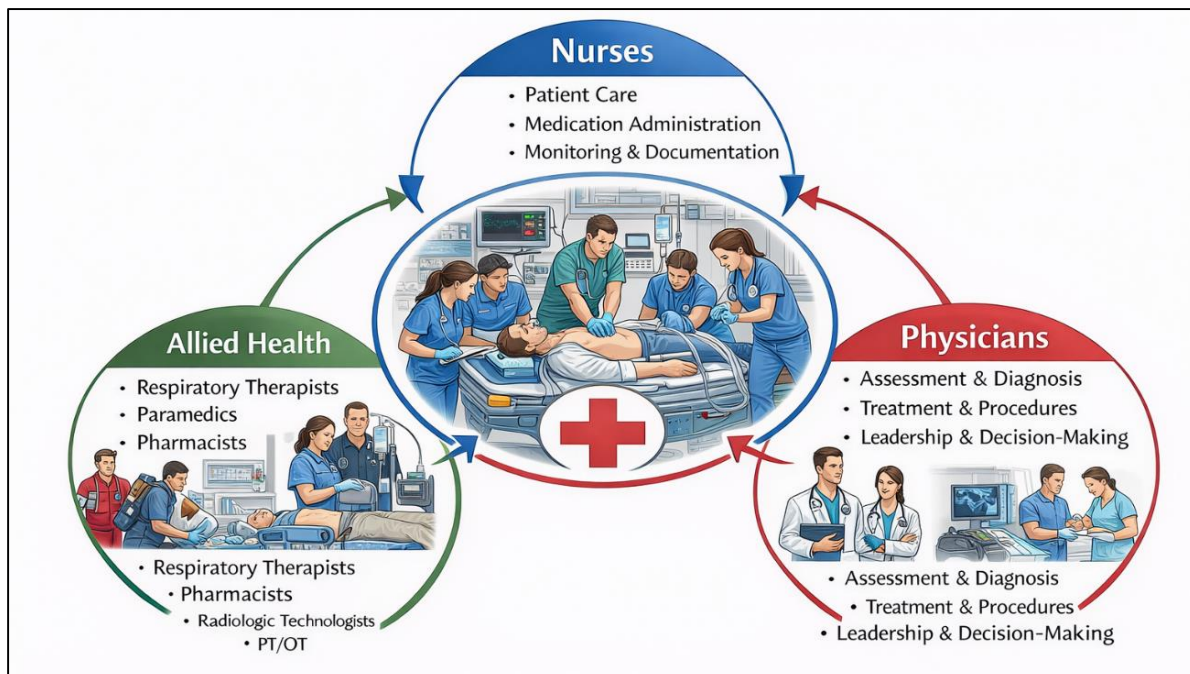


Figure. 5: Interprofessional teamwork model illustrating roles of nurses, physicians, and allied health professionals in coordinated emergency response

Leadership plays a crucial role in guiding team dynamics, as nurse leaders often coordinate tasks, manage workflow, and ensure that all team members are functioning cohesively within rapidly changing clinical environments (NCBI et al., 2023). Role clarity further improves team efficiency by reducing duplication of tasks and ensuring that each team member understands their responsibilities during emergency interventions (Alnakhli et al., 2024). In emergency departments, interprofessional teams must adapt quickly to changing patient conditions, requiring flexibility and continuous communication to maintain effective coordination (Svensson et al., 2022). Poor communication and lack of teamwork have been identified as major contributors to adverse events, highlighting the importance of structured collaboration in preventing errors and improving outcomes (O'Daniel et al., 2022). Additionally, environmental factors such as workload, noise, and time pressure can influence teamwork effectiveness, making it essential for nurses to maintain situational awareness and prioritize communication (O'Daniel et al., 2022). Simulation-based training has been shown to improve teamwork skills, communication, and confidence among healthcare professionals, enabling them to perform more effectively in real-life emergency scenarios (Chae et al., 2024). Continuous education and interprofessional training programs further enhance collaboration by fostering understanding of roles and improving coordination among team members (Williams et al., 2025).

10. Use of emergency protocols:

Emergency protocols provide structured guidelines for managing critical conditions, ensuring that healthcare professionals follow standardized and evidence-based approaches during life-threatening situations, and these protocols have been shown to significantly improve survival rates and clinical outcomes in emergency care settings (American Heart Association et al., 2024). Medical-surgical nurses rely on protocols such as Advanced Cardiac Life Support, Basic Life Support, and trauma care guidelines to standardize interventions and improve patient outcomes, and these protocols are designed to guide step-by-step clinical actions in high-pressure situations where rapid and accurate decisions are essential (ACLS Academy et al., 2024). Advanced Cardiac Life Support protocols include comprehensive interventions such as airway management, defibrillation, medication administration, and identification of reversible causes, which are crucial for managing cardiac emergencies effectively (Vaia et al., 2024). Basic Life Support protocols emphasize early recognition of cardiac arrest, initiation of high-quality cardiopulmonary resuscitation, and timely use of automated external defibrillators, forming the foundation of emergency cardiovascular care (Advanced Medical Certification et al., 2025). Trauma care guidelines provide structured approaches for assessing and stabilizing injured patients, ensuring that life-threatening conditions are addressed systematically and efficiently (American Heart Association et al., 2024).

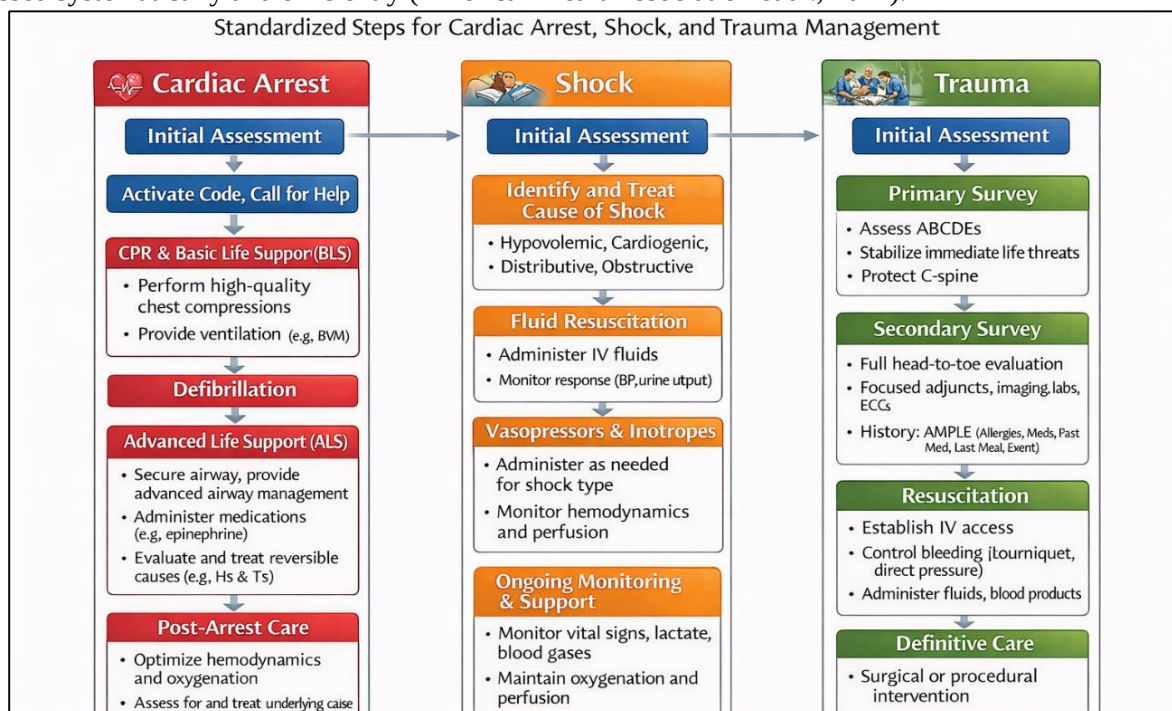


Figure. 6: Flowchart of emergency protocols highlighting standardized steps for cardiac arrest, shock, and trauma management

This structured sequence is clearly outlined in Figure 6, which presents a flowchart of emergency response pathways and demonstrates how standardized protocols guide clinical decision-making and intervention processes across different emergency scenarios (Vaia et al., 2024). Adherence to protocols ensures consistency in care delivery, reducing variability in clinical practice and minimizing the risk of errors during critical interventions (ACLS Academy et al., 2024). Furthermore, protocols support nurses in maintaining a systematic approach to patient care, enabling them to prioritize interventions and manage complex situations effectively even under time constraints (Advanced Medical Certification et al., 2025). The use of standardized guidelines also facilitates communication and coordination among healthcare team members, as all professionals follow the same framework and terminology during emergency responses (American Heart Association et al., 2024). In addition, emergency protocols are continuously updated based on the latest scientific evidence and clinical research, ensuring that healthcare providers are equipped with current best practices for managing critical conditions (ACLS Academy et al., 2024). Nurses play a vital role in implementing these protocols, as they are often the first to recognize patient deterioration and initiate appropriate interventions according to established guidelines (Vaia et al., 2024). The integration of protocols into clinical practice also enhances patient safety by promoting timely and appropriate interventions, reducing delays in treatment, and improving overall quality of care (Advanced Medical Certification et al., 2025).

11. Technological integration in emergency care:

Advancements in technology have enhanced emergency nursing practice through real-time monitoring, electronic health records, and decision-support systems, enabling faster and more accurate clinical decision-making in high-acuity environments (Conforti et al., 2025).

Real-time monitoring systems allow nurses to continuously track patient vital signs and detect early signs of deterioration, which significantly improves timely intervention and patient outcomes in emergency settings (Frontiers et al., 2024). Electronic health records serve as centralized platforms for patient data, facilitating rapid access to medical history, laboratory results, and treatment plans, thereby enhancing clinical efficiency and reducing delays in care delivery (Lacasse et al., 2024).

Medical-surgical nurses utilize these tools to improve accuracy and efficiency in patient care, integrating digital data with clinical judgment to ensure precise and timely interventions (Wei et al., 2025).

Their applications are summarized in Table 2, which outlines key technologies and their clinical roles, demonstrating how digital tools support assessment, monitoring, and intervention processes in emergency care environments (Schwamm et al., 2024).

Decision-support systems provide evidence-based recommendations by analysing patient data in real time, assisting nurses in identifying risks, prioritizing care, and selecting appropriate interventions during emergencies (Lee et al., 2024). These systems enhance patient safety by reducing clinical errors and improving consistency in decision-making across healthcare teams (Springer et al., 2025).

Technology also facilitates communication among healthcare professionals by enabling instant data sharing and coordination, which is critical for effective teamwork in emergency situations (Conforti et al., 2025).

Rapid documentation through digital platforms reduces administrative burden and allows nurses to focus more on direct patient care, improving overall workflow efficiency (Lacasse et al., 2024). In addition, technological strategies such as mobile applications and digital interfaces enhance patient engagement and provide real-time updates, contributing to improved patient experience and satisfaction (Silva et al., 2024).

Artificial intelligence and predictive analytics further enhance emergency nursing by identifying patterns in patient data and predicting potential complications, enabling proactive interventions (Frontiers et al., 2024).

Continuous advancements in digital health technologies are transforming emergency care delivery, making it more efficient, accurate, and patient-centered, while supporting nurses in managing complex clinical situations effectively (Conforti et al., 2025).

Table 2: Technological tools used in emergency nursing including monitoring devices, electronic records, and decision-support systems with their clinical applications

Technological Tool	Description	Clinical Application	Benefit in Emergency Care
Monitoring Devices	Includes cardiac monitors, pulse oximeters, blood pressure monitors, and ventilators used for continuous patient assessment	Real-time tracking of vital signs such as heart rate, oxygen saturation, and respiratory status	Enables early detection of deterioration and prompt intervention
Electronic Health Records (EHRs)	Digital systems for storing and accessing patient medical history, medications, and clinical data	Quick retrieval and documentation of patient information during emergencies	Improves accuracy, reduces duplication, and enhances continuity of care
Decision-Support Systems	Computer-based tools that assist clinicians with evidence-based recommendations and alerts	Guides clinical decisions such as drug dosing, diagnosis support, and risk assessment	Enhances clinical judgment, reduces errors, and supports standardized care
Telehealth Technologies	Use of remote communication tools such as video consultations and mobile health platforms	Facilitates remote assessment and specialist consultation in emergency situations	Expands access to care and enables timely expert input
Automated Medication Systems	Includes smart infusion pumps and automated dispensing units	Ensures accurate medication administration and dosage control	Reduces medication errors and improves patient safety
Communication Systems	Includes pagers, mobile apps, and hospital communication platforms	Supports rapid coordination among emergency team members	Improves teamwork, response time, and workflow efficiency

12. Challenges faced by medical-surgical nurses:

Emergency situations present numerous challenges including high patient acuity, limited resources, and emotional stress, and these factors collectively contribute to increased complexity in clinical decision-making and patient management in acute care environments (Wang et al., 2024). Nurses must manage these challenges while maintaining quality care, and studies show that high workload and time pressure significantly impact performance and increase the risk of errors in emergency settings (Subih et al., 2024). These multifactorial issues are illustrated in Figure 7, which highlights workload, stress, resource constraints, and emotional burden, demonstrating how interconnected challenges influence nursing practice and patient outcomes (Liang et al., 2025). High patient acuity requires nurses to deliver intensive and continuous care, often involving critically ill patients with rapidly changing conditions that demand constant monitoring and intervention (Pan et al., 2025). Limited resources, including staffing shortages and inadequate equipment, further exacerbate these challenges by increasing workload and reducing the capacity to provide optimal care (Öztürk Yıldırım et al., 2024). Emotional stress is another significant factor, as nurses are frequently exposed to trauma, suffering, and life-threatening situations that can affect their psychological well-being and job performance (Alshammari et al., 2025). Burnout and fatigue are common consequences of prolonged exposure to such stressors, with research indicating that a substantial proportion of emergency nurses experience emotional exhaustion and reduced professional efficacy (Liang et al., 2025). Fatigue resulting from long shifts and high patient loads can impair cognitive function, decision-making, and attention, thereby increasing the likelihood of clinical errors and compromising patient safety (Subih et al., 2024). Compassion fatigue is also prevalent among emergency nurses, arising from repeated exposure to patient suffering and emotional demands, which can lead to decreased empathy and reduced quality of care (Pan et al., 2025). The combination of physical, emotional, and organizational stressors creates a challenging work environment that

requires nurses to demonstrate resilience, adaptability, and effective coping strategies (Barnard et al., 2025). Supportive work environments play a crucial role in mitigating these challenges, as organizational support, adequate staffing, and access to mental health resources can significantly reduce stress and improve job satisfaction (Wang et al., 2024). Effective coping strategies such as stress management training, peer support, and professional counseling are essential for maintaining nurses' well-being and ensuring sustained performance in high-pressure environments (Liang et al., 2025). Leadership and management also play a key role in addressing these challenges by promoting a positive work culture, ensuring adequate resource allocation, and implementing policies that support nurse well-being (Öztürk Yıldırım et al., 2024). Continuous education and training can further enhance nurses' ability to address challenges by improving their clinical skills, confidence, and preparedness for emergency situations (Subih et al., 2024).

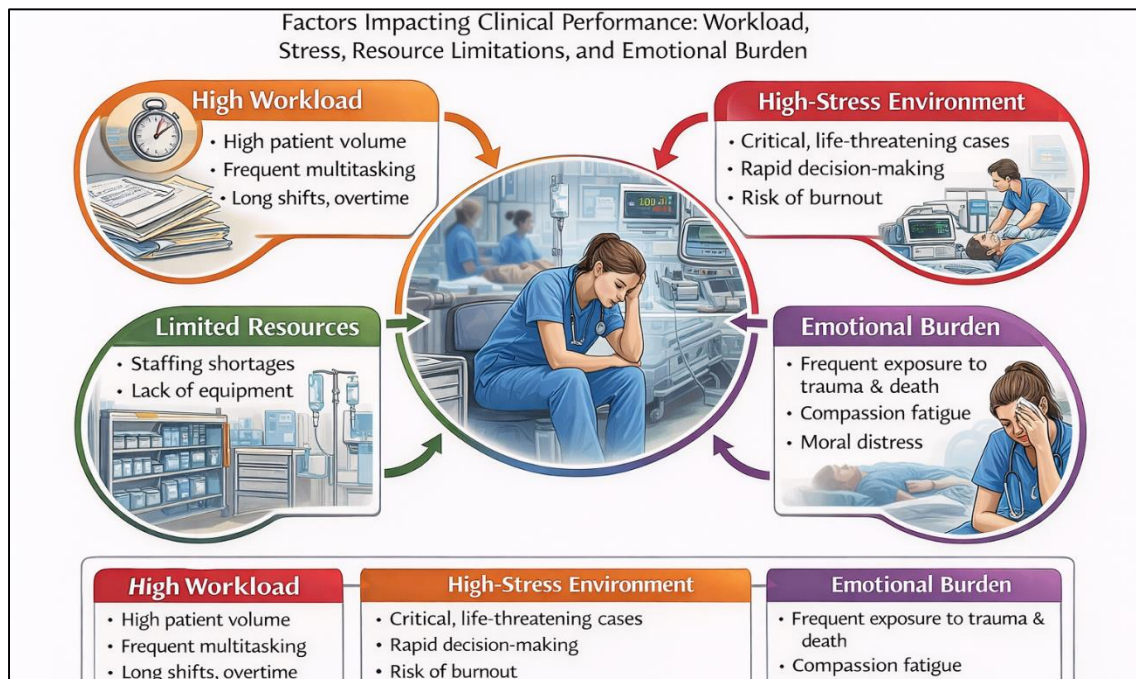


Figure. 7: Challenges in emergency nursing depicting workload, stress, resource limitations, and emotional burden affecting clinical performance

13. Strategies to improve emergency nursing practice:

Continuous education, simulation training, and adherence to evidence-based practices are essential for improving emergency nursing outcomes, as ongoing professional development enhances clinical competence, confidence, and the ability to respond effectively to complex and rapidly changing situations in acute care environments (Wang et al., 2026). Medical-surgical nurses benefit from regular skill updates and interdisciplinary training programs, which ensure that their knowledge remains current and aligned with evolving clinical guidelines and best practices (Tong et al., 2024). Simulation-based training has emerged as a highly effective educational strategy, enabling nurses to practice critical skills in realistic scenarios without risk to patients, thereby improving clinical performance and preparedness (Chow et al., 2023). These improvement strategies are summarized in Table 3, which integrates training, teamwork, protocol adherence, and technological advancements, illustrating how multiple factors contribute to enhanced emergency care delivery and patient outcomes (Daneshfar et al., 2025). Simulation training also improves decision-making skills, critical thinking, and confidence among nurses, allowing them to manage emergency situations more effectively and with greater accuracy (Kavakli et al., 2024). Interdisciplinary training programs further strengthen collaboration among healthcare professionals by promoting understanding of roles, improving communication, and enhancing teamwork during emergency responses (Kiessling et al., 2022). Adherence to evidence-based practices ensures that clinical interventions are grounded in the latest research, reducing variability in care and improving patient safety and outcomes (Azizi-Fini et al., 2022). Regular training and education programs also help bridge the gap between theoretical knowledge and practical application, enabling nurses to translate evidence into clinical practice effectively (Daneshfar et al., 2025). Leadership support plays a crucial role in facilitating continuous education by providing resources,

encouragement, and opportunities for professional development, which are essential for maintaining high standards of care (Labrague et al., 2024). Organizational policies that prioritize training and competency development contribute to improved preparedness and response efficiency, ensuring that healthcare teams are equipped to handle emergencies effectively (Wang et al., 2026). In addition, the integration of technology into training programs, such as virtual reality and high-fidelity simulation, enhances learning experiences and allows nurses to engage in immersive and interactive educational environments (Tong et al., 2024). Continuous evaluation and feedback mechanisms are also important components of training programs, as they help identify areas for improvement and support ongoing skill development among nurses (Chow et al., 2023).

Table 3: Strategies for improving emergency nursing practice including training programs, protocol adherence, teamwork enhancement, and technological integration

Strategy	Description	Implementation Approach	Expected Outcome
Training Programs	Continuous education and skill development initiatives for emergency nurses	Conduct regular workshops, simulation-based training, and certification courses such as ACLS and BLS	Enhances clinical competence, confidence, and preparedness in emergency situations
Protocol Adherence	Strict following of standardized clinical guidelines and evidence-based practices	Implement checklists, clinical pathways, and regular audits to ensure compliance	Improves consistency of care, reduces errors, and enhances patient outcomes
Teamwork Enhancement	Strengthening collaboration and coordination among multidisciplinary healthcare teams	Promote team-based training, effective communication strategies, and leadership development	Increases efficiency, reduces response time, and improves patient safety
Technological Integration	Incorporation of advanced medical technologies and digital tools in emergency care	Utilize electronic health records, monitoring systems, and decision-support tools in clinical practice	Enhances accuracy, supports quick decision-making, and improves overall care quality

14. Conclusion:

Medical-surgical nurses play an indispensable role in the management of emergency situations such as cardiac arrest, shock, and trauma, where timely intervention, clinical expertise, and coordinated care significantly influence patient outcomes. Their ability to perform rapid assessments, make critical decisions, and implement evidence-based interventions ensures effective stabilization and management of life-threatening conditions. The integration of teamwork, clear communication, and adherence to standardized emergency protocols enhances the efficiency and safety of care delivery in high-pressure environments. Technological advancements and continuous professional development further support nurses in improving accuracy, responsiveness, and overall quality of care. Despite the challenges of high workload, emotional stress, and resource limitations, medical-surgical nurses demonstrate resilience and adaptability in delivering patient-centered care. Strengthening educational programs, promoting supportive work environments, and ensuring access to adequate resources are essential for sustaining their performance and well-being. Overall, the contribution of medical-surgical nurses remains central to emergency care systems, and their role continues to evolve with advancements in healthcare practices, ultimately improving survival rates and enhancing patient recovery in critical situations.

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