



## Standardization of emergency carts in a teaching hospital: experience report

## Padronização de carros de emergência em um hospital de ensino: relato de experiência

## Estandarización de vehículos de emergencia en un hospital universitario: relato de experiencia

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### ABSTRACT

**Objective:** To report the experience of standardizing emergency carts using a structured methodology to optimize the organization of supplies, reduce nonconformities, and enhance safety in emergency care. **Methodology:** Experience report conducted between June 2022 and October 2023 in a public teaching hospital located in southern Brazil, exclusively serving the Brazilian Unified Health System. The process was developed in six structured stages, including situational diagnosis, targeted literature review, planning, implementation, multidisciplinary team training, and follow-up. **Results:** Standardization resulted in uniform organization of materials, improved operational efficiency, and strengthened patient safety through systematic layout structuring, standardized labeling, and reorganization of supplies. **Conclusion:** The experience demonstrated that standardization, combined with management tools and practical training, constitutes an effective strategy to optimize hospital processes and contribute to continuous improvement in healthcare delivery.

### DESCRIPTORS:

Cardiac Arrest; Emergency Equipment; Quality Assurance, Health Care; Hospitals.

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## RESUMO

**Objetivo:** Relatar a experiência de padronização dos carros de emergência, utilizando metodologia estruturada para otimizar a organização dos insumos, reduzir não conformidades e aprimorar a segurança no atendimento emergencial. **Metodologia:** Relato de experiência realizado entre junho de 2022 e outubro de 2023, em hospital público de ensino localizado na região sul do Brasil, com atendimento exclusivo pelo Sistema Único de Saúde. O processo foi desenvolvido em seis etapas estruturadas, incluindo diagnóstico situacional, revisão direcionada da literatura, planejamento, implementação, capacitação da equipe e acompanhamento. **Resultados:** A padronização resultou na uniformização da organização dos materiais, maior eficiência operacional e fortalecimento da segurança do paciente, com sistematização do layout, identificação padronizada e reorganização dos insumos. **Conclusão:** A experiência demonstrou que a padronização, associada a ferramentas de gestão e capacitação prática, constitui estratégia efetiva para otimizar processos hospitalares e contribuir para a melhoria contínua da assistência.

## DESCRIPTORIOS:

Parada Cardíaca; Equipamentos de emergência; Garantia de Qualidade em Cuidados de Saúde; Hospitais.

## RESUMEN

**Objetivo:** Relatar la experiencia de estandarización de los carros de emergencia utilizando una metodología estructurada para optimizar la organización de los insumos, reducir no conformidades y mejorar la seguridad en la atención de emergencias. **Metodología:** Relato de experiencia realizado entre junio de 2022 y octubre de 2023 en un hospital público universitario ubicado en el sur de Brasil, que presta atención exclusivamente al Sistema Único de Salud. El proceso se desarrolló en seis etapas estructuradas, incluyendo diagnóstico situacional, revisión dirigida de la literatura, planificación, implementación, capacitación del equipo multidisciplinario y seguimiento. **Resultados:** La estandarización permitió uniformizar la organización de los materiales, mejorar la eficiencia operativa y fortalecer la seguridad del paciente mediante la sistematización del layout, la identificación estandarizada y la reorganización de los insumos. **Conclusión:** La experiencia demostró que la estandarización, asociada a herramientas de gestión y capacitación práctica, constituye una estrategia efectiva para optimizar los procesos hospitalarios y contribuir a la mejora continua de la atención en salud.

## DESCRIPTORIOS:

Paro Cardíaco; Equipos de Emergencia; Garantía de la Calidad en Atención de Salud; Hospitales.

## INTRODUCTION

In-hospital emergencies are critical situations that demand rapid, coordinated, and safe responses to ensure patient survival and minimize serious complications. Among these emergencies, Cardiopulmonary Arrest (CPA) stands out as one of the main causes of mortality in hospital settings, requiring priority attention from healthcare teams and adequate organization of care resources<sup>(1-2)</sup>.

CPA is characterized by the sudden interruption of blood circulation and respiration, resulting in the cessation of oxygenation of tissues and vital organs. Rapid identification and intervention are fundamental to reversing the situation, involving cardiopulmonary resuscitation (CPR) maneuvers, effective chest compressions, adequate ventilation, medication administration, and electrical defibrillation<sup>(3-4)</sup>. The success of these interventions is directly related to response time, team competence,

and the immediate availability of appropriate materials and equipment, elements that directly impact clinical outcomes and neurological recovery of patients<sup>(5-6)</sup>.

In this context, the emergency cart constitutes a strategic device for patient safety, as it concentrates essential supplies and equipment for the care of CPA and other serious incidents. Failures related to its organization, absence or inadequacy of materials, expired or non-standardized medications constitute care risks and can compromise the effectiveness of the team's actions, reflecting in negative quality and safety indicators<sup>(7-8)</sup>.

The standardization of the emergency cart therefore emerges as a central component of care management, promoting uniformity of layout, systematized identification of drawers and compartments, and functional organization of materials. This measure favors the rapid location of supplies during high-pressure situations, reduces response time, and contributes to the reduction of errors related to the care process<sup>(9-10)</sup>.

Moreover, in teaching hospitals and institutions with high turnover of professionals and students, standardization assumes even greater relevance. The familiarity of the multidisciplinary team with the organization of the cart, especially the Nursing staff, responsible for the systematic checking of materials, and the Pharmacy staff, which is responsible for the control and replenishment of medications, promotes continuity of care, operational efficiency, and patient safety. Despite the relevance of the topic to clinical practice and hospital management, there is a scarcity of reports describing structured standardization methodologies and their implications in the context of teaching hospitals.

Given the above, this article describes the process undertaken by nurses to standardize emergency carts in a hospital, highlighting the application of a structured methodology, the steps implemented, and the results achieved.

## **OBJECTIVE**

To report the experience of nurses in the process of standardization of emergency cars in a public teaching hospital.

## **METHODOLOGY**

### **Study design, site and period**

This is a descriptive study, of the experience report type, which presents the experience of nurses in the process of standardizing emergency carts in a public teaching hospital, located in the Southern Region of Rio Grande do Sul, with exclusive care through the Unified Health System (UHS). The experience took place between June 2022 and October 2023.

The institution is a general hospital with 173 beds, distributed among internal medicine, gynecology and obstetrics, pediatrics, general surgery and surgical specialties, being a regional reference

in clinical and surgical oncology, onco-hematology, chemotherapy, radiotherapy, home care and palliative care.

### **Population and criteria**

Nurses working in the assistance units involved in the standardization of emergency carts participated in the process. Emergency carts in use were considered in the hospitalization units and critical areas of the hospital.

### **Study steps**

The process was developed in six structured and sequential stages: I) Situational Diagnosis, with evaluation of the conditions of emergency carts in the units; II) Literature review, for technical substantiation of standardization; III) Planning, with definition of items, organization and layout; IV) Implementation, with reorganization and adaptation of the carts in the units; V) Training of the multiprofessional team regarding the new standardization; and VI) Follow-up, for monitoring and necessary adjustments after deployment.

### **Data analysis**

The information obtained in the situational diagnosis was compiled from the Checklists, organized in a structured spreadsheet in Microsoft Word®, allowing descriptive analysis and comparison with recommendations from the literature and current guidelines, supporting decisions for standardization.

### **Ethical aspects**

For the use of institutional information, authorization was requested and obtained from the Teaching and Research Management through a letter of consent. Since this is an experience report, without direct involvement of participants or collection of identifiable data, the study was exempt from review by a Research Ethics Committee, according to current regulations.

## **RESULTS**

The standardization of emergency carts was motivated by the identification of challenges faced by nurses during emergency care, especially the lack of uniformity in the organization of materials and equipment. To solve these difficulties, a working group was formed, composed of clinical nurses, a nurse from the Continuing Education Center, and a professor from the Faculty of Nursing.

The standardization was structured in six stages. In Stage I (Situational Diagnosis), the quality tool "Checklist" was used to collect data on non-conformities in emergency carts in 11 care units. Problems such as improper use of seals, lack of verification of essential equipment, disorganization of materials, and lack of control over the expiration dates of medications and solutions were identified. Based on these findings, an action plan for standardization was developed.

Stage II consisted of a bibliographic survey, with a targeted review of the literature and consultation of guidelines and technical documents. A search for scientific publications was carried out in the PubMed, SciELO and Google Scholar databases, in addition to national and international guidelines related to cardiopulmonary resuscitation and the organization of emergency carts. Eight publications were selected that provided theoretical support for the development of the Standard Operating Procedure (SOP), a normative document on the organization and maintenance of emergency carts.

In Stage III (Planning), meetings were held to structure the action plan. A standardized layout was defined, dividing the emergency carts into functional categories: diagnostic assessment, airway control, vascular access and circulatory control, and medications. The organization of the drawers was established by colors and priorities, ensuring quick and safe access to materials. The SOP detailed the responsibilities of the professionals, verification routines and validity control forms.

Stage IV (Implementation) included the formalization of the SOP, its approval by the Quality and Patient Safety Sector, validation by the Nursing Continuing Education Center (NEPE), and official publication on the hospital's institutional page.

Stage V (Multiprofessional Team Training) included theoretical and practical training to ensure adherence to the SOP. Multiplier professionals actively participated in the reorganization of the carts and were trained to lead the dissemination of guidelines among the teams. In total, 113 professionals participated in the training, most of whom were from the nursing team.

In Stage VI (Monitoring), it was found that the initial monitoring strategy by the multipliers was not very effective, leading to the adoption of systematic reviews conducted by the technical group. The non-conformities identified were corrected through on-site training, ensuring alignment with the established guidelines. One year after implementation, a reassessment meeting was held, which found that standardization contributed to greater speed and safety in emergency care, better organization of supplies, and regular implementation of equipment testing. As a sustainability measure, an annual training plan was established due to the high turnover of professionals in the institution.

The results demonstrated that standardizing emergency carts reduced inconsistencies in the organization of materials, improved patient safety, and ensured adequate availability of supplies, positively affecting the efficiency of care in critical situations, as shown in Figure 1.

**Figure 1.** Standardized organization, color-coded identification, and compartmentalization of the emergency cart. Pelotas, Rio Grande do Sul, Brazil.



**Note:** On the left, drawers are identified by material type and corresponding color; in the center, a front view of the cart with standardized numbering; on the right, the internal organization of the medication drawer shows a systematized compartmentalization.

## DISCUSSION

The findings of this study show that standardization of emergency carts is an essential strategy for improving care in critical situations, as it reduces operational failures, optimizes the organization of supplies, and contributes to patient safety. The lack of uniformity in the arrangement of materials and in the checking of equipment, identified in the situational diagnosis, represents a risk factor for emergency care, as it can delay the team's response and compromise the effectiveness of interventions. These findings corroborate previous studies that point to the disorganization of supplies as a factor that negatively impacts the performance of teams in intra-hospital emergencies<sup>(7,9)</sup>.

The literature review enabled the construction of a Standard Operating Procedure (SOP) based on guidelines and good care practices. The adoption of normative documents as a reference in the organization and maintenance of emergency carts is a widely recommended strategy to minimize errors and ensure predictability in care, aligning with patient safety guidelines established by national and international bodies<sup>(6,10)</sup>. The literature also highlights that the implementation of structured protocols favors the adherence of teams to good practices and reduces variations in the execution of procedures, promoting greater standardization in care<sup>(10)</sup>.

Structured planning was crucial for the effectiveness of standardization, as it allowed for the definition of a functional layout and a logical organization of supplies, categorized by priority and function. Studies indicate that the systematic organization of materials and the delimitation of responsibilities within the team improve the clinical response during emergency care, especially in high-stress situations<sup>(7,8)</sup>. In addition, categorizing items according to priority levels favors decision-making and reduces the search

time for critical materials, a key factor for the effectiveness of interventions in cardiopulmonary arrest and other medical emergencies<sup>(8)</sup>.

The training stage was essential to ensure adherence to the new organizational model. The literature demonstrates that theoretical and practical training is fundamental for the internalization of new guidelines and for strengthening the organizational culture focused on patient safety<sup>(9)</sup>. The participation of professionals in the reorganization of emergency carts contributed to the appropriation of changes, which may have positively influenced the observed results. However, the need for a continuous training plan reinforces the importance of ongoing educational strategies, especially in institutions with high staff turnover.

The follow-up proved to be a challenge, as the initial monitoring strategy by multipliers was not effective. This finding is aligned with studies that demonstrate that regular audits and periodic training are fundamental to the sustainability of standardized processes in hospital environments<sup>(5,7,9)</sup>.

The observed results, such as greater agility in emergency care, the reduction of inconsistencies in the organization of materials, and the regular implementation of equipment testing, indicate that standardization contributes significantly to the efficiency and safety of care. In addition, guaranteeing the availability of essential supplies reinforces the importance of systematic organization as a critical component of hospital management.

The findings converge with studies that point to the standardization of emergency carts as a strategy to reduce care failures and strengthen patient safety. Its implementation, however, may face institutional barriers, such as resistance to change and structural limitations<sup>(5,9)</sup>. In the scenario analyzed, the systematized organization favored the work of the team, especially Nursing, qualifying the response to emergencies and impacting the management of the service.

Thus, this study contributes by presenting an applied methodology for the standardization of emergency vehicles, integrating technical and scientific references with institutional reality. The approach used proved to be a viable strategy to minimize risks, optimize team response in critical situations, and strengthen the patient safety culture.

### **Study Limitations**

This study has some limitations. As it is an experience report, the findings are specific to the institutional context in which it was developed, and there may be limitations in generalizing the results to other hospital settings. Furthermore, the analysis of non-conformities was based on observational records, which may be subject to variations in data collection. Another limitation relates to the need for long-term follow-up to assess the sustainability of the standardization of emergency carts and its ongoing impact on patient safety. Future studies could explore quantitative methodologies to evaluate the effectiveness of standardization in different healthcare contexts.

## Contributions for the Nursing Area, Health and Public Politics

This study contributes to nursing by presenting a structured methodology for standardizing emergency carts, promoting greater organization of supplies, reducing operational errors, and improving patient safety. It also highlights the importance of continuous training and the active involvement of professionals in the standardization process, favoring adherence to established guidelines and the sustainability of changes. The use of evidence-based organizational guidelines strengthens care management, improves the response of teams in emergencies, and contributes to the quality of care provided.

## CONCLUSION

The proposed objective was achieved by demonstrating that the standardization of emergency vehicles, through a structured methodology, constitutes a decisive strategy to optimize the organization of supplies, reduce non-conformities, and improve safety in emergency response. The implementation of the Standard Operating Procedure (SOP) contributed to greater efficiency in the response of the teams, ensuring the availability and correct arrangement of materials. Furthermore, training proved fundamental to guaranteeing adherence to the new guidelines and the sustainability of the process, and should be accompanied by a systematic plan that allows for the continuous updating of professionals and the maintenance of standardization over time.

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