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Clinical protocol of intra-hospital transport of critical care patients: action research*

Protocolo assistencial de transporte intra-hospitalar de pacientes em cuidados críticos: pesquisa-ação*

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ABSTRACT

Objective: To describe the process of developing and validating an intra-hospital transport protocol for critically ill patients. **Method:** Action research with a qualitative approach, conducted in a public university hospital in Southeast Brazil, with thirty-nine members of the multidisciplinary healthcare team who formed the Planning Group. Data collection occurred over nine seminars, using a flexible and non-linear script. Data were analyzed through categorical content analysis and descriptive statistics. **Results:** An intra-hospital transport protocol for critically ill patients was developed, along with five flowcharts and a transport checklist. **Conclusion:** The process was carried out with active and collaborative participation. The protocol will standardize tasks and procedures, ensuring safer and higher-quality care.

Descriptors: Clinical Protocols; Patient Safety; Critical Care; Patient Transfer; Total Quality Management.

RESUMO

Objetivo: Descrever o processo de elaboração e validação de um protocolo assistencial de transporte intra-hospitalar de pacientes críticos. **Método:** Pesquisa-ação, de abordagem qualitativa, realizada em um hospital universitário público do Sudeste do Brasil, com trinta e nove membros da equipe multidisciplinar em saúde que formaram o Grupo de Planejamento. A coleta de dados ocorreu durante os nove seminários, por meio de um roteiro flexível e não-linear. Os dados foram analisados pela análise de conteúdo categorial e por meio de estatística descritiva. **Resultados:** Foi elaborado um protocolo de transporte intra-hospitalar de pacientes críticos, cinco fluxogramas e um checklist de transporte. **Conclusão:** O processo ocorreu com participação ativa e colaborativa. O protocolo possibilitará padronizar as tarefas e condutas, garantindo uma assistência mais segura e de melhor qualidade.

Descritores: Protocolos Clínicos; Segurança do Paciente; Cuidados Críticos; Transferência de Pacientes; Gestão da Qualidade Total.

INTRODUCTION

Patient quality and safety have been a challenge for healthcare managers, with quality management being an essential tool that, when applied satisfactorily, can contribute to safer care[1-2].

Patient safety is an essential part of quality management and improving health outcomes. Among the care actions in healthcare institutions linked to patient safety and exposure to adverse event (AE) risks is Intra-hospital Transport (IHT), which requires standardized procedures to ensure safe practices[2-4].

IHT is defined as the transfer of a patient from one hospital unit to another by healthcare professionals such as doctors, nurses, nursing technicians, and physiotherapists, for diagnostic exams, therapeutic interventions, hospital admissions, or transfers between units[4-7]. This process involves health risks to patients when it is not carried out in a systematic and planned manner. These risks can be reduced through

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the implementation of safety measures, which may include the selection of an appropriate team and adherence to recommendations for each stage of the transport[5,8-9].

To ensure patient safety, it is necessary to use tools for organizing the service, among which are the clinical protocols. A clinical protocol is understood as a practice based on scientific evidence, ensuring better quality of care with the aim of assisting in the organization of work, constituting a health management instrument that, once implemented, works towards service excellence and the safety of both professionals and users[10-13].

Clinical protocols need to be easy to read, valid, reliable, built on the principles of evidence-based practice, and enable the improvement of care, reduction of discrepancies in decision-making, reduction of unnecessary service or exam demands, and minimization of variability in information and practices[10-16]. Thus, it is necessary to implement clinical protocols for transporting patients based on efficient planning and communication, in order to reduce the occurrence of AEs[11-18].

In view of the above, and considering that the institution under study does not have a clinical protocol to standardize the IHT of critically ill patients, this study aimed to describe the process of developing and validating a clinical protocol for the IHT of critical patients.

METHOD

Action research with a qualitative approach, operationalized through the twelve phases proposed by Thiollent[19]. The study report followed the guidelines of the Consolidated Criteria for Reporting Qualitative Research (COREQ)[20].

The study was conducted in a public university hospital, of medium size, part of the Brazilian Company of Hospital Services (EBSERH) network, located in the state of Espírito Santo, in the southeastern region of Brazil, with 100% of the care provided by the Unified Health System (SUS)".

The study involved thirty-nine professionals who made up the Planning Group, including twenty-three members of the multidisciplinary healthcare team: nurses, doctors, physiotherapists, social workers, and nursing technicians, from different departments, including the intensive care unit (ICU), operating room, inpatient unit, and healthcare regulation unit; and sixteen invited professionals, linked to strategic sectors with a focus on service management (nurses, doctors, physiotherapist, clinical engineer, pharmacist, logistics and infrastructure professional, from different departments, including emergency room, management of critical care units, quality and patient safety management, hospital infection control, nursing division, hospitality, healthcare management, pharmacy, clinical engineering and infrastructure unit, operating room, inpatient unit, and ICU). These professionals were selected for convenience, in order to form a multidisciplinary group representing various hospital departments.

For the organization of this group, the inclusion criteria were: to be interested in the topic and in participating in the study, to be a member of the multidisciplinary team or to hold positions focused on service management, to have at least six months of experience at the hospital under study, to have experience with critically ill patients or in the development of protocols, and to have some direct or indirect involvement with the patient transport process at this hospital. The exclusion criteria were: failure to participate in three or more seminar sessions conducted in face-to-face, mixed, or online formats, and professionals on medical leave.

Data collection took place during the seminars held between January 2022 and March 2023, based on the twelve phases of action research (Figure 1). The development of the action research was carried out through a flexible and non-linear script, considering the circumstances and peculiarities of the investigated situation.

ETAPA	OPERACIONALIZAÇÃO
1. Exploratory phase	The problem was brought up by the Quality Management and Patient Safety department. Contact was made with the participants and the research objectives were presented. Characterization of the participants through a questionnaire. The problem was raised and discussed through brainstorming, conducted situational diagnosis, and scope review. (Protocol with the DOI 10.17605/OSF.IO/F3DPY).
2. Research topic	IHT of critical patients.
3. Presentation of the problems	The problems were detailed during the development of the seminars. This included the presentation of the research, the topic, and an explanation of the problem, the participants' prior knowledge, discussion of the findings in the literature regarding IHT, the risks involved, the benefits, and patient safety with the implementation of a protocol.
4. The role of theory	Presentation and discussion of scientific articles and resolutions on IHT, and debate on the roles of the multiprofessional team, such as doctors, nurses, nursing technicians and physiotherapists, in IHT. The scientific literature used was adapted according to the practical knowledge of the professionals and the reality of the institution, for the joint development of the protocol.
5. Hypotheses	Given the problem of the lack of standardization in transportation and the theoretical deepening on the subject, the group established hypotheses that were addressed during the seminars.
6. Seminar	Nine seminars were held with the group in presencial, online, and hybrid formats for the development and validation of the IHT protocol for critical patients. Seminar 1 - Presentation of the topic, discussion, and planning; Seminar 2 - Use of the brainstorming technique to discuss the problem situation and conduct a situational diagnosis; Seminars 3 to 7 - Presentation of the preliminary version of the protocol and joint development, with necessary adaptations made; Seminar 8 - Presentation of the protocol with the suggested adjustments; Seminar 9 - Validation by consensus of the final version of the protocol and methodology evaluation.
7. Field of observation, sampling and qualitative representativeness	Multiprofessional healthcare team represented by professionals from the group.
8. Data collection	Seminars were held, the content of which was recorded and, along with the contributions received by email, transcribed, with subsequent registration in a field diary in the form of minutes, for analysis.
9. Learning	Scope review and discussions in seminars, conducted both in-person and remotely with the participants, where learning permeates all stages of the research.
10. Formal knowledge and Informal knowledge	Represented by scope review, brainstorming for situational diagnosis, interaction and sharing of experiences among participants, resolutions, discussions, and the development of the protocol with the Group.
11. Action plan	Developed collectively between the Group and the researcher.
12. External communication	Presentation to the scientific community through the preparation of a dissertation, article, and presentation of work at a conference. Dissemination of the final version of the protocol to the hospital managers and coordinators, as well as to the partner sectors that will contribute to its subsequent operationalization and implementation.

Figure 1 - Stages of action research for the development of the "Intra-hospital Critical Patient Transport Protocol". Vitória, ES, Brazil, 2024

The roadmap served as a starting point, which began in the "exploratory phase" and ended with the "dissemination of results." In the exploratory phase, a scope review was conducted, and the Planning Group was formed.

The scope review served as the foundation for the preliminary structuring of the IHT protocol and to identify in the national and international literature the key elements for composing a IHT protocol for critically ill patients, grouped into the following categories: a) clinical conditions of the patient, b) transport team, and c) organizational structure and infrastructure. The initial version of the IHT protocol was then structured, using the standard document provided by the hospital's quality department as a reference.

The Planning Group was invited to participate in the research and signed the Informed Consent Form (ICF) and completed the participant characterization instrument.

Subsequently, nine seminars were held with the Planning Group for the development and validation of the TIH protocol for critical patients. These seminars took place in person (1 to 8), via the Teams platform (9), and in a hybrid format (1 and 2).

The seminars were initially planned to last around 60 to 90 minutes, but by consensus with the Group, they were extended to up to 150 minutes due to the contribution and involvement of the participants.

Finally, the Dissemination stage included sending the IHT Care Protocol with the five flowcharts and the TIH checklist to the hospital's quality department for registration and dissemination to the hospital and scientific community. Additionally, the main points of the protocol were organized into banners and posters to be displayed in units that provide care to critically ill patients.

The TIH *checklist* was tested by nurses in the adult ICU to assess its practical applicability. The adult ICU was chosen because it handles the highest volume of transportation of critically ill patients, including transfers for exams, inter-unit transfers, admissions from different departments, such as hemodynamics, operating rooms, emergency rooms, and inpatient units. The *checklist* was tested for one month. After the first fifteen days of use, the nurses provided feedback to the researcher regarding the necessary adjustments, and corrections were made. The revised *checklist* was then applied for an additional fifteen days, with no further adjustments needed.

Data analysis

During the seminars, the data generated were recorded in MP3 format using a digital recorder, and a field diary was used for the researcher's general notes. The recording data were transcribed and read exhaustively, and the results were subjected to Bardin's content analysis[21].

The participants of the Planning Group were identified as: participant P, following the sequence P1, P2, P3…P39. The participants in the transport checklist testing stage were identified as participant E1, E2, E3… and the researcher as PE. The coding [...] means that part of the speech was omitted.

The research was approved by the Research Ethics Committee of the hospital under CAAE no. 40480020.0.0000.5071.

RESULTS

The planning group consisted of (N=39; 100%) members, with an average age of 39.9 years (± 5.4 years), the majority being female (N=24; 61.5%), compared to male (N=15; 38.5%). Regarding the highest level of education, (N=17; 43.6%) had completed specialization, (N=16; 41%) had a master's degree, (N=2; 5.1%) had a technical level, (N=1; 3%) had a doctorate, and (N=1; 2.6%) were undergraduates. The average length of service at the hospital was 8.6 years (± 5.9 years).

The discussions in the seminars were analyzed and grouped into four categories: Protocol development; Creation of the flowcharts; Creation of the checklist; and Action research as a collective strategy for protocol development.

Development of the IHT Protocol

The IHT protocol for critically ill patients was structured following the institution's standard document. In addition to the materials from the scope review[5-10,14-18,22-23], technical manuals from the Ministry of Health[2], ANVISA[5], and resolutions from the Federal Nursing Council[24] and the Federal Council of Medicine[25] were used.

The protocol addressed the main roles, competencies, and responsibilities of each professional category and sectors directly and indirectly involved in the IHT of critically ill patients. The protocol guided and directed the activities developed for this patient profile during the four stages of transport organization (classification, planning, execution, and evaluation) and its three phases (preparation, transfer, and stabilization). It also presented five transport flowcharts to guide and organize the work of professionals, as well as a transport checklist.

At the beginning of the seminars, participants were instructed to form groups composed of different professionals, allowing for mixed approaches with diverse perspectives on the work process. This was done to develop the protocol with a systemic view.

Participants highlighted the need to define critically ill patient in the protocol. These terms often cause confusion due to the lack of consensus in the scientific literature.

> *[...] who will read the protocol are those in care provision and they will have to define if the patient is critically ill or not to follow the protocol so there must be a care-related definition. (P8)*

> *[...] there is a regulation from the CRM (Regional Council of Medicine) that defines levels of care: level 1, level 2, level 3 [...] this regulation specifies who is considered a critically ill patient. (P27)*

During the discussions on the topic of critically ill patients, it was possible to address other subjects, such as: the definition of IHT, classification of IHT stages, classification of IHT, and indications and contraindications for transport. Regarding contraindications, it was suggested to consider environmental variables, not just the patient's physiological variables, and this topic was included in the protocol.

> *[...] I think it's interesting to include in the protocol an analysis of the environment at the time of transport, to assist in the physician's decision-making. Regarding the equipment, whether it's the right moment, what time it is, if there is power or not, if there is a ramp or not. A series of environmental factors that can help the physician when evaluating, at that specific moment, before deciding whether or not to transport the patient. (P28)*

It was defined that the team for a safe transport must include, at a minimum, a physician and a nurse. The participation of the physiotherapist was also discussed, as they previously did not have a clear and defined role in the transport of critically ill patients.

> *The physiotherapist will need to accompany due to the severity; sometimes the patient is on many medications, and each professional must focus on a specific action during the transport. The doctor and the physiotherapist will decide together whether or not there is a need for the physiotherapist's participation. (P13)*

Regarding the participation of other professional categories, with the definition of duties, competencies, and responsibilities, the team reached a consensus and defined a framework with the responsibilities of each professional involved in the transport of the critical patient.

> *[...] you are in an environment where there are doubts, you take the protocol and say, "According to the protocol, under these conditions, I need the doctor to go," and then you've established who your team is, "I need the air kit," and then you've already established the resources. I think this is interesting in the protocol. (P7)*

Some particularities regarding the professionals' duties during the transport phases were highlighted. In practice, however, in many situations, the duties of the team, specifically post-transport, are not observed.

And the stabilization phase, which is the post-transport phase, the literature indicates that in the first 30 minutes to 1 hour after transport, the patient may still be susceptible to hemodynamic instability. Therefore, in the post-transport phase, attention should be given to preparing the patient, organizing, checking if the medications are running out or not, and properly positioning the patient post-transport. The group also provided suggestions regarding the post-development stage of the protocol, already considering its implementation process in the hospital. They also mentioned the possibility of adjusting it to make it a reference for the creation of an institutional protocol that would address all patient profiles and all hospital areas:

> *The proposal is that after the delivery of this protocol, a group be created solely to discuss what has been resolved within it [...] it becomes easier to see the scope and actually develop and implement the protocol. (P13)*

> *[...] focused on the critically ill patient [...] we took a higher level of severity, so adjusting it to a lower level and integrating it into other departments, such as neonatology and pediatrics, becomes a bit easier with the scope already defined. (P18)*

Development of the flowcharts

The flowcharts refer to the graphical representation of the operational sequence in the development of a process or a work routine[11].

As defined by the participants, the main information of the protocol should be organized in flowcharts to ensure clear communication between the teams from the origin and destination departments.

> *[...] the flowchart will facilitate team communication, as information can easily be lost. (P37)*

> *The flowchart presents who or which professionals will be responsible for accepting the patient. (P16)*

Considering the adaptation of healthcare services after the Covid-19 pandemic, and the care of patients with various other multidrug-resistant microorganisms, flowcharts were proposed to address these issues.

Five flowcharts and one checklist were produced, as shown in Figures 2, 3, and 4. These are: 1) IHT communication flowchart for critically ill patients; 2) IHT communication flowchart for critically ill patients with Covid-19 and/or multidrug-resistant microorganisms; 3) Unidirectional IHT flowchart for critically ill patients; 4) Bidirectional IHT flowchart for critically ill patients; 5) IHT flowchart for critically ill patients with Covid-19 and/or multidrug-resistant microorganisms; and 6) IHT checklist for critically ill patients.

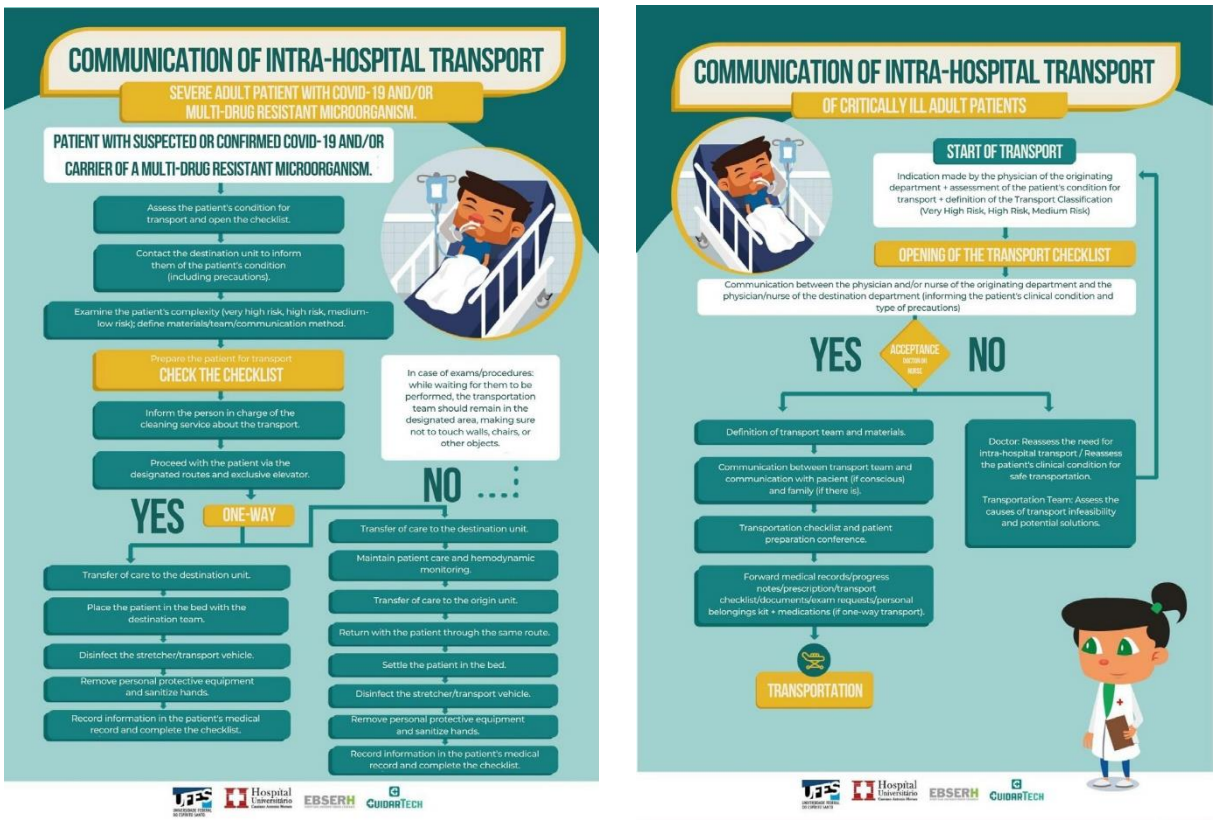


Figure 2 - IHT communication flowchart for critically ill patients. IHT communication flowchart for critically ill patients with Covid-19 and/or multidrug-resistant microorganisms. Vitória, ES, Brazil, 2024.

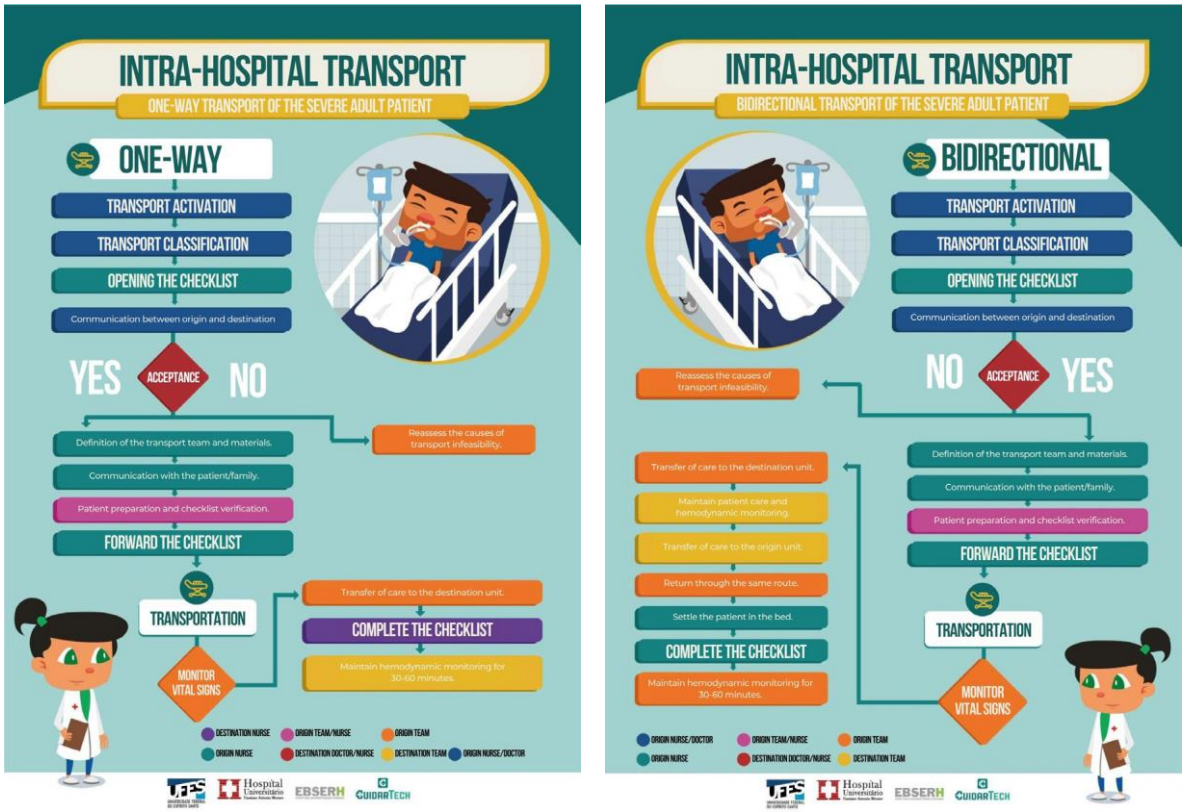
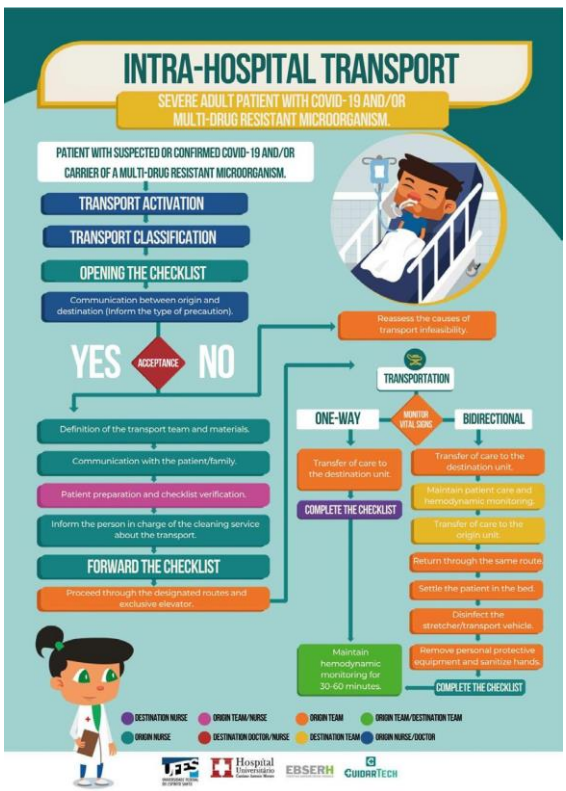


Figure 3 - Unidirectional IHT flowchart for critically ill patients. Bidirectional IHT flowchart for critically ill patients. Vitória, ES, Brazil, 2024.



INTRA-HOSPITAL TRANSPORT CHECKLIST FOR THE CRITICALLY ILL ADULT PATIENT

NAME:
AGE: | MEDICAL RECORD: | DATE:
PATIENT RISK CLASSIFICATION: ☐ VERY HIGH ☐ HIGH ☐ MEDIUM-LOW
ORIGIN: | DESTINATION:
REASON: ☐ EXAM ☐ SURGERY ☐ TRANSFER ☐ OTHERS (SPECIFY)
TRANSPORT TEAM: ☐ DOCTOR ☐ NURSE ☐ NURSE TECHNICIAN ☐ STRETCHER ATTENDANT ☐ PHYSIOTHERAPIST

TRANSPORT CLASSIFICATION

TYPE		RISK		PRECAUTION		
☐ UNIDIRECTIONAL		☐ VERY HIGH		☐ STANDARD	☐ DROPLET	
☐ BIDIRECTIONAL		☐ HIGH		☐ CONTACT	☐ AEROSOL	
		☐ MEDIUM		☐ COVID-19	SPECIFIC:	

PRE-TRANSPORT VITAL SIGNS

TIME: HR: SPO_2: TEMP: BP: BG:

EQUIPAMENT/MATERIALS

MEDICATION TRANSPORT BAG	PRESENT	☐ YES ☐ NO ☐ N/A	RECORDS	MEDICAL RECORD	☐ YES ☐ NO ☐ N/A
	WITH SEAL	☐ YES ☐ NO		MEDICAL REPORT	☐ YES ☐ NO
				DOCUMENTS (PATIENT)	☐ YES ☐ NO ☐ N/A
AMBU® BAG AND INTUBATION KIT	PRESENT	☐ YES ☐ NO ☐ N/A	TRANSPORT VENTILATOR	TESTED	☐ YES ☐ NO
	CHECKED	☐ YES ☐ NO		CHARGED	☐ YES ☐ NO ☐ N/A
O_2 CYLINDER	LEVEL CHECKED? ☐ YES ☐ NO ☐ N/A			FIO_2:	PEEP:
				MODE:	
CARDIAC MONITOR	CHARGED	☐ YES ☐ NO ☐ N/A	CONTINUOUS INFUSION PUMP	CHARGED	☐ YES ☐ NO ☐ N/A
	TESTED	☐ YES ☐ NO		TESTED	☐ YES ☐ NO ☐ N/A
INVASIVE DEVICES	CHECKED	☐ YES ☐ NO ☐ N/A	EQUIPMENT DELIVERED	☐ INFUSION PUMP ☐ PERSONAL BELONGINGS KIT ☐ CARDIAC MONITOR	
	PROTECTED	☐ YES ☐ NO ☐ N/A		OTHERS (SPECIFY)	
	NO TENSION	☐ YES ☐ NO ☐ N/A			

CONTINUOUS INFUSION MEDICATIONS

DRUG	FLOW RATE	DRUG	FLOW RATE	OTHER DRUGS	FLOW RATE
NOREPINEPHRIN		NITROGLYCERIN			
E EPINEPHRINE		NITROGLYCERIN			
DOBUTAMINE		DEXMEDETOMIDINE			
SODIUM NITROPRUSSIDE		TPN			

POST-TRANSPORT VITAL SIGNS

TIME: HR: SPO_2: TEMP: BP: BG:

INVASIVE DEVICES	CHECKED	☐ YES ☐ NO ☐ N/A	INTRAVENOUS MEDICATIONS	
	UNCLAMPED	☐ YES ☐ NO ☐ N/A		☐ YES ☐ NO ☐ N/A

RESPONSIBLE PROFESSIONAL

DEPARTURE:	DATE / /	TIME :	SIGNED:	
RETURN:	DATE / /	TIME :	SIGNED:	

OBSERVATIONS/INCIDENTS/ADVERSE EVENTS

Figure 4 - IHT flowchart for critically ill patients with Covid-19 and/or multidrug-resistant microorganisms. IHT checklist for critically ill patients. Vitória, ES, Brazil, 2024.

Development of the checklist

The preliminary version of the checklist had two pages and was simplified to one page after discussions in the seminars.

> *[...] the checklist has many items here that are unnecessary. (P8)*

> *[...] I suggest that the checklist be applied by nurses in a critical care unit to see if what we reduced and improved will actually be applicable in practice. (P13)*

During the *checklist* testing, the nurses in the adult ICU highlighted areas for improvement in its structure.

> *[...] I think the diagnostic item is unnecessary; the idea would be to collect all the data at the patient's bedside [...] usually, these diagnostic data are in the medical records and take up the team's time to retrieve them, which could even delay the completion of the tool. (E5)*

> *I think the section for the mechanical ventilator, the mode, and the parameters the patient is being transported with is important, as well as the vital signs before transport; these are essential, along with the infusion pumps. (E2)*

> *[...] I prefer the observation field at the end of the checklist form [...] we can include all the intercurrences and any specifics of the transport, including what didn't fit in the checkboxes. (E6)*

After the corrections and validation in the seminar, the checklist was reduced to 27 items, which included clinical data of the patient, transport materials and procedures, and observations/incidents/AEs. It was defined by the participants that the nurse would be the professional responsible for completing, opening, and closing the checklist.

Action research as a collective strategy for protocol development

In the participants' view regarding the research, the opportunity to produce knowledge collectively stood out, along with the integration, recognition, and appreciation of the team in the development of the project and the creation of tools for patient safety management.

> *An expanded discussion bringing reflection applied to reality and the possibility of multiprofessional discussion. (P27)*

> *[...] the opportunity to exchange information about transport with other departments, beyond the one I work in. (P21)*

> *Involvement of the team to arrive at a process that meets the institution's reality. (P22)*

> *Integration of the clinical and managerial teams. (P18)*

DISCUSSION

Patient safety protocols need to be adjusted to the patient profile and the reality of the institution[11-13]. The developed IHT protocol included key safety items, defined tasks and responsibilities for each professional involved in the transport process, and considered factors related to the patient's condition (organic state), the transport team (training/qualification), and the equipment and infrastructure (physical, material, and human resources/work processes) of the service provided by the healthcare institution[4,6-10].

Among the implications of IHT is the occurrence of AEs, which include the lack of adequate human and material resources in proper working condition and suggest the standardization of actions by the team involved in the transport and the provision of necessary equipment for the patient's hemodynamic monitoring, aiming to minimize the occurrence of AEs[3-4,7-9,22-23].

The TIH protocol is a management tool for healthcare services that, when applied, aims to achieve excellence in service delivery and ensure the safety of patients and professionals[2,11-13].

Regarding the minimum team for safe transport, there is a consensus in the literature that the team should include at least one physician, preferably with experience in advanced cardiovascular support and airway management, and a nurse with experience in intensive care[5,7,10]. It is also recommended that an orderly and a

nursing technician should accompany the transport when available, and that two additional healthcare professionals, besides these, should accompany the physician and the nurse[5,8-9,17]. Research indicates that in 73% of cases, the transport team consisted of three or four professionals, and only 24% had one or two professional[16].

Planning the number of professionals involved in patient transfer is crucial to ensure the process occurs safely and to prevent common AEs, such as loss of catheters, disconnection of tubes and endotracheal tubes, removal of oxygen catheters, and indwelling urinary catheters[3-4,16-18,22]. Training and qualification enable each professional to be prepared to intervene in potential AEs that a critically ill patient may experience, thereby improving the effectiveness of the transport process[6-9].

Effective communication among the members of the transport teams and the teams from other departments is crucial for the success of the process, facilitating planning for the destination department and avoiding unnecessary movement and exposure of the patient to risks[3-4,9-10,16].

The protocol took into account the interference of external factors, which characterize situations that increase the risk of incidents and are related to factors beyond the manager's governance[4,6-7].

The environmental factors that most impact patient safety are elevators (small, malfunctioning, or poorly maintained), hallway space, uneven flooring, doorway space for bed/stretcher passage, room space for transferring the patient from the bed to the stretcher, inadequate transport stretchers (incompatibility with beds or doors in the destination department), distance between departments, and inadequate preparation in the destination department[3-4,16]. Aiming to systematize this process, checklists help ensure that the assessment of clinical conditions is carried out more effectively during the pre-transport stage. The use of standardized documents improves healthcare, team communication, reduces variability in practices, and minimizes technical errors and iatrogenic incidents[14-18,26].

The use of standardized documents proves effective in preventing incidents and AEs, consequently enhancing safety during patient transport and for the professionals of the multidisciplinary team involved[2,4,7,10,13,15-18].

Regarding the study's limitations, it is emphasized that the protocol needs to be implemented, and its applicability and impact on the service should be evaluated. Another limitation was not considering the patient's preferences, since it was not validated by the users.

Regarding the implications of the study for advancing the field of healthcare and nursing, this research demonstrated the importance of integrating teaching-research-practice in the construction and translation of knowledge, in the exchange of experiences between researchers and clinicians, in the pursuit of solutions to practical problems based on the best scientific evidence, aimed at improving safety in healthcare services, ensuring a better experience for patients, families, and professionals.

CONCLUSION

This study developed and validated an institutional protocol for IHT, including a checklist for the IHT of critically ill patients and five flowcharts. The action-research enabled the active and collaborative participation of all study members and allowed for an important exchange of formal and informal knowledge between the researcher and participants through a rich sharing of experiences from the practice of different professionals with various specialties and roles in diverse sectors.

The protocol with its flowcharts and checklist is in the process of being implemented at the institution and will standardize tasks and procedures, assisting and guiding professionals in decision-making and the execution of work routines, ensuring safer and higher-quality care during the IHT of critically ill patients.

*Paper extracted from the Master's Dissertation entitled "Intra-hospital transport of critically ill adult patients: development of a protocol", presented to the Graduate Program in Nursing at the Federal University of Espírito Santo, Vitória, ES, Brazil, in 2022.

CONFLICT OF INTERESTS

The authors have declared that there is no conflict of interests.

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REFERENCES

1. Arlotta C, Meza EBM, Cardoso R. Uma análise bibliometrica sobre a qualidade do atendimento em serviços de saúde. Journal of Lean Systems [Internet]. 2021 [cited 2023 Sep 11];6(2):168-88. Available from: https://ojs.sites.ufsc.br/index.php/lean/article/view/4592
2. Agência Nacional de Vigilância Sanitária (BR). Documento de referência para o Programa Nacional de Segurança do Paciente [Internet]. Brasília: Ministério da Saúde; 2014 [cited 2023 Jan 29]. Available from: http://bvsms.saude.gov.br/bvs/publicacoes/documento_referencia_programa_nacional_seguranca.pdf
3. Germack HD, Fekieta R, Britton MC, Feder SL, Rosenberg A, Chaudhry SI. Cooperation and conflict in intra-hospital transfers: A qualitative analysis. Nurs Open. 2019;7(2):634-41. https://doi.org/10.1002/nop2.434
4. Putra KR, Wulandari I, Suharsono T, Hany A. Adverse events during intra-hospital transport of critically ill patients: an observational study. Central European Journal of Nursing and Midwifery. 2022;13(3):699-706. https://doi.org/10.15452/cejnm.2022.13.0012
5. Agência Nacional de Vigilância Sanitária (BR). Resolução-RDC nº 07, de 24 de fevereiro de 2010. Dispõe sobre os requisitos mínimos para funcionamento de Unidades de Terapia Intensiva e dá outras providências [Internet]. Brasília: Anvisa; 2010 [cited 2022 Dec 22]. Available from: http://www.medicinaintensiva.com.br/resolucao-07-anvisa-uti.htm
6. Abraham J, Burton S, Gordon HS. Moving patients from emergency department to medical intensive care unit: Tracing barriers and root contributors. Int J Med Inform. 2020; 133:104012. http://doi.org/10.1016/j.ijmedinf.2019.104012
7. Santos BS, Bueno CKS, Bizinelli TSQ, Ribeiro ER. A segurança no transporte do paciente crítico em ambiente intra-hospitalar: uma revisão integrativa. Espaço para a Saúde [Internet]. 2021 [cited 2024 Jul 10];20(2):9-101. Available from: https://espacoparasaude.fpp.edu.br/index.php/espacosaude/article/view/666
8. Sharafi RA, Ghahramanian A, Sheikhalipour Z, Ghafourirfard M, Ghasempour M. Improving the safety and quality of the intra-hospital transport of critically ill patients. Nurs Crit Care. 2021;26(4):244-52. https://doi.org/10.1111/nicc.12527
9. Esmail AM, Mohamed WY, Ali FS. Intrahospital transport related health consequences among critically ill patients. International Journal of Novel Research in Healthcare and Nursing. 2019 [cited 2024 Jul 10];6(3):679-91. Available from: https://www.noveltyjournals.com/upload/paper/Intrahospital%20transport%20related-2079.pdf
10. Martins JB, Wansing GB, Viegas K, Blatt CR. Prevenção de eventos adversos no transporte intra-hospitalar: revisão integrativa. Res Soc Dev. 2022;11(10):e272111032700. http://doi.org/10.33448/rsd-v11i10.32700
11. Ministério da Saúde (BR). Diretriz metodológica: síntese de evidências para políticas [Internet]. Brasília: Ministério da Saúde; 2020 [cited 2023 Dec 11]. Available from: https://pesquisa.bvsalud.org/portal/resource/pt/biblio-1178284
12. Hu Y, Shi D, You L, Li W. Intrahospital transport of critically ill patients: A survey of emergency nurses. Nurs Crit Care. 2021;26(5):326-32. https://doi.org/10.1111/nicc.12601
13. Nisha S, Sariga JT. Risk factors and adverse events during intra hospital transportation among critically ill with a view to develop patient transport checklist. International Journal of Nursing Education. 2022;14(3):111-7. https://doi.org/10.37506/ijone.v14i3.18361
14. García PN, Avión RC, Ruiloba MSL, Pérez JR, Dobarro AB, García AR. Estudio retrospectivo de la seguridad en el traslado de los pacientes críticos tras aplicación de la metodología para la gestión de riesgo. Rev Esp Anestesiol Reanim. 2020;67(3):119-29. https://doi.org/10.1016/j.redar.2019.10.003
15. Williams P, Karuppiah S, Greentree K, Darvall J. A checklist for intrahospital transport of critically ill patients improves compliance with transportation safety guidelines. Australian Critical Care. 2020;33(1):20-4. http://doi.org/10.1016/j.aucc.2019.02.004

16. Bergman L, Pettersson M, Chaboyer W, Carlström E, Ringdal M. Improving quality and safety during intrahospital transport of critically ill patients: A critical incident study. Australian Critical Care. 2020;33(1):12-9. http://doi.org/10.1016/j.aucc.2018.12.003

17. Garfinkel E, Lopez S, Troncoso R, Leon D, Hubble H, Bowman C, et al. A Critical Care Transport Program's Innovative Approach to Safety During the Coronavirus Disease 2019 Pandemic. Air Med J. 2021;40(2):112-4. http://doi.org/10.1016/j.amj.2020.12.002

18. Geldenhuys L, Wise R, Rodseth R. The impact of a bundled intrahospital transfer protocol on the safety of critically ill patients in a South African Metropolitan Hospital System. SAJAA. 2020;26(3):139-48. http://doi.org/10.36303/SAJAA.2020.26.3.2343

19. Thiollent M. Metodologia da pesquisa-ação. 18th ed. São Paulo: Cortez; 2022.

20. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care. 2007;19(6):349-57. https://doi.org/10.1093/intqhc/mzm042

21. Bardin L. Análise de conteúdo. São Paulo: Edições 70; 2016.

22. Lin SJ, Tsan CY, Su MY, Wu CL, Chen LC, Hsieh HJ, et al. Improving patient safety during intrahospital transportation of mechanically ventilated patients with critical illness. BMJ Open Qual. 2020;9(2):e000698. http://doi.org/10.1136/bmjoq-2019-000698

23. Veiga VC, Postalli NF, Alvarisa TK, Travassos PP, Vale RT da S, Oliveira CZ de, et al. Adverse events during intrahospital transport of critically ill patients in a large hospital. Rev Bras Ter Intensiva. 2019;31(1):15-20. http://doi.org/10.5935/0103-507X.20190003

24. Conselho Federal de Enfermagem (BR). Resolução nº 588, de 15 de outubro de 2018. Atualiza e normativa a atuação da equipe de Enfermagem no processo de transporte de pacientes em ambiente interno aos serviços de saúde [Internet]. Brasília: Cofen; 2018 [cited 2021 Nov 20]. Available from: http://www.cofen.gov.br/resolucao-cofen-no-588-2018_66039.html

25. Conselho Federal de Medicina (BR). Resolução 2.077, de 16 de setembro de 2014. Dispõe sobre a normatização do funcionamento dos Serviços Hospitalares de Urgência e Emergência, bem como do dimensionamento da equipe médica e do sistema de trabalho [Internet]. Brasília: CFM; 2014 [cited 2021 Nov 02]. Available from: https://portal.cfm.org.br/images/PDF/resolucao2077.pdf

26. World Health Organization. Global Patient Safety Action Plan 2021-2030 [Internet]. Geneva: World Health Organization; 2021 [cited 2022 Jul 13]. Available from: https://www.who.int/publications/i/item/9789240032705

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