ORIGINAL ARTICLE

REVISTA ENFERMAGEM ATUAL IN DERME

EARLY DISCHARGE AFTER PERCUTANEOUS CORONARY INTERVENTION: A METHODOLOGICAL STUDY FOR THE DEVELOPMENT OF A CARE PROTOCOL

ALTA PRECOCE APÓS INTERVENÇÃO CORONARIANA PERCUTÂNEA: ESTUDO METODOLÓGICO PARA DESENVOLVIMENTO DE PROTOCOLO ASSISTENCIAL

ALTA TEMPRANA TRAS INTERVENCIÓN CORONARIA PERCUTÁNEA: UN ESTUDIO METODOLÓGICO PARA EL DESARROLLO DE UN PROTOCOLO DE ATENCIÓN

[1]Jéferson Valente Vieira
[2]Paula Vanessa Peclat Flores

[1]Universidade Federal Fluminense, Niterói, Brazil Orcid:https://orcid.org/0009-0008-7813-7935
[2]Universidade Federal Fluminense, Niterói, Brazil Orcid: https://orcid.org/0000-0002-9726-5229.

Corresponding Author
Jéferson Valente Vieira
Rua São Claret, nº 481, - Bairro Silveira – CEP 31.140.350 - Belo Horizonte – MG – Brazil. phone: +5531 98251-2408 - E-mail: jvvieirajf@yahoo.com.br

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ABSTRACT
Percutaneous coronary interventions (PCIs) are an effective approach in the treatment of acute coronary syndromes (ACS), with high success rates and low complication rates. In this context, the length of hospital stay has been widely discussed. While in Europe and the United States there are guidelines that recommend early discharge, generally between 24 and 48 hours, in Brazil there are still gaps regarding the standardization of this practice. **Objective**: To develop a care protocol for early discharge in patients undergoing percutaneous coronary intervention, based on clinical and angiographic criteria described in the literature. **Methods**: Methodological study, of an applied nature, based on Implementation Science. The development occurred in two stages: a scoping review to identify evidence related to eligibility criteria for early discharge after PCI, and the development of a structured care protocol with criteria organized into pre-, intra-, and post-procedure periods, as well as an implementation plan based on the 5W3H tool. **Results**: Clinical and angiographic criteria associated with eligibility for early discharge were identified, highlighting hemodynamic stability, absence of periprocedural complications, and angiographic success. Based on these findings, a care protocol with a standardized decision-making flow was developed. **Conclusion**: The protocol shows potential to standardize care, improve decision-making, and contribute to patient safety, favoring resource optimization and quality of care.
Keywords: Percutaneous Transluminal Angioplasty; Discharge Planning; Continuous Quality Improvement.

RESUMO
As intervenções coronarianas percutâneas (ICP) constituem abordagem eficaz no tratamento das síndromes coronarianas agudas (SCA), com elevados índices de sucesso e baixas taxas de complicações. Nesse contexto, o tempo de internação hospitalar tem sido amplamente discutido. Enquanto na Europa e nos Estados Unidos há diretrizes que recomendam alta precoce, geralmente entre 24 e 48 horas, no Brasil ainda existem lacunas quanto à padronização dessa prática. **Objetivo:** Desenvolver um protocolo assistencial para alta precoce em pacientes submetidos à intervenção coronariana percutânea, fundamentado em critérios clínicos e angiográficos descritos na literatura. **Métodos:** Estudo metodológico, de natureza aplicada, fundamentado na Ciência da Implementação. O desenvolvimento ocorreu em duas etapas: revisão de escopo para identificação de evidências relacionadas aos critérios de elegibilidade para alta precoce após ICP e elaboração de protocolo assistencial estruturado, com critérios organizados nos períodos pré, intra e pós-procedimento, além de plano de implementação baseado na ferramenta 5W3H. **Resultados:** Foram identificados critérios clínicos e angiográficos associados à elegibilidade para alta precoce, destacando-se estabilidade hemodinâmica, ausência de complicações periprocedimento e sucesso angiográfico. Com base nesses achados, foi desenvolvido protocolo assistencial com fluxo decisório padronizado. **Conclusão:** O protocolo apresenta potencial para padronizar a assistência, qualificar a tomada de decisão e contribuir para a segurança do paciente, favorecendo a otimização de recursos e a qualidade assistencial.
Palavras-chave: Angioplastia Percutânea Transluminal; planejamento da Alta, Melhoria Contínua da Qualidade.

RESUMEN
Las intervenciones coronarias percutáneas (ICP) son un enfoque eficaz en el tratamiento de los síndromes coronarios agudos (SCA), con altas tasas de éxito y bajas tasas de complicaciones. En este contexto, la duración de la estancia hospitalaria ha sido ampliamente debatida. Mientras que en Europa y Estados Unidos existen guías que recomiendan el alta temprana, generalmente entre 24 y 48 horas, en Brasil todavía existen brechas con respecto a la estandarización de esta práctica. **Objetivo**: Desarrollar un protocolo de atención para el alta temprana en pacientes sometidos a intervención coronaria percutánea, basado en criterios clínicos y angiográficos descritos en la literatura. **Métodos**: Estudio metodológico, de naturaleza aplicada, basado en la Ciencia de la Implementación. El desarrollo se produjo en dos etapas: una revisión exploratoria para identificar evidencia relacionada con los criterios de elegibilidad para el alta temprana después de la ICP, y el desarrollo de un protocolo de atención estructurado con criterios organizados en períodos pre-, intra- y post procedimiento, así como un plan de implementación basado en la herramienta 5W3H. **Resultados**: Se identificaron criterios clínicos y angiográficos asociados a la elegibilidad para el alta temprana, destacando la estabilidad hemodinámica, la ausencia de complicaciones peri procedimentales y el éxito angiográfico. Con base en estos hallazgos, se desarrolló un protocolo de atención con un flujo de toma de decisiones estandarizado. **Conclusión**: El protocolo muestra potencial para estandarizar la atención, mejorar la toma de decisiones y contribuir a la seguridad del paciente, favoreciendo la optimización de recursos y la calidad de la atención.
Palabras clave: Angioplastia Transluminal Percutánea; Planificación del Alta; Mejora Continua de la Calidad.

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INTRODUCTION

Cardiovascular diseases (CVD) remain the leading cause of global mortality, accounting for approximately one-third of deaths. In Brazil, acute myocardial infarction (AMI) stands out among the leading causes of death, presenting a high incidence and significant epidemiological and healthcare impact on health systems [1–3].

In the context of CVD management, percutaneous coronary intervention (PCI) has established itself as an effective therapeutic strategy, especially in cases of AMI with ST-segment elevation, by enabling early myocardial reperfusion and a consistent reduction in mortality [4–6]. Furthermore, technological advances, the evolution of intracoronary devices, and the increased use of radial access have contributed to a decrease in complications associated with the procedure, favoring better clinical outcomes [7].

In this scenario, a reconfiguration of the care model is observed, characterized by the progressive reduction in hospital stay time after PCI. Recent evidence demonstrates that hospital discharge can be safely performed in carefully selected patients, without increasing the incidence of adverse events [8,9].

For the purposes of this study, early discharge is defined as hospital discharge performed within 24 hours after uncomplicated percutaneous coronary intervention, in patients with low clinical risk, hemodynamic stability and absence of complications.

International guidelines recommend early discharge for low-risk patients undergoing uncomplicated PCI, provided it is preceded by adequate clinical assessment and structured care support [9,10]. However, in Brazil, there is a gap in the standardization of this practice, reinforcing the need to adapt these recommendations to the reality of health services.

The implementation of early discharge is associated with reduced length of stay, lower risk of healthcare-associated infections, and optimized use of beds [9–12]. However, its adoption requires rigorous clinical criteria and the organization of safe care flows [13–15].

In this context, the development of evidence-based care protocols is a fundamental strategy to standardize clinical practice and promote patient safety.

Objective: To develop a care protocol for early discharge of patients undergoing percutaneous coronary intervention, based on the identification of clinical and angiographic criteria described in the literature.

METHODS

This is a methodological study, of an applied nature, based on Implementation Science and guided by the recommendations of the Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0) [16]. The study was developed in a large public hospital, located in the metropolitan region of Belo Horizonte, Minas Gerais, a reference in high-complexity cardiology care.

The design was structured in two complementary stages.

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In the first stage, a scoping review was carried out according to the recommendations of the Joanna Briggs Institute [17], following the PRISMA-ScR guidelines, with the aim of identifying clinical and angiographic criteria associated with eligibility for early discharge after PCI. The data were organized into three care moments: pre-procedure, intra-procedure and post-procedure.

In the second stage, the findings supported the development of a care protocol structured in sequential stages of clinical evaluation, covering the three moments of care and defining objective criteria for eligibility for early discharge.

In addition, an implementation plan for the protocol was developed using the 5W3H tool, with the definition of actions, responsible parties and institutional strategies [18]. As this is a study based exclusively on secondary data, there was no need for review by a research ethics committee.

RESULTS

The scoping review allowed mapping clinical and angiographic criteria associated with eligibility for early discharge in patients undergoing percutaneous coronary intervention [18].

The studies analyzed showed that eligibility for early discharge is related to the presence of favorable clinical conditions, including hemodynamic stability, absence of periprocedural complications, preserved ventricular function, and angiographic success, characterized by adequate coronary flow after the intervention. In addition, operational aspects, such as access route and care support, were also identified as determinants for the safety of discharge.

The findings were organized into three care moments, pre-procedure, trans-procedure, and post-procedure — allowing the systematization of criteria and highlighting the interdependence between these stages in the clinical decision-making process.

Based on these results, a care protocol structured in sequential steps was developed, including: identification of the eligible patient, pre-procedure assessment, trans-procedure assessment, and post-procedure assessment. The protocol establishes objective criteria for eligibility for early discharge, with the aim of standardizing care practice and supporting clinical decision-making.

The criteria identified and organized according to the care stages are presented in Table 1.

Table 1 - Clinical and angiographic characteristics – eligibility conditions

Preoperative study number that they cited
Elective procedure [5]
Age below 75 years: < 70 years[3]; < 75 years [13] and < 80 years [10]

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Living near a hospital or the place where the procedure was performed (living near the hospital and/or having a caregiver) < 96.5 km or 60 miles [1]
Having a caregiver (fragile social condition) [4]
Adherence to the therapeutic regimen[3]
Contraindication for antiplatelet therapy[2]
Absence of comorbidities requiring continued hospitalization.[10]
Previous history of myocardial infarction and/or cardiac arrest[10]
Time to AMI < 4 hours [3] and < 12 hours [5]
Normal laboratory investigation: Hb, Hct, creatinine (clearance > 60 ml/min) and Hemoglobin > 11 mg/dl[4]
Ejection fraction >50%: > 40% [2]; > 45% [1] and > 50% [5]
Hemodynamic and rhythmic stability (Killip I) [18]
Coronary artery disease in 1, 2 vessels [9]
Trans Operative [study nº]
Radial access road[4]
No involvement of the left main coronary artery [8]
Triple-vessel coronary artery disease[8]
Angiographic success (TIMI FLOW 3)[16]
Post-operative [study number]
Hemodynamic and rhythmic stability (Killip I)[16]
Systolic function preserved post-operatively[3]
No symptoms of ischemia[5]
Increased cardiac enzymes[1]
No need for vasoactive drugs [1]
No need for mechanical cardiac support [1]

Table 1: Eligibility conditions.

Source: 2024 scoping review data, Niterói, Brazil 2025.

The clinical and angiographic conditions identified in the scoping review demonstrated that eligibility for early discharge after percutaneous coronary intervention was directly related to the integrated assessment of the pre-procedure, trans-procedure, and post-procedure periods [17]. Organizing these criteria according to the care moments allowed for the systematization of the determining factors for clinical decision-making, as presented in Table 1.

Additionally, the review highlighted a gap in the scientific production of nursing related to early discharge after percutaneous coronary

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intervention, especially regarding the systematization of care and the nurse's role in the care line of these patients.

Based on the findings, the care protocol "Early Discharge of Patients Undergoing Coronary Angioplasty" was developed, structured from clinical and angiographic criteria organized sequentially. The protocol was designed to support the decision-making of the multidisciplinary team, based on objective eligibility parameters.

The protocol was constructed following a rigorous methodology, based on scientific evidence and the guidelines of the Guide for the Construction of Nursing Care Protocols of Coren-SP [19]. The resulting instrument was structured in stages that include patient identification and pre-procedure, trans-procedure and post-procedure assessments, allowing classification regarding eligibility for early discharge.

The systematization of these criteria made it possible to organize a standardized care flow, with the definition of clinical parameters for continuity or interruption of the early discharge process, contributing to greater safety in clinical decision-making. For the organization of the protocol implementation stages, the 5W3H tool was used as a methodological planning reference [20].

Figure 1 - Operational Guideline (cover)

Source: The author himself, Niterói, Brazil, 2025.

Patients who did not meet the established criteria for early discharge were managed according to the conventional strategy for defining the length of hospital stay. The developed instrument provided for its integration into the electronic medical record, with systematic registration of all cases, including those ineligible for early discharge, aiming at

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data traceability and monitoring of care indicators related to the protocol.

The instrument was structured in four sequential steps:

Step 1 — Identification: performed at the time of the patient's admission to the Hemodynamics unit, by a nurse or physician, with registration of the information available in the medical record.

Step 2 — Pre-procedure assessment: conducted upon admission, including gathering personal history and current clinical conditions. At the end, the patient was classified according to their suitability for follow-up in the early discharge flow. Ineligible patients were directed to conventional management.

Step 3 — Trans-procedure assessment: performed in the first hour of the immediate postoperative period, in Hemodynamics or the Coronary Unit, including clinical evaluation, angiographic characteristics and procedure performance, with definition of continuity in the protocol.

Step 4 — Post-procedure assessment: performed 24 hours after percutaneous coronary intervention, in the Coronary Unit, including clinical and angiographic analysis for final decision regarding eligibility for early discharge. At the end of the process, patients were classified as eligible or not for early hospital discharge. In ineligible cases, a summary record was provided in the instrument, ensuring documentation for follow-up. For eligible patients, the recorded information supported the multidisciplinary team's decision-making regarding discharge.

The structuring of the protocol was accompanied by the organization of an operational plan for its application, using the 5W3H tool as a methodological reference for defining steps, responsibilities and follow-up indicators [20], as presented in Table 2.

Table 2 – Action plan

ITEM	OBJECTIVE	OPERATIONALIZATION
What ?	Validate and implement the early discharge protocol for patients undergoing percutaneous coronary angioplasty	Using the AGREE II tool, to ensure quality in clinical guidelines.
Why ?	To reduce hospital stay time, minimize the risks of complications associated with prolonged hospital stays, improve patient satisfaction, and optimize the use of hospital resources.	Through the development of the operational guidelines for this protocol, a construction based on the Coren SP Protocol Construction Guide
Where ?	Large hospital located in the city of Belo Horizonte. A leading center for the treatment of myocardial infarction (MI).	Institution with available professional and material resources.
When ?	The action plan will be implemented over six months, beginning immediately after approval by the hospital's board of directors.	The authors will promote this operationalization.

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Who ?	Expert professionals in cardiology	Multidisciplinary team involving professionals (nurses and doctors) specializing in cardiology and working in the treatment of acute myocardial infarction (AMI) at this institution.
How ?	1. 1. Validate the protocol content with selected specialists. 2. 2. Conduct training for the multidisciplinary team on the early discharge protocol. 3. 3. Adapt hospital information systems to record and monitor the implementation of the protocol. 4. 4. Monitor the established indicator, as described in item 4.3 of this study. 5. 5. Hold periodic meetings to review results and make adjustments to the protocol, if necessary. 6. 6. Evaluate patient and staff satisfaction with the protocol.	Following the guidelines in the AGREE II manuals
How Much ?	The cost of team training, adapting information systems, and resources for evaluating results.	The authors will promote these activities within the institutional team, as described in the operational guideline.
How to measure?	The indicators and measurement methods have been defined to monitor and evaluate the progress and achievement of the objectives.	Early discharge complication rate; Early discharge eligibility rate; Early discharge conversion rate.

Source: the author himself, Niterói, Brazil, 2025.

DISCUSSION

The scoping review allowed us to identify and systematize the main clinical and angiographic characteristics associated with eligibility for early hospital discharge after percutaneous coronary intervention (PCI), showing that clinical decision-making is directly related to the integrated assessment of the pre-procedure, trans-procedure, and post-procedure periods. These findings are consistent with the literature, which points to risk stratification and clinical stability as central elements for the safety of early discharge in patients undergoing PCI.

The organization of criteria according to care moments made it possible to build a structured protocol, with sequential definition of clinical and angiographic parameters. This approach favors the standardization of care and reduces variability in decision-making, an aspect widely discussed in studies that address patient safety and quality of care in interventional cardiology.

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The protocol was developed following recognized methodological references, including the Coren-SP Guide for the Construction of Nursing Care Protocols and the domains of the AGREE II instrument, widely used to assess the quality of clinical guidelines. The incorporation of these benchmarks contributes to greater scientific rigor, methodological transparency, and applicability of the instrument in the care context.

The structuring of the protocol in sequential steps, corresponding to the pre-, trans-, and post-procedure periods, made it possible to delineate critical decision points throughout the care process. It is evident that eligibility for early discharge does not depend on a single moment, but on a continuous and dynamic assessment that considers both clinical evolution and the technical aspects of the procedure. This model is aligned with international recommendations that emphasize early monitoring of complications and the careful selection of patients for early discharge strategies.

Additionally, defining objective criteria and assigning responsibilities to professionals on the multidisciplinary team contributes to greater care safety and traceability of clinical decisions. In this context, the role of the nurse in data collection, clinical monitoring, and care coordination stands out, although the review revealed a scarcity of studies that delve into their specific role in this process.

The use of the 5W3H tool to support the organization of the protocol steps reinforces the integration between planning and care practice, favoring the operationalization of actions and the monitoring of indicators. Although widely used in health management, its application in clinical protocols is still little explored, representing an additional contribution of this study.

Early hospital discharge, when based on well-defined clinical and angiographic criteria, has been associated with reduced length of stay, optimization of beds, and decreased costs, without an increase in adverse events, provided that adequate patient selection is ensured. In this sense, the developed protocol does not aim to anticipate discharge indiscriminately, but to offer structured support for safe and evidence-based decision-making.

Limitations include the scarcity of national studies on early discharge after PCI, especially within the public health system, which restricts direct comparison of findings. Furthermore, the limited scientific output from nursing professionals on this topic highlights the need for future research to further explore the role of these professionals in cardiovascular care.

CONCLUSIONS

This study allowed us to systematize the main clinical and angiographic characteristics related to eligibility for early hospital discharge in patients undergoing percutaneous coronary intervention, highlighting the importance of integrated assessment of the pre-procedure, trans-procedure, and post-procedure periods in clinical decision-making.

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Based on these findings, a structured care protocol was developed based on objective criteria, organized sequentially, with the potential to support the decision-making of the multidisciplinary team and contribute to the standardization of care and patient safety.

The results also revealed gaps in the national literature, especially regarding the role of nursing in the cardiovascular care pathway and the systematization of strategies for early hospital discharge, indicating the need to expand scientific production in this area.

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The authors contributed to all stages of the article's production.

Conflict of Interest Statement

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Scientific Editor: Ítalo Arão Pereira Ribeiro. Orcid: https://orcid.org/0000-0003-0778-1447