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# CARE FOR PATIENTS WITH ACUTE CORONARY SYNDROME IN PREHOSPITAL CARE: AN INTEGRATIVE REVIEW

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## ABSTRACT

Acute Coronary Syndrome (ACS) is a term used to characterize a group of clinical signs compatible with acute myocardial ischemia. Pre-hospital care is essential for successful patient treatment and decreased mortality. In view of this scenario, the objective is to characterize the strategies adopted in pre-hospital care for better care of patients with suspected or diagnosed ACS. To this end, an integrative literature review was carried out with a descriptive approach based on consultation of the Scientific Electronic Library Online, National Library of Medicine, Virtual Health Library and Google Scholar databases. As inclusion criteria, texts available online, in full and free of charge, in Portuguese or English, published between 2019 and 2024, which were compatible with the theme and answer the research question, were eligible. After selection, the sample consisted of 20 studies, which evidenced the fundamental role of pre-hospital care in the care of ACS cases, also pointing out that the establishment of standardized care protocols, rapid triage, training of health professionals, regular monitoring of door-to-balloon and door-needle times, emergency care in mobile units, The use of software programs for mobile devices, as well as early recognition, electrocardiograms, oxygen administration in case of hypoxia, and the use of medications are strategies that favor better outcomes in care in cases of ACS.

**Keywords:** Acute Coronary Syndrome. Quality of Health Care. Pre-Hospital Care.

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## INTRODUCTION

Acute Coronary Syndrome (ACS) is a nosological term used to characterize a range of clinical signs compatible with acute myocardial ischemia. It is an acute event in which there is the rupture of an unstable atherosclerotic plaque, covering platelet activation, inflammatory and coagulation factors mechanisms that will cause the formation of thrombi, leading to vasospasm with greater or lesser importance, generating a reduction in myocardial blood flow and, consequently, myocardial ischemia. It is classified into three forms, according to the degree of occlusion of the vessel: Unstable Angina (UA), Acute Myocardial Infarction (AMI) without ST-segment elevation and ST-segment elevation AMI (Costa *et al.,* 2021; Santos *et al.,* 2017; Vasconcelos *et al.,* 2021).

As for the most present symptoms of this cardiovascular manifestation, there is chest pain in oppression or high-intensity retrosternal discomfort lasting more than twenty minutes, which can radiate to the neck, arms and jaw. There is also the possibility of other associated signs and symptoms such as dyspnea, nausea, fatigue, vertigo, sweating, syncope, epigastric pain, and lipothymia (Albuquerque Neto *et al.,* 2023; Vasconcelos *et al.,* 2021).

In terms of care, the agility of care must be considered, and pre-hospital care is essential for the successful treatment of these patients and the reduction of mortality. The Brazilian Society of Cardiology, according to guidelines published in 2022, determines that the electrocardiogram (ECG) is the main complementary exam to aid diagnosis, and should be performed and interpreted within a maximum of ten minutes after the patient's admission to the hospital (Albuquerque Neto *et al.,* 2023; Nicolau *et al.,* 2021; Samesima; Pastore, 2022).

Knowing that cardiovascular diseases correspond to a range of pathologies that represent a global concern due to their high prevalence and high morbidity and mortality, and that the estimate for the year 2030 is that about 35 million people will die from such diseases in the world (Silva *et al.,* 2020), it is believed that pre-hospital care is an auxiliary tool for this problem since rapid care and consequently the beginning of the treatment, is extremely important, as it is related to a better prognosis of patients, being essential to reduce high mortality and reduce sequelae

In view of this scenario, the objective is to characterize the strategies adopted in pre-hospital care for better care for patients with suspected or diagnosed Acute Coronary Syndrome.

## METHODOLOGY

Integrative literature review (RIL) with a descriptive approach, a method that allows the synthesis of knowledge and the incorporation of significant study results into practice. Thus, in order to achieve the proposed objective, the study was distributed in the following stages: identification of the central theme and elaboration of the hypothesis or research questions; stipulation of criteria for inclusion and exclusion; choice of information to be extracted from the selected studies; analysis of the studies included in the integrative review; understanding the results; presentation of the review (De Sousa; Bezerra; From Egyto, 2023).

All these phases were covered to carry out this study, which presented as a guideline: "What strategies to be adopted in pre-hospital care to minimize the time of care in the pre-hospital environment for patients with suspected or diagnosed Acute Coronary Syndrome?".

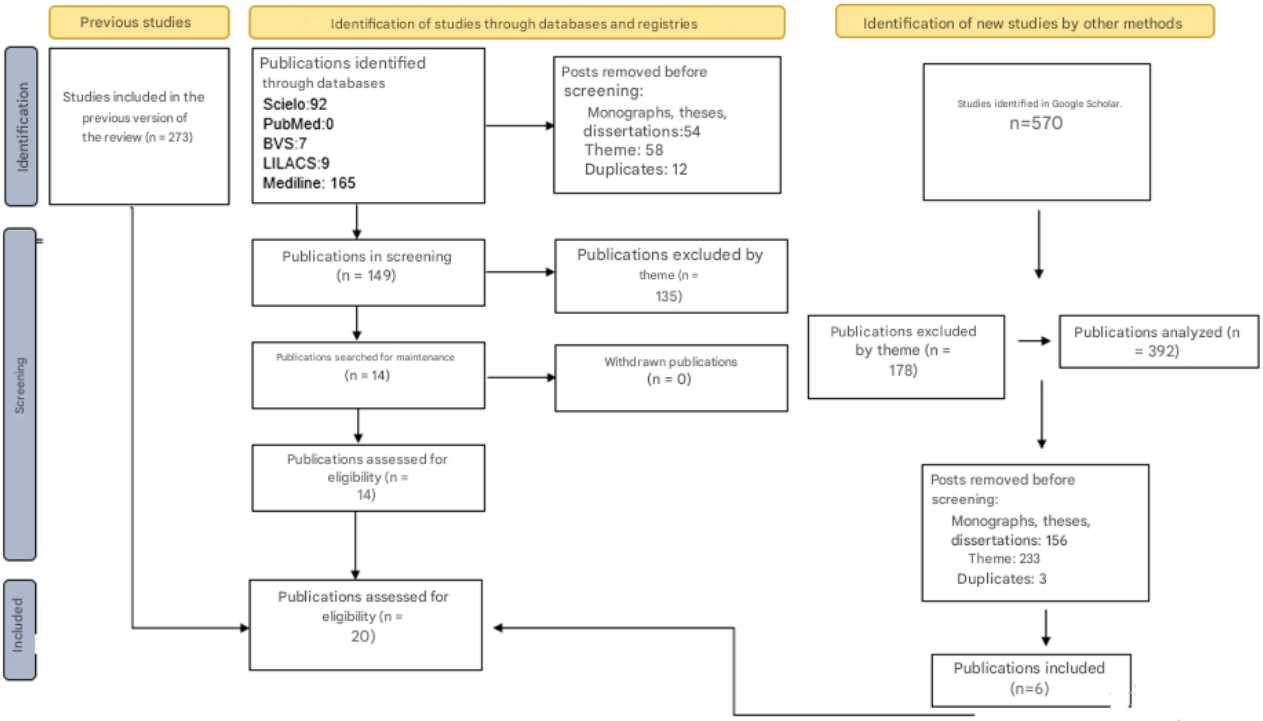
The search was carried out in the *Scientific Electronic Library Online* (SCIELO), *the National Library of Medicine* (PubMed) and the Virtual Health Library (VHL), which is composed of bibliographic databases such as Latin American and Caribbean Literature on Health Sciences (LILACS) and the Online System for the Search and Analysis of Medical Literature (MEDLINE). The following Health Sciences Descriptors (DeCS) were crossed: 1. Acute Coronary Syndrome; 2. Quality of health care; 3. Pre-Hospital Care, and their respective correspondences in English: 1. *Acute Coronary Syndrome; 2. Quality of health care; 3. Pre-Hospital Care.*

As inclusion criteria, texts available online, in full and free of charge, in Portuguese or English, published between 2019 and 2024, that were compatible with the theme and contemplated the research question, were eligible. The exclusion criteria were editorials, letters to the editor, theses, dissertations and monographs, duplicate texts (keeping them only once) and that did not address the proposed theme or answered the guiding question.

It is clarified that the selection process of studies eligible for the study objectives and in accordance with the research question and with the established inclusion and exclusion criteria was divided into four phases following the criteria *of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) (Page *et al.,* 2022): the first phase (identification) resulted in the search for studies published in the databases using the defined descriptors; in the second phase (selection), the filters were applied defining publications from the year 2020 and in the Portuguese language; in the third phase (eligibility), studies that did not deal with the theme were withdrawn; In the fourth and final phase (inclusion), the final sample of the study was found without gray literature. In order to

contemplate the research, Google Scholar searches were additionally carried out. In the previous search, 570 studies were found and after applying the eligibility criteria, 20 studies remained consistent with the intended objectives, 6 of which were found in *Google Scholar* (Figure 1).

Figure 1 – Flowchart for the selection of studies, adapted from Page *et al.* (2022).




Source: Survey data, 2024.

With the selection of the 20 studies that contemplated the sample, the studies were initially categorized, organizing them according to author, year, journal, type of study and objectives. Sequentially, the definition of the information to be extracted from the selected studies was carried out, thus allowing the qualitative data to be treated, through content analysis, as recommended by Bardin (2011), who states that the processing of qualitative data will take place through a set of analysis techniques that uses systematic and objective procedures of analysis and description of the content, using intuition, reflective analysis and criticism for this, with the purpose of enriching the understanding of the collected data.

Categories were worked on, dividing them into strategies that stabilize patients with ACS in pre-hospital care and strategies that minimize the time of care for patients with ACS.

Finally, in the fifth and sixth stages of the RL, it was dedicated, respectively, to the interpretation of the results and the presentation of the review, thus allowing a synthesis of knowledge.

## RESULTS

After selection based on the inclusion criteria, the sample consisted of 20 studies (Table 1). It is evident that there was a predominance of studies published in 2024 (31%; n=7). With regard to the journal, the *Brazilian Journal of Health Review and Research, Society and Development* stood out (10%; n=2 respectively). In addition, there was a prevalence of studies that developed a methodological design based on an integrative literature review (40%; n=8).

Table 1 – Research sample based on the included studies and categorized according to year, period, type of study and objectives.

| Authors (Year) | Periodic | Type of study | Goals |
|---|---|---|---|
| Alves *et al.* (2019) | Nursing in Focus | Integrative review | To develop guidelines for clinical nursing care in pre-hospital care in cardiovascular urgencies and emergencies in adult patients. |
| Barbosa *et al.* (2024) | *Brazilian Journal of Health Review* | Cross-sectional study | To characterize patients with ACS admitted to a referral hospital. |
| Carvalho *et al.* (2022) | *Research, Society and Development* | Narrative review | Describe in a narrative way the most relevant aspects regarding acute coronary syndrome. |
| Goés *et al.* (2021) | Brazilian Journal of Emergency Medicine | Exploratory and descriptive study | To assess these students' knowledge about ACS in order to signal the need to fill gaps in medical learning. |
| Gates; Magellan (2024) | Nursing Journal Reference | Cross-sectional study | To know the pre-hospital response time and the performance of the ambulance nurse and immediate life support in the occurrences of a person with suspected ACS. |
| Liebich *et al.* (2023) | Ibero-American Journal of Humanities, Sciences and Education | Retrospective and ecological study | To analyze the impact of the implementation and expansion of SAMU on hospitalization and general and in-hospital mortality rates due to acute myocardial infarction. |
| Lima *et al.* (2019) | Nursing Brazil | Integrative review | To describe the use of fibrolytic therapy in patients diagnosed with acute myocardial infarction in mobile emergency prehospital services. |
| Matos, Barbosa and Sena (2022) | *Health Journal* of Santa Izabel Hospital | Care protocol | To offer patients who seek the adult emergency service of Santa Izabel Hospital with Acute Coronary Syndrome a fast, organized care and appropriate treatment based on current guidelines. |
| Melo *et al.* (2024) | *Brazilian Journal of Health Review* | Integrative review | To analyze the application of care protocols for patients with acute myocardial infarction, focusing on the performance of the nursing |
| Oliveira *et al.* (2019) | Journal of Public Health | Ecological study | To evaluate the effectiveness of SAMU in the care of acute myocardial infarction. |

| | | | |
|---|---|---|---|
| Oliveira *et al.* (2023) | Electronic Magazine More Collection | Integrative review | To show ease and/or difficulties in accessing public services by people with acute myocardial infarction. |
| Paiva *et al.* (2020) | Medical Journal of Minas Gerais | Cross-sectional study | To analyze the potential benefit of early coronary reperfusion treatment in patients who suffered acute myocardial infarction. |
| Santos *et al.* (2022) | UFPI Nursing Journal | Exploratory and descriptive study | Identify the nursing care provided to patients in emergency care units. |
| Santos *et al.* (2023) | UFJF Nursing Journal | Cross-sectional study | To describe the pre-hospital aspects associated with delayed care of patients with acute myocardial infarction. |
| Santos *et al.* (2024) | *Brazilian Journal of Implantology and Health Sciences* | Integrative review | To describe the care provided by nursing professionals to patients with Acute Coronary Syndrome. |
| Silva *et al.* (2020a) | *Research, Society and Development* | Integrative review | To analyze emergency interventions for patients with suspected acute myocardial infarction. |
| Silva *et al.* (2020b) | *Brazilian Journal of Health Review* | Integrative review | To identify the actions performed during the care of a patient with chest pain, suggestive of acute myocardial ischemia in the hospital emergency service. |
| Soares *et al.* (2020) | Current Nursing Journal In Derme | Integrative review | To describe nursing conducts applied to patients with acute myocardial infarction in the pre-hospital period. |
| Souza *et al.* (2020) | Electronic Journal Enfermeria Actual en Costa Rica | Technological development research | Report on the development of a mobile health app to support patients with signs of acute myocardial infarction. |
| Vieira *et al.* (2022) | Brazilian Archives of Cardiology | Retrospective and ecological study | To evaluate the impacts of the implementation of pre-hospital care on hospitalization and mortality rates associated with acute myocardial infarction. |

Source: Survey data, 2024.

Based on the contributions of the authors of this review, it was possible to discuss the theme studied and gather information that evidences the necessary strategies for efficient care in the pre-hospital environment for patients with suspected or diagnosed Acute Coronary Syndrome. Thus, the discussion was categorized according to the theme of the included studies.

The detailed analysis showed that interventions aimed at minimizing care time were the most addressed (65%; n=17), highlighting the use of emergency care in mobile units, standardized care protocols, rapid triage and prioritization, training of the care team, monitoring of quality indicators, and the use of *software* developed to be used in mobile electronic devices.

Table 2 – Categorization of strategies, according to the study analyzed, that can be adopted to maximize the time of prehospital care for patients with suspected or diagnosed ACS.

| Intervention strategy in prehospital care for ACS | Subcategories | Authors | n | % |
|---|---|---|---|---|
| Strategies to minimize the time to care of patients with suspected or diagnosed ACS in the prehospital setting (65%; n=17) | Emergency care in mobile units | Gonçalves and Magalhães (2024)<br>Liebich *et al.* (2023)<br>Oliveira *et al.* (2019)<br>Oliveira *et al.* (2023)<br>Vieira *et al.* (2022) | 5 | 25 |
| | Standardized care protocols | Alves *et al.* (2019)<br>Matos, Barbosa and Sena (2022) | 2 | 10 |
| | Rapid Triage and Prioritization | Carvalho *et al.* (2022)<br>Goés *et al.* (2021)<br>Silva *et al.* (2020a)<br>Silva *et al.* (2020b)<br>Soares *et al.* (2020) | 5 | 25 |
| | Training of the Service Team | Goés *et al.* (2021) | 1 | 5 |
| | Monitoring and Review of Quality Indicators | Goés *et al.* (2021)<br>Paiva *et al.* (2020)<br>Santos *et al.* (2023) | 3 | 15 |
| | Use software programs for mobile electronic devices | Souza *et al.* (2020) | 1 | 5 |
| Strategies that stabilize the patient with ACS in prehospital care (35%; n=9) | Early Recognition | Barbosa *et al.* (2024)<br>Santos *et al.* (2023) | 2 | 10 |
| | Administration of Oxygen if the patient shows signs of hypoxia (oxygen saturation <90%) | Matos, Barbosa and Sena (2022) | 1 | 5 |
| | Electrocardiogram (ECG) | Matos, Barbosa and Sena (2022)<br>Santos *et al.* (2022)<br>Santos *et al.* (2024)<br>Melo *et al.* (2024) | 4 | 20 |
| | Use of First-Line Medications | Lima *et al.* (2019)<br>Matos, Barbosa and Sena (2022) | 2 | 10 |

Source: Survey data, 2024.

## DISCUSSION

The results of this review included two categories: 1) Strategies to minimize the time of care for patients with suspected or diagnosed ACS in the prehospital setting (65%; n=17) and 2) Strategies that stabilize patients with ACS in prehospital care (35%; n=9).

### STRATEGIES THAT MINIMIZE THE TIME OF PREHOSPITAL CARE OF PATIENTS WITH ACS

Minimizing the time of care for patients with suspected or diagnosed Acute Coronary Syndrome (ACS) in the prehospital setting is essential for better clinical outcomes. To this end, adopting strategies such as Standardized Care Protocols, Rapid Screening and

Prioritization, Training of the Care Team, and the Monitoring and Review of Quality Indicators, especially the door-to-balloon and door-to-needle times, is essential to promote efficient care and reduce mortality. The use of *software* programs developed for mobile electronic devices and emergency mobile response has played an important role in this context.

Alves *et al.* (2019) suggested that, in cases of cardiovascular emergency, the team should start with anamnesis and responsiveness assessment, followed by Cardiopulmonary Resuscitation (CPR) and use of the Automated External Defibrillator (AED) when necessary. Such procedures are essential, as they allow immediate intervention in cases of cardiorespiratory arrest, increasing the chance of recovery (Aehlert, 2017; Jones, 2016; Matos; Barbosa; Sena, 2022; Traeber *et al.,* 2017). The guidelines of the Brazilian Society of Cardiology highlight the relevance of pre-hospital care and non-adherence to these guidelines is directly related to high mortality rates (Nicolau *et al.,* 2021).

In addition, the reduced time to start treatment is one of the crucial factors for prognosis. According to Goés *et al.* (2021) and Silva *et al. (*2020b), the pre-hospital phase should occur in less than two hours after the onset of symptoms to reduce mortality and promote better quality of life. The agility of care and rapid prioritization directly influence the patient's prognosis, preventing irreparable damage to the myocardium (Carvalho, 2023).

Ribeiro (2020, p.19) emphasized that an efficient pre-hospital approach is important and "[...] translates into an early recognition of the syndrome, stabilization and initiation of treatment, in a reduction of associated myocardial damage and consequently in a reduction of morbidity and mortality". Carvalho *et al. (*2022) argued that early diagnosis and treatment determine the clinical outcome in patients with ACS. For Barbosa *et al.* (2024), Goés *et al.* (2021), Gonçalves and Magalhães (2024), O'Donnel *et al.* (2019), Silva *et al.* (2020a) and Soares *et al.* (2020) being agile in the area of pre-hospital care can provide better care and, consequently, ensure a higher survival rate for patients with ACS.

Therefore, Santos *et al.* (2023) warned of the relevance of quickly identifying the factors that interfere with care, promoting clear guidelines to minimize complications. Paiva *et al.* (2020) emphasized the importance of shorter times for door-to-balloon care, which should occur within 90 minutes, with a tolerance of up to 120 minutes, to reduce mortality and allow myocardial recovery.

It is necessary to mention that the Brazilian Society of Cardiology, as well as the American Association of Cardiology, recommend that the ECG needs to be performed as soon as possible, ideally performed and interpreted within 10 minutes after the patient's

arrival, becoming the central point of the initial decision-making process in patients with suspicion (Albuquerque Neto *et al.,* 2023).

In Brazil, the Mobile Emergency Care Service (SAMU) stands out in pre-hospital care for ACS, offering support and positive impacts on reducing mortality when performed in a timely manner and with qualified professionals (Brasileiro, 2007; Oliveira *et al.,* 2023; Santos *et al.,* 2018; Vieira *et al.,* 2022). According to Santos *et al.* (2018), the service reflects the advances of the Unified Health System (SUS), providing comprehensive and accessible care, although facing challenges such as lack of equipment and lack of preparation of professionals, which negatively impact the prognosis. In view of this, Liebich *et al.* (2023) and Oliveira *et al.* (2023) suggested greater investments to improve the support provided by SAMU, especially in resources for rapid diagnoses. Brasileiro (2007) corroborates this position.

Souza *et al.* (2020) proposed the development of a mobile application, S.O.S Infarto, as an additional strategy, which would guide patients to recognize the signs of infarction and find appropriate care, integrating the patient into their own care process. This use of mobile apps and devices facilitates early screening, empowering the patient to seek immediate care and thus improve their prognosis (Bonini *et al.,* 2022).

Additionally, it is relevant to consider the need for continuous training and qualification. This attribute has been reinforced in several studies (Brasileiro, 2007; Goés *et al.* 2021; O'Donnell *et al.*, 2019; Zhang *et al.,* 2020).

## STRATEGIES THAT STABILIZE PATIENTS WITH ACS IN PRE-HOSPITAL CARE

Continuing the data collected in this review, in pre-hospital care, strategies aimed at stabilizing patients with ACS include: Early Recognition, Electrocardiogram (ECG) at the site, Oxygen Administration in cases of hypoxemia (oxygen saturation <90%) and First-Line Medications, such as antiplatelets. According to Barbosa *et al.* (2024), Santos *et al.* (2023) and Santos *et al.* (2024), performing ECG in up to 10 minutes is essential for proper screening and accelerates diagnosis and treatment.

Matos, Barbosa, and Sena (2022) highlighted that in cases of ACS, an electrocardiogram should be performed in the first 10 minutes, administration of antiplatelet drugs (acetylsalicylic acid), and oxygenation should be performed in patients with arterial hypoxemia (saturation below 90%), dyspnea, and/or acute congestive heart failure.

In the case of suspected ACS, it is recommended that professionals perform rapid stabilization to facilitate transfer to a hospital with resources for definitive treatment. A study indicated that, in many cases, the lack of ECG in the prehospital compromises care,

especially in mobile units, where fibrinolytic intervention is still limited in Brazil (Lima *et al.,* 2019). According to Melo *et al.* (2024), the absence of ECG in prehospital care constitutes a gap that prevents a rapid and accurate diagnosis.

The optimization of prehospital care and treatment is accompanied by a sustained improvement is favored by the performance of ECG, actions to control potentially fatal dysrhythmias and the administration of drugs to stabilize atherosclerotic plaque and hemostasis (antiplatelets and antithrombins). It should be noted that, in addition to the rapid and correct conduct of pre-hospital care in patients with suspected heart muscle ischemia, the transfer time to hospitals trained with hemodynamics service and coronary unit is a considerable factor for the delay in medical and therapeutic management in these cases (Santos *et al.,* 2023; Varão *et al.,* 2024)

Therefore, the importance of a structured system for the transport of patients with ACS is highlighted, with well-equipped and qualified emergency services, essential for stabilization and rapid transfer (Santos *et al.,* 2023). Therefore, the continuity of investments and qualification in SAMU and pre-hospital services contributes to effective care, reduction of mortality and improvement in recovery.

Finally, it is clarified that this study had limitations since the interpretation of the data obtained may be subject to the subjectivity of the authors. In addition, it is emphasized that this type of study is considered a systematic method that combines qualitative and quantitative approaches, aggregating studies of different designs and methods, with heterogeneous characteristics, which can make it difficult to interpret the findings and compare them.

However, it is necessary to note that the findings ratify the importance of rapid care in the face of ACS in order to promote positive patient outcomes, thus arousing interest in in-depth investigations among the scientific community, in order to strengthen pre-hospital measures in the care of ACS.

## CONCLUSION

In view of the data, the fundamental role of pre-hospital care in the care of ACS cases is confirmed. The establishment of standardized care protocols, rapid triage, training of health professionals, regular monitoring of door-to-balloon and door-needle times, emergency care in mobile units, the use of *software* programs for mobile devices, as well as early recognition, electrocardiograms, oxygen administration in case of hypoxia, and the use of medications are presented as strategies presented that favor better outcomes in care in case of ACS.

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