

# Acute myocardial infarction: Time is muscle

**RESUMO |** Objetivo: descrever a importância de uma detecção precoce do Infarto Agudo do Miocárdio (IAM) por meio da equipe multidisciplinar de saúde e expor se o tempo interfere ou não na piora da lesão miocárdica. Método: Trata-se de uma revisão integrativa da literatura com artigos de 2015 e 2020. As bases utilizadas foram LILACS, MEDLINE, SCIELO, BDEFN e Google Acadêmico. Resultados: O tempo porta-balão <90 minutos é eficiente no manejo do paciente com IAM, pois quanto mais rápido atendimento melhor o prognóstico, mas ainda existem muitas dificuldades na realização desse manejo, pois muitos sintomas não são detectados precocemente, a busca pelo atendimento é demorada e as instituições não seguem os protocolos corretamente. Conclusão: Diante deste cenário a telemedicina surge como um aliado na prevenção, diagnóstico e tratamento e principalmente o menor tempo para o atendimento, pois trará mais saúde para o miocárdio e conseqüentemente para o paciente.

**Descritores:** Detecção precoce; Doenças Cardiovasculares; Infarto Agudo do Miocárdio.

**ABSTRACT |** Objective: to describe the importance of an early detection of Acute Myocardial Infarction (AMI) through the multidisciplinary health team and expose whether or not time interferes in the worsening of the myocardial injury. Method: This is an integrative literature review with articles from 2015 and 2020. The databases used were LILACS, MEDLINE, SCIELO, BDEFN and Google Scholar. Results: The door-to-balloon time <90 minutes is efficient in the management of patients with AMI, because the faster the treatment, the better the prognosis, but there are still many difficulties in carrying out this management, since many symptoms are not detected early, the search for care it is time consuming and institutions do not follow protocols correctly. Conclusion: Given this scenario, telemedicine emerges as an ally in prevention, diagnosis and treatment and especially the shortest time for care, as it will bring more health to the myocardium and consequently to the patient.

**Keywords:** Early Detection; Cardiovascular Diseases; Myocardial Infarction

**RESUMEN |** Objetivo: describir la importancia de la detección precoz del Infarto Agudo de Miocardio (IAM) a través del equipo multidisciplinario de salud y exponer si el tiempo interfiere o no en el empeoramiento de la lesión miocárdica. Método: Se trata de una revisión integrativa de la literatura con artículos de 2015 y 2020. Las bases de datos utilizadas fueron LILACS, MEDLINE, SCIELO, BDEFN y Google Scholar. Resultados: El tiempo puerta-balón < 90 minutos es eficiente en el manejo de los pacientes con IAM, pues cuanto más rápido el tratamiento, mejor el pronóstico, pero aún existen muchas dificultades para realizar este manejo, ya que muchos síntomas no se resuelven. detectada a tiempo, la búsqueda de atención lleva mucho tiempo y las instituciones no siguen correctamente los protocolos. Conclusión: Ante este escenario, la telemedicina surge como un aliado en la prevención, diagnóstico y tratamiento y sobre todo en el menor tiempo de atención, ya que traerá más salud al miocardio y conseqüentemente al paciente.

**Palabras claves:** Deteccion Precoce; Enfermedades Cardiovasculares; Infarto del Miocárdio

## José de Ribamar Medeiros Lima Júnior

PhD in Health Sciences (Postgraduate Program in Health Sciences - UFMA)  
Specialist in Pediatric ICU - Faculdade Cidade Verde Graduation in Nursing - Federal University of Maranhão  
ORCID:0000-0001-9172-3682

## Silmara Ribeiro Batista Rodrigues

Specialist in Dermatology - Faculdade Laboro (Laboro College)  
Graduation in Nursing - Faculdade Santa Terezinha - CEST (Santa Terezinha College)  
ORCID: 0000-0003-2660-3427

## Thaynara Dias Barros

Specialist in ICU- Uniredentor AMIB  
Graduation in Nursing - Faculdade Santa Terezinha - CEST (Santa Terezinha College)  
ORCID: 0000-0001-6792-7909

## Almir José Guimarães Gouveia

Specialist in General Surgery - UEMA  
Bachelor of Medicine - State University of Maranhão  
ORCID: 0000-0002-0563-397X

## Gilnara Frazão Sousa

Master in Collective Health Nursing Degree-UFMA  
ORCID: 0000-0002-8252-9906

## Maria Lúcia Lima Cardoso

Nurse- CEUMA University  
ORCID:0000-0001-5654-2413

## Adriana de Jesus Arouche

Nurse- CEUMA University  
ORCID:0000-0002-0932-8921

## Raissa Câmara Carvalho

Specialist in Urgency and Emergency - College of the State of São Paulo  
Graduation in Nursing - Faculdade Santa Terezinha - CEST (Santa Terezinha College)  
ORCID:0000-0002-7621-0149

**Recebido em:** 11/12/2022

**Aprovado em:** 23/01/2023

## INTRODUÇÃO

Cardiovascular diseases (CVD's) are considered a public health problem thanks to their morbidity and mortality, the increased prevalence of obesity, sedentary lifestyle

and smoking, for example, represent a serious risk factor for an even greater growth of cases.<sup>1</sup>

CVDs are the main cause of death in the world and, in Brazil, they represent about 30% of deaths, more people die annually from these diseases than from any other cause. Cardiovascular diseases kill twice as many people as all types of cancer,<sup>2,5</sup> times as many accidents and deaths from violence, and six times as many as infections, including deaths from acquired immunodeficiency syndrome (AIDS).<sup>2</sup>

Among these diseases, acute myocardial infarction stands out, which is considered the main cause of isolated death in Brazil, accounting for about 60,080 deaths annually, making it the leading cause of isolated death in the country.<sup>3</sup>

The term acute myocardial infarction basically means the death of cardiomyocytes due to prolonged ischemia, it commonly begins through a sudden and unexpected conversion of an atherosclerotic plaque of a stable nature, It is characterized by an insufficient demand for oxygen and nutrients to the myocardium, it is associated to a rupture of a plaque, formation of a thrombus, or even vasoconstriction; all these factors will generate myocardial ischemia or injury and cardiac muscle necrosis.<sup>4</sup>

The main characteristic of AMI is prolonged pain that can be located in the substernal region and radiate to the neck, shoulder and left arm. The big problem with symptomatology is that many of these are confused with symptoms of other diseases, which can lead to a delay in early recognition and end up injuring the already damaged muscle more deeply.<sup>5</sup>

According to Chagas et al.<sup>6</sup> the short time interval for the start of treatment is extremely important, as it is related to the better prognosis of patients, since the rapid restoration of blood flow can limit myocardial injury, reducing mortality and complications, thus, increased

ischemia time during acute myocardial infarction is directly related to permanent injury and patient mortality.

Currently, the door-to-balloon time is used to assess the quality of care provided to patients, as it measures the time elapsed from the patient's arrival at the emergency room, "door", until the "balloon" is started. Thus, different institutions aim to constantly reduce the door-to-balloon time to less than 90 minutes.<sup>2</sup>

In view of the above, the objective of this study is to describe the importance of early detection of AMI by the multidisciplinary health team and expose whether or not time interferes with the worsening of the myocardial injury.

#### METHODOLOGY

For the development of this study, it was decided to carry out a bibliographical research, with the integrative review method, following the inclusion criteria: articles available in full, in Portuguese, between the years 2015 to 2020 that coherently address the subject in question. As exclusion criteria: Duplicate articles, articles in English and Spanish, those published before 2015 and that deviated from the proposed theme were excluded, an electronic search was carried out in the Virtual Health Library (VHL) on: Acute Myocardial Infarction and the importance of early detection, focusing on investigating whether the early time of pathological detection is beneficial to the heart muscle, the search found 144 articles related to the topic in the aforementioned databases, which after applying the respective Inclusion criteria were selected 26, data collection was developed on the platforms Scientific Electronic Library Online (SCIELO), Latin American and Caribbean Database on Health Sciences (LILACS), Database on Nursing (BDENF) Medical Literature Analysis and Retrieval System Online (MEDLINE) and Google Scholar. The descriptors used are indexed to the

DECs, namely: Acute myocardial infarction; Cardiovascular diseases; Early detection.

#### RESULTS:

Through data searches, 144 articles were identified, after using the exclusion, inclusion and reading criteria, 9 studies were included, read in full and are part of this research. The table below shows the articles that make up the results and discussion, according to author, year, and title.

#### DISCUSSION

##### Door-to-balloon time and service efficiency

According to Amoras et al.<sup>7</sup> there is still a great challenge in achieving the door-to-balloon time <90 minutes, lack of adoption of work processes in a systematic way, as this would be an effective formula to reduce BPD, this would avoid unnecessary delays for patients, delay in diagnosis and even the treatment, so the service would be much more efficient.

Moraes et al.<sup>8</sup> state that infarction care should be agile, organized, unidirectional and mainly following protocols, following a balloon door time of <90 minutes as adequate for restoring blood flow in the affected artery.

Lima et al.<sup>9</sup> consolidates that the door-balloon time is already pre-established by the Brazilian Society of Cardiology, and that it helps to guarantee agility in care and guarantees that the patient has a better prognosis since he is treated more quickly.

As discussed by Ouchi et al.<sup>5</sup> one of the main factors that contribute to the reduction of mortality from AMI is the rapid care given to patients, for which it is necessary that professionals have knowledge about the disease, have quick reasoning and make correct decisions and immediate.

The four authors validate that time is gold, that the heart muscle depends a lot

on the time of arrival of the patient until the moment of making the initial decision, they corroborate when they exemplify the door balloon time <90 minutes and that the faster the actions are performed less myocardial and systematic damage the patient will present.

**Factors influencing rapid patient care.**

According to Soares and Ferreira<sup>10</sup>, one of the main influencing factors is the delay that the patient takes from the onset of symptoms to the search for the health service. He emphasizes that as soon as the patient arrives at the health unit with cardiac symptoms, it still takes time to request the ECG and that this is extremely aggravating and can lead to death more quickly.

Silva et al <sup>11</sup> state that care should be fast and objective, starting with a good assessment of the symptoms that the patient will report, which can be classified as a major challenge in care, since the symptoms may sometimes not be assessed correctly and the performance of the professional and care for the patient are crucial for proper clinical management.

Bassetti, et al <sup>12</sup> report that it is important to do a good research of the signs and symptoms that the patient is complaining about, as the service is often hampered by not having a good interview, in addition to that he mentions other factors that make access difficult, many patients delay in seeking the health service, as well as the delay in performing the ECG and other recommended treatments.

The three authors agree when they report that one of the main factors is the difficulty in analyzing the signs and symptoms when the patient arrives at the health service. It is also important to emphasize the delay in performing the ECG , the test considered gold in the diagnosis of AMI.

**Implementation of tools for better clinical management of AMI**

According to Soares and Ferreira Ac-

**Table 1- Description of articles according to author, year, and title, 2023.**

Author/Year	Title
Amoras, et al.,2020	Avaliação do tempo porta- balão como um indicador da (Evaluation of door-to-balloon time as an indicator of quality of care)
Bassetti, et al., 2018	Abordagem de pacientes com infarto agudo do Miocárdio em serviço de (Approach to patients with acute myocardial infarction in an emergency department)
França et al., 2020	Resultados de um programa (Results of a telemedicine de atendimento ao infarto por telemedicina (heart attack care program)
Lima, et al.,2019	Impacto da gestão da qualidade no gerenciamento do indicador tempo porta balão no infarto agudo do (Impact of quality management on the management of the door balloon time indicator in acute myocardial infarction)
Matsuda, et al., 2018	Implementação da Telemedicina no atendimento inicial do infarto agudo do miocárdio com supradesnivelamento do segmento ST (Implementation of telemedicine in the initial care of acute myocardial infarction with ST-segment elevation)
Amoras, et al.,2020	Perfil e tempo porta-balão de pacientes com infarto agudo do Miocárdio (Profile and door-to-balloon time of patients with acute myocardial infarction)
Silva et al,	Intervenções de emergência ao paciente com suspeita de infarto agudo do miocárdio (Emergency interventions for patients with suspected acute myocardial infarction)
Soares e Ferreira, 2017	A pessoa com enfarte agudo do miocárdio no serviço de urgência: fatores que influenciam o tempo de. atendimento. (The person with acute myocardial infarction in the emergency service: factors that influence the time of care)
Ouchi, et al.,2017	Tempo de Chegada do Paciente Infartado na Unidade de Terapia Intensiva: a Importância do Rápido Atendimento (Time of Arrival of the Infarcted Patient in the Intensive Care Unit: the Importance of Rapid Assistance)
Vaz, et al.,2019	Criação e Implementação de um Banco de Dados Prospectivo e Multicêntrico de Pacientes com Infarto Agudo do Miocárdio: (Creation and Implementation of a Prospective and Multicenter Database of Patients with Acute Myocardial Infarction:) RIAM

Source: author's data, 2023.

cording to Soares and Ferreira<sup>10</sup>, one of the main influencing factors is the delay that the patient takes from the onset of symptoms to the search for the health service. He emphasizes that as soon as the patient arrives at the health unit with cardiac symptoms, it still takes time to request the ECG and that this is extremely aggravating and can lead to death more quickly., one of the main influencing factors is the delay that the patient takes from the onset of symptoms to the search for the health service. It emphasizes that as soon as the patient arrives at

the health unit with cardiac symptoms, it still takes time to request the ECG and that this is extremely aggravating and can lead to death more quickly.

Vaz et al <sup>14</sup> used telemedicine to speed up care for patients with acute myocardial infarction, the author found that the intervention was effective on the part of health professionals who would already be inside the patient's entire clinic, showing effectiveness in clinical practice and better treatment of pathology.

França et al <sup>15</sup> state that it is extremely

important that there are new strategies for better diagnosis and interconnections between primary and secondary health services, the author consolidates that the use of telemedicine in the context of acute myocardial infarction provides rapid diagnosis, greater preservation quality of life, reduces morbidity and mortality rates and improves health in all areas.

The three authors in question are in agreement when mentioning that telemedicine greatly speeds up the service, improving the quality of life of the patient who will have the diagnosis completed more quickly and the treatment initiated, if time is muscle, the more tools are used to shorten the time, the

better it will be.

#### CONCLUSION

The Acute Myocardial Infarction is considered an important public health problem thanks to its increasing morbidity and mortality, it is classified as a decrease in the blood supply due to the obstruction of a coronary artery, time is one of the primordial factors for an efficient service, the more The longer the patient takes to have his diagnosis closed and treatment started, the more the muscle will be damaged. It was possible to observe that the door balloon time

less than 90 minutes is extremely important and that an accelerated and effective service guarantees a much hi-

gher survival rate. The factors that most influence the speed of care are the delay in seeking health services, the failure to recognize the signs and symptoms and the time between the patient's arrival at the hospital and the performance of the ECG. To ensure faster and more effective care, telemedicine was considered a great ally, as it streamlines care, improves quality of life and reduces morbidity and mortality. Therefore, it is imperative to continue studies on the topic addressed, since cardiovascular diseases, in particular Acute Myocardial Infarction, lead to extensive damage that could be easily avoided with a deepening of faster and more accurate care.

## Referências

1. PALANGANI, Emanuelle Aparecida et al. Análise dos óbitos de infarto agudo do miocárdio no estado de São Paulo. *REVISTA UNINGÁ*, v. 57, n. 51, p. 005-006, 2021.
2. ROCHA, Ricardo Mourilhe; MARTINS, Wolney de Andrade (Eds.). *Manual de prevenção cardiovascular*. 1. ed. São Paulo: Planmark; Rio de Janeiro: SOCERJ - Sociedade de Cardiologia do Estado do Rio de Janeiro, 2017.
3. SILVA, Mariana Pereira Barbosa et al. Intervenções de emergência ao paciente com suspeita de infarto agudo do miocárdio. *Research, Society and Development*, v. 9, n. 9, p. e781997949-e781997949, 2020.
4. CAVALCANTE, Daniel Alexandre Lima; FERNANDES, Laura Trindade; AMARANTES, Willian Amauri. Infarto Agudo do Miocárdio e suas características fisiopatológicas. *Revista Renovare de Saúde e Meio Ambiente*. Ano 7 – Volume 1 – União da Vitória – Paraná. Janeiro - Abril de 2020. ISSN: 2359-3326.
5. OUCHI, Janaina Daniel et al. Tempo de chegada do paciente infartado na unidade de terapia intensiva: a importância do rápido atendimento. *Ensaio e Ciência C Biológicas Agrárias e da Saúde*, v. 21, n. 2, p. 92-97, 2017.
6. CHAGAS, José Paulo Amaral; DE SOUZA, Luiz Otavio; RODRIGUES, Isabela Aurora. A importância do atendimento no tempo correto para pacientes com infarto agudo do miocárdio. *Revista Brasileira de Ciências da Vida*, v. 6, n. 3, 2018.
7. AMORAS, Tarcio Sadraque Gomes et al., 2020. Avaliação do tempo porta-balão como um indicador da qualidade assistencial. *Rev enferm UFPE on line*.
8. MORAES, Cladis Loren Kiefer et al. Perfil e tempo porta-balão de pacientes com infarto agudo do miocárdio. *Inova Saúde*, v. 10, n. 2, p. 107-124, 2020.
9. LIMA, Lilian Kelly Barbosa et al. Impacto da gestão da qualidade no gerenciamento do indicador tempo porta balão no infarto agudo do miocárdio. *Rev. Eletr. Evid & Enferm*. 2019;5(2):36-46
10. SOARES, Sônia Oliveira de Matos; FERREIRA, Paulo Alexandre Carvalho. A pessoa com enfarte agudo do miocárdio no serviço de urgência: fatores que influenciam o tempo de atendimento. *Revista de Enfermagem Referência*, n. 15, p. 31-42, 2017.
11. SILVA, Katherlyne Suellen Cavalcante et al. Emergência cardiológica: principais fatores de risco para infarto agudo do miocárdio. *Brazilian Journal of Health Review*, v. 3, n. 4, p. 11252-11263, 2020.
12. BASSETTI, Karla Scalfoni et al. Abordagem de pacientes com infarto agudo do miocárdio em serviço de emergência. *Revista Interdisciplinar Pensamento Científico*, v.4, n. 2, 2018.
13. MATSUDA, Camila Naomi et al., 2018. Implementação da telemedicina no atendimento inicial do infarto agudo do miocárdio com supradesnivelamento do segmento ST. *J Transcat Intervent*. 2018;26:1-6
14. VAZ, Jaqueline et al., 2019. Criação e Implementação de um Banco de Dados Prospectivo e Multicêntrico de Pacientes com Infarto Agudo do Miocárdio: RIAM. *Arq Bras Cardiol*. 2020; 114(3):446-455.
15. FRANÇA, Victor Eduardo de Almeida et al. Resultados de um programa de atendimento ao infarto por telemedicina. *J Transcat Intervent*, v. 28, p. -, 2020.