

Management health crises: acute myocardial infarction as a model

إدارة الأزمات الصحية: احتشاء عضلة القلب نموذجاً

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Abstract

This article evaluates the cost-effectiveness of early intervention strategies, and examines socioeconomic disparities in AMI outcomes. Drawing on recent studies, we highlight the economic benefits of reducing treatment delays and propose a national protocol to standardize AMI care. Our findings underscore the importance of integrating clinical and economic perspectives to optimize AMI management, reduce healthcare costs, and improve patient outcomes. Policy recommendations include investing in pre-hospital care,, and addressing disparities in populations. This study contributes to the growing literature on the economic implications of cardiovascular disease and offers actionable insights for policymakers and healthcare providers.

Keywords: management crises, Acute Myocardial Infarction (AMI), Economic Burden, Cost-Effectiveness, Healthcare Disparities.

JEL Classification: I 180

ملخص

يتناول هذا المقال فعالية التكلفة لاستراتيجيات عند التدخل المبكر، ويستعرض الفجوات الاجتماعية والاقتصادية في مخرجاتها من خلال الاستناد إلى دراسات حديثة، تبرز الفوائد الاقتصادية الناتجة عن تقليل تأخيرات العلاج ونقترح بروتوكولاً للرعاية، يحتوي العرض على أهمية دمج الجوانب السريرية والاقتصادية لتحسين إدارتها، وتقليل تكاليف الرعاية الصحية. تشمل التوصيات الاستثمار في الرعاية قبل دخول المستشفى، ومعالجة الفجوات في مختلف الحالات. تسهم هذه الدراسة في الأدبيات المتزايدة حول الآثار المترتبة للأمراض القلبية الوعائية وتقدم رؤية قابلة للتنفيذ لصانعي السياسات ومقدمي الرعاية الصحية.

كلمات مفتاحية: إدارة الأزمات الصحية، احتشاء عضلة القلب، الآثار الاقتصادية، ترشيد التكاليف، النظام الصحي.

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Introduction

Acute myocardial infarction (AMI), commonly known as a heart attack, is a leading cause of mortality and morbidity worldwide, placing a significant economic burden on healthcare systems. But what exactly are the costs of AMI to healthcare systems when it manifests as a crisis?

And What is the true burden of AMI in its early and late phases? And How can we address these issues by focusing on time and rapid action?

This article explores the economic burden of AMI, evaluates the cost-effectiveness of time-sensitive interventions, and proposes policy solutions to optimize care delivery. By addressing these challenges, we can not only improve patient outcomes but also create a more sustainable and equitable healthcare system.

1. Managing health crises

Managing health crises involves a multifaceted approach that includes strategic planning, effective leadership, technological innovations, and collaborative efforts across various sectors. Here are some key strategies and tools used in managing health crises:

Strategic Planning and Leadership , when

- **Global Public Health Leadership:** The World Health Organization (WHO) and national public health systems play crucial roles in managing global health crises. Public trust and collaboration with other agencies are essential for effective crisis management (Goniewicz et al., 2022)

Technological Innovations

- **Artificial Intelligence (AI) and Agent-Based Social Simulations (ABSS):** AI systems, particularly ABSS, are used to simulate scenarios and evaluate policy interventions during health crises. This approach helps in analyzing potential consequences of different interventions (Tucker & Lorig, 2024).

Healthcare and Emergency Response

- **Nursing Effectiveness:** Nurses play a pivotal role in managing health crises through triage, patient care, and infection control. Challenges faced by nurses include resource shortages

and emotional stress, highlighting the need for improved training and support (*Mohammed, A. D. N., Meqbel, et al*, 2020)

- **Emergency Departments:** Hospitals face significant challenges during health crises. Implementing effective strategies to enhance workflow, communication, and resource allocation is crucial for preparedness and response (Mohammed, 2023)

Economic and Trade Recovery

- **Trade Recovery Measures:** The COVID-19 pandemic has underscored the importance of designing effective trade recovery strategies. This involves shifting from emergency-oriented measures to comprehensive, enduring policies that account for the complexities of global trade (Yang, 2024)

managing health crises requires a comprehensive approach that integrates strategic planning, technological innovation, effective healthcare delivery, and economic resilience strategies.

2. How can emergency departments improve their workflow during health crises

Improving workflow in emergency departments (EDs) during health crises involves several strategic measures that enhance efficiency, communication, and patient care. Here are some key strategies:

2.1 Streamline Patient Flow

- **Direct Triage to Diagnostic Tests:** Implementing direct triage to diagnostic tests, such as CT scans for non-traumatic headaches, can significantly reduce the length of stay (LOS) for patients. This approach bypasses the initial physician consultation, allowing for quicker assessment and treatment (Giat et al., 2023)

2.2 Enhance Communication and Information Systems

- **Health Information Systems:** Implement user-friendly health information systems that provide patients and families with necessary information, helping them feel more in control and informed during their visit (Østervang et al., 2024)

- **Centralized and Democratized Communication:** Implement centralized communication systems that standardize information across roles and settings, while

democratizing access to ensure all stakeholders can understand and act on the information (Hayirli et al., 2023)

2.3 Leverage Technology and Virtual Support

- **Real-Time Virtual Support:** Utilize real-time virtual support (RTVS) to provide peer-to-peer pathways for patients and providers in rural or remote areas. This can enhance access to specialized care and reduce disparities in healthcare delivery (Lauscher et al., 2023)

2.4 Training and Staff Support

- **Staff Training and Support:** Provide ongoing training and support for healthcare staff to manage stress and improve performance under crisis conditions. This includes addressing burnout and ensuring adequate staffing levels (Hayirli et al., 2023) (Lauscher et al., 2023)

(Verulava & Arakishvili, 2024)By implementing these strategies, emergency departments can significantly improve their workflow during health crises, enhancing patient care and reducing operational challenges.

3. Managing health crises related to acute myocardial infarction

3.1 Timely Medical Response (A et al., 2016)

- **Emergency Services:** Most patients with AMI directly contact emergency services, bypassing primary care physicians. This approach ensures rapid access to emergency care, with 95.8% receiving treatment within two hours in some studies (Verulava & Arakishvili, 2024)

- **Role of Family Physicians:** While many patients bypass family doctors, those who consult them experience shorter delays in receiving emergency care. Family physicians can accurately recognize symptoms and refer patients promptly (Verulava & Arakishvili, 2024)

3.2 Post-AMI Care and Rehabilitation

- **Managed Care Programs:** Programs like Poland's Managed Care in Acute Myocardial Infarction (MC-AMI) significantly reduce mortality and major adverse cardiovascular events (MACE) by providing comprehensive post-AMI care, including cardiac rehabilitation and follow-up (Kulach et al., 2019) (Wita et al., 2020)

- **Health Literacy:** Improving health literacy among patients is crucial for better health-related quality of life post-AMI. Health literacy affects how well patients manage their condition and adhere to treatment plans (Kirchberger et al., 2024)

3.3 Psychological Support

- **Anxiety and Depression:** Patients with AMI often experience anxiety and depression, which can impact recovery. Addressing these psychological factors is essential for improving overall health outcomes (Kehaya et al., 2024) (Virani et al., 2021)

3.4 Prevention and Public Awareness

- **Public Health Campaigns:** Encouraging immediate emergency response for chest pain symptoms through public health campaigns can improve outcomes by reducing delays in seeking medical help (Verulava & Arakishvili, 2024)
- **Education on Risk Factors:** Educating the public about risk factors, such as cannabis use, which can lead to AMI, is important for prevention (Hajlaoui et al., 2016)

4. Impact of Acute Myocardial Infarction Crises on Patient Outcomes and Healthcare Systems

Acute myocardial infarction (AMI), commonly known as a heart attack, is a major cause of morbidity and mortality worldwide. The impact of AMI crises extends beyond individual patient outcomes, affecting healthcare systems, resource allocation, and long-term population health. This response examines the multifaceted effects of AMI on patient outcomes and healthcare systems, drawing insights from recent research studies.

4.1 Secondary Prevention and Adherence to Guidelines

Adherence to secondary prevention measures is critical for improving outcomes in AMI patients. However, studies reveal suboptimal adherence to recommended therapies and cardiac rehabilitation programs. For instance, a nationwide study in Austria found that only 13.4% of AMI patients adhered to cardiac rehabilitation programs, which was associated with a 27% reduction in mortality risk (Hammer et al., 2024). Similarly, adherence to dual antiplatelet

therapy (DAPT) and high-intensity statins was found to be low, with non-adherence linked to increased mortality rates (Hammer et al., 2024).

These findings underscore the importance of structured referral systems and personalized follow-ups to enhance adherence to secondary prevention measures. Improved adherence could significantly reduce morbidity and mortality, as evidenced by the 21% reduction in mortality observed with DAPT adherence (Hammer et al., 2024).

4.2 Long-Term Health Outcomes After AMI

The long-term health outcomes following AMI are profound and multifaceted. A population study of 56 million individuals in England revealed that up to 38% of AMI patients died within 9 years, with high rates of heart failure (29.6%), renal failure (27.2%), and atrial fibrillation (22.3%) (Hall et al., 2024). These findings highlight the need for comprehensive, long-term management strategies to mitigate the risk of secondary complications.

Additionally, the study identified increased risks of diabetes, cerebrovascular disease, and depression post-AMI, emphasizing the importance of holistic care that addresses both cardiovascular and non-cardiovascular comorbidities (Hall et al., 2024).

4.3 Emergency Treatment and Prognosis

The timing and method of emergency treatment significantly influence patient outcomes. A retrospective study comparing two emergency treatment approaches—"First Transport and Then Treatment" versus "Treatment Before Transport"—found that initiating treatment before transport resulted in lower rates of all-cause mortality (3.45% vs. 16.07%), recurrent myocardial infarction (5.17% vs. 19.64%), and rehospitalization for cardiovascular causes (8.62% vs. 25.05%) (Xiao et al., 2024). These results underscore the importance of prompt intervention in improving long-term prognosis.

5. Impact on Healthcare Systems

The burden of AMI on healthcare systems is substantial, with significant implications for resource utilization and clinical outcomes. A study analyzing 6.6 million AMI hospitalizations in the United States found that patients from lower socioeconomic backgrounds were less likely to receive invasive management, such as coronary angiography and percutaneous coronary

intervention (PCI), and experienced worse in-hospital outcomes, including higher mortality rates (Matetic et al., 2020).

Furthermore, the COVID-19 pandemic exacerbated existing disparities, with reduced hospitalizations for AMI during the early pandemic period but worse outcomes for those admitted, including higher in-hospital mortality and increased rates of cardiogenic shock (Gluckman et al., 2020) (Motovska et al., 2022).

6. Socioeconomic Disparities in AMI Outcomes

Socioeconomic status (SES) plays a significant role in AMI outcomes, with lower-income patients experiencing higher rates of readmission and mortality. A study using zip code-based median household income data found that patients in the lowest income group had a 13.88% increased risk of AMI readmission and a 4.79% increased risk of cardiovascular death compared to those in the highest income group (Chiu et al., 2022). These disparities highlight the need for targeted interventions to address inequities in access to care.

Similarly, another study found that patients from lower SES backgrounds were less likely to undergo invasive procedures, such as PCI, and experienced worse clinical outcomes, including higher rates of major adverse cardiac and cerebrovascular events (MACCE) (Matetic et al., 2020).

7. Economic burden of management in the early phase

The economic cost of managing acute myocardial infarction (AMI) in the first few hours is substantial, driven primarily by emergency medical services (EMS), rapid diagnostic evaluations, and immediate reperfusion therapies. The initial hours are critical, as timely intervention significantly impacts outcomes and reduces long-term costs. The average cost of AMI management within the first 24 hours can range from 10,000 to 15,000 per patient in high-income countries, with a significant portion attributed to PCI procedures, which alone can cost between 7,000 and 11,000 (Harlan K et al., 2009) . Additionally, EMS activation, emergency department care, and intensive cardiac monitoring contribute to these expenses. In low- and middle-income countries, while costs may be lower, the economic burden remains high relative to local healthcare budgets, often exacerbated by delays in care and limited access to advanced

therapies. Early intervention not only improves survival but also reduces downstream costs associated with complications, such as heart failure or arrhythmias (Mensah et al., 2019).

8. Managing acute myocardial infarction as a health crisis

Myocardial infarction (MI), commonly referred to as a heart attack, is the irreversible necrosis (death) of myocardial tissue caused by a prolonged lack of oxygenated blood supply to a portion of the heart muscle. This typically occurs due to the occlusion of a coronary artery, often resulting from the rupture of an atherosclerotic plaque and subsequent thrombus formation. MI is a critical manifestation of coronary artery disease (CAD) and is classified into different types based on clinical, electrocardiographic, and biochemical criteria (Thygesen et al., 2018).

8.1 Global Burden of myocardial infarction

Globally, the incidence of MI is higher in high-income countries due to aging populations and lifestyle factors, but low- and middle-income countries are increasingly affected by rising rates of risk factors such as hypertension, diabetes, and obesity.

In the United States, the annual incidence is approximately 605,000 new cases, with around 200,000 recurrent cases, while in Europe, the incidence ranges from 150 to 300 cases per 100,000 population annually. Improved survival rates, driven by advances in treatment like percutaneous coronary intervention (PCI) and thrombolysis, have contributed to the growing prevalence of MI. In the U.S., the prevalence is estimated at 3.0% among adults aged 20 and older, with higher rates observed in older populations and men compared to women. These trends highlight the ongoing global burden of MI and the need for targeted prevention and management strategies (Tsao et al., 2023; Virani et al., 2021).

The Global Burden of Disease (GBD) Study 2019 underscores the significant impact of ischemic heart disease (IHD), which includes myocardial infarction (MI), as the leading cause of death worldwide, accounting for approximately 9.1 million deaths annually. This highlights the persistent global burden of IHD and its critical role in shaping public health priorities. Similarly, the American Heart Association (AHA) 2023 Statistical Update emphasizes that MI remains a major contributor to the overall burden of cardiovascular disease (CVD) (Roth et al., 2020).

8.2 Revascularization in Myocardial Infarction

Revascularization is a cornerstone of acute MI management, aimed at restoring blood flow to the ischemic myocardium to limit infarct size, preserve cardiac function, and improve survival. The two primary methods of revascularization are percutaneous coronary intervention (PCI) and thrombolysis.

8.3 The significance of emergent revascularization

The "time is muscle" dogma emphasizes that early reperfusion of the occluded coronary artery is critical in MI to salvage ischemic myocardium, limit infarct size, and improve clinical outcomes. Delays in restoring blood flow lead to irreversible myocardial necrosis, which increases the risk of heart failure, arrhythmias, and death. Studies have shown that every 30-minute delay in reperfusion reduces life expectancy by approximately 1 year, highlighting the importance of minimizing door-to-balloon (for PCI) or door-to-needle (for fibrinolysis) times (De Luca et al., 2004).

8.4 The ischemic Time

The total ischemic time in acute myocardial infarction encompasses the period from symptom onset to reperfusion and is a critical determinant of outcomes. According to the latest ESC guidelines, this time includes patient-related delay (time from symptom onset to seeking medical help), system-related delay (time from first medical contact to reperfusion, including door-to-balloon time for PCI or door-to-needle time for thrombolysis), and treatment-related delay (time from diagnosis to initiation of reperfusion therapy) (Anderson & Morrow, 2017). The ESC emphasizes minimizing total ischemic time, with a target of ≤ 120 minutes from first medical contact to reperfusion, and ideally ≤ 90 minutes for PCI and less than 30 minutes for thrombolysis. Delays at any stage can lead to larger infarct size, increased mortality, and poorer long-term outcomes (Ibanez et al., 2018).

The objective is to minimize three specific types of delays: patient delays, system-related delays, and treatment-related delays. This initiative must be adapted to the context of a large middle-income country with limited access to percutaneous coronary intervention (PCI) centers.

9. Proposal for a National Program and acute MI Protocol

The establishment of a National Program and an Acute Myocardial Infarction (AMI) Protocol is of paramount importance in addressing the growing burden of cardiovascular diseases. Such a program aims to standardize and optimize the management of AMI across pre-hospital and in-hospital settings, ensuring timely diagnosis and treatment, which are critical for saving lives and improving patient outcomes. This national initiative not only enhances the overall quality of cardiovascular care but also reduces the economic burden associated with prolonged hospital stays and complications.

9.1 Characteristics of the National Protocol Program

Needs to be fulfilled

A national protocol program must account for interregional disparities in the availability and qualifications of healthcare personnel, the distribution and location of hospital facilities, and the distances between them. Additionally, it should consider the accessibility of necessary medical supplies and medications, the ease and speed of implementation, its applicability across all healthcare points throughout the territory, and it is relatively low cost.

Limitations

Delays in achieving timely reperfusion for patients with acute myocardial infarction (AMI) remain a significant challenge, particularly in remote or underserved areas. Misdiagnosis in rural or resource-limited hospitals is a critical barrier, often due to limited access to advanced diagnostic tools or expertise in interpreting acute cardiac symptoms (Anderson & Morrow, 2017). Furthermore, difficulties in emergency medical services (EMS) transportation, such as long distances, inadequate infrastructure, and limited availability of advanced life support, exacerbate delays in transferring patients to appropriate facilities (O’Gara et al., 2013). The scarcity of percutaneous coronary intervention (PCI) centers further compounds this issue, as many patients must be transported over considerable distances to reach a facility capable of performing primary PCI (Ibanez et al., 2018). Additionally, the rarity of hospitals staffed by cardiologists or urgent care specialists in remote regions limits the ability to provide immediate, guideline-directed medical therapy, further delaying reperfusion efforts (Thygesen et al., 2018).

9.2 A systematic methodical process

ECG and interpretation in under 10 min

The rapid acquisition and interpretation of an electrocardiogram (ECG) within 10 minutes of presentation is a critical step in the early diagnosis and management of acute myocardial infarction (AMI), particularly for patients presenting with symptoms suggestive of ischemia, such as upper body pain. The ECG should ideally be read promptly by a physician or transmitted to a cardiologist for interpretation, as early identification of ST-segment elevation or other ischemic changes is essential for initiating life-saving interventions. However, the effectiveness of this process relies heavily on the triage team's awareness, experience, and ability to recognize high-risk presentations

In a hospital or care facility setting any thoracic or abdominal pain that is not localized to the head or extremities in patients over the age of 18 necessitates an immediate electrocardiogram (ECG). This procedure should be conducted without delay in the waiting area, prior to the patient's consultation with the physician. It is the responsibility of the triage staff to ensure this protocol is followed. Once the ECG is completed, it must be promptly provided to the attending physician

In cases involving ambulance services or medical transport Any thoracic or abdominal pain that is not localized to the head or extremities in patients over the age of 18 necessitates an immediate electrocardiogram (ECG). Once the ECG is performed, it should be promptly provided to the attending physician or transmitted via telemetry without delay. This protocol also applies to any patient exhibiting an unexplained coma or any individual who has experienced a cardiac arrest and has been resuscitated.

It is essential to emphasize that healthcare personnel are immersed in a multitude of patients within emergency departments, complicating the identification of myocardial infarction cases, which introduces unnecessary and hazardous delays. To strive for intervention within the critical ten-minute window, we recommend displaying posters or signs on one wall of the triage area and another in the consultation room. These should feature a simplified diagram that serves as a reminder to the entire on-call team of the urgency to act swiftly for detection, ECG, and patient management.

9.3 Immediate on-site care (in under 30 minutes)

Delays often arise from factors such as traffic congestion, geographical distance, limited availability of emergency medical services (EMS), and delays in patient recognition of symptoms (Thygesen et al., 2018). Additionally, the "door-to-balloon" time, a critical metric for AMI care, can be prolonged by inefficiencies in hospital protocols or inter-facility transfers (Park et al., 2019). . These delays are particularly concerning because AMI is a time-sensitive condition where myocardial salvage is directly dependent on the speed of reperfusion therapy (Ibanez et al., 2018). Every minute of delay increases the risk of irreversible myocardial damage, heart failure, and mortality (De Luca et al., 2004)

Prevent the transfer and take action on-site: Acting fast on-site, such as initiating pre-hospital ECG diagnostics, administering antiplatelet agents, and facilitating direct communication with the receiving hospital, has been shown to significantly reduce ischemic time and improve outcomes (Steg et al., 2012). Pre-hospital interventions, including early administration of aspirin and nitrates, can stabilize the patient and limit infarct size, while rapid triage and transport planning ensure timely access to percutaneous coronary intervention (PCI) (Werf et al., 2008). Studies have demonstrated that systems emphasizing pre-hospital care and direct transport to PCI-capable hospitals achieve better clinical outcomes compared to those relying solely on in-hospital management (Nallamothu et al., 2006)

Selection of loading dose drugs: Once the diagnosis is established and the decision for revascularization is made, the administration of loading doses becomes the next immediate step to undertake. The utilization of the most recognized medications, which are accessible to medical teams nationwide without the risk of stock shortages or supply disruptions, appears to be a prudent approach.

-*Aspirin* is a well-established medication that does not present any issues, whether administered orally or via parenteral routes

-*P2Y₁₂ inhibitors (Clopidogrel)* Orally administered P2Y₁₂ inhibitors in loading doses, such as clopidogrel, prasugrel, and ticagrelor, are critical in the management of acute coronary syndromes (ACS) to achieve rapid and potent platelet inhibition. While clopidogrel has been a cornerstone therapy for years, newer agents like prasugrel and ticagrelor offer more consistent

and rapid antiplatelet effects due to their distinct pharmacokinetic and pharmacodynamic properties (Wallentin et al., 2009). However, in practical clinical settings, the initial antiplatelet effect of a loading dose of clopidogrel (300-600 mg) is comparable to that of newer P2Y₁₂ inhibitors in the early hours post-administration, particularly in patients without genetic resistance to clopidogrel (Montalescot et al., 2006). Studies have shown that a 600 mg loading dose of clopidogrel achieves significant platelet inhibition within 2 hours, which is similar to the onset of action of ticagrelor and prasugrel (Siller-Matula et al., 2013).

- *Heparin: Enoxaparin*, classified as a low-molecular-weight heparin (LMWH), has proven to be an effective anticoagulant in the treatment of acute myocardial infarction (AMI), especially when used alongside fibrinolytic therapy or percutaneous coronary intervention (PCI). In contrast to unfractionated heparin (UFH), enoxaparin presents multiple benefits, such as more consistent pharmacokinetic properties, simplified administration via the subcutaneous route, and a diminished requirement for regular monitoring. Furthermore, the selection of this molecule is attributed to its long-standing presence in the national market, its stability, and its reasonable cost, as well as the familiarity of physicians with its application and ease of use.

Opt for thrombolysis: Thrombolysis, when administered early, can be a highly effective and often equivalent alternative to primary percutaneous coronary intervention (PCI) in the management of ST-elevation myocardial infarction (STEMI), particularly in large countries with long distances to hospitals or in low-income settings where access to PCI-capable facilities is limited. The key advantage of thrombolysis lies in its rapid administration, which can be initiated in pre-hospital settings or non-PCI hospitals, significantly reducing the time to reperfusion. Studies have shown that when thrombolysis is administered within the first 2-3 hours of symptom onset, it can achieve comparable outcomes to PCI in terms of mortality reduction and myocardial salvage, especially in patients presenting early (within 2 hours) (Van De Werf, 1999). In resource-limited settings, where delays in transportation and lack of PCI infrastructure are common, thrombolysis remains a practical and life-saving intervention. The STREAM trial demonstrated that pre-hospital thrombolysis followed by timely coronary angiography (within 6-24 hours) yielded similar outcomes to primary PCI, further supporting its role in such contexts (Armstrong et al., 2013).

Additionally, thrombolysis is cost-effective and does not require specialized equipment or highly trained interventional cardiologists, making it a viable option for low-income countries.

- *Tenecteplase*: Tenecteplase (Metalyse[®]) has emerged as the preferred fibrinolytic agent for the treatment of ST-elevation myocardial infarction (STEMI) due to its favorable pharmacological profile, ease of administration, and superior efficacy compared to older fibrinolytics like alteplase, streptokinase, and reteplase. One of the key advantages of tenecteplase is its single-bolus administration, which simplifies delivery and reduces the risk of dosing errors, making it particularly suitable for pre-hospital or emergency settings. Tenecteplase also exhibits higher fibrin specificity and greater resistance to plasminogen activator inhibitor-1 (PAI-1), resulting in more efficient clot lysis and a lower risk of systemic bleeding complications compared to alteplase (Van De Werf, 1999) (Cannon et al., 1998).

Conclusion

The management of acute myocardial infarction (AMI) represents a significant economic burden for healthcare systems, driven by the high costs of emergency care, hospitalization, and long-term complications. However, time-sensitive interventions, such as the implementation of a nationwide AMI protocol, offer a cost-effective solution to mitigate this burden. By standardizing care, reducing treatment delays, and improving access to life-saving interventions, such protocols can significantly enhance patient outcomes while lowering overall healthcare costs. In middle-income countries, where resource constraints and geographic disparities often exacerbate the crisis, a well-designed national protocol is not only feasible but essential. Prioritizing rapid action and equitable access to care can transform AMI management, reducing both human and financial costs and paving the way for a more sustainable healthcare system.

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