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ORIGINAL ARTICLE

Disparities in Acute Myocardial Infarction Treatment Between Users of the Public and Private Healthcare System in Sergipe

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Abstract

Background: The Brazilian Unified Health System (SUS) was created to ensure universal, integral and equitable access to quality healthcare to Brazilians. However, studies scrutinizing the quality of the healthcare provided by the SUS are scarce. This is especially critical for patients with ST-elevation myocardial infarction (STEMI), who depend on healthcare system responsiveness and timely reperfusion to achieve better outcomes.

Objective: To describe the methodology of the VICTIM Registry aimed at characterizing and comparing the access to effective therapies and the outcomes of patients with STEMI, who use the SUS and the private healthcare system at hospitals capable of performing angioplasty in Sergipe. In addition, that registry aimed at identifying and measuring possible disparities in the quality of the care provided.

Methods and Results: The VICTIM Registry is an observational study, launched in December 2014, being still in the data collection phase, to investigate: the epidemiology of STEMI in Sergipe, the temporal and geographic courses of the patients up to their admission to one of the hospitals capable of performing angioplasty, the reperfusion therapy rates, the quality of the healthcare provided during the event, and the 30-day mortality. It compares the results obtained in the SUS with those of the private healthcare system.

Conclusions: The VICTIM Registry is an interinstitutional effort to identify opportunities for healthcare improvement for SUS and private healthcare system patients with STEMI. It is expected to provide healthcare managers with information to support new, more efficient and equitable healthcare policies. (Int J Cardiovasc Sci. 2018;31(4)339-358)

Keywords: Myocardial Infarction; Healthcare Disparities; Unified Health System; Private Health Care Coverage.

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Introduction

The guarantee that health is a constitutional right and the subsequent creation of the Brazilian Unified Health System (SUS) are fundamental landmarks of the Brazilian public health.[1,2] Based on that, every Brazilian would have universal, integral and equitable access to quality healthcare.[2] Although the SUS is more than three decades old, the quality of the healthcare it provides has been insufficiently scrutinized by the Science of Results.[3] This is particularly critical because 72.1% of the Brazilian population essentially depends on SUS, and only 27.9% of the Brazilians have some other type of healthcare coverage.[4]

Acute myocardial infarction (AMI) continues to be the major cause of cardiovascular morbidity and mortality in Brazil and worldwide.[5-7] In ST-segment elevation myocardial infarction (STEMI), the immediate access to reperfusion therapies increases substantially the chance of survival.[5-8] Although myocardial reperfusion for STEMI has been established since the 1980s,[9] contemporary data from several countries and regions have shown the variability and underuse of that therapy and several other pharmacological or procedural practices, essential to the treatment of patients with STEMI.[10-14] Developing countries, however, lack studies on the quality of the care provided to patients with AMI. In Brazil, studies investigating the quality of the healthcare provided by SUS are scarce.[3]

Therefore, generating representative and comprehensive knowledge on the healthcare quality provided by SUS is justified, in addition to assessing the existence of disparity as compared to the healthcare quality provided by the private system, which, if confirmed, should be quantified. However, assessing the healthcare provided to patients with STEMI in the huge territory of Brazil is a challenge. To fill that gap, limiting the research field to a circumscribed geography and developing pilot projects can be the most realistic strategy.[11,12,15,16]

Thus, Sergipe, by being the smallest state in Brazil, counting on only four referral hospitals specialized in cardiovascular diseases, can serve as a laboratory to measure the presumed disparity in the healthcare provided by the SUS and the private system to treat patients with STEMI.

Context of the VICTIM Registry

The VICTIM (*Via Crucis para o Tratamento do Infarto do Miocárdio*) Registry was designed to investigate and compare patients with STEMI cared for in the public and private health systems considering the following major objectives: 1) celerity in the search for medical care; 2) temporal and geographic course of patients, from symptom onset to search for care and access to referral hospitals specialized in cardiovascular disease; 3) demographic and clinical characteristics of the patients with STEMI referred to the centers specialized in cardiovascular disease in the State of Sergipe; 4) access to the myocardial reperfusion therapies occurring during transportation to those centers and those occurring upon arrival there; 5) to assess whether the healthcare practices of public and private health services are aligned with the metric indicators that represent hospital care quality for the management of STEMI; 6) the rate of cardiovascular events occurring in-hospital and up to 30 days from the index event. In addition, the VICTIM Registry has the following general objectives: 7) to collaborate with the institutions participating in the process of improving the quality of the care provided to patients with STEMI; 8) to identify opportunities of improving the quality of the care provided to patients with STEMI in the entire State of Sergipe; 9) to disseminate knowledge at local and national levels; 10) to serve as a research platform for larger, multicenter and national studies; 11) to influence the public policies regarding the healthcare provided to patients with STEMI at state and national levels, in addition to other countries with similar socioeconomic characteristics.

The present study describes the methodology of the VICTIM Registry and discusses its potential implications.

Domains analyzed

For the outline of the VICTIM Registry, the following domains were considered (Figure 1):

A. Epidemiology of STEMI at referral hospitals

B. Pre-hospital healthcare quality

C. Healthcare quality at the referral center

D. Clinical outcomes

E. Post-discharge healthcare quality

History of the project

Pilot projects for the VICTIM Registry were conducted from May 2013 to November 2014 aimed at training the data collection team and at raising awareness in each referral center about the need for studies on the healthcare quality provided to patients with STEMI.

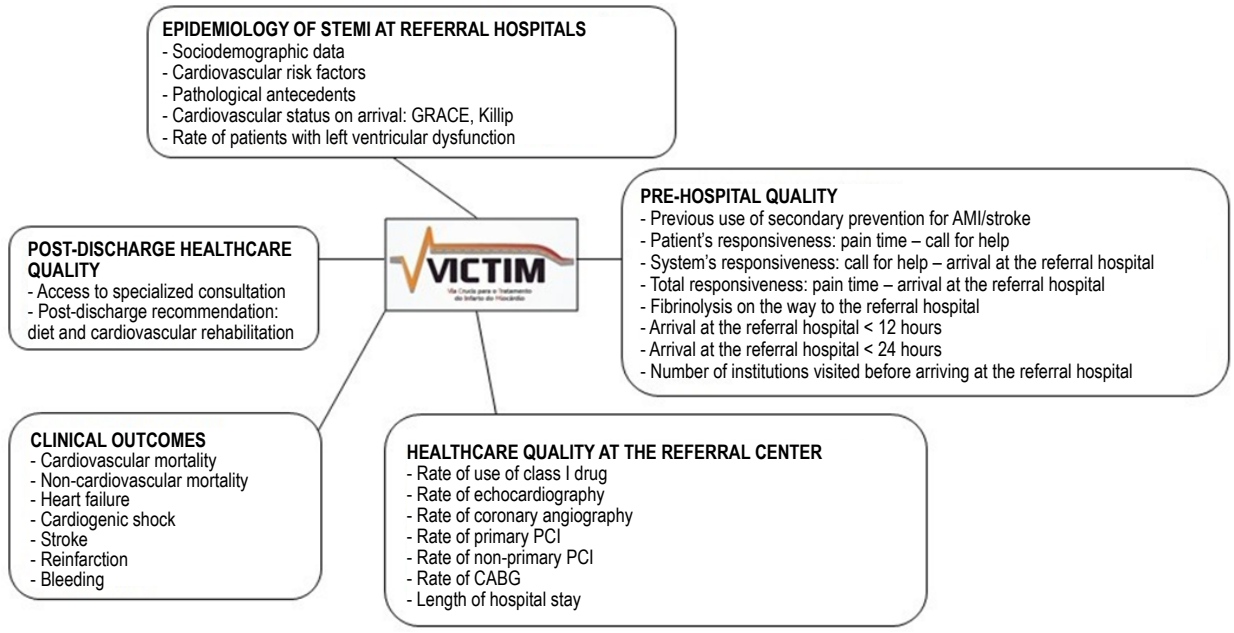

Figure 1 - Domains analyzed in the VICTIM Registry.
STEMI: ST-segment elevation myocardial infarction; PCI: percutaneous coronary intervention; CABG: coronary artery bypass grafting; AMI: acute myocardial infarction.

During that period, 319 patients were included in the study, 274 from the public healthcare and 45 from the private healthcare. During that phase, the variables to be collected were defined, the collection tool was refined (Annex A), and the logistic of data collection was adjusted regarding the number of field researchers, their training in the field and their allocation to the centers.

In December 2014, data collection finally started to feed the VICTIM Registry, an ongoing phase for greater sample representativeness. To participate in the study, the field researcher should undergo training, consisting of a formal presentation of the research's objectives and the data collection methodology, by using the appropriate tool. Then, each investigator underwent a supervised training with the study coordinator at the hospital of allocation to become acquainted with the research site and its functioning routines, in addition to being instructed on data collection. After that basic training, the researchers could undertake their specific tasks. Whenever necessary, the members of the teams underwent updating trainings aimed at refining the technique of data collection. Since the beginning of the post-pilot phase, the coordinators have taken constant and very good care of data collection.

Methods

Hospitals of the state of Sergipe included in the VICTIM Registry

Sergipe is the smallest state of Brazil, occupies an area of 21,918.454 km², has 75 municipalities, the city of Aracaju is the capital, and the Metropolitan region includes the municipalities of Barra dos Coqueiros, Nossa Senhora do Socorro and São Cristóvão.[17] The state has 34 general hospitals, 14 of which are public hospitals, 10 are philanthropic hospitals and 10 are private hospitals.[18]

The VICTIM Registry portrays the care provided to patients with STEMI admitted to the four cardiovascular hospitals of Sergipe that have interventional cardiology services. All of them are located in the city of Aracaju, one provides care to the users of SUS (hospital 1), and three are private hospitals that provide care to users of the supplemental healthcare system (hospitals 2, 3 and 4) (Table 1). All four hospitals can perform primary angioplasty and heart surgery seven days a week.

In the VICTIM Registry, the public hospital is philanthropic, but has no direct entrance to the emergency unit. The users of SUS have access to that public hospital through referral from another health unit.

Table 1 - Characteristics of the hospitals participating in the VICTIM Registry

Characteristics of the hospitals	Public hospital patients N (370*)	Private hospital patients N (82*)		
	Hospital 1 (370*)	Hospital 2 (35*)	Hospital 3 (17*)	Hospital 4 (30*)
Location	Capital	Capital	Capital	Capital
Type	Non-profit-making	Profit-making	Profit-making	Profit-making
Total number of beds	279	208	147	49
COU beds	10	10	0	8
General hospital	YES	YES	YES	NO
Access as user of SUS	YES	NO	NO	NO
Ability to perform PCI	YES	YES	YES	YES
Ability to perform heart surgery	YES	YES	YES	YES
Patients admitted via direct access*	6 (1.5%)	27 (77%)	15 (88%)	12 (40%)
Patients admitted via referral*	364 (98.5%)	8 (23%)	2 (12%)	18 (60%)

N: Number of patients; COU: Coronary Unit; SUS: Brazilian Unified Health System; PCI: Percutaneous Coronary Intervention; (*) Period: December 2014 to April 2016.

The private hospitals, however, provide care to a heterogeneous population, comprising patients with different health insurance plans and those who choose to pay for their own healthcare. Each of the three private hospitals has its specific set of health insurance plans, which makes their population heterogeneous. Such hospitals have direct entrance to their emergency units, thus, the patient can have direct access to those hospitals or can be referred from another health institution.

In the state of Sergipe, 80.7% of the population has no health insurance, relying, therefore, on the SUS, depending consequently on one single hospital as reference for the treatment of STEMI. The other 19.3% of the population has health insurance, counting on three hospitals with catheterization laboratory. Because of the lack of the necessary responsiveness in the SUS, some patients, even with neither health insurance nor a favorable economic condition, opt for the private service care.[19]

Except for those four hospitals, no other hospital of the Sergipe healthcare system has a team of cardiologists on call or a clinical team capable of identifying and treating patients with STEMI, especially regarding the prescription of thrombolytic agents or the infrastructure to perform primary angioplasty.

The basic assumption is that the care provided to patients with STEMI in the four cardiovascular referral hospitals has the best quality in the state (Figure 2). Thus, to compare the quality of the care provided to users of the SUS with that provided at the three private hospitals will reflect the best public and private healthcare provided in the state of Sergipe.

Eligibility of the patients

Patients with the following characteristics are considered eligible for the VICTIM Registry: both sexes; older than 18 years; clinical findings compatible with acute coronary syndrome and electrocardiogram (ECG) showing persistent ST-segment elevation > 1 mm on two contiguous leads;[7,8] and who provide written informed consent.

The diagnosis of AMI is confirmed later, based on the classical changes of the biomarkers CK-MB and/or troponin,[7,8] taking into consideration the final opinion of the medical team.

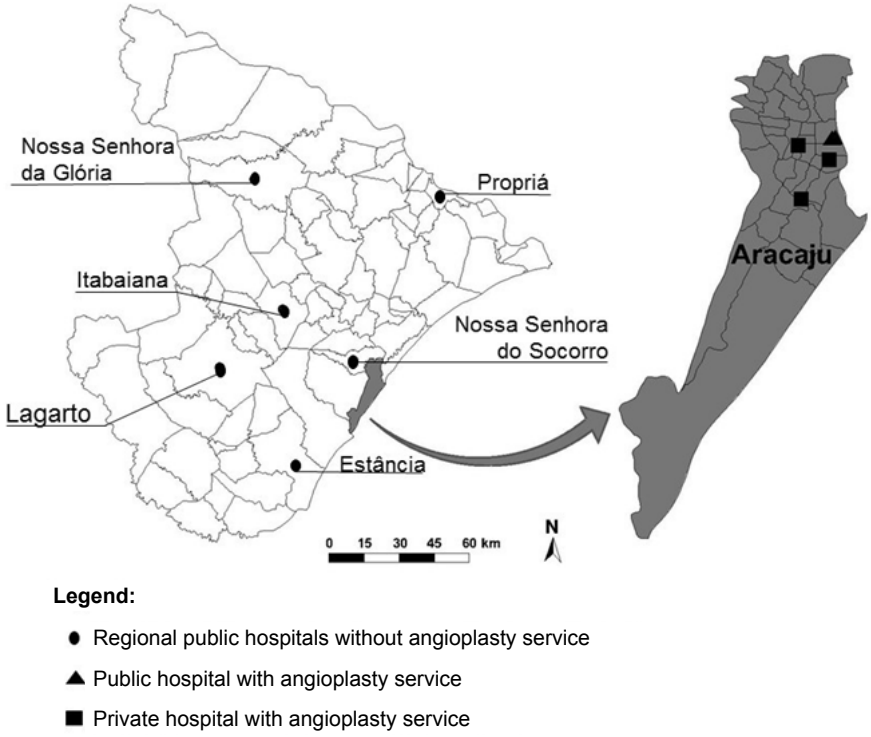

Figure 2 - Location of the regional hospitals that can perform angioplasty in the state of Sergipe.

Patients meeting the eligibility criteria described will be included in this study.

The following patients will be excluded: (1) those who die before the interview; (2) patients who develop STEMI inside the hospital, whose pre-hospital phase cannot be characterized; (3) those who refuse to provide written informed consent; (4) those whose acute event of STEMI is characterized as reinfarction (new AMI within 30 days from the incident infarction); (5) individuals whose diagnosis is changed, that is, their initial diagnostic suspicion of STEMI is not confirmed during hospitalization; (6) patients cared for by use of their health insurance at a philanthropic hospital (Figure 3).

Data collection

The team of field researchers is subdivided so that there is a fixed schedule with a researcher on duty every day of the week at the hospitals participating in the study. This ensures an active search is performed every day for patients with STEMI admitted to the four hospitals of the study.

After the patients provide written informed consent, data are collected as follows: (1) from their medical records with extraction of data pertinent to the study; (2) from an interview with the patients.

The interview collected the following demographic variables: age; socioeconomic level; educational level; marital status; pathological history; and time-related elements, such as the date and hour of symptom onset, the time that help was required, the time the patient arrived at the first institution that could not perform angioplasty, and the time the patient arrived at the specialized institution. From the medical records, the following data are retrieved: characteristics of the diagnostic ECG with ST-segment elevation, physical examination and laboratory tests, drugs used within 24 hours from STEMI detection, tests performed on admission, such as echocardiography and coronary angiography, data regarding the angioplasty or revascularization surgery, in addition to data regarding the in-hospital outcomes.

Fortnightly meetings with the team are systematically held to assess the progress of the investigation and occasional adjudication of doubtful cases, in addition to assessing the quality of data collection.

To obtain the data regarding the outcomes of patients included in the registry, a phone call with structured

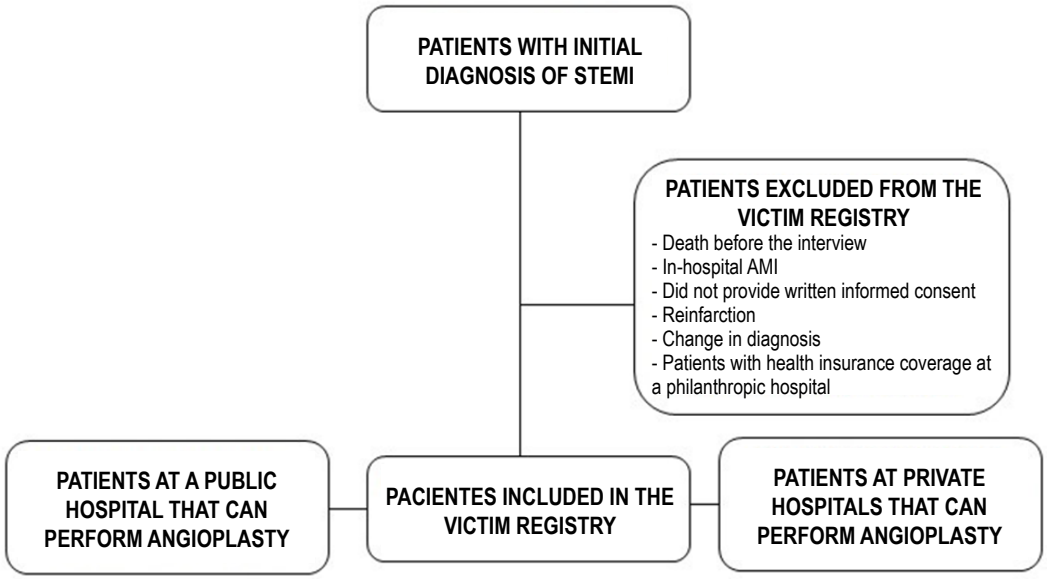

Figure 3 - Flowchart representing the exclusion criteria for patients with ST-segment elevation myocardial infarction (STEMI).
AMI: acute myocardial infarction.

interview is performed 30 days after the detection of STEMI. On the occasion, the coordinator responsible for the calls gets information with the patients and/or their guardians on the occurrence of death, reinfarction, heart failure, cardiogenic shook, angina pectoris, stroke, hemorrhage, cardiac arrest and/or new hospitalization, in addition to assessing whether the patients attended a specialized consultation after discharge, and, if not, whether they have one scheduled.

When the patient cannot be reached via telephone, other resources are used, such as a relative's or neighbor's telephone contact, e-mail or post letter with the major researcher's contacts, to minimize data loss.

If the patient remains hospitalized for 30 days, the final visit is performed during hospitalization, and after that the patient's participation in the study ends.

Case report form and data bank

Case report form (CRF) is the collection tool (Annex A) adopted by the VICTIM Registry and comprises the following: (1) patient's identification; (2) eligibility; (3) time line; (4) clinical presentation; (5) hospitalization; (6) outcomes. In 2015, the CRF passed from the print version to the electronic version, in which data storage is virtually fed, facilitating their maintenance and reducing the form filling out process errors. The data collected in loco are stored in an electronic cloud, ensuring lower risk for data loss.

Data originating from the electronic CRF are transferred to a spreadsheet, facilitating their analysis and interpretation. The system is always fed by a researcher who underwent previous training and is the sole responsible for that activity. Aiming at minimizing errors of data bank input, the procedure is performed systematically right after patient's assessment. Each CRF entered into the system receives an identification number, eliminating, thus, the need for contact with the names of the patients included in the study, and ensuring the right to anonymity.

Statistical analysis

Qualitative variables will be expressed as frequency (percentage), and quantitative variables will undergo Kolmogorov-Smirnov test to determine the distribution type; those meeting the normality assumption will be expressed as mean and standard deviation. The variables without a normal distribution will be described as median and interquartile range or maximum and minimum values. The qualitative variables will be compared by using Pearson's chi-square test or Fisher exact test, when appropriate.[20] Non-paired Student t test will be used to compare between the two major

groups when the continuous or discrete variables have normal distribution. In case of asymmetric distribution, Wilcoxon-Mann-Whitney test will be used.[21]

To assess the effect of demography, clinical data, laboratory data and the time for reperfusion treatment to be performed, a model of multivariate logistic regression will be used with generalized equations that consider the clustering effect[22] and stratified Cox regression.[23]

The Kaplan-Meier method[24] and the log-rank test[25] will be used to compare event-free survival curves in users of the SUS and of the private hospitals, with and without adjustment for the confounding variables. The SPSS Statistics program for Windows version 17 and R Core Team 2014[26] will be used for the statistical analysis. The significance level adopted in future analyses will be 5%.

Ethical considerations

Before entering the study, all volunteers or their guardians provide a written informed consent. Illiterate individuals who choose to participate in the study complete the informed consent process by signing with a fingerprint and two literate witnesses verify the process with a signature. This study was approved by the Ethics Committee in Research of the Federal University of Sergipe (nº 23392313.4.0000.5546).

Commitment of the VICTIM team

In addition to answering specific questions, the leaders of the VICTIM Registry are committed to continuously spreading the study results aiming at contributing to improve the healthcare quality for AMI. The present investigation is expected to provide constantly and systematically the health managers with technical information that can support new health policies or care strategies, contributing to the construction of a more efficient and equitable healthcare system. The central idea is to identify in the presently practiced line of care opportunities to improve the care provided regarding infrastructure, logistics of healthcare processes and especially the healthcare results.

In addition, the VICTIM Registry is expected to constitute a continuous field of training in several research areas, such as cardiovascular biomedicine, outcomes research and health services, for post-graduate and graduate students, to aid in the scientific qualification and formation of researchers in the health sciences area.

Author contributions

Conception and design of the research: Oliveira JC, Oliveira LCS, Oliveira JC, Barreto IDC, Arcelino LAM, Prado LFA, Silveira FS, Nascimento TA, Ferreira EJP, Barreto RV, Moraes EV, Mendonça JT, Sousa ACS, Barreto-Filho JA. Acquisition of data: Oliveira JC, Oliveira LCS, Oliveira JC, Lima TCRM, Arcelino LAM, Barreto-Filho JA. Analysis and interpretation of the data: Oliveira JC, Oliveira LCS, Oliveira JC, Barreto IDC, Almeida-Santos MA, Lima TCRM, Arcelino LAM, Sousa ACS, Barreto-Filho JA. Statistical analysis: Oliveira JC, Oliveira LCS, Barreto IDC, Almeida-Santos MA, Barreto-Filho JA. Obtaining financing: Oliveira JC, Oliveira LCS, Oliveira JC, Barreto-Filho JA. Writing of the manuscript: Oliveira JC, Oliveira LCS, Oliveira JC, Arcelino LAM, Barreto-Filho JA. Critical revision of the manuscript for intellectual content: Oliveira JC, Oliveira LCS, Oliveira JC, Barreto IDC, Almeida-Santos MA, Lima TCRM, Arcelino LAM, Prado LFA, Silveira FS, Nascimento TA, Ferreira EJP, Barreto RV, Moraes EV, Mendonça JT, Sousa ACS, Barreto-Filho JA. Supervision / as the major investigador: Barreto-Filho JA.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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Study Association

This article is part of the thesis of Doctoral submitted by Jussiely Cunha Oliveira, from Universidade Federal de Sergipe.

Ethics approval and consent to participate

This study was approved by the Ethics Committee of the Universidade Federal de Sergipe under the protocol number 483.749. All the procedures in this study were in accordance with the 1975 Helsinki Declaration, updated in 2013. Informed consent was obtained from all participants included in the study.

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Annex A

Data collection tool

REGISTRATION

Control number: _____ Date of enrollment: ☐☐☐

Researcher's Name: _____

PATIENT IDENTIFICATION

Name: _____

Patient's registration number: _____

ID: _____ **Brazilian Social Security number:** _____

Birth date: ☐☐☐ Sex: ☐ F ☐ M

Age: ☐ Race: ☐ White ☐ Non white

Socioeconomic level* ☐ A ☐ B ☐ C ☐ D ☐ E ☐ NI Total household members: _____

Marital status: ☐ Married ☐ Divorced ☐ Single ☐ Widow ☐ Unmarried couple

Occupation: ☐ Self-employed ☐ Civil servent ☐ Private employee ☐ Retired ☐ Others: _____

Education: ☐ Elementary ☐ High school ☐ Upper level ☐ Post-graduation ☐ Never studied

Healthcare insurance: ☐ SUS ☐ IPES ☐ Private ☐ Health insurance

Which? _____

Address: _____

City: _____ State: _____

E-mail: _____ Telephone: ( ) _____

Zip Code: _____ ( ) _____

( ) _____

( ) _____

Additional Contacts

Name: _____

Degree of kinship: _____

City: _____

State: _____

Telephone: ( ) _____

( ) _____

( ) _____

( ) _____

Additional information:

Additional Contacts

Name: _____

Degree of kinship: _____

City: _____

State: _____

Telephone: ( ) _____

( ) _____

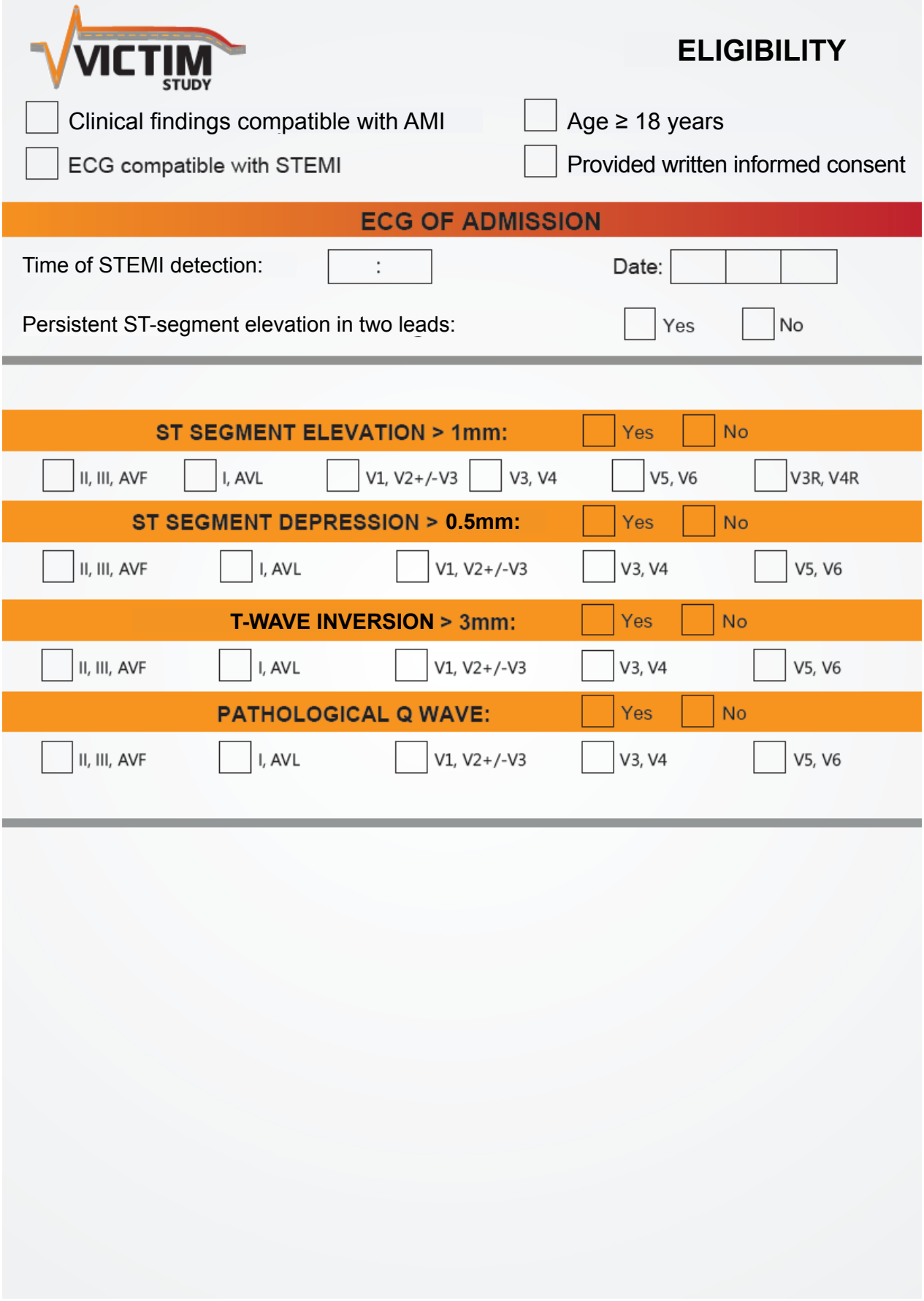
( ) _____

( ) _____

Additional information:

***Socioeconomic level:**

A: income > 20 minimum wages
B: 10-20 minimum wages
C: 4-10 minimum wages
D: 2-4 minimum wages
E: <2 minimum wages
NI: not informed


VICTIM STUDY
ELIGIBILITY
Clinical findings compatible with AMI
ECG compatible with STEMI
Age ≥ 18 years
Provided written informed consent
ECG OF ADMISSION
Time of STEMI detection: :
Date:
Persistent ST-segment elevation in two leads: Yes No
ST SEGMENT ELEVATION > 1mm: Yes No
II, III, AVF I, AVL V1, V2+/-V3 V3, V4 V5, V6 V3R, V4R
ST SEGMENT DEPRESSION > 0.5mm: Yes No
II, III, AVF I, AVL V1, V2+/-V3 V3, V4 V5, V6
T-WAVE INVERSION > 3mm: Yes No
II, III, AVF I, AVL V1, V2+/-V3 V3, V4 V5, V6
PATHOLOGICAL Q WAVE: Yes No
II, III, AVF I, AVL V1, V2+/-V3 V3, V4 V5, V6

VICTIM STUDY

TIMELINES

SYMPTOM ONSET

Date: ___ ___ ___ Address at the time of symptom onset: _____

Hour: ___ : ___ h City: _____ State: _____

DECISION TO CALL TRANSPORTATION

Date: ___ ___ ___ Address at the time transportation was requested: _____

Hour: ___ : ___ h ☐ Mobile emergency medical service ☐ Own transportation ☐ Other

ARRIVAL AT THE 1st HOSPITAL WITHOUT PCI

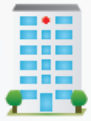
Date: ___ ___ ___

Hour: ___ : ___ h Which? _____

ARRIVAL AT THE 2nd HOSPITAL WITHOUT PCI

Date: ___ ___ ___

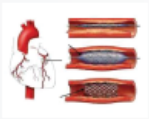
Hour: ___ : ___ h Which? _____



ARRIVAL AT THE 3rd HOSPITAL WITHOUT PCI

Date ___ ___ ___

Hour: ___ : ___ h Which? _____



ARRIVAL AT THE HOSPITAL WITH PCI

Date: ___ ___ ___

Hour: ___ : ___ h Which? _____

STEMI DETECTION: Date: ___ ___ ___ Hour: ___ : ___ h Where? _____

DOOR-BALLOON Date ___ ___ ___ Hour: ___ : ___ h Hospital: _____ ΔDoor-balloon: _____

FIBRINOLYSIS: ☐ Yes ☐ No Which? ☐ SK ☐ t-PA ☐ TNK

Date: ___ ___ ___ ΔT:

Hour: ___ : ___ h Place: _____

Cardiopulmonary arrest during transfer? ☐ Yes ☐ No Local: _____

***Hospitals:**

Hospital São Lucas - HSL
Hospital Primavera - HP
Hospital do Coração - H.Cor
Hospital de Cirurgia - HC
Hospital de Urgências de Sergipe - HUSE
Hospital Zona Norte - HZN
Hospital Zona Sul - HZS
Hospital Regional de Itabaiana - HRI

VICTIM STUDY

CLINICAL PRESENTATION

PRODROMAL SYMPTOMS FOR MORE THAN 24H FROM THE MAJOR FINDING

☐ No ☐ Yes ☐ 24-72 h ☐ >72h - 1 week ☐ >1 week - 30 days

☐ Chest Pain ☐ GI/Indigestion ☐ Dyspnea ☐ Others

PRESENTATION SYMPTOMS ☐ Yes ☐ No

☐ Typical anginal chest pain/epigastric pain
☐ Atypical chest pain
☐ Sweating
☐ Pre-syncope/ syncope
☐ Dyspnea
☐ Nausea/vomiting
☐ Fatigue/ Asthenia
☐ Palpitations
☐ Others: _____

INFARCTION TRIGGERS ☐ Yes ☐ No

☐ Strenuous physical exertion 2h before symptom onset
☐ Sexual intercourse 2 hours before symptom onset
☐ Cocaine or other illicit drug use within the previous 24h _____
☐ Infection in the past 10 days: _____
☐ Severe emotional stress within the previous 24h
☐ Alcohol use within the previous 24h
☐ Copious meal (last meal)

PREVIOUS PATHOLOGICAL HISTORY AND CARDIOVASCULAR RISK FACTORS

Current smoker: ☐ Yes ☐ No

Ex-smoker: ☐ Yes ☐ No ☐ Stopped how long ago? : _____

Systemic arterial hypertension: ☐ Yes ☐ No

Diabetes Mellitus: ☐ Yes ☐ No Treatment ☐ Diet ☐ Medicament ☐ Insulin

Dyslipidemia: ☐ Yes ☐ No

Family history of early CAD / male<55 and female<65: : ☐ Yes ☐ No

Congestive heart failure: ☐ Yes ☐ No

Angina pectoris: ☐ Yes ☐ No

Previous CAD (>50%): ☐ Yes ☐ No

Previous AMI: ☐ Yes ☐ No How long ago?_____

Previous PCI: ☐ Yes ☐ No

Previous CABG: ☐ Yes ☐ No

Previous stroke or TIA: ☐ Yes ☐ No

Peripheral vascular disease: ☐ Yes ☐ No

Chronic kidney disease: ☐ Yes ☐ No

Renal replacement theraphy (dialysis): ☐ Yes ☐ No ☐ Hemodialysis ☐ Peritoneal dialysis

PREVIOUS DRUG THERAPY ☐ Yes ☐ No

Aspirin:	☐ Yes	☐ No	*DOSAGE: _____
Clopidogrel:	☐ Yes	☐ No	DOSAGE: _____
Prasugrel:	☐ Yes	☐ No	DOSAGE: _____
Ticagrelor:	☐ Yes	☐ No	DOSAGE: _____
Beta-blocker	☐ Yes	☐ No	DOSAGE: _____
ACE inhibitor:	☐ Yes	☐ No	DOSAGE _____
ARB:	☐ Yes	☐ No	DOSAGE: _____
Statin:	☐ Yes	☐ No	DOSAGE: _____
Calcium-channel blocker	☐ Yes	☐ No	DOSAGE: _____
Nitrates:	☐ Yes	☐ No	DOSAGE _____
Diuretics:	☐ Yes	☐ No	DOSAGE _____
Aldosterone Antagonist:	☐ Yes	☐ No	DOSAGE: _____
Insulin:	☐ Yes	☐ No	DOSAGE: _____
Others:	☐ Yes	☐ No	

*DOSAGE: Amount of prescription drug in 24 hours

If yes, which? _____

PHYSICAL EXAMINATION OF ADMISSION

BP: _____ X _____ mm Hg | **HR.:** _____ bpm | **WEIGHT** kg _____ | **HEIGHT:** _____ cm

HEMOGLOBIN: _____ g/dl | **HEMATOCRIT:** _____ % | **LEUKOCYTES:** _____

CREATININE: _____ | **GLYCEMIA:** _____ mg/dl | **KILLIP:** ☐ I ☐ II ☐ III ☐ IV

GRACE SCORE: _____ In-hospital (Age, HR, systolic blood pressure, creatinine, KILLIP)

BIOMARKERS OF ADMISSION

High CK-MB: ☐ Yes ☐ No Highest value: _____

High TpN +: ☐ Yes ☐ No Highest value: _____

VICTIM STUDY

HOSPITALIZATION

DRUG THERAPY IN THE FIRST 24 HOURS ☐ Yes ☐ No

Aspirin:	☐ Yes	☐ No	*DOSAGE: _____	Eligible:	☐ Yes	☐ No
Clopidogrel:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Prasugrel:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Ticagrelor:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Beta-blocker:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
ACE inhibitor:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
ARB:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Statin:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Calcium-channel blocker:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Nitrates:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Diuretics:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Aldosterone antagonist:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Insulin:	☐ Yes	☐ No	DOSAGE: _____			
Low-molecular-weight heparin:	☐ Yes	☐ No	DOSAGE: _____			
Conventional heparin:	☐ Yes	☐ No	DOSAGE: _____			
Others:	☐ Yes	☐ No				

*DOSAGE: Amount of prescription drug in 24 hours

If yes, which? _____

IN-HOSPITAL TESTS ☐ Yes ☐ No

ECHOCARDIOGRAPHY Date: ☐☐☐

EF:_____ %

Simpson: ☐ Yes ☐ No

LA:_____ cm

LA volume: _____

Segment deficit: ☐ Yes ☐ No

Anterior ☐ Inferior ☐

Lateral ☐ Septal ☐

Posterior ☐

FIRST CORONARY ANGIOGRAPHY ☐ Yes ☐ No

Date: ☐☐/☐☐/☐☐ Hour: ☐☐:☐☐ h Hospital: _____ Cath number: _____

Access: ☐ Femoral ☐ Radial ☐ Other: _____

RESULT OF CORONARY ANGIOGRAPHY

	LCA	AD	Dg	Cx	Mg	PD-Cx	RC	PD-RC
Lesion severity								
Culprit artery								

*Normal angioplasty = 0%; LCA: Left main coronary artery; AD: Anterior descending artery; Dg: Diagonal artery; Cx: Circumflex artery; Mg: Marginal artery; PD-Cx: Posterior descending-Circumflex artery; RC: Right coronary artery; PD-RC: Posterior descending-Right coronary artery.

PATHOLOGICAL SEARCH OF GUILTY ARTERY ☐ Yes ☐ No

Finding ☐ Thrombus ☐ Spasm ☐ Embolism ☐ Myocardial bridging ☐ Dissection

PRIMARY PCI: ☐ Yes ☐ No

Less than 12 hours: ☐ Yes ☐ No Date: ☐☐/☐☐/☐☐ Hour: ☐☐:☐☐ h Hospital: _____

Access: ☐ Femoral ☐ Radial ☐ Other: _____

Artery	Obstruction %	Number of stents	Conventional stent	Drug-eluting stent
LCA				
AD				
Dg				
Cx				
Mg				
PD-Cx				
RC				
PD-RC				
Other				

Angiographic success ☐ Yes ☐ No

ADJUVANT PHARMACOTHERAPY

Bivalirudin: ☐ Yes ☐ No DOSAGE: _____

GPIIb/IIIa inhibitors ☐ Yes ☐ No DOSAGE: _____

NON-PRIMARY PCI ☐ Yes ☐ No

Date: ☐☐☐ Hour: : h Hospital:_____ _____

Access: ☐ Femoral ☐ Radial ☐ Other: _____

Artery	Obstruction %	Number of stents	Conventional stent	Drug-eluting stent
LCA				
AD				
Dg				
Cx				
Mg				
PD-Cx				
RC				
PD-RC				
Other				

Angiographic success ☐ yes ☐ No

CORONARY ARTERY BYPASS GRAFTING ☐ Yes ☐ No

Date: ☐☐☐ Hospital: _____

Left internal mammary artery: ☐ Yes ☐ No

Right internal mammary artery: ☐ Yes ☐ No

Radial: ☐ Yes ☐ No

Number of saphenous vein grafts: _____

Complete CABG: ☐ Yes ☐ No

Cardiopulmonary bypass: ☐ Yes ☐ No

VICTIM STUDY

OUTCOMES

IN-HOSPITAL OUTCOMES

☐ Yes ☐ No

CARDIOVASCULAR DEATH: ☐ Yes ☐ No Date: ☐☐/☐☐/☐☐

NON-CARDIOVASCULAR DEATH: ☐ Yes ☐ No Date: ☐☐/☐☐/☐☐

CARDIOGENIC SHOCK: ☐ Yes ☐ No Date: ☐☐/☐☐/☐☐

REINFARCTION: ☐ Yes ☐ No Date: ☐☐/☐☐/☐☐

POST-AMI ANGINA: ☐ Yes ☐ No Date: ☐☐/☐☐/☐☐

HEART FAILURE: ☐ Yes ☐ No Date: ☐☐/☐☐/☐☐

STROKE: ☐ Yes ☐ No Date: ☐☐/☐☐/☐☐

CARDIAC ARREST: ☐ Yes ☐ No Date: ☐☐/☐☐/☐☐

HEMORRHAGE: ☐ Yes ☐ No

- Lowest hemoglobin recorded _____ Date ☐☐/☐☐/☐☐
- Lowest hematocrit recorded _____ Date: ☐☐/☐☐/☐☐
- Eye hemorrhage: ☐ Yes ☐ No Date ☐☐/☐☐/☐☐
- Puncture site-related hemorrhage ☐ Yes ☐ No Data: ☐☐/☐☐/☐☐
- Brain hemorrhage: ☐ Yes ☐ No Date: ☐☐/☐☐/☐☐
- Fatal hemorrhage: ☐ Yes ☐ No Date: ☐☐/☐☐/☐☐
- Blood transfusion: ☐ Yes ☐ No Date: ☐☐/☐☐/☐☐

If yes, how many blood bags? _____

DIAGNOSTIC OUTCOME

In the medical record, the diagnosis of STEMI was maintained: ☐ Yes ☐ No

If not, what was the final diagnosis? _____

Does the medical record have any post-infarction dietary/nutritional instruction? ☐ Yes ☐ No

If yes, who recorded the instruction? ☐ Nutricionist ☐ Doctor ☐ Nurse ☐ Others: _____

Does the medical record have any instruction on post-infarction cardiac rehabilitation?

☐ Yes ☐ No

If yes, who recorded the instruction? ☐ Doctor ☐ Physiotherapist ☐ Physical trainer ☐ Others: _____

HOSPITAL DISCHARGE

Date: ☐☐/☐☐/☐☐ Hour: ☐☐:☐☐ h

DISCHARGE MEDICATION

Aspirin:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Clopidogrel:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Prasugrel:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Ticagrelor:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Beta-blocker:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
ACE inhibitor:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
ARB:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Statin:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Aldosterone antagonist:	☐ Yes	☐ No	DOSAGE: _____	Eligible:	☐ Yes	☐ No
Calcium-channel blocker:	☐ Yes	☐ No	DOSAGE: _____			
Nitrates:	☐ Yes	☐ No	DOSAGE: _____			
Diuretics:	☐ Yes	☐ No	DOSAGE: _____			
Insulin:	☐ Yes	☐ No	DOSAGE: _____			
Others:	☐ Yes	☐ No				

*DOSAGE: Amount of prescription drug in 24 hours

If yes, which? _____

OUTCOMES 30 DAYS AFTER STEMI

Contact after 30 days?	☐ Yes	☐ No	If not, what reason? _____	
CARDIOVASCULAR DEATH:	☐ Yes	☐ No	Date: ☐☐☐	
NON-CARDIOVASCULAR DEATH:	☐ Yes	☐ No	Date: ☐☐☐	
REINFARCTION:	☐ Yes	☐ No	Date: ☐☐☐	
POST-AMI ANGINA:	☐ Yes	☐ No	Date: ☐☐☐	
HEART FAILURE/SHOCK:	☐ Yes	☐ No	Date: ☐☐☐	
STROKE:	☐ Yes	☐ No	Date: ☐☐☐	
CARDIAC ARREST:	☐ Yes	☐ No	Date: ☐☐☐	
NEW CORONARY ANGIOGRAPHY:	☐ Yes	☐ No	Date: ☐☐☐	
HEMORRHAGE:	☐ Yes	☐ No	Date: ☐☐☐	Where? _____
REHOSPITALIZATION:	☐ Yes	☐ No	Date: ☐☐☐	Reason? _____ Hospital? _____
Post-discharge consultation?	☐ Yes	☐ No	Date: ☐☐☐	Where? _____
If not, is it scheduled?	☐ Yes	☐ No	Date: ☐☐☐	