What Is the Acceptable Miss Rate for a Major Adverse Cardiac Event (MACE)?

A Follow-Up Survey After Release of the American College of Emergency Physicians (ACEP) Clinical Policy on Acute Coronary Syndromes

Urgent message: Previously *JUCM*-published research revealed that even very low risk for a major adverse cardiac event left clinicians uncomfortable with discharging patients per 2018 ACEP guidelines. What can be learned from a follow-up study reflecting the updated version?

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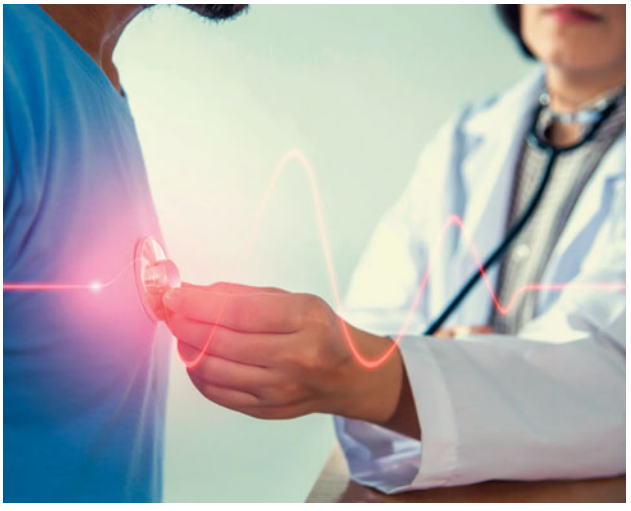
Abstract

Introduction

This study sought to characterize the acceptable miss rate among participants of the Essentials of Emergency Medicine conference in 2021 to determine if responses have changed since the publication of the 2018 chest pain guidelines of the American College of Emergency Physicians. A very low "acceptable miss rate" among clinicians results in unnecessary admissions and risk of patient harm from nosocomial infections, falls, false positive tests, unnecessary procedures, and expense.

Methods

A survey was conducted during the Essentials of Emergency Medicine conference in 2021, the same conference at which the pilot survey was conducted in 2018.



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The 2021 survey consisted of one clinical and five demographic questions, identical to the 2018 pilot survey. The clinical question directly polled participants on what percent of possible MACE within 30 days they would be comfortable when discharging a patient presenting to the ED with symptoms of acute coronary syndrome (ACS).

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Table 1. Polling Question

Clinical question
What level of possibly missed major cardiac event (MACE) within 30 days do you consider acceptable to allow discharge and cessation of investigation in a patient presenting to the emergency department with symptoms of an acute coronary syndrome (ACS)?
- Missed MACE of 0.01% (1 in 10,000)
- Missed MACE of 0.1% (1 in 1,000)
- Missed MACE of 0.25% (1 in 400)
- Missed MACE of 0.5% (1 in 200)
- Missed MACE of 1.0% (1 in 100)
- Missed MACE of 2.0% (1 in 50)
- Missed MACE of 4.0% (1 in25)
- Missed MACE of 5.0% (1 in 20)

Results
Out of the 126 study participants, most were attending physicians (66.4%) with 0-5 years of clinical experience (37.1%). Nearly half of the participants practiced medicine in the United States, with the remaining participants practicing in Canada (18.7%), Australia (2.4%), United Kingdom (0.8%), and other countries (27.6%). Half of study participants reported an acceptable miss rate of 0.01% to 0.1%. Only 31% of participants were comfortable with a MACE rate of 1% to 2% as recommended by the 2018 ACEP guidelines.

Conclusion
Among a small international cohort of emergency medicine providers, a significant number of clinicians were not comfortable with the current ACEP guidelines regarding the acceptable miss rate for MACE, with only 50% comfortable with a miss rate of greater than 0.1% for MACE.

Introduction
In 2018, chest pain was the second most common presenting symptom to the emergency department, accounting for 5.5% of all encounters and totaling more than 7 million visits.[1] Chest pain is also a common presentation to the urgent care, either as a primary complaint, or an associated complaint. Clinicians must investigate and triage these patients to avoid deadly consequences such as acute coronary syndrome (ACS), while also weighing the risks of false positive testing, costs of the evaluation, and the risks and benefits of admission. Unfortunately, even with thorough data gathering (history, exam, testing), ACS is occasionally not identified. Therefore, we must define an acceptable miss rate of ACS.

Patients presenting with possible cardiac symptoms are stratified into risk categories; the HEART score and EDACS pathway are two examples of clinical decision aides. The HEART score uses a scoring system based on history, ECG findings, age, risk factors, and troponin.[2,3] With a low-risk HEART score (0-3), there is an expected 0.8%[4] to 1.7%[2] risk of major adverse cardiac event (MACE), defined as death, myocardial infarction, or revascularization in the following 4–6 weeks. With a low-risk score on the HEART pathway (two troponin tests), there is a 0.4% risk of MACE.[3] With a low-risk score on EDACS,[5] there is a 0.54% risk of MACE, based on a 2021 systematic review .[6] Based on the risk, a disposition decision is made based on the recommendation of the clinician and/or with a process of shared decision making (SDM).

Without the ability to completely rule out the possibility of ACS, there is a possibility of a MACE even in low-risk patients.

The question *What is an acceptable rate of MACE (major adverse cardiac event)?* was presented to healthcare providers at the Essentials of Emergency Medicine conference in Las Vegas in 2018 and published previously, showing the majority of clinicians (47%) were only comfortable with rate of MACE less than 0.1%.[7] This previous work was completed prior to the release of the 2018 American College of Emergency Physicians (ACEP) clinical practice guidelines, which recommended a higher acceptable missed diagnosis rate of 1%–2% for a 30-day MACE in nSTEMI ACS.[8]

This study sought to characterize the acceptable miss rate among participants of the Essentials of Emergency Medicine conference in 2021 to determine if responses have changed since the publication of the 2018 ACEP chest pain guidelines.

Methods
A survey was conducted during the Essentials of Emergency Medicine conference in 2021, the same conference at which the pilot survey was conducted in 2018.[7] The conference is a 3-day event for continuing medical education credit that is certified by the American Medical Association for Physician's Recognition Award Category. Due to social distancing, the 2021 conference was online only and had a total of 2,187 livestream attendees. The survey was available to all the attendees as a link on the conference app, which the conference attendees were asked to download.

The 2021 survey consisted of one clinical and five demographic questions identical to the 2018 pilot survey. All data were compiled into a Microsoft Excel

spreadsheet. Demographic questions covered professional role, practice setting, years of experience, primary work environment, and country of practice. The clinical question directly polled participants on what percent of possible MACE within 30 days they would be comfortable when discharging a patient presenting to the ED with symptoms of ACS (**Table 1**). Descriptive statistics were calculated. This investigation received an "exempt" status by the Adena Health System IRB.

Results

Out of the 126 study participants most were attending physicians (66.4%) with 0–5 years of clinical experience (37.1%). Nearly half of the participants practiced medicine in the United States, with the remaining participants practicing in Canada (18.7%), Australia (2.4%), United Kingdom (0.8%), and other countries (27.6%) (**Table 2**).

Half of study participants reported an acceptable miss rate of 0.01% to 0.1%. Only 31% of participants were comfortable with a MACE rate consistent with the 2018 ACEP guidelines of 1% to 2% (**Table 3**).

Discussion

The ACEP Clinical Policy states an acceptable missed rate of adverse cardiac events is 1% to 2%.[8] In our 2021 study, which demographically had fewer participants from the United States but similar percentage of attending responses, we found that half of the surveyed participants only accept a missed MACE rate of 0.01% or 0.1%, 10-200 times lower than the 2018 recommended ACEP guideline. Furthermore, a similar 2018 study reported that nearly half of surveyed emergency medicine providers also accepted a missed rate of only 0.01%-0.1%.[7] These results are both similar to the original study performed by Than, et al.[9] The evident discrepancy of accepted rates between ACEP and practicing physicians poses a simple question: *Why?*

Though our study defines the acceptable miss rate and not the reasons for such a conservative approach in such a large percentage of clinicians, the risk of litigation can certainly play a decisive role in the influence of how physicians practice medicine. Over 90% of physicians believe that physicians order more tests due to fear of litigation.[10] With missed MI being the leading