

## LETTER TO THE EDITOR

## Automatic emergency calls from smartphone/smartwatch applications in trauma

Dear Editor,

Timely access to care is essential for severely injured trauma patients.<sup>1</sup> Some modern smartphones (iPhone 14; Apple Inc.) and smartwatches (Apple Watch Series 8; Apple Inc.) are equipped with crash detection systems, which are designed to detect shocks associated with car collisions and automatically send out emergency calls, resulting in immediate activation of the emergency medical services (EMS) system. Meanwhile, there are potentially a number of “false positive” cases that users unintentionally make emergency calls for nonemergencies.<sup>2</sup> Understanding present practice is therefore important to further develop this innovative system. The aim of this study was to estimate the current incidence of emergency calls associated with crash detection systems.

We conducted this retrospective cohort study in Okayama City using data from the database of the Okayama City Fire Bureau from October 2022 to March 2023. The Ethics Committee of Okayama University approved this study (K2305-011). The population of Okayama City in February 2023 was 0.72 million within an area of 790 km<sup>2</sup>. A single dispatch center coordinates 20 fire stations that respond to emergency calls. Okayama City launched this notification system in October 2022. In brief, when a severe car crash is detected, the owners of the device can choose to connect to emergency services or abort the alert if they are able to respond. If the potential victims are unable to respond, emergency services will be automatically called after a 20 s delay.

Among 2731 emergency calls related to traumatic injuries, there were 49 reports using these applications during the study period. Of the 49 reports, 13 cases were true positive associated with motor vehicle accidents or falls, 35 cases were identified as false positive resulting from sudden deceleration by braking or accidental phone drop, and one was unknown. In-depth distribution and consequences of 49 emergency calls activated by crash detection systems are shown in [Figure 1](#).

This study was limited by its nature as a preliminary study. We did not examine the impact of this crash detection system on patients' outcomes. From the view of false-positive calls, detailed information on how this detection system worked is still unclear, which would be important to reduce unnecessary EMS dispatch.

We found an overall false-positive rate of 71% (35/49). This rate was similar (71% [10/14]) even after limiting cases to those for whom ambulances were dispatched (the denominator represents cases for whom ambulances were actually sent, while the numerator indicates the number of patients who were not transported to the hospital). Assuming that an overtriage rate of <35% would be acceptable,<sup>3</sup> the false-positive rate was deemed to be quite high. Even if the emergency call is erroneous, it can be resolved if the command center returns the call and the caller can answer and verify that dispatch is not necessary or that the call was erroneous without hanging up the phone. If the caller cannot be reached, the location of the call will be identified and an ambulance will be sent. This would be advantageous over an automatic triggering system that is equipped within a “smart vehicle”.<sup>4</sup>

Further studies with a larger cohort are warranted to evaluate the effectiveness and impact of the car crash detection feature on patients' outcomes and the EMS system. The system should be widely recognized and available to more people and aligned to optimize its performance.

### ACKNOWLEDGMENTS

We thank Yuuichi Hata and the Okayama City Fire Bureau for data collection.

### CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

### ETHICS STATEMENT

Approval of the research protocol: This study was approved by the Ethics Committee of Okayama University (K2305-011).

Informed consent: N/A.

Registry and the registration no. of the study/trial: N/A.

Animal studies: N/A.

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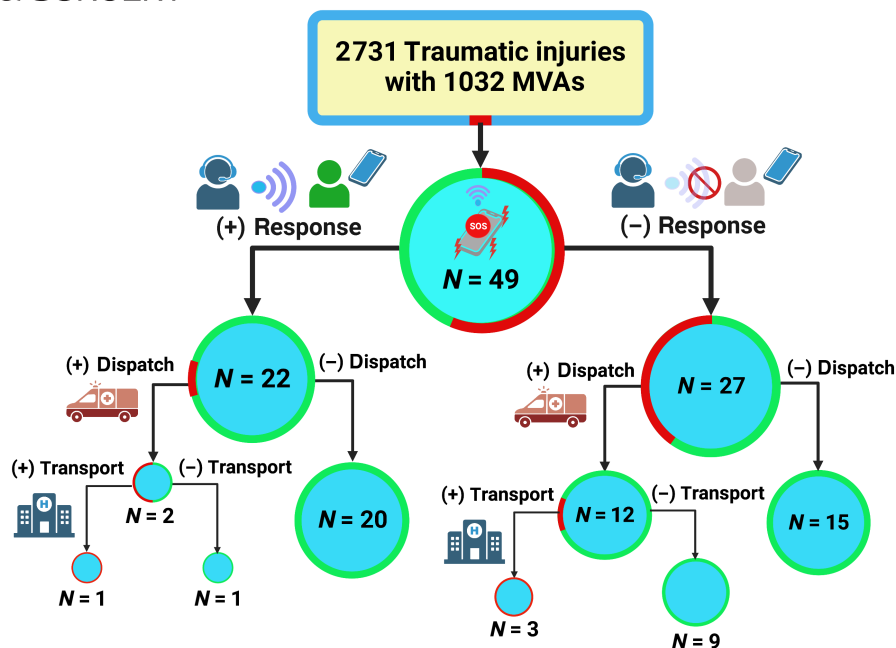
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**FIGURE 1** Distribution and consequences of 49 emergency calls activated by crash detection systems. Of the 49 cases, 22 were responsive and were able to contact emergency services, while 27 cases were unresponsive to the command center. Of the 22 cases that were responsive, the ambulance was dispatched in two cases, and one injured person required urgent transportation. The ambulance dispatch was canceled for the remaining 20 cases based on the information obtained. Among 27 cases that were unresponsive, the ambulance was sent in 12 cases; among them, 3 victims were transported to the hospital, and 15 erroneous calls were confirmed to be false crashes. The images were created by BioRender software. MVA, motor vehicle accident.

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