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# EMERGENCY DISPATCH RESEARCH AT WORK

RESEARCH BRIEF

**A "YES" ANSWER TO THE PROTOCOL KEY QUESTION "IS ANYONE PINNED (TRAPPED)?" IS A BETTER PREDICTOR OF EXTRICATION BY RESPONDERS FOR MVAs THAN THE PRESENCE OF SEMI-TRUCK OR HEAD-ON MECHANISM.**

## No Time to Lose


**OF MOTOR VEHICLE ACCIDENT DEATHS HAPPEN WITHIN ONE HOUR OF THE ACCIDENT.**

# SHOULD WE ASK CALLERS "IS ANYONE PINNED (TRAPPED)?" DURING MOTOR VEHICLE ACCIDENTS (MVAs)?

## We should! The question directs callers to pay attention to what matters most.

**What is Extrication?:** For a traffic collision, the higher the speed of the vehicle, the higher the chances an occupant suffers severe injuries.[1] After a serious crash, the absorbed kinetic energy can cause the vehicle to deform significantly, displacing parts of the vehicle into the interior. This displacement frequently limits an occupant's ability to move or be removed. When there is need for *extrication*, deformity and damage hinder an occupant's safe exit or removal.

The primary focus of most vehicle extrication operations is to remove the entanglement from around an occupant, not an occupant from the entanglement. Extrication of an occupant from a damaged vehicle can be accomplished several ways dependent on the extent and nature of the damage and the urgency of an occupant's removal. Some vehicle extrication operations require removal of the roof and doors. Other operations require forced hydraulic movement of interior vehicle parts to create room around an occupant. Vehicle extrication can be technically challenging and time-consuming, requiring multiple personnel, specialized equipment, and occasionally, extended periods of time to achieve the desired safe outcome.[2]

Identifying the need for extrication during a Motor Vehicle Accident (MVA) is very important. Research shows the need for extrication services predicts fatalities and the seriousness of injuries.[3] Delays that happen during dispatch can contribute to these fatalities: Of those who die in MVAs, about 50% die within one hour.[4]

**The "Is Anyone Pinned (Trapped)?" KQ:** The "Is anyone pinned (trapped)?" Key Question (KQ) appears on three of the Priority Dispatch Protocols™. To be compliant when asking this KQ, emergency dispatchers must first encounter evidence that the nature of the accident and mechanism of injury potentially caused serious harm. For instance, asking this KQ is appropriate for a head-on or high-speed collision. It is unsuitable for a fender bender, as long as it is obvious.

The caller's answer to "Is anyone pinned (trapped)?" contributes to the final assessment of the emergency call's Determinant Level. Furthermore, depending on local policies, a "yes" answer sends extrication resources to the scene of the road collision.

However, a skeptic might ask: Is there any evidence that we should ask callers "Is anyone pinned (trapped)?" Thanks to the work of Chris Davis and his collaborators, there is.

**Predicting Extrication:** While attending a research workshop organized by the International Academies of Emergency Dispatch®, Davis became interested in the following research question: How well can the KQ "Is anyone pinned (trapped)?" predict extrication?

A good predictor of extrication would do two things very well. First, when there is an extrication event, the good predictor would tell you that extrication is needed (this is measured as the *"sensitivity"*). Secondly, when there is no extrication event, the good predictor would let you know that no extrication is called for (this is measured as the *"specificity"*). A predictor that is 100% sensitive and 0% specific is the policy of sending extrication resources no matter what; clearly it is not a good predictor because it wastes valuable resources.

**"A Comparatively Good Predictor":** After returning to his dispatch agency in Butler County, Kansas (USA), Davis worked hard to investigate this question using data collected from three Kansas counties (985 total MVA cases). He eventually completed a peer-reviewed research manuscript entitled "Predicting the Need for Extrication in Traffic Accidents Reported to 911: Is Anyone Pinned/Trapped?" with his collaborators.[5]

To assess the predictive ability of the KQ, Davis et al. (2018) compared answers to the KQ with incidents in which there was Semi-truck involvement or a Head-on collision, both usually "high mechanism" events. *They found that answers to the "Is anyone pinned (trapped)?" KQ were significantly better at predicting extrication than the presence of Semi-truck or Head-on involvement* (see the infographic for exact numbers). This KQ has a place on the protocols, after all.

**A Plausible Explanation:** But why does the KQ appear to perform better than the presence of Semi-truck or Head-on involvement? A possible answer is vehicle damage is misleading. Though they are linked, damage to a vehicle cannot always be treated the same as injury to a person.

Advances in technology bring this distinction to the forefront. For instance, newer vehicles are equipped with "crumple zones," which are designed to absorb and redistribute force from high-speed collisions. The presence of these zones improves the likelihood of an occupant being able to self-extricate from the vehicle.

In conclusion, "Is anyone pinned (trapped)?" is in the protocols because it guides callers to consider more than just the accident type. Instead, it directs them to focus on the effects of the accident on the occupants. Turns out, the evidence suggests that this is the right philosophy.

## FOR MORE INFORMATION:


1. Federal Highway Administration. Self-enforcing roadways: a guidance report. U.S. Department of Transportation website. September 26, 2018. Accessed July 23, 2020. **fhwa.dot.gov/publications/research/safety/17098/003.cfm**
2. Cowley A. Self-extrication in road traffic collisions: do we really need to cut the roof off? *Journal of Paramedic Practice*. 2014;6(11):584-588.
3. Brown JB, Rosengart MR, Biliar TR et al. Distance matters: effect of geographic trauma system resource organization on fatal motor vehicle collisions. *Journal of Trauma and Acute Care Surgery*. 2017;83(1):111-118.
4. Wik L, Hansen TB, Kjensli K, Steen PA. Rapid extrication from a car wreck. *Injury, International Journal of the Care of the Injured*. 2004;35:739-745.
5. Davis C, Dodson P, Pore C, Sangaraju S, Broadbent M, Scott G, Gardett I, Olola C. Predicting the need for extrication in traffic accidents reported to 911: is anyone pinned/trapped? *Ann Emerg Dispatch & Response*. 2018;6(3):5-9.


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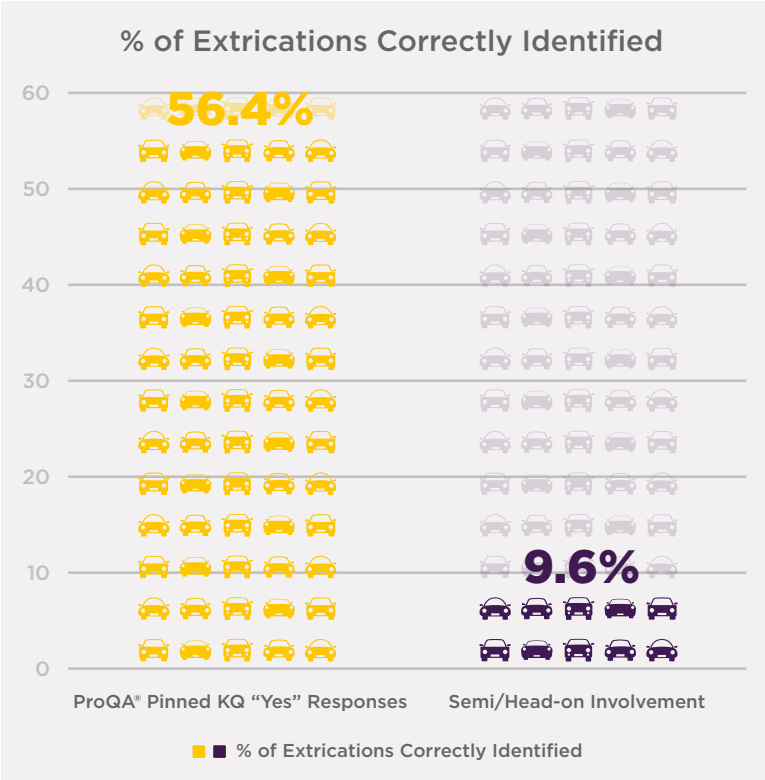



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