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Creators	Pennington, Elspeth, Price, Jon, Bell, Steve and Hill, James Edward

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## How Safe is Pre-hospital Care?

### Key Points

- The prevalence, severity and preventability of pre-hospital Patient Safety Incidents (PSIs) is varies very varied when looking at the current evidence available for this
- It is unclear whether record review or incident reporting systems, or an alternative approach, is best for identifying PSIs in the pre-hospital setting.
- Further research is needed to determine the most appropriate system for identifying pre-hospital PSIs and also to more comprehensively understand the frequency, severity and preventability of pre-hospital PSIs.

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### Abstract

The provision of safe and effective healthcare is a mainstay for all services and clinicians associated with the delivery of pre-hospital care, however little is empirically known about the prevalence and impact of harm caused in the pre-hospital phase. This commentary critically appraises a recent systematic review which sought to identify the frequency of patient safety incidents and the harm associated with them in prehospital care.

Commentary on: [How Safe is Pre-hospital Care?: A Systematic Review](#) O'Connor, P., O'Malley, R., Lambe, K. et al. [How Safe is Pre-hospital Care?: A Systematic Review.](#) International Journal for Quality in Health Care, 2021; 1–7. <https://doi.org/10.1093/intqhc/mzab138>

### Introduction

Pre-hospital care is an established element of the healthcare system encompassing the emergency medical care given to patients at the scene of illness or injury, during transfer and prior to their arrival

at a healthcare facility (Wilson et al, 2015). The undifferentiated presentation of patients to pre-hospital care services and the varied and at times complex environments in which they present entails that decision making is complex and those made in the pre-hospital period, and the subsequent actions and interventions can impact upon safe and effective patient outcomes (Bijani et al, 2021). However, the provision of healthcare services has been demonstrated to be associated with harm being caused to patients (Panagioti et al, 2019). The World Health Organisation (WHO) defines patient harm as “an incident that results in harm to a patient such as impairment of structure or function of the body and / or any deleterious effect arising there from or associated with plans or actions taken during the provision of healthcare, rather than an underlying disease or injury, and may be physical, social or psychological (e.g. disease, injury, suffering, disability and death)” (WHO, 2009, P.16). These occurrences may be termed ‘patient safety incidents’ (PSI) themselves defined as ‘unintended or unexpected incidents which could have, or did, lead to harm for one or more patients receiving healthcare’ (NHS Improvement, 2019). Acknowledging that compared to primary or secondary care, little is known about the extent of patient harm caused by the provision of pre-hospital care, the systematic review undertaken by O’Connor et al (2021) seeks to establish the prevalence and harm associated with PSIs in the pre-hospital setting.

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## Aim of commentary

This commentary aims to critically appraise the methods used within the review by O’Connor et al (2021) and expand upon the findings in the context of clinical practice.

## Methods

A comprehensive multi-database search was carried out on Medline, Web of Science, PsycInfo, CINAHL and Academic Search Complete, and grey literature examined (January 2001 to October 2020). Any English language, prehospital study that reported numerical form data with a useable denominator for calculating PSI frequency on at least one of the following: the number/frequency of PSIs; the harm associated with PSIs; and/or included PSIs that occurred during routine care, were included. Consideration of the exclusion criteria reveals that studies looking at patients with specific conditions/procedures; the performance of a single or small number of drug/devices; and incidences of providers deciding not to perform a treatment, were all excluded.

These areas all appear to be part of normal or expected prehospital practices and all are very relevant to the topic of PSIs; their exclusion from this review is therefore contentious

Title and abstract screening were undertaken by only one reviewer with full-text screening completed by the research team. However, it was not stipulated if this was done in duplicate or if blinding of the screening took place. Two reviewers undertook a quality assessment of the included studies using the Quality Assessment Tool for Studies with Diverse Designs, but it is unclear if this was done independently or collaboratively. Data extraction was conducted independently by two reviewers with a third reviewer involved to resolve any disagreements. Data synthesis raised some concerns: due to a lack of heterogeneity between studies, descriptive and narrative synthesis was instead undertaken but this appears to have been inappropriate in some cases; as an indicative example frequency data for PSIs per 100 transports was combined with a non-equivalent comparator of PSIs per 100 medication doses.

## Results

The search strategy identified 3,264 papers. After full screening, 22 studies were included (1 study was qualitative, 1 was a mixed-methods design and 20 were quantitative). Most of the studies were located in Europe (12), with 6 from the USA, 2 from Australia and 2 from the Middle East. Of the studies included in the review, the majority (86.4%) were assessed to be of medium quality following application of the Quality Assessment Tool for Studies with Diverse Designs.

The review found the frequency of patient safety incidents (PSIs) to vary greatly from 0 to 71.2 per 100 records \_\_/\_\_ transports \_\_/\_\_ patients \_\_/\_\_ medication doses. Although the review considered subgroup analyses of these findings, due to a lack of standardisation in how PSIs are classified within the studies included in the review, a low level of confidence can be put in the combined PSI frequency rates.

The authors of this review did provide supplement information on PSIs for each included study which allowed the direct comparison of consistent denominators for measuring PSIs. Greatest consistency was found when looking at rates of PSIs per 100 dispatches, which ranged from . Greatest consistency was found when looking at rates of PSIs per 100 dispatches, which ranged from 0.4 to 1.7; and greatest variation was found when looking at PSIs associated with medications with a range from 0.2 to 71.2 per 100 doses.

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Italy 1  
Sweden 1  
France 3  
Germany 4  
Netherlands 1  
Qatar 1  
Israel 1  
USA 6  
Australia 2

I have attempted to summarise the above

Similarly, to the frequency of PSIs, the presence of harm occurring during PSIs was found to have great variation from 0 to 80.6% in the studies that focused on this. The severity of this harm caused was determined within four of the included studies with around 10% of PSIs estimated to result in severe harm; between 19.4-25.8% resulting in moderate harm and 19.5-54.8% resulting in low harm.

The review highlighted that the process through which PSIs are identified may impact on the information obtained about them, with different frequency rates and reports of harm being recorded through incident reporting systems compared to processes involving record review. There also appears to be a lack of focus on the preventability of PSIs, with the only study that included this as a focus identifying that 45.3% of PSIs were preventable.

## Commentary

Using the Joanna Briggs Institute Critical Appraisal Tool for Systematic Rreviews, 7 out of the 10 applicable criteria were deemed to be satisfactory for this review. The comprehensiveness of the review is likely limited due to an unclear review question; some contention around the methodology and criteria of the excluded and included studies in the review, and some potential for bias identified through the critical appraisal not being conducted by two or more reviewers independently. However, this review is still of value.

When considering patient safety incidents in prehospital care, it is important that systems are implemented to accurately capture the prevalence and associated harm caused by these incidents, given the potential impact on patients. It is not clear from this review whether incident reporting systems or instead processes involving record review, result in more accurate capture of PSI data. Including a focus on the preventability of PSIs identified through current systems for capturing PSI information, may be beneficial for then implementing strategies to prevent further similar incidents from occurring.

A further review of the literature, using more robust methods, including more appropriate combining of data, would likely be beneficial to obtain a more accurate and thorough understanding of PSIs in

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the pre-hospital setting. Additionally further research into the topic of pre-hospital PSIs is needed. This should include: examining what system works best to most accurately identify PSIs; the harm associated with PSIs; and the preventability of PSIs in this setting. This research is needed to be able to make further recommendations for ambulance service practice on this topic.

### CPD reflective questions

- Do you know what processes exist within your own pre-hospital setting for identifying PSIs?
- Have you reported all PSI that have happened during your care of patients?
- What is the significance of not reporting PSIs?

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**Commented [JEH<oS&HS10]:** would expand upon this point below in regards to future research needs: There also appears to be a lack of focus on the preventability of PSIs, with the only study that included this as a focus identifying that 45.3% of PSIs were preventable.

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