

# Progressing patient safety in the Emergency Medical Services

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## INTRODUCTION

Patients are vulnerable during emergency episodes outside the formal care sector, for example, care provided by paramedics responding to a stroke or heart attack at home. Yet much less is known about the safety of Emergency Medical Services (EMS) as compared with primary or secondary healthcare.<sup>1</sup> This relative lack of information is important given there are aspects of EMS care that create unique patient safety challenges. EMS staff are not surrounded by the usual safety infrastructure one finds in hospitals or community facilities. The episodic nature of each interaction means EMS staff lack the information one finds in more predictable care contexts. Even in highly developed EMS systems, patient history will be unavailable. This results in an almost complete reliance on the patient, family/carer or bystander to describe pertinent clinical history such as ‘do not resuscitate’ plans for the patient, or how the current emergency is connected to previous care.<sup>2</sup> This does not necessarily impede immediate life-saving care. However, as populations age and the proportion of people with chronic diseases increases, there is an increasing cohort of EMS patients with care needs that are more difficult to differentiate, particularly in the absence of clinical history.<sup>3</sup>

Further, the care provided by EMS is changing. The traditional ‘scoop and run’ model—where EMS providers deliver basic first aid and rapid transport to the nearest hospital—has largely been replaced by an increasingly sophisticated clinical EMS model. There is increasing recognition that transport to hospital is unnecessary and even inappropriate in response to some emergency calls. However, ‘hospital avoidance’ does not remove the need for EMS patients to be provided with definitive care but rather

places increased responsibility on EMS to ensure definitive care is provided or that appropriate referral is assured.<sup>4</sup> Alternative care pathways that enable EMS to ‘hear and treat’ or ‘treat and refer’ patients are highly desirable, but EMS agencies must ensure that systems are safe and acceptable to patients, and result in similar or better clinical outcomes. An example of a treat and refer pathway is the treatment of a patient who sustains a hypoglycaemic episode; here the paramedic treats the hypoglycaemic episode reversing the same with glucagon, ensures non-conveyance criteria are met, and refers the patient for follow-up by a General Practitioner based in the community. Alternative care pathways may also be desirable to support mental health related issues. In such cases, the paramedics could have capacity to schedule a community psychiatry follow-up appointment within a safe window of time, potentially supplemented with other forms of safety netting including telemedicine consultations, thereby reducing reliance on conveying the patient to a hospital emergency department that does not meet their needs. EMS care is rapidly evolving and standards and practice are under continual review and renewal. The clinical competencies of EMS care providers vary widely internationally (eg, paramedic-provided vs physician-provided care). This makes it difficult to benchmark the quality and safety of care provided. Traditionally, acute conditions like cardiac arrest and major trauma have been used to benchmark care, but these account for a small and ever-decreasing proportion of patients. Additionally, quantifying the impact of EMS care on patient outcomes can be difficult. With the exception of some procedures (eg, resuscitation) the clinical impact of EMS

care can be hard to directly associate with patient outcomes.<sup>5</sup>

Finally, media, government and regulators remain focused on non-clinical parameters like response times when evaluating the quality and safety of EMS, and the adage that ‘what is measured is monitored’ continues to hold true. This focus is compounded by the fact that the volume of patients who make an emergency call to EMS is exponentially increasing, which in turn impacts response times and service availability.<sup>6</sup> Therefore, EMS constitutes a complex setting for healthcare delivery. Care provision is less uniform than elsewhere and unique challenges to the provision of safe care are inherent. Truly tackling the issue of patient safety in EMS requires careful, tailored consideration of how we assess safety, and how we intervene to reduce the likelihood of patient harm occurring.

In this issue of the journal Wilson *et al*'s<sup>7</sup> systematic review and meta-analysis illustrates the important effects that feedback in the EMS can have on safety-relevant processes such as ambulance response times, protocol adherence and documentation. The review<sup>7</sup> notes that the issue of feedback in EMS has been ‘relatively neglected’ and is still in its ‘infancy’. We argue that this is reflective of a wider lack of attention to the issue of patient safety in the EMS that is detrimental for both patients and EMS care providers. It is now time for attention to how we can, and must, provide guidance for improving patient safety in the EMS.

### Measuring and monitoring safety in the Emergency Medical Services


A lack of reliable and useful data on safety is a consistent problem within healthcare, and limits the attempts to improve safety.<sup>8</sup> Lessons on safety measurement from other healthcare sectors should be adopted by EMS. First, a proactive approach to assessing and improving safety must be adopted. Within healthcare, there has been a predominant focus on ‘lagging indicators’, or reactive measures of safety captured after an incident has occurred.<sup>8</sup> A shift in focus to identifying precursors to safety events (referred to as ‘leading’ indicators of safety) is required.<sup>8</sup> Proactive engagement with safety assessment may take various forms including safety culture surveys and safety walk-arounds.<sup>8</sup> This proactive approach might also usefully see EMS employ failure modes and effects analysis (FMEA) to identify vulnerability within systems.<sup>9</sup> Hospital-based research has already demonstrated that FMEA can be applied to improve many processes key to EMS including medication administration, communication and handover, and treatment delivery.<sup>9</sup>

Second, systems of assessing safety in EMS must be inclusive of patients. Typical safety assessment focuses on engagement with healthcare providers who, for example, use incident reporting systems and complete safety surveys.<sup>8</sup> The potential for patients to contribute has largely been ignored.<sup>10</sup> However, patients and their

families are often best placed to feedback on important elements of care including continuity of care, communication failures, and dignity and respect. Wilson *et al*'s<sup>7</sup> review notes a use of patient-outcome feedback across 10% of studies but these are data *on* patients rather than data *from* patients. Patient-experience feedback was considered in just 4% of studies. Advancing safety in EMS requires that we create routine opportunities for patients and caregivers to provide feedback on quality and safety of care.

Finally, it will be important to learn from the body of work that has accumulated in primary and secondary care on assessing safety. Burdensome, ineffectual, uninterpretable, costly measurement is a significant problem across many healthcare domains that can impede improvement, fatigue staff and managers, and make identifying issues more difficult.<sup>11</sup> It is imperative that systems for assessing safety are carefully designed for EMS, including being proactive and inclusive of patients. Such systems must support EMS staff in engaging openly and constructively on the issue of safety and potentially other related and important variables such as well-being, workload and teamwork. Vincent *et al*'s framework<sup>8</sup> outlines five dimensions of safety measurement and monitoring: (1) Past harm (eg, incident reporting systems); (2) Reliability of clinical systems (eg, audits of compliance with protocols); (3) Sensitivity to operations (eg, safety briefings); (4) Anticipation and preparedness (eg, assessment of safety culture); and (5) Integration and learning (eg, analysis and learning from incidents). A review of

**Table 1** Hierarchy of effectiveness of patient safety interventions (adapted from Institute for Safe Medication Practices<sup>16</sup>)

<i>Forcing functions</i> Designing processes so that errors are difficult to make (eg, luer locks for syringes and lines that have to be matched before fluid can be infused).		More effective systems-focused interventions
<i>Automation and computerisation</i> Automating and computerising of EMS processes and tasks (eg, use of technology to automatically capture clinical data).		
<i>Simplification and standardisation</i> Standardisation and simplifications of practices (eg, standardisation of the equipment used in a particular EMS service).		
<i>Reminders, checklists and double-checks</i> Application of checklists (eg, checklist for prehospital rapid sequence intubation).		
<i>Rules and policies</i> Establishing and enforcing rules related to error prevention and safety (eg, policies on safe medication use).		Less effective person-focused interventions
<i>Education and training</i> Educating and training healthcare staff to reduce errors and to promote and ensure patient safety (eg, non-technical skills training).		
EMS, Emergency Medical Services.		

safety assessment in EMS<sup>12</sup> has identified a predominant focus on past harm and little consideration of sensitivity to operations or integration and learning. There is therefore an important need to bring stakeholders, including EMS clinicians, together to define important measures and establish what a robust safety surveillance system should look like in EMS such that it addresses Vincent *et al*'s<sup>8</sup> domains while also avoiding redundancy, duplication and the collection of unnecessary data.

### Improving safety in the Emergency Medical Services

Although measuring and monitoring safety is important, what is also essential is that these data are used to identify and evaluate the effectiveness of interventions to improve patient safety and quality of care.<sup>13</sup> In fact, it could be argued that there is little point in collecting safety data that are not then used to bring about improvement. Valid and reliable safety data will provide information to identify, and evaluate, the effectiveness of EMS safety interventions. A potential useful application of feedback is to use this information to identify areas for training to improve patient safety and quality of care in prehospital care settings. This may include training in clinical skills (eg, resuscitation), as well as non-technical skills (ie, cognitive, social and personal resource skills such as communication, decision making and teamworking).<sup>14</sup> Non-technical skills are crucial to effective team performance and impact patient safety and quality of care. In the last two decades non-technical skills training has become increasingly commonplace in secondary care. However, there has been limited research on the non-technical skills required by EMS personnel.<sup>15</sup> Specific areas in which there has been research on non-technical skills for EMS personnel are resuscitation<sup>16</sup> and helicopter EMS.<sup>17</sup> Nevertheless, even in these areas, there is considerably less NTS research than in secondary care. Therefore, information to inform the design of training interventions is limited. It is suggested that feedback on the performance of non-technical skills could be valuable in the development of non-technical skills training for EMS personnel, as well as identifying areas in which clinical skills training should be focused.

It is also important to consider interventions beyond training. Although person-focused interventions, such as training, may have impact, systems-focused interventions are likely to have a more lasting effect as they are focused on 'fixing' the system rather than only changing the behaviour of the people within the system. The hierarchy of effectiveness of patient safety interventions,<sup>18</sup> summarised in table 1, provides a useful framework for considering systems focused interventions that will have a lasting impact on patient safety.

### CONCLUSION

The relative lack of safety research in EMS to date may be conceptualised as an opportunity as well as

a challenge. As Wilson *et al*'s<sup>7</sup> review reaches *BMJ Quality and Safety*'s audience, we hope that it will spark conversations about progressing patient safety in the EMS. There exists ample learning from elsewhere in healthcare that can be applied to improving patient safety and quality of care in EMS. Employing practices identified as effective (eg, FMEA) and capitalising on systems-focused safety interventions may help progress to occur in EMS more quickly than has been the case in other domains of healthcare.

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