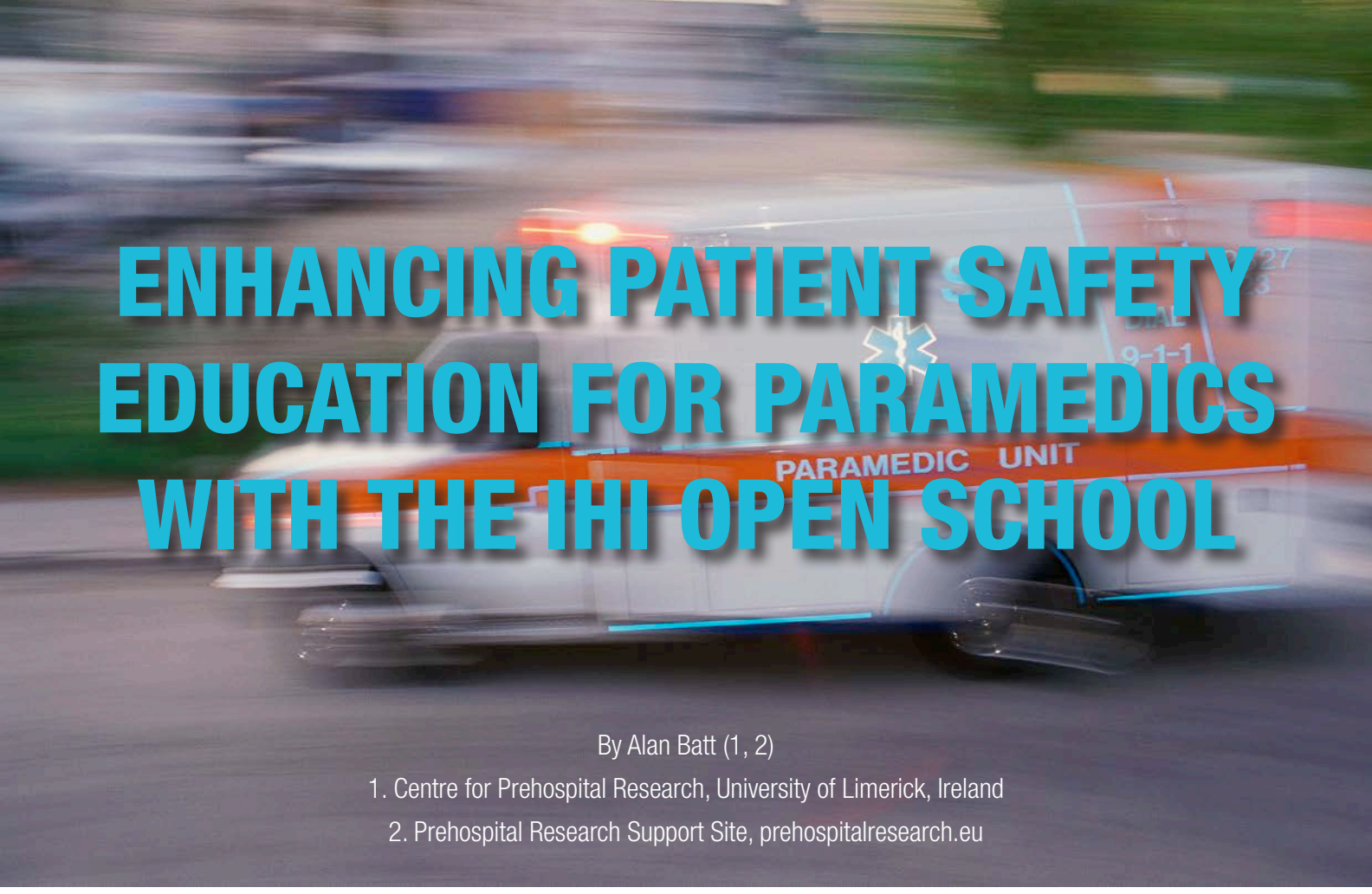

ENHANCING PATIENT SAFETY EDUCATION FOR PARAMEDICS WITH THE IHI OPEN SCHOOL

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Introduction

Every year, thousands of patients die and millions are harmed by medical care provision [1]. Paramedics care for patients in dynamic and challenging environments every day, which creates conditions that are ideal for mistakes to occur and for harm to be caused as a result. Remember, paramedics provide care according to the fundamental principles of medical ethics: the paramedic should first do no harm (non-maleficence-primum non nocere).

Harm is defined by the World Health Organization as "an outcome that negatively affects the patient's health and/or quality of life, impairment of structure or function of the body and/or any deleterious effect arising there from" [2]. Harm (utilizing this definition) includes disease transmission, injury (intentional or accidental), suffering, disability and death.

Patient safety in the prehospital setting

A review by Bigham et al. in Canada demonstrated a paucity of research surrounding the issue of patient safety in the prehospital setting [3]. This is unfortunately reflective of the level of research conducted into patient safety in the prehospital setting across the globe [4]. In the hospital setting, an evidence-based estimate of patient harm estimated that the true number of premature deaths associated with preventable harm to patients was estimated at more than 400,000 per year in the USA [5]. With an adverse event rate in Emergency Departments of over 52 per cent documented in the Institute of Medicine's To Err is Human: Building a Safer Health System Report in 1999 [1], it isn't unreasonable to assume a similar, if not higher, rate of adverse event occurrence in the prehospital setting [6].

Unfortunately, the true number of patients harmed in the prehospital setting is not known. Ambulance services must take appropriate steps to ensure the risk of harm occurring to patients is mitigated in so far as is reasonable. For instance, the hands off time during a resuscitation attempt may not be recorded, but has a serious impact on morbidity and mortality. Any interruption in chest compressions greater than 10 seconds compromises myocardial function [7] and thus should be considered an adverse event, but unless the service in question utilizes CPR feedback and performs individual case review of every cardiac arrest, this adverse event will never be identified.

A number of authors have studied the abilities of paramedics to perform drug calculations, and the results have not been favourable. Hubble et al. found that of the 109 paramedics studied, the average score achieved on an examination of medication doses was 51 per cent (SD 27.4) [8]. IV infusion rate problems were correct in 68.8 per cent of cases. Only 4.5 per cent of percentage-based medication infusions were calculated correctly. They also found that scores were lower in paramedics who were qualified longer, and higher in those with college-level education. LeBlanc et al. found that paramedics scored lower in medication calculation accuracy during stressful simulated scenarios [9]. Considering that many prehospital scenes and events that paramedics attend are stressful by their very nature, this area requires further research to determine the best approaches to minimizing risk to patients. A study by Lammers et al. revealed similar findings, where 46 per cent of crews gave an incorrect dose of a medication during a paediatric simulation [10]. These findings suggest a very real risk to patients.

Implementation of clinical/incident reporting systems in the prehospital setting has been proven to allow for identification of near-miss events, allowing for changes to be made to the system prior to harm being caused to a patient [11]. A Canadian national reporting mechanism has been put in place where information

on adverse events is shared across the country. Incident reporting is however only the initial step in mitigating harm [12], and all incidents warrant some level of additional investigation. Outcomes from these investigations can be used to inform changes in educational approaches, clinical practices and organizational processes to improve patient safety.

More importantly, the priority of patient safety education needs to be reflected in the educational standards. The Canadian National Occupational Competency Profiles [13] (NOCP) identify that patient safety competencies are required in educational content, but the details of those competencies are not explicitly outlined. Groups involved in paramedic education in Canada do however recognize patient safety as a key competency for both seasoned practitioners and individuals new to the profession.

Enhancing education

The Institute for Healthcare Improvement offers a series of online patient safety and quality improvement lessons that paramedic educators can easily incorporate into their paramedic curricula in order to enhance and supplement education on patient safety. These courses are free for students, residents, and professors of all health professions, and available by subscription to health professionals. This ensures equity of access to patient safety education to all healthcare students. Educators can incorporate the materials from these courses, or alternatively require students to undertake the courses independently online on the IHI Open School website and then use classroom time to conduct group activities aligned to the learning objectives.

In PS100: Introduction to Patient Safety, students learn why knowledge of patient safety is critical for everyone involved in health care today. The lesson covers the human and financial toll of medical error and adverse events. It also explains why blame is rarely an appropriate or helpful response to error. Students will also be presented with four essential behaviours that any health care professional can adopt right away to improve the safety of patients.

PS101: Fundamentals of Patient Safety provides an overview of the key concepts in the field of patient safety. The lesson details the relationship between error and harm, and how unsafe conditions and human error lead to harm utilizing the 'Swiss cheese' model. When patient safety issues occur it is uncommon for any single event to be wholly responsible. It is far more likely that a series of seemingly minor events all happen consecutively and/or concurrently so that at one time, all the 'holes' line up and a serious event happens [14]. Students will learn how to classify different types of unsafe acts that humans commit, including error, and how the types of unsafe acts relate to harm.

Considering that human factors account for around 60 per cent of all errors [15], educating student paramedics and practicing paramedics on the impact of human factors on patient safety is paramount in reducing the risk to patients in the prehospital setting. PS102: Human Factors and Safety provides an introduction to the field of "human factors": how to incorporate knowledge of human behaviour, especially human frailty, in the design of safe systems. Students will explore case studies to analyse the human factors issues involved in health care situations, and learn how to use human factors principles to design safer systems of care – including the most effective strategies to prevent errors and mitigate their effects. The impact that technology can have in reducing errors – or potentially creating new errors is also discussed.

Effective teamwork and communication is essential in reducing the risk to patients. In PS103: Teamwork and Communication, students are introduced to what makes an effective team. Through case studies from health care and elsewhere, they will analyse the effects of teamwork and communication on safety. Communication tools, such as briefings, SBAR, and the use of critical language are covered. This course can be a useful segue to introduction of prehospital handover tools, such as IMIST-AMBO, which are used at transition in care [16] when errors are most likely to occur.

The goal of root cause analysis (RCA) is to learn from adverse events and prevent them from happening in the future. This is the focus of PS104: Root Cause and Systems Analysis. The lessons in this course explain RCA in detail, using case studies and examples from both industry and health care. Conducting a root cause analysis is an ideal opportunity to have paramedic students work in groups, as these are normally conducted in group settings. The UK NHS National Patient Safety Agency for example, provide a Root Cause Analysis Investigation Tool resource, as do the Joint Commission and several other organizations.

Communicating with patients after adverse events can be difficult for health care professionals. PS105: Communicating with Patients after Adverse Events teaches students what to say to a patient, and how to say it, immediately after such an event occurs. Students will also cover how to construct an effective apology that can help restore the trust between the caregiver and the patient after an adverse event.

Within the prehospital setting, the culture of self-reporting is not well-established, mainly due to fears of disciplinary action, and a "blame culture" existing. A study by Jennings and Stella in 2010 identified seven themes as barriers to incident notification in an ambulance service in Australia [11].

1. Burden of reporting
2. Fear of disciplinary action
3. Fear of potential litigation
4. Fear of breaches of confidentiality
5. Fear of embarrassment
6. Concern that 'nothing would change' even if the incident was reported
7. Lack of familiarity with process and impact of 'blame culture'

The final patient safety course, PS106: Introduction to the Culture of Safety, encourages students to dismantle the 'blame culture' and instead foster a 'culture of safety' in their workplace. This is an environment that encourages people to speak up about safety concerns, makes it safe to talk about mistakes and errors, and encourages learning from these events.

IHI Open School Chapter

An IHI Open School Chapter is a face-to-face, multi-disciplinary group that can be established amongst groups of student paramedics, and within EMS systems and paramedic services. Their purpose is to bring together healthcare professionals with a shared interest in learning about quality improvement and improving care for patients. This is an ideal forum in which to undertake patient safety discussions, collaborative exercises and IHI Open School courses.

A chapter allows students, faculty and practicing paramedics to interact and help each other gain skills to improve care, network with peers, connect with faculty, and accomplish scholarly activities such as publishing and presenting patient safety and quality improvement research. The chapter can also provide an informal opportunity to train other healthcare staff and involve patients in the patient safety education process.

The role of chapter leaders is an ideal opportunity to encourage student paramedics to gain leadership experience, and to take a formal role in advocating for patient safety topics and initiatives in their institution. This leadership structure can take the form of a board structure, flat structure, multi-campus model or a dual leadership model, details of which are outlined in the IHI Open School Chapter Leader Toolkit. Faculty should provide an advisory role to the chapter and its leaders, encouraging its growth and development.

Some suggested IHI Chapter activities are outlined below.

- Review IHI Open School online courses, or discuss case studies focused on prehospital patient safety issues.
- Invite guest speakers to share their knowledge, such as faculty, other healthcare

professionals, patients, organizations, and safety/quality improvement personnel.

- Join local patient safety and public health awareness campaigns.
- Organize patient safety clinical learning events such as simulation scenarios.
- Undertake patient education activities.
- For further information on establishing an IHI Open School Chapter, visit http://www.ihi.org/education/IHIOpenSchool/Chapters/Pages/default.aspx

Disclaimer: The views and opinions expressed in this article are those of the author and do not necessarily reflect the official policy or position of any employer or organization. The author is an IHI Open School Chapter leader (unpaid, voluntary position).

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