

**Title:** Promoting effective interprofessional collaboration using simulation in Emergency Medicine

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## **Introduction**

Safe clinical handover of care is recognised as a part of good professional practice<sup>1</sup>. Failure in this process has been acknowledged to pose significant risks to patients<sup>2</sup>. In 2012-2013, over one million patient safety incidents were reported in acute care in England and Wales<sup>2</sup>, one quarter of these incidents related to access, admission, transfer and discharge from care, when structured patient handover and effective interprofessional communication are of key importance<sup>2</sup>. Although effective strategies for patient handover have been identified<sup>3</sup>, there is a lack of consistency and uniformity in the communication and clinical skills training of various health professionals and the tools they use for patient handover<sup>4,5</sup>. Tools to overcome such barriers include standardised handover using a structured system e.g. “SBAR” (Situation, Background, Assessment, Recommendations), communication skills training on critical language<sup>4</sup>, situational awareness and human factors training<sup>6</sup>.

The importance of patient safety in health professional education has been emphasised by numerous professional bodies, including the World Health Organisation (WHO)<sup>7</sup>, the General Medical Council & the Medical Schools Council<sup>1</sup> and the College of Paramedics in the UK<sup>8</sup>. Strategies for improving patient safety in health professionals’ education include effective interprofessional collaborative practice and communication<sup>9</sup>. Since interprofessional education (IPE) can lead to positive attitudinal and knowledge effects<sup>9</sup>, more opportunities for healthcare students to train alongside each other during their undergraduate training needs to be offered.

## **Background**

The University of East Anglia (UEA), has provided fully integrated IPE to their healthcare students for over 12 years. In order to address the issues, particularly around interprofessional working in acute care, an interprofessional clinical skills (ICS) session involving year four medical and year two paramedic students was designed. The year groups were selected according to the necessary clinical skill set for this intervention.

This ICS session comprises a six-station teaching rotation where pairs of one paramedic and one medical student work together to solve clinical scenarios (Box 1), each lasting 20 minutes, within a simulated acute practice setting. The ICS stations were designed by Faculty members from both professions and staff in the Centre for Interprofessional Practice (CIPP) at the UEA with the aim of stimulating clinical reasoning and subjecting students to many of the same human factors and pressures that apply around maintaining patient safety in a practice environment, as outlined by the WHO<sup>7</sup>. The stations were carefully balanced to create equal opportunities for each student to take the lead depending on their respective skill set. Each station was designed to simulate situations in which the two cohorts of students would interact in the clinical environment when qualified and working autonomously. They were based on the clinical experience of the faculty and were intended to feel authentic and representative of the reality of practice. In many cases the stations concerned high acuity patients and serious medical situations whilst retaining a non-threatening and enjoyable atmosphere. The facilitation of the stations focused on encouraging interaction and collaboration rather than correcting technical errors and mistakes that occurred. Every station was peer reviewed by members of the faculty with the intention that over the course of the six stations students would feel they had equal opportunity to take the lead. Although the station content and intended learning outcomes remained largely unchanged from the first ICS to the second a new station was introduced in the second ICS: a simulated major incident exercise. This new station introduced a situation in which both cohorts were unfamiliar with and it prompted a balanced leadership role between medical and paramedic students and also acted as an opportunity to discuss how organizational and human factors as well as operational pressures can precipitate challenges to communication and interaction leading, inevitably, to “human” error.

Faculty from both professions, i.e. doctors and paramedics, provide immediate verbal feedback on how the students managed the case and also on how they worked collaboratively. Guidance was provided to tutors to help them structure the feedback and to ensure there was

equal emphasis placed on clinical skills, as well as interaction and collaboration between the medical and paramedic students.

Following a successful pilot of the process and content with a small group of students and some minor revisions of some stations, the ICS session was subsequently incorporated into the curricula of both paramedic and medical students. It now runs annually in order to encourage a collaborative approach to patient care between medics and paramedics in acute care.

### **Box 1. Main content of each of the six stations**

- 1) Communication skills: Admission of confused elderly lady. The medical student (GP on home visit) takes a medication history from a simulated patient and then hands over to paramedic student, whom they have called to take the patient to the hospital.
- 2) Low-fidelity simulation: Patient with Atrial fibrillation and Chest infection. The paramedic student assesses the patient and summarises assessment to medical student in the Emergency department in a handover.
- 3) Telephone consultation, confidentiality and consent: An elderly patient seen by the paramedic student refuses hospital admission for sepsis following a urinary tract infection. The paramedic calls the patients' GP (medical student) in order to negotiate a management plan using SBAR.
- 4) High-fidelity simulation: Patient with GI bleed. SIMMAN© model represents a patient with hemorrhagic shock following a gastrointestinal bleed in a patient on warfarin. The pair work together to stabilize and manage the patient.
- 5) Emergencies in practice: Three clinical scenarios relating to medical emergencies in the community. This is an unsupervised written station. Students are given answer sheets to check against their answers after 10 minutes.
- 6) Major Incident station: Combination of high and low fidelity simulation, human factors and problem-solving around triage in a major incident (train crash). Students are required to wear full protective equipment, noise and scene are simulated, but illustrations are used rather than simulated patients for triage purposes.

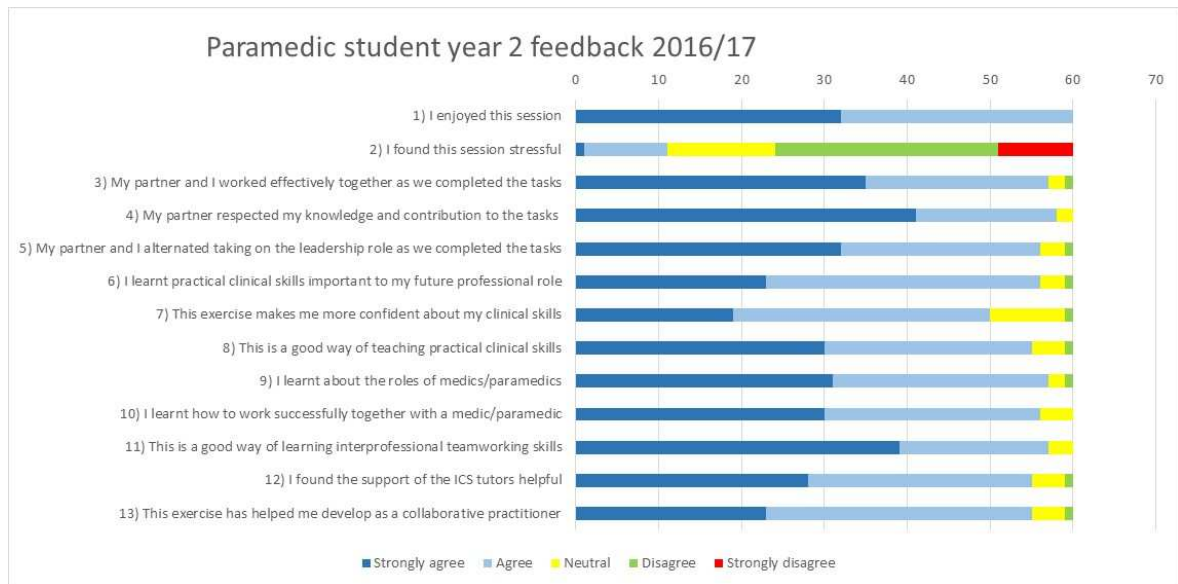
### **Methods**

During the academic year 2016-2017, 60 second-year paramedic and 63 fourth-year medical students completed this ICS. The intervention took place on two different days and on each day there were three two-hour sessions. Each student was allocated a session, emailed with the date and time relevant to them further to it appearing on their timetable. Part from this email, there is no other preparation for this IPL intervention for students. Clinical skills required would have been obtained in the course as applicable by either profession(s).

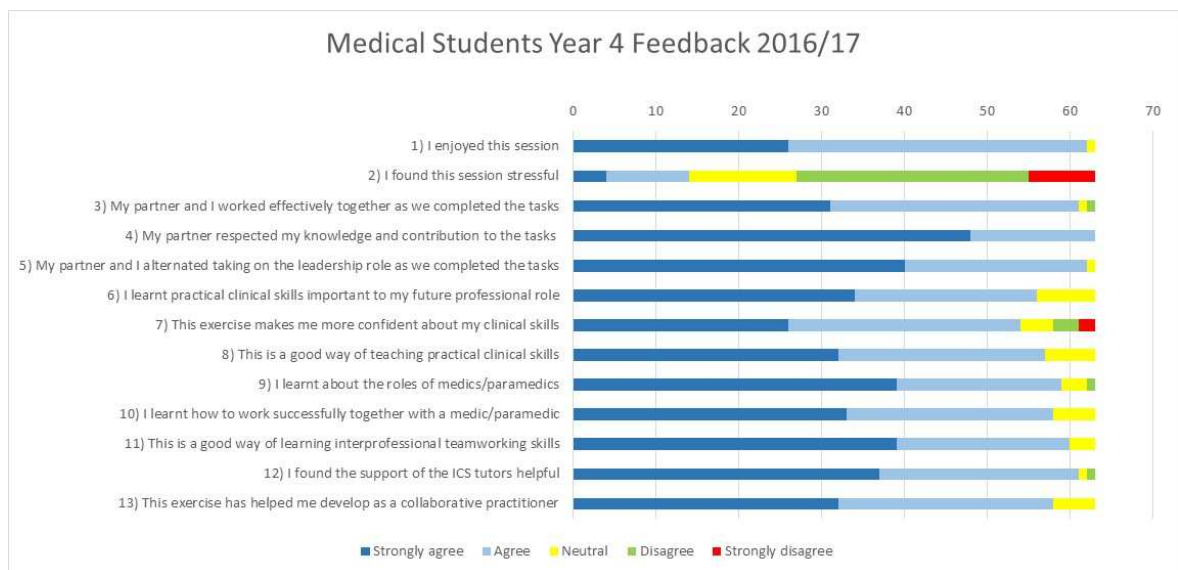
A feedback and satisfaction questionnaire (see appendix 1), developed by Faculty members from both professions and in collaboration with CIPP to monitor students' perceived achievement of the learning outcomes linked to this ICS, was completed by all student participants immediately after the event. Students were asked to rate their level of agreement of 13 statements related to the two-hour ICS session on a five point Likert scale, where 5 = strongly agree; 4 = agree; 3 = neither agree or disagree; 2 = disagree; 1 = strongly disagree. Data were collated and the mean score presented for each of the five points of the Likert scale and for each statement. In addition to providing quantitative data, students were also asked to add free text comments about what they learnt from this experience. These comments were collated and analyzed to ensure key points were taken onboard for future development of this initiative. Questionnaires were anonymous, but students were asked to say if they were a paramedic or medical student.

## **Results**

The response rate was 100%. Students enjoyed the ICS (122/123 students = 99% strongly agreed, or agreed). They felt that they worked effectively together (96%) and that they learnt about the others' professional role (94%). Students also felt that the ICS helped them develop as collaborative practitioners (92%). Results for paramedic (Figure 1) and medical students (Figure 2) correlated closely (see Figures 1 and 2). Additionally, the ICS was deemed a low-stress environment for 80% of students and high-stress for 20%.



**Figure 1.** The figure shows scores of the 60 paramedic students on each of the 13 statements.



**Figure 2.** The figure shows scores of the 63 medical students on each of the 13 statements.

Main themes arising from the free text comments included: understanding of the other profession's role and skill set; appreciation of collaborative practice; getting to know each other as people. These are outlined in Box 2 together with some example extracts.

**Box 2.** Main themes elicited from the comments and representative extracts from students.

### **Understanding of the other profession's roles and skill set**

*"I learnt the role of doctors and what they have to offer. Enjoyed the session and gained a lot from it."* – **Paramedic student**

*"I learnt most of all what it was like working with a paramedic and learning the extent of their skills and how they work together! Very enjoyable experience."* **Medical student**

### **Appreciation of collaborative practice**

*"I have learnt how to work collaboratively with another healthcare professional in a fun way, which will give me confidence to work effectively with other healthcare professionals in future practice."* **Paramedic student**

*"I have learnt more about importance of collaboration with doctors and have developed my skills in terms of patient presentations."* **Paramedic student**

*"The scenarios were useful... they made me think about shared care ie: the role of a paramedic and a doctor in emergency situations, and how to reach a shared decision on management plan."* **Medical student**

### **Getting to know each other as people**

*"Very enjoyable afternoon 😊 - fun to work with medics."* **Paramedic student**

*"Thanks! Lovely paramedics 😊"* **Medical student**

## **Discussion**

Findings presented here show that students think that ICS is an enjoyable way of learning collaborative skills in a simulated practice-setting, enhancing mutual respect and recognition of roles between the two professionals.

The success of the ICS model rests on four areas. Firstly, authentic clinical scenarios, which reflect clinical practice and areas in which handover of patient care is emphasized in a practical setting. Secondly, the use of a relaxed, enjoyable and an interactive practical teaching session



allows students to engage and get familiar with each other, which enables effective collaboration - both as people and professionals. Thirdly, the tutors provided immediate verbal feedback to students, which students really valued and appreciated. Finally, the presence of tutors from both professional backgrounds, visibly working as an interprofessional faculty throughout the event and thus role-modelling collaborative practice, is likely to positively influence the hidden curriculum. These aspects of the ICS are highly valuable for future healthcare professionals, particularly in light of the importance of effective communication between professionals during patient handover to enhance interprofessional teamworking and the understanding of professional roles and limitations<sup>4</sup> for the safety of patients.

Long *et al.*<sup>10</sup> have previously outlined a number of skills for safety that can be trained, as well as identifying which skills are most pertinent to promoting patient safety. Each of the skills enhanced by ICS and shown in Figures 1 and 2 are in the top 14 of the 72 skills for safety identified by Long and colleagues<sup>10</sup>. Despite the fact that ICS challenges the students in a variety of ways e.g.: unfamiliar teams; tools and processes encountered; high acuity patients; time pressure; complex decision-making, all but one student found the ICS enjoyable. This high level of enjoyment, coupled with the fact that 80% students report the ICS with low stress, may account for the high level of learning reported by the students. The emphasis on interprofessional collaboration and interaction between the students, coupled with the novelty and enjoyable nature of this ICS, may have contributed to the low levels of stress reported by students, despite the stations being challenging and complex. For educators, this is an important point to highlight since this type of environment enable students to learn from the tasks undertaken, rather than focus on managing their stress levels. Additionally, it will allow them to develop new schema for how they can approach similar challenges in future, and also to think ahead as to how they may enhance the safety of their future clinical practice. Regardless of this positive finding, it is important to recognise that 20 % did report that this was a high level learning exercise and explore reasons for why this may be and then address

these in the most appropriate way, perhaps by asking the tutors to provide some further reassurance during the actual event.

The learning at each station was further enhanced through immediate feedback after each ICS station. By promoting a culture of mutual respect and compassion, errors and human failures were discussed openly in a constructive manner. ICS provided students with the opportunity to standardise their approach to handover by the use of SBAR with the aim of promoting one professional language – standardisation ranks highly in the hierarchy of patient safety interventions<sup>11</sup>.

The ICS data illustrate new learning about each profession's roles, which may address some possible pre-existing stereotypical views around roles and hierarchies linked to these two professions. Hence allowing students to develop a positive attitude to each other's professions and collaborative working. Opportunities for debrief allowed for students to discuss the 'hows' and 'whys' of what occurred to validate the learning involved in relation to human error, and to consider the effect of environmental factors on reliable decision making, teamworking and communication in relation to each scenario. This study suggest that learning opportunities like this ICS can provide a safe environment where students can learn about the roles of other healthcare professionals they are likely to collaborate with in the future.

There are a number of limitations linked to the evaluation of this initiative and we recognise the importance of further work, especially in relation to the long-term impact on the day-to-day practice of the students, as future professionals. Healthcare is a highly complex socio-technical system and it is important to acknowledge that this complexity can make it challenging to make inferences about the efficacy of educational interventions such as ICS on improving patient safety. Simple metrics and positivist approaches may struggle to capture the true nature and complexity of factors that contribute to patient safety in the reality of the

clinical setting. It is however felt that by encouraging closer collaboration projects like ICS may contribute to the patient safety agenda.

It is reasonable to conclude that the findings from this study suggest that ICS is an innovative, enjoyable and meaningful learning experience for medical and paramedic students that is likely to facilitate their collaboration as future clinicians involved in acute care. Although we are unable to show empirical evidence of the effects of the intervention on patient safety, it is plausible to hypothesize that effective interprofessional learning can help improve communication between professionals and thus positively impact on the handover of patients. Further investigation is needed to follow up on graduates' experiences as clinicians to measure long-term impact on interprofessional collaborative practice and patient safety.

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