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# The Necessity of Human Factors Training in Emergency Medicine Residency: A Road Less Travelled

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Human factors have an established role in the management of critically ill patients in the intensive care unit (ICU) and emergency department (ED). This notion has undergone vigorous research in most of the developing countries with its incorporation in the training programmes, but its practice in low middle-income countries residency programmes seems bleak. The International Ergonomics Association proposed its consensus-based definition for human factors as “scientific discipline concerned with the understanding of the interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design to optimise human well-being and overall system performance.”<sup>1</sup>

The field of human factors plays an important role in critically analysing mental workload, physical demands, team dynamics, work environments, and device design needed to complete a task optimally; and improving safety and effectiveness. By understanding how we are likely to make errors, we can create an environment that helps us to make the right decisions, so that patient-safety and reliability are incorporated into every clinical operation and process in the emergency department. According to a study, an emergency physician performs on average 67 discrete tasks in a 180-minute interval and is interrupted (defined as an interruption lasting more than 10 seconds) more than 30 times!<sup>2</sup> The practice of staff intruding physicians, while they are dictating or processing patient information, is well documented and widespread. Although not all interruptions are inherently detrimental, some being beneficial to the physician with regards to a deteriorating condition of a patient or a high alert laboratory result. These frequently innate interruptions to the ED have been documented not only to be a contributing factor to medical errors, and drug dispatch errors; but, also lead to fatigue, job stress and sleep-deprivation.<sup>3</sup> Interruptions during patient consultation have also been accredited to lack of patient satisfaction and breach of confidentiality as well.<sup>4</sup> A physician is required to be attentive, vigilant and productive which becomes an uphill task, if their flow of thought is interrupted resulting in decreased job efficiency and an error-prone environment.

The incorporation of human factors into the emergency medicine residency curriculum, and especially in the resuscitation practice, can have an immense role in improving outcomes through improved training. This should be addressed each year with a sequential increase in skill, associated with their promotion. Human factor training can be accompanied by a cultural shift with acknowledgement of the need for a space designated for uninterrupted time and problem-solving. The Academic Emergency Medicine Consensus Conference, conducted in 2017, highlighted human factors and simulation in emergency medicine.<sup>5</sup> The breakout-group concluded that although it is a field less taught to physicians, it holds a high yield, if learned and performed. Human factor teachings have proved beneficial in many other high-risk industries, such as aviation, engineering, military, to name a few, and is still incorporated alongside their technical skills. Thus, if it works for them, it should work for us. The aim of human factors training is to build defensive layers to prevent errors or palliate their effects. One way of reducing human factor errors is crew resource management (CRM), an area that has become an integral part of aviation training and operation.<sup>6</sup>

An emergency physician is prone to two types of bias during his daily work— confirmation bias and availability bias.<sup>7</sup> If we consider the environment, an emergency physician is required to make life-saving decisions; it will encompass a physician who does shift work. Each physician is on a different schedule with an ample supply of clinically diverse patients, most with limited to no diagnostic information on arrival. Whilst each patient is being treated under limited time constraints, the flow of care and thought-process is hampered by relevant interruptions and irrelevant distractions. An emergency physician is reliant on multiple other specialties for their expert opinion, but these clinicians have a limited understanding of how the emergency department works; and thus, becoming a barrier to effective teamwork. If a clinician can understand what leads to an error, he may also preempt it and thus prevent it. A human being is destined to make mistakes, intentionally or unintentionally; there is always a predictable pattern. A recruit in any system is most likely to make an error due to incomplete knowledge; whereas, a trained physician is likely to make errors due to semi-autonomous behaviour. Considering the chaotic environment along with the teamwork required to maintain calm, it is routine for errors to take place in the emergency room. Some errors have become tolerable daily; and it is when the depart-

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ment gets comfortable in its disastrous setting. It becomes more likely that these routine errors will lead to a sentinel event. A department that is prone to making errors, will not carry the best team dynamics; thus losing the value of each member and an atmosphere resonating lack of leadership. Paying attention to these issues in each year of the residency with practice through a defined curriculum may shed some light on this important component of emergency medicine resuscitation practice.

Emergency medicine training requires completion of some courses such as Basic Life Support (BLS), Advanced Cardiac Life Support (ACLS), Pediatric Advanced Life Support (PALS) and Advanced Trauma Life Support (ATLS). In each of these life-support acronym courses, human factors are addressed, but their practice and application are not adequate as per the low resource settings. These non-technical skills, which deemed a trait of personality, are what human factors training can change. Currently, there is no academic training in emergency medicine to improve team function. There ought to be formal training of each emergent physician in the field of human factors, encompassing situational awareness, decision-making, leadership, conflict resolution, workload management, alarm fatigue, stress and communication etc. We, thus propose a simulation-based course that will utilise emergency case-based scenarios to improve methods of applying human factors; and thus training each resident yearly in a different non-technical, yet essential skill.



## REFERENCES

1. What is ergonomics? [Internet]. lea.cc. [cited 2021 May 22]. Available from: <https://iea.cc/what-is-ergonomics/>
2. Chisholm CD, Collison EK, Nelson DR, Cordell WH. Emergency department workplace interruptions: are emergency physicians "interrupt-driven" and "multitasking"? *Acad Emerg Med* 2000; **7(11)**:1239-43. doi: 10.1111/j.1553-2712.2000.tb00469.x.
3. Johnson M, Sanchez P, Langdon R, Manias E, Levett-Jones T, Weidemann G, et al. The impact of interruptions on medication errors in hospitals: An observational study of nurses. *J Nurs Manag* 2017; **25(7)**:498-507. doi: 10.1111/jonm.12486.
4. Paxton F, Heaney D, Howie J, Porter BA. A study of interruption rates for practice nurses and GPs. *Nurs Stand* 1996; **10(43)**:33-6. doi: 10.7748/ns.10.43.33.s53.
5. Rosenman ED, Fernandez R, Wong AH, Cassara M, Cooper DD, Kou M, et al. Changing Systems Through Effective Teams: A Role for Simulation. *Acad Emerg Med* 2018; **25(2)**:128-43. doi: 10.1111/acem.13260.
6. Bleetman A, Sanusi S, Dale T, Brace S. Human factors and error prevention in emergency medicine. *Emerg Med J* 2012; **29(5)**:389-93. doi: 10.1136/emj.2010.107698.
7. Hartigan S, Brooks M, Hartley S, Miller RE, Santen SA, Hemphill RR. Review of the basics of cognitive error in emergency medicine: Still no easy answers. *West J Emerg Med* 2020; **21(6)**:125-31. doi: 10.5811/westjem.2020.7.47832.