Simulation based training

Are simulation and didactic crisis resource management (CRM) training synergistic?

J B Cooper

Simulation may have an additive component to classroom style training, at least in the short term

Full environment simulation is achieving wide adoption despite weak evidence of its impact on outcome. It is doing so because it has strong face validity, creates much enthusiasm from both students and teachers, and because it is what other high hazard industries do to mitigate errors and to create and maintain a culture of safety. Yet most of us working with simulation technologies and techniques generally try to maintain our fidelity is needed to achieve our educational goals, and how we weigh the costs and benefits. When we are using it for non-technical training such as improving teamwork, we want to understand how it should be used to meet the real objective—creating real lasting behavior and culture changes that will make health care more effective and safer.

The paper in this issue of *QSHC* by Shapiro and colleagues demonstrates a model for using simulation to sustain behavior change and adds some additional evidence to bolster our general beliefs. But, as often happens with studies of educational and training interventions, we are left with many more questions than answers and are disappointed by an underpowered study, although not by much. That is not the fault of the investigators whose underlying methods were an advance over what we usually see in the world of non-technical simulation based training. The fault lies with having so few resources to perform the robust research designs needed, and also with the challenges of doing any research on human performance in naturalistic settings.

What is the utility of high fidelity, high realism, simulation based training for non-technical skills and culture change? We have plenty of evidence that those who experience it usually feel strongly that it is important for teaching skills which they do not otherwise experience or practice. We have anecdotes illustrating how it appears to impact on clinical performance. Almost anyone who uses simulation to teach or reinforce teamwork or crisis resource management (CRM, or crew resource management as it is called in aviation) has encountered students who say they altered their fundamental way of doing things and working with their colleagues. I have heard many of these stories first hand, so I know the passion of those who have had such a transformational experience. That is one of the most useful applications of this form of simulation: transformational change for those who need first to recognize the problem before they can start to work on it. But fundamental, lasting, outcome altering organizational change cannot come with single interventions of one type. The important illustration from this study is how simulation can be coupled with other forms of CRM techniques to sustain improvements. Neither simulation nor non-simulation based training is likely to be effective alone for their intended purposes.

Aviation, maritime, and nuclear industries all use combinations of stand-up training and simulation based training to establish and maintain human factors programs intended to minimize error, mitigate the error chain, and enhance performance. We get some tantalizing evidence in this new report that simulation has an additive component, at least in the short term, to classroom style training.

The general methodology used by Shapiro et al is illustrative of the kind of trials needed to produce evidence of transfer-of-training. The groups are randomized, there are sound validated measures of behavior with a measure of inter-rater reliability, and the raters are blinded to which cohort they are observing. But the study also demonstrates the flaws typical of educational studies: the sample size is too small, it is not linked to patient health outcomes (injury, death, reduced length of stay in hospital), there is no cost/benefit measure, and there are many sub-elements in the independent variable (degree of realism, quality of instruction, time of instruction, time between the MedTeams and simulation training) which can strongly impact on the effectiveness of training but are not examined in the experiment.

It is easy to criticize educational studies. I have not personally been involved with a successful one that is up to the standards of the “hard” sciences (which often themselves give us answers that later prove to be wrong by further research). This is difficult work but it needs to be done—even with the flaws—because each piece of evidence adds something to what we know. We also have to be willing to publish the negative results and to validate tools and approaches for studying simulation.

Regardless of any criticism I might have of studies of simulation, when it comes to adopting simulation as an integral component of creating high reliability healthcare organizations, I accept and promote Gaba’s observation that “... no industry in which human lives depend on the skilled performance of responsible operators has waited for unequivocal proof of the benefits of simulation before embracing it.” Why should health care be different?


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Informed consent

Informed consent: don’t throw out the moral baby with the critical bath water

L Doyal

Informed consent is one of the most important bricks in the edifice of “right” medical treatment, but low standards must be recognised and corrected

It is well over two decades since Ian Kennedy published “Unmasking Medicine” based on his Reith lectures. He launched an inspired attack on medical paternalism in the UK which in many important respects has now been won—at least in principle. Clinical practice is now expected to embody the duty both to protect life and health and to respect individual autonomy—the right of competent patients to make informed choices about their medical options. Indeed, it is now both legally and professionally clear that, when these two duties are in conflict, the latter trumps the former. Ultimately, the competent adult patient has the final say about whether or not to accept or reject proposed treatment, even when refusing may mean death.

There is now a well articulated body of statute and case law designed to reinforce the right of patients to consent to or refuse treatment on the basis of appropriate information. Guidance from the GMC and professional organisations—particularly the BMA—does the same.23 The Department of Health has issued specific instruction about the standard of obtaining consent to which Trusts are expected to conform, including the structure and content of consent forms.4 In relation to medical education, courses abound in ethics and law concerning the structure and content of consent forms. In many important respects has now been won—at least in principle. Clinical practice is now expected to embody the duty both to protect life and health and to respect individual autonomy—the right of competent patients to make informed choices about their medical options. Indeed, it is now both legally and professionally clear that, when these two duties are in conflict, the latter trumps the former. Ultimately, the competent adult patient has the final say about whether or not to accept or reject proposed treatment, even when refusing may mean death.

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amounts of appropriate information, it is hardly surprising that patients may sometimes feel that interactions are abrupt and lack meaning. This would be the case irrespective of the ethical and legal understanding and the communication skills of their clinicians. Of course, this problem may be mitigated by the effective use of published information about surgical and medical procedures. However, the development and design of such literature is not easy, especially regarding the communication of understandable information about risks. Effectiveness entails the consumption of scarce NHS resources. These may not be available because of the need to use what resources are available simply to optimise the quality and safety of clinical interventions. In short, good ethics costs money and the NHS has some way to go in creating hospital or primary care environments that are consistent with optimal success in obtaining truly informed consent.

CONCLUSION

It is difficult to know how representative the study by Habiba et al is about the quality of consent within O&G. On the one hand, we know nothing of the communication training and skills of the staff who obtained consent from the women who were interviewed or the time and other resources that they had to do so. On the other hand, and this is always a problem with in-depth interview techniques, it is hard compare a process that has engendered complaints with the level of complaints there would be if there were no such process at all, even a substandard one. The fact remains that the doctrine of informed consent is one of the most important bricks in the edifice of what Kennedy calls “right” medical treatment. Without it, patients would be little better than slaves to whom doctors could use their “clinical discretion” to treat as they pleased. We want the communication and negotiation associated with informed consent to be as effective as possible and to recognise and correct low standards where they exist. But we do not want to throw out the moral baby with the critical bath water when and if we discover it. Certainly, some of the women having elective O&G care who were interviewed understood this. They indicated that having to sign a consent form reminded them that only they could ultimately determine whether or not they would receive treatment. Indeed!


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Exploring the use of game theory to address quality

G Elwyn

PRINCIPLES OF GAME THEORY

The central principle in game theory is that “players think about what others are likely to do, and do so with some degree of thought.” Although there are many types of games used to explore this “thinking”, all have a structure that involves an interaction leading to a reward or a loss between people, in pairs or, more recently, between and within groups. The “laboratory rat” of game theory is called the Prisoner’s Dilemma where two players independently face a decision whether to collaborate or defect (box 1).

The Prisoner’s Dilemma predicts a rational strategy for players, one of mutual defection (the Nash equilibrium) which gives a safe but low return over many interactions, rather than cooperation which offers a greater reward but at a greater risk. What is surprising is that humans spurn the rational strategy more often than not, preferring instead to cooperate. This outcome is one demonstrated repeatedly, not just in the Prisoner’s Dilemma but in more complex games such as the Centipede.

How this irrational behaviour persists in the “survival of the fittest” paradigm is ironically best explained by those evolutionary theorists who have looked to game theory themselves, and suggest that our oversized cerebral cortex with its unique consciousness has arisen not from a “dog eat dog” strategy of survival but from a Machiavellian drive to forge allegiances and beat the competition using guile rather than brute force.

The problem of cooperation is an area of active research where interdisciplinary debates between game theorists (mathematicians generally),
and found disadvantages to both consumer and provider in each design. Medicine could usefully extend this work to examine where continuity adds (or detracts) value to professional-patient interactions.

Existing research on the medical consultation is devoid of a theoretical basis. While there are plenty of prescriptive models such as the “patient centred method”; the “Cambridge Calgary” approach and so on, this field does not seem to have provided a theory on which to examine the empirical findings. Descriptive work such as that by Byrne and Long, assessment of videotapes in the Royal College of General Practitioners’ examination, and the recent analyses by discourse analysts reveal that practitioners do not come anywhere near performing according to the prescribed “idealised” models.

So where does the fault lie? With the practitioners or with the models? The models are based on professionally constructed idealised communication methods and have not been based on adequate theories of how humans interact, given the differing payoffs for patients and practitioners. For health professionals, keeping to time and limiting their exposure to large volumes of patients is a way of managing their workload, maximising income, and keeping sane. At the same time they need to retain the cooperation of patients by building trust, obtaining information, and proving to be good at solving and dealing with problems. The payoffs for doctors of engaging in advocacy methods of communicating—exploring ideas, concerns and expectations, for instance—are not so clear. Payoffs for patients are different in different situations. Fast provision of a sought-for medication is all some people are looking for; others are looking for supportive ongoing relationships where chronic illnesses are explained and mastered in partnerships, while others are looking for a screening investigation but are unaware of the possible harms involved, and so on. It may well be time to pause for thought and to examine the motivations for doctors and patients in a different way.

When combined with developments in neuroscience, particularly real time MRI scans, games such as the Prisoner’s Dilemma show that cooperation leads to activation of brain areas associated with reward processing and learning, reinforcing the behaviour over and above the payoff itself. So it appears that humans are programmed to be more than calculating machines, interested only in maximising utility, as pure game theory would have it. Instead, we like to work together, to some extent at least, and it is a matter for further research to explain how. Game theory offers medicine a potential method, yet the complexity and the layered nature of the consultation cannot be easily modelled by one or other of the existing games in the game theory playground. In their paper in this issue of QSHC, Tarrant and colleagues12 concede that this will be a considerable challenge. If it is possible, perhaps we can then think about improving the quality of the consultation process and create gains for practitioners, patients, and health service economists.

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