Modelling clinical judgement improved health care delivery: using “how nurses think” to manage the deteriorating patient

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Aims: This study aims to construct a model for learning reasoning in the workplace, using computer based system dynamic processes, to support clinical decision-making in relation to detection and management of the deteriorating patient.

Background: Assessment and timely management of a deteriorating patient is a priority area for improvement highlighted by several Government, independent and health agency reports[1-4]. Computer modelling of judgement processes can identify areas of difficulty in decision-making and assist nurses and other health care professionals to recognise and seek timely assistance for patients who deteriorate. Seminal work by Benner and Tanner[5-7] on “how expert nurses think” led to the publication of Tanner’s theoretical model of clinical judgement[8] (Figure 1). This model maps the primary processes involved in clinical reasoning, and forms the basis of curricula in nursing courses internationally and within Australia. By explicitly modelling the time nurses take to progress through the processes of decision-making when planning and providing patient care, we can identify points where potential error and harm could occur, and thereby potentially improve patient outcomes.

Figure 1: Clinical Judgment Model

Methods: A concept map, based on Tanner’s Clinical Judgement Model, was developed and converted to a computational system dynamics model, using the approach described by Rudolph et. al. The model was refined via input from experienced nursing academics and practitioners. To obtain data to populate the model, nurses’ performance will be observed in three training encounters: an undergraduate critical care nursing elective trauma patient simulation; a postgraduate critical care nursing oral viva challenge and a postgraduate acute care nursing simulation. Videotapes of simulation exercises will be analysed to allow concurrent tracking of nurses’ verbal statements and actions. This also allows the time taken by nurses to interpret cues, and to initiate action, to be calculated. Post hoc video reviews will be conducted with nurse participants to facilitate exploration and interpretation of ambiguous cues, and to examine cognitive processes underpinning decisions. Opinions from experienced viva examiners will provide additional data on clinical decision-making processes.

Results: The study produced a dynamic model of reasoning, showing how nurses of varying experience make decisions about care requirements for deteriorating patients. Importantly, the model is potentially able to identify nurses’ patterns of problem-solving behaviour, and pinpoint where delays in clinical decision-making processes are most likely to occur. ‘What if’ scenarios can be run on the model to explore the impact of factors affecting decisionmaking on the timely identification and management of the deteriorating patient. This is expected to have significant clinical benefits by providing an opportunity for educators to develop targeted training programs that help staff recognize and appropriately manage patients who are clinically deteriorating.

Conclusions: The dynamic model of reasoning will be available to be used for clinical practice review, training development and assessment activities. The model could be used to support professional development in clinical reasoning.
training using case studies, playing out and debriefing simulation scenarios, planning and evaluating the impact of eHealth interventions such as nurse decision support, data collection framework for patient safety and systems improvement, and analysis of critical incidents.

References: