

Virtual patients may make hospitals safer for 'real' patients

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Background

The incidence of safety breaches due to problem-solving or decision-making errors made by junior doctors in hospitals remains constant (Baker et al. 2004, Stewart et al. 2009), despite medical schools providing early patient contact, more robust assessments and critical incident training for students. Although the UK public accepts hospitals are educational institutions, everyone is concerned to ensure that new doctors practise as safely as possible.

BADGER is a Leicester University based project exploring the potential of *Virtual Ward*, a web-based software program which creates virtual patients (VPs), for resolving this tension. BADGER is an acronym for 'Browser-based Assessment of Decision-making using virtual patients Generated by Expert peer-Review', and reflects key features of the project – technology, testing of technical skills, teachers and trainees in medicine.

Browser-based Assessment of Decision-making using virtual patients Generated by Expert peer Review

The BADGER project – primarily funded by the East Midlands Deanery and the University Hospitals of Leicester NHS Trust – investigates the use of browser- or web-based virtual patients for developing clinical reasoning skills amongst health professionals. The development of problem-solving and decision making amongst undergraduate students across the 5 years of medical school will be explored in partnership with the University of Leicester, and OCB Media who have developed the 'Virtual Ward' software.



BADGER will contribute 15 virtual patient cases across 5 clinical specialities at the University Hospitals of Leicester NHS Trust for use in the MBChB curriculum. The entire process from case storyboarding through to advertising virtual patients on VLE will be characterised to show what is required from institutions (University and NHS) to deliver these high quality resources.

What will BADGER achieve?

BADGER addresses a strong need for providing high quality authentic educational resources for health professionals to learn about problem-solving and decision-making in the workplace.

BADGER aims to explore the individual experience from using virtual patients for learning clinical medicine and characterise the influence of virtual patients on the development of reasoning by:

- Designing and developing 15 virtual patient cases for use as educational resource or formative assessment.
- Usability test virtual patient cases in direct use with learners and professional to provide empirical data for validating published guidelines and commentary from wider medical education community
- Introduce and investigate how learners use virtual patients, when they use them, and in what circumstances.
- Evaluate the utility for virtual patients to be used in formative or summative assessment



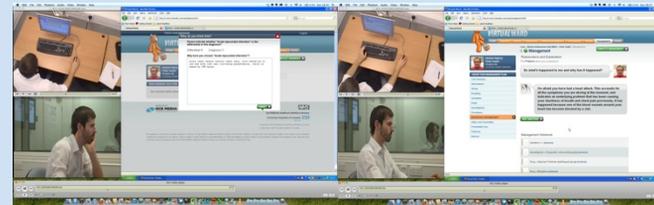
A VP is a specific type of computer program, which simulates real-life clinical scenarios, so learners can emulate the roles of health care professionals to obtain a history, conduct a physical exam, and make diagnostic and therapeutic decisions (Cook, Erwin & Triola 2010).

Methods

A 'waiting room' of VPs was integrated into the undergraduate curriculum at Leicester Medical School in Spring 2011. Students in the first, third and fifth year of the 5-year medical (MBChB) course were provided access to VPs alongside their usual learning resources. Students were given similar challenges to those faced by doctors when treating real patients, as VPs 'came to the hospital' for attention.



Multiple consultations with VPs allowed students to master the skills necessary for safe and effective clinical decision-making over a seven-week clinical rotation.



One-to-one sessions with medical educators were also offered to explore the usefulness of the technology as a coaching tool. Cognitive mapping (Cropper, Eden & Ackermann 1990) was used to capture student thoughts as they worked through problems and made decisions during the personal sessions.

Results

Preliminary evaluations show students find VPs useful because they provide an immersive experience in which they can learn from their mistakes, without fear of reprisal or causing harm to real patients.

"Teaching/learning problem solving or decision-making is difficult especially during medical school as we hardly get any opportunities where we might be challenged to give our opinions... the virtual ward also experience puts us in a position to make decisions and actually go through cases and approach them as if you were the doctor" ... – Vaishnavi Kumar, Year 5 medical student



"... Virtual Ward allows you to practice making decisions just as though you are on the wards. I wasn't sure about a particular drug, but prescribed it knowing I would get feedback from the expert afterwards. I'd definitely recommend this resource to medical students wanting to improve their clinical skills" ... – Anoop Babu, Year 5 medical student



The experience of medical educators who undertook one-to-one sessions suggest VPs may be an effective tool for screening and remediating difficulties associated with clinical problem-solving or decision-making with students who struggle.

Feedback from medical students also suggest VPs created using *Virtual Ward* enabled them to identify areas of learning which could be strengthened by themselves, or during personal sessions with medical educators.

"I think the session is a great method of teaching. The program allows the student an opportunity to work through a clinical case, from history to management, in a safe environment. The one-to-one session has the added value of providing feedback from an experienced doctor after he has observed your problem-solving skills, something that the program can't really do. As I have explained, I think we all hope to find a clinician willing to do this during our placements, but for obvious reasons, this is rarely possible. I think it would be great if the two (program and session) are made available for future medical students" – Anna Harrison, Year 5 medical student

Conclusions and next steps

VPs created using the *Virtual Ward* provide authentic challenges facing health professionals for medical students within a safe learning environment which allows repeated practice.

The blended approach of using VPs with medical students during one-to-one sessions alongside a medical educator, may have the potential to avert serious errors of thought or judgement from escalating into the NHS.

Further longitudinal research is planned to establish whether VP technologies can help improve real world performance and reduce clinical errors amongst health professionals.

References

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